Structural
Geotechnical

Materials Testing
Forensic

SOILS AND GEOLOGY STUDY

Currently Addressed: 11525 Howells Road
Schedule No. 6214000071
El Paso County, Colorado

PREPARED FOR:

William Guman & Associates, Ltd
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JOB NO. 198665

May 27, 2026

Respectfully Submitted,
RMG Engineers

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1.0 GENERAL SITE AND PROJECT DESCRIPTION

1.1 Project Location

The project lies in the SW¼ of the SW¼ of Section 14, Township 12 South, Range 66 West of the 6th Principal Meridian in El Paso County, Colorado. 11525 Howells Road is generally located northeast of the intersection of Mountain View Drive and Howells Road. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

1.2 Existing and Proposed Land Use

The site consists of one parcel (per the El Paso County Assessor's website). The parcel included in this study is:

- **Schedule No. 6214000071**, currently addressed as 11525 Howells Rd, zoned *"RR-5 – Residential Rural",* and consists of 5.00 acres.

An existing single family residence resides near the southwestern corner of the property. A two-lot minor subdivision is proposed. If approved, it is our understanding the zoning designation is to change from "*RR-5 to RR-2.5".*

1.3 Project Description

It is our understanding the existing 5.00-acre parcel is to be subdivided into two lots. The western lot is to be 2.5 acres and is to retain the existing single-family residence, individual water supply well and on-site wastewater treatment system. The eastern lot is to be approximately 2.5 acres, and is to eventually contain a new single-family residence, individual well, and on-site wastewater treatment system (OWTS) once the subdivision is approved. The Proposed Lot Layout Map is presented in Figure 2.

1.4 Previous Investigations

Reports of previous geotechnical engineering/geologic investigations for this site were not available for our review. However, reports in the immediate area are listed below:

1. *Soil and Geology Study, Canyon Creek Ranch, El Paso County, Colorado,* prepared by RMG – Rocky Mountain Group, Job No. 189360, last dated January 9, 2025.
2. *Open Hole Observation, 11525 Howells Road, El Paso County, CO,* prepared by Front Range Geotechnical, Inc, dated January 20, 1999.
3. *Soils Report, 11525 Howells Road, El Paso County, Colorado,* prepared by Front Range Geotechnical, Job #5996 GC, dated December 18, 1998.

2.0 QUALIFICATIONS OF PREPARERS

This Soils and Geology Study was prepared by a professional geologist as defined by Colorado Revised Statures section 34-1-201(3) and by a qualified geotechnical engineer as defined by policy statement 15, "Engineering in Designated Natural Hazards Areas" of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors. (Ord. 96-74; Ord. 01-42)

The principle investigators for this study are Kelli Zigler P.G., and Tony Munger, P.E. Ms. Zigler is a Professional Geologist as defined by State Statute (C.R.S 34-1-201) with over 25 years of experience in the geological and geotechnical engineering field. Ms. Kelli Zigler holds a B.S. in Geology from the University of Tulsa. Ms. Zigler has supervised and performed numerous geological and geotechnical field investigations throughout Colorado.

Tony Munger, P.E. is a licensed professional engineer with over 25 years of experience in the construction engineering (residential) field. Mr. Munger holds a B.S. in Architectural Engineering from the University of Wyoming

3.0 STUDY OVERVIEW

The purpose of this investigation is to characterize the general geotechnical, geologic site conditions, and on-site wastewater treatment system (OWTS) feasibility in order to present our opinions of the potential effect of these conditions on the proposed development within El Paso County, Colorado. As such, our services exclude evaluation of the environmental and/or human, health related work products or recommendations previously prepared, by others, for this project.

Revisions to the conclusions presented in this report may be issued based upon submission of the Development Plan. This study has been prepared in accordance with the requirements outlined in the El Paso County Land Development Code (LDC) specifically Chapter 8, last updated August 27, 2019. Applicable sections include 8.4.8 and 8.4.9, and the El Paso County Engineering Criteria Manual (ECM), specifically Appendix C last updated July 9, 2019.

3.1 Scope and Objective

The scope of this study is to include a physical reconnaissance of the site and a review of pertinent, publically available documents including, but not limited to, previous geologic and geotechnical reports, overhead and remote sensing imagery, published geology and/or hazard maps, design documents, etc.

The objectives of our study are to:

- Identify geologic conditions present on the site
- Analyze potential negative impacts of these conditions on the proposed site development
- Analyze potential negative impacts to surrounding properties and/or public services resulting from the proposed site development as it relates to existing geologic conditions
- Provide our opinion of suitable techniques that may be utilized to mitigate any potential negative impacts identified herein

This report presents the findings of the study performed by RMG-Rocky Mountain Group relating to the geologic conditions of the above-referenced site. Revisions and modifications to this report may be issued subsequently by RMG, based upon:

- Comments received from the governing jurisdiction and/or their consultants subsequent to submission of this document
- Additional observations made during grading and construction which may indicate conditions that require re-evaluation of some of the criteria presented in this report
- Review of pertinent documents (development plans, plat maps, drainage reports/plans, etc.) not available at the time of this study

3.2 Site Evaluation Techniques

The information included in this report has been compiled from several sources, including:

- Field reconnaissance
- Geologic and topographic maps
- Review of selected publicly available, pertinent engineering reports
- Available aerial photographs
- Subsurface exploration by RMG
- Visual and tactile characterization of representative site soil and rock samples
- Geologic research and analysis
- Site plan prepared by others

Geophysical investigations were not considered necessary for characterization of the site geology. Monitoring programs, which typically include instrumentation and/or observations for changes in groundwater, surface water flows, slope stability, subsidence, and similar conditions, are not known to exist and were not considered applicable for the scope of this report.

3.3 Additional Documents

Additional documents reviewed during the performance of this study are included in Appendix A.

4.0 SITE CONDITIONS

4.1 Existing Site Conditions

The western portion of the site is developed with an existing single-family residence, well, and septic system. The eastern portion of the site is undeveloped land and largely covered with dense forest. The site is generally located northeast of the intersection of Mountain View Drive and Howells Road in El Paso County, Colorado and comprises approximately 5.0 acres. The site is currently zoned RR-5, Residential Rural and is to be changed to RR-2.5. Adjacent properties to the north, south, east, and west are zoned RR-5 and consist of 5 acres of more. Kettle Creek resides near the northeastern

property boundary. The banks of Kettle Creek have significant slopes/drop-offs up to 30 feet in areas, to the bottom of the creek.

4.2 Topography

Based on our site reconnaissance on December 12, 2025 and review of the USGS 2023 topographic Pikeview Quadrangle, the site generally slopes down to the north towards Kettle Creek. The overall elevation change of the majority of the site (excluding the banks of Kettle Creek) is approximately 15 feet. Kettle Creek is a major creek which is located near the northeastern property boundary. The creek drops off steeply near the northeastern portion of the site and has more than a 15-foot elevation change.

4.3 Vegetation

The western portion of the site consists primarily of low-lying native grasses and weeds, manicured lawn with minor landscaping while the eastern portion of the lot consists of tall undisturbed grasses and weeds with dense stands of ponderosa pine trees. The creek banks are barren of vegetation and sandstone outcrops are visible. The bottom of the creek had low lying vegetation and scattered trees throughout. A thin band of water was present at the bottom of the creek.

4.4 Aerial Photographs and Remote-Sensing Imagery

Personnel of RMG reviewed aerial photos available through Google Earth Pro dating back to 1999, CGS surficial geologic mapping, and historical photos by historicaerials.com dating back to 1947. Historically, the site was vacant, undeveloped land prior to the existing single-family residence construction in 1999. Since 1999, the site has remained relatively unchanged.

5.0 SUBSURFACE SOIL INVESTIGATIONS

A site-specific soil report was completed for the existing residence in 1998. The subsurface conditions below the existing residence were previously investigated by Front Range Geotechnical. Two additional test borings were performed by RMG on December 2, 2025 as part of this investigation to confirm the soils on the proposed new eastern lot.

5.1 Previous Investigation – Existing Residence

The original soil report for the existing residence that is to remain, was obtained from the Pikes Peak Regional Building website. The report is discussed briefly below.

Two test borings were performed on November 25, 1998. The test borings extended to approximately 15 feet below the ground surface. The subsurface soil conditions reportedly encountered topsoil to 4 inches, overlying native sand that extended to the 15-foot termination depths of the borings. Groundwater was not reported.

5.2 Previous Laboratory Testing – Existing Residence

The soils were reported to have a low swell potential. Based on the open hole observation, no anomalies, soft spots, or debris was present in the foundation area. An overexcavation was not performed.

5.3 RMG 2025 Site Exploration

RMG's test borings were located on the new proposed eastern lot. The test boring locations were selected to provide preliminary soil information for the proposed subdivision and future residence. The materials encountered near the surface consisted of silty sand with gravel and sandy clay overlying sandstone with interbedded claystone seams.

The subsurface conditions were explored by RMG by drilling two (2) test borings. The test borings were performed on December 2, 2025 and extended to 20 and 30 feet below the existing ground surface. Additionally, two (2) test pits were observed on December 12, 2025. The approximate location of the test borings and test pits are presented on the Test Boring/Pit Location Plan, Figure 3.

The test borings were drilled with a power-driven, continuous-flight auger drill rig. Samples were obtained during drilling of the test boring in general accordance with ASTM D-1586 and D-3550, utilizing a 2-inch O.D. Split Barrel Sampler and a 2½-inch O.D. California Sampler, respectively. The test pit logs and soil descriptions are presented in the Wastewater Study, included in Appendix B.

5.4 RMG 2025 Laboratory Testing

The moisture content for the recovered samples was obtained in the laboratory. Grain-size analysis, and Atterberg Limits tests were performed on selected samples for purposes of classification and to develop pertinent engineering properties. An Explanation of Test Boring Logs is presented in Figure 4. The Test Boring Logs are presented in Figure 5. A Summary of Laboratory Test Results is presented in Figure 6. Soil Classification Data are presented in Figure 7.

5.5 Test Pit Excavations

Test pits were not performed on the western lot that is to contain the existing residence. The existing residence is to retain the existing septic system. The two test pits on the proposed new eastern lot were performed to explore the subsurface soils surrounding the existing On-site Wastewater Treatment System on the proposed new eastern lot. The number of test pits is in accordance with Regulations of the El Paso County Board of Health, Chapter 8, On-site Wastewater Treatment Systems (OWTS) as required by 8.5.D.3.a.

The test pits were excavated to approximately 6 and 7 feet below the existing ground surface. Additional information is provided in Section **9.0 On-site Disposal of Wastewater**.

5.6 OWTS Visual and Tactile Evaluation

A visual and tactile evaluation was performed in conjunction with this investigation. The soils were evaluated to determine the soils types and structure. Bedrock was encountered at 5 and 7 feet in the test pits. Bedrock is considered a restrictive layer for the treatment area. Evidence of seasonally fluctuating high groundwater was not observed in the test pits. The test pit logs and soil descriptions are presented in the Wastewater Study, included in Appendix B.

5.7 Groundwater

Groundwater was not encountered in the test borings or test pits performed for this investigation.

We do understand surface and subsurface water elevations will fluctuate throughout the year. The test borings (both previous and current) were performed in the winter season. Generally boring performed in the winter months' exhibit "deeper" groundwater during the "drier" season (winter). It should be noted that in granular soils and bedrock, some perched water conditions might be encountered due to the variability of the soil/bedrock. Isolated sand and gravel layers within the soil, even those of limited thickness and width, can carry water in the subsurface. Groundwater may also flow atop the underlying bedrock. Future construction is currently proposed on the new eastern lot, builders and planners should be cognizant of the potential for the occurrence of subsurface water conditions during on-site construction, in order to evaluate and mitigate the site specific problem as necessary. Groundwater is not expected to influence the construction of the proposed single-family residence on the new eastern lot.

Fluctuations in groundwater and subsurface moisture conditions will occur due to variations in rainfall, irrigation, changes in surface drainage patterns, and other factors not readily apparent at this time. Development of the property and adjacent properties may also affect groundwater levels. However, it is our opinion that groundwater will not affect the proposed construction as currently proposed.

6.0 SOIL, GEOLOGY, AND ENGINEERING GEOLOGY

The site is located within the central portion of the Great Plains Physiographic Province. A major structural feature known as the Rampart Range Fault is located approximately 8.3 miles west of the site. The Rampart Range Fault marks the boundary between the Great Plains Physiographic Province and the Southern Rocky Mountain Province. The site exists within the southern portion of a large structural feature known as the Denver Basin. In general, the geology at the site consists of Holocene-aged arkosic loamy colluvium and sheetwash alluvium overlying sandstone of the Dawson Formation facies unit three.

6.1 Subsurface Soil Conditions

Based on the RMG reports referenced above and the test borings performed, the on-site surficial soil on the proposed new eastern lot is comprised of silty sand with gravel and sandy clay. The surficial soils extended to depths ranging between 9.5 to 12 feet below the ground surface. The sandy soils are

considered non-expansive and suitable for bearing of foundations. The clay soils are considered expansive and not suitable for bearing of foundations.

6.2 Bedrock Conditions

Bedrock (as defined by USDA) was encountered in the test borings performed on the proposed new eastern lot. The bedrock beneath the site is considered to be part of the Dawson formation. The Dawson formation is thick-bedded to massive, generally light colored arkose. The sandstones are poorly sorted with variable clay contents. The sandstone is generally permeable, well drained, and has good foundation support characteristics. The Dawson sandstone could be considered a limiting layer for the OWTS. The sandstone bedrock was encountered in both the test borings performed by RMG on the proposed new eastern lot. The sandstone was encountered at 13 and 12 feet in the test borings. The sandstone was encountered at medium hard to very hard densities. If the sandstone is encountered in the foundation excavation it is considered "excavatable" with standard construction equipment. The sandstone is considered suitable for bearing of foundations.

Claystone bedrock was encountered in test boring TB-1 at a depth of 9.5 feet. The claystone within the Dawson formation is generally brown to gray, well sorted with variable sand contents. The claystone is generally non-permeable, collects and holds water, and does not have good foundation support characteristics. The claystone would be considered a limiting layer for the OWTS. The claystone was encountered in TB-1 with residual claystone encountered in TB-2 at a depth of 5 feet. The claystone was encountered at a medium hard density. The claystone encountered is considered "excavatable" with standard construction equipment. If the claystone (or clay) is encountered in the foundation excavation, it is not considered suitable for bearing of foundations and will require mitigation prior to placing foundation components.

6.3 U.S. Soil Conservation Service

The USDA/NRCS soil survey identifies the site soils as:

- **41 – Kettle Gravelly Loamy Sand**, 8 to 40 percent slopes. The Kettle Gravelly Loamy Sand was mapped by the USDA to encompass a small portion of the southeast corner of the property. Properties of the loamy sand include somewhat excessively drained soils, depth of the water table is anticipated to be greater than 80 inches, runoff is anticipated to be medium, frequency of flooding and/or ponding is none, and landforms include hills.
- **68 – Peyton-Pring complex**, 3 to 8 percent slopes. The Peyton-Pring complex was mapped by the USDA to encompass the majority of the property. Properties of the Peyton-Pring complex include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be low, frequency of flooding and ponding is none, and landforms include hills.

this is not the correct property

The USDA Soil Survey Map is presented below.



6.4 General Geologic Conditions

Based on our field observations and review of relevant geologic maps, we identified the geologic conditions (listed below) affecting the development, as shown on the Engineering and Geology Map, Figure 8.

The geologic units mapped at the site are discussed below:

- ***Tkda3 – Dawson Formation Facies Unit Three (Paleocene)*** – this unit is generally light-gray to greenish-gray, contains interbedded sandy claystone that is known to be expansive in the area, and underlies the entire site. This unit was encountered in the both the test borings. Residually weathered claystone, claystone and sandstone were encountered at approximately 9.5 to 12-foot below the surface. The claystone within the Dawson Formation is known to possess low to moderate expansiveness.
- ***"No Build Zone"*** – Areas that contain slopes greater than 30% within the Kettle Creek drainageway are to be considered a "No Build Zone".

6.5 Engineering Geology

The engineering geology unit mapped at the site is discussed below:

- ***2A – Stable Alluvium***, ***colluvium and bedrock*** on gentle to moderate slopes (5-12%). This unit applies to the area west of the steeper Kettle Creek banks. The banks of Kettle Creek are exposed near the northeast corner of the site with slopes greater than 12%, near vertical in some locations.

The map unit description was provided by Charles Robinson and Associates (1977). RMG agrees with the slope percentages as they relate to the subject site.

Please include where the no-build plat restriction should be located on the plat and how much of a setback is needed from the top of the slope to ensure new construction will not compromise slope stability.

Please provide recommendations to mitigate the accelerated erosion.

6.6 Structural Features

Structural features such as schistocity, folds, zones of contortion or crushing, joints, shear zones or faults were not observed by RMG on the site or in the surrounding area.

6.7 Surficial (Unconsolidated) Deposits

Lake and pond sediments, swamp accumulations, sand dunes, marine terrace deposits, creep, or slope wash were not observed on the site. Slump and slide debris were also not observed on the site. Talus accumulations were observed in Kettle Creek, within the low lying areas in the form of accumulations at the base of the slopes in sheet and cone-like features. The identification of talus within the creek is not an anomaly and will not affect the site.

6.8 Features of Special Significance

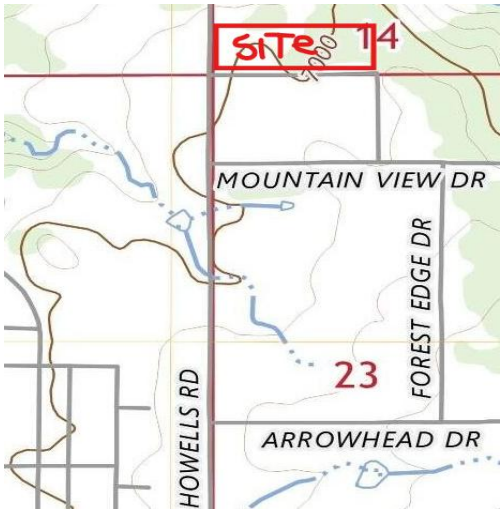
Features of special significance such as accelerated erosion, (advancing gully head, badlands, or cliff reentrants) were observed near the northeast corner of the property. This portion of the property slopes down to Kettle Creek. It is our understanding that construction is not to encroach within the badland/ravine features located on the property. Features indicating settlement or subsidence such as fissures, scarplets, and offset reference features were not observed on the study site or surrounding areas.

Features indicating creep, slump, or slide masses in bedrock and surficial deposits were also not observed on the property. The banks of Kettle Creek are steep to vertical and are to be avoided with new construction on the new lot. This area is considered a “No-Build Zone”.

6.9 Drainage of Water and Groundwater

The overall topography of the site slopes down to the north, northeast. Generally, the direction of surface water and groundwater flows in the same direction. Groundwater was not encountered at the time of drilling and is not expected to affect basement foundation, if selected. Groundwater is known to fluctuate depending on the season, variations in rainfall, new development, proximity to drainages, etc. Groundwater measurements in test borings are limited to the time of year measured (a snapshot) and are inherently inaccurate in predicting depth to groundwater during the engineering life of a structure/development. At this time, there is not enough conclusive evidence to preclude basement construction (e.g. elevated moisture conditions, redoximorphic features) or recommend a groundwater-monitoring program to observe seasonal fluctuations. However, if construction is not to occur within a few years, a follow up test boring to verify the groundwater conditions would be prudent for the future homeowners.

Multiple natural drainage/ravine features are located north of the site. Kettle Creek had a trickle of water at the time of site reconnaissance performed by RMG in December 2025. The USGS Topo Map is presented below.



6.10 Flooding and Surface Drainage

Based on our review of the Federal Emergency Management Agency (FEMA) Community Panel Nos. 08041C0507G and the online ArcGIS El Paso County Risk Map, the entire site lies outside the 100-year floodplain and regulatory floodway. FEMA Map is presented below. The site is outlined in red.



Zone X is defined by FEMA as an area of minimal flood hazard that is determined to be outside the floodway and floodplain.

7.0 ECONOMIC MINERAL RESOURCES

Under the provision of House Bill 1529, it was made a policy by the State of Colorado to preserve for extraction commercial mineral resources located in a populous county. Review of the *El Paso Aggregate Resource Evaluation Map, Master Plan for Mineral Extraction*, *Map 1* indicates the site is identified as Eolian Deposits consisting of wind-blown sand. The tract is underlain primarily by the Dawson Arkose, a sedimentary formation of Tertiary age related to uplift and erosion of the Front Range.

According to the *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands*, the site is mapped within the Denver Basin Coal Region, the tract identifier is 41-17. However, the area of the site has been mapped “Poor" for coal resources. In this part of the Denver coal region, coal resources are locally present within the lower part of the Laramie Formation of Upper Cretaceous age. This area is not prospective for metallic mineral resources. No oil and gas wells are drilled in the area.

8.0 IDENTIFICATION AND MITIGATION OF POTENTIAL GEOLOGIC CONDITIONS

The El Paso County Engineering Criteria Manual recognizes and delineates the difference between geologic hazards and constraints. A *geologic hazard* is one of several types of adverse geologic conditions capable of causing significant damage or loss of property and life. Geologic hazards are defined in Section C.2.2 Sub-section E.1 of the ECM. A *geologic constraint* is one of several types of adverse geologic conditions capable of limiting or restricting construction on a particular site. Geologic constraints are defined in Section C.2.2 Sub-section E.2 of the ECM (1.15 Definitions of Specific Terms and Phrases). The following geologic constraints/hazards were considered in the preparation of this report and are not considered to pose a significant risk to the proposed subdivision and future development:

- Avalanches
- Compressible Soils
- Corrosive Minerals
- Debris Flow-Fans/Mudslides
- Downhill/Down-slope Creep
- Floodway / Floodplain
- History of Landfill
- Ground Subsidence and Abandoned Mining Activity
- Groundwater Springs or Seeps
- Landslides
- Rockfall
- Scour, Erosion, Accelerated Erosion Along Creek Banks and Drainageways
- Steeply Dipping Bedrock

The following sections present the geologic conditions that have been identified on the property:

8.1 Expansive Soils/Bedrock

Based on our experience with the soils and bedrock in the vicinity and within the Dawson formation, the sandy clay and claystone bedrock possess low to high swell potential. The sandy clay and claystone were encountered in the test borings at depths that would influence a new foundation. Clay soils are anticipated to be encountered in the excavation. Depending on the depth of a basement foundation (if utilized), claystone bedrock may be encountered in the excavation. Additional mitigations will be required if the clay or claystone are encountered in the open excavation observation. These materials

are readily mitigated with typical construction practices common to this region of El Paso County, Colorado.

Mitigation

Areas of expansive soils and bedrock are expected within the Dawson Formation. The expansive soils or bedrock will require mitigation prior to placing foundation components. Overexcavation and replacement with non-expansive (on-site or imported) soils is a suitable mitigation that is commonly utilized for mitigation of expansive soils/bedrock throughout this region. Floor slabs bearing directly on expansive material would be expected to experience movement. Overexcavation and replacement has also been successful in reducing slab movement. Overexcavation for expansive soils/bedrock is anticipated.

Our test borings may or may not be located within the future proposed foundation footprint. Our test borings are to provide preliminary recommendations for the subdivision and future residence. The final determination of mitigation alternatives and foundation design criteria is to be made in site-specific subsurface soil investigation for the new residence prior to permitting. The final site-specific recommendations to mitigate expansive soils/bedrock are to be provided within a site-specific subsurface soil investigation, once the house location and configuration have been finalized. At this time, the presence of expansive soils or bedrock is not considered to pose a risk to the proposed structures, provided that they are appropriately mitigated prior to the construction of the new residence.

8.2 Unstable or Potentially Unstable Slopes

The northeast corner of the property encroaches upon the Kettle Creek drainageway. The ground surface slopes steeply down to the creek. The banks and bottom of the creek are visible, and sandstone bedrock is exposed along the cliff banks.

Mitigation

The slope stability of the Kettle Creek drainageway is strongly controlled by the interaction between steep channel incision, exposed sandstone bedrock, intermittent high-energy runoff, and surficial weathering processes. The creek banks frequently exceed 30% slope and consist of “competent” sandstone bedrock weathering in place. Overall, the exposed sandstone banks of Kettle Creek are considered conditionally stable in their current natural state but susceptible to episodic localized failures driven by stormwater erosion and progressive weathering. Stability decreases substantially where human activity alters drainage patterns, loads atop the crest, removal of vegetation, or concentrates runoff over the top of the bank edge.

No construction is currently proposed in the northeast corner of the property, nor is future construction proposed. This corner is to be a “No Build Zone” where no construction is to occur. Additionally, roof drains and surface water from the new residence should be directed to the south or west of the lot and concentrated drainage flows shall not be directed over the crest of the slope or towards the existing residence.

8.3 Undocumented Fill Placement

Fill soils (exterior backfill) are expected around the existing foundation.

Mitigation
The existing residence is to remain. Construction of a new residence is to occur on a new lot east of the existing residence. Fill soils were not encountered in our test borings (or test pits) which were located on the proposed new eastern lot. Based on review of historical photos, observations of the existing ground surface, and the mature trees on-site, undocumented fill is not anticipated to be encountered in the excavation for the future residence.

Fill soils from the existing foundation are not considered a constraint for the new future residence.

8.4 Faults and Seismicity

Based on review of the Earthquake and Late Cenozoic Fault and Fold Map Server provided by CGS located at http://dnrwebmapgdev.state.co.us/CGSOnline/ and the recorded information dating back to November of 1900, Colorado Springs has not experienced a recorded earthquake with a magnitude greater than 1.6 during that period. The nearest recorded earthquakes over 1.6 occurred in December of 1995 in Manitou Springs, which experienced magnitudes ranging between 2.8 to 3.5. Additional earthquakes over 1.6 occurred between 1926 and 2001 in Woodland Park, which experienced magnitudes ranging from 2.7 to 3.3. Both of these locations are located near the Ute Pass Fault, which is greater than 10 miles from the subject site. Earthquakes felt at this site will most likely result from minor shifting of the granite mass within the Pikes Peak Batholith, which includes pull from minor movements along faults found in the Denver basin. It is our opinion that ground motions resulting from minor earthquakes may affect structures (and the surrounding area) at this site if minor shifting were to occur.

Mitigation
The Pikes Peak Regional Building Code, 2023 Edition, indicates maximum considered earthquake spectral response accelerations of 0.202g for a short period (S_s) and 0.057g for a 1-second period (S_1). Based on the results of our experience with similar subsurface conditions, we recommend 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.

8.5 Radon

Radon is a gas that can move feely within the soil and air can become trapped in structures constructed on the soil. Radon is a byproduct of the natural decay of uranium and radium. Trace amounts of radioactive nuclides are common in the soils and bedrock that underlie this region and site. ***"Radon Act 51*** *passed by Congress set the natural outdoor level of radon gas (0.4 pCi/L) as the target radon level for indoor radon levels".*

A radon Zone of *1* predicts an average indoor radon screening level greater than 0.4 pCi/L (picocuries per liter), which is above the recommended levels assigned by the EPA. *The EPA recommends corrective measures to reduce exposure to radon gas.*

All of the State of Colorado is considered EPA Zone 1 based on the information provided at https://county-radon.info/CO/El_Paso.html. Elevated hazardous levels of radon from naturally occurring sources are not anticipated at this site.

Mitigation

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.

Passive and active mitigation procedures are commonly employed in this region to effectively reduce the buildup of radon gas. Measures that can be taken after the residence is enclosed during construction include installing a blower connected to the foundation drain and sealing the joints and cracks in concrete floors and foundation walls. If the occurrence of radon is a concern, it is recommended that the residence be tested after they are enclosed and commonly utilized techniques are in place to minimize the risk.

9.0 ON-SITE DISPOSAL OF WASTEWATER

It is our understanding one On-site Wastewater Treatment Systems (OWTS) is proposed for the new eastern lot. The eastern portion of the site was evaluated by observing 2 profile pits, to obtain a general understanding of the soil and bedrock conditions. The Test Pit Logs are presented in the Wastewater Study included in Appendix B.

9.1 Subsurface Materials

The subsurface materials encountered in the test pit excavations were classified using Table 10-1 Soil Treatment Area Long-term Acceptance Rates from the EPCDHE Chapter 8, OWTS Regulations and the USDA Soil Structure Shape and Grade.

Limiting layers were encountered in the test pits at depths of 5 and 7 feet. The long term acceptance rate (LTAR) associated with the most restrictive soils observed in the test pits was 0.50 gallons per day per square foot (gpd/sf) for the sandy loam (Soil Type 2A). Neither groundwater nor indications of seasonally shallow groundwater were observed in the test pit excavations at the time of the field observation.

Bedrock (as defined by USDA Soil Structure and Grade) was encountered in the test pits observed by RMG. In general, the bedrock (as defined by Colorado Geologic Survey) beneath the site is considered to be part of the Dawson formation. The Dawson formation is generally considered a restrictive layer for OWTS. The shallow depth of this formation and the required separation from the bottom of the OWTS treatment areas may result in limitations on the depth of the treatment area. An engineered OWTS should be anticipated.

9.2 Treatment Areas

Treatment areas at a minimum must achieve the following:

- The treatment areas must be 4 feet above groundwater or bedrock as defined by the Definitions 8.3.4 of the Regulations of the El Paso County Board of Health, Chapter 8, *OWTS Regulations*, effective July 7, 2018, amended May 23, 2018;
- Prior to construction of an OWTS, an OWTS design prepared per *the Regulations of the El Paso County Board of Health, Chapter 8, OWTS Regulations* will need to be completed. A scaled site plan and engineered design will also be required prior to obtaining a building permit;
- Comply with any physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCDHE);
- Treatment areas are to be located a minimum 100 feet from any well (existing or proposed), including those located on adjacent properties per Table 7-2 per the EPCDHE;
- Treatment areas must also be located a minimum 50 feet from any spring, lake, water course, irrigation ditch, stream or wetland, and 25 feet from dry gulches;
- Other setbacks include the treatment area to be located a minimum 10 feet from property lines, cut banks and fill areas (from the crest);
- The lots are laid out to ensure that the proposed OWTS does not fall within any restricted areas, (e.g. utility easements, right of ways, No Build Areas). Based on the test pit observations, the parcel has a minimum of two locations for the OWTS on the new eastern lot.
- The existing septic system is to remain.

Contamination of surface and subsurface water resources should not occur provided the OWTS is installed according to the El Paso County Guidelines and is property maintained by the homeowner.

In summary, it is our opinion the site is suitable for one individual on-site wastewater treatment systems within the cited limitations. It should be noted that the LTAR values stated above are for the test pit locations performed only, for the purpose of demonstrating suitability of the proposed systems. The final OWTS systems shall be designed based on an LTAR determined at the time of the site-specific OWTS Site Evaluation. This does not constitute an OWTS design.

10.0 BEARING OF GEOLOGIC CONDITIONS UPON PROPOSED DEVELOPMENT

Geologic hazards (as described in section 8 of this report) found to be present at this site include faults, seismicity, and radon. Geologic conditions (as described in section 8 of this report) found to be present at this site include expansive soils/bedrock and unstable or potentially unstable steep slopes. It is our opinion that the existing geologic and engineering conditions can be satisfactorily mitigated through proper engineering, design, construction practices, and avoidance.

11.0 ADDITIONAL STUDIES

The findings, conclusions and recommendations presented in this report were provided to evaluate the suitability of the site for the minor subdivision and future development. Unless indicated otherwise, the test boring and test pit logs, laboratory test results, conclusions and recommendations presented in this report are not intended for use for design and construction. ***A site-specific subsurface soil investigation will be required for the proposed future residence prior to permitting.***

12.0 CONCLUSIONS

Based upon our evaluation of the geologic conditions, it is our opinion that the proposed development is feasible. The geologic conditions identified are considered typical for the Front Range region of Colorado. Mitigation of geologic conditions is most effectively accomplished by avoidance. However, where avoidance is not a practical or acceptable alternative, geologic conditions should be mitigated by implementing appropriate planning, engineering, and suitable construction practices.

In addition to the previously identified mitigation alternatives, surface and subsurface drainage systems should be considered. Exterior, perimeter foundation drains should be installed around below-grade habitable or storage spaces. A typical perimeter drain detail is presented in Figure 9. Surface water should be efficiently removed from the building area to prevent ponding and infiltration into the subsurface soil.

In our opinion, the sand soils should generally be considered a Type “B” soil when applying the OSHA guidelines. For these soil conditions, OSHA recommends a temporary slope inclination of 1H:1V or flatter for excavations 20 feet or less in depth.

In our opinion, the clay soils should generally be considered a Type “C” soil when applying the OSHA guidelines. For these soil conditions, OSHA recommends a temporary slope inclination of 1 1/2H:1V or flatter for excavations 20 feet or less in depth. In some cases (particularly "clean" sand soils with very few "fines"), excavation cuts may be unstable at much shallower slopes. Excavations in sand soils should be carefully evaluated for stability, particular when in close proximity to existing structures, fences, etc.

In our opinion, the sandstone and claystone should generally be considered "Stable Rock" when applying the OSHA guidelines. For these conditions, OSHA indicates that temporary vertical excavations should remain intact while exposed.

Some surface sloughing may occur on the slope face at these angles. Steeper cut slopes may be utilized for excavations less than 4 feet deep depending on the strength, moisture content, and homogeneity of the soils as observed in the field. Appropriate slope inclinations should be evaluated in the field by an OSHA-qualified “Competent Person” based on the actual conditions encountered.

Long term cut slopes in the upper soil should be limited to no steeper than 3:1 (horizontal to vertical). Flatter slopes will likely be necessary should subsurface water conditions occur. It is recommended that long term fill slopes be no steeper than 3:1 (horizontal to vertical).

Revisions and modifications to the conclusions and recommendations presented in this report may be issued subsequently by RMG based upon additional observations made during grading and construction, which may indicate conditions that require re-evaluation of some of the criteria presented in this report.

It is important for the Owner(s) of the property to read and understand this report, and to carefully familiarize themselves with the geologic hazards associated with construction in this area. This report only addresses the geologic constraints contained within the boundaries of the site referenced above.

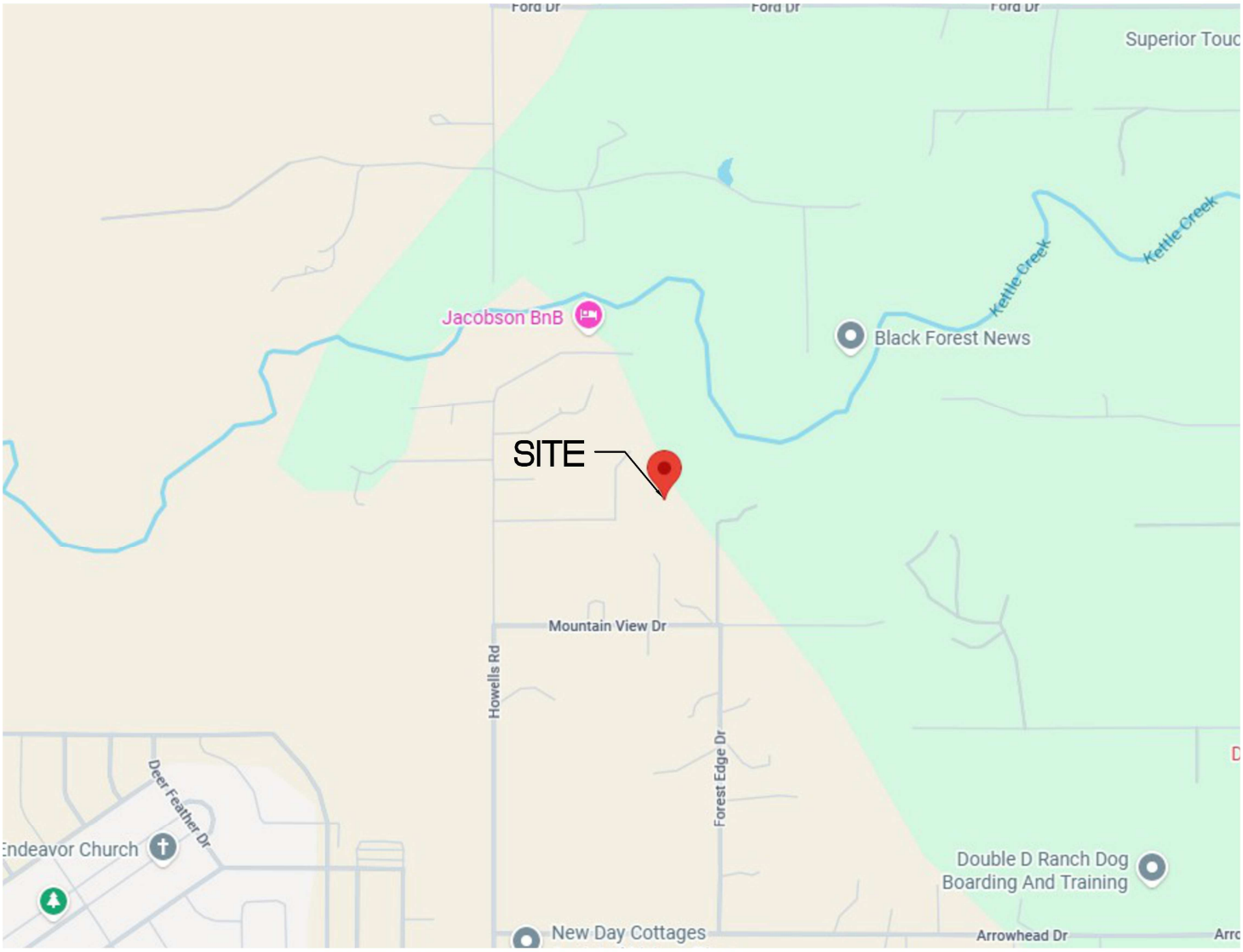
13.0 CLOSING

This report is for the exclusive purpose of providing geologic hazards information and preliminary geotechnical engineering recommendations. The scope of services did not include, either specifically or by implication, evaluation of wild fire hazards, 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 owner is concerned about the potential for such contamination or conditions, other studies should be undertaken.

This report has been prepared for **William Guman and Associates** in accordance with generally accepted geotechnical engineering and engineering geology practices. The conclusions and recommendations in this report are based in part upon data obtained from review of available topographic and geologic maps, review of available reports of previous studies conducted in the site vicinity, a site reconnaissance, and research of available published information, soil test holes, soil laboratory testing, and engineering analyses. The nature and extent of variations may not become evident until construction activities begin. If variations then become evident, RMG should be retained to re-evaluate the recommendations of this report, if necessary.

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.

FIGURES



NOT TO SCALE

Structural
Geotechnical

RMG
ENGINEERS

Materials Testing
Forensics

SOUTHERN COLORADO OFFICE
5085 LIST DRIVE, SUITE 200, COLORADO SPRINGS, CO 80919
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
Southern Colorado, Denver Metro, Northern Colorado

SITE VICINITY MAP

Currently Addressed: 11525 HOWELLS RD
2-LOT MINOR SUBDIVISION
EL PASO COUNTY, CO
WILLIAM GUMAN AND
ASSOCIATES, LLC

JOB No. 198665

FIG No. 1

DATE 5-27-26



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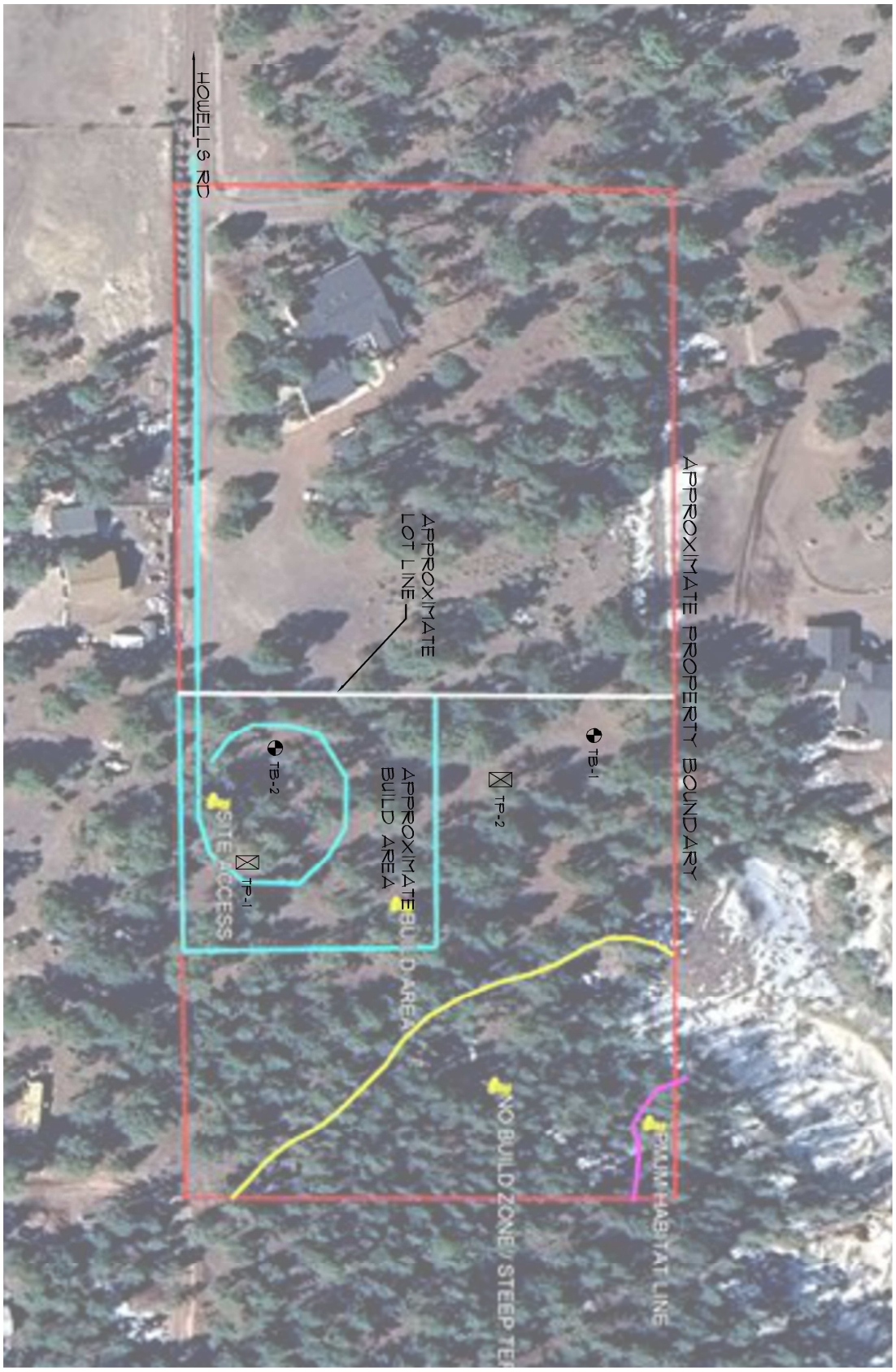
PROPOSED LOT LAYOUT PLAN

Currently Addressed: 11525 HOWELLS RD
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EL PASO COUNTY, CO
WILLIAM GUMAN AND
ASSOCIATES, LLC

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FIG No. 2

DATE 5-27-26



NOT TO SCALE

DENOTES APPROXIMATE LOCATION OF TEST BORINGS

DENOTES APPROXIMATE LOCATION OF TEST PITS

Structural Geotechnical

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TEST BORING/PIT LOCATION PLAN

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FIG No. 3

DATE 5-27-26

SOILS DESCRIPTION


CLAYSTONE


SANDSTONE


SANDY CLAY


SILTY SAND

UNLESS NOTED OTHERWISE, ALL LABORATORY
TESTS PRESENTED HEREIN WERE PERFORMED BY:
RMG - ROCKY MOUNTAIN GROUP
5085 LIST DRIVE, SUITE 200
COLORADO SPRINGS, COLORADO

SYMBOLS AND NOTES


XX — STANDARD PENETRATION TEST - MADE BY DRIVING A SPLIT-BARREL SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-1586. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).


XX — UNDISTURBED CALIFORNIA SAMPLE - MADE BY DRIVING A RING-LINED SAMPLER INTO THE SOIL BY DROPPING A 140 LB. HAMMER 30", IN GENERAL ACCORDANCE WITH ASTM D-3550. NUMBER INDICATES NUMBER OF HAMMER BLOWS PER FOOT (UNLESS OTHERWISE INDICATED).


FREE WATER TABLE


DEPTH AT WHICH BORING CAVED


BULK — DISTURBED BULK SAMPLE


AUG — AUGER "CUTTINGS"

4.5 — WATER CONTENT (%)

ROCKY MOUNTAIN GROUP

Structural Forensics

SINCE 1986 RMG 40 CELEBRATING YEARS

Geotechnical Materials Testing

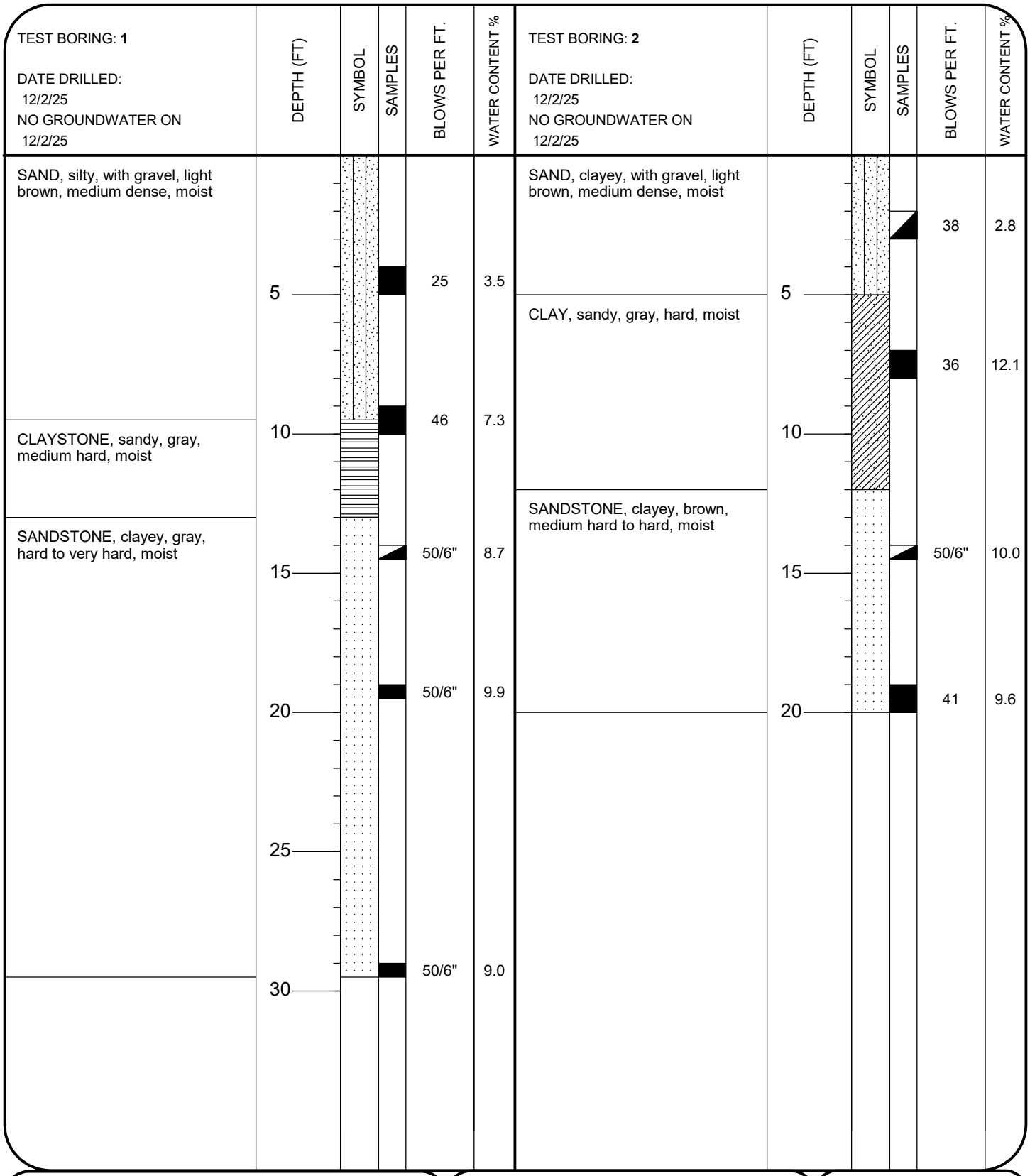
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5085 List Drive, Suite 200
Colorado Spings, CO 80918
(719) 548-0600
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

EXPLANATION OF TEST BORING LOGS

JOB No. 198665

FIGURE No. 4

DATE May/27/2026



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TEST BORING LOG

JOB No. 198665

FIGURE No. 5

DATE May/27/2026

Test Boring No.	Depth	Water Content (%)	Dry Density (pcf)	Liquid Limit	Plasticity Index	% Retained No.4 Sieve	% Passing No. 200 Sieve	Load at Saturation (psf)	% Swell/ Collapse	USCS Classification
1	4.0	3.5								
1	9.0	7.3				1.1	47.0			
1	14.0	8.7	103.8							
1	19.0	9.9								
1	29.0	9.0				2.8	40.8			
2	2.0	2.8				4.1	14.2			
2	7.0	12.1		43	27					
2	14.0	10.0								
2	19.0	9.6								

ROCKY MOUNTAIN GROUP

Structural Forensics

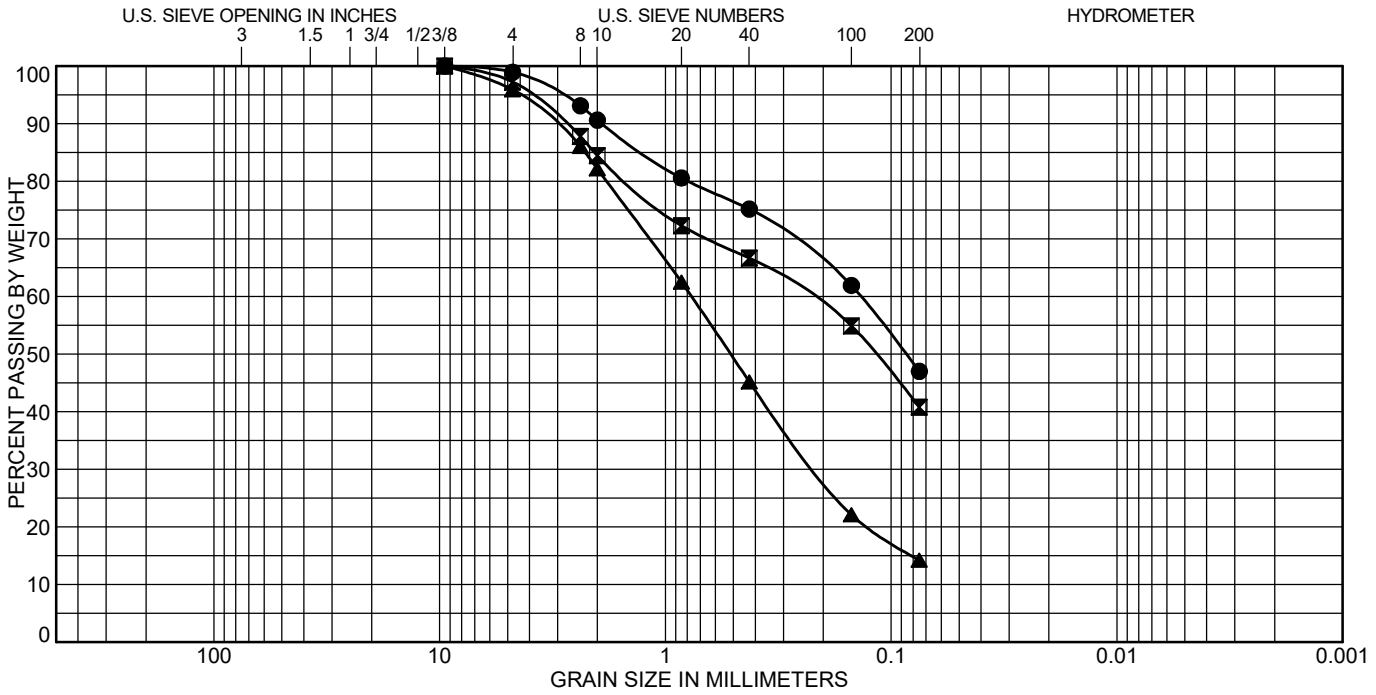
SINCE 1986 RMG 40 CELEBRATING YEARS

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SUMMARY OF LABORATORY TEST RESULTS

JOB No. 198665
FIGURE No. 6
PAGE 1 OF 1
DATE May/27/2026



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Test Boring	Depth (ft)	Classification	LL	PL	PI
●	1	9.0				
⊠	1	29.0				
▲	2	2.0				

	Test Boring	Depth (ft)	%Gravel	%Sand	%Silt	%Clay
●	1	9.0	1.1	51.9	47.0	
⊠	1	29.0	2.8	56.5	40.8	
▲	2	2.0	4.1	81.7	14.2	

ROCKY MOUNTAIN GROUP

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SOIL CLASSIFICATION DATA

JOB No. 198665

FIGURE No. 7

DATE May/27/2026



NOT TO SCALE

GEOLOGIC UNITS

Tkda3 - Dawson Formation Facies Unit Three (Paleocene) - this unit is generally light-gray to greenish-gray, contains interbedded sandy claystone that is known to be expansive in the area, and underlies the entire site. This unit was encountered in the borings. Residually weathered claystone, claystone and sandstone were encountered at approximately 12-foot below the surface.

"No Build Zone" - Areas that contain slopes greater than 30% within the Kettle Creek drainageway are to be considered a "No Build Zone".

ENGINEERING UNITS

2A - Stable Alluvium, colluvium and bedrock on gentle to moderate slopes (5-12%)

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Currently Addressed: 11525
HOWELLS RD
2-LOT MINOR SUBDIVSION
EL PASO COUNTY, CO
WILLIAM GUMAN AND
ASSOCIATES, LLC

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	5-27-2026
REVISION:	DATE:
	JOB #:

ENGINEERING AND GEOLOGY MAP

SHEET No.
FIG-8

Appendix A

Additional Reviewed Documentation

1. *Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Areas, Community Panel No. 081041C0507G,* Federal Emergency Management Agency (FEMA), effective December 7, 2018. *FEMA Flood Map Service Center:* https://msc.fema.gov/portal/home.
2. *Geologic Map of the Pikeview 7.5 Minute Quadrangle, El Paso County, Colorado,* Colorado Geological Survey, Thorson, J.P., Carroll, C.J., and Morgan, M.L., 2002, Open-File Report OF-01-03.
3. *Environmental and Engineering Geologic Map for Land Use*, compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
4. *Map of Potential Geologic Hazards and Surficial Deposits,* compiled by Dale M. Cochran, Charles S. Robinson & Associates, Inc., Golden, Colorado, 1977.
5. *Reconnaissance Geologic Map of Colorado Springs and Vicinity, Colorado,* Department of the Interior United State Geologic Survey, prepared by Glenn R. Scott and Reinhord A. Wobus, Miscellaneous Field Studies, Map MF-482, Sheets 1 and 2, 1973.
6. *El Paso County, Master Plan for Mineral Extraction,* dated February 8, 1996.
7. *Evaluation of Mineral and Mineral Fuel Potential of El Paso County State Mineral Lands Administered by the Colorado State Land Board,* prepared by Colorado Geological Survey, dated February 19, 2003, Open-file Report OF-03-07.
8. *USDA – Natural Resources Conservation Service, Web Soil Survey* https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx
9. *Colorado Springs Landslide Susceptibility, Colorado Geological Survey:* https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=5e7484a637c4432e84f4f16d0af306d3
10. *Colorado Landslide Inventory, Colorado Geological Survey:* https://cologeosurvey.maps.arcgis.com/apps/webappviewer/index.html?id=9dd73db7fbc34139abe51599396e2648.
11. *Pikes Peak Regional Building Department:* https://www.pprbd.org/.
12. *City of Colorado Springs, Subdivision Document Viewer:* http://www.springsgov.com/SubDivView/default.asp?cmdGoBack=New+Search....
13. *El Paso County Assessor, El Paso County, Colorado:* https://property.spatialest.com/co/elpaso/#/property/7323109006
14. *Colorado Geological Survey, USGS Geologic Map Viewer*: http://coloradogeologicalsurvey.org/geologic-mapping/6347-2/.
15. *Historical Aerials:* https://www.historicaerials.com/viewer, Images dated 1952, 1953, 1955, 1960, 1969, 1984, 1993, 1999, 2004, 2005, 2009, 2011, 2013, 2015, 2017, 2019, 2021, and 2023.
16. *USGS Historical Topographic Map Explorer:* http://historicalmaps.arcgis.com/usgs/ Images dated 1962, 1981, 2011, and 2023.
17. *Google Earth Pro,* Imagery dated 1999, 2004, 2005, 2006, 2008, 2010, 2011, 2015, 2017, 2019, 2020, 2023, and 2024.

Job No. 198665

May 27, 2026

William Guman & Associates, Ltd
731 North Weber Street, Ste 10
Colorado Springs, CO 80903

Re: Wastewater Study
Currently addressed as: 11525 Howells Rd
Schedule No. 6214000071
El Paso County, Colorado

Dear Mr. Guman:

As requested, personnel of RMG Engineers (RMG) has performed a preliminary investigation and site reconnaissance at the above referenced address. It is our understanding the parcel included in this study is:

- **Schedule No. 6214000071**, currently addressed as 11525 Howells Rd, zoned *"RR-5 – Residential Rural",* and consists of 5.0 acres.

An existing single family residence resides near the southwestern corner of the property. A two-lot minor subdivision is proposed. If approved, it is our understanding the zoning designation is to change from "*RR-5 to RR-2.5".*

It is our understanding the existing 5.0-acre parcel is to be subdivided into two lots. The western lot is to be 2.5 acres and is to retain the existing single-family residence, individual water supply well and on-site wastewater treatment system. The eastern lot is to be approximately 2.5 acres, and is to eventually contain a new single-family residence, individual well, and on-site wastewater treatment system (OWTS) once the subdivision is approved. The approximate location of the site is shown on the Site Vicinity Map, Figure 1.

This letter is to provide information for the on-site wastewater report per the On-Site Wastewater Treatment Systems (OWTS) Regulations of the El Paso County Board of Health pursuant to Chapter 8.

The following are also excluded from the scope of this report including (but not limited to) foundation recommendations, site grading/surface drainage recommendations, subsurface drainage recommendations, geologic, natural and environmental hazards such as landslides, unstable slopes, seismicity, snow avalanches, water flooding, corrosive soils, erosion, radon, wild fire protection, hazardous waste and natural resources.

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. *Soil and Geology Study, Currently Addressed: 11525 Howells Road, El Paso County, Colorado*, prepared by RMG Engineers, Job No. 198665, dated May 27, 2026.
2. *Soil and Geology Study, Canyon Creek Ranch, El Paso County, Colorado,* prepared by RMG – Rocky Mountain Group, Job No. 189360, last dated January 9, 2025.
3. *Open Hole Observation, 11525 Howells Road, El Paso County, CO,* prepared by Front Range Geotechnical, Inc, dated January 20, 1999.
4. *Soils Report, 11525 Howells Road, El Paso County, Colorado,* prepared by Front Range Geotechnical, Job #5996 GC, dated December 18, 1998.

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

SITE CONDITIONS

Personnel of RMG performed a reconnaissance visit on December 12, 2025. The purpose of the reconnaissance visit was to evaluate the site surface characteristics including landscape position, topography, vegetation, natural and cultural features, and current and historic land uses. Two test pits (6 and 7 feet deep) were performed on the new proposed (eastern) lot, during our reconnaissance visit. A Test Pit Location Plan is presented in Figure 2.

The western portion of the site is developed with an existing single-family residence with well and septic system. The eastern portion of the site is undeveloped land consisting largely of dense forest. Kettle Creek slopes extends near the northeastern property boundary. The banks of Kettle Creek have significant slopes/drop-offs, more than 50 feet in areas, to the bottom of the creek.

The following conditions were observed with regard to the 5.0-acre parcel:

- A well currently **does** exist on the existing 5.0-acre site;
- No runoff or irrigation features anticipated to cause deleterious effects to treatment systems on the site were observed;
- No major waterways exist on the property. The entire site lies outside the designated floodway or floodplain;
- Slopes greater than 20 percent **do** exist on the site; and
- Significant man-made cuts **do not** exist on the site.

Treatment Areas

Treatment areas at a minimum must achieve the following:

- The treatment areas must be 4 feet above groundwater or bedrock as defined by the Definitions 8.3.4 of the Regulations of the El Paso County Board of Health, Chapter 8, *OWTS Regulations*, effective July 7, 2018;

- Prior to construction of an OWTS, an OWTS design prepared per *the Regulations of the El Paso County Board of Health, Chapter 8, OWTS Regulations* will need to be completed. A scaled site plan and engineered design will also be required prior to obtaining a building permit;
- Comply with any physical setback requirements of Table 7-1 of the El Paso County Department of Health and Environment (EPCDHE);
- Treatment areas are to be located a minimum 100 feet from any well (existing or proposed), including those located on adjacent properties per Table 7-2 per the EPCDHE;
- Treatment areas must also be located a minimum 50 feet from any spring, lake, water course, irrigation ditch, stream or wetland, and 25 feet from dry gulches;
- Other setbacks include the treatment area to be located a minimum 10 feet from property lines, cut banks and fill areas (from the crest);
- The new lot shall be laid out to ensure that the proposed OWTS does not fall within any restricted areas, (e.g. utility easements, right of ways). Based on the test pit observations, the parcel has a minimum of two locations for the OWTS.
- The existing septic system is not to be utilized for the new residence.

Contamination of surface and subsurface water resources should not occur if the treatment areas are evaluated and installed according to El Paso County Health Department and State Guidelines in conjunction with proper maintenance.

DOCUMENT REVIEW

RMG has reviewed a preliminary concept plan. We have identified the soil conditions anticipated to be encountered during construction of the proposed OWTS for the new lot (not yet addressed). Our review included a review of documented Natural Resource Conservation Service (NRCS) data provided by websoilsurvey.nrcs.usda.gov. The Soil Survey Descriptions are presented below. A review of FEMA Map No. 08041C0507G, effective December 7, 2018 indicates that the proposed treatment areas are not located within an identified floodplain.

SOIL EVALUATION

Personnel of RMG performed a soil evaluation consisting of one 6-foot deep test pit and one 7-foot deep test pit on December 12, 2025 (Test Pit TP-1 and TP-2), utilizing the visual and tactile method for the evaluation of the site soils. The test pits were terminated at 6 and 7 feet due to bedrock. The test pits were excavated in areas that appeared most likely to be used for residential construction. The Test Pit Logs are presented in Figure 3. A Septic Suitability map is presented in Figure 4.

The soil conditions as indicated by the NRCS data are anticipated to consist of:

- **41 – Kettle Gravelly Loamy Sand**, 8 to 40 percent slopes. The Kettle Gravelly Loamy Sand was mapped by the USDA to encompass a small portion of the southeast corner of the property. Properties of the loamy sand include somewhat excessively drained soils, depth of the water table is anticipated to be greater than 80 inches, runoff is anticipated to be medium, frequency of flooding and/or ponding is none, and landforms include hills.
- **68 – Peyton-Pring complex**, 3 to 8 percent slopes. The Peyton-Pring complex was mapped by the USDA to encompass the majority of the property. Properties of the Peyton-

Pring complex include, well-drained soils, depth of the water table is anticipated to be greater than 6.5 feet, runoff is anticipated to be low, frequency of flooding and ponding is none, and landforms include hills. A USDA Soil Survey Map is presented below.



Groundwater was not encountered in the test pits but bedrock was encountered at 5 and 7 feet in the test pits performed by RMG.

An OWTS is proposed for the new eastern lot and should conform to the recommendations of a future OWTS site evaluation, performed in accordance with the applicable health department codes prior to construction. This report may require additional test pits in the vicinity of the proposed treatment field. A minimum separation of 4 feet shall be maintained from groundwater and bedrock to the infiltrative surface.

Redoximorphic features indicating the fluctuation of groundwater or higher ground water levels were not observed in the test pits.

CONCLUSIONS

In summary, it is our opinion the site is suitable for individual on-site wastewater treatment systems within the cited limitations. There are no foreseeable or stated construction related issues or land use changes proposed at this time.

Limiting layers were encountered in the test pits at depths of 5 and 7 feet. The long term acceptance rate (LTAR) associated with the most restrictive soils observed in the test pits was 0.50 gallons per day per square foot (gpd/sf) for the sandy loam (Soil Type 2A). Neither groundwater nor indications of seasonally shallow groundwater were observed in the test pit excavations at the time of the field observation.

Bedrock (as defined by USDA Soil Structure and Grade) was encountered in the test pits observed by RMG. In general, the bedrock (as defined by Colorado Geologic Survey) beneath the site is considered to be part of the Dawson formation. The Dawson formation is generally considered a restrictive layer for OWTS. The shallow depth of this formation and the required separation from the bottom of the OWTS treatment areas may result in limitations on the depth of the treatment area. An engineered OWTS should be anticipated.

LIMITATIONS

The information provided in this report is based upon the subsurface conditions observed in the profile pit excavations and accepted engineering procedures. The subsurface conditions encountered in the excavation for the treatment area may vary from those encountered in the test pit excavations. Therefore, depth to limiting or restrictive conditions, bedrock, and groundwater may be different from the results reported in this letter.

An OWTS site evaluation will need to be performed in accordance with the applicable health department codes prior to construction.

I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

RMG Engineers

Kelli Zigler

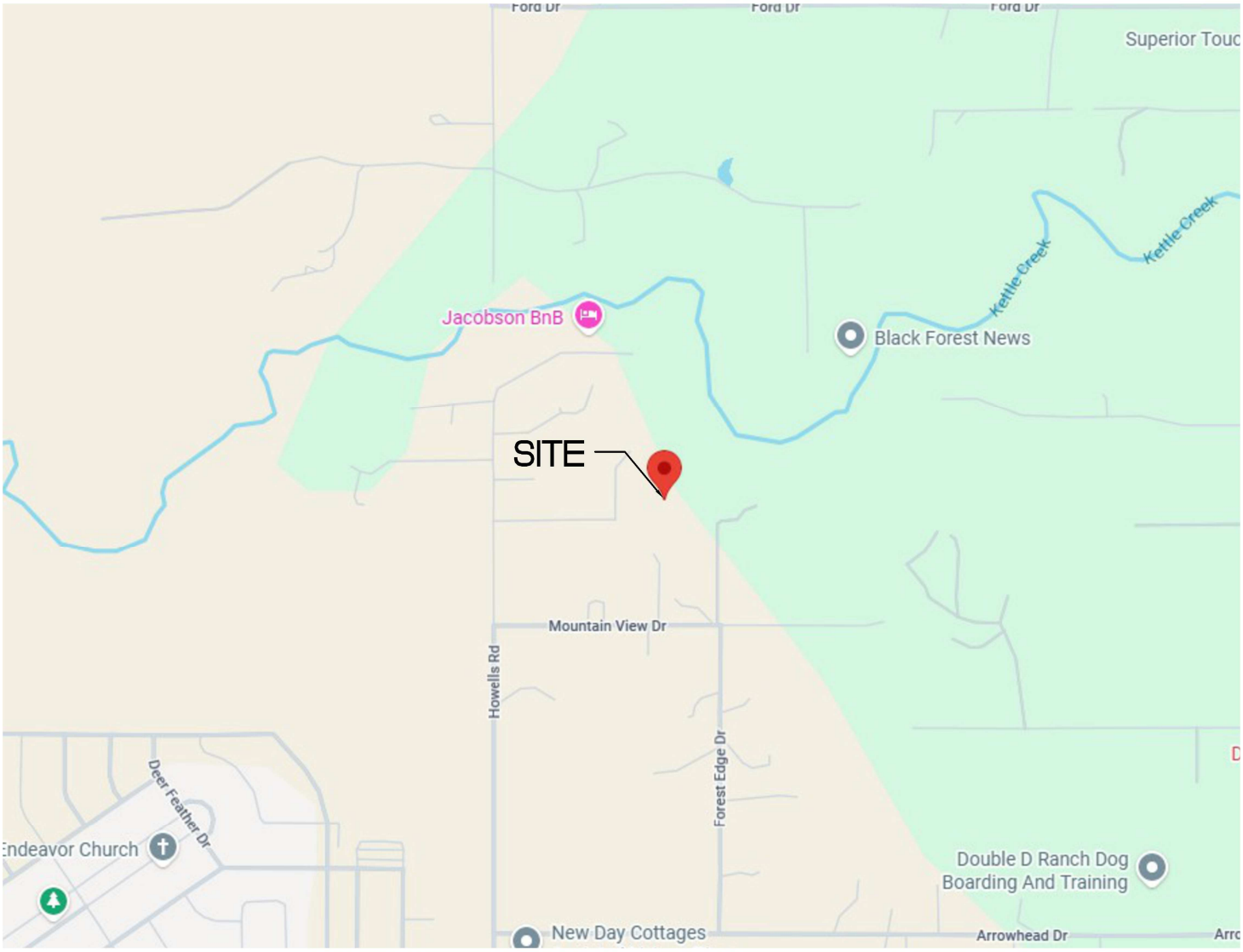
Kelli Zigler
Geotechnical Group Director

Reviewed by,

RMG Engineers

COLORADO REGISTERED
ANTHONY P. MUNGER
5/28/26
39818
PROFESSIONAL ENGINEER

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



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(719) 548-0600 ~ WWW.RMGENGINEERS.COM
Southern Colorado, Denver Metro, Northern Colorado

SITE VICINITY MAP

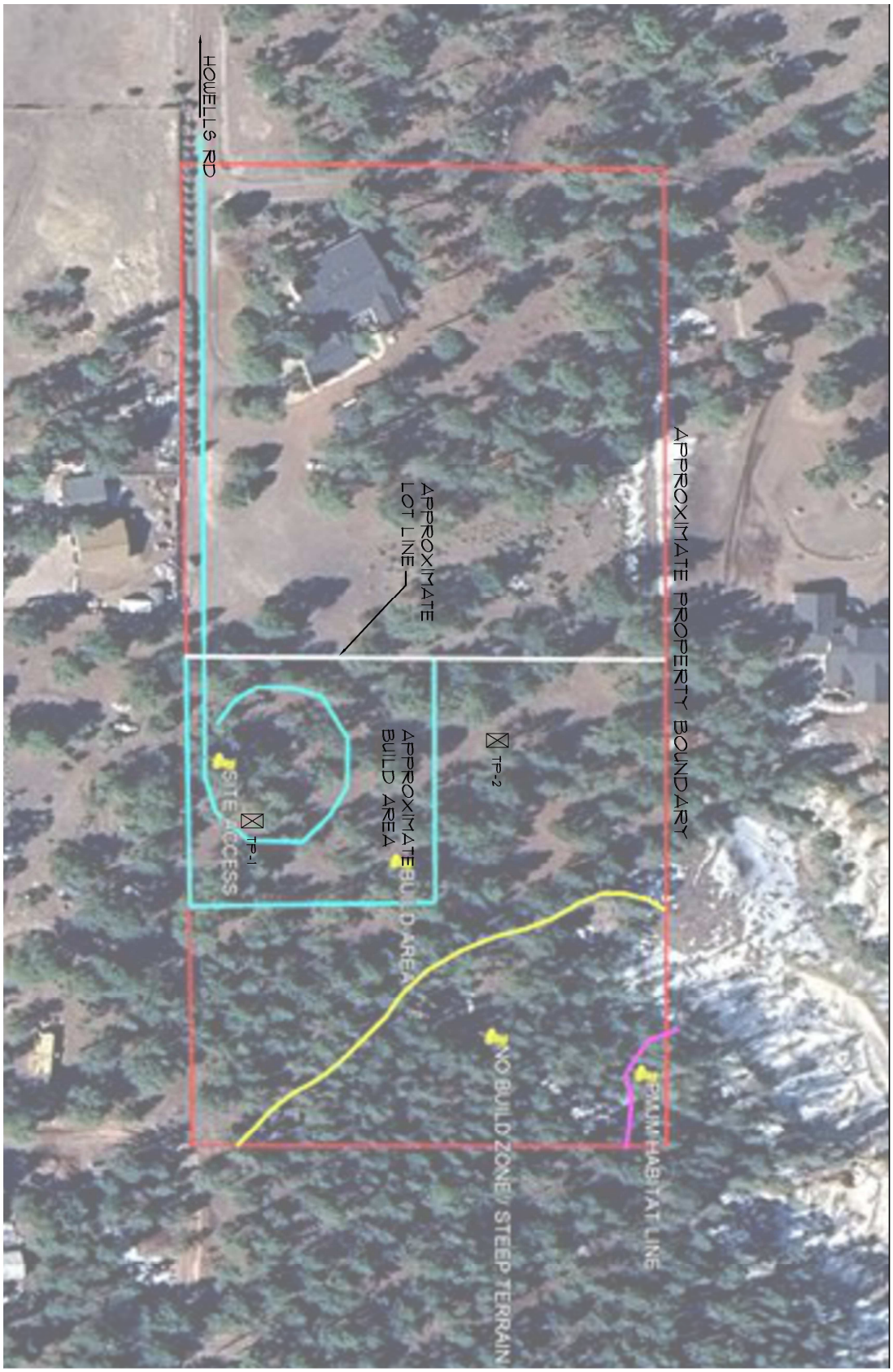
Currently Addressed: 11525 HOWELLS RD
2-LOT MINOR SUBDIVISION
EL PASO COUNTY, CO
WILLIAM GUMAN AND
ASSOCIATES, LLC

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FIG No. 1

DATE 5-27-26

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DENOTES APPROXIMATE LOCATION OF TEST PITS

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TEST PIT LOCATION PLAN

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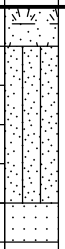
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FIG No. 2

DATE 5-27-26

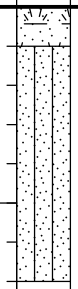
TEST BORING: **TP1**

DATE DRILLED:
12/12/25
NO GROUNDWATER ON
12/12/25

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
0-1 FOOT - TOPSOIL: SANDY LOAM, GRANULAR, WEAK SOIL TYPE 2A				
1-5 FEET - SAND, SINGLE-GRAIN, STRUCTURELESS SOIL TYPE 1				
5				
5 TO 6 FEET -- BEDROCK, BLOCKY, WEAK LIMITING LAYER AT 5 FEET				

TEST BORING: **TP2**

DATE DRILLED:
12/12/25
NO GROUNDWATER ON
12/12/25

DEPTH (FT)	SYMBOL	SAMPLES	BLOWS PER FT.	WATER CONTENT %
0-1 FOOT - TOPSOIL: SANDY LOAM, GRANULAR, WEAK SOIL TYPE 2A				
1-7 FEET - SAND, SINGLE-GRAIN, STRUCTURELESS SOIL TYPE 1				
5				
7 FEET - BEDROCK, BLOCKY, WEAK LIMITING LAYER AT 7 FEET				

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TEST BORING LOG

JOB No. 198665

FIGURE No. 3

DATE May/27/2026



"No Build Zone" - Areas that contain slopes greater than 30% within the Kettle Creek drainageway are to be considered a "No Build Zone".

Denotes two possible locations for the OWTS

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HOWELLS RD
2-LOT MINOR SUBDIVSION
EL PASO COUNTY, CO

WILLIAM GUMAN AND
ASSOCIATES, LLC

ENGINEER:	TM
DRAWN BY:	KZ
CHECKED BY:	TM
ISSUED:	5-27-2026
REVISION:	DATE:
	JOB #:

SEPTIC SUITABILITY MAP

SHEET No.
FIG-4

Soils & Geology Report_plus Summary.pdf Markup Summary

Joseph Sandstrom (1)

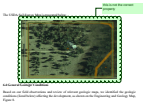


Subject: Text Box
Page Label: 12
Author: Joseph Sandstrom
Date: 11/10/2026 7:01:04 AM
Status:
Color:
Layer:
Space:

Please include where the no-build plat restriction should be located on the plat and how much of a setback is needed from the top of the slope to ensure new construction will not compromise slope stability.

Please provide recommendations to mitigate the accelerated erosion.

Juhler (1)



Subject: Planner
Page Label: 11
Author: Juhler
Date: 11/5/2026 9:40:13 AM
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this is not the correct property