Exhibit C

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GEOLOGIC HAZARDS EVALUATION
PROPOSED RESIDENCE AND ASSOCIATED IMPROVEMENTS
FOR MAUSE/RILEY
28007 MERCURIO ROAD
CARMEL VALLEY
MONTEREY COUNTY, CALIFORNIA

December, 2024

Prepared for

Patrick Mause and Robin Riley

Prepared by

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December 9, 2024
Project: G-912.1

Project: **Proposed Residence and Improvements for Mause/Riley**
28007 Mercurio Road
Carmel Valley
Monterey County, California

Subject: Geologic Hazards Evaluation

Dear Mr. Mause and Mrs. Riley;

As you authorized, presented herein is the geologic hazards evaluation of the subject site located at 28007 Mercurio Road in the Carmel Valley area of Monterey County, California. This geologic evaluation has been prepared for your use in developing your property for the proposed improvements. The report describes the general site geologic characteristics, identifies potential geologic hazards, and provides preliminary input for site development. One digital copy of this report is submitted to your agents for distribution on your behalf.

We appreciate the opportunity to have provided geologic services for this project and look forward to working with you again in the future. If there are questions concerning this report, please contact us at your earliest convenience.

Sincerely,

CERTIFIED ENGINEERING GEOLOGIST
CRAIG S. HARWOOD
No. 2275
STATE OF CALIFORNIA

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PG #6831, EG #2275

Distribution: Addressee (1)
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1.0 INTRODUCTION

Construction of single-family residence and associated improvements is planned at the subject site. The project development plans by Studio Carver Architects (dated 10/17/2024) indicate the proposed residence will be a split-level structure located in the central portion of the property, with a detached garage located just on the north of the residence. Access to the building site will by way of a paver stone driveway that will extend into the building envelope area from Mercurio Road at the east property line as shown on the attached "Site Geologic Map" (Appendix A). The building envelope is located on a gently inclined, westerly facing slope. Within 30 feet of the building pad slopes become steep on the northwest, and moderate on the south. Terracing (grading) and retaining walls will be required in order to achieve the design grades. Achieving the design grades will require cuts made into the hillside for the driveway entrance, garage and residence building pads.

2.0 PURPOSE AND SCOPE OF SERVICES

The project RFP document by Studio Carver indicates the Monterey County Planning Department is requiring a geologic evaluation for the proposed project. This geologic hazards evaluation report has been prepared to generally characterize and evaluate the geologic conditions and potential geologic hazards associated with the proposed development of the site. The scope of work included but is not necessarily limited to; review of available geologic and geotechnical reports and maps, a review of stereo aerial photo pairs and LiDAR imagery covering the site area, geologic mapping of the site, review of a geotechnical investigation conducted at the site by others (Soil Surveys Group, Inc., 2023) and evaluation of the data collected and preparation of this report. The scope of our work is intended to comply generally with the provisions of ASTM D420-93, Standard Guide to Site Characterization for Engineering, Design and Construction Purposes, in general accordance with the Monterey County Planning Department requirements for this project, and in general accordance with the requirements of "Guidelines for Geologic/Seismic Reports" of the California Division of Mines and Geology (CDMG Notes No. 42), now known as the "California Geological Survey".

It is our intent that this report be used exclusively by the client and the client's architect/engineer to form the geologic/seismic basis of the design of the project as described herein, and in the preparation of plans and specifications. Analysis of the soil and rock for radioisotopes, asbestos, hydrocarbons, or chemical properties are beyond the scope of this geologic hazards assessment. A geotechnical engineering field investigation for the building envelope was conducted in March of 2023 by Soil Surveys Group, Inc., of Salinas, California. The project geotechnical engineer should be provided a copy of this geologic hazards evaluation report.

3.0 SITE SETTING

The site is located in the northern foothills of the Santa Lucia Range on the north slopes of Carmel Valley, approximately 9-1/2 miles south of the city of Salinas in Monterey County, California. The Site Location Map (Appendix A) gives the general location of the site with respect to the surrounding geographic area. The "Site Geologic Map (Appendix A) presents a more detailed depiction of the relative setting of the site. The site is an undeveloped parcel in an area characterized by rolling hills and south trending ridges and northwest trending ridges and valleys. The actual building site exists on top of a short spur ridge that dominates the local topography. The topographic map provided by Landset Engineers indicates the building site is on a very gently inclined, southwest-facing slope at an average elevation of approximately 82 feet above mean sea level. There is approximately 40 feet of topographic relief across the site, approximately 8 feet of relief across the residence pad and approximately 10 feet of relief across the garage pad. We understand that a onsite septic system (leacheifld) will be located on the southwest side of the building envelope on a gently inclined slope.

Drainage patterns at the site are a function of the physiography. Natural drainage is generally not controlled amd presently and sheets during heavy rainfall events toward the lower elevations to the south, southwest and southeast. The central portion of the site is open grassland whereas there is a moderate grown of trees around the perimeter of the parcel. Portions of the site perimeter contain a very thick ground cover of shrubs.

4.0 GEOLOGY

Regional Geology

The site is located within the coast range geomorphic province of central California. Throughout the Cenozoic Era central California has been affected by tectonic forces associated with lateral or transform plate motion between the North American and Pacific crustal plates, producing a complex system of northwest-trending faults - the San Andreas Fault system (Page, 1998). Uplift, erosion and subsequent re-deposition of sedimentary rocks within this province have been driven primarily by the northwest directed, strike-slip movement of the tectonic plates and the associated northeast oriented compressional stress. The northwest-trending coastal mountain ranges are the result of an orogeny (formation of mountains by the process of tectonic uplift) believed to have been occurring since the Pleistocene epoch (approximately 2-3 million years before present). The portion of the Santa Lucia Range where the site exists is within the Salina Block, which is bound by the San Andreas fault on the east, and by the San Gregorio - Palo Colorado fault to the west. The Salina block is composed of an elongate prism of granites and metamorphic rock types. The Salina basement complex is overlain primarily by marine sedimentary rocks of tertiary age and terrestrial rocks of Pliocene to Pleistocene age. The geologic formations in the vicinity of the site (the northern portion of the Carmel Valley) consist of granitic basement rocks overlain by a sequence of marine and terrestrial sedimentary rocks that have been deformed into a series of northwest trending folds by regional tectonic forces.

Local Geology

Published maps covering the regional geology in the general vicinity of the site include those by Clark et al. (1997), Dibblee (1999), and Rosenberg (1993 and 2001). These regional maps are based upon aerial photo interpretation, reconnaissance style mapping and field checking at sparsely distributed locations in the area and do not include an evaluation of site-specific data. Additional geologic maps and publications reviewed for this study are discussed in later sections of this report under the appropriate subject headings. The Regional Geologic Map (Appendix A) is a partial reproduction of the published geologic map of Clark et al., (1997) (Appendix A).

All the above quoted geologic maps depict the Miocene Monterey Formation (mapping unit “Tm”) in the immediate area of the site. The Monterey Formation within the northern Carmel Valley foothills is folded into a series of northwest trending anticinal and synclinal folds and is faulted as well. The Monterey Formation is described by Clark et al., (1997) as consisting of a light gray, moderately to well indurated, severely weathered siliceous and diatomaceous shale. Furthermore, the Monterey Formation is cut by the Navy Fault which is projected through the hillside area about 325 feet southwest of the building envelope (see Local Fault Map, Appendix A). Our site reconnaissance revealed that a thin surfical layer of Quaternary Terrace deposits (mapping unit Qt) occurs across the ground surface at the site and overlies the Monterey Formation at shallow depths (see boring logs from SSG, 2023, Appendix B).

Geotechnical Investigation (Soil Surveys Group, 2023)

Soil Surveys Group ("SSG") conducted a geotechnical investigation of the site which included drilling, logging and sampling within three exploratory borings which were bottomed at a depth of 11.25 feet (B-3), 16.75 feet (B-2) and 30.0 feet (B-1) below the adjacent ground surface. Additionally, SSG drilled three percolation test holes on the south side of the building pad area which were extended to depths that ranged from 3 feet to 9.5 feet.

Their graphic logs do not identify the geologic units encountered however their description of the encountered subsurface materials suggests the geologic units encountered were Pleistocene terrace deposits (Qt) overlying the Monterey Formation (Tm). Their geotechnical borings encountered alternating layers of silt and silty sand with some gravel sized fragments of shale within the uppermost 2 to 6 feet of the profile, depending on location. These surfical materials belong to the "terrace deposits" geologic unit. Below the Qt unit they encountered shale belonging to the Monterey Formation. Field blow counts collected within the subsurface profile indicate the Qt subunit is in a loose to very stiff and hard condition and the Monterey Formation was found to be in a very dense to hard condition (field blow counts ranging from 33 to +100 bpf).

Their borings did not encounter any anomalously soft zones or zones of crushing within the encountered geologic units. Copies of the graphic logs of the SSG borings and percolation test holes are included in Appendix B of this report, and the locations of the borings and percolation test holes is shown on the Site Geologic Map (Appendix A).

Geologic Reconnaissance

A geologic reconnaissance of the site was performed on November 17, 2024 by Geologist Craig S. Harwood. The purpose of the reconnaissance was to observe exposures of earth materials and to identify existing or potential geologic hazards. The results of the reconnaissance are shown on the Site Geologic Map (Appendix A). The geologic materials encountered during our site reconnaissance include colluvium, terrace deposits (Qt), and siliceous shale of the Monterey Formation ("Tm") and minor accumulations of fill ("Af").

The fill occurs in slivers at the site due to past minor grading and also along the north property line along Mercurio Road. The fill is a variable mixture of colluvium, residual soil, terrace deposits and weathered bedrock fragments. The fill slopes are generally 2 to 3 feet thick. The terrace deposits generally consist of silty sand with subrounded to rounded cobbles and gravel. The Monterey Formation is a light tan to orange-brown, fissile and moderately-hard to hard siliceous shale. The Monterey shale is exposed at one isolated outcrop at the site but is also extensively exposed along Mercurio Road and adjacent areas. Roadcuts and natural outcrops adjacent to the site reveal the Tm unit is thin-bedded to medium-bedded and generally dips moderately (21° to 22°) to the southwest. Small scale folding within the Tm unit has resulted in slight variations in bedding attitude. The Monterey Formation is thin bedded and is generally semi brittle. Thus faults extending through the Monterey Formation tend to be expressed as abrupt, discordant changes in bedrock structure (i.e., bedding angles and direction). Bedding attitudes taken further afield of the site within the general neighborhood reveal a clear structural disruption of the formation associated with the Navy Fault. The Monterey shale dips gently to moderately toward the northeast along the southwest side of the fault and, alternatively the bedding dips gently to moderately toward the southwest on the northeast side of the fault zone. Using the collected structural measurements taken at outcrops around the neighborhood, we confirmed the location of the fault generally as it is shown on the Local Fault Map in Appendix A.

Groundwater

The site is located within an upland area which is underlain by a well consolidated geologic formation that generally does not serve as groundwater bearing unit (aquifer). We encountered no evidence in our research suggesting the presence of a relatively shallow, laterally continuous water bearing stratum or significant source of groundwater at the site. Additionally the explorations of SSG did not encounter groundwater to the depths of at least 30 feet. In general, groundwater conditions and fluctuations in the level of subsurface water are possible due to variations in rainfall, temperature, irrigation and other factors.

Landsliding (non-seismic conditions)

Our review of published literature and maps covering the area indicates there are no landslides depicted at the subject site or immediately adjacent to the site (Dupre, 1990; Rosenberg, 1993, 2001; Clark et. al., 1997; and Dibblee, 1999). The county geologic hazards web portal provides interpretive mapping of the area in terms of susceptability for landsliding. This interpretive mapping is not based on site-specific evaluations and primarily serves as a tool for planning purposes. The northern half of the site is within in an area designated as “moderate susceptibility for landsliding” and the steeper, southern half of the site is in area designated as an area with a “high susceptibility for landsliding.”

Our review of stereo aerial photos and LiDAR imagery and our site reconnaissance did not reveal any evidence suggesting the building envelope area and immediately adjacent areas are underlain by landslides. The extensive bedrock outcrops in the immediate area do not suggest structural disruption or disturbance of the formation that would result from moderate or large scale slope movements. The continuity of the underlying bedrock is confirmed by the SSG subsurface exploration located generally within the building envelope area. It is our interpretation that the landslide susceptibility classification of the area of the site does not reflect the site-specific conditions for the building envelope area (see below).

Debris flows, or mudslides, can originate during periods of heavy rainfall on steep slopes such as occurred in 1982 throughout the San Francisco and Monterey bay areas (Ellen and Weiczorek, 1988). Narrow, steeply inclined swales containing relatively thick colluvium deposits can become sources of debris flows as well (Turner and Schuster, 1996). Colluvium does exist over sloping portions of the site; based upon natural and man-made exposures it is generally less than 1 feet thick. The proposed building envelope is not located within or downslope of any swales where debris source material might exist.

Artificially over-steepened slopes, accumulations of nonengineered fill, unprotected slopes in graded areas can upset the equilibrium in slopes and can increase the potential for slope instability. Additionally, control of surface runoff is essential in preventing debris flows or other shallow slope failures on both natural and modified slopes (see Conclusions and Recommendations).

It is our judgment that the natural slopes have attained a relatively stable configuration in the present environmental (climatic) conditions and have a low potential for gross instability or debris flow activity in their natural undeveloped state. The relatively minor cuts planned for the buiding pad area and garage would not be expected to result in slope instability.

Faulting

The San Andreas Fault system and related fault systems in the region generally strike northwest and are characterized by a combination of strike-slip and reverse displacement. Some active faults in the region include (in order of increasing distance from the site): the Monterey Bay-Tularcitos Fault system (1.4 mi. west), the San Gregorio Fault system (9.3 mi. southwest), the Reliz/Rinconada Fault Zone (9.8 mi. northeast), the San Andreas Fault ("Creeping" segment; 27 mi. northeast), the San Andreas fault ("Pajaro Gap" segment; 29 mi. northeast), and the southern extension of the Calaveras Fault zone (31 mi. northeast), (Jennings and Bryant, 2010; U.S.G.S. Quaternary Fault/Fold Database, 2006). Additional local faults which have yet to be classified as active (undivided Quaternary activity status) include the Ord Terrace Fault, the Seaside Fault, the Chupines Fault and the Berwick Canyon Fault (Rosenberg, 2001). As already stated, a trace of the Navy Fault has been mapped as extending through the hillside area located just south of the subject site (Clark et. al., 1997; and Dibblee, 1999, Rosenberg, 1993, and 2001; Monterey County GIS, 2001). Refer to the attached Local Fault Map (Appendix A). Due to the proximity of the Navy Fault to the site, the building envelope is located within a county-designated fault surface rupture hazard zone. This zoning designation is broadly applied to sites located within 1/8 miles (660 feet) of a mapped Quaternary fault but it is important to note that this does not reflect the actual fault related hazards at individual sites. The Carmel Valley section of this fault is characterized by Rosenberg (1993) as follows:

> *The Navy fault is a northwest-striking, steeply southwest-dipping fault extending from Carmel Valley northwestward to Monterey Bay. Local shearing, structural discordances, and the discontinuity of westerly-trending fold axes delineate the Navy fault, although the trace is locally concealed by alluvium and landslide deposits. Its near alignment with the mapped Tularcitos fault to the southeast and the similarity in trend strongly suggest that these two faults are continuous. The Navy fault is mapped northwestward from the mouth of Berwick Canyon and is characterized by locally sheared shale, truncated en echelon fold axes, and offset fluvial terrace deposits.*
>
> *Several lines of evidence support strike-slip movement along the Navy fault. Well-defined geomorphic features such as linear drainages, aligned benches, and saddles characteristic of strikeslip faults are common along the Navy fault. Also, the presence of northwest-trending thrust faults and en echelon fold axes is consistent with transpression developed along a right-lateral strike-slip fault. Seismologic evidence includes one fault plane solution that shows a combination of reverse and right-lateral motion (Rosenberg and Clark, 1994). Between two wells across the fault, the "Aguajito 1" well and the "Saucito" wildcat well, the difference in elevation of granitic basement rock is only 200 feet. This difference is small compared to other regional reverse faults, and suggests that much of the displacement on the Navy fault is strike-slip. Several earthquakes that plot near the Navy fault indicate continuing Holocene activity (Rosenberg and Clark, 1994).*

Our research, site reconnaissance, review of previous subsurface data and our review of LiDAR technology did not reveal any evidence indicative of a fault trending through the site or immediately adjacent to the site. Additionally, our mapping and review of roadcuts in the neighborhood area confirmed the location of the fault as generally located on the published geologic maps within the county planning department's Geologic Hazards web portal, and as mapped by Rosenberg, (1993 and 2001). The fault appears to be located approximately 325 feet southwest of the subject residence building envelope.

5.0 SEISMICITY

Historical Earthquakes

Within historic time, significant earthquakes have severely damaged man-made structures over a large part of the central coastal area surrounding the Monterey Bay area. These earthquakes included the 1906 M 8.3 San Francisco (Lawson, 1908), the 1926 Monterey Bay doublet, the 1984 M 6.2 Morgan Hill (Stover, 1984), and the 1989 M 7.1 Loma Prieta earthquakes (Shakal, 1989; Rosenberg, 2001). The 1989 Mw 6.9 October 17, 1989 Loma Prieta Earthquake is notable because it was a major earthquake event with an epicentral area located within the general region of the site (40 mi/62 km north) and resulted in widespread damage throughout the central coastal region. The estimated probability of one or more magnitude 6.7 earthquakes (the size of the destructive 1994 Northridge earthquake) expected to occur somewhere in the San Francisco Bay Area has been determined to be 72 percent for the period 2014 to 2043 (Aagaard et al., 2016). During such an earthquake the danger of fault surface rupture at the site is slight, but very strong to severe ground shaking would occur.

Primary Seismic Hazards

Ground Shaking

Ground shaking from a seismic event is considered the primary hazard that will impact the proposed development within its design life span. The severity of ground shaking during an earthquake depends upon a number of factors such as earthquake magnitude, epicenter distance to site, local geologic conditions, thickness and wave-propagation properties of earth materials, groundwater conditions, and topographic setting. According to the 1997 Uniform Building Code (ICBO, 1997, Figure 16.2), all of Monterey County lies within Seismic Zone 4, the most active seismic zone rated.

Rosenberg (2001) indicates Monterey County is subject to very strong (0.3 - 0.6g) to severe (greater than 0.6g) shaking from the Holocene age active faults in the county, including the San Andreas, the San Gregorio, or the Monterey Bay-Tularcitos fault zones and there is a 10% probability that a 0.35g level of ground shaking could occur in the vicinity of the site over the next 50 years – the typical design life of a residence. These faults are considered the key seismic sources in the vicinity due to their location relative to the site, their slip rate, the maximum moment earthquake that these faults are capable of, and the fault rupture surface area. However, as mentioned earlier, there are a number of potential sources of large magnitude earthquakes in the region. Ground shaking can trigger other secondary seismic hazards that are discussed in following sections.

Surface-Fault Rupture

Earthquakes are generally caused by a sudden slip or displacement along a zone of weakness in the earth's crust, termed a fault. Surface-fault rupture is a manifestation of the fault displacement at the ground surface and is usually associated with moderate to large-magnitude earthquakes ($M > 6.5$: Sutch and Dirth, 2003), however more recent paleoseismic studies of faults suggest that in some scenarios earthquake magnitudes as low as M_W 5.0 can produce fault surface rupture (Tang, et al., 2015, Champenois et al., 2017). The amount of surface-fault displacement depends on the earthquake magnitude and other factors. The displacements associated with surface fault rupture can have devastating effects to structures and lifelines situated astride the zone of rupture. As already mentioned, our review of geologic maps and literature, review of aerial photos and LiDAR imagery, our site reconnaissance revealed no evidence of faults (active or otherwise) at or near the building envelope area. Thus, the potential for surface-fault rupture at the residential building envelope location is considered to be very low.

Secondary Seismic Hazards

Soil Liquefaction

Liquefaction is the sudden loss of soil strength during a significant seismic event. It occurs primarily in saturated, loose to medium-dense, fine to medium grained sands and sandy silts. Common types of liquefaction-related ground failure include differential settlement and lateral spreading. During the 1906 and the 1989 earthquakes, liquefaction occurred in areas of Seaside and in the Salinas Valley within several miles of the site (Lawson, 1908; Galloway and Plafker, 1989; Rosenberg, 2001). These liquefaction events generally occurred in areas of shallow groundwater and relatively young, unconsolidated geologic materials. The site is located within a zone that is designated as having a low potential for liquefaction (Dupre, 1990; Rosenberg, 2001). The site is underlain at relatively shallow depths by well consolidated, hard shale, and no laterally continuous or significant water bearing strata are know to occur in the immediate area of the site. The shallow bedrock conditions, relative hardness of the bedrock and the absence of a laterally continuous groundwater table indicate that there is a very low potential for liquefaction to occur at the site. For similar reasoning as that stated for liquefaction, there is a low potential for the occurrence of lateral spreading to occur.

Seismically-Induced Landsliding

Landslides were triggered in the Monterey Bay area as a result of seismic shaking during the 1906 and the 1989 earthquakes (Plafker and Galloway, 1989; Keefer and Mason, 1991, Rosenberg, 2001). Large-scale landslides mapped in the general vicinity of the site including the Corral de Tierra area and Tularcitos Ridge areas (Bryant, 1985a; Currey, 1984). These landslides have been interpreted by some previous investigators to be caused by large pre-historic earthquakes (Clark and others, 2000) however a seismic origin for these landslides has not been proven (Rosenberg, 2001). As noted earlier, we have concluded there is a low potential for landsliding to impact the site due to climatic events. The presence of competent bedrock at and adjacent to the site and the lack of previous landsliding in the area indicate there is a low potential for the site to be impacted by seismically induced landsliding.

Seismically Induced Settlement

Seismically induced settlement of sufficient magnitude to cause structural damage is normally associated with poorly consolidated, predominantly sandy soils, or variable consolidation characteristics within the building areas. Our mapping and the previous field investigation by SSG suggests that very dense to hard bedrock underlies the building envelope area at very shallow depths. Existing (undocumented) fills identified within the interior of the site should be removed from the areas of proposed improvements (see Site Geologic Map). New fills placed in the area of the proposed improvements, if implemented in accordance with current codes and the recommendations of the geotechnical engineering report for the project, would be unlikely to experience seismically induced settlement sufficient to pose a threat to the proposed residence and detached garage. It is anticipated that the residence and garage foundations will be bottomed consistently along their perimeter into firm and unyielding, undisturbed native soil or bedrock, rather than transitioning from undisturbed native soils or bedrock into fill.

Tsunamis and Seiches

Due to the inland location and the relatively high elevation of the site, the potential for tsunamis affecting the site are non-existent. No large bodies of impounded water are known to be located proximal to the site. Therefore, the site is not susceptible to the effects of seiches.

6.0 DISCUSSION

Changes to the natural conditions at or adjacent to the site can directly affect the risk levels from geologic hazards to the proposed development. For example, grading activities (cutting or filling), altering natural drainage characteristics, removing vegetative ground cover or excessive landscape irrigation activity can increase the risk from geologic hazards at a site. Conclusions are drawn considering the current site conditions and general recommendations offered considering the current proposed development concept.

7.0 CONCLUSIONS AND RECOMMENDATIONS

General

Based on the information obtained during this geologic hazards evaluation, we judge that there are no geologic hazards that would preclude development of the property for residential purposes as currently proposed. Any changes to the project development concept should be reviewed by the engineering geologist and geotechnical engineer to verify conformance with the recommendations presented in the respective reports (geological evaluation and geotechnical investigations).

Landsliding (Non Seismic Conditions)

The building pad area and immediately adjacent slopes are underlain at very shallow depths by well consolidated (very dense to hard) bedrock. Our review of available information and reconnaissance revealed no evidence suggesting previous landslides existing within or immediately adjacent to the building envelope. We judge that the natural slopes have attained some degree of relative stability in the present geologic and climatic conditions. The potential for debris flows occurring on natural slopes at the building envelope area is low. In terms of potential impact on slope stability, the leachfield is currently planned for a gently inclined area within the southern portion of the building pad area. See also recommendations for drainage (below).

Seismic Hazards

The geologic hazard that poses the greatest impact to the site is seismic shaking. The San Andreas Fault zone or the San Gregorio Fault are likely to produce the highest levels of seismic shaking at the site, although there are a number of active faults in the region that are capable of producing very strong to severe levels of seismic shaking during the design life of the future residence and garage. Selection of seismic design parameters should be made after careful consideration of the site profile, analytical procedures, and past performance of similar structures during magnitudes of shaking similar to those anticipated for the site. The residence and other site improvements should be designed to resist damage associated with very strong to severe ground shaking in accordance with current building codes and design standards (see also Geotechnical Investigation report by SSG, 2023).

There is no evidence of a fault surface trace crossing the site. The Navy Fault appears to be located approximatel;y 325 feet southwest of the proposed residence. Therefore, the potential for fault surface rupture impacting the site is considered to be very low. The building envelope area is underlain at shallow depths by competent bedrock and there is no evidence of a laterally continuous groundwater-bearing stratum at the site. Therefore, the potentials for liquefaction, lateral spreading and lurching occurring in any area that could affect the building site is low. It is our judgment that there is a low potential for seismically-induced landsliding or gross instability to occur on the natural (undeveloped) slopes that potentially affect the building pad areas.

Drainage and Slope Protection

In general, all drainage facilities should be designed to collect, direct and discharge runoff to appropriate discharge points located well beyond improvements, steep slopes or cut or fill slopes in a non-erosive manner.

Runoff should be directed away from the steep slope on the northwest side of the residence and garage area.

Drainage should be collected and deposited into infiltration trenches located well away from any moderate to steep slopes at the site (i.e. away from the steep slope on the northwest of the building pad area). Slopes disturbed as a result of development activities should be provided with slope protection and revegetated measures prior to the rainy season to help reduce the effects of erosion. Guidelines and recommendations for accomplishing these aspects of site development are presented in the geotechnical engineering investigation report for the project.

Flooding and Water Related Hazards

The site is located near the top of a topographic knoll and well above the nearest creek and is not located in a floodplain or area prone to inundation. Therefore the potential for flooding is virtually nil. Due to the elevation of the site and the lack of stored or otherwise confined bodies of water in the area, the potential for the site to be affected by tsunamis and seiches is nil.

8.0 LIMITATIONS

1. The conclusions of this report are based on data acquired and evaluated from this study. As the development concept has yet to be fully formulated, our conclusions and recommendations should be considered preliminary in nature. The conclusions of this report are based upon the assumption that the site geologic conditions do not deviate substantially from those disclosed in the research and our observations of a limited number of natural and man-made exposures at and immediately adjacent to the site. Although exploratory boring logs from previous consultants studies were reviewed as part of this work, we make no warrantee as to the accuracy of those those characterizations and they are merely referred to for background information. If any variations or unforeseen conditions are encountered during construction, or if the proposed construction will differ substantially from that planned at the present time, the geologic consultant should be notified so that reevaluation of the conditions and supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner or the owner's representative to ensure that the information presented herein is called to the attention of the project architect and engineer.

3. The findings of this report are valid as of the present date. Changes in the conditions of a property can occur with the passage of time. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of the control of the consulting geologist. Therefore, this report should not be relied upon after a period of one year without being reviewed by a qualified engineering geologist.

4. This report was prepared in general accordance with currently accepted standards of professional geologic practice in this area at this time. No warranty is intended, and none shall be inferred from the statements or opinions expressed.

End of Text

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STEREO PAIR AERIAL PHOTOGRAPHS REVIEWED

Date	Scale	Type	Source	Flight I.D./Frames
2/24/1945	1:7,200	B&W	Fairchild Aerial Surveys	C_9820-2 28, 29
4/14/61	1:12,000	B&W	Mark Hurd Aerial Surveys	HA-LG-41
5/30/2001	1:12,000	Color	American Aerial Surveys	113-2, 3

APPENDIX A

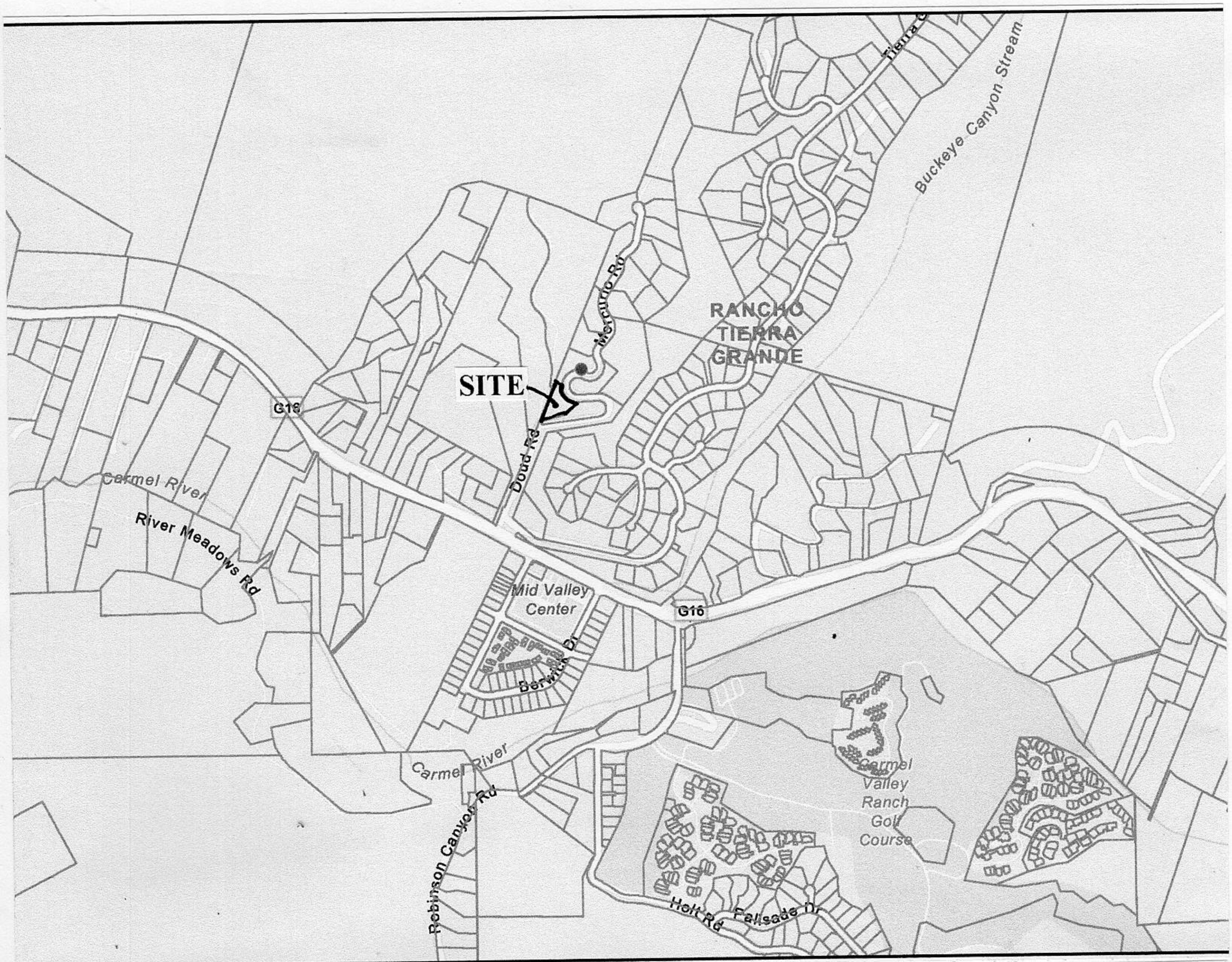
Site Location Map

Regional Geologic Map (Clark, et. al., 1997)

Local Fault Map

Site Geologic Map

Site Location Map



Proj. G-912.1

Date: December, 2024

1:18,056

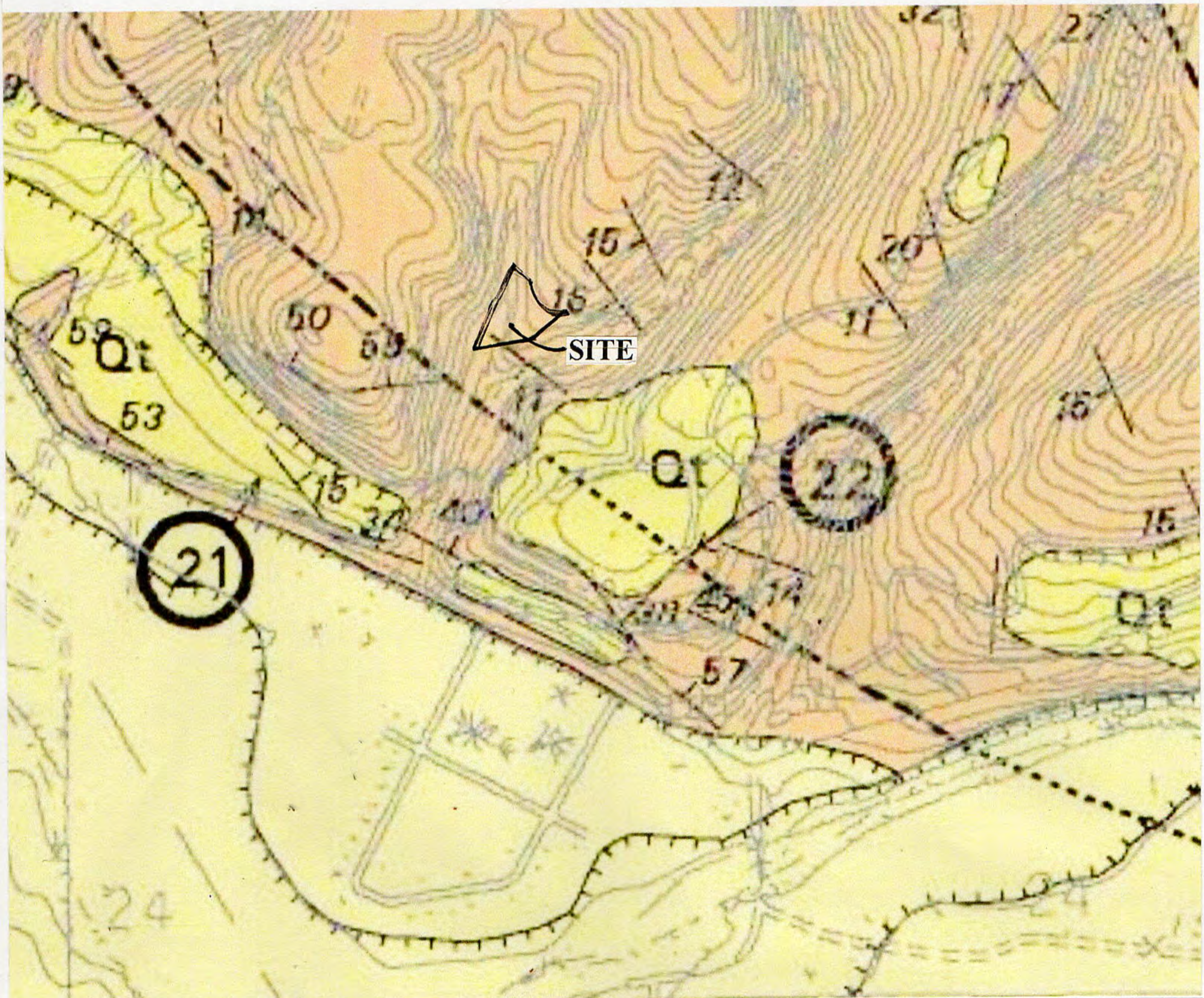
0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Craig S. Harwood
Engineering Geologist

Proposed Residence for Mause/Riley
28007 Mercurio Road
Carmel Valley, Calif.

Regional Geologic Map



Proj. G-912.1

Source: Clark et al., 1997

Date: December, 2024

Map Explanation*

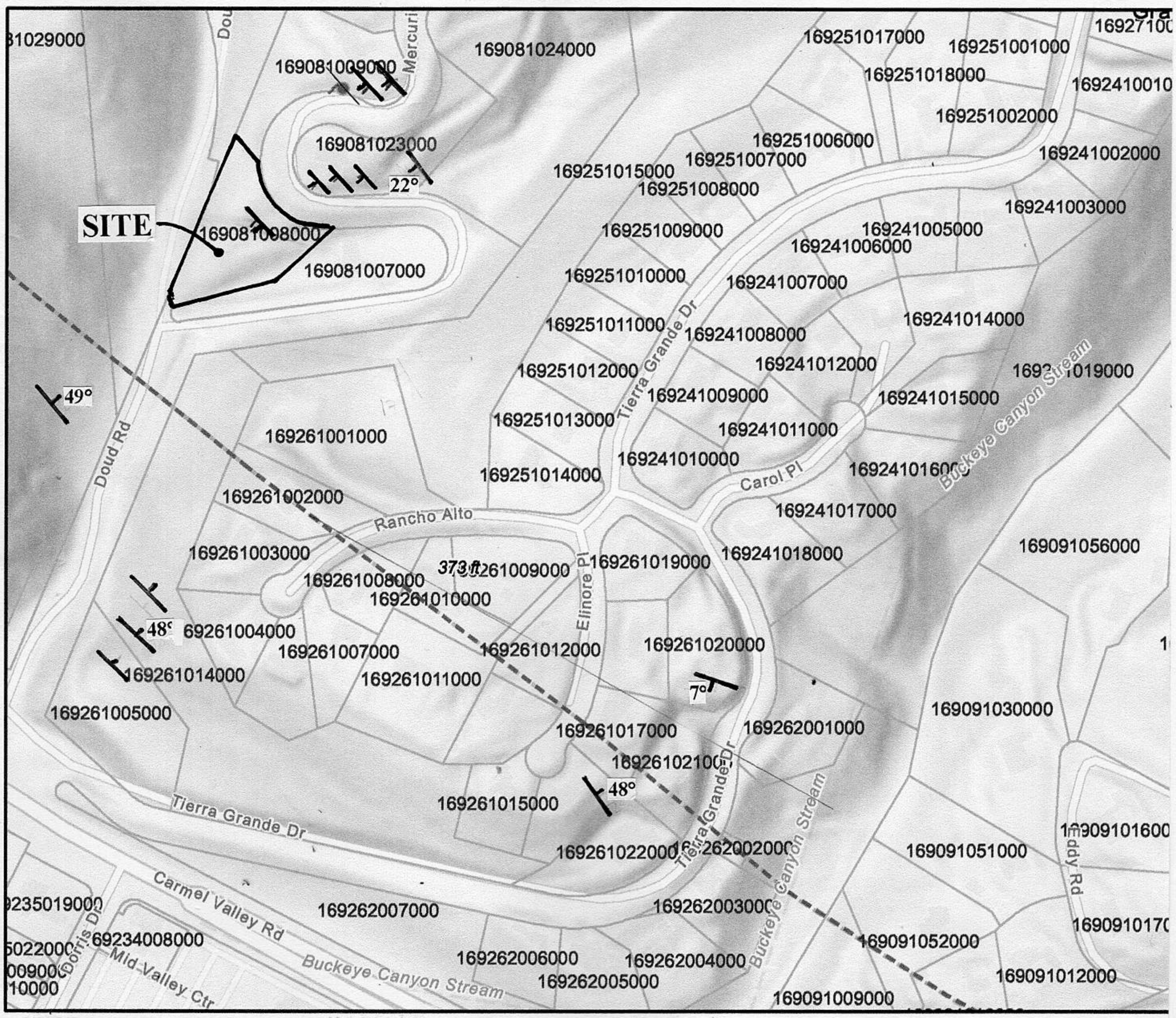
Qt	Fluvial terrace deposits (Pleistocene)
Tm	Miocene Monterey Formation
17°	Strike and dip of bedrock bedding

*** only select units described**

Craig S. Harwood
Engineering Geologist

Proposed Residence for Mause/Riley
28007 Mercurio Road
Carmel Valley, Calif.

Local Fault Map



Proj. G-912.1

1:4,514

0 0.03 0.06 0.12 mi

0 0.05 0.1 0.2 km

Date: December, 2024

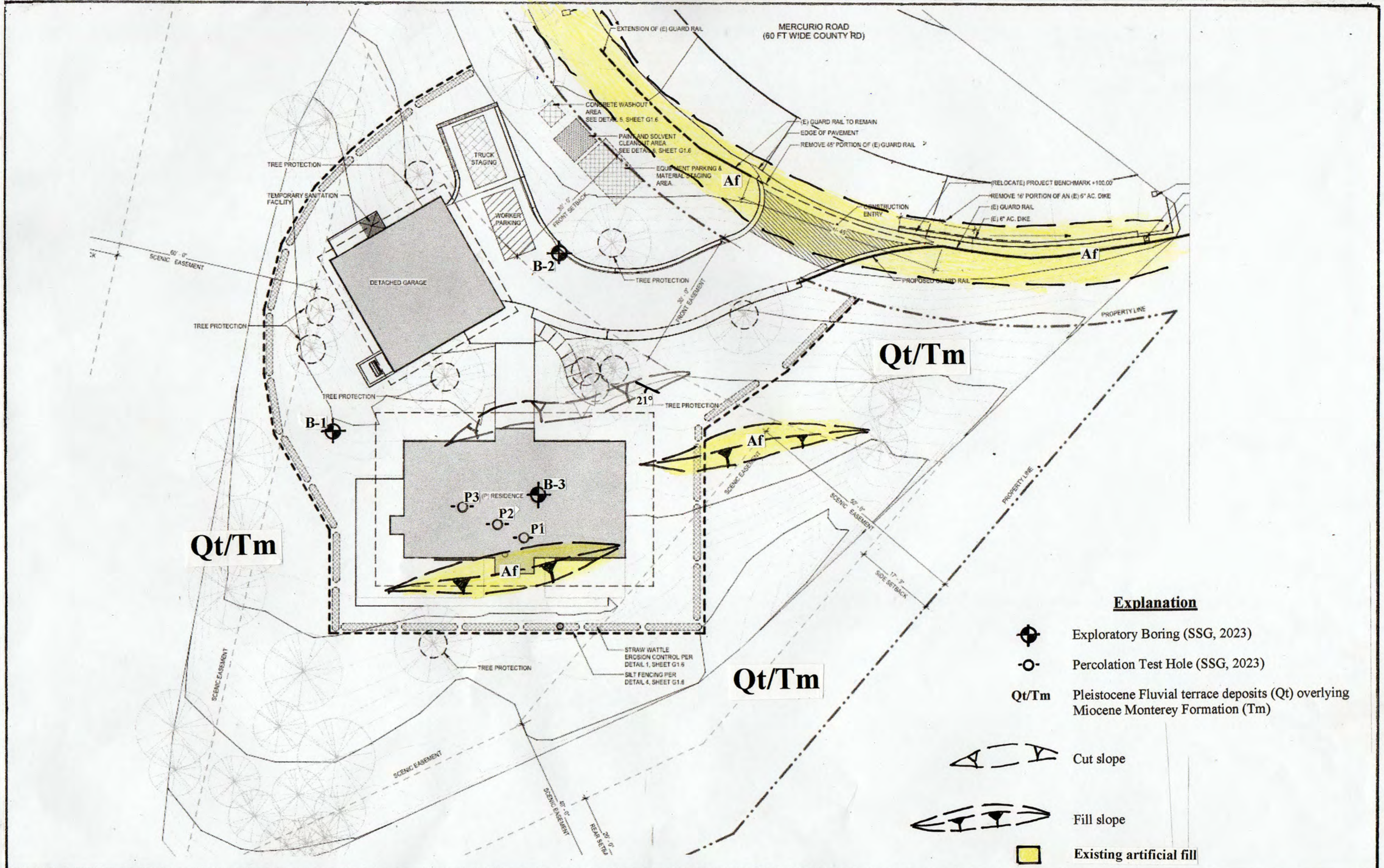
23° Strike and dip of bedrock bedding

Craig S. Harwood
Engineering Geologist

Proposed Residence for Mause/Riley
28007 Mercurio Road
Carmel Valley, Calif.

Source: County GIS

Site Geologic Map



Explanation

- Exploratory Boring (SSG, 2023)
- Percolation Test Hole (SSG, 2023)
- Qt/Tm — Pleistocene Fluvial terrace deposits (Qt) overlying Miocene Monterey Formation (Tm)
- Cut slope
- Fill slope
- **Existing artificial fill**

Proposed Residence for Mause/Riley
28007 Mercurio Road
Carmel Valley, Calif.

Proj. G-912.1

Date: December, 2024

APPENDIX B

Graphic Logs of Exploratory Boring and Perc Test Holes (SSG, 2023)

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines.
			SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

GRAIN SIZES

U.S STANDARD SERIES SIEVE — CLEAR SQUARE SIEVE OPENINGS

200 | 40 | 10 | 4 | 3/4" | 3" | 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FT*
VERY LOOSE	0 - 4
LOOSE	4-10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	STRENGTH**	BLOWS/FT*
VERY SOFT	0 - 1/4	0 - 2
SOFT	1/4 - 1/2	2 - 4
FIRM	1/2 - 1	4 - 8
STIFF	1 - 2	8 - 16
VERY STIFF	2 - 4	16 - 32
HARD	OVER 4	OVER 32

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D) split spoon (ASTM D-1586)

**Unconfined compressive strength in tons/ft^2 as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

FIGURE NO. KEY TO LOGS

EXPLORATION DRILL LOG

BORING NO. B-1

PROJECT 28007 Mercurio Road | Job #8290 | DATE 1.30.23 | LOGGED BY JG

DRILL RIG CCD Tractor | HOLE DIA. 6" | SAMPLER 2.5"Cal & Terzaghi Split Spoon(SPT)

GROUNDWATER DEPTH: | INITIAL --- | FINAL --- | HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Leaf litter/Dark brown, silty, SAND with organics;	SM								
wet, loose		1							
Dark brown, clayey, sandy, SILT with fractured	ML		2.5"Cal	7,15,35					
sub-rounded shale gravels; moist to wet, very		2	1-1-1		59.0	44.9			---
stiff to hard			1-2-2	50(30)					
Light tan with reddish-yellow iron staining, slightly	ML	3	SPT	7,22,50/3	86.6	16.1			---
clayey, fine sandy, SILT with fractured shale									
gravels; moist, hard		4	1-3-3	72/9"	49.3	50.8			---
		5							
Reddish-yellow, tan, fine sandy, SHALE with thin	Tm		2.5"Cal	18,50/3"					
veins of silty clay; intense fracturing, friable;		6	1-4-4	68(41)/8"	44.9	53.7			>4.5
moderately weathered									
		7							
		8							
Olive-tan with reddish-yellow, tan, siliceous	Tm		SPT	50/6"	---	47.8			---
SHALE; Intense fracturing, low hardness,		9	(1-5-5)						
moderately weathered									
		10							
		11							
		12							
Whitish-tan, siliceous SHALE; Intense fracturing,	Tm		SPT	50/6"	nosample	47.2			---
hardness, moderately weathered		13							
		14							
		15							
		16							
Light tan with iron staining, siliceous SHALE;	Tm		SPT	50/6"	62.8	36.1	66	53	---
Intense fracturing, low hardness, moderately		17							
weathered									
		18							
		19							
		20							

DEPTH 30'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-1 CONTINUED

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Light tan with iron staining, siliceous SHALE; moist intense fracturing, low hardness, moderately weathered	Tm	21	SPT (1-8-8)	50/6"	55.8	35.0			---
		22							
		23							
		24							
Light tan, siliceous SHALE; intense fracturing, low hardness, moderately weathered	Tm	25							
		26							
		27							
		28							
		29							
Light tan, siliceous SHALE; intense fracturing, low hardness, moderately weathered	Tm	30							
		31							
-Bottom of boring at 30' -3 inch perforated pipe and gravel pack installed for groundwater monitoring		32							
		33							
		34							
		35							
		36							
		37							
		38							
		39							
		40							
		41							
		42							

DEPTH 30' Job #8290

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

EXPLORATION DRILL LOG			BORING NO. B-2
PROJECT 28007 Mercurio Road	Job #8290	DATE 1.30.23	LOGGED BY JG
DRILL RIG CCD Tractor	HOLE DIA. 6"	SAMPLER 2.5"Cal & Terzaghi Split Spoon(SPT)	
GROUNDWATER DEPTH:	INITIAL ---	FINAL ---	HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
2" blue-grey, granitic gravel/Dark brown, silty,	GP/SM								
SAND with organics; moist to wet, loose		1							
Reddish-yellow, tan, fractured fine sandy cemented	ML		2.5"Cal	10,12,18					
SILT; moist, very stiff		2	2-1-9		54.3	51.3			---
			2-2-10	30(18)	82.2	19.8			---
		3							
Light greyish-tan with reddish-yellow iron staining,	Tm		SPT	8,17,50					
fine sandy, SHALE; intensely fractured, friable,		4							
deeply weathered			2-3-11	67	44.9	54.4			---
		5							
Light tan with iron staining, fine sandy, SHALE;	Tm		2.5"Cal	22,50/3					
intense fracturing, friable, moderately weathered		6	2-4-12		46.2	54.4			>4.5
				50(30)/6"					
		7							
		8							
Dark tan with iron staining, siliceous SHALE;	Tm		SPT	19,50					
intense fracturing, low hardness, moderately		9	2-5-13	50/6"	41.1	50.0			---
weathered									
		10							
		11							
		12							
Greyish-tan with iron staining, siliceous SHALE;	Tm		SPT	50/6"	57.7	41.2			---
intense fracturing low hardness, moderately		13	2-6-14						
weathered									
		14							
		15							
		16							
Dark olive-tan with iron staining, SHALE with	Tm		SPT	12,50/3					
thin veins of dark brown silty clay; intense		17	2-7-15	50/3"	58.1	37.7			---
fracturing, low hardness, moderately weathered									
-Bottom of boring at 16.75'		18							
-Backfilling with soil cuttings									
		19							
		20							

DEPTH 16.75'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. B-3

PROJECT 28007 Mercurio Road | Job #8290 | DATE 1.30.23 | LOGGED BY JG

DRILL RIG CCD Tractor | HOLE DIA. 6" | SAMPLER 2.5"Cal & Terzaghi Split Spoon(SPT)

GROUNDWATER DEPTH: | INITIAL --- | FINAL --- | HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Forbs/Dark brown, clayey, silty, SAND, with shale	SM								
gravels; moist, very loose		1							
Dark brown, clayey, sandy, SILT with shale	ML		2.5"cal	2,2,2					
gravels; moist, very soft		2	3-1-16		57.4	25.6	61	45	---
			3-2-17	5(3)	50.4	50.3			---
		3							
Dark brown, clayey, sandy SILT with fractured	ML		2.5"Cal	3,2,3					
shale gravels; moist, soft		4	3-3-18		58.6	51.2			---
			3-4-19	6(4)	60.4	49.9			---
		5							
			2.5"Cal	2,5,50					
Same	ML	6	3-5-20		56.5	48.4			>4.5
Whitish-tan with iron staining, fine sandy,	Tm		3-6-21	55(33)	74.0	19.2			---
diatomaceous SHALE with thin veins of dark brown		7							
sandy, clayey, silt; crushed, soft, deeply weathered									
		8							
Light tan with iron staining SHALE; intense	Tm		SPT	50/3"					
fracturing, friable, deeply weathered		9							
		10							
		11							
Light tan with iron staining, SHALE; intense	Tm		SPT	50/1"					
fracturing, friable, moderately weathered		12							
-Practical drilling refusal at 11.25 feet		13							
- Backfilled with soil cuttings									
		14							
		15							
		16							
		17							
		18							
		19							
		20							

DEPTH 11.25'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. P-1

PROJECT 28007 Mercurio Road	Job #8290	DATE 1.30.23	LOGGED BY JG
DRILL RIG CCD Tractor	HOLE DIA. 6"	SAMPLER: N/A	
GROUNDWATER DEPTH:	INITIAL ---	FINAL ---	HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Dark brown, clayey, silty, SAND with shale	SM								
gravels; moist, very loose		1							
Dark brown, clayey, sandy, SILT with shale	ML								
gravels; moist, very soft		2							
		3							
Dark brown, clayey, sandy, SILT with fractured	ML								
shale gravels; moist, soft		4							
		5							
Same	ML	6							
Whitish-tan with iron staining, fine sandy	Tm								
diatomaceous SHALE with thin veins of dark brown		7							
sandy, clayey, silt; intense fracturing, friable, deeply									
weathered		8							
Light tan with iron staining fractured SHALE;	Tm								
slightly moist		9							
-Bottom of boring at 9.5 feet									
-3 inch perforated pipe and gravel pack installed		10							
for percolation testing									
		11							
		12							
		13							
		14							
		15							
		16							
		17							
		18							
		19							
		20							

DEPTH 9.5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO. P-2

PROJECT 28007 Mercurio Road	Job #8290	DATE 1.30.23	LOGGED BY JG
DRILL RIG CCD Tractor	HOLE DIA. 6"	SAMPLER: N/A	
GROUNDWATER DEPTH:	INITIAL ---	FINAL ---	HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Dark brown clayey, silty SAND with shale	SM								
gravels; moist, very loose		1							
Dark brown, clayey, sandy, SILT with shale	ML								
gravels; moist, very soft		2							
		3							
Same	ML								
		4							
Light tan SHALE; intense fractured, friable, deeply	Tm								
weathered		5							
-Bottom of the boring at 5 feet									
-3 inch perforated pipe and gravel pack installed		6							
for percolation testing									
		7							
		8							
		9							
		10							
		11							
		12							
		13							
		14							
		15							
		16							
		17							
		18							
		19							
		20							

DEPTH 5'

SOIL SURVEYS GROUP, INC.

EXPLORATION DRILL LOG

BORING NO.P-3

PROJECT 28007 Mercurio Road	Job #8290	DATE 1.30.23	LOGGED BY JG
DRILL RIG CCD Tractor	HOLE DIA. 6"	SAMPLER: N/A	
GROUNDWATER DEPTH:	INITIAL ---	FINAL ---	HOLE ELEV.

DESCRIPTION	SOIL TYPE	DEPTH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (pcf)	WATER CONTENT %	LIQUID LIMIT	PLASTIC LIMIT	POCKET PEN. (tsf)
Dark brown, clayey, silty, SAND with shale	SM								
gravels; moist, very loose		1							
Dark brown, clayey, sandy, SILT with shale	ML/SM								
gravels; moist, very soft		2							
Same	ML	3							
-Bottom of boring at 3 feet									
-3 inch perforated pipe and gravel pack installed		4							
for percolation testing									
		5							
		6							
		7							
		8							
		9							
		10							
		11							
		12							
		13							
		14							
		15							
		16							
		17							
		18							
		19							
		20							

DEPTH 3'

SOIL SURVEYS GROUP, INC.

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