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Preliminary Geotechnical Narrative

Project: SoCalGas Ventura Compressor Modernization – Site Alternatives Assessment

Site: Devil's Canyon Road

Date: 7/28/2025

Preliminary Geotechnical Narrative

Note the contents of this Preliminary Geotechnical Narrative specifically excludes design considerations and impacts associated with the environmental contaminants, active/decommissioned nearby oil and gas wells, wildfires, and dam inundation risks

Site Conditions

The Devil's Canyon Road site is located approximately 6000 feet north of the existing Ventura Compressor Station on the west side of the SR-33 corridor in Ventura County, CA. The site is an 8-acre brownfield oil extraction area situated within the alluvial valley of the Ventura River. The site is relatively flat and is bounded by the Ventura River to the south and east, and foothills containing active oil fields to the north and west. An aerial image of the proposed site is presented in Figure 1.

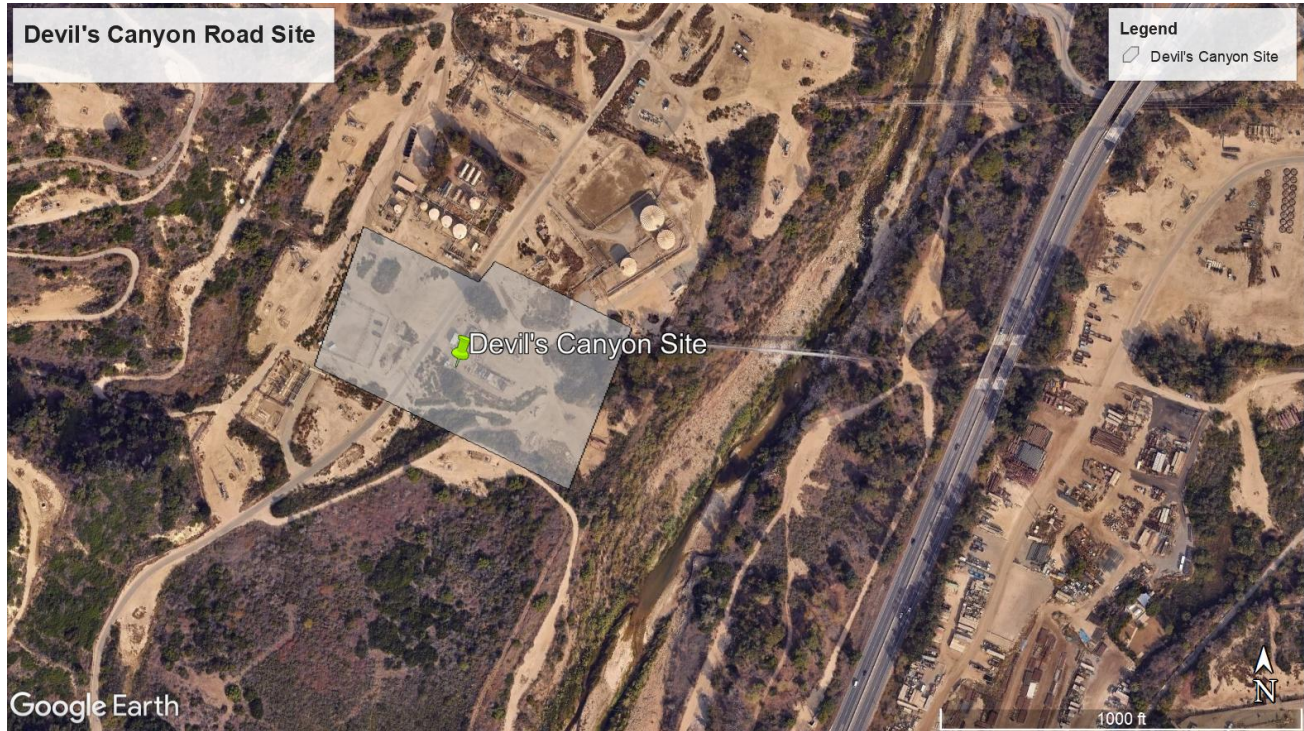


Figure 1: Aerial Image of the Devil's Canyon Road Site (Google Earth, 2025)

General Devil's Canyon Road Pipeline Alignment Conditions

The proposed Devil's Canyon Road site pipeline alignment is approximately 0.96 miles in length and runs primarily north-south as shown on Figure 2. The alignment is comprised of two pipelines: one for suction and one for discharge. The pipeline extends from an existing natural gas transmission pipeline to the proposed Devil's Canyon Road compressor station. The Ventura River runs to the south and east of the alignment. Avocado farms and active oil fields lie to the north and west. Much of the proposed alignment runs along existing service roadways, such as Devil's Canyon Road as seen in Figure 2.

Ground elevation along the Devil's Canyon Road alignment varies significantly, with approximately 140-ft of elevation loss over the 0.15 miles immediately north of the southern terminus. The ground's elevation then rises in two distinct steps, regaining about 90-ft of elevation before gradually decreasing until the pipeline reaches the proposed compressor station tie-in in the north. Slopes range from <5% to >50% along the alignment.

General Cable Canyon Pipeline Alignment Conditions

The proposed Cable Canyon pipeline alignment is approximately 1.9 miles in length and runs as shown on Figure 2. The alignment is comprised of two pipelines: one for suction and one for discharge. The pipeline extends from an existing natural gas transmission pipeline on Taylor Ranch Road to the proposed Devil's Canyon Road compressor station. Much of the proposed

alignment runs along the existing Cable Canyon service roadway, through active oil fields north and west of the proposed Devil's Canyon Road compressor station.

Ground elevation along the Cable Canyon alignment is variable with approximately 140-ft of elevation change along the proposed route. Slopes range from <5% to >50% along the alignment.

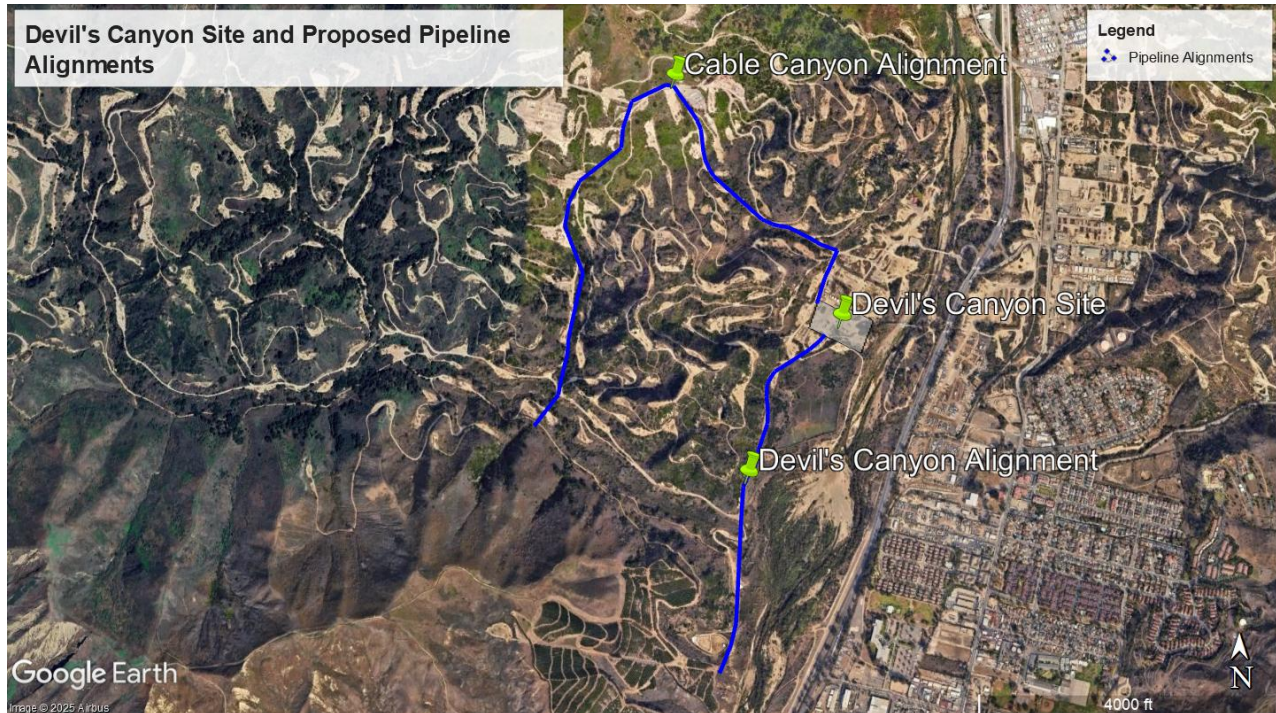


Figure 2: Devil's Canyon Road Proposed Pipeline Alignment (Google Earth, 2025)

General Subsurface Conditions

Based on publicly available information, identified soil types at the Devil's Canyon Road Site generally consist of Undivided Holocene alluvial and colluvial deposits [Qha] typically encountered on the floors of valleys and in hill slope areas. These deposits typically consist of unconsolidated sandy clay with varying amounts of gravel.

Groundwater levels at the site are unknown but are expected to reflect seasonal levels associated with the neighboring Ventura River.

Subsurface Conditions Along Proposed Pipeline Alignments

Geological information about the surficial soils relevant to the design of the proposed pipeline alignments can be found on the "Geologic Map of the Ventura 7.5' Quadrangle Ventura County, California: A Digital database" provided by United States Geological Survey (USGS) and the California Department of Conservation (CDC) 2003. Bedrock composition along the proposed

alignments can be found on the “California Geological Survey 150th Anniversary Geologic Map of California 2010” by Jennings (1977) and Gutierrez et al (2010).

The Devil’s Canyon Road pipeline alignment crosses through five recorded geologic units. Starting from the southern terminus and moving northward, the proposed alignment crosses the Pleistocene Las Posas Sandstone, composed of weakly indurated sand with some gravelly sand units [Qlp], active wash deposits within major river channels, composed of unconsolidated sand, gravel, and silts [Qw], undivided Holocene alluvial, colluvial, and active stream deposits on the floors of valleys, composed of unconsolidated sandy clay with some gravel [Qha], undivided Pleistocene stream terrace deposits, consisting of clay, sand, gravel, cobbles, and some boulder-sized materials [Qpt], and the Pliocene undivided Pico Formation, composed of claystones, siltstones, sandstones and which is locally pebbly [Tp]. The Cable Canyon pipeline alignment crosses through three recorded geological units. The alignment primarily resides within undivided Holocene alluvial, colluvial, and active stream deposits on the floors of valleys [Qha], occasionally intersecting the Pico Formation [Tp] and undivided Pleistocene stream terrace deposits [Qpt].

Bedrock along both alignments is mainly sedimentary, consisting of moderately consolidated sandstone, siltstone, shale, and conglomerate from the Pliocene epoch. Commencing at Devil’s Canyon Road alignment mile marker 0.0 in Figure 3, from approximately mile 0.0 to 0.1, bedrock is at a depth greater than 6-ft below grade. Between approximately mile 0.1 to 0.4, bedrock is between 4- to 6-ft below grade. From approximately mile 0.4 to 0.8, bedrock is at a depth greater than 6-ft below grade. Approximately between mile 0.8 to 0.9, bedrock is at a depth between 3- to 4-ft below grade. The remaining length of the alignment has bedrock greater than 6-ft below grade.

Commencing at Cable Canyon alignment mile marker 0.0 in Figure 3, from approximately mile 0.0 to 0.7, depth to bedrock is greater than 6-ft below grade. Approximately between mile 0.7 and 0.9, depth to bedrock is between 4- to 6- ft below grade. Depth to bedrock is greater than 6-ft below grade from approximately mile 0.9 to 1.0. From approximately mile 1.0 to 1.1, bedrock is between 4- to 6-ft below grade. Between approximately mile 1.1 to 1.5, bedrock is greater than 6-ft below grade. From approximately mile 1.5 to 1.6, the depth to bedrock is between 4- to 6-ft below grade. Between approximately mile 1.6 to 1.7, bedrock is between 4- to 6-ft below grade. From approximately mile 1.7 to 1.8, bedrock is greater than 6-ft below grade. The remaining length of the alignment has bedrock between 4- to 6-ft below grade.

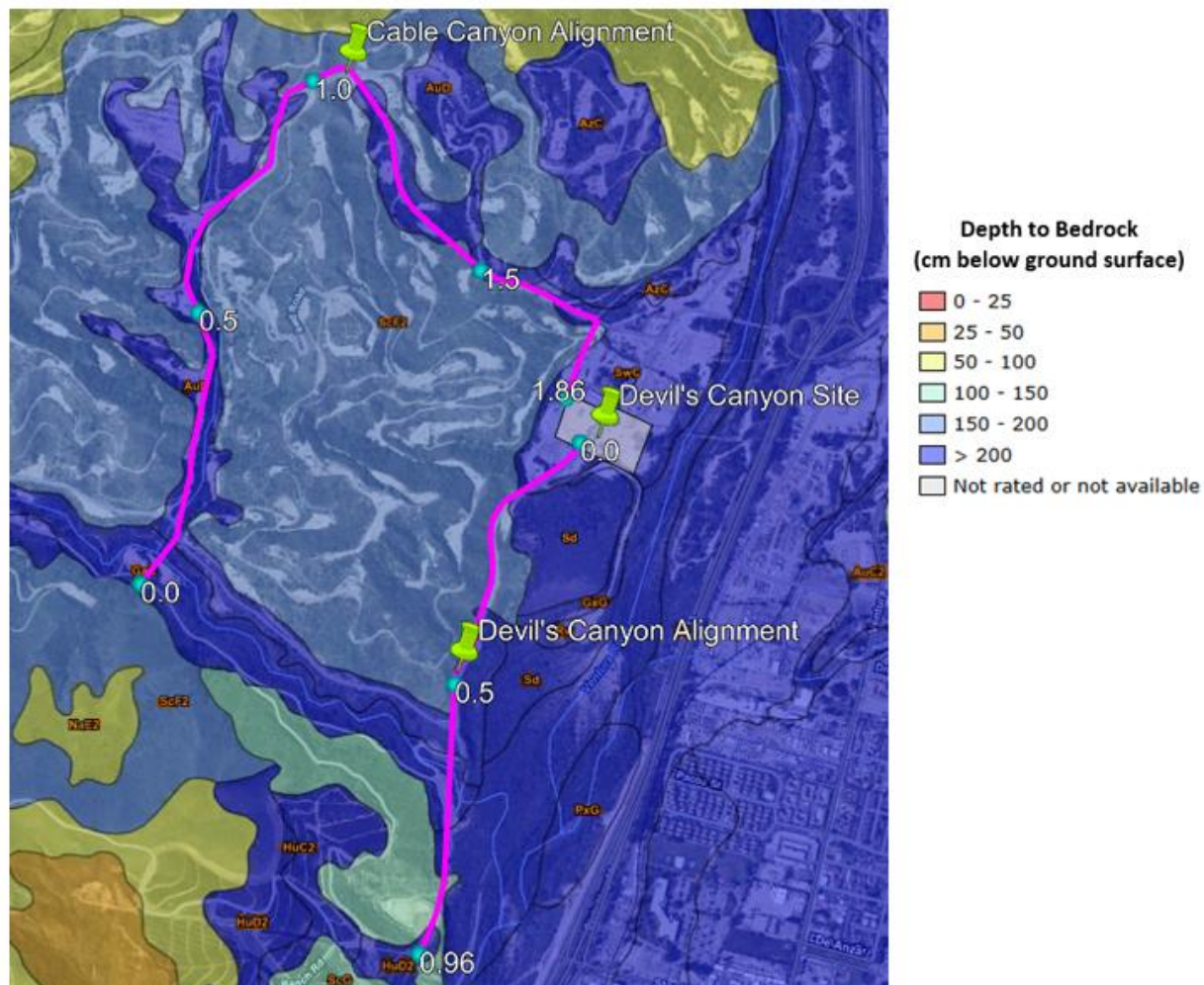


Figure 3: Mapped Depth to Bedrock (United States Department of Agriculture National Resources Conservation Service (USDA NRCS), 2025)

No mapped landslides intersect the proposed alignments, however, Pleistocene Las Posas Sandstone [Qlp] and the Pico Formation [Tp] are both noted as highly susceptible to landsliding. Multiple sliding events (debris flows and rockslides) have been documented along service roads through Holocene alluvial and colluvial deposits in the area [Qha]. Documented landslide activity in the immediate vicinity of the proposed pipeline ranges from 0-50 ft in thickness. The nearest mapped landslide to the Devil's Canyon Road alignment is approximately 200-ft west of the alignment as shown on Figure 4. The nearest mapped landslide to the Cable Canyon alignment is approximately 140-ft east of the alignment as shown on Figure 4.

Groundwater levels along the proposed pipeline alignments are unknown but may be impacted by water level fluctuations in the nearby Ventura River.

Preliminary Geotechnical Narrative (cont'd)

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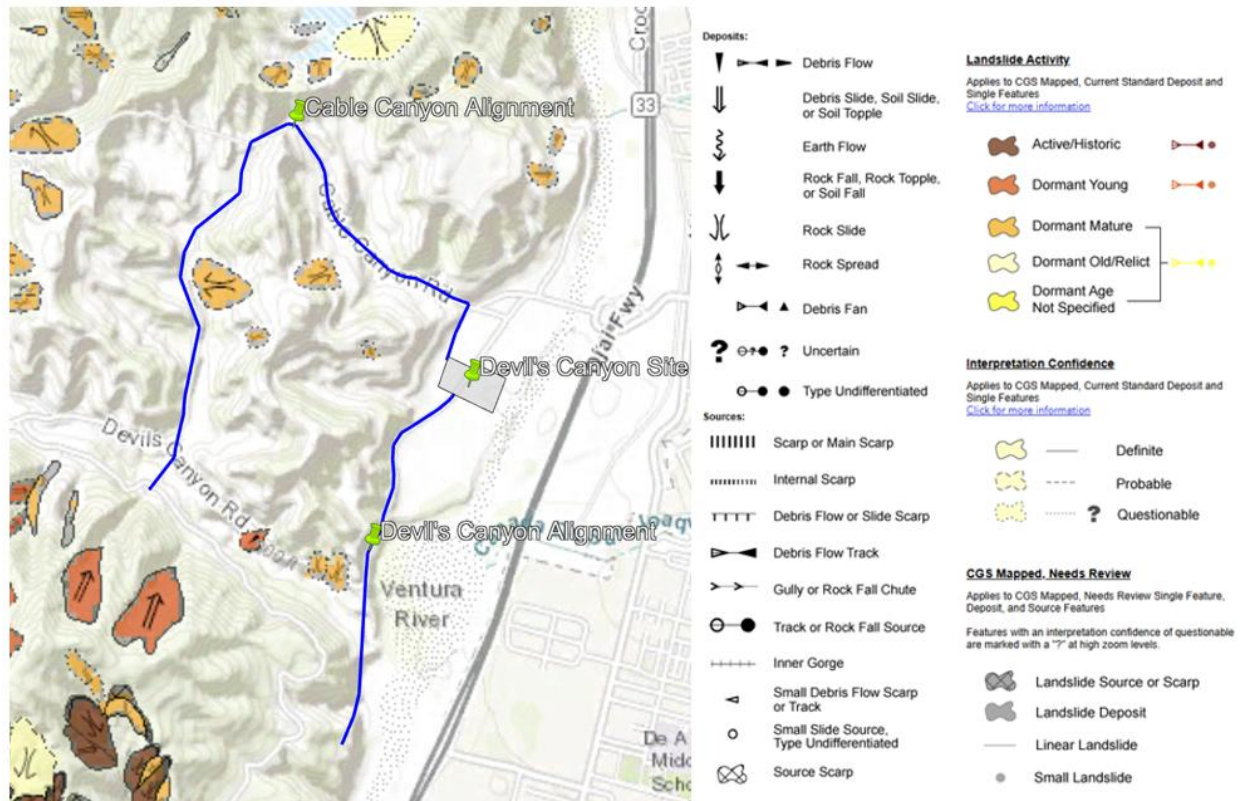


Figure 4: California Geological Survey Landslide Inventory in Relation to Pipeline Alignments (CGS, 2015)

Anticipated GeoHazards

A cursory review of geological hazards from publicly available data pertinent to the Devil's Canyon Road Site and pipeline alignments is summarized in Tables 1, 2, and 3.

Table 1: Devil's Canyon Road Site GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Fault Rupture	Late Quaternary, moderately constrained, unnamed fault identified to immediately adjacent to the site (see Figure 5).	High	California Geological Survey (CGS) Fault Maps
Strong Ground Shaking	Mapped $PGA_M = 1.091$, Ground Motion Hazard Analysis required per Section 11.4.8 of ASCE 7-16.	High	American Society of Civil Engineers (ASCE) 7 Hazard Tool
Landslide	To the north and west, upslopes and geologic units near the site are noted as highly to extremely susceptible to landsliding. Landslide potential within the site proper (at the base of the hills) is mapped as Low (Figure 6).	High to Low	California Geological Survey Landslide Inventory
Liquefaction	Site within mapped hazard area (Figure 7).	High	California Geological Survey Seismic Hazard Maps
Flooding	FEMA Zone 'X' Designation – Area of Minimal Flood Hazard. See Appendix A for Federal Emergency Management Agency (FEMA) maps.	Low	Federal Emergency Management Agency (FEMA) National Flood Hazard Maps
Tsunamis	Site outside mapped hazard area.	Low	California Geological Survey (CGS)/National Oceanic and Atmospheric Administration (NOAA) Tsunami Hazard Area Map

Preliminary Geotechnical Narrative (cont'd)



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Table 1 (cont.): Devil's Canyon Road Site GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Shrink/Swell Potential	Soils prone to moisture induced volumetric changes identified at the site.	Moderate	United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Soil Survey Maps
Corrosion	Soils identified as potentially degradative to exposed buried concrete or steel elements identified at the site.	Low to Moderate	

Table 2: Devil's Canyon Road Pipeline GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Fault Rupture	No known active faults were identified to intersect the alignment.	Low	California Geological Survey (CGS) Fault Maps
Strong Ground Shaking	Mapped $PGA_M = 0.97$, Ground Motion Hazard Analysis required per Section 11.4.8 of ASCE 7-16.	High	American Society of Civil Engineers (ASCE 7) Hazard Tool
Landslide	The alignment does not intersect any known active or recent landslides as mapped in 2015 by CGS. Some geological units along the alignment are noted as being extremely susceptible to landslides (Figure 6) (CGS 2003). CDC and CGS Earthquake Zones of Required Investigation Map = Alignment spans mapped zones of landslide potential (Figure 7).	Low to High	California Geological Survey (CGS) Landslide Inventory California Geological Survey (CGS) and California Department of Conservation (CDC)

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Table 2 (cont.): Devil's Canyon Road Pipeline GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Liquefaction	CDC and CGS Earthquake Zones of Required Investigation Map = Parts of alignment span mapped zones of liquefaction potential. CGS Seismic Hazard Mapping Program: Liquefaction Zones Map = Parts of alignment fall within mapped zones of liquefaction potential (see Figure 7). City of Ventura in conjunction with CDC and CGS = Parts of alignment fall within Mapped Zones of liquefaction potential.	Low to High	California Geological Survey (CGS) and California Department of Conservation (CDC) Seismic Hazard Maps California Geological Survey (CGS) City of Ventura and California Geological Survey (CGS)
Flooding	Most of alignment falls within FEMA Zone 'X' Designation – Area of Minimal Flood Hazard FEMA Zone "AE" directly abuts part of alignment – Special Flood Hazard Areas with Base Flood Elevation (BFE) between 73 and 77 ft above mean sea level (MSL) (Figure 8). See Appendix A for Federal Emergency Management Agency (FEMA) maps.	Low to Moderate	Federal Emergency Management Agency (FEMA) National Flood Hazard Maps
Tsunamis	Alignment outside mapped hazard area.	Low	California Geological Survey (CGS)/ National Oceanic and Atmospheric Administration (NOAA) Tsunami Hazard Area Map

Preliminary Geotechnical Narrative (cont'd)



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Table 2 (cont.): Devil's Canyon Road Pipeline GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Shrink/Swell Potential	Soils prone to moisture induced volumetric changes identified along the alignment.	Moderate to High	United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS) Soil Survey Maps
Corrosion	Soils are identified as potentially degradative to exposed buried concrete and steel elements along the alignment.	Low to High	

Table 3: Cable Canyon Pipeline GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Fault Rupture	Late Quaternary, moderately constrained, unnamed fault identified to intersect the alignment (see Figure 5).	High	California Geological Survey (CGS) Fault Maps
Strong Ground Shaking	Mapped $PGA_M = 0.99$, Ground Motion Hazard Analysis required per Section 11.4.8 of ASCE 7-16.	High	American Society of Civil Engineers (ASCE) 7 Hazard Tool
Landslide	The alignment does not intersect any known active or recent landslides as mapped in 2015 by CGS. Some geological units along the alignment are noted as being extremely susceptible to landslides (Figure 6) (CGS 2003). CDC and CGS Earthquake Zones of Required Investigation Map = Alignment spans mapped zones of landslide potential (Figure 7).	Low to High	California Geological Survey (CGS) Landslide Inventory California Geological Survey (CGS) and California Department of Conservation (CDC)

Table 3 (cont.): Cable Canyon Pipeline GeoHazards Summary

Geohazard	Details	Hazard Level	Source
Liquefaction	CDC and CGS Earthquake Zones of Required Investigation Map = Parts of alignment span mapped zones of liquefaction potential (see Figure 7). CGS Seismic Hazard Mapping Program: Liquefaction Zones Map = Parts of alignment fall within mapped zones of liquefaction potential. City of Ventura in conjunction with CDC and CGS = Parts of alignment fall within Mapped Zones of liquefaction potential.	Low to High	California Geological Survey (CGS) and California Department of Conservation (CDC) Seismic Hazard Maps California Geological Survey (CGS) City of Ventura and California Geological Survey (CGS)
Flooding	Alignment falls within Federal Emergency Management Agency (FEMA) Zone 'X' Designation – Area of Minimal Flood Hazard. See Appendix A for FEMA maps.	Low to Moderate	Federal Emergency Management Agency (FEMA) National Flood Hazard Maps
Tsunamis	Alignment outside mapped hazard area.	Low	California Geological Survey and National Oceanic and Atmospheric Administration Tsunami Hazard Area Map
Shrink/Swell Potential	Soils prone to moisture induced volumetric changes identified along the alignment.	Moderate to High	United States Department of Agriculture (USDA) National Resources Conservation Service (NRCS)
Corrosion	Soils identified as potentially degradative to exposed buried concrete and steel elements along the alignment.	Low to Moderate	

Potential Site and Pipeline Impacts

Based upon publicly available information, the Devil's Canyon Road site is likely to be comprised of colluvial and alluvial deposits, underlain at depth (>6-ft below grade) by weak sedimentary bedrock. The Devil's Canyon Road alignment is likely to be underlain by a combination of active wash deposits within major river channels, undivided alluvial and colluvial deposits on the floors of valleys, stream terrace deposits, as well as sandstone and the Pico Formation. The Cable Canyon alignment is likely to be underlain by alluvial, colluvial, and active stream deposits, the Pico Formation, and stream terrace deposits.

Potential impacts to the proposed compressor station site and pipeline are as follows:

- An ASCE 7-required Ground Motion Hazard Analysis (GMHA) will be required during the future site and alignment-specific geotechnical investigations. The design of foundation and retaining/slope systems will need to consider the effects of strong ground shaking, and vet the likelihood of the geohazards described in Tables 1, 2, and 3.
- Per the State of California 1993 Alquist-Priolo Earthquake Faulting Zone Act, no land divisions or structures proposed for human occupancy shall be permitted to be placed across, or within 50-ft of the trace of an active fault. (An active fault is defined per the Alquist-Priolo Act as one that has ruptured in the last 11,000 years.) Although the project site does not appear to intersect a mapped Earthquake Fault Zone (EFZ), the project site is immediately adjacent to a late quaternary, moderately constrained, unnamed fault that spans approximately 0.15 miles (Figure 5). The Cable Canyon alignment intersects this same fault where it ties into the Devil's Canyon Road site (Figure 5). Although limited data about the fault is available from the California Geological Survey, the site and alignment's location relative to this unnamed fault should be thoroughly evaluated by the SoCalGas with respect to long-term performance.

Coordination with local agencies for the identification of any more restrictive requirements beyond State law regarding the Cable Canyon alignment and the site's intersection with a mapped fault is recommended. The geotechnical risks need to be further identified and/or evaluated through the performance of an alignment and site-specific geotechnical investigation which should include a detailed fault study of the project area.

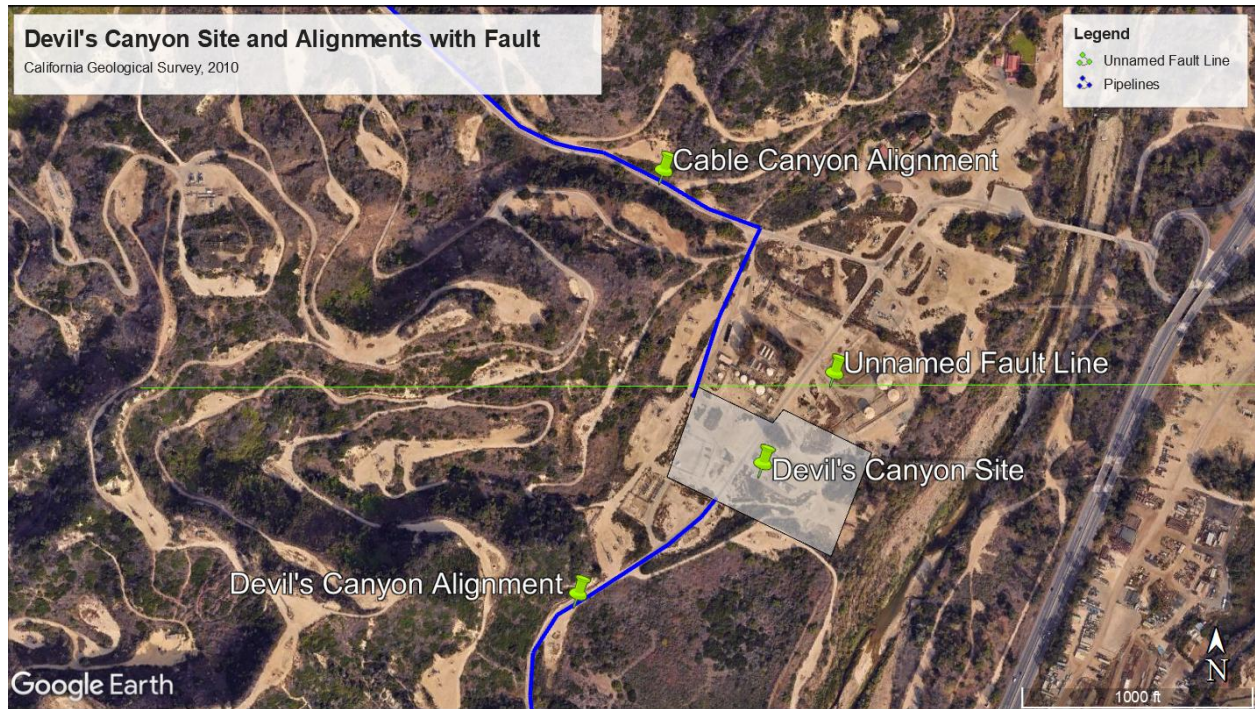


Figure 5: Aerial schematic of unnamed fault (as indicated in green) intersecting the Devil's Canyon Road Site (Google Earth 2025 and California Geological Survey, 2015)

- The site is located adjacent to a steeply sloped area identified to have high landslide potential ($>15\%$) (Figure 6). Grading activities at the site are not expected to impact the known landslide risks nearby, however, sections of the proposed pipeline alignments are located within steeply sloped areas identified to have high landslide potential ($>15\%$) (Figure 6). The alignments also span earthquake-induced landslide zones as shown in Figure 7. The pipelines may be negatively impacted by slope failures directly along the proposed alignments (leading to direct damage of the pipelines) or may be impacted by a slope failure (blocked access roads).
- Given the high landslide potential of the area and the presence of known active and recent landslides, the geotechnical risks need to be further identified and/or evaluated through the performance of an alignment-specific geotechnical investigation which should include, but not be limited to:
 - o Static and seismic global stability of the existing slopes along the proposed pipeline alignments and access roadways.
 - o Drainage and erosion potential of the area relative to any proposed earthwork activities.

The geotechnical risks need to be further identified and/or evaluated through the performance of a site and alignment-specific geotechnical investigation which should include (but not be limited to) a static and seismic global stability analysis of slopes in close proximity to the proposed site and pipeline alignments.

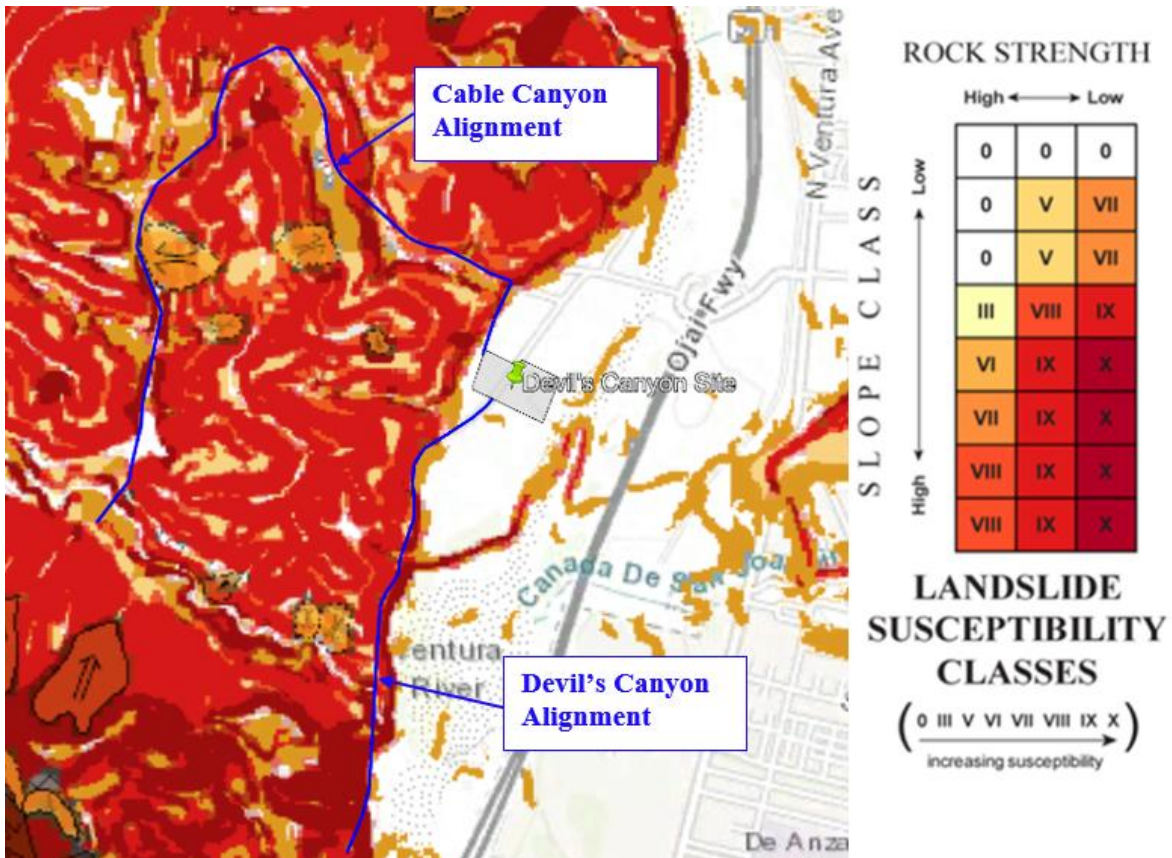


Figure 6: CGS Landslide Susceptibility Class Map per Wilson & Keefer (1985) and Ponti et al (2008)

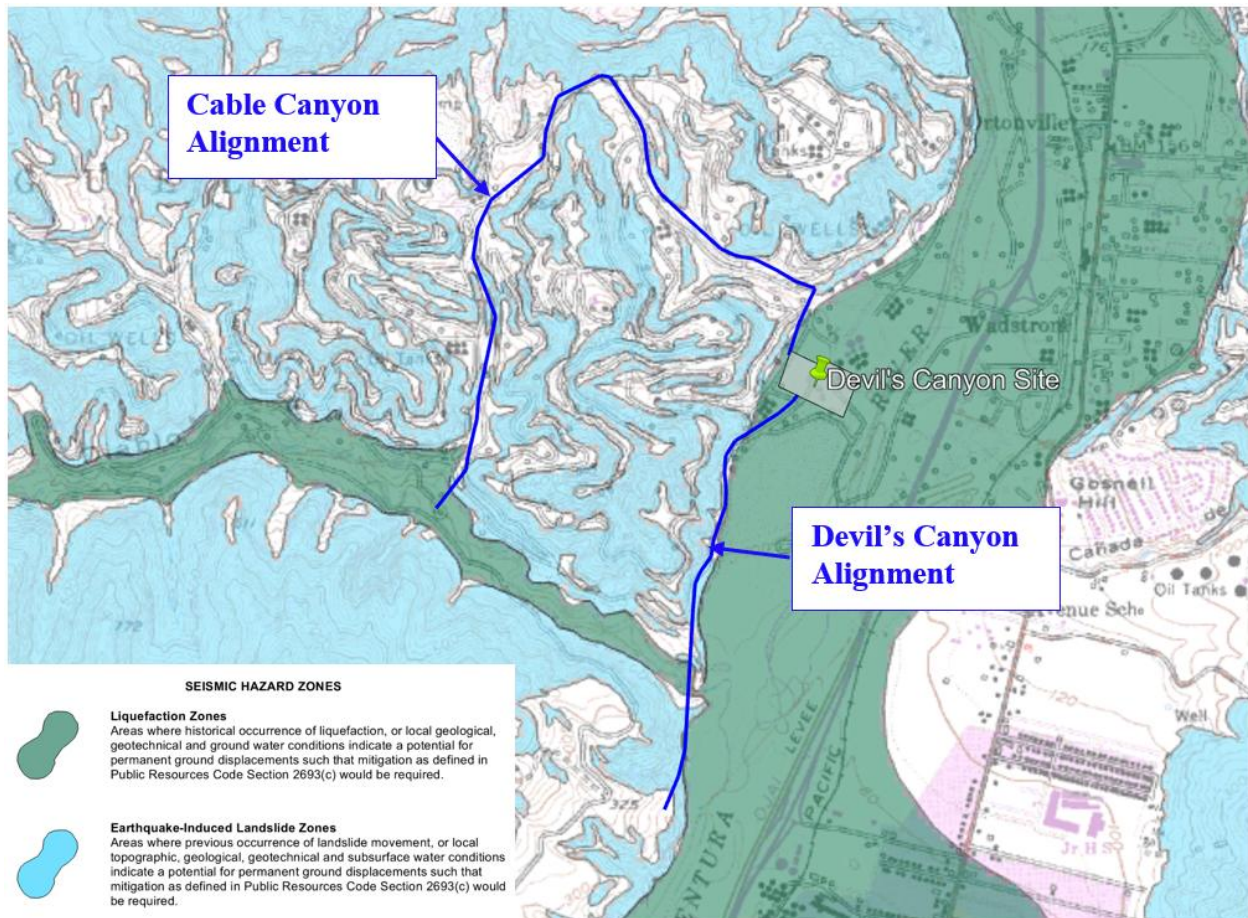


Figure 7: Earthquake Zones of Required Investigation (CGS 2003)

- Per California Geological Survey (CGS) Earthquake hazard maps, the compressor station site is in a liquefaction hazard zone. Sections of both pipeline alignments also cross liquefaction hazard zones (Figure 7). Liquefaction is generally defined as a phenomenon that occurs when saturated granular soils are subjected to strong ground shaking. During shaking, in-situ porewater pressures exceed the effective stress of the soil, subsequently reducing its strength and stiffness and making it behave as a fluid. Negative structural effects commonly associated with liquefaction include increased settlements, loss of bearing capacity, and buoyancy uplift effects (buried structures).

The performance of site and alignment-specific geotechnical investigations should further identify liquefaction susceptibility, as a function of strong ground shaking, subsurface conditions, and depth to groundwater. Structures sensitive to vertical movement may

require deep foundation systems to prevent bearing capacity failure, limit settlement, and generally mitigate the negative effects of liquefaction.

- Much of the Devil's Canyon alignment runs through areas of minimal flood hazard, but mild flooding may occur along one section of the proposed alignment (Figure 8). Structures sensitive to vertical movement may require deep foundation systems to prevent bearing capacity failure, limit settlement, and generally mitigate the negative effects of high-water levels associated with flooding. It is unlikely that the Cable Canyon route will be affected by flooding along the alignment. Supplemental Federal Emergency Management Agency (FEMA) maps are attached in Exhibit A to support Cable Canyon's low-risk characterization.

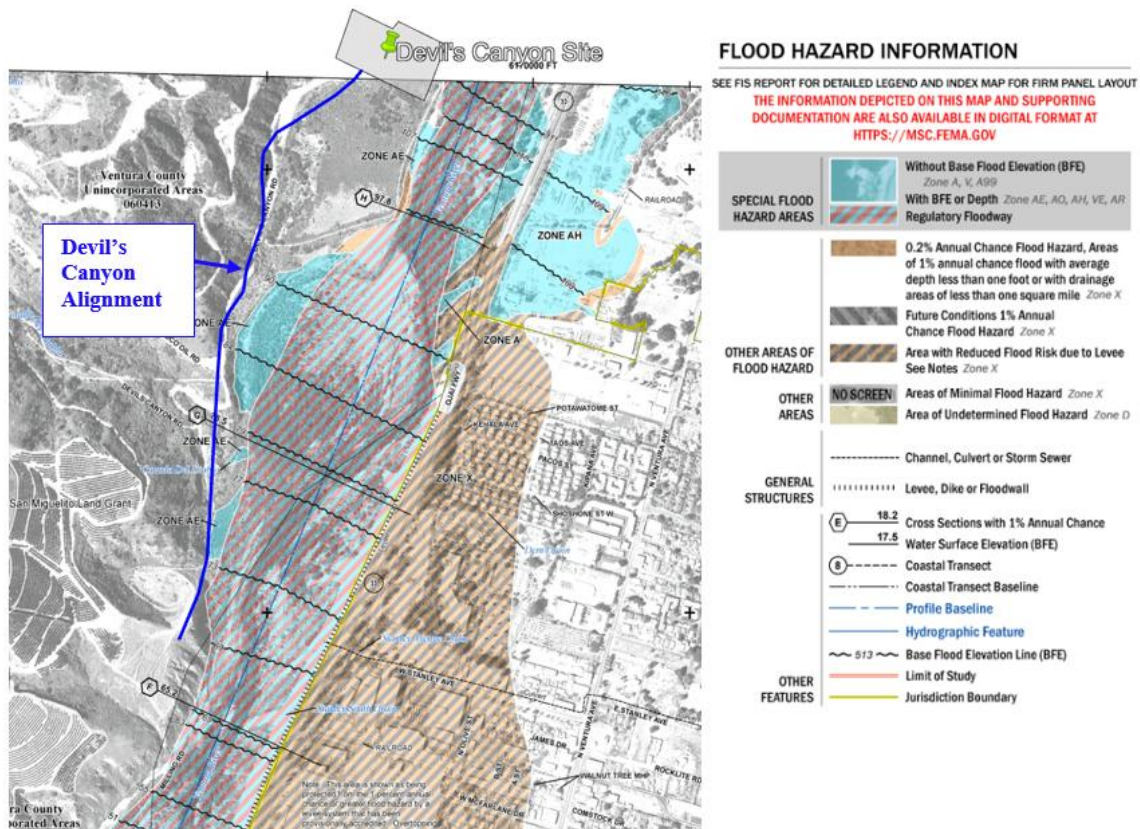


Figure 8: FEMA FIRM Map for Ventura County, CA (FEMA 2021)

- Potentially compressive and unsuitable materials in surficial soils may be present at the Devil's Canyon Road site and along the pipeline alignments. For shallow foundations, depending on the severity of the compressibility/shrink-swell potential, additional mitigation measures may be required, such as over-excavation and replacement. If deep foundations are required, increased embedment depths may be needed.

- Existing access roadway subgrades may be generally unsuitable for traffic loads associated with compressor station and pipeline construction and operation. Additional over-excavation and backfill with low volume change material, chemical treatment, or other means may be necessary to improve existing roadways. Modification/remediation of adjacent roadway slopes to improve global stability may also be required.
- Concrete and steel foundations could be affected by corrosion, which may lead to an increase in thickness to account for sacrificial steel or consider special coatings. Both impacts could have an impact to the overall foundation design and require site and alignment-specific investigations.

Exhibits

A – Supplemental Federal Emergency Management Agency (FEMA) National Flood Hazard Maps