DOCKETED	
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Document Title:	Section 4-4_Geological Hazards and Resources
Description:	This section provides an evaluation of the proposed Project in terms of potential exposure to geological hazards and potential to affect geologic resources of commercial, recreational, or scientific value.
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4.4 Geological Hazards and Resources

This section provides an evaluation of the proposed project in terms of potential exposure to geological hazards and potential to affect geologic resources of commercial, recreational, or scientific value. The information presented in the following sections is based on readily available and preliminary geotechnical testing that has been performed within the Project boundary. Construction of the proposed project involves site grading, earthwork, and trenching to prepare the site for installation of BESS-related infrastructure, access roads, walls, and stormwater management areas.

Site-specific geotechnical exploration has been performed within the Project boundary to characterize the site-specific surface and subsurface conditions and a report was prepared to document results (see Appendix 4.4A, Geotechnical Evaluation Report). The project's subsurface exploration included 26 test borings to approximate depths ranging between 63 and 100 feet below existing ground surface (bgs) within and adjacent to the proposed BESS facility footprint.

4.4.1 Affected Environment

4.4.1.1 Regional Geology

The site is located on the southwestern border of the Peninsular Ranges at the southeasternmost portion of the Los Angeles Basin. Specifically, the site lies on the central portion of the sedimentary basin known as the Capistrano Embayment, an early Cenozoic seaway, which trended northerly between the Peninsular Ranges and a hypothetical Catalina uplift off the Southern California coast. Locally, the Capistrano Embayment refers to the flat-bottomed structural trough formed by the downward displacement along the west side of the Cristianitos Fault and down-warping along the east side of the San Joaquin Hills. The embayment was subsequently in-filled with marine siltstone and clayey siltstone of the late Miocene to early Pliocene (approximately 5 to 15 million years old) Capistrano Formation. This sedimentary unit, in excess of 3,000 feet thick near the center of the embayment, was uplifted, folded, and eroded in Pliocene and post-Pliocene times (approximately 2 to 3 million years ago) producing the low, rolling ridges observed today. More recently, the local geology has also been influenced by a drop in sea level resulting in a series of abandoned terrace deposits, both marine and non-marine.

4.4.1.1.1 Faulting and Seismicity

The site is in southern California, which is a seismically active area, however, earthquake faults are not mapped within or projecting toward the site. The nearest Alquist-Priolo fault zone is the Elsinore fault zone located approximately 18 miles northeast of the site. Figure 4.4-1 shows the faults identified in the vicinity of the Project Site.

The CGS Data Viewer application was also used to determine the epicenter locations of historic earthquakes around the Project Site (CGS 2023). The CGS Data Viewer program shows known magnitude 5.0 or greater earthquakes occurring from 1769 through 2015. The closest identified earthquake to the site had a magnitude of 5.3 to 6.4 and occurred approximately 17 miles to the northwest. The closest earthquake with a magnitude 7.0 or higher occurred approximately 57 miles north of the site associated with the San Andreas fault zone.

4.4.1.2 Local Geology and Stratigraphy

The site is situated on a stream terrace west of and adjacent to Oso Creek in Orange County, California. Oso Creek forms a canyon that dissects a portion of the San Joaquin Hills - a coastal range of southern California. The hills are formed in layered sedimentary formations that include the Capistrano Formation. The Capistrano Formation consists of poorly-consolidated, fossiliferous, marine sandy-siltstone and mudstone. Capistrano beds are susceptible to landsliding as evidenced by landslide deposits mapped west of the site. The geologic materials identified in the site geotechnical evaluation include artificial fill, topsoil/colluvium, Quaternary alluvial deposits, Quaternary river terrace deposits, Quaternary older alluvial deposits, Quaternary landslide deposits, and Tertiary Capistrano Formation.

4.4.1.3 Seismic Setting

The subject site is not located within an Alquist-Priolo Earthquake Fault Zone and no faults were identified on the site during the site evaluation. The possibility of damage due to ground rupture is considered low since no active faults are known to cross the site.

Secondary effects of seismic shaking resulting from large earthquakes on the major faults in the Southern California region, which may affect the site, include ground lurching, shallow ground rupture, soil liquefaction and dynamic settlement. These secondary effects of seismic shaking are a possibility throughout the Southern California region and are dependent on the distance between the site and causative fault and the onsite geology. The major active nearby faults that could produce these secondary effects include the onshore and offshore segments of the Newport-Inglewood Fault Zone, located approximately 6 miles southwest of the site. The presence of a blind thrust fault has been interpolated from limited data, to exist at a depth of approximately eight miles below the uplifted local hills; however, the San Joaquin Hills Blind Thrust Fault does not have a known location of surface rupture.

4.4.1.4 Potential Geologic Hazards

The following subsections present the potential geological hazards that may occur within the Project area.

4.4.1.4.1 Ground Rupture

Soil lurching refers to the rolling motion on the ground surface by the passage of seismic surface waves. Effects of this nature are not likely to be significant where the thickness of soft sediments do not vary appreciably under structures. Ground rupture due to active faulting is not likely to occur on site due to the absence of known active fault traces. Ground cracking due to shaking from distant seismic events is not considered a significant hazard, although it is a possibility at any site.

4.4.1.4.2 Seismic Shaking

Due to the site’s proximity to surrounding fault zones, the site may experience strong ground motions in the event of an earthquake. The CGS Earthquake Shaking Potential Map web application categorizes areas based on their expected intermediate period ground motions with a 2 percent exceedance probability in 50 years (CGS 2023). This application incorporates anticipated amplification of ground motions by local soil conditions and places the earthquake shaking potentials in a qualitative ranking system from highest to lowest potential. The project site is ranked by the web application as having medium shaking potential.

Section 1803.5.12 of the 2022 CBC (per Section 11.8.3 of ASCE 7) states that the maximum considered earthquake geometric mean (MCE_G) Peak Ground Acceleration (PGA) should be used for liquefaction potential. The PGA_M for the site is equal to 0.563g (SEAOC, 2024). The design PGA may be taken as 0.375g (2/3 of PGA_M). A deaggregation of the PGA based on a 2,475-year average return period (MCE) indicates that an earthquake magnitude of 6.68 at a distance of 12.48 km from the site would contribute the most to this ground motion.

4.4.1.4.3 Liquefaction

Liquefaction is a seismic phenomenon in which loose, saturated, granular soils behave similarly to a fluid when subject to high-intensity ground shaking. Liquefaction occurs when three general conditions coexist: 1) shallow groundwater; 2) low density non-cohesive (granular) soils; and 3) high-intensity ground motion. Studies indicate that saturated, loose near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential. In general, cohesive soils are not considered susceptible to liquefaction, depending on their plasticity and moisture content (Bray & Sancio, 2006). Effects of liquefaction on level ground include settlement, sand boils, and bearing capacity failures below structures. Dynamic settlement of dry loose sands can occur as the sand particles tend to settle and densify as a result of a seismic event.

The site is located within a State of California Seismic Hazard Zone (CDMG, 2002a) for liquefaction potential. The vast majority of the alluvial soils tested are cohesive and not considered to be susceptible to liquefaction based on their Plasticity Index (Bray & Sancio, 2006). However, the data obtained from the field evaluation indicates that the site contains isolated typically relatively thin sandy layers susceptible to liquefaction in the upper 50 feet. Liquefaction potential was evaluated using the procedures outlined by Special Publication 117A (SCEC, 1999 & CGS, 2008). Liquefaction analysis was performed based on the seismic criteria (PGA_M) of the 2022 California Building Code (CBC) and an estimated high groundwater depth of 5 feet below existing grade. Estimated total and differential seismic settlement due to liquefaction potential are estimated at 1-inch and ½ inch over 50 feet, respectively.

4.4.1.4.4 Landslides

The potential for landslides to occur depends on a variety of factors including, but not limited to, the steepness of the slope, geology, and soil moisture. Rock Strength and slope are combined according to the methodology of Wilson and Keefer (1985) as implemented by Ponti et al (2008) to create classes of landslide susceptibility. These classes express the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weaker rocks. Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes in hard rocks and moderate to very steep slopes in weak rocks. Based on a review of a CGS mapping, the southwest portion of the Project site is partially located within landslide class VII designated area which is not considered a very high landslide susceptibility area; the remainder of the site is designated in landslide class 0.

The underlying bedrock formation within this geologically complex area is the Capistrano Formation, a generally massive siltstone with few very thin clay beds within the stratigraphy of the formation, which are locally sub horizonal to slightly westward-dipping. Bedding angles within the bedrock as observed in in the site geotechnical evaluation has a general range between 2 degrees and 7 degrees to the southwest. Uplift and weathering of the bedrock formation commonly produces block-type landslide failures that fail along the very thin clay bedding, creating block-glide type landslides with steep backscarps and gently dipping basal rupture surfaces. The hillside to the west of the proposed development area has previously been identified to have numerous landslides as depicted on the regional geologic map. The presence of landslide on-site has been confirmed with the recent investigation.

As observed in the recent large-diameter borings, landslides have both failed along clay bed(s) as a block-glide and accumulated over time as a series of slopewash pulses and organic-rich debris-flows (up to 65 feet deep in LGC

Geotechnical boring B-3 and up to 80 feet deep in LGC Geotechnical boring B-2). Geologic structure of the on-site portion of landslides ranges from lacking structure entirely as gently downslope-dipping slopewash to highly sheared displaced bedrock material. The basal rupture clays of the on-site portions of the landslides were observed to be approximately ¼-inch thick or less, and typically oriented parallel to bedding as observed in numerous borings.

Rotational failures along the west Oso Creek channel walls were mapped and observed to be heavily vegetated, well-defined slumps that likely were saturated and undercut at the toe, by the flowing water of Oso Creek.

4.4.1.4.5 Subsidence

Subsidence occurs as the gradual settling of the ground surface over time due to underground material movement. Subsidence is most often caused by the removal of groundwater through pumping activities, fracking activities for oil extraction, or the mining of other mineral resources. Soil compaction, sinkhole formation, and earthquakes can also cause subsidence to occur. As discussed above, seismically induced settlement of saturated and unsaturated sands was found to occur in one of the four borings (B-2). Estimated total and differential seismic settlement due to liquefaction potential are estimated at 1-inch and ½ inch over 50 feet, respectively No groundwater or petroleum extraction is known to have occurred on or in the vicinity of the site.

4.4.1.4.6 Expansive Soils

Expansive soils have the potential to shrink and swell with variations in saturation, which could cause ground instability in the form of differential ground heave. Based on lab testing results and experience with the Capistrano Formation, site materials should be anticipated to have “Medium” to “Very High” potential for expansion.

4.4.1.4.7 Tsunamis and Seiches

Tsunamis are large ocean waves that are seismically induced and often the result of offshore earthquakes or landslides. The proposed site is approximately 4.5 miles from the coastline. Per a review of the CGS Tsunami Hazard Area Map, the Project Site is not located within a tsunami hazard area (CGS 2023).

Seiches are waves and oscillations within confined bodies of water that are seismically induced by ground shaking. There are no large, confined bodies of water immediately adjacent to or uphill of the site, and therefore the potential for an off-site seiche to impact the Project Site is negligible.

4.4.1.5 Geologic Resources of Recreational, Commercial, or Scientific Value

The California Department of Conservation (CDOC) Division of Mines and Geology published a map showing the generalized mineral land classification of Orange County, California in 1994 (CDOC 1994). The mineral land classification maps evaluate areas based on the presence of aggregate resources. The project site contains lands classified as MRZ-1 and MRZ-3. MRZ-1 are areas where adequate information indicates that no significant construction aggregate deposits are present, or where it is judged that little likelihood exists for their presence. MRZ-3 are areas containing construction aggregate deposits the significance of which cannot be evaluated from available data. The Project site will be entirely located on lands classified as MRZ-3. A Mineral Land Classification map is included as Figure 4.4-5.

In addition, a review of the CDOC Mines Online mapping was performed, which contains a webmap showing the commodities produced by California's mines and their status. No mines are located within the Project Site or a 2-

mile radius from the project site (CDOC 2023). The nearest mine is a specialty sand mine located approximately 5.5 miles southeast of the Project site.

4.4.2 Environmental Analysis

The following sections present the potential effects from the construction and operation of the proposed Project on geologic resources and risks to life and property from geologic hazards.

4.4.2.1 Significance Criteria

According to Appendix G of the California Environmental Quality Act statutes, a project would have a significant environmental impact in terms of geological hazards and resources if it would do the following:

- Directly or indirectly cause potential adverse effects, including the risk of loss, injury, or death involving the following:
  - Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault
  - Strong seismic ground shaking
  - Seismic-related ground failure, including liquefaction
  - Landslides
- Be located on a geologic unit or soil that is unstable or that would become unstable as a result of the project, and potentially result in on- or offsite landslide, subsidence, liquefaction, or collapse.
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.
- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan.

4.4.2.2 Geological Hazards

As described in Section 4.4.1.4, the following potential geological hazards, with corresponding impact assessment, have been identified. Mitigation measures to reduce the impact(s) to less than significant are described in Section 4.4.4.

- The likelihood for a fault ground rupture to occur at the proposed Project Site is considered low. Ground rupture related impacts are considered less than significant.
- The Project Site considered as having medium shaking potential. Seismic shaking related impacts can be mitigated to less than significant.
- The site is located within a State-designated Seismic Hazard Zone for liquefaction potential. A preliminary liquefaction analysis conducted as part of the site-specific geotechnical exploration showed the potential for a minor amount of seismically induced settlement. Liquefaction related impacts can be mitigated to less than significant.
- The site is bounded from the east and west by steep slopes and contains mapped landslide potential areas. Landsliding related impacts can be mitigated to less than significant.

- Seismically induced settlement was found onsite. The Project will not pump groundwater or petroleum. Subsidence related impacts can be mitigated to less than significant.
- Soils onsite have medium to very high expansion potential. Expansive soils related impacts can be mitigated to less than significant.
- The Project Site is not located within a tsunami hazard area and there are no large, confined bodies of water immediately adjacent to or uphill of the site, and therefore the potential for an off-site seiche to impact the Project Site is negligible. Tsunamis and seiches related impacts are less than significant.

Overall, the Project's site-specific geotechnical investigation determined the site is suitable for the proposed use based upon geotechnical conditions encountered in the test borings, provided that the findings and recommendations presented in the geotechnical engineering report are incorporated into project design and construction (see Appendix 4.4A). The Project will be required to be designed and constructed to meet the applicable seismic requirements of the California Building Code (CBC).

4.4.2.3 Geological Resources

The Project will not result in a loss of availability of any known valuable mineral resources because no mineral land classification zones exist onsite or in the vicinity of the Project. Additionally, the Project will not result in the loss of availability of a locally important mineral resource recovery site delineated on a local plan, specific plan, or other land use plan because no mines are located within the Project Site or a 2-mile radius from the Project Site.

4.4.3 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the GESC (Public Resources Code Section 21083; CCR, Title 14, Sections 15064[h], 15065[c], 15130, and 15355).

Risks related to geological hazards and resources are typically localized in nature because they tend to be related to on-site conditions or conditions caused by a project's construction. Cumulative projects that would have the potential to be considered in a cumulative context with the proposed project's incremental contribution, and that are included in the analysis of cumulative impacts relative to geological hazards and resources, are identified in Table 4-1 and Exhibit 4-1. Cumulative projects were chosen based on proximity to the proposed project. Other projects include residential, commercial, and industrial development. The majority of the cumulative projects are similar to the proposed project regarding construction and operational activities. These selection factors are appropriate in the context of geological hazards and resources cumulative impacts because generally there needs to be a direct nexus and similar geologic conditions for a synergistic impact to occur, such as site modifications at nearby projects combining to destabilize soils. Currently, there is not a known existing significant cumulative impact related to geological hazards and resources within this geographic scope.

As discussed above, like much of Southern California, the project site is a seismically active area. All areas of San Bernardino County are considered seismically active, to a less or greater extent depending on their proximity to active regional faults. Impacts of the proposed project would be cumulatively considerable if the project, in combination with related projects, would result in significant cumulative impacts. However, the effects of the cumulative projects are not of a nature to cause cumulatively significant effects from geological hazards and resources impacts, because such impacts are site-specific and would only have the potential to combine with impacts of the proposed project if they occurred in the same location.

Additionally, on-site soils are located on fairly level slopes, which generally limits erosion potential because runoff across flat surfaces does not have a substantially high velocity. Although construction activities have the potential to result in erosion on the project site, adherence to the recommendations in the geotechnical report and other grading and building requirements will mitigate erosion impacts to less-than-significant levels. Other cumulative scenario projects would be required to adhere to similar requirements, thereby minimizing cumulative scenario erosion impacts. Specifically, all planned projects in the vicinity of the proposed project are subject to environmental review and would be required to conform to Building Code requirements. With implementation of mitigation measures and other grading and building requirements, the proposed project would not contribute to cumulative impacts for geological hazards and resources or related events because the proposed project and other cumulative projects in the area would be required to demonstrate compliance with local, state, and federal building and safety standards. As a result, with implementation of mitigation, cumulative impacts related to geological hazards and resources would be less than significant.

4.4.4 Mitigation Measures

The following mitigation measures will reduce potential impacts related to geological hazards to less than significant during construction and operation of the proposed Project:

- Adhere to the recommendations provided in the geotechnical evaluation report during the construction and operation of the proposed Project. The recommendations are provided in Section 5 of Attachment 4.4A.

4.4.5 Laws, Ordinances, Regulations, and Standards

Federal, state, and local Laws, Ordinances, Regulations, and Standards (LORS) applicable to geological hazards and resources are discussed below and summarized in Table 4.4-1. There are no federal LORS that apply to geological hazards and resources.

Table 4.4-1. Laws, Ordinances, Regulations, and Standards for Geological Hazards and Resources

LORS	Requirement/Applicability	Administering Agency	Application Section Explaining Conformance
State			
California Building Code, 2022	Acceptable design criteria for structures with respect to seismic design and load-bearing capacity	California Building Standards Commission, State of California	Section 4.4.2.2
Alquist-Priolo Earthquake Fault Zone Act (Title 14, Division 2, Chapter 8, Subchapter 1, Article 3, CCR)	Identifies areas subject to surface rupture from active faults	California Building Standards Commission, State of California	Section 4.4.2.2

Table 4.4-1. Laws, Ordinances, Regulations, and Standards for Geological Hazards and Resources

LORS	Requirement/Applicability	Administering Agency	Application Section Explaining Conformance
The Seismic Hazards Mapping Act (Title 14, Division 2, Chapter 8, Subchapter 1, Article 10, CCR)	Identifies secondary seismic hazards (liquefaction and seismically induced landslides)	California Building Standards Commission, State of California	Section 4.4.2.2
Local			
City of San Juan Capistrano General Plan	Identifies geological hazards and resource areas in the City and provides related goals and policies for development	City of San Juan Capistrano Planning Division	Section 4.4.2.2
City of San Juan Capistrano Municipal Code	Standards for grading, including permit requirements	City of San Juan Capistrano Building Division	Section 4.4.2.2

4.4.5.1 State LORS

4.4.5.1.1 California Building Code

The State of California establishes minimum standards for building design and construction through the California Building Code (CBC) (California Code of Regulations, Title 24). The CBC is based on the Uniform Building Code, which is used widely throughout the United States (generally adopted on a state-by-state or district-by-district basis) and has been modified for conditions in California. State regulations and engineering standards related to geology, soils, and seismic activity in the Uniform Building Code are reflected in the CBC requirements.

The CBC contains specific requirements for seismic safety, excavation, foundations, retaining walls, and site demolition. It also regulates grading activities, including drainage and erosion control.

4.4.5.1.2 Alquist-Priolo Earthquake Fault Zone Act (Title 14, Division 2, Chapter 8, Subchapter 1, Article 3, CCR)

The Alquist–Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults, and published maps showing these zones. Earthquake fault zones are designated by the CGS and are delineated along traces of faults where mapping demonstrates surface fault rupture has occurred within the past 11,700 years. Construction within these zones cannot be permitted until a geologic investigation has been conducted to prove that a building planned for human occupancy would not be constructed across an active fault. These types of site evaluations address the precise location and recency of rupture along traces of the faults, and are typically based on observations made in trenches excavated across fault traces.

4.4.5.1.3 The Seismic Hazards Mapping Act (Title 14, Division 2, Chapter 8, Subchapter 1, Article 10, CCR)

The Seismic Hazards Mapping Act of 1990 (California Public Resources Code, Chapter 7.8, Section 2690 et seq.) directs the CGS to protect the public from earthquake-induced liquefaction and landslide hazards (these hazards are distinct from fault surface rupture hazard regulated by the Alquist–Priolo Act). This act requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones (i.e., zones of required investigation). Before a development permit may be granted for a site within a seismic hazard zone, a geotechnical investigation of the site must be conducted and appropriate mitigation measures incorporated into project design. Evaluation and mitigation of potential risks from seismic hazards within zones of required investigation must be conducted in accordance with the CGS Special Publication 117A, adopted March 13, 1997, updated in 2008, by the State Mining and Geology Board (CGS 2008).

4.4.5.2 Local LORS

4.4.5.2.1 City of San Juan Capistrano General Plan

The City's General Plan includes policies and programs that are intended to address geology and soils and guide future development in a way that lessens impacts. For instance, the Safety Element addresses issues related to protecting the community from any unreasonable risks associated with seismically induced surface rupture, ground shaking, ground failure, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards identified on seismic hazard maps; other known geologic hazards; flooding; and wildland and urban fires. Goals and policies from the City's General Plan relevant to the project are summarized below:

Safety Goal 1: Reduce the risk to the community from hazards related to geologic conditions, seismic activity, wildfires, flooding, and climate change.

Seismicity

Policy 1.1: Reduce the risk of impacts geologic and seismic hazards by applying proper development engineering, building construction, and retrofitting requirements.

Policy 1.2: Explore funding sources to create an inventory of hazardous or substandard structures in the City that may collapse in the event of an earthquake and prepare a program to work with the property owners to seismically retrofit, rehabilitate, or if necessary, removal or replacement of unsafe structures.

Policy 1.3: Explore the possibility of creating a Geologic Hazard Abatement District (GHAD) to finance the prevention, mitigation, abatement, or control of a geologic hazard.

Policy 1.4: Continue the Soils subsidence remediation program that establishes specific measures to provide financial resources and programs to assist in the correction of damages arising from slope displacement.

4.4.5.2.2 City of San Juan Capistrano Municipal Code

The City adopted, with amendments, and enforces the 2016 edition of the CBC as published by the International Code Council. Chapter 2, Building Code, of Title 8, of the City's Municipal Code is the City's Building Code. The purpose of a building code is to provide minimum standards to safeguard life or limb, health, property, and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all buildings and structures within the City. Building Code provisions apply to the construction, alteration, moving, demolition, repair, and use of any building or structure within the City.

4.4.6 Agencies and Agency Contacts

Applicable permits and agency contacts for geological hazards and resources are shown in Table 4.11-2. Building and grading permits from the City of San Juan Capistrano Building Division would be superseded by CEC approval of the Project under the opt-in program.

Table 4.4-2. Permits and Agency Contacts

Permit or Approval	Agency Contact	Applicability
City of San Juan Capistrano Grading and Building Permit*	City of San Juan Capistrano Public Works and Engineering Department 30448 Rancho Viejo Road San Juan Capistrano, CA 92675 (949) 443-6337	Building and Grading Permits

* Building and grading permits from the City of San Juan Capistrano Building Division would be superseded by CEC approval of the Project under the opt-in program.

4.4.7 Permits and Permit Schedule

There are no applicable permits or permit schedule for geological hazards and resources. Pending Project approval from the CEC, construction of the project would commence.

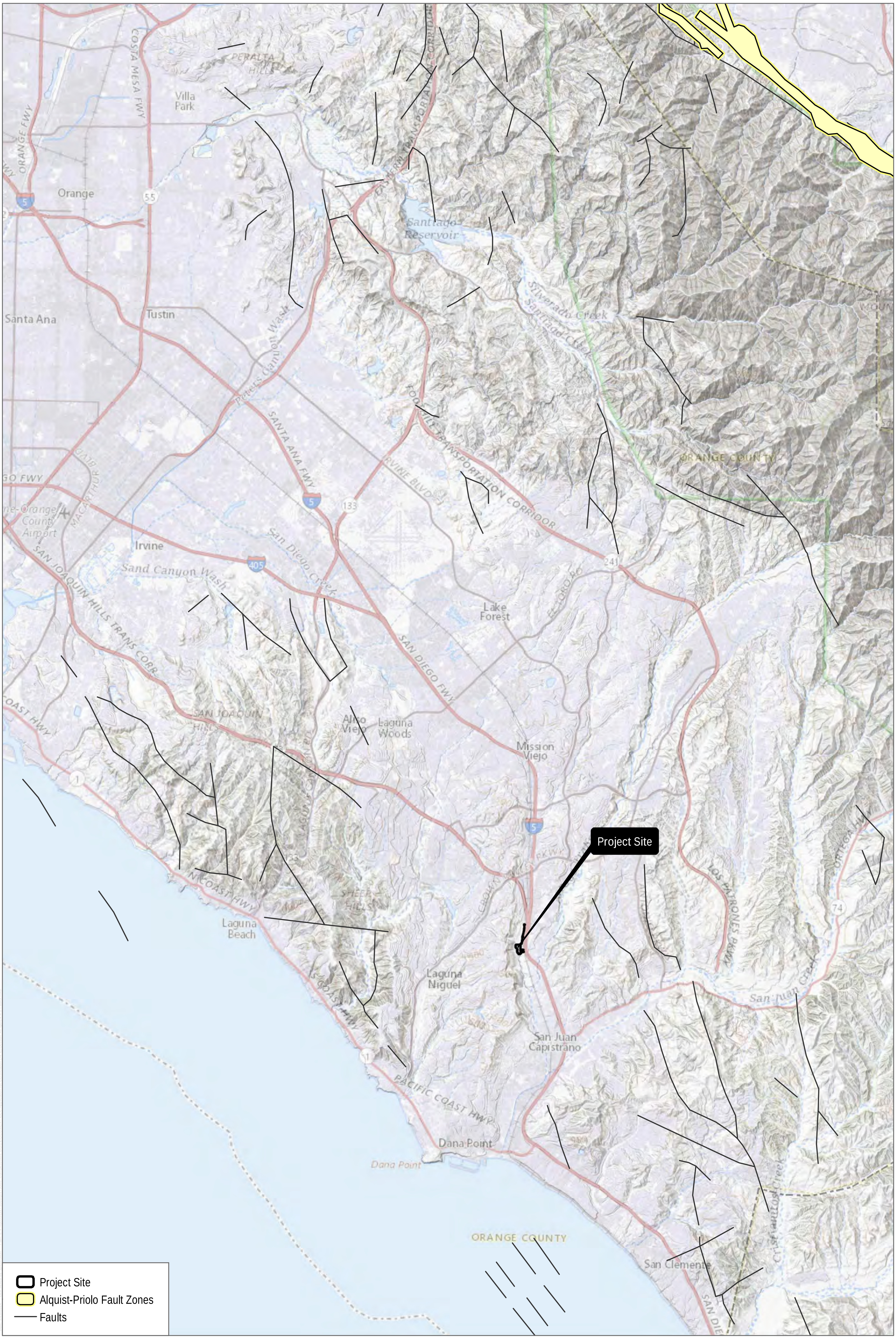
4.4.8 References

California Department of Conservation (CDOC). 1994. Update of Mineral Land Classification of Portland Cement Concrete Aggregate in Ventura, Los Angeles, and Orange Counties, California, Part III - Orange County. https://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=mlc

CDOC. 2023. Division of Mine Reclamation. Mines Online webmap. https://maps.conservation.ca.gov/mol/index.html

California Geological Survey (CGS). 2002. California Geomorphic Provinces, Note 36. California Department of Conservation. December. https://www.conservation.ca.gov/cgs/Documents/Publications/CGS-Notes/CGS-Note-36.pdf

CGS. 2023. DOC Maps Data Viewer. https://maps.conservation.ca.gov/cgs/DataViewer/index.html



SOURCE: Esri; USGS 2000; California Department of Conservation 2005

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FIGURE 4.4-1

Faults

Compass Energy Storage Project

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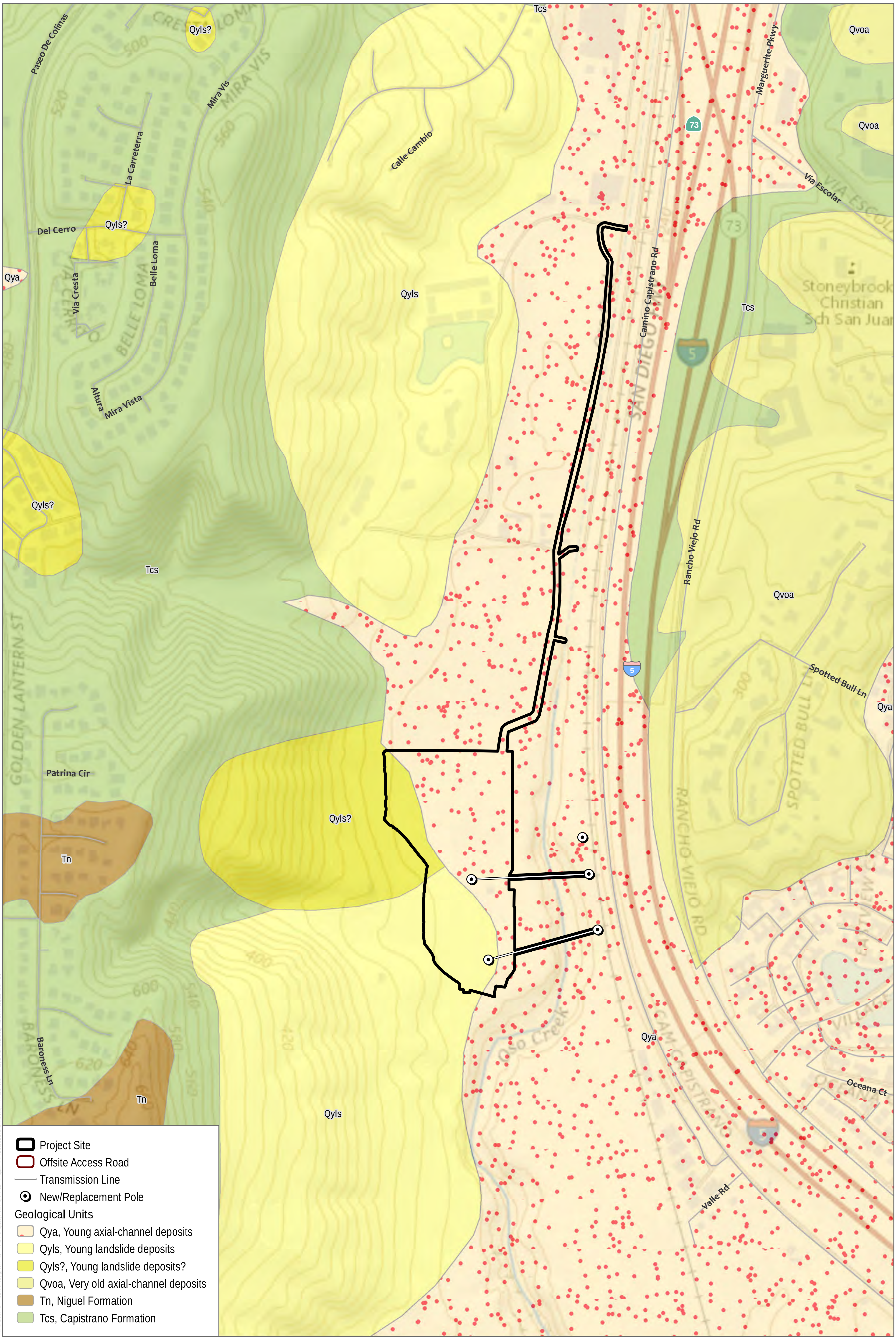

SOURCE: USGS 2006

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FIGURE 4.4-2

Geological Units

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SOURCE: Esri; USGS 2000; California Department of Conservation 2005

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FIGURE 4.4-3

Liquefaction Potential

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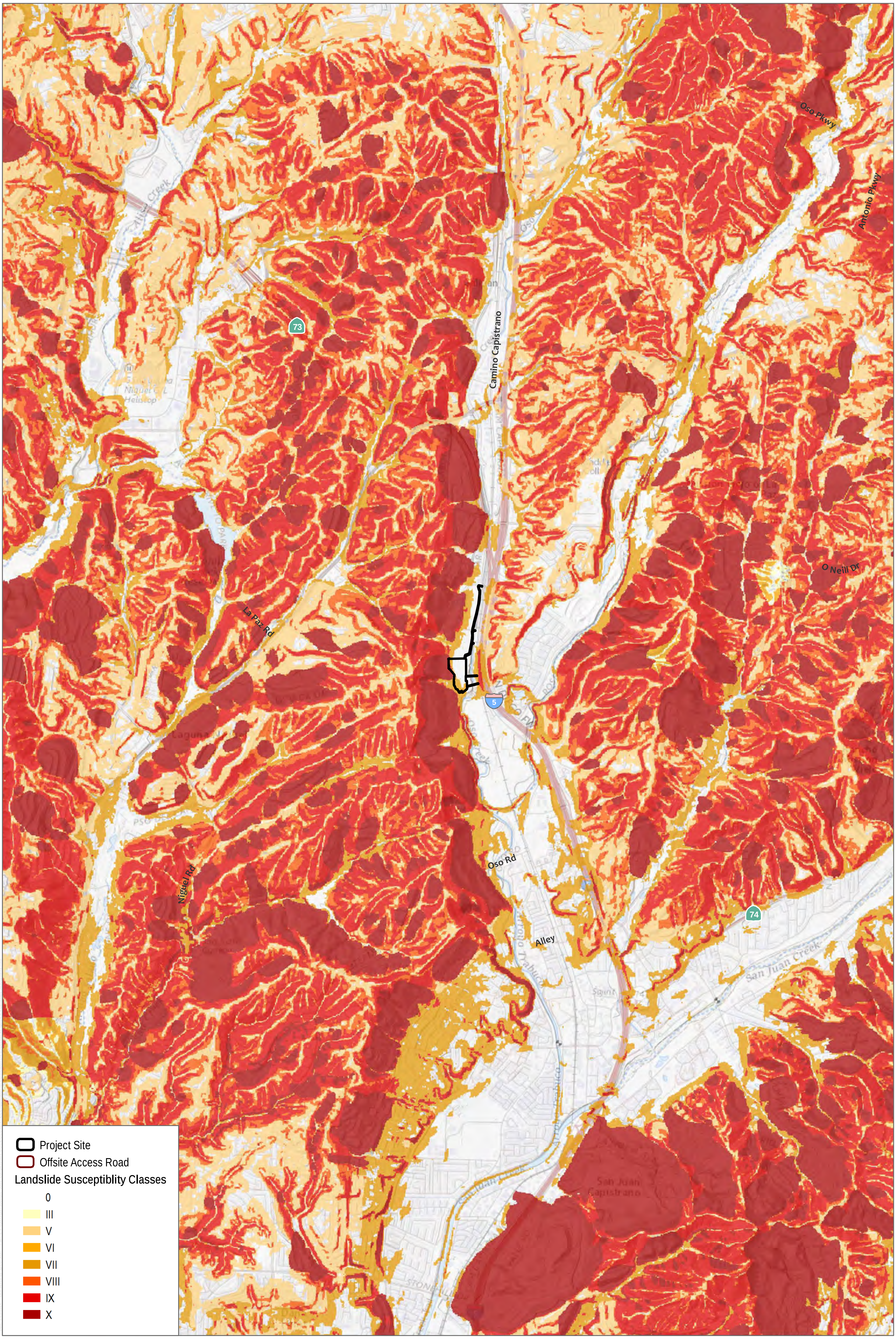

SOURCE: Esri; USGS 2000; California Department of Conservation 2008

DUDEK 0 1,000 2,000 Feet

FIGURE 4.4-4

Landslide Susceptibility

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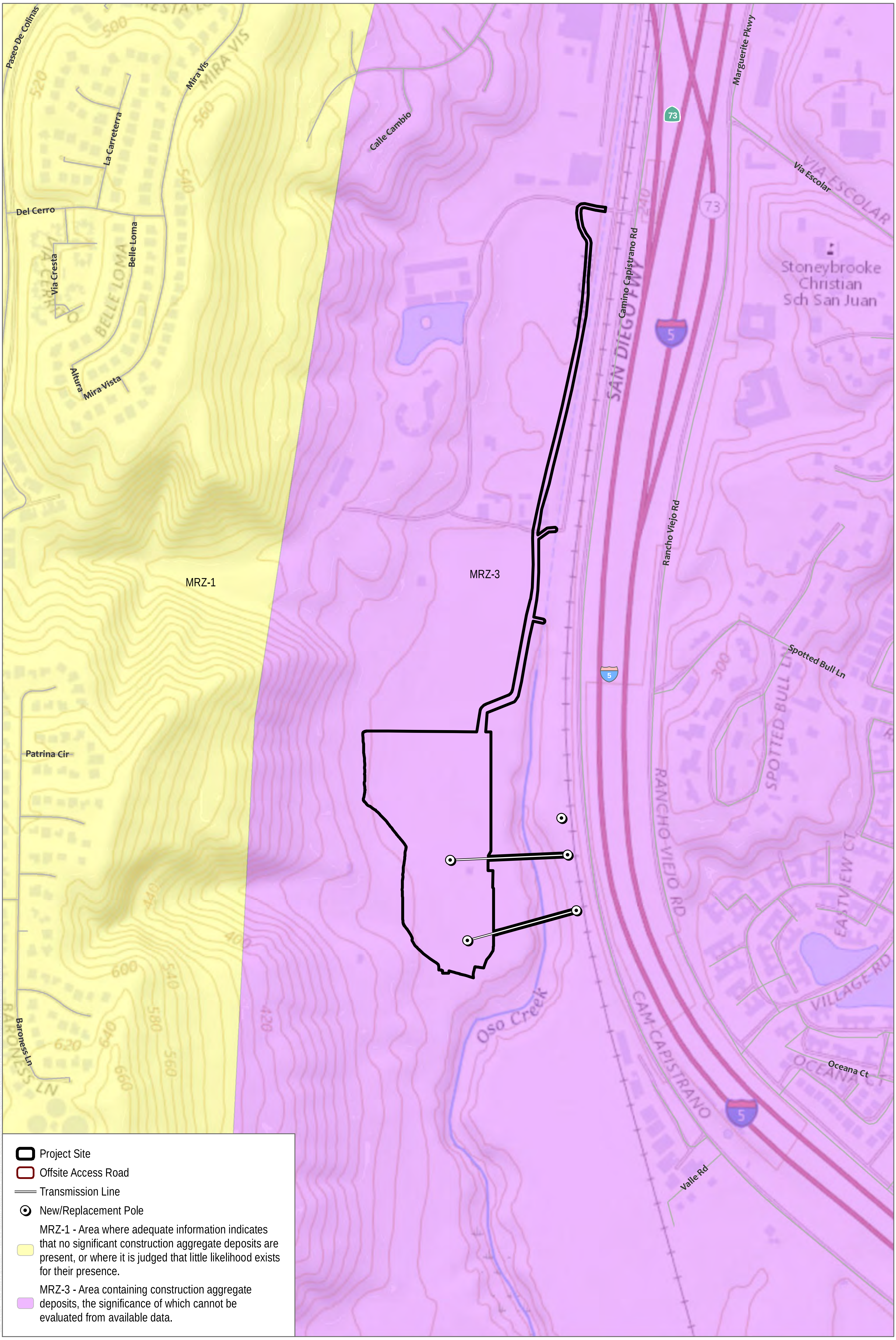

SOURCE: USGS National Map 2023; Miller et al. 1981

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FIGURE 4.4-5

Mineral Resource Zones

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