CHAPTER 3.0 – EXISTING CONDITIONS

Chapter 3.0 sets forth the Existing Conditions of the Project site and describes the present physical conditions within the area of the Proposed Project. This section of the EIR describes the baseline conditions for each environmental resource against which the potential impacts of the Proposed Project and alternatives will be compared to each other in Chapter 4.0, *Environmental Impact/Environmental Consequences and Mitigation*. Generally, the baseline used for the analysis of environmental impacts reflects the conditions present at or about the time the EIR is initiated. The environmental issue areas described in Chapter 3.0 include:

<u>Subchapter</u>

3.1 Geological Resources

3.2 Hydrology/Water Quality

3.3 Biological Resources

3.4 Cultural Resources

3.5 Noise

3.6 Air Quality

3.7 Transportation/Circulation

3.8 Hazardous Materials, Public Health and Safety

3.9 Land Use and Planning

3.10 Aesthetics

3.11 Public Services and Utilities

3.12 Climate Change

3.13 Paleontological Resources

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3.1 Geological Resources

As described in Subchapter 1.1, *Introduction and Overview*, a number of design options have been assessed for the Proposed Project since 2005, with the current design representing efforts to reduce biological resource impacts by limiting the mining/processing impact footprint to approximately 105 acres within the 410-acre Project site. Accordingly, a number of technical assessments have been prepared to describe and evaluate geotechnical conditions at the Project site, including the following: (1) a Geotechnical Evaluation Report prepared by Testing Engineers-U.S. Laboratories (TEUSL, 2005) for the originally proposed 210-acre mining impact footprint; (2) a letter report prepared by Geotechnics, Inc. (Geotechnics; 2009) to assess the 2005 Geotechnical Evaluation with respect to slope stability; (3) an evaluation of restoration backfill feasibility (Geotechnics 2010); (4) a Reclamation Plan prepared under the Surface Mining and Reclamation Act (SMARA) by EnviroMINE (2019b) to assess the mining operation and related IDEFO; (5) a Geologic Reconnaissance and Slope Stability Analysis prepared by Christian Wheeler Engineering (CWE 2011) to assess the 110-acre impact footprint and IDEFO identified at that time; and (6) a Revised Report of Slope Stability Analyses and Reclamation Fill Settlement prepared by CWE to reflect the current Proposed Project design (CWE 2014). Applicable information from these analyses is summarized below along with other applicable data, with the Geologic Reconnaissance and Slope Stability Analyses included in Appendix C of this EIR (and additional description of the technical analyses provided under the discussion of potential Project impacts in Subchapter 4.1, *Geological Resources*).

Based on the above discussion, the following assessment of existing geological resources is focused primarily on the approximately 105-acre impact footprint. That is, the remaining 305 acres within the Project site would be placed in a permanent biological preserve as part of the Proposed Project and would not be impacted by Project-related mineral extraction and processing operations (refer to Chapter 2.0, *Description of the Proposed Project/Action and Alternatives*, for additional information). Some areas outside of the impact footprint, including additional portions of the Project site and certain off-site locations, are also included in the following discussion where appropriate for regional and/or local resource descriptions.

3.1.1 Regulatory Framework

Development of the Proposed Project is subject to a number of regulatory requirements and industry standards related to potential geologic hazards. These requirements and standards typically involve measures to evaluate risk and mitigate potential hazards through design and construction techniques. Specific guidelines encompassing geologic criteria that may be applicable to the design and construction of the Proposed Project include: (1) the San Diego County General Plan Safety Element; (2) the County Guidelines for Determining Significance, Geologic Hazards (County 2007b); (3) Title 8, Division 4 (Design Standards and Performance Requirements) and Division 7 (Excavation and Grading), and Title 5, Division 1 (Amendments to the State Building Standards Code) of the County Code of Regulatory Ordinances; (4) the International Code Council, Inc. (ICC) International Building Code (IBC; ICC 2006, as amended), and the related California Building Code (CBC; CCR, Title 24, Part 2); and (5) SMARA (PRC, Division 2, Chapter 9, Section 2710 et seq.), and related County standards. Regulatory requirements related to potential erosion and sedimentation effects (i.e., under the NPDES Industrial General Permit) are discussed in Subchapter 3.2 of this EIR, due to their relationship to water quality issues. Summary descriptions of the listed geologic standards are provided below, with specific elements applicable to the Proposed Project discussed in Subchapter 4.1.

3.1.1.1 *County Standards*

The San Diego County General Plan Safety Element is intended to identify and evaluate seismic hazards in the County, and to provide policies to reduce the loss of life and property damage related to seismic hazards. Associated policies in the Safety Element applicable to the Proposed Project include requirements for submittal and approval of appropriate geotechnical investigations, as well as conformance with applicable laws and standards such as the referenced Geologic Hazard Guidelines, the Alquist-Priolo Act (for Fault-Rupture Hazard Zones), and the CBC/IBC.

The County Geologic Hazard Guidelines provide direction for evaluating environmental effects related to geologic hazards. Specifically, these guidelines address potential adverse effects to life and property (pursuant to applicable CEQA standards) from hazards including fault rupture, ground shaking, liquefaction, landslides, rockfalls, and expansive soils. Significance guidelines are identified for the noted issues, as well as related regulatory standards, impact analysis methodologies, potential mitigation/design strategies, and reporting requirements.

Chapter 7 of the County Grading Ordinance regulates all surface mining operations in the unincorporated area of the County. In addition to the standards associated with SMARA, discussed below in Section 3.1.1.3, *SMARA Standards*, the County Grading Ordinance requires annual mine inspections by a County Official, to ensure that the mine is complying with the MUP and the approved Reclamation Plan. Additionally, stipulations regarding the transfer of a surface mining operation, compliance with design standards, and requirements for idle mines are defined in the County Grading Ordinance. While the proposed Project would be required to comply with applicable requirements in the County Grading Ordinance, no grading permit would be required for the proposed mining operation.

County Building Code standards related to geotechnical concerns include applicable portions of the CBC and IBC, along with specific County amendments. The County Building Code is implemented through the issuance of building permits, which may encompass requirements related to preparation of soils reports and implementation of structural loading and drainage criteria.

3.1.1.2 *International Building Code and California Building Code Standards*

The IBC (which encompasses the former Uniform Building Code [UBC]) is produced by the International Code Council, Inc. (ICC; formerly the International Conference of Building Officials [ICBO]) to provide standard specifications for engineering and construction activities, including measures to address geologic and soil concerns. Specifically, these measures encompass issues such as seismic loading (e.g., classifying seismic zones and faults), ground motion, and engineered fill specifications (e.g., compaction and moisture content). The referenced guidelines, while not comprising formal regulatory requirements per se, are widely accepted by regulatory authorities and are routinely included in related standards such as municipal grading codes. The IBC guidelines are regularly updated to reflect current industry standards and practices, including criteria such as The American Society of Civil Engineers (ASCE) and ASTM International (ASTM, formerly known as the American Society for Testing and Materials). The previously noted

CBC guidelines are derived from the IBC and encompass criteria specific to California such as geologic and seismic characteristics.

3.1.1.3 *SMARA Standards*

Mineral extraction operations under State jurisdiction are required by SMARA to implement a reclamation plan approved by the Lead Agency. Pursuant to County Ordinance 87.701 and Section 6556 of the County Zoning Ordinance, the County is the SMARA Lead Agency for applicable operations, including the Proposed Project (Appendix B). Reclamation plans are required to define both the proposed mining operations and the activities/uses proposed after completion of mineral extraction. With respect to site reclamation, extraction areas (and related sites used for purposes such as processing) must be returned to a "useful, approved alternative purpose." Associated reclamation efforts typically involve activities such as regrading or contouring, construction of manufactured slopes, erosion control and/or revegetation.

3.1.2 Environmental Setting

3.1.2.1 *Regional Geology/Topography*

The Proposed Project is located within the Peninsular Ranges Geomorphic Province, a region characterized by northwest-trending structural blocks and intervening, generally parallel, fault zones. Typical lithologies in the Peninsular Ranges include a variety of igneous intrusive (i.e., formed below the surface) rocks associated with the Cretaceous (between approximately 65 and 135 million years old) Southern California Batholith (a large igneous intrusive body). Batholithic rocks in western San Diego County are often intruded into Jurassic (between approximately 135 and 195 million years old) metavolcanic and/or metasedimentary units, with basement rocks in coastal areas locally overlain by a sequence of Tertiary (between approximately 2 and 65 million years old) marine and non-marine sedimentary strata. These sedimentary rocks are associated mainly with a number of sea level transgression and regression cycles (i.e., advances and retreats) that have occurred over approximately the last 55 million years. Geologic exposures in the southwestern corner of San Diego County (including the Project site and impact footprint as described below) consist primarily of Jurassic metavolcanic and Tertiary sedimentary rocks, with batholithic rocks generally occurring further to the east.

Topographically, the Peninsular Ranges Province is composed of generally parallel ranges of steep-sloping hills and mountains separated by alluvial valleys. More recent uplift and erosion has produced the characteristic canyon and mesa topography present today in western San Diego County, as well as the deposition of surficial materials including Quaternary (less than approximately two million years old) alluvium, colluvium, and topsoil.

3.1.2.2 *Site Geology/Topography*

The geology of the Project impact footprint (and the entire Project site) is dominated by the Jurassic-age Santiago Peak Volcanics. This unit is mapped in much of the impact footprint, and likely underlies the entire Project site and adjacent areas (Figure 3.1-1, *Geologic Map*). The Santiago Peak Volcanics are overlain by shallow surficial deposits in most areas, with bedrock outcrops occurring on steeper slopes. The Tertiary Otay Formation underlies more level (generally rolling) terrain in the northern and westernmost portions of the impact footprint, with more extensive occurrences to the west and south (California Geological Survey [CGS], formerly known as the California Division of Mines and Geology [CDMG] 1977). Quaternary alluvial deposits are associated with portions of a larger drainage course in the northern portion of the Project impact footprint, with shallow deposits of Holocene (less than approximately 11,000 years old) topsoils overlying much of the impact footprint and surrounding areas. Additional description of geologic and surficial units within the Project impact footprint is provided below under Stratigraphy.

The Project impact footprint (along with the remainder of the site) is predominantly undeveloped, with existing land uses including an overhead transmission line located within a 60-foot wide SDG&E easement that crosses the northern portion of the impact footprint from northwest to southeast, and a number of unpaved roads and trails. Topography within the Project impact footprint is characterized by generally steep and rugged terrain in the southern and central areas, and relatively gentler slopes to the north. The overall topographic grade is to the west and south, with impact footprint elevations ranging from approximately 575 feet AMSL near the southwestern corner, to over 800 feet AMSL along portions of the east-central boundary (refer to Figure 3.1-2, *Site Topography/Slope Analysis*. Surface drainage within the Project site and impact footprint is generally to the west and south (with local flow directions varying with topography) and occurs as both non-point runoff (sheet flow) and within a number of small, unnamed drainages. Flows from the Project site and impact footprint continue generally to the west and south, and ultimately reach the Tijuana River south of the U.S.-Mexico international border (refer to Subchapter 3.2, *Hydrology/Water Quality*, for additional description of local drainage patterns).

3.1.2.3 *Stratigraphy*

As noted above, surficial and geologic exposures within the Project impact footprint include native topsoils, Quaternary alluvial deposits, the Tertiary Otay Formation, and the Jurassic Santiago Peak Volcanics (TEUSL 2005 and CWE 2011). All of these units are described below in order of increasing age, with on-site deposits (except for topsoils) shown on Figure 3.1-1.

<u>Native Topsoils (Not shown on Figure 3.1-1)</u>

Topsoil mapping within the Project impact footprint and vicinity has been conducted by the U.S. Natural Resources Conservation Service (NRCS, formerly the U.S. Soil Conservation Service 1973). Mapped soils within and adjacent to the Project impact footprint include two individual soil types: Huerhuero Loam, 9 to 15 percent slopes; and San Miguel-Exchequer rocky silt loam, 9 to 70 percent slopes. These soils are generally characterized by loams and rocky loams encompassing clay subsoils, with a summary of soil locations and features provided in Table 3.1-1, *Description of Impact Footprint Soil Characteristics*.

<u>Quaternary Alluvium (Qal)</u>

Quaternary alluvium is mapped within the on-site drainage course located in the northern portion of the impact footprint (Figure 3.1-1), with smaller (unmapped) deposits potentially occurring in other on-site drainages. Alluvial materials generally consist of unconsolidated and poorly sorted sand, silt, and clay deposits with variable amounts of larger-grained materials, and typically exhibit relatively shallow depths.

<u>Tertiary Otay Formation (To)</u>

The Tertiary Otay Formation occurs in portions of the northern impact footprint and in minor areas along the western property boundary (Figure 3.1-1). This unit is non-marine in origin, and consists of light gray to brown, moderately well-sorted, poorly consolidated, massive (i.e., no distinct structural features) sandstone and claystone. The claystone portion of this formation exhibits a waxy texture and consists almost entirely of bentonite, which is formed from the in-place alteration of volcanic ash. Within the Project impact footprint, the Otay Formation overlies the Santiago Peak Volcanics as a narrow wedge and thickens in more extensive exposures to the west (TEUSL 2005).

<u>Jurassic Santiago Peak Volcanics (Kda, Kag)</u>

The Santiago Peak Volcanics are present in much of the impact footprint, with this unit comprising the principal source for proposed aggregate production. These rocks are primarily volcanic, although some metavolcanic and volcaniclastic units are also present (with volcaniclastic units generally consisting of sedimentary deposits derived from the weathering of volcanic rocks). The Santiago Peak Volcanics can exhibit a wide range of compositions and forms including basalt, dacite (the volcanic equivalent of granodiorite), andesite, rhyolite (the volcanic equivalent of granite), agglomerate (angular volcanic rubble, or breccia), and tuff (a consolidated ash, or pyroclastic, deposit). As shown on Figure 3.1-1, the Santiago Peak Volcanics within the impact footprint are mapped as dacite and agglomerate, with local metavolcanic units consisting of ignimbrites (or welded tuff) formed from superheated volcanic ash and steam. Ignimbrites are typically very hard and resistant to weathering, although local deposits have been somewhat brecciated by faulting and subsequent jointing and fracturing (TEUSL 2005).

3.1.2.4 *Groundwater*

No evidence of shallow groundwater or related surface features (e.g., springs) was observed during Project geotechnical investigation, including core drilling to depths of approximately 190 feet below existing grade at one site within the Project impact footprint and two additional locations in other portions of the Project site (Figure 3.1-1; TEUSL 2005). Two "limited groundwater investigations" were also conducted for the Project in 2011 and 2004 (AECOM 2012 and Earth Tech 2004), and a well was drilled near the northern impact footprint boundary to a depth of 1,013 feet in 2005. This well intersected a groundwater aquifer in fractured volcanic rock at depths of between approximately 335 and 600 feet, with an associated yield of approximately 0.5 gallon per minute (Earth Tech 2007). Based on these data and additional analysis, the 2011 Groundwater Investigation estimates that the static water level is approximately 300 feet below the ground surface at the well site and assumes that the general direction of groundwater movement in the Project area is east to west (AECOM 2012). Additional description of local/regional groundwater conditions is provided in Subchapter 3.2.

3.1.2.5 *Structure/Seismicity*

Geotechnical investigation of the Project impact footprint and vicinity identified a number of prominent discontinuities, or joint sets, within local bedrock units. The most prevalent joint set within the impact footprint exhibits a generally east-west dip direction and inclinations of 65 North to 90 degrees, while a secondary joint set was observed with a dip direction of 20 degrees east of north and inclinations of 65 North to 90 degrees (TEUSL 2005). Most on-site joint surfaces were clean and rough, although iron coating was observed locally. Because sliding occurs on joint surfaces, the condition of the surface can significantly affect the associated slope stability. Specifically, clean and rough surfaces are more stable than coated surfaces, and joint surfaces covered with clay gouge (i.e., material produced by movement) are the least stable (TEUSL 2005). Based on review of field data collected from rock outcrops during Project geotechnical investigation, no wedge-type failures were observed in any existing on-site slopes.

The Project impact footprint and surrounding areas are within an area mapped as containing slopes exceeding 25 percent (County 2007b), and therefore exhibit potential for landslide-related hazards (refer also to Figure 3.1-2). Additional discussion of potential landslide hazards and the related slope stability analyses conducted for the Proposed Project is provided in Subchapter 4.1 of this EIR.

The Project impact footprint is within a broad, seismically active region characterized by a series of northwest-trending faults associated with the San Andreas Fault System (Figure 3.1-3, *Regional Fault Map*). No active or potentially active faults, County-designated Near-Source Shaking Zones, CGS Alquist-Priolo Earthquake Fault Zones, or County Special Study Fault Zones are mapped or known to occur within the Project impact footprint and vicinity (CGS 2007, County 2007b). The closest active faults to the Project impact footprint are located within the Rose Canyon and Coronado Banks fault zones, approximately 16 and 21 miles to the west, respectively. Active faults are defined as those exhibiting historic seismicity or displacement of Holocene materials, while potentially active faults have no historic seismicity and displace Pleistocene (between approximately 11,000 and 2 million years old) but not Holocene strata. The described CGS and County fault zone designations are generally intended to "[r]egulate development near active faults so as to mitigate the hazard of surface fault rupture" (CGS 2007). The closest seismic hazard designations to the Project impact footprint are CGS Earthquake Fault Zones located along onshore sections of the Rose Canyon Fault Zone approximately 18 miles to the northwest.

Based on the described fault and seismicity conditions, the referenced 2011 Geologic Reconnaissance and Slope Stability Analysis concludes that ground acceleration (ground shaking) levels in the Project vicinity "[a]re expected to be low" (CWE 2011). Regional seismicity analyses estimate that the maximum peak ground acceleration values likely to affect the Project impact footprint and vicinity are approximately 0.2 to 0.3g (where g equals the acceleration due to gravity), in association with a magnitude 7.0 earthquake event along the Rose Canyon Fault Zone (CGS 1992).

Table 3.1-1
DESCRIPTION OF IMPACT FOOTPRINT SOIL CHARACTERISTICS

Soil Series	Physical Characteristics/ Location	Expansion (shrink-swell) Potential	Reactivity	Erosion Potential
Huerhuero Loam, 9 to 15 percent slopes	Moderately well-drained loam with a clay subsoil and a gravelly/cobbly surface layer. Soils are derived from sandy marine sediments and occur along the western, northern, and southern impact footprint boundaries.	High, due to the presence of a clay subsoil	Strongly acidic to moderately alkaline over profile (pH 5.1-8.4)	Moderate
San Miguel-Exchequer Rocky Silt Loams, 9 to 70 percent slopes	Well-drained silt loams with a clay subsoil and approximately 10 percent rock outcrops. Soils are derived from metavolcanic rock and occur in much of the impact footprint.	Low to high	Very strongly to slightly acidic over profile (pH 4.5 to 6.5)	Moderate to high

Source: NRCS/U.S. Soil Conservation Service 1973

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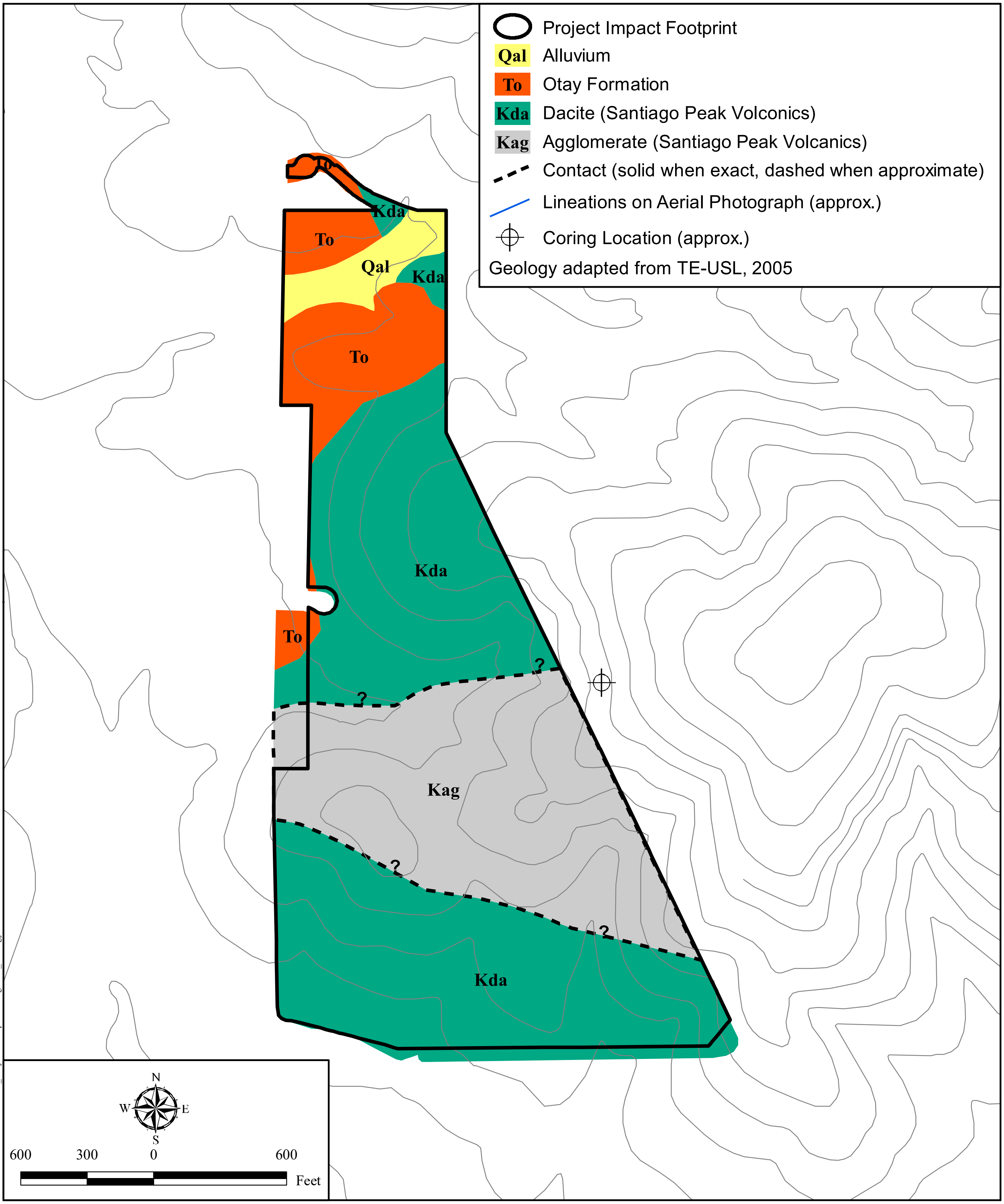

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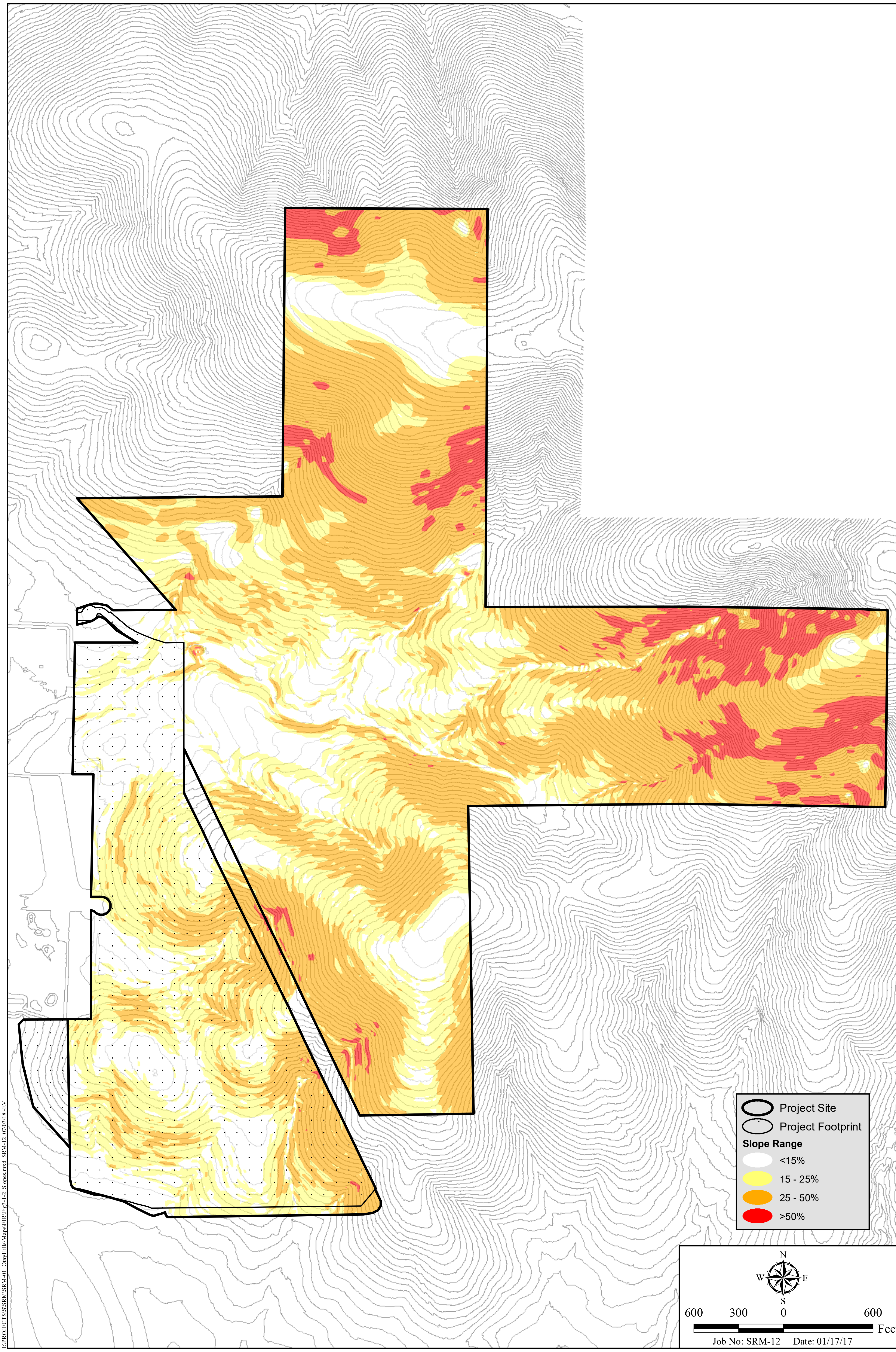
Geologic Map

OTAY HILLS EIR

Figure 3.1-1

HELIX Environmental Planning

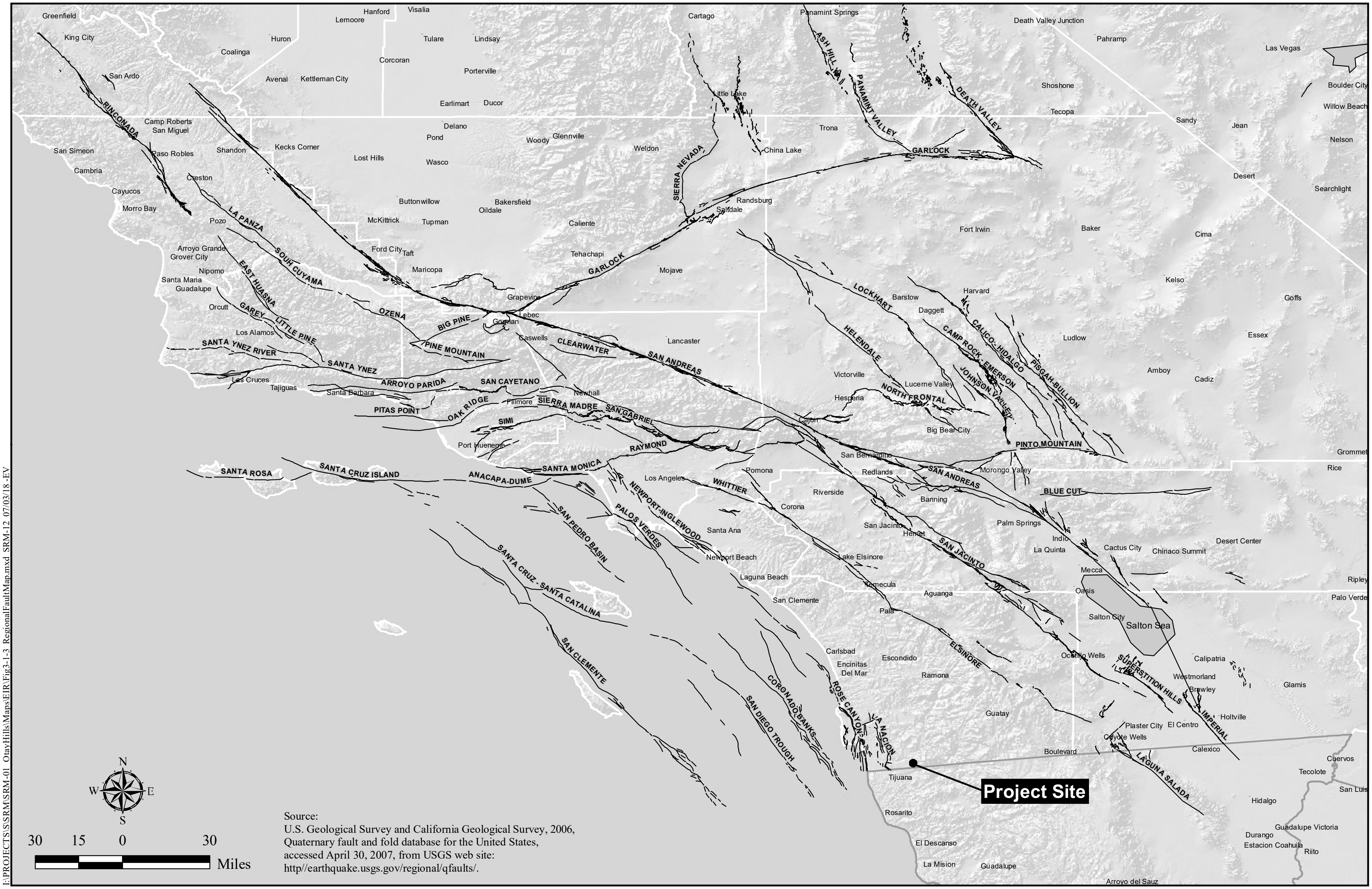


Site Topography/Slope Analysis

OTAY HILLS EIR

HELIX Environmental Planning

Figure 3.1-2



Regional Fault Map

OTAY HILLS EIR

Figure 3.1-3

HELIX
Environmental Planning

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