November 22, 2024

Mr. Kyle La Viscount, PE
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Carlsbad, CA 92008

Subject: **PRELIMINARY EVALUATION**
ESCONDIDO EAST VALLEY PARKWAY &
MIDWAY DRIVE DRAINAGE PROJECT
CITY OF ESCONDIDO
AGE Project No. 252 GS-24

Dear Kyle,

In accordance with your request, we have performed preliminary geologic evaluation along the proposed project alignments labeled as Lines B, B-1, B-2, C, E, F and F-1. The alignments are underlain by old alluvial deposits which in general are considered capable of providing support for the proposed storm drain culverts. A generalized geologic map of the project alignments is shown on Figure 1. The soil materials within the anticipated depths of the excavation along the project alignments consists primarily of shallow man-made fills and old alluvial deposits which are generally can be readily excavated with conventional heavy-duty construction equipment. The majority of the soil materials anticipated to be encountered during construction are considered suitable for use as compacted fill materials.

Groundwater

It is anticipated that groundwater elevation along the project alignments is heavily influenced by the water level in the Escondido River. Based on our experience with similar geologic conditions, we anticipate that during heavy regional precipitation event, groundwater levels in the vicinity of Escondido River will likely raise to an elevation of a few feet beneath the existing ground surface. The project alignments in the vicinity of Escondido River is also subject to regular flooding during heavy precipitation events. Localized groundwater depths based historical measurements obtained from the Regional Water Quality Control Board (RWQCB) is shown on Figure 2.

Potential Geologic and Seismic Hazards

Geologic hazards are those hazards that could impact a site due to local and surrounding area geologic and seismic conditions. Seismic hazards include phenomena that occur during an earthquake such as ground shaking, surface fault rupture, liquefaction, differential seismic-induced settlement, lateral spread displacement, ground lurching, tsunami or seiches, and seismic-induced flooding. Geologic hazards include subsidence, landslides, and poor soil conditions (expansive or collapsible soil). The potential impact of these hazards to the site has been assessed and is summarized in the following sections.

Faulting

No active or potentially active faults are mapped near the project alignments (Kennedy and Tan, 1999). The primary geologic and seismic hazard potentially impacting the project site would be strong ground shaking. The project site is not located within any United States Geological Survey (USGS) special study zones.

For the purpose of this project we consider the Newport-Inglewood - Rose Canyon fault zone (NIRCFZ) and the Elsinore Fault Zone (EFZ) to represent the most significant seismic hazards. The NIRCFZ is a complex set of anastomosing and en-echelon, predominantly strike slip faults beginning offshore south of downtown San Diego and extending northwesterly near the Orange County coastline and continuing across the western portion of the Los Angeles basin. The NIRCFZ is considered active, although several strands of the Rose Canyon section of the fault zone are classified as potentially active instead of active.

The EFZ is a major dextral strike-slip fault zone that is part of the San Andreas fault system (Jennings, C.W., 1994, Magistrale, H., and Rockwell, T., 1996, Magistrale, H., and Rockwell, T., 1990). The Elsinore fault zone has been subdivided into seven sections which are listed here from north to south: Whittier section, Chino section, Glen Ivy section, Temecula section, Julian section, Coyote Mountain section, and Laguna Salada section. Research studies have been done to assess faulting on most of the sections, and have documented Holocene activity for the length of the fault zone with a slip rate around 4-5 millimeter per year (mm/yr). Multiple events have only been dated on the Whittier fault and Glen Ivy North fault strand, so interaction between faults and adjacent sections is not well-known. Multiple strands within several sections mean that the studies are not always fully representative of the whole section.

Fault Ground Rupture

The project alignments are not located astride or near any known (mapped) active or potentially active faults (Kennedy and Tan, 2007). Therefore, the potential for fault ground rupture at the site is considered insignificant.

Soil Liquefaction

Seismically-induced soil liquefaction is a phenomenon in which loose to medium dense, saturated granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground vibrations induced by earthquakes or other means. Segments of the project alignments are located in areas identified to have liquefaction potential which are shown on Figure 2. The liquefiable zones are deepest in the vicinity of Escondido River and are estimated to be on the order of 20 feet maximum.

Lateral Spread Displacement

The risk of lateral spread displacement due to a major seismic event in the vicinity of the Escondido River during high groundwater level is considered high.

Differential Seismic-Induced Settlement

Differential seismic settlement occurs when seismic shaking causes one type of soil to settle more than another type. It may also occur within a soil deposit with largely homogeneous properties if the seismic shaking is uneven due to variable geometry or thickness of soil deposit. Based on our investigation, the potential for seismic induced differential soil settlement in the vicinity of the Escondido River is considered high.

Ground Lurching

Ground lurching is permanent displacement or shift of the ground in response to seismic shaking. Ground lurching occurs in areas with high topographic relief, and usually occurs near the source of an earthquake. These displacement can results in permanent cracks in the ground surface. Considering the distance from the project site to the nearest potential source of seismic event, it is our opinion that ground lurching does not present a potential hazard for the proposed project.

Landslides

A review of the pertinent geologic map indicates that the project alignments are not located on or below any known (mapped) ancient landslides (Kennedy and Tan, 2007). Furthermore, a review of the State of California Seismic Hazard Zones (2009) indicates that the site is not located in an area that is susceptible to landslide hazards.

Other Seismic-induced Hazards

The Escondido River is located within Zone AE (1% annual chance flood hazard, FEMA's National Flood Hazard 2023). The elevation of the site and the distance from the coastal area preclude the potential of property damage from a seismic-induced tsunami.

Expansive Soil

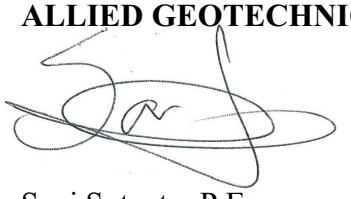
The project alignments are not located in areas underlain by expansive soil materials (see Figure 3). Based on our previous experience with other projects located in the vicinity of the project alignments, it is our opinion that the on-site soil materials may be classified as to having low to very low expansion potential.

Closure

We appreciate the opportunity to be of service on this important project. If you have any questions regarding the contents of this letter or need further assistance, please give us a call.

Very truly yours,

ALLIED GEOTECHNICAL ENGINEERS, INC.



Sani Sutanto, P.E.
Principal

SS/NB:cal
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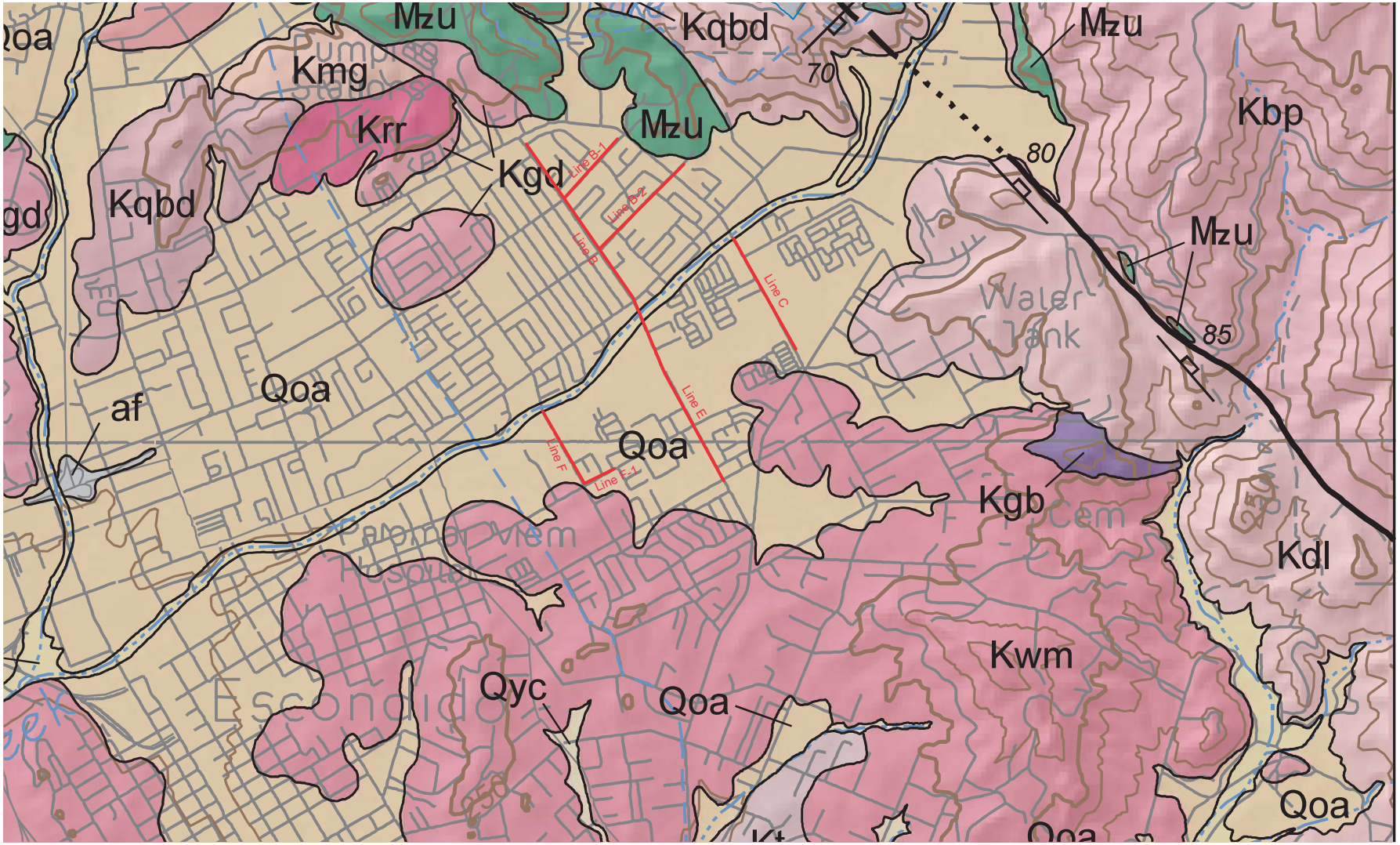
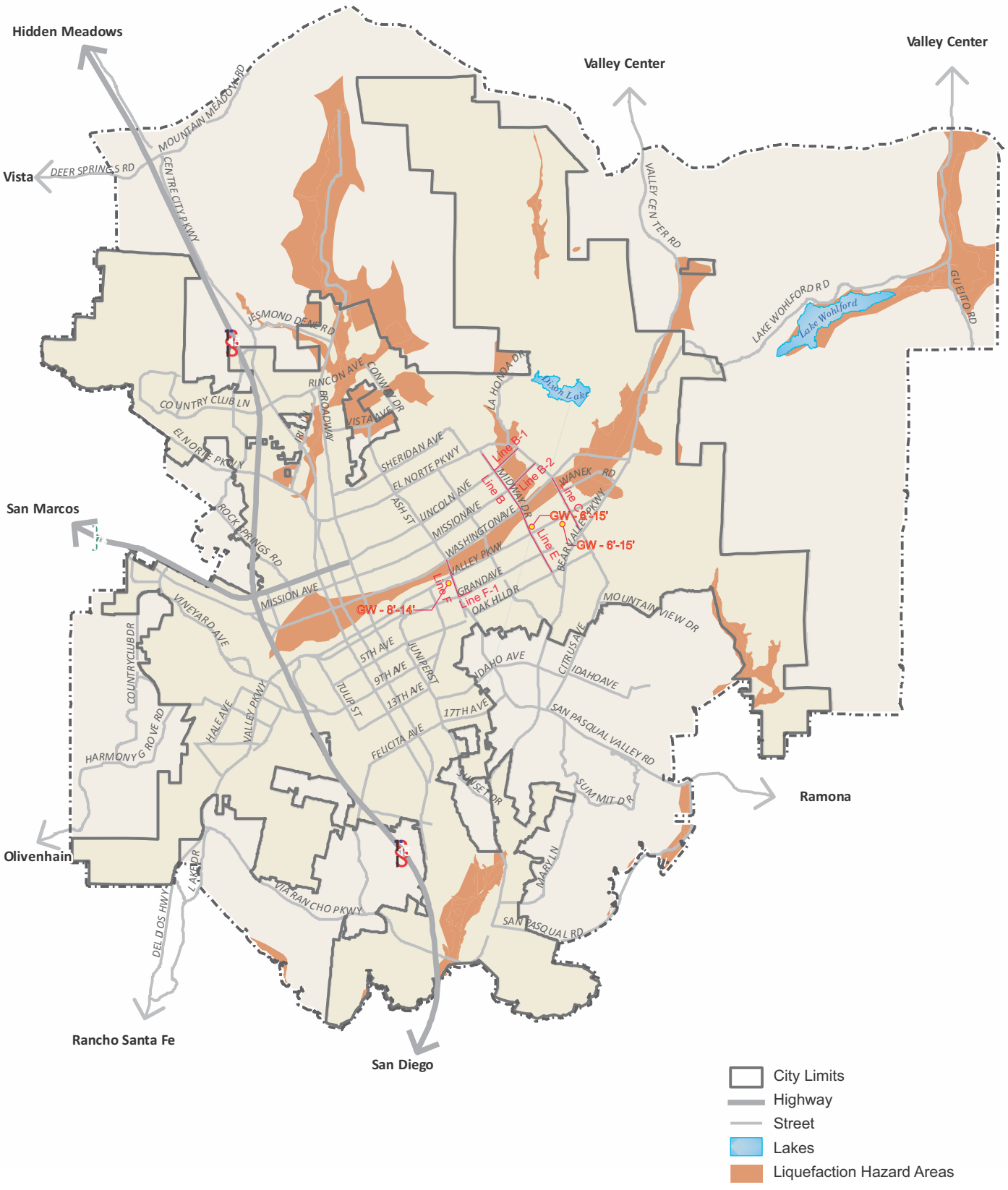


Af - artificial fill
Qyc - young colluvia deposits
Qoa - old alluvial plain deposits

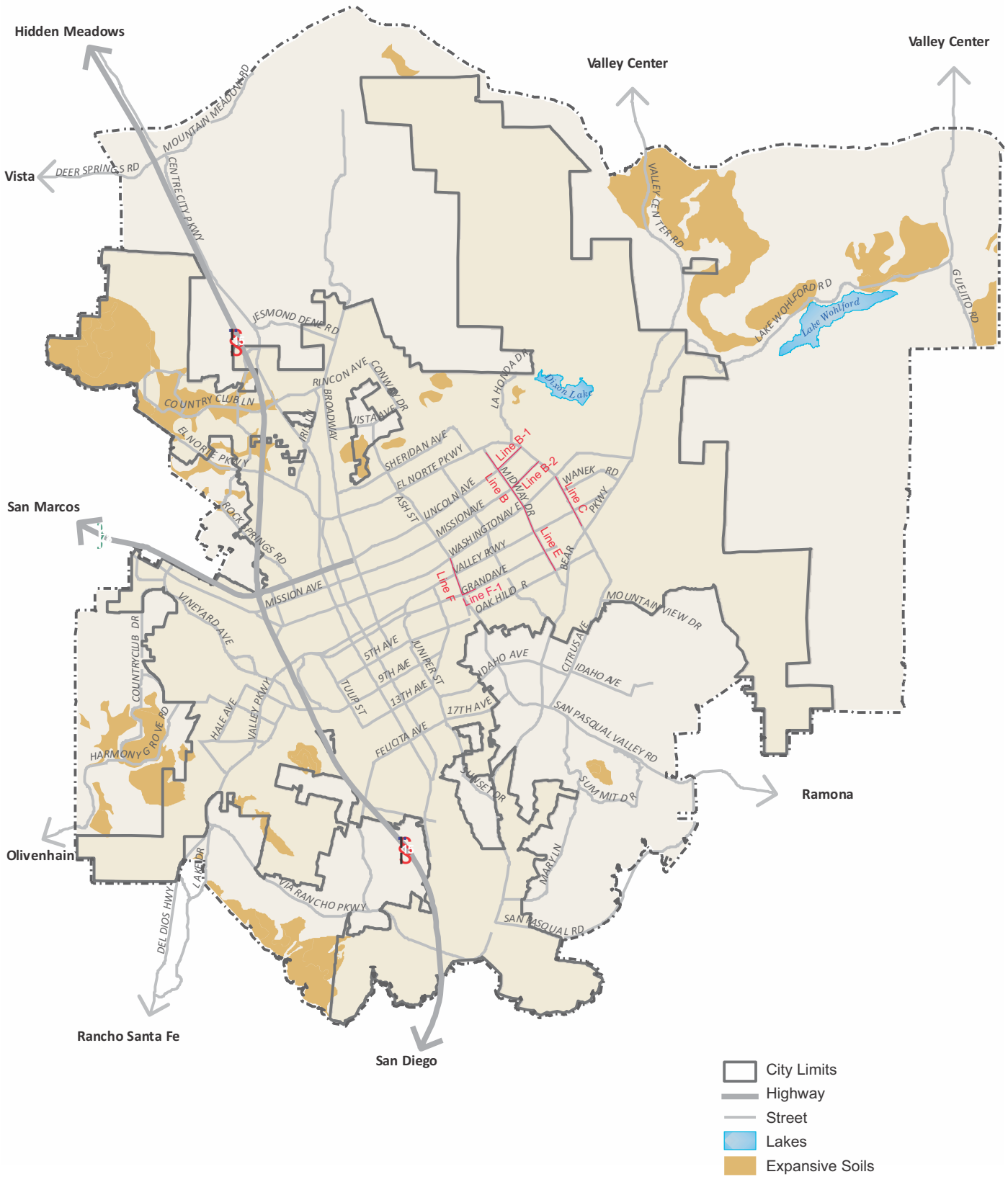
GENERALIZED GEOLOGIC MAP
FIGURE 1



Source: City of Escondido 2011

0 .75 1.5
Miles

LIQUEFACTION HAZARD AREAS
FIGURE 2



Source: City of Escondido 2011

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EXPANSIVE SOILS
FIGURE 3