4.6 GEOLOGY AND SOILS

This section provides an overview of geology and soils in the Project Area and evaluates impacts associated with geology and soils for the Proposed Plan. Topics addressed include suitability of soil for development, seismicity, faults, ground shaking, liquefaction, and landslides. This section was prepared utilizing documents and maps published by the California Department of Conservation (DOC), California Geological Survey (CGS), County of Los Angeles, City of Los Angeles, and other applicable sources.

REGULATORY FRAMEWORK

Federal, state and local laws, regulations, plans, and guidelines that are potentially applicable to the Proposed Plan are summarized below.

FEDERAL

International Building Code (IBC). The IBC is published by the International Code Council and forms the basis of California's building code. It has been adopted by the California Legislature to address the specific building conditions and structural requirements for California. The IBC contains provisions that are intended to ensure that structures can adequately resist seismic forces during earthquakes. These seismic provisions represent the best available guidance on how structures should be designed and constructed to limit seismic risk.

National Pollutant Discharge Elimination System (NPDES). NPDES permits are required by Section 402 of the Clean Water Act. The goal of the NPDES diffuse-source regulations is to improve the quality of stormwater discharged to receiving waters to the "maximum extent practicable" through the use of best management practices (BMPs). The NPDES permit system regulates point source discharges (e.g., a municipal or industrial discharge at a specific location or pipe) and certain types of diffuse source dischargers (e.g., municipal stormwater and construction runoff). The NPDES permit sets erosion control standards and requires implementation of nonpoint source control of surface drainage through the application of a number of BMPs to decrease the effects of erosion and sedimentation associated with grading. See Section 4.9, Hydrology and Water Quality, of this Draft EIR for further discussion of the NPDES.

STATE

Alquist-Priolo Earthquake Fault Zoning Act (Alquist-Priolo Act). The Alquist-Priolo Act, which is codified in the Public Resources Code (PRC) Division 2, Chapter 7.5, provides policies and criteria to assist cities, counties, and state agencies in the development of structures for human occupancy across the trace of active faults.[1] The Alquist-Priolo Act was intended to provide citizens of the state with increased safety and to minimize the loss of life during and immediately following earthquakes by facilitating seismic retrofitting to strengthen buildings, including historical buildings, against ground shaking. This Act requires the State Geologist to establish regulatory zones known as "Earthquake Fault Zones" around the surface traces of active faults and to issue appropriate maps. Before a project can be permitted within an Alquist-Priolo Earthquake Fault Zone, the City of Los Angeles requires a geologic investigation to

[1]A fault trace is the intersection of a geological fault with the ground surface, leaving a visible mark; also, the line commonly plotted on geologic maps to represent a fault (U.S. Geological Survey, Earthquake Glossary, https://earthquake.usgs.gov/learn/glossary/?term=fault%20trace).

demonstrate that proposed building(s) will not be constructed across active faults. If an active fault is found, a structure for human occupancy cannot be placed over the trace of the fault and must be set back from the fault (generally 50 feet).

Seismic Hazards Mapping Act. To address the effects of strong ground shaking, liquefaction, landslides, and other ground failures due to seismic events, the State of California passed the Seismic Hazards Mapping Act of 1990. Under the Seismic Hazards Mapping Act, which is codified in PRC Chapter 7.8, Sections 2690-2699.6, the State Geologist is required to delineate "seismic hazard zones." Cities and counties must regulate certain development projects (i.e., development projects that involve structures for human occupancy with the exception of single-family dwellings that are less than two stories and are not part of a development of four or more dwellings, and subdivision of land which contemplates the eventual construction of structures for human occupancy) within these zones to ensure that geologic and soil conditions are investigated and appropriate mitigation measures, if any, are incorporated into development plans. The State Mining and Geology Board provides additional regulations and policies to assist municipalities in preparing the Safety Element of their General Plan and encourages land use management policies and regulations to reduce and mitigate those hazards to protect public health and safety. Under PRC Section 2697, cities and counties shall require, prior to the approval of a project located in a seismic hazard zone, a geotechnical report defining and delineating any seismic hazard. The requirement for a report may be waived if the city finds that no undue seismic hazard exists, based on information resulting from studies conducted on sites in the immediate vicinity of the project and of similar soil composition to the project site. Each city or county shall submit one copy of each geotechnical report, including mitigation measures, to the State Geologist within 30 days of its approval.

California Building Code (CBC). The CBC, found in California Code of Regulations (CCR) Title 24, is a compilation of the state building standards, including seismic safety standards for new buildings. Each jurisdiction in California must adopt its own building code that incorporates the CBC. Local codes are permitted to be more stringent than the CBC (with limitations), but, at a minimum, are required to meet all State standards and enforce the regulations of the CBC. The CBC standards are based on (1) building standards that have been adopted by state agencies without change from the IBC, (2) building standards based on the IBC that have been changed to address particular California conditions, and (3) building standards authorized by the California Legislature but not covered by the IBC.

Given the state's susceptibility to seismic events, the seismic standards within the CBC are among the strictest in the world. The CBC applies to all occupancies in the state, except where stricter standards have been adopted by local agencies. Chapter 16 of the CBC deals with structural design requirements governing seismically resistant construction (Section 1604), including (but not limited to) factors and coefficients used to establish seismic site class and seismic occupancy category for the soil/rock at the building location and the proposed building design (Sections 1613.5 through 1613.7). Chapter 18 includes (but is not limited to) the requirements for foundation and soil investigations (Section 1803); excavation, grading, and fill (Section 1804); allowable load-bearing values of soils (Section 1806); and the design of footings, foundations, and slope clearances (Sections 1808 and 1809), retaining walls (Section 1807), and pier, pile, driven, and cat-in-place foundation support systems (Section 1810). Chapter 33 includes (but is not limited to) requirements for safeguards at worksites to ensure stable excavations and cut or fill slopes (Section 3304).

CBC Appendix J applies to grading, excavation, and earthwork construction, and prohibits grading from occurring without first having obtained a permit from the building official. Section J104.3 requires the preparation of a geotechnical report that contains at least the following:

- The nature and distribution of existing soils,
- Conclusions and recommendations for grading procedures,
- Soil design criteria for any structures or embankments required to accomplish the proposed grading, and

- Where necessary, slope stability studies, and recommendations and conclusions regarding site geology.

LOCAL

City of Los Angeles General Plan Safety Element and Conservation Element. State law requires that the City's General Plan includes a Safety Element, which addresses the issue of protecting its people from unreasonable risks associated with natural disasters (e.g., fires, floods, and earthquakes). The Safety Element of the General Plan contains policies that emphasize seismic safety issues because seismic events present the most widespread threat of devastation to life and property. The Safety Element provides a contextual framework for understanding the relationship between hazard mitigation, response to a natural disaster, and initial recovery from a natural disaster. Policy 1.1.6 of the Safety Element addresses compliance with applicable state and federal planning and development regulations (e.g., Alquist-Priolo Act, Seismic Hazards Mapping Act and Cobey-Alquist Flood Plain Management Act).

The Conservation Element is intended to provide for the conservation and preservation of natural resources. Policies of the Conservation Element address the effect of erosion on natural resources, such as beaches, watersheds and watercourses. The Conservation Element cites erosion of hillsides resulting in the loss of natural watersheds and features, as well as flooding and endangerment to structures and people, as ongoing issues. The Conservation Element also contains limited policies related to erosion and refers to the Los Angeles Municipal Code (LAMC) Sections 91.700 et seq. and the Specific Plan for Management of Flood Hazards (Ordinance 172.081) for specific guidance.

Los Angeles Building Code (LABC). Earthwork activities, including grading, are governed by the LABC, which is contained in LAMC Chapter IX, Article 1. Specifically, Section 91.7006.7 of the LABC includes requirements regarding import and export of material; Section 91.7010 includes regulations pertaining to excavations; Section 91.7011 includes requirements for fill materials; Section 91.7013 includes regulations pertaining to erosion control and drainage devices; Section 91.7014 includes general construction requirements; and Section 91.7016 includes regulations for areas that are subject to slides and unstable soils. Additionally, the LABC includes specific requirements addressing seismic design, site grading, foundation design, cut and fill slope design, soil expansion, geologic investigations and reports before and during construction, retaining walls, soil and rock testing, basement walls, shoring of adjacent properties, and potential primary and secondary seismic effects and groundwater.

City requirements to address grading, excavation, and fill are specified in LABC (i.e., LAMC Chapter IX, Article 1, Division 70). Under this part of the LABC, the Los Angeles Department of Building and Safety (LADBS) has the authority to withhold building permit issuance if a project cannot mitigate potential hazards to the project or which are associated with the project. The Grading Code periodically is revised to reflect new technology and improved standards and requirements.

The LABC incorporates by reference the CBC, with City amendments for additional requirements; LADBS is responsible for implementing the provisions of the LABC. Throughout the permitting, design, and construction phases of a building project, LADBS engineers and inspectors confirm that the requirements of the LABC pertaining specifically to geoseismic and soils conditions are being implemented by project architects, engineers, and contractors.

Standard Urban Stormwater Mitigation Plan (SUSMP) Requirements. On March 8, 2000, SUSMP requirements were approved by the Los Angeles Regional Water Quality Control Board (LARWQCB) to address stormwater pollution from new construction and redevelopment projects. The SUSMP requirements contain a list of minimum BMPs that must be employed to infiltrate or treat stormwater runoff, control peak flow discharge, and reduce the post-project discharge of pollutants from stormwater conveyance systems. SUSMP requirements include BMPs to decrease the effects of erosion. See Section 4.9, Hydrology and Water Quality for further discussion of the SUSMP.

Stormwater Pollution Prevention Plan (SWPPP). As part of the NPDES permitting system, a SWPPP is required to be prepared prior to the beginning of construction activities. The SWPPP specifies BMPs that will prevent construction pollutants from contacting stormwater with the intent of keeping all products of erosion from moving off-site into receiving waters. See Section 4.9, Hydrology and Water Quality for further discussion of the SWPPP.

Hillside Construction Regulation (HCR). The HCR Supplemental Use District, effective March 2017, was established by Ordinance No. 184827 to provide additional protections that would address the cumulative construction related impacts of multiple single-family houses in hillside areas. New single-family home developments in HCR districts are required to comply with grading limits, hauling truck operation standards, and specific operating hours for construction activity. In addition, any single-family home development exceeding 17,500 square feet in a HCR district will need to file for a Site Plan Review discretionary approval. Properties located within HCR districts are identified with the HCR suffix as part of the zoning string. There are currently two HCR districts in the western part of the Community Plan Area (CPA): the Bel Air Beverly Crest neighborhood (Ordinance 184828, effective March 2017) and the Bird Streets and Laurel Canyon neighborhood (Ordinance 185491, effective May 28, 2018).

EXISTING SETTING

SEISMICITY

The entire Southern California region is considered a seismically active region. Seismic events present the most widespread threat of devastation to life and property. With an earthquake, there is no containment of potential damage. Since 1800, there have been approximately 60 damaging seismic events, or earthquakes, in the Los Angeles region. In 1857, one earthquake exceeded Richter magnitude 8.0. Since 1933, there have been four moderate-size earthquakes which have caused numerous deaths and substantial property damage in the metropolitan Los Angeles area. These four events are identified by their location as the Long Beach (March 11, 1933; magnitude 6.3), San Fernando (February 9, 1971; magnitude 6.4), Whittier Narrows (October 1, 1987; magnitude 5.9), and Northridge (January 17, 1994; magnitude 6.7) earthquakes.

The Project Area may be exposed to strong ground shaking during a seismic event since it is within the seismically-active Southern California region. Issues of concern relating to earthquakes include fault rupture, strong ground shaking, liquefaction, and landslides.

Faults. A fault is a fracture or line of weakness in the earth's crust, along which rocks on one side of the fault are offset relative to the same rocks on the other side of the fault. Based on criteria established by the California Geological Survey, faults may be categorized as active, potentially active, or inactive. Active faults are those that show evidence of surface displacement within the last 11,000 years (Holocene age). Potentially active faults are those that show evidence of surface displacement within the last 1.6 million years (Quaternary age). Faults showing no evidence of surface displacement within the last 1.6 million years may be considered inactive in most cases.

Many active earthquake fault zones are mapped in the Los Angeles area. A number of earthquake faults are visible and aboveground, such as the San Andreas Fault. However, earthquakes along unmapped faults, such as the blind thrust fault associated with the Northridge earthquake, are increasingly becoming the focus of study and concern. These faults may dominate the geology of the Los Angeles Basin in a way not previously known.

Table 4.6-1 provides a summary of major active faults in the Los Angeles region, and **Figure 4.6-1** identifies the faults in the Southern California region.

TABLE 4.6-1: MAJOR NAMED ACTIVE FAULTS IN SOUTHERN CALIFORNIA

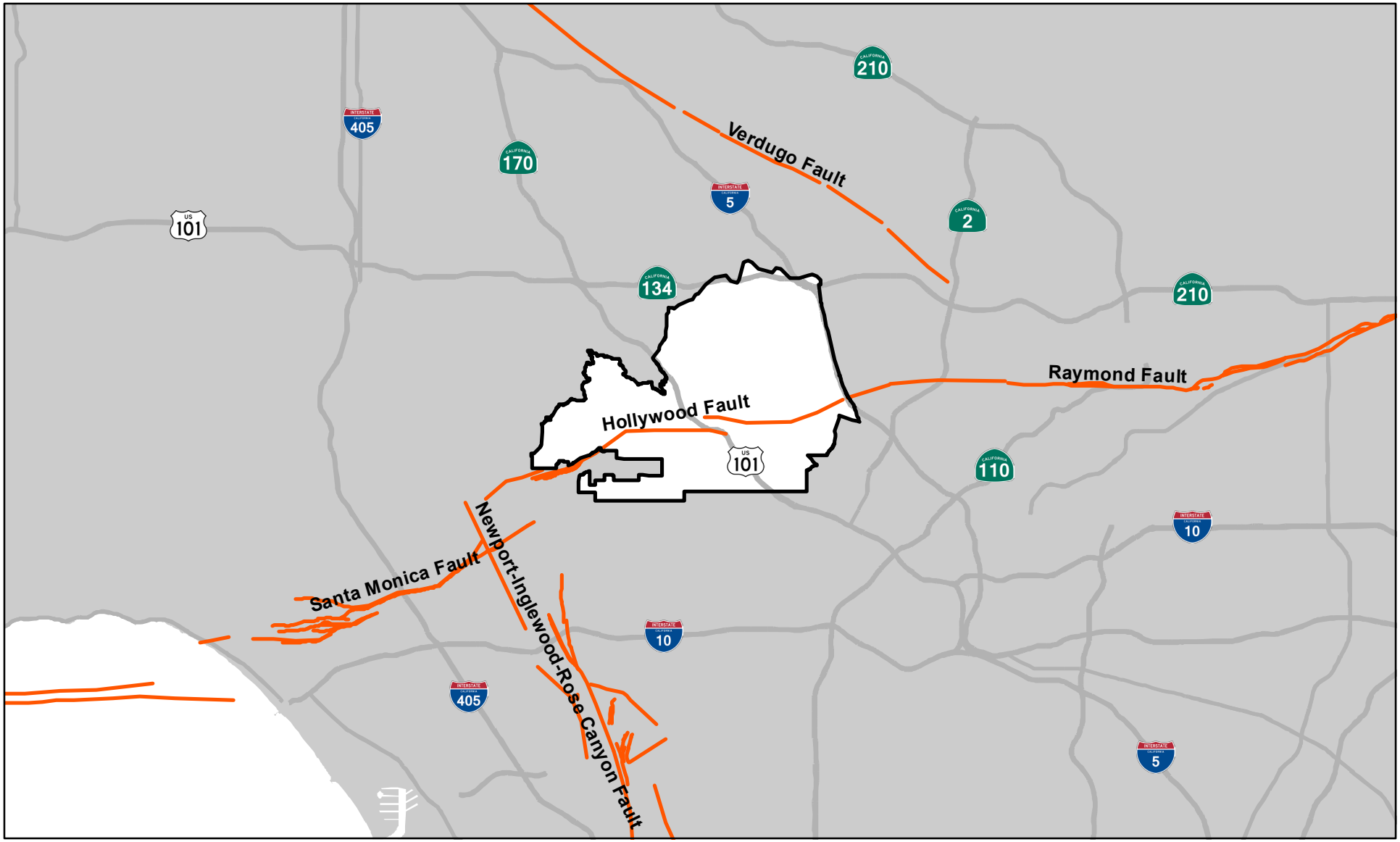
Fault	Maximum Magnitude	Slip Rate (mm/yr)	Type of Fault	Most Recent Seismic Event
Cabrillo	6.0 - 6.8	Uncertain	Right normal	Holocene
Cucamonga	6.0 - 7.0	5.0 - 14.0	Thrust	Holocene
Elsinore (Glen Ivy Segment)	6.5 - 7.5	4.0	Right lateral strike-slip	1910
Hollywood	5.8 - 6.5	0.33 - 0.75	Left reverse	Holocene
Los Alamitos Thrust	Uncertain	Uncertain	Thrust	Uncertain
Malibu Coast	Uncertain	0.3	Reverse	Holocene
Northridge Thrust (Pico Thrust)	6.5 - 7.5	3.5 - 6.0	Thrust	1994
Newport-Inglewood – Rose Canyon	6.0 - 7.2	0.8 – 2.1	Right lateral	Holocene
Oak Ridge	6.5 - 7.5	3.5 - 6.0	Thrust	Holocene
Palos Verdes	6.0 - 7.0	0.1 - 3.0	Right reverse	Holocene
Raymond	6.0 - 7.0	0.10 - 0.22	Left lateral	Holocene
San Andreas (Southern Segment)	6.8 - 8.0	20.0 - 35.0	Right lateral strike-slip	1857
San Cayetano	6.5 - 7.3	1.3 - 9.0	Thrust	Uncertain
San Fernando	6.0 - 6.8	5.0	Thrust	1971
San Gabriel	Uncertain	1.0 - 5.0	Right-lateral strike-slip	Late Quaternary
San Jacinto (San Bernardino Segment)	6.5 - 7.5	7.0 - 17.0	Right lateral strike-slip	1968
Santa Monica	6.0 - 7.0	0.27 - 0.39	Left reverse	Late Quaternary
Sierra Madre	6.0 - 7.0	0.36 - 4.0	Reverse	Holocene
Simi (also known as Santa Rosa)	Uncertain	Uncertain	Reverse	Holocene
Verdugo	6.0 - 6.8	0.5	Reverse	Holocene
Whittier	6.0 - 7.2	2.5 - 3.0	Right lateral strike-slip	1987

SOURCE: Southern California Earthquake Data Center, http://www.data.scec.org/significant/fault-index.html, accessed September 12, 2016.

The Hollywood fault traverses through the Project Area. The Hollywood fault is located along the southern side of the eastern Santa Monica Mountains. This fault starts in the City of Beverly Hills, traverses through the Project Area to Los Angeles River, and continues eastward as the Raymond fault. Within the Project Area, the Hollywood Alquist-Priolo Earthquake Fault Zone generally encompasses the area surrounding Sunset Boulevard in the western portion of the Project Area, Franklin Avenue, Yucca Street, Carlos Avenue, Hollywood Boulevard, and Los Feliz Boulevard in the eastern portion of the Project Area. Several residential streets that are located near the aforementioned streets are also located within this fault zone. The Hollywood fault and Earthquake Fault Zone are shown in **Figure 4.6-2**.

In addition to the Hollywood fault, four faults are located within two miles of the Project Area: the Raymond, Verdugo, Newport-Inglewood-Rose Canyon, and Santa Monica faults (see **Figure 4.6-1**). The Raymond fault traverses in an east-west direction from Interstate 5 (I-5), just east of the Project Area's eastern boundary, to the Sierra Madre fault at the southern side of the San Gabriel Mountains.

The Verdugo fault is located approximately 1.5 miles north of the Project Area. This fault starts in the Arleta-Pacoima Community of the City of Los Angeles and travels in a southeasterly direction towards the State Route 2/State Route 134 (SR-2/SR-134) junction, where it becomes the Eagle Rock fault.



SOURCE: City of Los Angeles, 2016; California Department of Conservation, 2018; TAHA, 2018.

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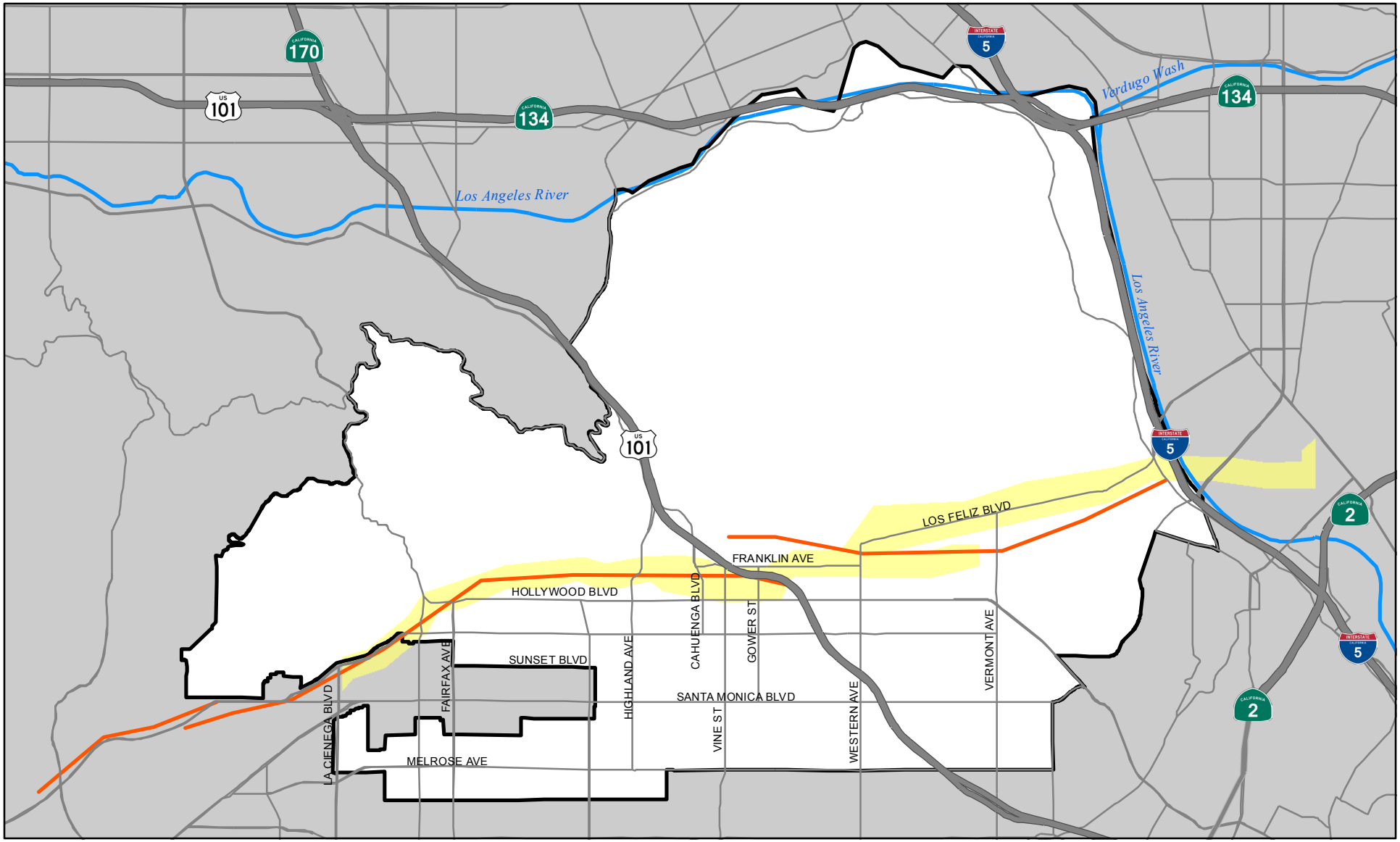
FIGURE 4.6-1
ACTIVE FAULTS



LEGEND:

Hollywood CPA — Hollywood Fault — Alquist-Priolo Earthquake Fault Zone

N W E S

0 2,900 5,800 Feet

SOURCE: City of Los Angeles, 2016; California Department of Conservation, 2016; TAHA, 2018.

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FIGURE 4.6-2

ALQUIST-PRIOLO
EARTHQUAKE FAULT ZONE

A segment of the Newport-Inglewood fault is approximately 1.8 miles southwest of the Project Area. This fault extends from Beverly Hills to Newport Bay along the western side of the Los Angeles Basin. From Newport Bay, it heads offshore. The offshore reach of the fault zone continues southeastward until offshore of Oceanside where it continues on a more south-southeast trend, paralleling the coastline in San Diego.

The Santa Monica fault is located approximately 2.0 miles southwest of the Project Area. The fault travels in an east-west direction. It extends from Beverly Hills to Potrero Canyon and offshore towards Malibu.

Ground Failure. The principal seismic hazard occurring as a result of an earthquake produced by local faults is strong ground shaking. The intensity of ground shaking depends on several factors, including the magnitude of the earthquake, distance from the earthquake epicenter, and the underlying soil conditions. In general, the larger the magnitude of an earthquake and the closer a site to the epicenter of the event, the greater the effects will be. However, soil conditions can also amplify the earthquake shock waves. Generally, the shock waves remain unchanged in bedrock, are amplified to a moderate degree in thick alluvium, and are greatly amplified in thin alluvium.

Most of the Project Area is covered by Quaternary alluvial basin and fan deposits consisting mainly of sand, silt, and clay. Since not all alluvial material is unconsolidated (clay, for example, is highly cohesive), the risk of structure damage in the Project Area as the result of earthquake-induced ground shaking would vary from site to site. Younger alluvial deposits is located along the flatlands, with older Quaternary deposits mostly exposed over the southern portion of the Project Area, as well as in the hillside area located at the eastern portion of the Project Area. The young Quaternary alluvial deposits consist mainly of clayey sand and silt that overlie older Quaternary deposits at depths of 10 to 15 feet. Most of these sediments likely accumulated as slope wash and debris flow deposits along the base of the Santa Monica Mountains.[2]

In the northeasterly portion of the Project Area, younger alluvium consists of sand and silty sand. Additionally, modern streambed sediments are located along and next to the Los Angeles River, I-5, and SR-134. In this area, loose to moderately dense sand and silty sand are found. These finer sediments of sand and silty sand are very porous and move easily during seismic activity. These types of soil tend to amplify damage during seismic activity.[3]

Pre-quaternary bedrock is primarily located in the Santa Monica Mountains, as well as in the hillside at the eastern portion of the Project Area. Pre-quaternary bedrock is also found in several areas in the flatlands towards the eastern portion of the Project Area. Cretaceous granitic rocks are located along the western portion of the Santa Monica Mountains within the Project Area. These soil types are relatively stable and do not easily move during seismic activity.[4]

Modern, well-constructed buildings are designed to resist ground shaking through the use of shear walls and reinforcements. The entire Southern California area, which includes the Project Area, is considered a seismically active region, and every building in the region is susceptible to ground shaking and earthquakes.

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[2]California Department of Conservation (DOC), Division of Mines and Geology, *Seismic Hazard Zone Report 026, Seismic Hazard Zone Report for the Hollywood 7.5-Minute Quadrangle, Los Angeles County, California*, 1998; California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 016, Seismic Hazard Zone Report for the Burbank 7.5-Minute Quadrangle, Los Angeles County, California*, 1998; California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 023, Seismic Hazard Zone Report for the Beverly Hills 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

[3]California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 016, Seismic Hazard Zone Report for the Burbank 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

[4]California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 026, Seismic Hazard Zone Report for the Hollywood 7.5-Minute Quadrangle, Los Angeles County, California*, 1998; California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 016, Seismic Hazard Zone Report for the Burbank 7.5-Minute Quadrangle, Los Angeles County, California*, 1998; California DOC, Division of Mines and Geology, *Seismic Hazard Zone Report 023, Seismic Hazard Zone Report for the Beverly Hills 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

As discussed above in the Regulatory Framework subsection, the LABC includes regulations and requirements designed to reduce risks to life and property to the maximum extent feasible.

Liquefaction. Liquefaction involves the sudden loss of strength in saturated, cohesionless soils that are subjected to ground vibration and result in temporary transformation of the soil into a fluid mass. If the liquefying layer is near the surface, the effects are much like that of quicksand for any structures located on top of it. If the layer is deeper in the subsurface, it may provide a sliding surface for the material above it. The effects of liquefaction include the loss of the soil's ability to support footings and foundations, which can cause buildings and foundations to buckle. These failures were observed in the 1971 San Fernando and the 1994 Northridge earthquakes. Liquefaction-related phenomena include subsidence and lateral spreading. Subsidence is the gradual settling or sudden sinking of land due to movement or removal of underlying earth materials. Lateral spreading can occur on relatively shallow slopes. Liquefaction of shallow layers causes a loss of shear strength, allowing the surface to move laterally across gentle slopes. Areas with lateral spreading potential would most likely be adjacent to drainages where slopes are steepest and water may be more likely to accumulate.

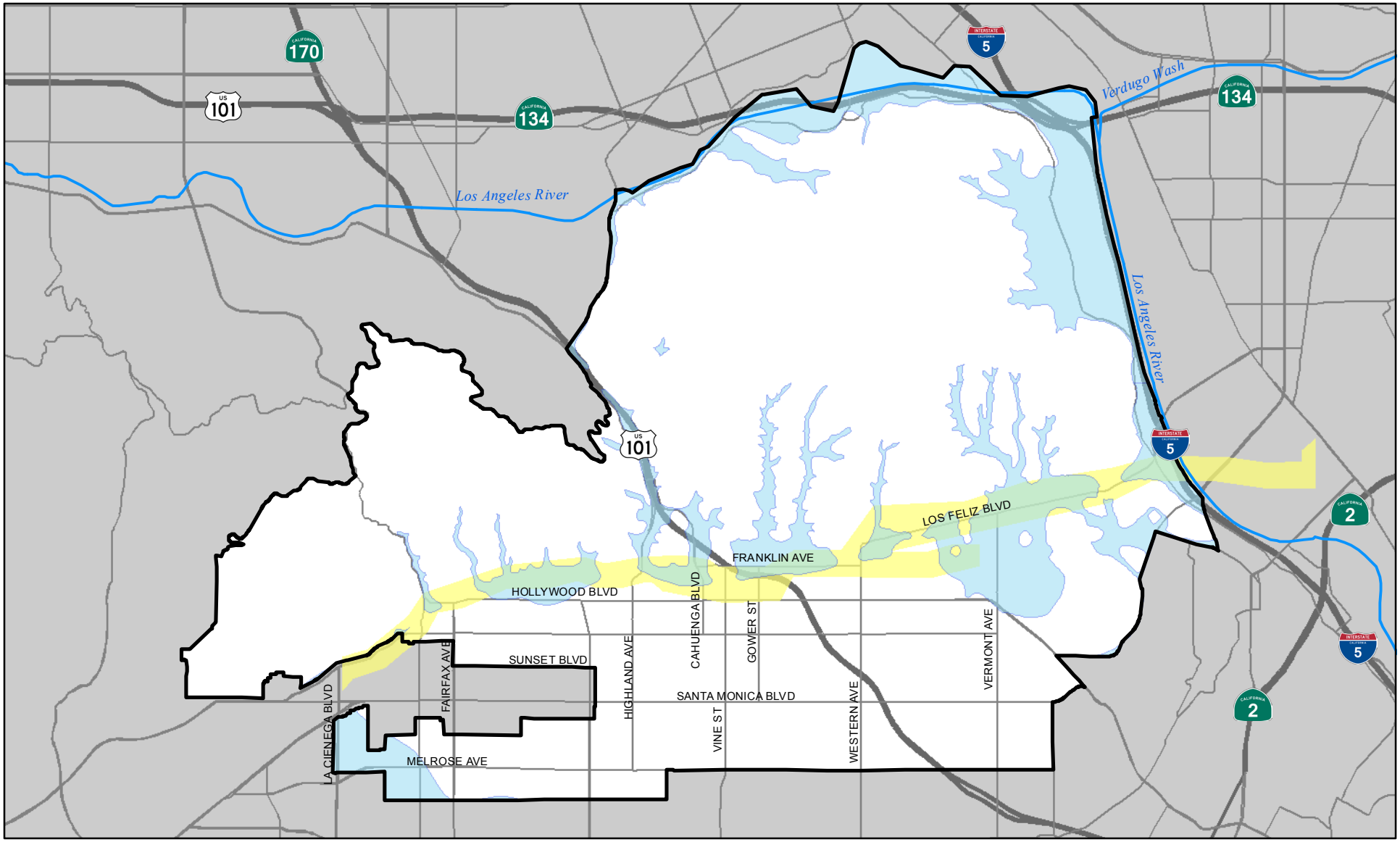
The Beverly Hills and Burbank Quadrangle Seismic Hazard Zones Maps, as well as the Hollywood Quadrangle Earthquake Zones of Required Investigation Map, prepared by the DOC, Division of Mines and Geology, identify the southwestern, northern, and eastern portions of the Project Area, as well as various areas north of Hollywood Boulevard, as located in liquefaction zones and are, thus, susceptible to liquefaction. Along the base of the hillside, liquefaction zones overlap with the Hollywood Earthquake Fault Zone. **Figure 4.6-3** identifies the portions of the Project Area that is within liquefaction zones.

Landslide. A landslide is a mass down-slope movement of earth materials under the influence of gravity, and includes a variety of forms including rockfalls, debris slides, mudflows, block slides, soil slides, slumps, and creeps. These mass movements are triggered or accelerated by earthquake-induced ground motion, increased water content, excessive surface loading, or alteration of existing slopes by man or nature. Earthquake-induced landslides, usually associated with steep canyons and hillsides, can originate on, or move down, slopes as gentle as one degree in areas underlain by saturated, sandy materials, such as alluvium, which are present in the Project Area. In addition to being triggered by earthquakes, landslides can be caused by increased water content, excessive surface loading, or alteration of existing slopes by man or nature.

The Santa Monica Mountain Range extends from the Project Area's northern boundary to Franklin Avenue. Additionally, a hill is located in the area east of Talmadge Street. According to the California DOC, Division of Mines and Geology Beverly Hills and Burbank Quadrangle Seismic Hazard Zones Maps, as well as the Hollywood Quadrangle Earthquake Zones of Required Investigation Map, a majority of the Santa Monica Mountains within the Project Area north of Franklin Avenue and Sunset Boulevard are within earthquake-induced landslide zones. Additionally, various portions of the hillside area east of Talmadge Street are within earthquake-induced landslide zones. **Figure 4.6-4** identifies the portions of the Project Area that are within earthquake-induced landslide zones.

Unstable Soils. Under certain circumstances, strong ground shaking can cause densification or compaction of soils, resulting in local or regional settlement of the ground surface. This can result in local differential settlement and damage to foundations and structures, as well as damage to water and sewer lines. The potential for seismically-induced settlement to occur is controlled by the intensity and duration of ground shaking, and the relative density of the subsurface soils.[5] Recently deposited alluvial sediments that contain loose to moderately dense sands are potentially subject to seismically induced settlement. The areas along and next to the Los Angeles River, I-5, and SR-134, as well as the northeasterly portion of the Project Area, contain such alluvial sediments – Tujunga fine sandy loam (see **Figure 4.6-5**).

[5]Relative density is the ratio between the in-place density and the maximum density.



LEGEND:

Hollywood CPA | Liquefaction Zone | Alquist-Priolo Earthquake Fault Zone

N W E S

0 2,900 5,800 Feet

SOURCE: City of Los Angeles, 2016; TAHA, 2018.

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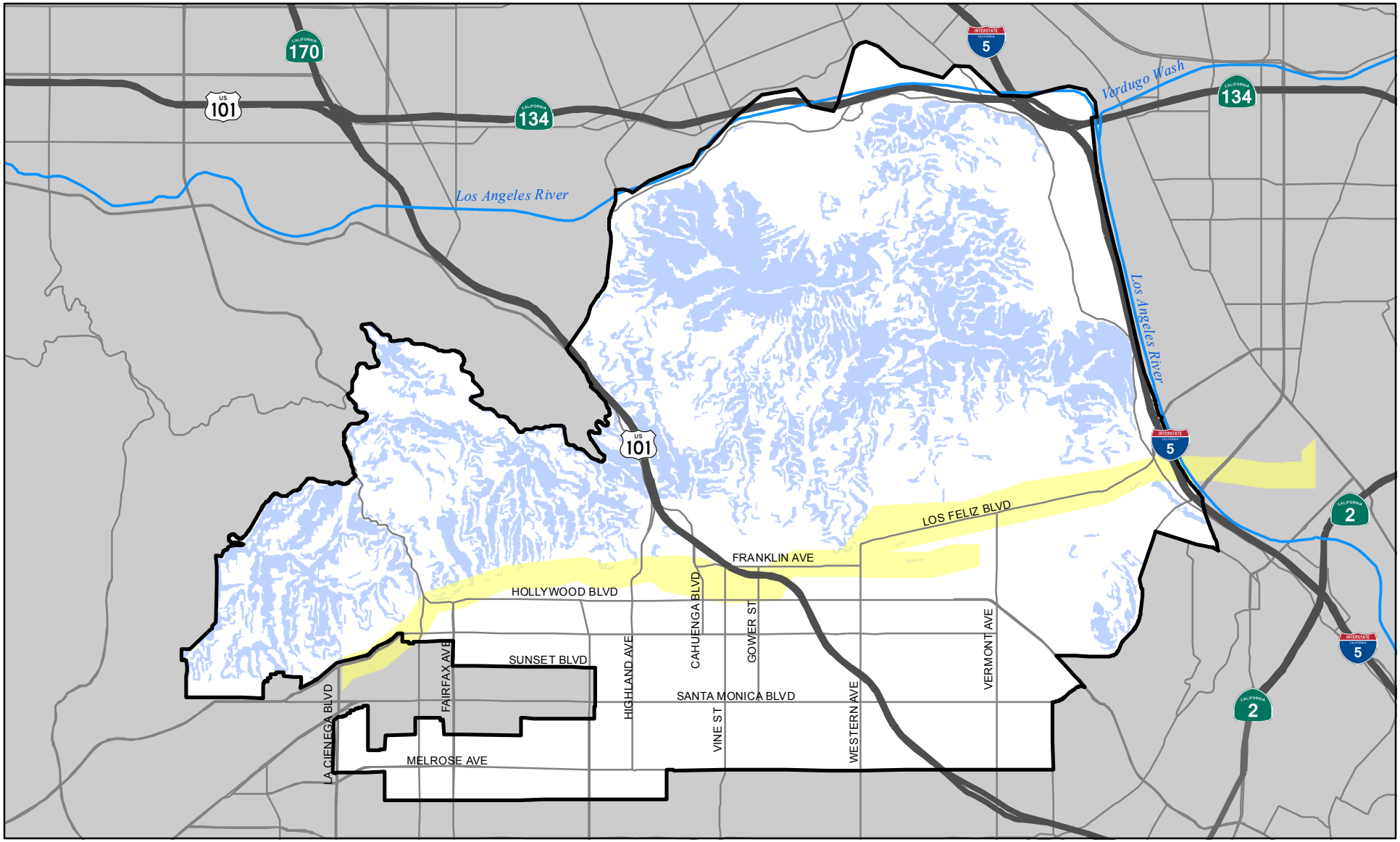
FIGURE 4.6-3

LIQUEFACTION ZONES



LEGEND:

Hollywood CPA

Alquist-Priolo Earthquake Fault Zone

Landslide Area

N W E S

0 2,900 5,800 Feet

SOURCE: City of Los Angeles GeoHub; TAHA, 2016.

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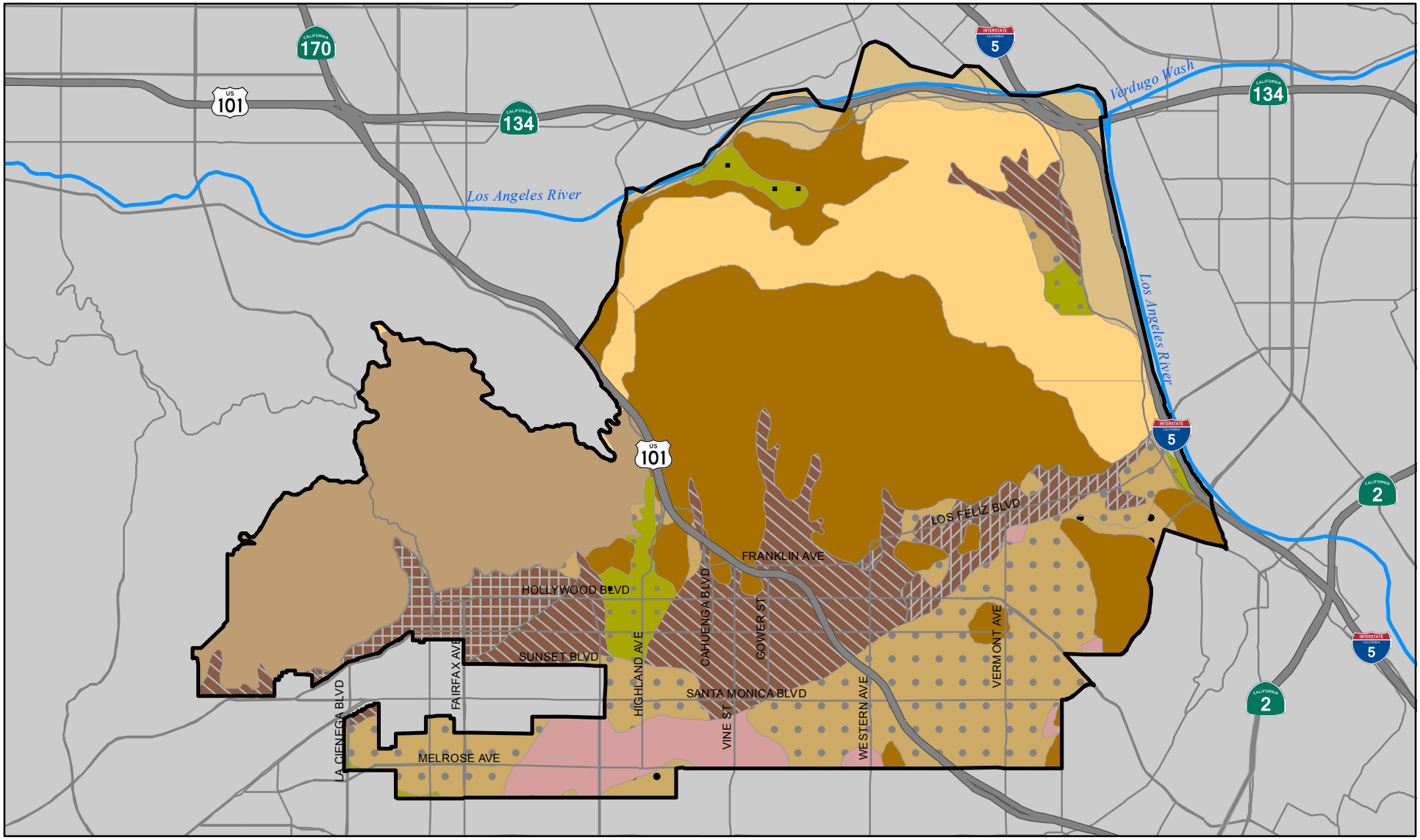
FIGURE 4.6-4

EARTHQUAKE-INDUCED LANDSLIDE AREAS



LEGEND:

- Hollywood CPA
- Altamont Clay Loam
- Hanford Fine Sandy Loam
- Hanford Gravelly Sandy Loam
- Hanford Silt Loam
- Montezuma Clay Adobe
- Ramona Clay Loam
- Ramona Loam
- Santa Monica Mountains
- Tujunga Fine Sandy Loam
- Upper Los Angeles River
- Yolo Clay Loam
- Yolo Loam

0 3,000 6,000 Feet

N W E S

SOURCE: USGS, 2006; TAHA, 2018.

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FIGURE 4.6-5
SOIL TYPES

SOILS AND GEOLOGIC MATERIALS

The Project Area contains a variety of soils. Native soils found in the Santa Monica Mountains portion of the Project Area include Altamont clay loam, as well as soils associated with the Upper Los Angeles River and Santa Monica Mountains. Native soils found within the northerly base of the Santa Monica Mountains (within Forest Lawn – Hollywood Hills and Mt. Sinai Memorial Park) include Yolo Clay Loam and Altamont Clay Loam. Native soils found in the northeastern base of the Santa Monica Mountains (Los Angeles Zoo, Wilson and Harding Golf Courses, and John Ferraro Athletic Fields) include Tujunga Fine Sandy Loam, Yolo Loam, and Hanford Fine Sandy Loam.

The native soil that is predominately found in the hill at the eastern end of the Project Area is composed of Altamont Clay Loam. Native soils that are found within the southerly foothills of the Santa Monica Mountains and the flatlands include Hanford Silt Loam Montezuma, Hanford Fine Sandy Loam, Yolo Loam, Yolo Clay Loam, Clay Adobe, Ramona Clay Loam, and Ramona Loam. Pockets of Altamont Clay Loam can also be found within these areas.[6] The soils underlying the Project Area are shown in **Figure 4.6-5**.

Soil Erosion. Factors that contribute to potential soil erosion include climate, the physical characteristics of soils, topography, land use, and the amount of soil disturbance. Excessive soil erosion can eventually lead to damage of building foundations, roadways and dam embankments. Rates of erosion can vary depending on the soil material, structure, and placement by human activity. The erosion potential for soils is variable throughout the Project Area. Soil containing high amounts of silt can be easily erodible while sandy soils are less susceptible. In general, the loss of ground cover caused by construction activities is a primary factor contributing to an increase in soil erosion potential. Erosion potential is also directly related to the terrain's steepness. While the Project Area includes the Santa Monica Mountains to the north and a hill to the east, the actual potential for erosion is difficult to predict, as the conditions where erosion occurs are site-specific.

Expansive Soils. Expansive soils are typically associated with fine-grained clayey soils that have the potential to shrink and swell with repeated changes in the moisture content. The ability of clayey soil to change volume can result in uplift or cracking to foundation elements or other rigid structures, such as slabs-on-grade, rigid pavements, sidewalks, or other slabs or hardscape located on these soils. Expansive soils, such as alluvium that are clay and silt based, are present within the Project Area. See **Figure 4.6-5** for areas that has clay- and silt-based soil.

Septic Tanks. The Project Area is served by City-owned wastewater treatment and disposal facilities. However, there are a few properties that use septic systems to dispose of wastewater as public sewers are not available nearby for connection or homes were built before public sewers were available. Since septic systems are on private property, property owners are completely responsible for taking care of them.[7]

[6]County of Los Angeles, Department of Public Works, *2006 Hydrology Manual*, 2006; County of Los Angeles Department of Public Works, *Soil Types Shapefile*, http://ladpw.org/wrd/publication/, 2004.

[7]City of Los Angeles Department of Public Works, Bureau of Sanitation, *On-Site Wastewater Treatment Systems Map*, https://www.lacitysan.org/san/sandocview?docname=cnt009972, April 15, 2013.

THRESHOLDS OF SIGNIFICANCE

In accordance with Appendix G of the State CEQA Guidelines the Proposed Plan would have a significant impact related to geology and soils if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving;
  - 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. Refer to Division of Mines and Geology Special Publication 42.
  - Strong seismic ground shaking.
  - Seismic-related ground failure, including liquefaction.
  - Landslides.
- Result in substantial soil erosion or the loss of topsoil.
- 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 off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

METHODOLOGY

This analysis uses the thresholds in Appendix G of the State CEQA Guidelines to make a significance determination.

In 2015, the California Supreme Court in *California Building Industry Association v. Bay Area Air Quality Management District (CBIA v. BAAQMD)*, held that CEQA generally does not require a lead agency to consider the impacts of the existing environment on the future residents or users of a project. However, if a project exacerbates a condition in the existing environment, the lead agency is required to analyze the impact of that exacerbated condition on the environment, which may include future residents and users within the Project Area. Analysis of the Appendix G questions in this impact analysis will apply to the decision from *CBIA v. BAAQMD*.

Baseline information for the analysis was compiled from a review of published geologic maps and reports, as well as information compiled and evaluated by the City of Los Angeles in conjunction with its overall planning and hazard mitigation processes to identify geologic conditions and geologic hazards in the areas that could potentially be affected by the Proposed Plan. For geology and soils, the areas that could potentially be affected by the Proposed Plan is the Project Area since potential impacts related to geology and soils are generally site-specific.

Independent of the CEQA process, there is a comprehensive regulatory framework implemented at the state and city levels to mitigate potential hazards associated with geologic and soils conditions. The design-controllable aspects of building foundation support, protection from seismic ground motion, and soil instability are governed by existing regulations. Compliance with these regulations is required, not optional. Any proponent of a development project must demonstrate compliance by incorporating the regulations in the project's design before permits for project construction are issued. The analysis presented

herein assumes compliance with all applicable laws, regulations, and standards, as part of the initial CEQA baseline and future conditions.

The impact analysis for geology and soils addresses impacts within the entire Project Area. It was based on proposed land use designations under the Proposed Plan, the existing geologic conditions and hazards in the Project Area, and the thresholds of significance for geology and soils.

IMPACTS

IMPACT 4.6-1 Would implementation of the Proposed Plan expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving the 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? **No impact.**

In light of the California Supreme Court ruling in *CBIA v. BAAQMD*, which held that CEQA generally does not require a lead agency to consider the impacts of the existing environment on the future residents or users of a project, the potential for substantial adverse effects on people or structures from the rupture of a known earthquake, an existing environmental condition, would not be an impact under CEQA unless the project exacerbated the existing environmental condition. The type of development expected to occur under the Proposed Plan is typical of urban environments and would not involve mining operations, deep excavation into the Earth, or boring of large areas creating unstable seismic conditions or stresses in the Earth's crust that would result in the rupture of a fault. While the Proposed Plan would increase development potential in some Active Change Areas, and some Administrative Change Areas and Non-Change Areas could potentially be redeveloped with higher density uses as permitted by the existing Zoning Code and General Plan land use designation, thereby potentially increasing the number of people and structures exposed to an earthquake rupture, the Proposed Plan would not cause or accelerate existing geologic hazards. Future development under the Proposed Plan would not exacerbate the rupture of the Hollywood fault or any other fault in the Project Area. Therefore, the Proposed Plan would have ***no impacts*** related to the rupture of a known earthquake fault.

The following information about the Earthquake Fault Zones, the implementation of the Proposed Project, and building and seismic codes is provided for informational purposes.

Table 4.6-1 and **Figure 4.6-1**, above, identify active and potentially active faults in the region, as well as within the Project Area. **Figure 4.6-2** shows the location of the Hollywood fault and the Alquist-Priolo Earthquake Fault Zone within the Project Area. The Hollywood fault traverses through the Project Area along the southern side of the eastern Santa Monica Mountains. This fault is within the Hollywood Earthquake Fault Zone and generally encompasses the area surrounding Sunset Boulevard in the western portion of the Project Area, Franklin Avenue, Yucca Street, Carlos Avenue, Hollywood Boulevard, and Los Feliz Boulevard in the eastern portion of the Project Area. Several residential streets that are located near the aforementioned streets are also located within this fault zone. Commercial and residential structures currently exist within the Earthquake Fault Zone.

The Alquist-Priolo Act mitigates fault rupture hazards by prohibiting the location of most structures for human occupancy across traces of active faults. Additionally, LADBS requires surface fault rupture hazard investigations for development projects located within an official or preliminary Alquist-Priolo Earthquake Fault Zone. Before a project can be permitted within an Earthquake Fault Zone, a fault investigation must be conducted to demonstrate that proposed building(s) will not be constructed across active faults. The investigation must be conducted by a licensed California Certified Engineering Geologist or Professional

Geologist who is experienced with fault investigations. If an active fault is found on a property, buildings are required to be set back from active fault traces. The building setback from an active fault is typically 50 feet, but is determined on a case-by-case basis, depending on whether the location, trend, and nature of the fault trace are accurately established.

Active Change Areas are proposed within the Hollywood Earthquake Fault Zone between La Brea Avenue and US-101, as well as along Hillhurst Avenue. The existing conditions in the Active Change Areas within the Earthquake Fault Zone include multi-family residential and commercial areas that are generally developed with existing uses. Proposed changes to the commercial areas would generally permit an increase in allowable floor area ratio (FAR). Proposed changes to the multi-family residential areas would implement reduced or new height limits in some areas and increased density to allow for more housing in other areas. As such, the Proposed Plan is expected to result in redevelopment of larger and taller structures and more people living in the Earthquake Fault Zone. Although the Proposed Plan does not propose changes that would affect development potential in the Administrative and Non-Change Areas, these areas could potentially be redeveloped with larger and taller structures that are permitted by the existing Zoning Code and General Plan land use designation and, thus, potentially increasing the number of people living in the Earthquake Fault Zone. Future development within the Earthquake Fault Zone (both in the Change and Non-Change Areas) would be subject to project-specific foundation and structural studies and imposition of structural design standards to reduce structural failure during a fault rupture. Development will be required to adhere to up-to-date seismic design requirements of the CBC and LABC, which ensure new buildings are designed to withstand seismic events through modern construction techniques (as further described in Impact Section 4.6-2, below).

Based on the above, the Proposed Plan would result in ***no impact*** related to fault rupture.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impact.

IMPACT 4.6-2 Would implementation of the Proposed Plan expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking? **No impact.**

In light of the California Supreme Court ruling in *CBIA v. BAAQMD*, which held that CEQA generally does not require a lead agency to consider the impacts of the existing environment on the future residents or users of a project, the potential for substantial adverse effects on people or structures from strong seismic ground shaking from earthquakes would generally not be an impact under CEQA unless it results from the project exacerbating the existing environmental condition. The type of development expected to occur under the Proposed Plan is typical of urban environments and would not involve mining operations, deep excavation into the Earth, or boring of large areas creating unstable seismic conditions or stresses in the Earth's crust. While the Proposed Plan would increase development potential in some Active Change Areas, and some Administrative Change Areas and Non-Change Areas could potentially be redeveloped with higher density uses as permitted by the existing Zoning Code and General Plan land use designation, thereby potentially increasing the number of people and structures exposed to strong seismic ground shaking, the Proposed Plan would not cause or accelerate existing geologic hazards. This condition exists throughout the Los Angeles area given that it is a seismically active area. Future development under the

Proposed Plan would not exacerbate existing seismic conditions in the Project Area. Therefore, the Proposed Plan would have ***no impacts*** related to strong seismic ground shaking.

The following information about seismic risk and building and seismic codes is provided for informational purposes.

The Project Area and all communities in the City of Los Angeles are in a seismically active region and are subject to risk of damage to persons and property as a result of seismic ground shaking from earthquakes originating on one or more of the active faults in the region (**Table 4.6-2**). Any new development in the State, including future development within the Project Area, would be required to conform to the most up-to-date seismic design provisions to ensure new buildings are designed to resist ground shaking through modern construction techniques. Buildings in California are strictly regulated by the CBC, as adopted and enforced by each jurisdiction, to reduce risks from seismic events to the maximum extent possible. The currently accepted design standards for seismically induced ground shaking-resistant construction are addressed in the CBC and LABC. These requirements are considered minimum standards for the design and construction of buildings and must be incorporated into any final project designs. Because the design and construction of new habitable structures are required to be in compliance with the CBC's recommended seismic design criteria, potential hazards associated with strong seismic ground shaking on new development in the Project Area would be reduced.[8]

The City's plan check and permitting process ensures that all new construction adheres to adopted Building Code requirements and incorporates structural features and construction methods that meet seismic and geologic safety standards. Compliance with the CBC, LABC, Policy 1.1.6 of the General Plan Safety Element (as described in the Regulatory Framework, above), and related applicable regulatory requirements would reduce the level of risk to future residents or users associated with strong seismic ground shaking on any particular site within the Project Area.

Based on the above, the Proposed Plan would not result in impacts associated with seismic ground shaking, and ***no impact*** is anticipated.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impact.

IMPACT 4.6-3 Would implementation of the Proposed Plan expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction and/or landslides? **No impact.**

In light of the California Supreme Court ruling in *CBIA v. BAAQMD*, which held that CEQA generally does not require a lead agency to consider the impacts of the existing environment on the future residents or users of a project, the potential for substantial adverse effects on people or structures from seismic-related ground failure, generally a result of existing environmental conditions, would not be an impact under CEQA unless the project exacerbated the existing environmental conditions. The type of development expected

[8]Conformance to the recommended seismic design criteria does not constitute any kind of guarantee or assurance that substantial structural damage or ground failure would not occur if a maximum magnitude earthquake occurred. The primary goal of seismic design is to protect life through prevention of structural collapse and not to avoid all damage.

to occur under the Proposed Plan is typical of urban environments and would not involve mining operations, deep excavation into the Earth, or boring of large areas creating unstable seismic conditions or stresses in the Earth's crust. While the Proposed Plan would increase development potential in some Active Change Areas, and some Administrative Change Areas and Non-Change Areas could potentially be redeveloped with higher density uses as permitted by the existing Zoning Code and General Plan land use designation, thereby potentially increasing the number of people and structures exposed to seismic-related ground failure, it would not cause or accelerate existing conditions with respect to geologic hazards which are common to areas throughout the City and region due to its seismically active nature. As such, future development under the Proposed Plan would not cause or exacerbate existing conditions with respect to seismic-related ground failure in the Project Area. Therefore, the Proposed Plan would have ***no impacts*** related to seismic-related ground failure.

The following information about liquefaction and landslides is provided for informational purposes.

Liquefaction. Liquefaction-prone areas cover the southwestern, northern, and eastern portions of the Project Area, as well as various areas north of Hollywood Boulevard along the foothills of the Santa Monica Mountains, as shown in **Figure 4.6-3**, above. The foothills and the southwestern portion of the Project Area are already developed with residential and commercial structures. The Proposed Plan would not directly increase liquefaction hazards because it would not affect seismic conditions or alter underlying soil or groundwater characteristics that govern liquefaction potential. However, some of the Active Change Areas are located in liquefaction zones, and some of the Active Change Areas would increase density compared to existing conditions. Additionally, some Non-Change areas and Administrative Change Areas have potential for build-out in liquefaction zones. As such, the number of occupied structures could increase in the Project Area, which could potentially increase the number of people or structures that could be exposed to liquefaction and geologic hazards.

Under the provisions of state law and LABC, all new construction in liquefaction-prone areas would be required to prepare a geotechnical report. Additionally, for properties with mapped maximum considered earthquake spectral response, as determined by Section 1613 of the CBC, a liquefaction potential study of the property is required. The recommendations (including structural and foundation design features) that are contained in the liquefaction potential study prepared by a geologist are required by the City to be incorporated in grading and construction plans. Required compliance with the recommendations identified in the project-specific geotechnical evaluation, the LABC, and any specific requirements established by Los Angeles Department of Public Works (LADPW) and/or the City's Engineer would ensure that future development (within both the Change and Non-Change Areas) would not be exposed to substantial risks associated with liquefaction. Therefore, the Proposed Plan would not be expected to create risks to future residents and users of the Project Area associated with liquefaction.

Landslides. As shown in **Figure 4.6-4**, above, a majority of the Santa Monica Mountains within the Project Area north of Franklin Avenue and Sunset Boulevard are within earthquake-induced landslide zones. Additionally, various portions of the hillside area east of Talmadge Street are within earthquake-induced landslide zones. It is the City's standard practice to require the preparation, review, and approval of geotechnical reports for new developments in landslide susceptible areas. Required compliance with the recommendations identified in the project-specific geotechnical evaluation, the LABC, and any specific requirements established by LADPW and/or the City's Engineer would ensure that future development within the Project Area would not be exposed to substantial risks associated with landslides. As such, future development during the lifetime of the Proposed Plan would not be expected to result in risks associated with landslides.

Conclusion

In summary, compliance with the LABC and the recommendations contained within the project-specific geotechnical reports and any specific requirements established by LADPW and/or the City's Engineer would help to minimize the potential risk of loss, injury, or death due to liquefaction and landslides for future residents and users within the Project Area. Moreover, future development under the Proposed Plan would not cause or exacerbate environmental conditions that would cause seismic-related ground failure in the Project Area. Therefore, the Proposed Plan would have ***no impacts*** related to seismic-related ground failure, including liquefaction and/or landslides.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impact.

IMPACT 4.6-4 Would implementation of the Proposed Plan result in substantial soil erosion or the loss of topsoil? **Less than significant impact.**

The agents of soil erosion are water and wind, each contributing a significant amount of soil loss. The effects of erosion are intensified with an increase in slope (as water moves faster, it gains momentum to carry more debris), the narrowing of runoff channels (which increases the velocity of water), and by the removal of groundcover (which leaves the soil exposed to erosive forces). The potential for soil erosion can be accelerated and increased by human activities such as grading and cut-and-fill methods, particularly on steep slopes. Erosion can result in the loss of valuable ground surface materials, depositing them into basins and the ocean, and can result in the reduction in air quality due to wind-carried dust.

Grading for most structures that would be constructed during the lifetime of the Proposed Plan involves grading for foundations, building pads, and utility trenches. Excavations for utility trenches and foundations typically involve less-than-five feet of change in ground surface elevations. Most pad grading typically would be less-than-two feet deep. Nonetheless, deeper excavations could accompany the emplacement of underground facilities and high-rise buildings.

Implementation of the Proposed Plan would increase development potential in various portions of the Project Area, which could result in increased grading and subsequent erosion and loss of topsoil within these portions of the Project Area. However, all future construction activities that involve earthwork and grading must comply with applicable provisions of Chapter IX, Division 70 of the LAMC, which addresses grading, excavations, and fills, and the recommendations of a site-specific geotechnical report. The City and PRC Section 2697 require the preparation of a site-specific geotechnical report to evaluate soils issues. Development projects would also be required to comply with the City's Low Impact Development Ordinance (See Section 4.7, Hydrology and Water Quality), which would help reduce soil erosion and the loss of topsoil.

Because one of the major effects associated with grading is sedimentation in receiving waters, erosion control standards are set by the Regional Water Quality Control Board (RWQCB) through administration of the NPDES permit process for storm drainage discharge. The NPDES permit requires implementation of nonpoint source control of stormwater runoff through the application of a number of BMPs. These BMPs are meant to reduce the amount of constituents, including eroded sediment, that enter streams and other water bodies. A SWPPP, as required by the RWQCB, is required to describe the stormwater BMPs (structural and operational measures) that would control the quality and quantity of stormwater runoff.

Erosion and sedimentation issues are addressed more fully in Section 4.9, Hydrology and Water Quality. All new development permitted under the Proposed Plan will be required to comply with the State NPDES permit process, the City's standard grading and building permit requirements, and the application of BMPs.

Compliance with the state permit process; compliance with the City's codes, regulatory requirements, standard grading and building permit requirements; and the application of BMPs would ensure that the Proposed Plan would not result in substantial soil erosion or the loss of topsoil. Thus, potential impacts from soil erosion or loss of top soils would be ***less than significant***.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

Less than significant.

IMPACT 4.6-5 Would implementation of the Proposed Plan 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 off-site landslide, lateral spreading, subsidence, or collapse? **No impact.**

Landslides. The hillside areas within the Project Area are generally susceptible to landslides and generally include the Santa Monica Mountain Range and the hillside area east of Talmadge Street. It is the City's standard practice to require the preparation, review, and approval of geotechnical reports for new developments in landslide susceptible areas. The City requires developers to implement the recommendations contained within the geotechnical reports. Required compliance with the recommendations identified in the project-specific geotechnical evaluation, the LABC, and any specific requirements established by LADPW and/or the City's Engineer would reduce landslide hazards. As such the Proposed Plan would not cause landslides or exacerbate existing conditions associated with landslides and would have ***no impacts*** related to landslides.

Lateral Spreading. Lateral spreading is a phenomenon where large blocks of intact soil move downslope in a rapid fluid-like flow movement, primarily as a result of liquefaction. The mass moves toward an unconfined area, such as a descending slope or stream-cut bluff, and can occur on slope gradients as gentle as one degree. Lateral spreading often occurs along riverbanks and shorelines where loose, saturated sandy soils are commonly encountered, as well as in liquefaction-prone areas. Lateral spreading could also occur in unsupported walls of pits excavated in the existing fill or loose alluvium. Pursuant to Section 1613 of the CBC, projects located in liquefaction zones shall incorporate seismic design features into grading and construction plans. Furthermore, compliance with the recommendations of the geotechnical report, as well as the LABC, would reduce lateral spreading and other liquefaction-related hazards. Thus, the Proposed Plan would not cause or on or off site lateral spreading or exacerbate existing conditions associated with on- or off-site lateral spreading and would have ***no impacts*** related to lateral spreading.

Subsidence and Collapse. Subsidence is a localized mass movement that involves the gradual downward settling or sinking of the earth's surface resulting from the extraction of mineral resources, subsurface oil, groundwater, or other subsurface liquids, such as natural gas. Collapse is an abrupt depression of the ground cover that is clearly visible to the naked eye which is also principally caused by the extraction of subsurface liquids or mining of mineral resources. The Project Area currently does not contain any subsurface oil extraction facilities. No mining activities or extraction of mineral resources occur within or near the Project Area. Additionally, the proposed changes associated with the Proposed Plan would not introduce any subsurface oil extraction facilities, mining activities, or extraction of mineral resources. Thus, the Proposed

Plan would not cause subsidence or collapse or exacerbate existing conditions associated with subsidence and collapse and would have ***no impacts*** related to subsidence and collapse.

Unstable Soil. Future development occurring under the Proposed Plan could take place on unstable soils, such as alluvium, which is present in the Project Area. The CBC and LABC require a geotechnical report for development in the Project Area where unstable soils may be present. All on-site grading and site preparation activities must comply with the applicable provisions of LAMC Chapter IX, Division 70, which addresses grading, excavations, and fills, and the recommendations of the geotechnical report. The requirements contained within LAMC Chapter IX, Division 70 are considered minimum standards for design and construction of buildings. Additionally, the City requires the recommendations contained within the geotechnical report to be implemented by the individual project applicant. The requirements of LAMC Chapter IX, Division 70 and the recommendations contained within the geotechnical report must be incorporated into any final project designs. Additionally, all earthwork and grading activities require grading permits from the LADBS that include requirements and standards designed to limit potential impacts related to soil instability. Therefore, the Proposed Plan would not cause unstable soils or exacerbate existing conditions associated with unstable soils and would have ***no impacts*** related to unstable soils.

Conclusion

In summary, implementation of the Proposed Plan would not cause impacts related to unstable geologic units or soil or exacerbate existing conditions associated with unstable geologic unit or soil. The Proposed Plan does not involve components that would cause subsidence and collapse. Additionally, compliance with the LABC and the requirements of project-specific geotechnical reports and any specific requirements established by LADPW and/or the City's Engineer would help to minimize the potential risk associated with landslides, lateral spreading, subsidence, collapse, and unstable soil. Thus, the Proposed Plan would have ***no impacts*** associated with unstable geologic units or soil.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impact.

IMPACT 4.6-6 Would implementation of the Proposed Plan be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? **No impact.**

Expansive soils are typically associated with fine-grained clayey soils that have the potential to shrink and swell with repeated changes in the moisture content. The ability of clayey soil to change volume can result in uplift or cracking to foundation elements or other rigid structures such as slabs-on-grade, rigid pavements, sidewalks, or other slabs or hardscape founded on these soils. Future development under the Proposed Plan could be constructed in areas of expansive soils, such as alluvium. The existence of expansive soils would be uncovered in the geotechnical report as required by the CBC and LABC. All earthwork and grading activities require grading permits from LADBS that include requirements and standards designed to limit potential expansive soil impacts to acceptable levels. All on-site grading and site preparation must comply with applicable provisions of LAMC Chapter IX, Division 70, which addresses grading, excavations, and fills, and the recommendations of the geotechnical report. Compliance with the recommendations of the geotechnical report as required by LABC are reasonably expected to be sufficient to reduce impacts from expansive soil-related hazards. Because development within the Project Area will be required to implement such appropriate design and construction measures, the Proposed Plan

would not cause substantial risks to life and property from expansive soil or exacerbate existing conditions resulting in substantial risks to life or property from expansive soil and would have ***no impacts*** related to expansive soils.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impact.

IMPACT 4.6-7 Would implementation of the Proposed Plan have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? **No impact.**

It is the City's policy that all new development must be connected to a public sewerage system. No development would occur in areas that are not served by sewer service (i.e., undeveloped open space areas within the Santa Monica Mountains) as a result of the Proposed Plan. Therefore, the Proposed Plan would have ***no impacts*** related to construction on soils incapable of adequately supporting septic tanks.

Mitigation Measures

No mitigation measures are required.

Significance of Impacts after Mitigation

No impacts.

CUMULATIVE IMPACTS

It is not anticipated that the Proposed Plan would contribute to a cumulatively considerable increase in risk associated with geologic hazards in light of the *CBIA v. BAAQMD* decision and the fact that the geographic context for the analysis of cumulative impacts resulting from geologic hazards is generally site-specific. As discussed above, future development under the Proposed Plan would not exacerbate the Hollywood fault or any other fault in the Project Area; would not exacerbate existing seismic conditions or seismic-related ground failure; would not result in substantial soil erosion or the loss of topsoil; would not exacerbate the risks associated with landslides, lateral spreading, subsidence, collapse, and unstable soil; and would not exacerbate existing soil conditions in the Project Area. Additionally, no development would occur in areas that are not served by sewer service. Therefore, the Proposed Plan would not result in a cumulatively considerable contribution to a significant impact on geology and soils.

The following information is provided for informational purposes.

Seismic-related Impacts. Individual building sites could be affected by ground shaking and seismic-related ground failure. These effects are site-specific, and would not be compounded by additional development. New buildings in the City are required to be sited and designed in accordance with appropriate geotechnical and seismic guidelines and recommendations, consistent with the requirements of the CBC and LABC. Although there is risk from seismic events inherent in all development in seismically active areas in the state of California, compliance with applicable regulations reduces this risk because those regulations have been formulated to preserve public safety. Individual projects that could be developed as a result of the Proposed Plan will be required to comply with the provisions of all applicable codes and regulations and current seismic safety design

requirements. Therefore, there would be no seismic-related impacts as a result of the implementation of the Proposed Plan and impacts would not be cumulatively considerable.

Soils and Geologic-related Impacts. Development in the Project Area and other projects in the vicinity could expose soil surfaces and further alter soil conditions. Development in the City of Los Angeles, including under the Proposed Plan, is required to conform to the provisions of applicable federal, state, and local laws and ordinances pertaining to erosion and sedimentation control. This includes the City's SUSMP requirements, which implement the federal and State NPDES program regulations (refer to Section 4.9, Hydrology and Water Quality). Because the development in accordance with the Proposed Plan would be in compliance with applicable NPDES permit requirements and would implement and maintain the BMPs required by individual project SWPPPs, the Proposed Plan would not make a cumulatively considerable contribution to impacts related to soil erosion. The geographic context for analysis of impacts from unstable soil conditions, including landslides, liquefaction, subsidence, collapse, or expansive, unstable, or corrosive soils is generally site-specific. Development projects are required to undergo analysis of geological and soil conditions applicable to the specific individual project, and restrictions on development would be applied in the event that geological or soil conditions pose a risk to safety as a result of site-specific geologic or soils instability. Because development under the Proposed Plan would be required to implement appropriate design and construction measures, impacts to soils and geologic conditions would not be cumulatively considerable.

REFERENCES

California Department of Conservation, Division of Mines and Geology, *Seismic Hazard Zone Report 016, Seismic Hazard Zone Report for the Burbank 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

California Department of Conservation, Division of Mines and Geology, *Seismic Hazard Zone Report 023, Seismic Hazard Zone Report for the Beverly Hills 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

California Department of Conservation, Division of Mines and Geology, *Seismic Hazard Zone Report 026, Seismic Hazard Zone Report for the Hollywood 7.5-Minute Quadrangle, Los Angeles County, California*, 1998.

California Department of Conservation, Division of Mines and Geology, U.S. Geological Survey, *Seismic Hazard Zones: Burbank Quadrangle Official Map*, March 25, 1999.

California Department of Conservation, Division of Mines and Geology, U.S. Geological Survey, *Seismic Hazard Zones: Beverly Hills Quadrangle Official Map*, March 25, 1999.

California Department of Conservation, Division of Mines and Geology, U.S. Geological Survey, *Earthquake Zones of Required Investigation: Hollywood Quadrangle*, November 6, 2014.

City of Los Angeles Department of Public Works, Bureau of Sanitation, *On-Site Wastewater Treatment Systems Map*, https://www.lacitysan.org/san/sandocview?docname=cnt009972, April 15, 2013.

County of Los Angeles, Department of Public Works, *2006 Hydrology Manual*, 2006.

County of Los Angeles Department of Public Works, *Soil Types Shapefile*, http://ladpw.org/wrd/publication/, *2004*.

Southern California Earthquake Data Center, http://www.data.scec.org/significant/fault-index.html, accessed September 12, 2016.

United States Department of Agriculture Natural Resources Conservation Service Soil Survey Division, *Online Web Soil Survey*, http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/, 2016.

United States Geological Survey, 2007 Working Group on California Earthquake Probabilities, *The Uniform California Earthquake Rupture Forecast, Version 2 (UCERF 2)*, http://pubs.usgs.gov/of/2007/1437/of2007-1437_text.pdf, 2008.