IV. Environmental Impact Analysis

D. Geology and Soils

1. Introduction

This section of the Draft EIR evaluates potential existing geologic and soils hazards of the Project, including the potential for the Project to cause direct or indirect impacts associated with existing environmental conditions that could cause, in whole or in part, fault rupture, ground shaking, liquefaction of soils, expansion of soils, and/or landslide. Impacts regarding these topics are based on the Geologic and Soils Engineering Exploration, Proposed Twelve-Story, At-Grade Mixed-Use Building, 650–674 South San Vicente Boulevard, Los Angeles, California (Geotechnical Investigation) prepared by Byer Geotechnical on July 25, 2019, and updated January 14, 2020, and the Cultural Resources Assessment Report, prepared by Environmental Science Associates (ESA) in July 2019. These reports are provided in Appendix F and D, of this Draft EIR, respectively.

It is important to note that in addition to the site-specific field work conducted for this Project, the above-cited investigations reviewed and considered available information provided in previous reports and from published sources. For example, considerable seismic information is available from the California Geological Survey (CGS) and the United States Geological Survey (USGS), and the site-specific investigations considered, used, and cited those sources, as appropriate. In addition, numerous previous investigations have been conducted for the Project Site and nearby sites. The above-cited investigations, reviewed, incorporated, and updated the information, as appropriate. For example, Byer Geotechnical had previously performed a geotechnical investigation for the site in 2017 for a different project that was previously proposed on the Project Site. The Project Site was also the subject of a 1976 compaction test report for proposed grading at the Big 5 Sporting Goods building located in the southern portion of the Project Site.[1] In addition, the Metropolitan Transportation Authority (Metro) Purple Line Extension project is proposed to be between 50 and 70 feet below ground surface approximately 70 feet south of the southern-most corner of the Project Site.[2]

1 Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

2 Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

2. Environmental Setting

a) Regulatory Framework

Federal, state, and local regulations pertaining to geology and soils include the following:

- Earthquake Hazards Reduction Act
- National Pollutant Discharge Elimination System
- Paleontological Resources Preservation Act
- Society of Vertebrate Paleontology Standard Guidelines
- Alquist-Priolo Earthquake Fault Zoning Act
- Seismic Hazards Mapping Act
- California Coastal Management Program
- California Building Code
- California Division of Oil, Gas, and Geothermal Resources
- California Penal Code Section 622.5
- California Public Resources Code Section 5097.5
- City of Los Angeles General Plan Safety Element
- City of Los Angeles Conservation Element
- Hillside Construction Regulation
- City of Los Angeles Municipal Code

(1) Federal

(a) Earthquake Hazards Reduction Act

The Earthquake Hazards Reduction Act was enacted in 1977 to "reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards and reduction program." To accomplish this, the Act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended by the Earthquake Hazards Reduction Program Reauthorization Act of 2004 (Public Law 108-360).

NEHRP's mission includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improvement of building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improvement of mitigation capacity; and accelerated application of research

results. The NEHRP designates the Federal Emergency Management Agency (FEMA) as the lead agency of the program and assigns it several planning, coordinating, and reporting responsibilities. Programs under NEHRP help inform and guide local planning and building code requirements such as emergency evacuation responsibilities and seismic code standards such as those to which a proposed project would be required to adhere.

(b) National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) Program has been responsible for substantial improvements to our nation's and state's water quality since 1972. The NPDES permit sets erosion control standards and requires implementation of nonpoint source control of surface drainage through the application of several Best Management Practices (BMPs). NPDES permits are required by Section 402 of the Clean Water Act.[3]

(c) Paleontological Resources Preservation Act

The Paleontological Resources Preservation Act (PRPA) was signed into law in 2009. It directs the Department of Agriculture and the Department of the Interior to implement comprehensive paleontological resource management programs on federal lands. The PRPA protects scientifically significant fossils on federal lands and provides a permitting system where researchers can collect and study scientifically significant fossils which will remain in the public trust. The act also allows for the collection of common plant and invertebrate fossils for personal, non-commercial use on federal lands.[4] The PRPA requires the Secretaries of the Interior and Agriculture to manage and protect paleontological resources on federal land. The PRPA furthers the protection of fossils on federal lands by criminalizing the unauthorized removal of fossils.

(d) Society of Vertebrate Paleontology Standard Guidelines

The Society of Vertebrate Paleontology (SVP) has established standard guidelines5 that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. The Paleontological Resources Preservation Act (PRPA) of 2009 calls for uniform policies and standards that apply to fossils on all federal public lands. All federal land management agencies are required to

3 United States Environmental Protection Agency, Section 404 of the Clean Water Act, https://www.epa.gov/cwa-404/clean-water-act-section-402-national-pollutant-discharge-elimination-system, accessed November 6, 2020.

4 United States Department of the Interior, National Park Service, Paleontological Resources Preservation Act.

5 Society of Vertebrate Paleontology (SVP), Standard procedures for the assessment and mitigation of adverse impacts to paleontological resources, 2010.

develop regulations that satisfy the stipulations of the PRPA. As defined by the SVP, significant nonrenewable paleontological resources are:[6]

> *Fossils and fossiliferous deposits here are restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. Certain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.*

As defined by the SVP, significant fossiliferous deposits are:[7]

> *A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years BP [before present].*

Based on the significance definitions of the SVP, all identifiable vertebrate fossils are considered to have significant scientific value.[8] This position is adhered to because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a statistically significant number of specimens of the same genus. Therefore, every vertebrate fossil found has the potential to provide significant new information on the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units in which vertebrate fossils have previously been found are considered to have high sensitivity. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as significant by project paleontologists, specialists, or local government agencies.

6 SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

7 SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

8 SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

(2) State

(a) Alquist-Priolo Earthquake Fault Zoning Act

Alquist-Priolo Earthquake Fault Zoning Act (formerly the Alquist-Priolo Special Studies Zone Act) was signed into law December 22, 1972 (revised in 1994) and codified into State law in the Public Resources Code as Division 2, Chapter 7.5 to address hazards from earthquake fault zones. The purpose of this law is to mitigate the hazard of surface fault rupture by regulating development near active faults. As required by the Act, the State has delineated Earthquake Fault Zones (formerly Special Studies Zones) along known active faults in California, which vary in width around the fault trace from about 200 to 500 feet on either side of the fault trace. Cities and counties affected by the zones must regulate certain development projects within the zones. The State Geologist is also required to issue appropriate maps to assist cities and counties in planning, zoning, and building regulation functions. Local agencies enforce the Alquist-Priolo Earthquake Fault Zoning Act in the development permit process, where applicable, and may be more restrictive than State law requires. According to the Alquist-Priolo Earthquake Fault Zoning Act, before a project that is within an Alquist-Priolo Earthquake Fault Zone can be permitted, cities and counties shall require a geologic investigation, prepared by a licensed geologist, to demonstrate that buildings 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 a distance to be established by a California Certified Engineering Geologist. Although setback distances may vary, a minimum 50-foot setback is typically required.

(b) Seismic Hazards Mapping Act

In order 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 (Public Resources Code Sections 2690-2699.6). Under the Seismic Hazards Mapping Act, the State Geologist is required to delineate “seismic hazard zones.” Cities and counties must regulate certain development projects within these zones until the geologic and soil conditions of their project sites have been investigated and appropriate mitigation measures, if any, have been 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 Plans and to encourage the adaptation of land use management policies and regulations to reduce and mitigate seismic hazards to protect public health and safety. Under Public Resources Code Section 2697, cities and counties must require, prior to the approval of a project located in a seismic hazard zone, submission of a geotechnical report defining and delineating any seismic hazard.

(c) California Coastal Management Program

The California Coastal Commission was established by voter initiative in 1972 and later made permanent by the Legislature through adoption of the California Coastal Act of 1976. In partnership with coastal cities and counties, the Coastal Commission plans and regulates the use of land and water in the Coastal Zone. Development activities, which are broadly defined by the Coastal Act to include (among others) construction of buildings, divisions of land, and activities that change the intensity of use of land or public access to coastal waters, generally require a coastal permit from either the Coastal Commission or the local government. The Coastal Act includes specific policies (see Division 20 of the Public Resources Code [PRC]) that address issues such as shoreline public access and recreation, lower cost visitor accommodations, terrestrial and marine habitat protection, visual resources, landform alteration, agricultural lands, commercial fisheries, industrial uses, water quality, offshore oil and gas development, transportation, development design, power plants, ports, and public works. The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the Commission and by local governments, pursuant to the Coastal Act. PRC Section 30253 states that new development shall minimize risks to life and property in areas of high geologic, flood, and fire hazard. Development should be prevented or limited in high hazard areas whenever possible. However, where development cannot be prevented or limited, land use density, building value, and occupancy should be kept at a minimum. Coastal Zones in the City of Los Angeles are also regulated in local coastal plans under the State Local Coastal Program. Note that the Coastal Act is not applicable to the Project as the Project Site is not located within a Coastal Zone.

(d) California Building Code

The California Building Code (CBC), which is codified in Title 24 of the California Code of Regulations, Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards related to structural strength, means of egress facilities, and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under State law, all building standards must be centralized in Title 24 or those standards are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2019 edition of the CBC is based on the 2018 International Building Code (IBC) published by the International Code Council. The code is updated triennially,

and the 2019 edition of the CBC was published by the California Building Standards Commission on July 1, 2019, and became effective January 1, 2020. Every three years, the State adopts new codes (known collectively as the California Building Standards Code) to establish uniform standards for the construction and maintenance of buildings, electrical systems, plumbing systems, mechanical systems, and fire and life safety systems. Sections 17922, 17958 and 18941.5 of the California Health and Safety Code require that the latest edition of the California Building Standards Code apply to local construction 180 days after publication. The significant changes to Title 24 in the 2019 edition can be found at California Department of General Services website.[9]

(e) California Division of Oil, Gas, and Geothermal Resources

The California Division of Oil, Gas, and Geothermal Resources (CalGEM) regulates production of oil and gas, as well as geothermal resources, within the State of California. CalGEM requirements in preparation of environmental documents under CEQA are defined in CCR, Title14, Division 2, Chapter 2. Staff also assists operators in avoiding or reducing environmental impacts from the development of oil, gas, and geothermal resources in California, including subsidence. PRC Sections 3315, et seq. CalGEM regulations, which are defined in CCR, Title 14, Division 2, Chapter 4, include well design and construction standards, surface production equipment and pipeline requirements, and well abandonment procedures and guidelines to ensure effectiveness in preventing migration of oil and gas from a producing zone to shallower zones, including potable groundwater zones, as well as subsidence.

(f) California Penal Code Section 622.5

California Penal Code Section 622.5 provides the following: “Every person, not the owner thereof, who willfully injures, disfigures, defaces, or destroys any object or thing of archeological or historical interest or value, whether situated on private lands or within any public park or place, is guilty of a misdemeanor.”

(g) California Public Resources Code Section 5097.5

California PRC Section 5097.5 provides protection for paleontological resources on public lands, where Section 5097.5(a) states, in part, that:

> *No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, rock art, or any other archaeological, paleontological or historical feature,*

[9] Department of General Services, California Building Standards Code, https://www.dgs.ca.gov/BSC/Codes#@ViewBag.JumpTo/, accessed February 23, 2021.

situated on public lands, except with the express permission of the public agency having jurisdiction over the lands.

(3) Local

(a) City of Los Angeles General Plan Safety Element

The Safety Element of the City of Los Angeles General Plan (Safety Element), which was adopted in 1996, addresses public safety risks due to natural disasters, including seismic events and geologic conditions, and sets forth guidance for emergency response during such disasters. The Safety Element also provides maps of designated areas within Los Angeles that are considered susceptible to earthquake-induced hazards, such as fault rupture and liquefaction.

(b) City of Los Angeles General Plan Conservation Element

The Conservation Element of the City of Los Angeles General Plan (Conservation Element) recognizes paleontological resources in Section 3, Archaeological and Paleontological [Resources], specifically the La Brea Tar Pits, and identifies protection of paleontological resources as an objective (II-5). The General Plan identifies site protection as important, stating, "Pursuant to CEQA, if a land development project is within a potentially significant paleontological area, the developer is required to contact a bona fide paleontologist to arrange for assessment of the potential impact and mitigation of potential disruption of or damage to the site. Section 3 of the Conservation Element, adopted in September 2001, includes policies for the protection of paleontological resources. As stated therein, it is the City's policy that paleontological resources be protected for historical, cultural research, and/or educational purposes. Section 3 sets as an objective the identification and protection of significant paleontological sites and/or resources known to exist or that are identified during "land development, demolition, or property modification activities." Section 5 of the Conservation Element recognizes the City's responsibility for identifying and protecting its cultural and historical heritage. The Conservation Element establishes the policy to continue to protect historic and cultural sites and/or resources potentially affected by proposed land development, demolition, or property modification activities, with the related objective to protect important cultural and historical sites and resources for historical, cultural, research, and community educational purposes.[10]\

(c) Hillside Construction Regulation

The Hillside Construction Regulation (HCR) Supplemental Use District, effective March 2017 and updated in May 2018, was established by Ordinance No. 184827 to provide additional protections that would address the cumulative construction-

[10] City of Los Angeles, Conservation Element of the City of Los Angeles General Plan, City Plan Case No. 2001-0413-GPA, Council File No. 01-1094, 2001, pages II-6 to II-9.

related impacts of multiple single-family houses in hillside areas. All single-family home development projects within the HCR District shall comply with LAMC Section 13.20. However, if a Haul Route approval by the Board of Building and Safety Commissioners is required for import and/or export of 1,000 cubic yards or more, then the conditions or "Hauling Truck Operations Standards" set by the Board of Building and Safety Commissioners during the Haul Route approval process shall prevail. In addition, the builder of any single-family home development exceeding 17,500 square feet in HCR Districts needs to file for a Site Plan Review discretionary approval. Note that the Hillside Construction Regulation is not applicable to the Project as the Project Site is not located within a hillside Area.

(d) City of Los Angeles Municipal Code

Chapter IX of the LAMC contains the City's Building Code, which incorporates by reference the CBC, with City amendments for additional requirements. The LADBS is responsible for implementing the provisions of the LAMC. To that end, LADBS issues building and grading permits for construction projects. Building permits are required for any building or structure that is erected, constructed, enlarged, altered, repaired, moved, improved, removed, converted, or demolished. Grading permits are required for all grading projects other than those specifically exempted by the LAMC. 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. Throughout the permitting, design, and construction phases of a building project, LADBS engineers and inspectors confirm that the requirements of the LAMC pertaining specifically to geoseismic and soils conditions are being implemented by project architects, engineers, and contractors

The function of the City's Building Code, which comprises Chapter IX of the LAMC, is to protect life safety and compliance with the LAMC. Chapter IX address numerous topics, including earthwork and grading activities, import and export of soils, erosion and drainage control, and general construction requirements that address flood and mudflow protection, slides and unstable soils. Additionally, the LAMC includes specific requirements addressing seismic design, grading, foundation design, geologic investigations and reports, soil and rock testing, and groundwater.

Specifically, Chapter IX of LAMC Div. 18 Section 91.1803 requires that a Final Geotechnical Report with final design recommendations prepared by a California-registered geotechnical engineer and submitted to the LADBS for review prior to issuance of a grading permit.[11] Final foundation design recommendations must be developed during final project design, and other deep foundation systems that may be suitable would be addressed in the Final Geotechnical Report. All earthwork (i.e.,

[11] California Building Code, 2019 Part 2, Volume 1, Chapter 18, Soils and Foundations, Section 1803, Geotechnical Investigations.

excavation, site preparation, any fill backfill placement, etc.) must be conducted with engineering control under observation and testing by the Geotechnical Engineer and in accordance with LADBS.

b) Existing Conditions

This section summarizes the existing geologic and paleontological conditions outlined in the Geotechnical Investigation[12] and Cultural Resources Assessment Report,[13] prepared for the Project, which are included in Appendix F and D, of this Draft EIR, respectively. The information provided below is primarily from these investigations unless otherwise cited. As noted in the introduction to this section, the above-cited investigations reviewed and incorporated information from other sources and previous investigations, as appropriate, and citations for those other sources are provided in the above-cited reports.

The Geotechnical Investigation conducted on the Project Site included reviewing previous investigation results, drilling four hollow-stem auger borings to a maximum depth of 96.5 feet below the existing grade, logging the soil types encountered in boring logs, and conducting geotechnical laboratory testing to further evaluate and correlate the physical properties and engineering characteristics of the soils encountered. The Geotechnical Investigation report documented and evaluated the findings to discuss Project feasibility and provide preliminary geotechnical recommendations to inform the Project design.

(1) Regional Geologic Setting

Regionally, the Project Site is located at the boundary of the Transverse and Peninsular Ranges Geomorphic Provinces within the Los Angeles Basin area of southern California. The boundary of the geomorphic provinces is defined structurally by a complex zone of faulting that includes the Santa Monica-Hollywood-Raymond Fault System. The Santa Monica Mountains have been uplifted to the north relative to the Los Angeles Basin to the south along this fault zone. Cyclic Quaternary[14] sea level rise and fall has resulted in deeply eroded canyons and subsequent fill, with alluvial fan deposition at the base of the mountains. Holocene[15] alluvial deposition is concentrated within the canyons and southward extending drainages.

[12] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.
[13] Environmental Science Associates (ESA), Cultural Resources Assessment Report, July 2019.
[14] Quaternary time is from the present to 1.6 million years before present time.
[15] Holocene time is from the present to 11,700 years before present time.

(2) Site Geology

(a) Generalized Subsurface Conditions

The Project Site generally slopes towards the south with drainage primarily occurring by sheet flow into existing drainage systems. As noted above, on-site subsurface conditions were evaluated through field exploration data obtained from hollow-stem auger borings.

Based on the Geotechnical Investigation, the subsurface conditions as encountered included the following generalized stratigraphic units from shallow and younger to deeper and older:

- **Compacted fill** (from past grading activities) – roughly two feet thick and consists primarily of decomposed granite. Fill was not observed in the borings located within the on-site parking lots.
- **Alluvium** (generally clay) – approximately 25-30 feet thick and consists of brown to dark brown clay that is moist to very moist and medium stiff to very stiff.
- **San Pedro Formation** – encountered at approximately 30 feet below ground surface. The upper 25 feet consists of clay and silt that is bluish-gray to gray, moist to very moist, and stiff to very stiff with varying amounts of sand. Below the formation consists of layers of gray sand and silty sand that is moist to very moist and medium dense to dense.

(b) Geological Context for Paleontological Resources

As discussed in the Cultural Resources Assessment Report, the surficial geology of the Project Site and vicinity is composed of Alluvial-fan deposits from the Holocene period consistent with what is described above. Quaternary Alluvium deposits found at depth have the potential to yield vertebrate fossils.[16] According to a review of paleontological resource records, two fossil localities from older Quaternary deposits (LACM 7669 and 7670) are located immediately southeast and northeast and adjacent to the Project Site along San Vicente Boulevard near the intersections of Wilshire Boulevard and Orange Street, respectively. These localities have yielded fossil specimens of ground sloth, elephantoid, and bison at unspecified depths.[17] Additionally, other fossil localities (LACM 1238, 3176, 3329, 7671 and 7672) located approximately 0.30 to 0.65 miles from the Project Site have also produced fossils specimens of mastodon, deer, elephantoid and horse at unspecified depths and depths from 13 to 30 feet below ground surface (bgs). Furthermore, there are a number of vertebrate fossils within one mile of the Project Site from Older Quaternary Alluvium (LACM 6297-6300).

16 ESA, Cultural Resources Assessment Report, July 2019.
17 ESA, Cultural Resources Assessment Report, July 2019.

(3) Expansive Soils

Expansive soils are soils that swell when subjected to moisture and shrink when dried. Expansive soils are typically associated with clayey soils. When not addressed, soil expansion can have adverse effects on structures. The field soil classifications and laboratory testing indicated that the near surface soils have a moderate potential for expansion.[18]

(4) Groundwater

Groundwater was encountered during the geotechnical site investigation at varying depths between 34 feet and 53 feet bgs of the Project Site. The historically-highest groundwater level at the Project Site was measured at approximately 15 feet bgs. Seasonal fluctuations in groundwater levels is anticipated due to variations in precipitation, irrigation, and regional groundwater pumping.

(5) Geologic Hazards

(a) Faulting and Seismicity

A fault is a fracture in the crust of the earth along which rocks or sediment on one side has moved relative to those on the other side.[19] Faults are the result of excessive strain cause by compression or extension within the earth's crust over long periods of time. A fault trace is the line on the earth's surface representing the fault location. Surface rupture occurs when movement along a fault causes ground displacement at the surface. Fault rupture may occur suddenly during an earthquake or slowly in the form of a fault creep. Sudden displacements are more damaging to structures because they are accompanied by shaking. Fault creep is the slow displacement (movement) of the earth's crust.

Terms, such as "potentially active" and "inactive," have been commonly used in the past to describe faults that do not meet the State Mining and Geology Board (SMGB) definition of "active fault" which is defined by deformation within the last 11,700 years. However, these terms have the potential to cause confusion from a regulatory perspective as they are not defined in the Alquist-Priolo Earthquake Fault Zoning Act and may have other non-regulatory meanings in the scientific literature or in other regulatory environments. In order to avoid these issues, below are terms that provide added precision when used in classifying faults regulated by the Alquist-Priolo Earthquake Fault Zoning Act. Faults are classified into three categories on the basis of the absolute age of their most recent movement:

[18] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

[19] California Geological Survey (CGS), Earthquake Fault Zones, 2018, A Guide For Government Agencies, Property Owners / Developers, and Geoscience Practitioners for Assessing Fault Rupture Hazards in California, Special Publication 42, 2018.

1. Holocene-active (active) faults: Faults that have moved during the past 11,700 years. This age boundary is an absolute age (number of years before present).
2. Pre-Holocene faults: Faults that have not moved in the past 11,700 years and, thus, do not meet the criteria of "Holocene-active fault" as defined in the Alquist-Priolo Earthquake Fault Zoning Act and SMGB regulations. This class of fault is not regulated under the Alquist-Priolo Earthquake Fault Zoning Act.
3. Age-undetermined faults: Faults where the recency of fault movement has not been determined. Faults can be "age-undetermined" if the fault in question has simply not been studied in order to determine its recency of movement. Faults can also be age-undetermined due to limitations in the ability to constrain the timing of the recency of faulting. Examples of such faults are instances where datable materials are not present in the geologic record, or where evidence of recency of movement does not exist due to stripping (either by natural or anthropogenic processes) of Holocene-age deposits. Within the framework of the Alquist-Priolo Earthquake Fault Zoning Act, age-undetermined faults within regulatory Earthquake Fault Zones are considered "Holocene-active" until proven otherwise.

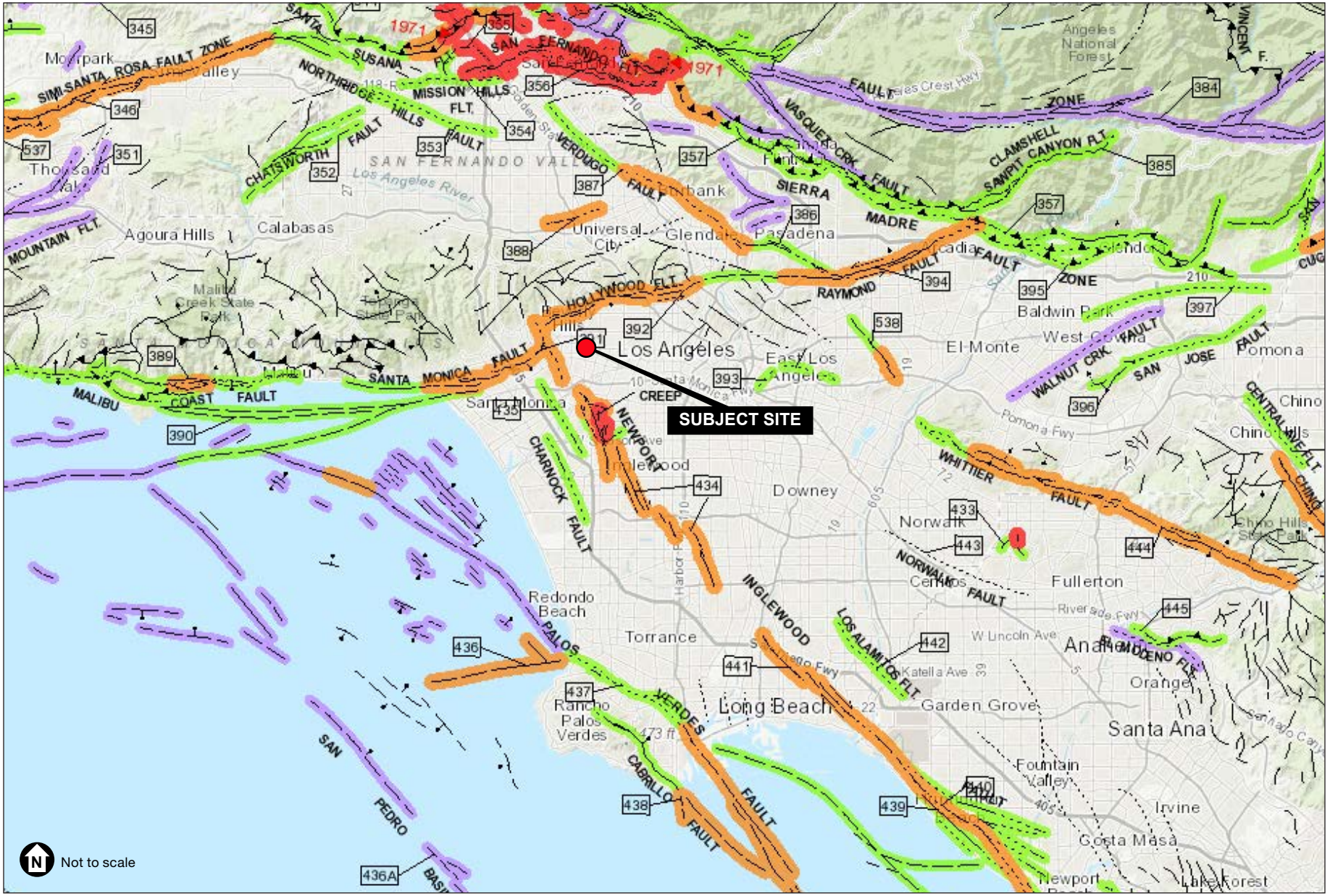
Earthquake Fault Zones are regulatory zones (also known as Alquist-Priolo Earthquake Fault Zones) that encompass traces of Holocene-active faults to address hazards associated with surface fault rupture. Earthquake Fault Zones are delineated by the State Geologist and implemented by lead agencies through permitting, inspection and land-use planning activities (PRC Chapter 7.5, Section 2621).

CGS policy is to delineate a boundary zone on both sides of a potential Holocene fault trace, called the Earthquake Fault Zone. The Project Site is not located within an Alquist-Priolo Earthquake Fault Zone. The nearest active and potentially active faults that could produce the most significant groundshaking at the Project Site include the Santa Monica, Newport-Inglewood, and Hollywood faults.[20]

The location of the Project Site with respect to regional faults with the potential for future seismic activity is provided in **Figure IV.D-1, *Regional Faults Map***.[21] The source for this map covers the entire state and identifies faults on a regional scale.

The nearest significant active fault to the Project Site is the Santa Monica Fault, located approximately 0.9 miles west of the site. The Santa Monica Fault is capable of producing a maximum moment magnitude of 7.4 and an average slip rate of approximately 1.0 millimeter per year. The Newport-Inglewood and Hollywood Faults are also relatively close to the Project Site at approximately 1.2 miles north of the site (Hollywood) and 1.5 miles south of the site (Newport-Inglewood).

[20] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.
[21] CGS, Fault Activity Map of California, 2010.



SOURCE: Byer Geotechnical Inc., 2020

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Figure IV.D-1
Regional Faults Map

The San Andreas Fault Zone is the largest fault zone within the Southern California area and is capable of producing large earthquakes. This fault zone is a strike slip[22] plate boundary that traverses over 800 miles along the western side of California. The San Andreas Fault Zone is located approximately 35 miles northeast of the Project Site. The zone of faulting nearest the Project Site is known as the Mojave segment of the San Andreas Fault Zone. A significant earthquake scenario on this fault may trigger a series of earthquakes on surrounding regional faults affecting the Los Angeles area at large. The recurrence interval of the Mojave segment is considered by CGS to be approximately every 140 years. The last major earthquake event on this fault in the Southern California area was in 1857, with an estimated potential maximum Mw 7.9.

Other nearby regional faults include the Upper Elysian Park Fault and the Puente Hills Fault. The Upper Elysian Park Fault is estimated to be about two miles east of the Project Site, and the Puente Hills Fault is about five miles south of the Project Site in the area in between the Newport, Hollywood, and Whittier Faults. Both faults are blind thrust faults that trend northwest and dip shallowly to the northeast. Blind thrust faults have the potential for surface deflection deformation and folding during earthquakes. While they do produce earthquakes, their rupture planes lie below the ground surface and, therefore, are not regulated and are not considered for surface fault rupture hazard by the Alquist-Priolo Earthquake Fault Zoning. Because the fault planes do not extend to the surface, the fault traces are not shown in Figure IV.D-1. A potential maximum Mw 6.7 is estimated for these blind thrust faults.

Local historical earthquakes recorded from 1933 to present within a 60-mile radius of the Project Site include over 40 recorded events with magnitudes greater than Mw 5.0. Significant historical earthquake epicenters nearest the Project Site include ruptures along the Elsinore, Newport-Inglewood, Raymond, and Northridge faults. Two historical earthquakes are estimated to have had epicenters located along the Elsinore Fault Zone – one in 1910 estimated to a Mw 6.0 located near Temescal Valley and the second in 1987 estimated to be Mw 5.9 located just south of Pasadena. In 1933, an estimated Mw 6.4 earthquake ruptured along the Newport-Inglewood Fault Zone near Newport Beach. In 1988, an estimated Mw 5.0 earthquake ruptured along the Raymond Fault Zone near Pasadena. In 1994, an estimated Mw 6.7 earthquake ruptured along the Northridge Blind Thrust Fault (Pico Thrust) near Northridge and reportedly triggered lesser ruptures on nearby faults.

[22] Strike-slip faults are vertical (or nearly vertical) fractures where the blocks have mostly moved horizontally. If the block opposite an observer looking across the fault moves to the right, the slip style is termed right lateral; if the block moves to the left, the motion is termed left lateral. Source: United States Geological Survey (USGS), Earthquake Hazards Program, Earthquake Glossary, Strike-slip, https://earthquake.usgs.gov/learn/ glossary/?term=strike-slip, accessed March 12, 2020.

(b) Ground Surface Rupture

As noted above, the Project Site is not located within any Alquist-Priolo Earthquake Fault Zone. As such, the Project Site is considered to have a very low potential for future ground surface ruptures.[23]

(c) Site Stability – Liquefaction, Lateral Spreading, and Seismic Settlement

Liquefaction involves the sudden loss in strength of a saturated, cohesionless soil caused by the build-up of pore water pressure during cyclic loading, such as that produced by an earthquake. This increase in pore water pressure can temporarily transform the soil into a fluid mass, resulting in vertical settlement and can also cause lateral ground deformations (lateral spreading). Typically, liquefaction occurs in areas where there are loose to medium dense non-cohesive soils and the depth to groundwater is less than 50 feet from the surface. Seismic shaking can also cause soil compaction and ground settlement without liquefaction occurring, including settlement of dry sands above the water table.

According to the State of California Seismic Hazard Zones Map of the Hollywood Quadrangle, the Project Site is located within a State of California seismic hazard liquefaction zone.

As discussed in SP 117A,[24] the vast majority of liquefaction hazards are associated with sandy soils and silty soils of low plasticity (not a lot of clay). Cohesive soils are generally not considered susceptible to soil liquefaction. Based on results of the site-specific soil investigation, the saturated soils between the depths of 15 and 25 feet are not considered susceptible to liquefaction. However, two 2.5-foot thick soil layers encountered at depths of 20 and 27.5 feet bgs are considered potentially susceptible to liquefaction.

Lateral spreading is related to liquefaction when liquefied materials are exposed to adjacent slopes or free-faces such as steep slopes or embankments. The Project Site is located in a relatively flat area that does not include any free-faces, slopes, or canals and is thus not susceptible to lateral spreading.[25]

The Geotechnical Investigation evaluated the potential for liquefaction-induced settlement and determined that total dynamic settlement ranged from 0.71 to 1.2 inches at the site.[26]

[23] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

[24] CGS, Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication 117A, 2008.

[25] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

[26] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

(d) Landslide and Seismically Induced Slope Instability

Landslides are movements of surface material down a slope.[27] The Project Site is relatively level and is not located within a designated landslide area, as shown in the Safety Element, Exhibit C, Landslide Inventory and Hillside Areas in the City of Los Angeles.[28] In addition, according to the Geotechnical Investigation, the potential for landsliding and seismically induced slope instability at the Project Site is considered low.

(e) Erosion

Soil erosion refers to the process by which soil or earth material is loosened or dissolved and removed from its original location. Erosion can occur by varying processes and may occur in an area where bare soil is exposed to wind or moving water (both rainfall and surface runoff). The processes of erosion are generally a function of material type, terrain steepness, rainfall or irrigation levels, surface drainage conditions, and general land uses. Topsoil is used to cover bare surface areas for the establishment and maintenance of vegetation due to its high concentrations of organic matter and microorganisms.

The Project Site is located in a highly urbanized area of Los Angeles and is currently developed with residential uses and surface parking. Negligible, if any, native topsoil exists on the Project Site as it is currently developed with structures and surface parking.

(f) Paleontological Resources

A database search for records of fossil localities within the Project Site was conducted by the LACM on July 6, 2017. The database search results indicated that no known localities exist within the Project Site; however, there are a number of vertebrate fossils within one mile of the Project Site from Older Quaternary Alluvium from Older Quaternary Alluvium (LACM 6297-6300). The closest fossil localities from older Quaternary deposits are LACM 7669 and 7670 and these have been described as being located “immediately southeast and northwest of [the Project Site] along San Vicente Boulevard near the intersections with Wilshire Boulevard and Orange Street, respectively”.[29] These localities have yielded fossil specimens of ground sloth, elephantoid, and bison at unspecified depths.

Approximately 0.30 miles west of the Project Site is LACM 3176, which produced fossil specimens of bison at 30 feet below surface while LACM 7671 is located approximately 0.40 miles northwest of the Project Site and it yielded fossil specimens of mastodon at unspecified depths. LACM 7672 situated about .65

[27] USGS, Earthquake Hazards Program, Earthquake Glossary, Landslide, https://earthquake.usgs.gov/learn/glossary/?term=landslide, accessed April 28, 2020.

[28] City of Los Angeles, Safety Element of the City of Los Angeles General Plan, Exhibit C, Landslide Inventory and Hillside Areas in the City of Los Angeles, 1996.

[29] ESA, Cultural Resource Assessment Report, July 2019.

miles northwest of the Project Site and it produced fossil specimens of deer and elephantoid, at unspecified depths. LACM 1238 is located approximately 0.40 miles south of the Project Site and it yielded a fossil specimen of a mammoth at a depth of 13 feet below surface. Lastly, LACM 3329 located approximately 0.35 miles south west of the Project Site produced specimens of bison and horse at a depth of 16 feet below surface. In addition to the above mentioned fossil localities, there is an array of vertebrate fossil localities east of the Project Site (approximately 0.75 miles away) in Hancock Park at the Ranch La Brea; however, these deposits do not extend as far west as the Project Site.

3. Project Impacts

a) Thresholds of Significance

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

Threshold (a): Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. 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[30] Special Publication 42.

ii. Strong seismic ground shaking.

iii. Seismic-related ground failure, including liquefaction.

iv. Landslides.

Threshold (b): Result in substantial soil erosion or the loss of topsoil;

Threshold (c): 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;

[30] Now the CGS.

Threshold (d): Be located on expansive soil, as defined in Table 18-1B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property;[31]

Threshold (e): 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 wastewater; or

Threshold (f): Directly or indirectly destroy a unique paleontological resource or site of unique geologic feature.

For this analysis, the Appendix G Thresholds are relied upon. The analysis utilizes factors and considerations identified in the 2006 L.A. CEQA Thresholds Guide, as appropriate, to assist in answering the Appendix G Threshold questions. The factors to evaluate geology and soils impacts are listed below.

(1) Geologic Hazards

- Cause or accelerate geologic hazards, which would result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury.

(2) Sedimentation and Erosion

- Constitute a geologic hazard to other properties by causing or accelerating instability from erosion; or
- Accelerate natural processes of wind and water erosion and sedimentation, resulting in sediment runoff or deposition which would not be contained or controlled on-site.

(3) Landform Alteration

- Cause one or more distinct and prominent geologic or topographic features to be destroyed, permanently covered, or materially and adversely modified as a result of the project. Such features may include, but are not limited to, hilltops, ridges, hillslopes, canyons, ravines, rock outcrops, water bodies, streambeds, and wetlands.

(4) Paleontological Resources

- Whether, or the degree to which, the project may result in the permanent loss of, or loss of access to, a paleontological resource.
- Whether the paleontological resource is of regional or statewide significance.

[31] The California Building Code (CBC), based on the International Building Code and the now defunct Uniform Building Code, no longer includes a Table 18-1-B. Instead, Section 1803.5.3 of the CBC describes the criteria for analyzing expansive soils.

b) Methodology

(1) Geology and Soils

The analysis of impacts associated with geology and soils is based largely on the Geotechnical Investigation prepared for the Project by Byer Geotechnical on July 25, 2019 and updated January 14, 2020, included in Appendix F, of this Draft EIR. As discussed above, information, conclusions, and recommendations in the report was based on field exploration on the Project Site (i.e., exploratory soil borings) with laboratory testing to determine the characteristics of the subsurface conditions at the Project Site, and records review of prior geotechnical investigations.

The Geotechnical Investigation evaluated the underlying geologic and soil conditions to determine the potential for the Project to directly or indirectly cause hazardous conditions and identified preliminary foundation requirements needed to ensure that new building construction is safe. Site borings were drilled at various locations across the Project Site to ensure coverage across the entire Project Site and evaluate conditions at all locations. The Geotechnical Investigation provides sufficient detail to determine whether the Project Site is suitable for the intended use and whether more detailed studies are required to address specific geological issues. The Geotechnical Investigation also identifies considerations to be taken into account in the design of building foundations.

According to LAMC Section 91.1803, a Final Geotechnical Report must also be prepared based on the final construction and building plans prepared by the Applicant and reviewed by the City prior to the issuance of building permits to construct the Project. Based on the ground conditions and building design, the Final Geotechnical Report will include specific recommendations for site preparation, excavation, foundation design and shoring/retaining wall specifications.

The Project would be regulated by the various laws, regulations, and policies summarized in the Regulatory Framework. Compliance by the Project with applicable federal, state, and local laws and regulations is assumed in this analysis, and local and state agencies would be expected to continue to enforce applicable requirements to the extent that they do so now. Note that compliance with many of the regulations is a condition of permit approval.

(2) Paleontological Resources

A Cultural Resources Assessment Report, which includes an analysis of paleontological resources, was prepared in July 2019 by qualified ESA Cultural Resources Group personnel who meet and exceed the SVP Qualification Standards; the SVP Guidelines are discussed further below. The analysis is based on a review of the Natural History Museum of Los Angeles County (NHMLAC) paleontological records search results and other documentation regarding

disturbances to the Project Site and its subsurface geological conditions (e.g. the Geotechnical Investigation provided in Appendix F, of this Draft EIR). The objective of the record search through the NHMLAC was to determine the geological formations underlying the Project Site, whether any paleontological localities have previously been identified within the Project Site or in the same or similar formations near the Project Site, and the potential for excavations associated with the Project to encounter paleontological resources. These methods are consistent with the SVP guidelines for assessing the importance of paleontological resources in areas of potential environmental effect.

Although no known resources were identified within the Project Site from the NHMLAC search, this does not preclude the possibility of previously unknown buried paleontological resources within the Project Site that may be impacted during construction of the Project. The potential to encounter paleontological resources during construction at the Project Site was determined by reviewing the results of the records search, the depth of native versus fill soils, land use history, past disturbances, and the proposed excavation parameters for the Project.

The SVP has established standard guidelines,[32,33] which outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation. Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements pursuant to the standard guidelines. Most State regulatory agencies with paleontological resource-specific laws, ordinances, regulations, and standards likewise accept and use the professional standards set forth by the SVP.

As defined by the SVP, significant paleontological resources are:[34]

> *Fossils and fossiliferous deposits[,] here restricted to vertebrate fossils and their taphonomic and associated environmental indicators. This definition excludes invertebrate or paleobotanical fossils except when present within a given vertebrate assemblage. [However,] [c]ertain invertebrate and plant fossils may be defined as significant by a project paleontologist, local paleontologist, specialists, or special interest groups, or by lead agencies or local governments.*

[32] SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

[33] SVP, Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, 2010.

[34] SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

As defined by the SVP, significant fossiliferous deposits are:[35]

> *A rock unit or formation which contains significant nonrenewable paleontologic resources, here defined as comprising one or more identifiable vertebrate fossils, large or small, and any associated invertebrate and plant fossils, traces, and other data that provide taphonomic, taxonomic, phylogenetic, ecologic, and stratigraphic information (ichnites and trace fossils generated by vertebrate animals, e.g., trackways, or nests and middens which provide datable material and climatic information). Paleontologic resources are considered to be older than recorded history and/or older than 5,000 years BP [before present].*

Based on the above-cited significance definitions, all identifiable vertebrate fossils have scientific value and are therefore considered scientifically significant. This position is maintained because vertebrate fossils are relatively uncommon, and only rarely will a fossil locality yield a large number of specimens of the same genus; thus, abundance of fossils is not a requirement for designating a given rock unit as a significant fossiliferous deposit. Therefore, every vertebrate fossil found has the potential to provide important new scientific information regarding the taxon it represents, its paleoenvironment, and/or its distribution. Furthermore, all geologic units that have previously yielded vertebrate fossils are considered to have high sensitivity for the presence of fossils in the future. Identifiable plant and invertebrate fossils are considered significant if found in association with vertebrate fossils or if defined as scientifically significant by project paleontologists, specialists, or local government agencies.

(i) Paleontological Sensitivity

Paleontological sensitivity is the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, past history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit; for this reason, paleontological sensitivity depends on the known fossil data collected from the entire geologic unit, not just a specific survey. The SVP[36] defines four categories of paleontological sensitivity or, per the SVP guidelines, potential, for the presence of paleontological resources – high, low, undetermined, and no potential – as follows:

- **High Potential.** Rock units that have yielded vertebrate or significant invertebrate, plant, or trace fossils are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources

[35] SVP, Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources: Standard Guidelines, 1995.

[36] SVP, Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, 2010.

include, but are not limited to, (1) sedimentary formations and some volcanoclastic formations (e. g., ashes or tephras [rock fragments and particles from volcanic eruptions]), (2) some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, (3) and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. The latter includes middle Holocene and older, fine-grained fluvial sandstones, argillaceous (i.e., clay-bearing) and carbonate-rich paleosols (rock units representing former, now lithified, soils), cross-bedded point bar sandstones, fine-grained marine sandstones, etc.

- **Low Potential.** Some rock units have been concluded to contain low potential for yielding scientifically significant fossils, based on field survey findings reported reports in the paleontological literature by qualified professional paleontologists. These conclusions may be based on the fact that certain rock units are poorly represented by fossil specimens in institutional collections, leading to the determination that they are not generally fossil-bearing, or on general scientific consensus that a given rock unit only preserves fossils in rare circumstances and their presence of fossils is an exception in such units, not the rule, as in basalt flows or colluvium deposited during Holocene time. Rock units with low potential typically do not require impact mitigation measures to protect fossils.
- **Undetermined Potential.** Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment are considered to have undetermined potential. Further study is necessary to determine if these rock units have high or low potential to contain significant paleontological resources. A field survey by a qualified professional paleontologist to specifically determine the paleontological resource potential of these rock units is required before development of a paleontological resource impact mitigation program. In cases where no subsurface data are available, strategically located excavations into subsurface stratigraphy can determine paleontological potential.
- **No Potential.** Some rock units have no potential to contain significant paleontological resources. An example is high-grade metamorphic rocks, which have typically been distorted or recrystallized through intense processes of heat or other stresses (e.g., gneisses and schists). Likewise, plutonic igneous rocks such as granite are considered to have no potential to yield fossils, as they are formed from (liquid) magma that has dissolved the original rock matrix including any fossils it may once have contained. Rock units with no potential to yield fossils require no protections; no impacts are anticipated on such units and no mitigation is not required.

For geologic units with high potential, full-time monitoring is appropriate during any project-related ground disturbance because of the risk to paleontological resources. For geologic units with low potential, protection or salvage efforts is not generally required because of the low risk of encountering paleontological resources. For geologic units with undetermined potential, accepted professional

practice recommends field surveys conducted by a qualified vertebrate paleontologist to determine the paleontologic potential of the rock units present in the study area, which in turn prescribes how mitigation measures should be assigned.

c) Project Design Features

No specific project design features are proposed with regard to geology, soils, seismicity, or paleontological resources.

d) Analysis of Project Impacts

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. 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.

As discussed in **Section VI, *Other CEQA Considerations***, and in the Initial Study (Appendix A) of this Draft EIR, there is no active faulting beneath the Project Site or extending toward the Project Site. The nearest active fault to the Project Site is approximately 0.9 miles away. As there is no active faulting beneath the Project Site, development of the Project would not directly or indirectly exacerbate existing environmental conditions, causing substantial adverse effects, including risk of loss, injury, or death involving fault rupture. **Therefore, impacts with respect to Threshold (a)i would be less than significant and no further analysis is required.**

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

ii. Strong seismic ground shaking?

As discussed in **Section VI, *Other CEQA Considerations***, and in the Initial Study (Appendix A) of this Draft EIR, compliance with applicable regulatory requirements (i.e., the Los Angeles Building Code and the CBC) and incorporation of the recommendations provided in the Final Geotechnical Investigation would reduce the potential for significant damage to structures resulting from strong seismic ground shaking and the exposure of people or structures to potential substantial adverse effects, including the risk of loss, injury or death, to the maximum extent

practical. As such, development of the Project would not directly or indirectly exacerbate existing environmental conditions to cause substantial adverse effects, including risk of loss, injury, or death involving strong seismic ground shaking hazards. **Therefore, impacts with respect to Threshold (a)ii would be less than significant and no further analysis is required.**

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

iii. Seismic-related ground failure, including liquefaction?

(1) Impact Analysis

As discussed above, according to the State of California Seismic Hazard Zones Map of the Hollywood Quadrangle, the Project Site is located within a State of California seismic hazard liquefaction zone. However, the City's ZIMAS website indicates that the Project Site is not subject to liquefaction hazards.

According to the Geotechnical Investigation, site-specific liquefaction analysis indicates that the Project Site is mostly underlain by dense/stiff older alluvial soils that are not considered susceptible to liquefaction or lateral spreading. However, a 2.5-foot layer encountered at 27.5 feet is considered potentially susceptible (based on LADBS Criteria 1) and a 2.5-foot layer encountered at depths of 20 and 27.5 feet is considered to be potentially susceptible to liquefaction (based on LADBS Criteria 2).[37,38]

Application of appropriate engineering controls and compliance with applicable code and regulatory requirements for planned excavation and construction activities on site as well as foundation design would preclude adverse effects related to liquefaction at the Project Site and protect surrounding developments. While complete avoidance of any damage may not be feasible, incorporation of seismic design measures in accordance with current building requirements would reduce potential impacts related to liquefaction to less than significant levels. The Geotechnical Investigation, which would comply with City standards, would require a deepened foundation system that consists of drilled friction piles, or equivalent foundation system. The deepened foundation system would be embedded a minimum of 10 feet into the bedrock, which is located 30 feet below ground surface, in accordance with the City's building code requirements. Under this design of the deepened foundation system, the friction piles would extend through the potentially liquefiable soil layers and, as such, would not subject the proposed building to

[37] In guidance provided by the Los Angeles Department of Building and Safety (LADBS), LADBS includes two different criteria that may be used to analyzed liquefaction potential.

[38] Byer Geotechnical, Inc., Geologic and Soils Engineering Exploration, July 25, 2019, updated January 14, 2020. Provided in Appendix F of this Draft EIR.

liquefaction. In addition, pursuant to LAMC Section 91.7006, the Project would be required to provide a final, site-specific geotechnical report that would include the preliminary recommendations for the Geotechnical Report as well as the final recommendations from the report that would be enforced by the Los Angeles Department of Building and Safety.

Based on the above, development of the Project would not directly or indirectly exacerbate existing environmental conditions to cause potential substantial adverse effects, including risk of loss, injury, or death involving seismic-related ground failure hazards, including liquefaction and as such, the impact relative to seismic-related ground failure would be less than significant.

(2) Mitigation Measures

Impacts regarding seismic-related ground failure, including liquefaction would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Impacts regarding seismic-related ground failure, including liquefaction, would be less than significant without mitigation. Therefore, no mitigation measures are required or included, and the impact level remains less than significant.

Threshold (a): Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

iv. Landslides

As discussed in **Section VI, *Other CEQA Considerations***, and in the Initial Study (Appendix A) of this Draft EIR, due to the relatively flat nature of the Project Site (less than twenty-five feet of overall elevation change) and the fact that the Project Site is not located within a designated landslide area, the Project would not directly or indirectly exacerbate existing environmental conditions to cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. **Therefore, no impacts would occur with respect to Threshold (a)iv, and no further analysis is required.**

Threshold (b): Would the Project result in substantial soil erosion or the loss of topsoil?

As discussed in **Section VI, *Other CEQA Considerations***, and in the Initial Study (Appendix A) of this Draft EIR, the Project would be subject to existing regulations associated with the protection of water quality. Construction activities would be conducted in accordance with applicable City standard erosion control practices required pursuant to the CBC and the requirements of the National Pollutant Discharge Elimination System (NPDES) Construction General Permit issued by

the Los Angeles Regional Water Quality Control Board (LARWQCB), as applicable. Once constructed, disturbed areas would be protected by coverings such as structures, pavement, concrete, or vegetation, such that the potential for subsequent erosion is very low. **Therefore, impacts with respect to Threshold (b) would be less than significant and no further analysis is required.**

Threshold (c): Would the Project 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?

(1) Impact Analysis

As discussed above in Threshold (a), the Project Site's susceptibility to liquefaction would be addressed through compliance with building code requirements. According to the Geotechnical Investigation, the potential for lateral spreading is considered to be very low. The amount of dynamic settlement (subsidence) was estimated for the Project Site and would require that the site preparations and foundation design reduce the potential for settlement in accordance with current building code requirements. As noted above, the Project Site is relatively flat and not susceptible to landslides. Nonetheless, it is accepted that Project excavation would cause disturbance of existing soils and with code compliance, would not contribute to potential localized raveling or caving of excavated areas (e.g. the excavated side walls loosing stability). All required excavations would be sloped and properly shored in accordance with the applicable provisions of the CBC incorporated into the City's Building Code to minimize the potential for site stability hazards during temporary excavation activities. Per City Building Code requirements, prior to issuance of a grading permit, a qualified geotechnical engineer must prepare and submit to the LADBS a Final Geotechnical Report that includes site-specific design recommendations for seismic safety and design requirements for foundations, retaining walls/shoring and excavation to meet applicable State and City code, and regulatory requirements. As with the Geotechnical Investigation, the Final Geotechnical Report would recommend a shoring system of waterproofed restrained/braced retaining walls with subdrains or weepholes, and other suitable excavation engineering techniques.

Once constructed, all surfaces would be covered by pavement, landscaping, or buildings and would therefore not expose soils.

Based on the above, development of the Project would not cause or accelerate geological hazards related to soils 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. Therefore, impacts would be less than significant.

(2) Mitigation Measures

Impacts regarding unstable soils during Project construction and operation would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Impacts regarding unstable soils during Project construction and operation would be less than significant without mitigation. Therefore, no mitigation measures are required or included, and the impact level remains less than significant.

Threshold (d): Would the Project be located on expansive soil creating substantial risks to life or property?

(1) Impact Analysis

As discussed above, geotechnical testing of the soils at the Project Site indicates that the near surface soils have a moderate potential for expansion. However, expansive soil hazards would be further evaluated for the Project Site as part of the LADBS approved Final Geotechnical Report that would include site-specific design recommendations for addressing expansive soils, as needed. Further, compliance with standard construction and engineering practices (i.e., on-site excavation requiring suitable engineered stabilization in accordance with the CBC and proper engineering erosion control and proper engineering drainage design), addressing expansive soils and building code regulations pertinent to foundation stability would ensure that expansive soils are removed, as necessary.

Once constructed, all surfaces would be covered by pavement, landscaping, or buildings, and all shallow soils that may have been susceptible to expansion would have been removed.

Based on the above, development of the Project would not exacerbate expansive soils conditions such that substantial direct or indirect risks to life or property would be created. Therefore, impacts regarding expansive soils would be less than significant.

(2) Mitigation Measures

Impacts regarding expansive soils would be less than significant. Therefore, no mitigation measures are required.

(3) Level of Significance After Mitigation

Impacts regarding expansive soils would be less than significant without mitigation. Therefore, no mitigation measures were required or included, and the impact level remains less than significant.

Threshold (e): Would the Project 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 wastewater?

As discussed in **Section VI, *Other CEQA Considerations***, and in the Initial Study (Appendix A) of this Draft EIR, the Project would not use septic tanks or alternative waste water disposal systems. The Project would connect to the existing sewer system. **Therefore, no impact would occur with respect to Threshold (e) and no further analysis is required.**

Threshold (f): Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

(1) Impact Analysis

Given the Project is located in a developed urban area, there are no unique geologic features and unique geologic features are not discussed further. Analysis regarding the potential for unique paleontological resources are discussed further below.

Background research was conducted and a detailed analysis prepared, which are presented in the Cultural Resources Assessment Report (refer to Appendix D, of this Draft EIR). Although the records search resulted in no known localities within the Project Site, two fossil localities from older Quaternary deposits (LACM 7669 and 7670) are located within very close proximity to the Project Site and have yielded fossil specimens of ground sloth, elephantoid, and bison at unspecified depths. Additionally, other fossil localities (LACM 1238, 3176, 3329, 7671 and 7672) located approximately 0.30 to 0.65 miles from the Project Site have also produced fossils specimens of mastodon, deer, elephantoid and horse at unspecified depths and depths from 13 to 30 feet below surface. Construction activities for the Project would include excavation of 30 feet below ground surface to the bedrock and 10 additional feet into the bedrock. **As a result, Project construction would have the potential to directly or indirectly destroy a unique paleontological resource not identified in the analysis conducted for the Project Site and, as such, could result in a potentially significant impact and mitigation measures are required.**

As it relates to Project operation, no impacts would occur as there would be no continuous groundbreaking and excavation activities during Project operation.

(2) Mitigation Measures

The following mitigation measures are proposed to address the potential significant impacts on paleontological resources that could occur during Project construction:

- **GEO-MM-1:** A qualified paleontologist meeting the Society of Vertebrate Paleontology (SVP) Standards[39] (Qualified Paleontologist) shall be retained prior to the approval of grading permits. The Qualified Paleontologist shall provide technical and compliance oversight of all work as it relates to paleontological resources, shall attend the Project kick-off meeting and Project progress meetings on a regular basis, and shall report to the Project Site in the event potential paleontological resources are encountered.

- **GEO-MM-2:** The Qualified Paleontologist shall conduct construction worker paleontological resources sensitivity training at the Project kick-off meeting prior to the start of ground disturbing activities (including vegetation removal, pavement removal, etc.). In the event construction crews are phased, additional training shall be conducted for new construction personnel. The training session shall focus on the recognition of the types of paleontological resources that could be encountered within the Project Site and the procedures to be followed if they are found. Documentation shall be retained by the Qualified Paleontologist demonstrating that the appropriate construction personnel attended the training.

- **GEO-MM-3:** Paleontological resources monitoring shall be performed by a qualified paleontological monitor (meeting the standards of the SVP 2010) under the direction of the Qualified Paleontologist. Paleontological resources monitoring shall be conducted for all ground disturbing activities in previously undisturbed sediments which have high sensitivity for encountering paleontological resources. Depending on the conditions encountered, full-time monitoring can be reduced to part-time inspections or ceased entirely if determined adequate by the Qualified Paleontologist. The Qualified Paleontologist shall spot check the excavation on an intermittent basis and recommend whether the depth of required monitoring needs to be revised based on his/her observations. Monitors shall have the authority to temporarily halt or divert work away from exposed fossils or potential fossils. Monitors shall prepare daily logs detailing the types of activities and soils observed and any discoveries.

  If construction or other Project personnel discover any potential fossils during construction, regardless of the depth of work or location, work at the discovery location shall cease in a 50-foot radius of the discovery until the Qualified Paleontologist has assessed the discovery, conferred with the City, and made recommendations as to the appropriate treatment. Any significant fossils collected during Project-related excavations shall be prepared to the point of identification and curated into an accredited repository with retrievable storage, such as the Natural History Museum of Los Angeles County. The Qualified Paleontologist shall prepare a final monitoring and mitigation report for submittal to the City in order to document the results of the monitoring effort

[39] SVP, Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources, 2010.

and any discoveries. If there are significant discoveries, fossil locality information and final disposition shall be included with the final report, which shall be submitted to the appropriate repository and the City.

(3) Level of Significance After Mitigation

Implementation of Mitigation Measures GEO-MM-1 through GEO-MM-3 would require retention of a qualified paleontologist meeting the SVP Standards in order to provide technical and compliance oversight, construction worker paleontological resources sensitivity training, and paleontological resources monitoring. Impacts related to paleontological resources during Project construction would be reduced to less than significant with implementation of the above mitigation measures. The Project would have no impacts to paleontological resources during operation as there would be no continuous groundbreaking and excavation activities during Project operation.

e) Cumulative Impacts

(1) Impact Analysis

Due to the site-specific nature of geological conditions (i.e., soils, geological features, subsurface features, seismic features, etc.), geology and paleontological impacts are typically assessed on a project-by-project basis rather than on a cumulative basis. Nonetheless, cumulative growth through 2027 (buildout year), inclusive of the four related projects identified in **Chapter III, *Environmental Setting***, of this Draft EIR, could potentially result in impacts on geology and paleontological resources. However, as with the Project, related projects would be subject to established guidelines and regulations pertaining to building design and seismic safety, including those set forth in the CBC and the Los Angeles Building Code. **Therefore, considering the proposed land uses of the Project and related projects, as well as the existing regulatory requirements and regulations that would apply to all development, the Project's contribution to cumulative impacts would not be cumulatively considerable. As such, cumulative impacts regarding geology and soils would be less than significant.**

With regard to paleontological resources, projects within the cumulative study area for the Project include those related projects that require excavation on parcels that have been disturbed or are already developed, or would have the potential to disturb geological units that are sensitive for paleontological resources, such as Related Project No. 4, Metro Purple Line Extension. Generally, projects with the potential for substantial excavation would be subject to environmental review under CEQA. If the potential for significant impacts on paleontological resources were identified given the site characteristics and development program of the related projects, mitigation measures, similar to the ones proposed under the Project (refer to Mitigation Measures GEO-MM-1 through GEO-MM-3), would be

required. As with the Project, these measures would include a monitoring program and treatment/curation of discovered fossils. Implementation of these measures would reduce the potential for adverse effects on fossil resources individually and cumulatively, and would preserve and maximize the potential of these resources to contribute to the body of scientific knowledge. The related projects would be required to comply with applicable regulations and standard City mitigation measures regarding paleontological resources. **Therefore, the Project's contribution to cumulative impacts would not be cumulatively considerable. As such, cumulative impacts on paleontological resources would be less than significant.**

(2) Mitigation Measures

Cumulative impacts to geology and soils would to be less than significant. Therefore, no additional mitigation measures beyond those identified for the reduction of impacts related to paleontological resources are required.

(3) Level of Significance After Mitigation

Cumulative impacts to geology and soils would be less than significant without additional mitigation measures beyond those identified for the reduction of impacts related to paleontological resources.