Appendix E

Paleontological Resources Technical Report

Paleontological Resources Technical Report for the East End Studios Arts District Los Angeles Project, Los Angeles, California

JUNE 2023

PREPARED FOR

Eyestone Environmental

PREPARED BY

SWCA Environmental Consultants

PALEONTOLOGICAL RESOURCES TECHNICAL REPORT FOR THE EAST END STUDIOS ARTS DISTRICT LOS ANGELES PROJECT, LOS ANGELES, CALIFORNIA

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EXECUTIVE SUMMARY

Purpose and Scope: On behalf of the Alameda Studios Owner, LLC (project applicant), Eyestone Environmental retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment in support of the proposed East End Studios Arts District Los Angeles Project (project) in the Central City North Community area of the city of Los Angeles, California. The project applicant proposes to demolish two extant warehouse buildings and associated surface parking and construct a new production studio campus with a five-level parking structure. As the Lead Agency under the California Environmental Quality Act (CEQA), the City of Los Angeles (City) requires the assessment of potentially significant impacts to the environment caused by construction or implementation of the project. SWCA has prepared this paleontological resources technical report to summarize the results of a paleontological resources assessment that includes a review of geologic maps, scientific literature, confidential fossil locality records from the Natural History Museum of Los Angeles County, and other relevant site-specific geologic information. This technical report also includes a discussion of potential impacts to scientifically significant paleontological resources and mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to the CEQA.

Date of Investigation: SWCA reviewed the relevant maps and literature in February 2023 and received the results of a museum records search from the Natural History Museum of Los Angeles County on February 19, 2023.

Summary of Findings: According to published geologic mapping, the surface of the project site is mapped as late Pleistocene older young alluvium (Qya_2). Based on previous site development during construction of the existing structures, however, unmapped Recent artificial fill is present from the surface to depths of 1 to 3 feet below ground surface (bgs), partially replacing the uppermost "native" deposits of older young alluvium. Unmapped Recent artificial fill has a low paleontological sensitivity but is underlain by late Pleistocene older young alluvium (Qya_2) that has a high paleontological sensitivity. Additionally, early Pleistocene to Pliocene Fernando Formation and/or early Pliocene to late Miocene Puente Formation may be present in the subsurface at moderate to deep depths and also have a high paleontological sensitivity. The maximum depth of ground-disturbing activities for the project is anticipated to reach 8 feet bgs. Based on the results of this assessment, the known paleontological sensitivity of the geologic units anticipated to be at the surface or present in the subsurface, and the anticipated depth of excavations, ground-disturbing activities associated with the project that are greater than or equal to 3 feet bgs may impact geologic units of relatively higher paleontological sensitivity. Any fossils encountered during ground disturbances in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA.

Recommendations: SWCA recommends the following mitigation measures to reduce potential significant impacts to less-than-significant levels, pursuant to CEQA. These recommended mitigation measures have been developed in accordance with and incorporate the performance standards of the Society of Vertebrate Paleontology (SVP), state and local regulations, and best practices in mitigation paleontology: 1) retain a Qualified Professional Paleontologist who meets or exceeds the SVP qualification standards and who will obtain a curation agreement with an accredited repository prior to the start of construction activities; 2) conduct a worker training to educate the construction crew on the legal requirements and procedures to follow in the event of a fossil discovery; 3) have an SVP-qualified paleontological monitor conduct full-time paleontological monitoring during ground-disturbing activities greater than or equal to 3 feet bgs that have the potential to impact previously undisturbed sediments of high paleontological sensitivity (earthwork less than 3 feet bgs, or impacting only previously disturbed sediments or Recent artificial fill should not be monitored regardless of depth); and 4) prepare a paleontological resources monitoring report upon the conclusion of ground-disturbing activities to

document the paleontological monitoring efforts for the project and describe any paleontological resources discoveries observed and/or recorded during the life of the project. If paleontological resources are curated, the final monitoring report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final monitoring report should be filed with the City.

Disposition of Data: This report will remain on file with the project applicant, the City, and SWCA's Pasadena office.

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INTRODUCTION

On behalf of the Alameda Studios Owner, LLC (project applicant), Eyestone Environmental retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources assessment in support of the proposed East End Studios Arts District Los Angeles Project (project) in the Central City North Community Plan area of the city of Los Angeles, California (Figure 1). The project applicant proposes to demolish two extant warehouse buildings and associated surface parking and construct a new production studio campus with a five-level parking structure. As the Lead Agency under the California Environmental Quality Act (CEQA), the City of Los Angeles (City) requires the assessment of potentially significant impacts to the environment caused by construction or implementation of the project. Therefore, SWCA has prepared this paleontological resources technical report to summarize the results of a paleontological resources assessment that includes a review of geologic maps, scientific literature, confidential fossil locality records from the Natural History Museum of Los Angeles County (NHMLA), and other relevant information. This technical report also includes a discussion of potential impacts to scientifically significant paleontological resources and mitigation recommendations to reduce potential impacts to less-than-significant levels, pursuant to the CEQA. This study follows the guidelines of the Society of Vertebrate Paleontology (SVP) and best practices in mitigation paleontology (Murphey et al. 2019; SVP 2010).

SWCA Paleontology Team Lead Mathew Carson, M.S., and SWCA Staff Paleontologist Kristina Akesson, B.S., conducted the paleontological resources assessment presented herein and authored this technical report. Mathew Carson served as the overall technical lead and project manager. SWCA Principal Investigator Russell Shapiro, Ph.D., peer reviewed this technical report and provided additional quality assurance/quality control. Figures were generated by SWCA geographic information system (GIS) Specialist Marty Kooistra, M.A. Copies of the report are on file with SWCA's Pasadena office.

PROJECT DESCRIPTION AND LOCATION

The project includes the development of a new production studio campus on an approximately 14.6-acre (635,551-square-foot) site located at the southeast corner of 6th Street and Alameda Street (project site). The project would include 16 studios which would be grouped together within five studio buildings; three covered production support areas adjacent to the studio buildings; and two new office buildings. The Project could also include up to 8,000 square feet of retail, inclusive of up to 4,000 square feet of restaurant space. If included, the proposed retail area would be located within the ground level lobbies of the proposed office buildings. If this area is not used by a retailer, the area would be used as additional common area for the office tenants. The project would comprise a total floor area of 675,611 square feet, with a floor area ratio of 1.06:1. Up to 800 vehicular parking spaces is anticipated to be provided for the proposed uses within a five-story parking structure located along Mill Street as well as within surface parking areas located internal to the Project Site. The existing two warehouse structures consisting of approximately 311,000 square feet would be demolished as part of the project. The maximum depth of excavation is expected to be 8 feet below ground surface (bgs) resulting in approximately 40,000 cubic yards of soil/sediment export.

The project site is bounded by 6th Street to the north, Mill Street to the east, commercial and industrial zoned land currently developed with warehouse uses to the south, and Alameda Street to the west (Figure 2). The project site consists of three contiguous parcels located at 1206–1338 East 6th Street, 1205–1321 Wholesale Street, 1210–1361 Produce Street, 635 and 639 Mill Street, and 640 South Alameda Street within the Central City North Community Plan area of the city of Los Angeles (Assessor Parcel Numbers

Figure 1. Project site location vicinity.

Figure 2. Project site location plotted on a 2017 aerial photograph.

5164-010-003, -004, -005). The project site is in Section 34, Township 1 South, Range 13 West, as depicted on the U.S. Geological Survey Los Angeles, California, 7.5-minute topographic quadrangle (Figure 3).

PROFESSIONAL STANDARDS

The SVP has established standard guidelines 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 (SVP 1995, 2010). Most practicing professional mitigation paleontologists in California adhere closely to the SVP's assessment, mitigation, and monitoring requirements as specifically provided in its standard guidelines. Most state regulatory agencies with paleontological laws, ordinances, regulations, and standards accept and use the professional standards set forth by the SVP.

As defined by the SVP, significant paleontological resources are

> fossils and fossiliferous deposits, here defined as consisting of identifiable vertebrate fossils, large or small, uncommon invertebrate, plant, and trace fossils, and other data that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, and/or biochronologic information. Paleontological resources are considered to be older than recorded human history and/or older than middle Holocene (i.e., older than about 5,000 radiocarbon years). (SVP 2010:11)

Numerous paleontological studies have developed criteria for the assessment of significance for fossil discoveries (e.g., Eisentraut and Cooper 2002; Murphey et al. 2019; Scott and Springer 2003). In general, these studies assess fossils as significant if one or more of the following criteria apply:

1) The fossils provide information on the evolutionary relationships and developmental trends among organisms, living, or extinct.
2) The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein.
3) The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas.
4) The fossils demonstrate unusual or spectacular circumstances in the history of life.
5) The fossils are in short supply and/or are in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation and are not found in other geographic locations.

Geologic units known to preserve significant fossils or fossil localities are likely to contain additional undiscovered and potentially significant fossils and are generally considered sensitive for paleontological resources throughout their areal and stratigraphic extent. The extent of sensitivity differs from that defined for archaeological resource sites as follows:

It is extremely important to distinguish between archaeological and paleontological (fossil) resource sites when defining the sensitivity of rock units. The boundaries of archaeological sites define the areal extent of the resource. Paleontological sites, however, indicate that the containing sedimentary rock unit or formation is fossiliferous. The limits of the entire rock formation, both areal and stratigraphic, therefore define the scope of the paleontological potential in each case (SVP 1995:23).

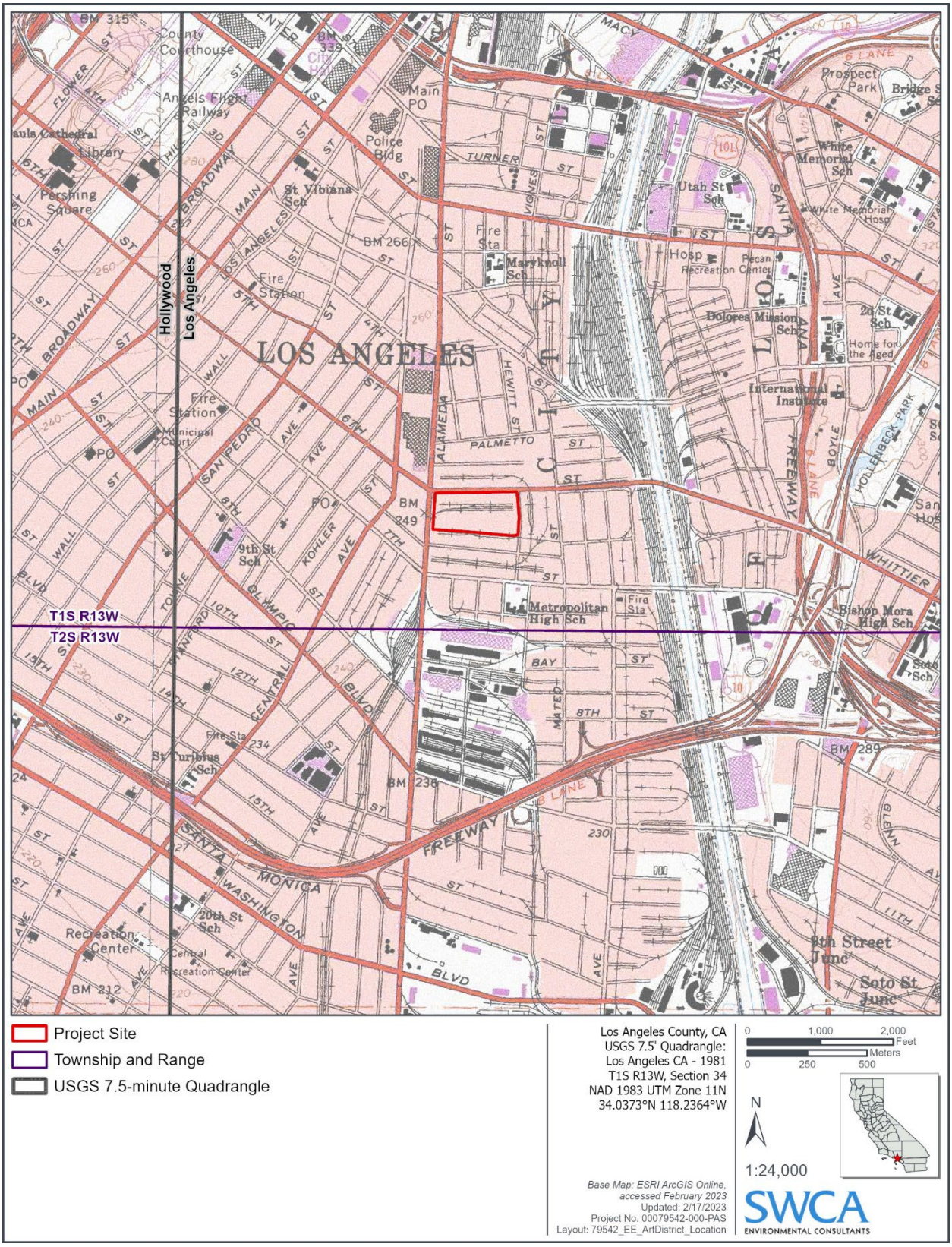

Figure 3. Project site location plotted on the U.S. Geological Survey Los Angeles, California, 7.5-minute topographic quadrangle.

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils may be present at the surface or at depth within sediments or bedrock. Subsurficial fossils would not be observable or detectable unless exposed by erosion or human activity. In the case of human activity, such as project-related ground disturbances within geologic units with a high probability to yield significant fossils, direct or indirect adverse impacts to significant fossils may occur.

In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or anthropogenic exposure. As a result, even in the absence of fossils on the surface, it is necessary to assess the sensitivity of geologic units based on their known potential to produce significant fossils elsewhere within the same geologic unit (both within and outside the study area), a similar geologic unit, and whether the unit in question was deposited in a type of environment known to be favorable for fossil preservation. Monitoring by experienced paleontologists greatly increases the probability that fossils will be discovered during ground-disturbing activities and that, if such fossils are determined to be potentially significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under state and local laws and regulations.

State Regulations

California Environmental Quality Act

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at California Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine whether a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. Guidelines for the Implementation of CEQA, as amended December 28, 2018 (Title 14, Chapter 3, California Code of Regulations 15000 et seq.), define procedures, types of activities, persons, and public agencies required to comply with CEQA. Section VII(f) of the Environmental Checklist (State CEQA Guidelines: Appendix G) asks whether a project would directly or indirectly destroy a unique paleontological resource and result in impacts to the environment.

Public Resources Code Section 5097.5

Requirements for paleontological resource management are included in PRC Division 5, Chapter 1.7, Section 5097.5, which states,

> 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, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

These statutes prohibit the removal, without permission, of any paleontological site or feature from land under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC Section 5097.5 for their

own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) land.

Local Regulations

City of Los Angeles General Plan

Section 3 (Archaeological and Paleontological) of the *City of Los Angeles General Plan Conservation Element* (Conservation Element) recognizes paleontological resources (pages II–3) and contains an objective (pages II–5) to protect the City's archaeological and paleontological resources for historical, cultural, research, and/or educational purposes (City of Los Angeles 2001). The Conservation Element includes the policy to "continue to identify and protect significant archaeological and paleontological sites and/or resources known to exist or that are identified during land development, demolition or property modification activities." The Conservation Element also states the following:

> 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. If significant paleontological resources are uncovered during project execution, authorities are to be notified and the designated paleontologist may order excavations stopped, within reasonable time limits, to enable assessment, removal or protection of the resources. (City of Los Angeles 2001:II–5)

Section D:1 of the *L.A. CEQA Thresholds Guide* (City of Los Angeles 2006) specifies that the determination of significance for paleontological resources shall be made on a case-by-case basis, taking into consideration the following factors:

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

METHODS

The following sections present an overview of the methodology used to analyze the potential for paleontological resources within the project site. This report conforms to industry standards as developed by the SVP (1995, 2010) and best practices in mitigation paleontology (Murphey et al. 2019). The purpose of this analysis is to 1) determine whether any previously recorded fossil localities occur in the project site at the surface or at depth; 2) if so, assess the potential for disturbance of these localities during construction; 3) evaluate the paleontological potential of the project site; and 4) evaluate the potential for adverse impacts to previously undiscovered significant paleontological resources that could be present within the project site and adversely impacted by implementation of the project.

Existing Data Analysis

SWCA conducted an analysis of available existing data pertinent to paleontological resources. This analysis included a review of geologic maps, scientific literature, museum records search results, and other relevant site-specific, subsurface geologic information. The geologic mapping used in this analysis

is from Campbell et al. (2014) at a scale of 1:100,000. In addition to a review of published geologic maps and scientific literature, SWCA also reviewed the results of several geological investigations conducted at the project site by EEI Geotechnical and Environmental Solutions (EEI 2015, 2016), Leighton Consulting, Inc. (Leighton 2021), and Langan Engineering and Environmental Solutions, Inc. (LANGAN 2022). A museum records search request was submitted to the NHMLA on February 17, 2023, and the results of the museum records search were received on February 19, 2023. The museum records search results are incorporated into the Results section of this report. Appendix A (confidential) provides a copy of the museum records search results.

Paleontological Potential Classification

Paleontological potential ("sensitivity") is defined as the potential for a geologic unit to produce scientifically significant fossils. This is determined by rock type, history of the geologic unit in producing significant fossils, and fossil localities recorded from that unit. Paleontological sensitivity is derived from the known fossil data collected from the entire geologic unit, not just from a specific survey. In *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (SVP 2010:1–2), the SVP defines four categories of paleontological sensitivity for rock units: high, low, undetermined, and no potential.

> **High Potential**. Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered are considered to have a high potential for containing additional significant paleontological resources. Rocks units classified as having high potential for producing paleontological resources include, but are not limited to, sedimentary formations and some volcaniclastic formations (e.g., ash or tephra), and some low-grade metamorphic rocks which contain significant paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils (e.g., middle Holocene and older, fine-grained fluvial sandstone, argillaceous and carbonate-rich paleosols, cross-bedded point bar sandstone, fine-grained marine sandstone, etc.). Paleontological potential consists of both a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, plant, or trace fossils and b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, paleoecologic, taphonomic, biochronologic, or stratigraphic data. Rock units which contain potentially datable organic remains older than late Holocene, including deposits associated with animal nests or middens, and rock units which may contain new vertebrate deposits, traces, or trackways are also classified as having high potential.
>
> **Low Potential**. Reports in the paleontological literature or field surveys by a qualified professional paleontologist may allow determination that some rock units have low potential for yielding significant fossils. Such rock units will be poorly represented by fossil specimens in institutional collections or based on general scientific consensus only preserve fossils in rare circumstances and the presence of fossils is the exception not the rule, e.g., basalt flows or Recent colluvium. Rock units with low potential typically will 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 a paleontological resource impact mitigation program can

be developed. In cases where no subsurface data are available, paleontological potential can sometimes be determined by strategically located excavations into subsurface stratigraphy.

No Potential. Some rock units have no potential to contain significant paleontological resources, for instance high-grade metamorphic rocks (such as gneisses and schists) and plutonic igneous rocks (such as granites and diorites). Rock units with no potential require no protection or impact mitigation measures relative to paleontological resources. (SVP 2010:1–2)

RESULTS

Regional Geology

The project site is located in the southern extent of the Transverse Ranges Geomorphic Province (sometimes referred to as the northernmost portion of the Peninsular Ranges Geomorphic Province) within the northern Los Angeles Basin. Norris and Webb (1990) characterize the Transverse Ranges as consisting of a complex series of young, east-west-trending mountain ranges and valleys that contradict the general north-south orientation of California's other mountain ranges, such as the northwest-trending Peninsular Ranges that consist of fault-bound blocks, each of which contains uplifted ranges or subsided valleys. The Los Angeles Basin represents a broad valley plain between these two provinces. The project site is located within the northeastern Central Block of Yerkes and others (1965) that includes the low portions of the Los Angeles coastal plain from Beverly Hills to the Downey Plain within central Orange County (Norris and Webb 1990). More specifically, the Central Block is bounded by the Hollywood, Santa Monica, and Whittier faults on the north; the Whittier and Elsinore faults and Elysian and Repetto hills on the east; the San Joaquin Hills and Huntington and Newport mesas on the south; and the Newport-Inglewood Fault Zone and Dominguez and Baldwin hills on the west (Yerkes et al. 1965).

Within the Central Block, sedimentary strata overlying basement rocks consist of mostly marine and nonmarine sedimentary rocks, with the geologic history of the strata spanning from the Cretaceous to the Holocene (Norris and Webb 1990; Yerkes et al. 1965). Beginning in the Cretaceous and early Paleogene, western North America was the site of a convergent margin where the Farallon Plate was actively subducted eastward beneath the North American Plate. Subduction continued throughout the Paleogene, but by the late Oligocene (i.e., latest Paleogene), a portion of the East Pacific Rise collided with the subduction zone initiating the development of the San Andreas Fault system (Saucedo et al. 2016). The Los Angeles Basin formed when fault-bound blocks of the Transverse Ranges were translated and rotated away from the Peninsular Ranges due to movement along the San Andreas Fault system. This led to subsidence within the early Los Angeles Basin occurring during the middle to late Miocene (Critelli et al. 1995). Transtensional rifting that resulted in the formation of the Los Angeles Basin continued to enlarge the basin through the Pliocene, resulting in the deposition of thick shallow marine strata (Olson 2007). By the Pleistocene, changes in global sea level, tectonic subsidence, and rates of sedimentation resulted in the deposition of thick accumulations (maximum thickness of 35,000 feet thick) of coastal and terrestrial alluvial deposits within the Los Angeles Basin (Yerkes et al. 1965). Erosion and transportation of sediments away from the surrounding uplifted blocks (i.e., the San Gabriel and Santa Ana mountains) resulted in continued basin infilling during the late Pleistocene and Holocene, resulting in thick alluvial deposits within the present-day Los Angeles Basin that has yielded some of the best fossil sites in North America.

Local Geology and Paleontology

According to geologic mapping by Campbell and others (2014), the surface of the project site is mapped as late Pleistocene older young alluvium, also named young alluvium, Unit 2 (Qya_2) (Figure 4). Based on previous site development during construction of the existing structures (see Figure 2), however, and the results of the 2015 geotechnical evaluation (EEI 2015), the 2016 supplemental infiltration study (EEI 2016), the 2021 geotechnical update (Leighton 2021), and the 2022 geotechnical desktop review (LANGAN 2022), the project site contains unmapped Recent artificial fill at the surface to depths of 1 to 3 feet bgs, likely partially replacing the uppermost strata of the late Pleistocene older young alluvium (Qya_2). Although not mapped at the surface within the bounds of the project site or its immediate vicinity by Campbell and others (2014), early Pleistocene to Pliocene Fernando Formation and/or early Pliocene to late Miocene Puente Formation are variably present at moderate depths throughout the central Los Angeles Basin, often underlying younger alluvial deposits. Although not identified in the borehole logs during the geotechnical investigation of the subsurface (EEI 2015, 2016; LANGAN 2022; Leighton 2021), nearby fossil records indicate that the Fernando Formation and/or the Puente Formation may be present at moderate depth.

Therefore, unmapped Recent artificial fill, late Pleistocene older young alluvium (Qya_2), early Pleistocene to Pliocene Fernando Formation, and early Pliocene to late Miocene Puente Formation are given consideration in this paleontological resources assessment. These geologic units are described in geochronological order (youngest to oldest) below.

Recent Artificial Fill

Based on previous site development (see Figure 2) and the results of the geotechnical investigations (EEI, 2015, 2016; LANGAN 2022; Leighton 2021), unmapped Recent artificial fill is present at the surface of the project site to depths of 1 to 3 feet bgs, partially replacing the uppermost strata of "native" sediments of late Pleistocene older young alluvium (Qya_2). The maximum depth of the artificial fill may vary within the project site, but for the purposes of this assessment, SWCA assumes the maximum depth of artificial fill across the project site is approximately 1 to 3 feet bgs. Within the project site, artificial fill consisted of silty sand with some gravel (EEI 2015, 2016; LANGAN 2022; Leighton 2021).

Artificial fill sediments typically consist of reworked and recompacted sediments originating either from within a project site during its construction, or from outside a project site as imported sediments that are delivered from other regions and recompacted at a project site. Previously disturbed sediments or artificial fill may contain fossils, but any such fossil from these deposits has been removed from its original stratigraphic, taphonomic, or paleoenvironmental context (provenance), making it scientifically invalid. Recent artificial fill is unlikely to yield significant paleontological resources and has low paleontological sensitivity (SVP 2010); however, artificial fill deposits are underlain by undisturbed "native" sediments that may have the potential to contain significant paleontological resources (see below).

Late Pleistocene Older Young Alluvium

According to geologic mapping by Campbell and others (2014), late Pleistocene older young alluvium, also named young alluvium, Unit 2 (Qya_2), is mapped at the surface of the project site (see Figure 4). Today, the surface is capped with artificial fill to depths of 1 to 3 feet bgs, partially replacing the uppermost "native" strata of late Pleistocene older young alluvium (Qya_2) (see above). Based on the results of the geotechnical review (EEI 2015, 2016; LANGAN 2022; Leighton 2021), late Pleistocene older young alluvium is likely present at shallow depths below the artificial fill (e.g. approximately 1 to 3 feet bgs) and likely extends to moderate to deep depths. The borehole logs of the geotechnical studies (EEI 2015, 2016; LANGAN 2022; Leighton 2021) do not differentiate the between the alluvial deposits

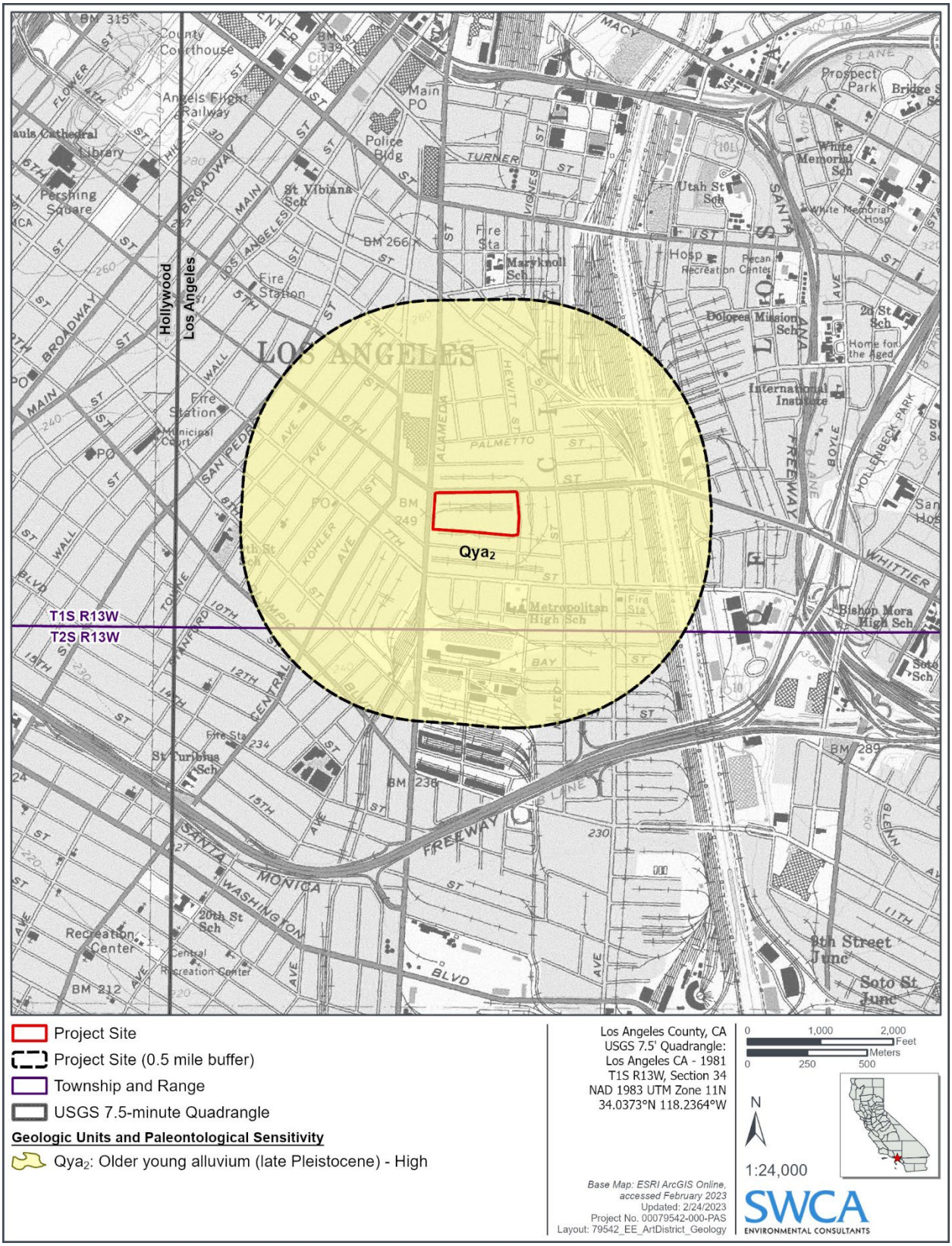

Figure 4. Geologic units and paleontological sensitivity within the project site and 0.5-mile buffer.

and the underlying "bedrock" formations (i.e., Fernando Formation and/or Puente Formation); however, based on the results of the NHMLA (2023) records search, Pleistocene-age fossils have been recovered from depths of approximately 43 feet bgs in the project's vicinity, suggesting that late Pleistocene older young alluvium (Qya_2) may extend in the subsurface of the project site to similar depths.

Late Pleistocene older young alluvium (Qya_2) in the region consists of silt, sand, and gravel deposited on flood plains via fluvial systems and are regarded as unconsolidated and generally friable (Campbell et al. 2014). Although very coarse-grained alluvial deposits are not known to preserve intact organic remains as fossils due to the higher-energy environment in which they represent, medium- to fine-grained alluvial deposits, such as gravel, sand, silt, and clay present within the project site, are typically deposited in a relatively lower energy environment that is conducive to the (nondestructive) burial and subsequent preservation of intact organic remains as fossils.

Pleistocene alluvial deposits have a rich fossil history in southern California, especially in the Los Angeles Basin (Jefferson 1991a, 1991b; McDonald and Jefferson 2008; Miller 1971; Reynolds and Reynolds 1991; Springer et al. 2009). The most common Pleistocene terrestrial mammal fossils include the bones of mammoth, bison, deer, and small mammals, but other taxa, including horse, lion, cheetah, wolf, camel, antelope, peccary, mastodon, capybara, and giant ground sloth, have been reported (Graham and Lundelius 1994), as well as reptiles, snakes, frogs, and salamanders (Hudson and Brattstrom 1977). In addition to illuminating the striking differences between southern California in the Pleistocene and southern California today, this abundant fossil record has been vital in studies of extinction (e.g., Barnosky et al. 2004; Sandom et al. 2014; Scott 2010), ecology (e.g., Connin et al. 1998), and climate change (e.g., Roy et al. 1996). Therefore, late Pleistocene older young alluvium (Qya_2) has a high paleontological sensitivity (SVP 2010).

Early Pleistocene to Pliocene Fernando Formation

Although not mapped at the surface within the project site or its immediate vicinity, the early Pleistocene to Pliocene Fernando Formation is mapped at the surface near downtown Los Angeles (Campbell et al. 2014; Dibblee and Ehrenspeck 1991) and is present at depth throughout the Los Angeles Basin. For example, SWCA (2021) observed the Fernando Formation underlying older alluvial deposits at depths of 15 to 38 feet bgs during paleontological monitoring of a mixed-use development in the Koreatown neighborhood of Los Angeles, located approximately 3.5 miles northwest of the project site. The borehole logs of the geotechnical studies (EEI 2015, 2016; LANGAN 2022; Leighton 2021) do not differentiate the between the overlying alluvial deposits and the underlying "bedrock" formations (i.e., Fernando Formation and/or Puente Formation). The NHMLA (2023) documents 17 fossil localities from the Fernando Formation at depths ranging from 30 to 80 feet bgs in an area approximately 0.92 mile to 1.48 miles northwest of the project site, however, suggesting that the Fernando Formation may be present at depths as shallow as 30 feet bgs within the project site. The Fernando Formation may "pinch out" or interfinger with the similarly aged Puente Formation in this portion of the Los Angeles Basin. Nonetheless, the early Pleistocene to Pliocene Fernando Formation may be present at moderate depths within the project site, underlying the late Pleistocene older young alluvium (Qya_2) and overlying or interfingering with the early Pliocene to late Miocene Puente Formation. The Fernando Formation consists of light olive brown and light yellowish brown to dark yellowish brown, clayey siltstone, fine- to medium-grained sandstone, and pebbly conglomerate of marine origin, which is massive, highly weathered, and oxidized and becoming darker in color, more massive, unoxidized, and more lithified with depth (Campbell et al. 2014; Dibblee and Ehrenspeck 1991; Lamar 1970; Yerkes 1997a, 1997b).

The Fernando Formation has yielded marine and nonmarine fossils and is generally regarded as fossiliferous. Fossil localities from this unit have yielded foraminiferans, sponges, corals, brachiopods, bryozoans, scaphopods, gastropods, bivalves, cephalopods, fiddler crabs, sea urchins, sharks, bony fish,

bird, unidentifiable mammals, and plants (Clarke et al. 1980; Groves 1992; Huddleson and Takeuchi 2006; Morris 1976; Paleobiology Database 2022; Schoellhamer et al. 1981; University of California Museum of Paleontology 2022; Woodring 1938). Therefore, the early Pleistocene to Pliocene Fernando Formation has a high paleontological sensitivity (SVP 2010).

Early Pliocene to Late Miocene Puente Formation

Although not mapped at the surface within the project site or its immediate vicinity, the late Miocene to early Pliocene Puente Formation is mapped at the surface approximately 1.2 miles northwest of the project site (Campbell et al. 2014; Yerkes and Campbell 2005). The Puente Formation consists of four members: Sycamore Canyon (referred to by Dibblee and Ehrenspeck [1991] as "unnamed shale"), Yorba, Soquel, and La Vida; however, the mapped geologic subunits of the Puente Formation in central Los Angeles are not assigned to any of these members. The Puente Formation consists of light gray siltstone that is well bedded with thick beds that progressively thin and interbed at depth (Campbell et al. 2014). The Puente Formation is widespread within the subsurface near downtown Los Angeles, where it mostly underlies (but sometimes interfingers with) the Fernando Formation if/when the Fernando Formation is present at depth (see above). For example, SWCA (2021) observed the Puente Formation underlying the Fernando Formation at depths approximately 38 feet bgs and greater during paleontological monitoring of a mixed-use development in the Koreatown neighborhood of Los Angeles, located approximately 3.5 miles northwest of the project site. The borehole logs of the geotechnical studies (EEI 2015, 2016; LANGAN 2022; Leighton 2021) do not differentiate the between the overlying alluvial deposits and the underlying "bedrock" formations (i.e., Fernando Formation and/or Puente Formation); however, the Puente Formation is notably present at moderate to deep depths throughout the Los Angeles Basin and is exposed at the surface within its surrounding hills. Additionally, the NHMLA (2023) fossil locality records search notes the presence of fossils from the Puente Formation approximately 1.2 miles northwest of the project site; however, no depth information was provided. Nonetheless, the Puente Formation may be present at deep, but unknown, depths below the late Pleistocene older young alluvium (Qya_2) and/or early Pleistocene to Pliocene Fernando Formation.

The Puente Formation has a history of preserving terrestrial fossil taxa, such as rhinoceros, mastodons, rabbits, rodents, and insects, and marine fossil taxa, such as pinnipeds, desmostylids, whales, sharks, bony fish, crustaceans, cephalopods, bivalves, sponges, and foraminifers (Barboza et al. 2017; Carnevale et al. 2008; David 1943; Feldmann 2003; Fritzsche 1980; Hilton and Grande 2006; Huddleston and Takeuchi 2006; Leatham and North 2017; Pajak 1992; Pierce 1945; Pimiento 2014; Rigby and Albi 1996; Santos et al. 2016; Saul and Stadum 2005; Scherzer 2017). Therefore, the early Pliocene to late Miocene Puente Formation has a high paleontological sensitivity (SVP 2010).

Museum Records Search

The NHMLA (2023) performed a museum records search for fossil localities within the vicinity of the project site. Based on the results of the museum records search, the NHMLA (2023) does not possess records of paleontological resources from within the project site; however, several fossil localities have been recorded in the vicinity of the project site from unnamed Pleistocene deposits varying from 20 to 43 feet bgs, as well as unrecorded depths. Additionally, 17 invertebrate fossil localities were recorded in the project's vicinity from the early Pleistocene to Pliocene Fernando Formation from moderate to deep depths varying from 30 to 80 feet bgs, and one fossil locality in the project's vicinity was recorded from the early Pliocene to late Miocene Puente Formation at an unrecorded depth. Table 1 summarizes the results of the NHMLA (2023) museum records search. Appendix A (confidential) provides the results of the museum records search.

Table 1. NHMLA Fossil Localities near the Project Site

Locality Number	Approximate Distance from the Project Site	Formation	Taxa	Approximate Depth (bgs)
17 LACM IP localities	0.92 to 1.48 miles	Early Pleistocene to Pliocene Fernando Formation	Invertebrates, including *Crepidula princeps* and *C. grandis*; *Haliotis*; Mitraidae; and others	30–80 feet
LACM VP 5961, 7990	1.22 miles	Early Pliocene to late Miocene Puente Formation	Teleostei fish, including viperfish (*Chauliodus*); cod (Gadiformes); herring/shad/sardines (Clupeidae); mackerel/tuna/bonito (Scombridae); slickheads (Alepocephalidae); smelts (Argentinidae); scaly dragonfish (Stomiatidae); bristlemouths (Gonostomatidae)	Unrecorded
LACM VP 2032	1.93 miles	Unspecified Pleistocene deposits	Mastodon (*Mammut*)	20–35 feet
LACM VP 1023	2.1 miles	Unspecified Pleistocene deposits	Sabertooth cat (*Smilodon*); horse (*Equus*); deer (*Odocoileus*); Turkey (*Meleagris*)	Unrecorded
LACM VP 1755	3.9 miles	Unspecified Pleistocene deposits	Horse (*Equus*)	43 feet
LACM VP 1893	4.1 miles	Unspecified Pleistocene deposits	Bison (*Bison antiquus*); mammoth (*Mammuthus*)	Unrecorded

Source: NHMLA (2023)

IMPACT ASSESSMENT

SWCA conducted this assessment to analyze the potential for significant impacts to paleontological resources resulting from implementation or construction of the project. SWCA analyzed the existing data to estimate the depth of artificial fill and to determine the geologic units likely to be present in the subsurface that may be impacted by the project.

The results of the geotechnical investigation studies indicate that unmapped Recent artificial fill extends from the surface to 1 to 3 feet bgs throughout most of the project site (EEI 2015, 2016; LANGAN 2022; Leighton 2021). Geologic mapping by Campbell and others (2014) indicates that the surface of the project site is mapped as late Pleistocene older young alluvium (Qya_2), of which the uppermost "native" strata were partially replaced by artificial fill at the aforementioned depths. Assuming the maximum depth of artificial fill is 3 feet bgs, late Pleistocene older young alluvium (Qya_2) is likely present at 3 feet bgs and extend to moderate to deep depths (e.g., 43 feet bgs). Older young alluvium deposits are stratigraphically underlain by early Pleistocene to Pliocene Fernando Formation and/or the early Pliocene to late Miocene Puente Formation. Based on the results of this assessment, unmapped Recent artificial fill has a low paleontological sensitivity (but is underlain by geologic units of relatively higher paleontological sensitivity), and late Pleistocene older young alluvium (Qya_2), early Pleistocene to Pliocene Fernando Formation, and early Pliocene to late Miocene Puente Formation all have a high paleontological sensitivity.

The maximum depth of ground-disturbing activities for the project is anticipated to reach 8 feet bgs, resulting in approximately 40,000 cubic yards of soil/sediment export. Based on the results of this assessment, the known paleontological sensitivities of the geologic units anticipated to be at the surface or present in the subsurface, and the anticipated depth of excavations to 8 feet bgs, ground-disturbing activities associated with the project that are greater than or equal to 3 feet bgs may impact geologic units of relatively high paleontological sensitivity (i.e., late Pleistocene older young alluvium [Qya_2], as well as

the early Pleistocene to Pliocene Fernando Formation and/or early Pliocene to late Miocene Puente Formation in the unlikely event that they are present at depths less than or equal to 8 feet bgs). Any fossils encountered during ground disturbances in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA.

CONCLUSIONS AND RECOMMENDATIONS

SWCA conducted an analysis of existing data, including a review of geologic maps, scientific literature, museum records, and other relevant site-specific geologic information, to classify the paleontological sensitivity of the geologic units present at the surface and subsurface and to determine the potential for significant impacts to scientifically significant paleontological resources due to implementation or construction of the project. Unmapped Recent artificial fill, present from the surface to depths of 1 to 3 feet bgs across the project site, has a low paleontological sensitivity but is underlain by geologic units of relatively higher paleontological sensitivity. Geologic mapping indicates that late Pleistocene older young alluvium (Qya_2), which have been partially replaced by artificial fill in their uppermost "native" strata, have a high paleontological sensitivity. Although unlikely to be present at relevant depths within the subsurface of the project site, the underlying early Pleistocene to Pliocene Fernando Formation and early Pliocene to late Miocene Puente Formation also have a high paleontological sensitivity. The maximum depth of ground-disturbing activities for the project is anticipated to reach approximately 8 feet bgs. Based on the results of this assessment, the known paleontological sensitivity of the geologic units anticipated to be at the surface or present in the subsurface, and the anticipated depth of excavations, ground-disturbing activities associated with the project that are greater than or equal to 3 feet bgs may impact geologic units of relatively high paleontological sensitivity. Any fossils encountered during ground disturbances in previously undisturbed sediments of high paleontological sensitivity would be at risk for damage or destruction from construction activities, which would constitute an impact under CEQA. The implementation of appropriate mitigation measures will ensure that fossils, if encountered, are assessed for significance and, if deemed significant, salvaged and curated with an accredited repository. These actions will reduce impacts to paleontological resources to less-than-significant levels, pursuant to CEQA.

Accordingly, SWCA recommends the following mitigation measures, which have been developed in accordance with and incorporate the performance standards of the SVP (1995, 2010), state and local regulations, and best practices in mitigation paleontology (Murphey et al. 2019).

1) **Retain a Qualified Professional Paleontologist:** The project applicant should retain a Qualified Professional Paleontologist (Qualified Paleontologist/Project Paleontologist/Principal Paleontologist), who meets or exceeds the SVP definition, to carry out all regulatory compliance measures and protocols related to paleontological resources. The Qualified Paleontologist should obtain a curatorial arrangement with a qualified repository (e.g., NHMLA) prior to construction in the event of significant paleontological resource discoveries during construction.
2) **Conduct Worker Training:** The Qualified Paleontologist should develop Worker Environmental Awareness Program training to educate the construction crew on the legal requirements for preserving fossil resources, as well as the procedures to follow in the event of a fossil discovery. This training program should be given to the crew before ground-disturbing work commences and should include handouts to be given to new workers as needed.
3) **Monitor for Paleontological Resources:** Full-time paleontological monitoring should occur during ground-disturbing activities that impact previously undisturbed sediments at depths of 3 feet bgs or greater that have relatively higher paleontological sensitivity, including late Pleistocene older young alluvium (Qya_2), as well as early Pleistocene to Pliocene Fernando

Formation and/or early Pliocene to late Miocene Puente Formation in the unlikely event that they are present at depths less than or equal to 8 feet bgs. Monitoring should not be required when ground-disturbing activities are less than 3 feet bgs, or when impacting only previously disturbed sediments and/or Recent artificial fill regardless of depth. Monitoring should be conducted by a qualified paleontological monitor who meets the standards of the SVP (2010) and who should be supervised by the Qualified Paleontologist. The Qualified Paleontologist may periodically inspect construction activities to adjust the level of monitoring in response to subsurface conditions. Monitoring efforts can be increased, reduced, or ceased entirely if determined adequate by the Qualified Paleontologist. Paleontological monitoring should include inspection of exposed sedimentary units during active excavations within sensitive geologic sediments. The monitor should have authority to temporarily divert activity away from exposed fossils to evaluate the significance of the find and, should the fossils be determined significant, professionally and efficiently recover the fossil specimens and collect associated data. The monitor should record pertinent geologic data and collect appropriate sediment samples from any fossil localities. Recovered fossils should be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological repository (e.g., NHMLA).

4) **Prepare a Paleontological Resources Monitoring Report:** Upon conclusion of ground-disturbing activities, the Qualified Paleontologist overseeing paleontological monitoring should prepare a final monitoring report that documents the paleontological monitoring efforts for the project and describes any paleontological resources discoveries observed and/or recorded during the life of the project. If paleontological resources are curated, the final monitoring report and any associated data pertinent to the curated specimen(s) should be submitted to the designated repository. A copy of the final monitoring report should be filed with the City.

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APPENDIX A

Natural History Museum of Los Angeles County Paleontological Records Search

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This confidential report is on file with the Department of City Planning.