Paleontological Resources Technical Report for The Villages at The Alhambra Project, Alhambra, Los Angeles County, California

April 2019

PREPARED FOR

The Ratkovich Company
1000 S. Fremont Avenue, Unit 1
Building A1, Suite 1150
Alhambra, California 91803

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SWCA Project No. 49511

April 2019

EXECUTIVE SUMMARY

Purpose and Scope: The Ratkovich Company retained SWCA Environmental Consultants (SWCA) to conduct a paleontological resources study in support of the proposed The Villages at The Alhambra Project (project) located in the city of Alhambra, Los Angeles County, California. This paleontological resources study is intended to characterize and describe paleontological resources identified within the project area that could be affected by ground-disturbing activities associated with the project. The Ratkovich Company proposes to develop an urban neighborhood across the project site, including a network of landscape and communal spaces that fuse office and residential uses into a single community with a unique identity and sense of place. Active uses will be featured along street frontages to avoid blank walls and visible parking areas. All but one of the existing office buildings on the site would be retained as part of the project.

Overall the proposed project would construct 1,061 residential units (516 for sale; 545 rental), a 490-space parking structure, and associated open space, landscape, and vehicle/pedestrian circulation areas to accompany the existing 902,001 square feet of office space that would be retained within the Office Plan Area. Development of the proposed project would occur in a phased manner over a 7- to 10-year period, as defined in the requested Development Agreement.

This report includes a review of laws, ordinances, and regulations relevant to this project, as well as a records search from the Natural History Museum of Los Angeles County (LACM) and a review of geologic mapping and the scientific literature. This study was completed in compliance with federal statutes (The Antiquities Act of 1906; The National Environmental Policy Act of 1969; The Omnibus Public Lands Act; etc.) as well as California state statutes (the California Environmental Quality Act and the California Public Resources Code) and following the professional standards of the Society of Vertebrate Paleontology.

Dates of Investigation: A records search was requested from the Natural History Museum of Los Angeles County on May 19, 2018. This report was completed in July 2018.

Findings of the Investigation: The surface of the project area consists of older alluvium. Older alluvium has high paleontological sensitivity because it is of an age known to preserve fossil resources and has a well-established record of fossil preservation throughout the Los Angeles Basin (Jefferson, 1991a, 1991b; Miller, 1971; Reynolds and Reynolds, 1991; Springer et al., 2009. No previously recorded fossil localities were identified within the project area during the records search. However, the LACM has records of fossil localities from similar geologic units within 8 km (5 miles) of the project area.

Impact Analysis and Recommendations Summary: Pleistocene-aged older alluvium has a record of preserving significant fossil resources in the region and is present in the project area. Recommendations to avoid significant impacts to fossil resources include a worker environmental awareness program (WEAP) training, the development of a paleontological monitoring and mitigation plan by a qualified paleontologist, and monitoring of ground-disturbing activities. Should any significant fossils be encountered, they should be salvaged and curated at an approved repository.

Disposition of Data: This report will be on file with the following entities: City of Alhambra, The Ratkovich Company, and SWCA's Pasadena, California, office.

CONTENTS

FIGURES

ATTACHMENT

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1 INTRODUCTION

The Ratkovich Company retained SWCA Environmental Consultants (SWCA) to provide paleontological resources services in support of The Villages at The Alhambra (project) in the city of Alhambra, Los Angeles County, California (Figure 1). SWCA performed a desktop analysis to assess paleontological conditions throughout the project area and reviewed relevant technical documents and agency-maintained databases on paleontological resources. The desktop research is summarized in this paleontological resources technical report (PRTR), which documents the existing paleontological conditions within the project area.

1.1 Paleontological Resources Study Personnel

SWCA Lead Paleontologist Alyssa Bell, Ph.D., conducted the paleontological analysis and authored this report. Geographic Information Systems (GIS) Specialist John Walls produced the figures. SWCA Paleontological Resources Principal Investigator Russell Shapiro, Ph.D., reviewed this report. SWCA project managers Chris Millington and Alex Wesson provided oversight on this project.

2 PROJECT DESCRIPTION

2.1 Proposed Project Work

The project site consists of the entire block bounded by Fremont Avenue on the west, Mission Road on the south, Date Avenue on the east, and Orange Street on the north (Figures 2 and 3). The total site area is approximately 1,675,498 square feet (or 38.38 acres). The project area is fully developed with office, warehouse, storage, utility substation, and surface parking lot uses. For purposes of the proposed project, the project site is being divided into five plan areas: Office, North, East, South, and Corner. The development proposal for each of these plan areas is described below.

2.1.1 Office Plan Area

- Retention of 902,001 square feet of office space and approximately 1,800 parking spaces, including the existing LA Fitness building, the three-story parking structure (Bldg. B2), and the five-level parking structure (Bldg. B7).
- No new development will occur within the Office Plan Area, although vehicle and pedestrian circulation areas along its edges will be modified to provide consistent linkages with the adjacent plan areas.

2.1.2 North Plan Area

- Demolition of all existing structures (A12, B14, B15, and B16), totaling 20,876 square feet, and surface parking lots.
- Construction of 516 for-sale residential units (stacked flats and townhomes; 731,698 square feet) in five-story buildings (Bldgs. N1, N2, N3, and N4) with accompanying residential amenities.
- Provision of 1,136 parking spaces for residents and guests in 2.25-level below-grade parking garages for stacked flat units, individual garages for townhomes, and on-street parking within Plan area.

2.1.3 East Plan Area

- Demolition of existing warehouse/storage buildings (B12 and B13) totaling 21,700 square feet and surface parking lots.
- Construction of a five-story, 490-stall parking garage (Bldg. E1) to serve the existing office uses in the Office Plan Area as well as the proposed residences in the other plan areas.

2.1.4 South Plan Area

- Demolition of all existing structures and surface parking lots except Building A0 (10,145 square feet).
- Construction of 392 rental apartment units (stacked flats; 449,816 square feet) in two five-story buildings (Bldgs. S1 and S2) with accompanying residential amenities.
- Provision of 913 parking spaces for residents and guests.

2.1.5 Corner Plan Area

- Demolition of existing office and maintenance buildings (42,222 square feet) and surface parking lots.
- Construction of 153 rental apartment units (176,116 square feet) in a five-story building (stacked flats) with accompanying residential amenities (Bldg. C1).
- Provision of 337 parking spaces for residents and guests.

The proposed project is intended to develop an urban neighborhood across the project site, including a network of landscape and communal spaces that fuse office and residential uses into a single community with a unique identity and sense of place. Active uses will be featured along street frontages to avoid blank walls and visible parking areas. All but one of the existing office buildings on the site would be retained as part of the project.

Overall the proposed project would construct 1,061 residential units (516 for sale; 545 rental), a 490-space parking structure, and associated open space, landscape, and vehicle/pedestrian circulation areas to accompany the existing 902,001 square feet of office space that would be retained within the Office Plan Area. Development of the proposed project would occur in a phased manner over a 7- to 10-year period, as defined in the requested Development Agreement.

Figure 1. Project location and vicinity.

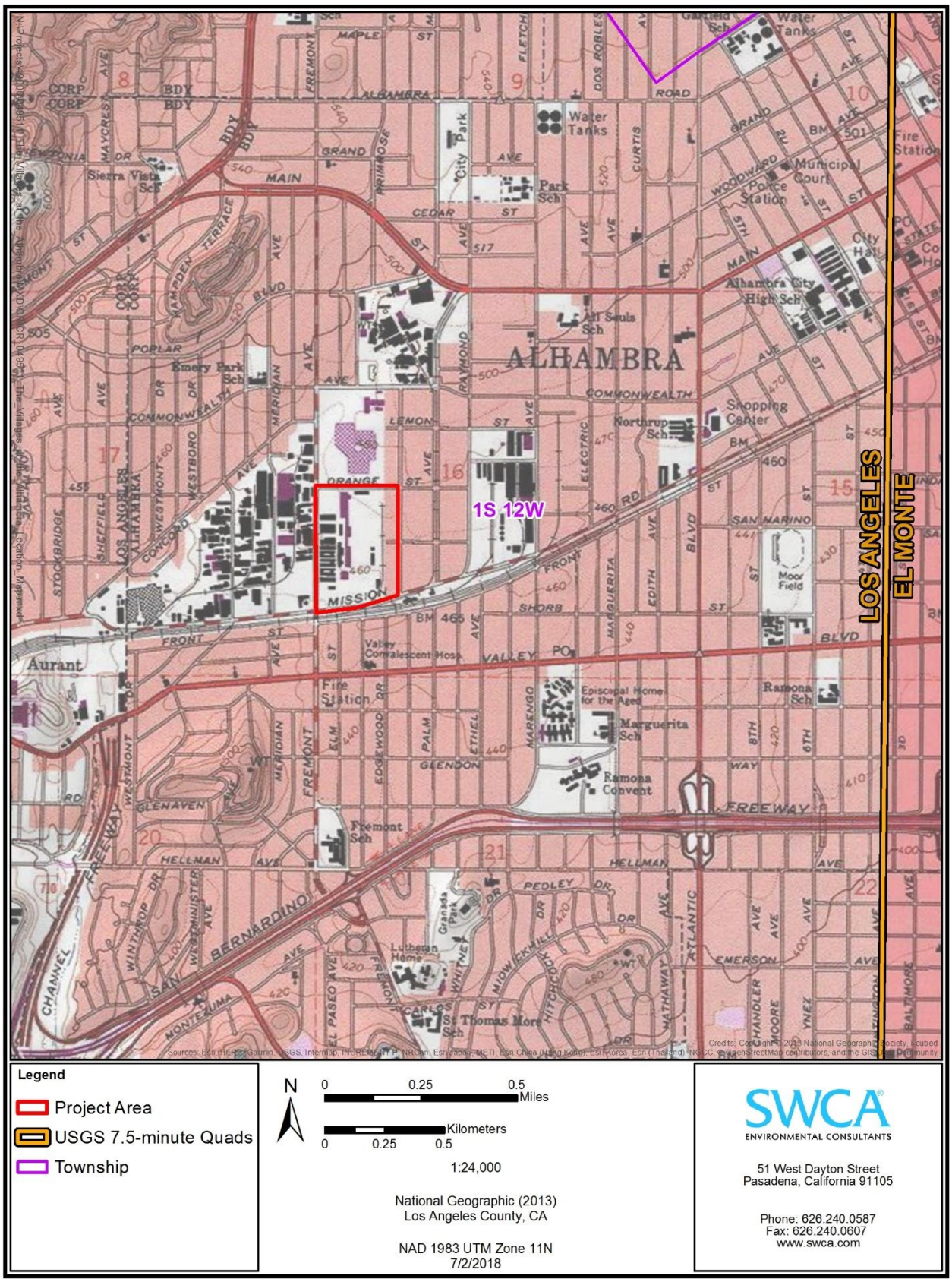

Figure 2. Project area (topographic).

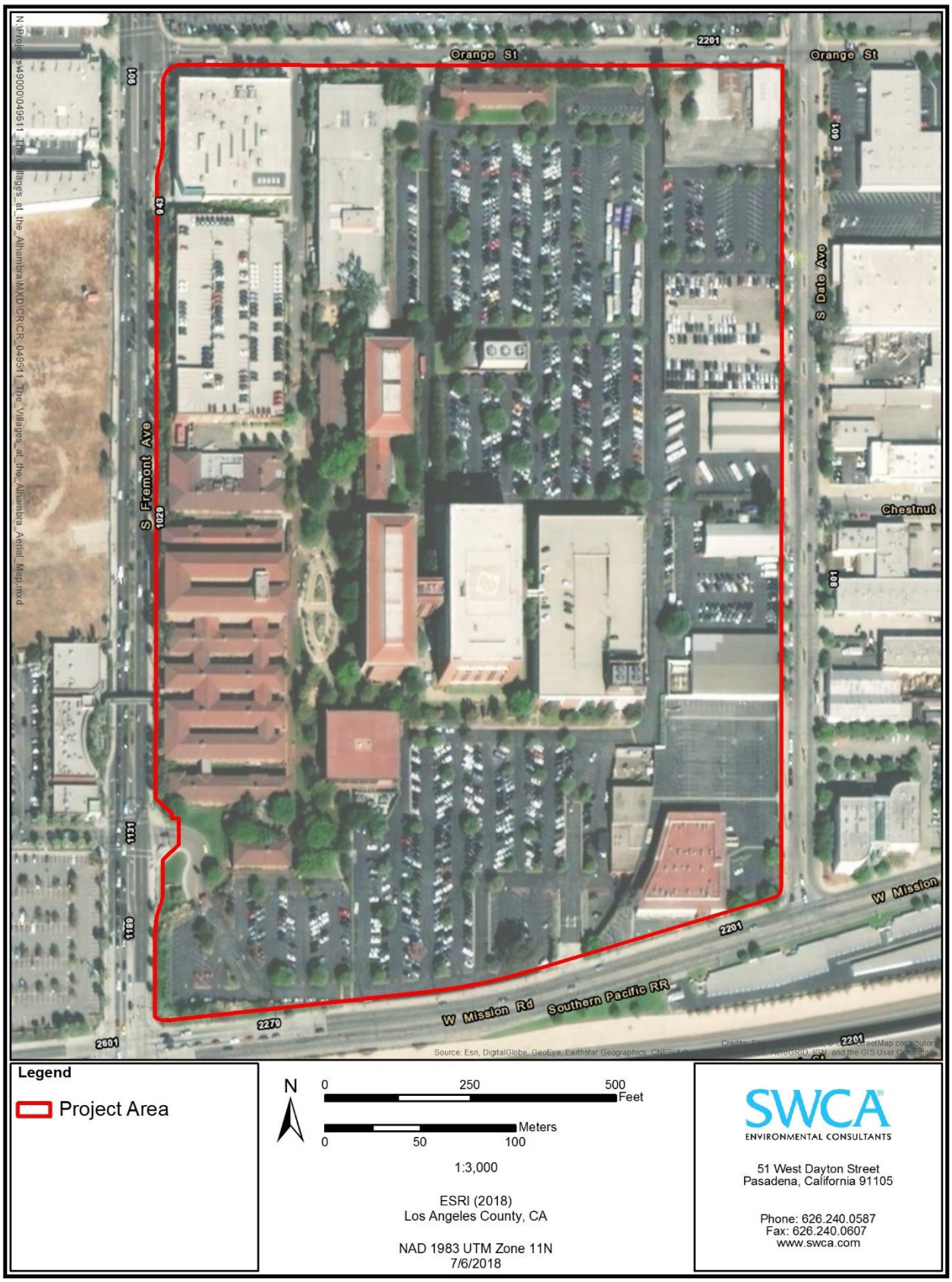

Figure 3. Project area (aerial).

3 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments (Murphey and Daitch, 2007). Therefore, a wide range of material is represented in the fossil record, including bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains, which may vary in their degree of mineralization

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered nonrenewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced (Murphey and Daitch, 2007). Fossils are important scientific and educational resources and can be used to:

- study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- reconstruct ancient environments, climate change, and paleoecological relationships;
- provide a measure of relative geologic dating, which forms the basis for biochronology and biostratigraphy, and is an independent and corroborating line of evidence for isotopic dating;
- study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- study patterns and processes of evolution, extinction, and speciation; and
- identify past and potential future human-caused effects to global environments and climates (Murphey and Daitch, 2007).

4 REGULATORY SETTING

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal and state laws and regulations. This study satisfies project requirements in accordance with both federal and state regulations. This analysis also complies with guidelines and significance criteria specified by the Society of Vertebrate Paleontology (1995, 2010).

4.1 Federal Regulations

4.1.1 Paleontological Resources Preservation, Omnibus Public Lands Act, Public Law 111-011, Title VI, Subtitle D (PRPA), 2009

This legislation directs the Secretaries of the U.S. Department of the Interior (USDI) and U.S. Department of Agriculture (USDA) to manage and protect paleontological resources on federal land using "scientific principles and expertise." To formulate a consistent paleontological resources management framework, the Paleontological Resources Preservation Act (PRPA) incorporates most of the recommendations from the report of the Secretary of the Interior titled *Assessment of Fossil Management on Federal and Indian Lands* (USDI, 2000). In passing the PRPA, Congress officially recognized the scientific importance of paleontological resources on some federal lands by declaring that fossils from these lands are federal property that must be preserved and protected. The PRPA codifies existing policies of the Bureau of Land

Management (BLM), National Park Service (NPS), U.S. Forest Service (USFS), Bureau of Reclamation, and U.S. Fish and Wildlife Service (USFWS), and provides the following:

- uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from federal lands;
- uniform minimum requirements for paleontological resource-use permit issuance (terms, conditions, and qualifications of applicants);
- uniform definitions for "paleontological resources" and "casual collecting;" and
- uniform requirements for curation of federal fossils in approved repositories.

4.1.2 Federal Land Policy and Management Act (FLPMA) of 1976

The Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S. Code [USC] 1712[c], 1732[b]); Section 2, Federal Land Management and Policy Act of 1962 [30 USC 611]; Subpart 3631.0 et seq.), Federal Register Vol. 47, No. 159, 1982, does not refer specifically to fossils. However, "significant fossils" are understood and recognized in policy as scientific resources. Permits, which authorize the collection of significant fossils for scientific purposes, are issued under the authority of FLPMA. Under FLPMA, federal agencies are charged to:

- manage public lands in a manner that protects the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, archaeological, and water resources, and, where appropriate, preserve and protect certain public lands in their natural condition (Section 102[a][8][11]);
- periodically inventory public lands so that the data can be used to make informed land-use decisions (Section 102[a][2]); and
- regulate the use and development of public lands and resources through easements, licenses, and permits (Section 302[b]).

4.1.3 The National Environmental Policy Act (NEPA) of 1969

The National Environmental Policy Act of 1969 (NEPA), as amended (Public Law [PL] 91-190, 42 USC 4321-4347, January 1, 1970, as amended by PL 94-52, July 3, 1975, PL 94-83, August 9, 1975, and PL 97-258 Section 4(b), Sept. 13, 1982) recognizes the continuing responsibility of the federal government to "preserve important historic, cultural, and natural aspects of our national heritage…" (Section 101 [42 USC Section 4321]; No. 382). With the passage of the PRPA, paleontological resources are considered a significant resource, and it is therefore now standard practice to include paleontological resources in NEPA studies in all instances where there is a possible impact.

4.1.4 Antiquities Act of 1906

The Antiquities Act of 1906 (16 USC 431-433) states, in part:

> That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR 3]), the term "objects of antiquity" has been interpreted to include fossils by the NPS, BLM, USFS, and other federal agencies. Permits to collect fossils on lands administered by federal agencies are authorized under this Act. However, due to the large gray areas left open to interpretation due to the imprecision of the wording, agencies are hesitant to interpret this act as governing paleontological resources.

4.2 State Regulations

4.2.1 California Environmental Quality Act (CEQA)

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at Public Resources Code (PRC) Section 21000 et seq. CEQA requires lead agencies to determine if 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, and include as one of the questions to be answered in the Environmental Checklist (Section 15023, Appendix G, Section VII, Part f) the following: will the proposed project "directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?"

4.2.2 Public Resources Code (PRC) Section 5097.5

Requirements for paleontological resource management are included in the PRC Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, 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 lands 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 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) lands.

5 RESOURCE ASSESSMENT GUIDELINES

The loss of any identifiable fossil that could yield information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant environmental impact. Direct impacts on paleontological resources primarily concern the potential destruction of nonrenewable paleontological resources and the loss of information associated with these resources. This includes the unauthorized collection of fossil remains. If potentially fossiliferous bedrock or surficial sediments are disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information (a significant impact). At the project-specific level, direct impacts can be mitigated to a less-than-significant level through the implementation of paleontological mitigation.

The CEQA threshold of significance for a significant impact to paleontological resources is reached when a project is determined to "directly or indirectly destroy a significant paleontological resource or unique geologic feature" (Appendix G, State CEQA Guidelines). In general, for project areas underlain by paleontologically sensitive geologic units, the greater the amount of ground disturbance, the higher the potential for significant impacts to paleontological resources. For project areas directly underlain by geologic units with no paleontological sensitivity, there is no potential for impacts on paleontological resources unless sensitive geologic units that underlie the non-sensitive unit are also affected.

5.1 Professional Standards

The Society of Vertebrate Paleontology (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 (1995, 2010). Most practicing professional vertebrate paleontologists 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 (2010:11), significant paleontological resources are defined as:

> 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).

Based on the significance definitions of the SVP (2010), all identifiable vertebrate fossils are considered to have significant scientific value. This is 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 about 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.

A geologic unit known to contain significant fossils is considered sensitive to adverse impacts if there is a high probability that earth-moving or ground-disturbing activities in that rock unit will either disturb or destroy fossil remains directly or indirectly. This definition of sensitivity differs fundamentally from the definition for archaeological resources 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).

Many archaeological sites contain features visually detectable on the surface. In contrast, fossils are often contained within surficial sediments or bedrock, and are therefore not observable or detectable unless exposed by erosion or human activity.

In summary, paleontologists cannot know either the quality or quantity of fossils prior to natural erosion or human-caused exposure. As a result, even in the absence of fossils on the surface, it is necessary to assess the sensitivity of rock 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, or based on 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 these remains are significant, successful mitigation and salvage efforts may be undertaken to prevent adverse impacts to these resources.

5.2 Paleontological Sensitivity

Paleontological 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 its "Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources," the SVP (2010:1–2) defines four categories of paleontological sensitivity (potential) 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).

6 METHODS

This PRTR is based on a desktop review of available scientific literature, geologic maps, and a records search from the Natural History Museum of Los Angeles County (LACM). This PRTR conforms to industry standards as developed by the SVP (1995, 2010). The purpose of this analysis is to 1) determine whether any previously recorded fossil localities occur in the project area, 2) assess the potential for disturbance of these localities during construction, and 3) evaluate the paleontological sensitivity of the project area. The results of the LACM records search is included here as Attachment A.

7 RESULTS

7.1 Literature Search Results

7.1.1 Geologic Setting

The project area is located in the Los Angeles Basin, a structural depression approximately 80 km (50 miles) long and 32 km (20 miles) wide in the northernmost Peninsular Ranges Geomorphic Province (Ingersoll and Rumelhart, 1999). The Los Angeles Basin developed as a result of tectonic forces and the San Andreas Fault zone, with subsidence occurring 18 to 3 million years ago (Ma; Critelli et al., 1995). Although sediments dating back to the Cretaceous (66 Ma) are preserved in the basin, continuous sedimentation began in the middle Miocene (around 13 Ma; Yerkes et al., 1965). Since that time, sediments have been eroded into the basin from the surrounding highlands, resulting in thousands of feet of accumulation (Yerkes et al., 1965). Most of these sediments are marine until sea level dropped in the Pleistocene (2.58 Ma to 11,700 years ago) and deposition of the alluvial sediments that compose the uppermost units in the Los Angeles Basin began.

The Los Angeles Basin is further subdivided into four structural blocks; the project site is in the Central Block, where sediments range from 9,754 to 10,668 m (32,000–35,000 feet) thick (Yerkes et al., 1965). The Central Block is wedge shaped and extends from the Santa Monica Mountains in the northwest, where it is about 16 km (10 miles) wide, to the San Joaquin Hills to the southeast, where it widens to around 32 km (20 miles) across (Yerkes et al., 1965).

Locally, the project area is near the Repetto and Elysian hills, where the lower sequence of Pliocene-aged rocks (5.3–2.58 Ma) are exposed. These rocks include a thick sequence (up to 914 m [3,000 feet] thick) of sandy siltstone and massive siltstone with thin beds of conglomerate deposited in a marine basin with water depths of 1,890 m (6,200 feet; Yerkes et al., 1965). Well log data indicate these sediments are present in the subsurface across the Los Angeles Basin, including beneath the surficial alluvium in the project area (Yerkes et al., 1965).

7.1.2 Project Geology

Yerkes (1997) mapped the geology in the vicinity of the project area at a scale of 1:24,000 (Figure 4). The surficial geology of the project area is mapped as older alluvium (Qao in Figure 2). Outcrops of the Fernando and Puente formations are present surrounding the project area, and are likely present in the subsurface at an undetermined depth. These units are discussed below.

Older Alluvium (Qao). Sediments mapped as older alluvium consist of moderately to well-consolidated gravel, sand, silt, and clay deposited in the basin during the late Pleistocene, approximately 78,000 to 11,700 years ago (Yerkes, 1997). These Pleistocene sediments have a rich fossil history in southern California (Jefferson, 1991a, 1991b; 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, camelid, antelope, peccary, mastodon, capybara, and giant ground sloth, have been reported (Graham and Lundelius, 1994), as well as reptiles such as frogs, salamanders, and snakes (Hudson and Brattstrom, 1977). In addition to illuminating the striking differences between southern California in the Pleistocene and today, this abundant fossil record has been vital in studies of extinction (e.g., Sandom, et al., 2014; Barnosky et al., 2004), ecology (e.g., Connin et al., 1998), and climate change (e.g., Roy et al., 1996; Shapiro, 2016).

Fernando Formation (Tf3). Outcrops of the Pliocene-aged Fernando Formation occur 0.85 km (0.53 mile) to the southwest of the project area, and it is likely present in the project area at an undetermined depth. The Fernando Formation is roughly 110 m (360 feet) thick in the vicinity of the project area and consists of massive siltstone with soft, micaceous layers of pebbly sandstone (Yerkes, 1997). The Fernando Formation has an extensive record of preserving scientifically significant fossils, including invertebrates such as mollusks, echinoids, and bryozoans (Groves, 1992; Morris, 1976; Woodring, 1938), fish (Huddleston and Takeuchi, 2006), squid (Clarke et al., 1980), and a number of unidentified megafossils (Schoellhamer et al., 1981).

Puente Formation (Tpn1, 3, and 4). Outcrops of the Puente Formation occur 0.8 km (0.5 mile) to the southwest and 0.99 km (0.62 mile) northeast of the project area, and it is likely present in the project area at an undetermined depth. The Puente Formation consists of marine sandstone, siltstone, and shale that dates from the Miocene to the early Pliocene (Critelli et al., 1995; Morton and Miller, 2006). In the vicinity of the project area the Puente consists of well bedded, poorly cemented siltstone (Tpn1), well-bedded diatomaceous shale (Tpn3), and well-cemented medium to coarse-grained sandstone (Tpn4; Yerkes, 1997). The Puente Formation has a history of preserving both invertebrate and vertebrate marine fossils, such as cephalopods (Saul and Stadum, 2005), crustaceans (Feldman, 2003), fish (Carnevale et al., 2008; David, 1943; Hilton and Grande, 2006; Huddleston and Takeuchi, 2006), and other marine and terrestrial vertebrates (Barboza et al., 2017, Leatham and North, 2017).

7.1.3 Records Search Results

The data provided by the LACM indicates that although there are no reported fossil localities in the project area, fossils have been reported nearby from older alluvium deposits similar to those that are likely to occur at depth in the project area (McLeod, 2018). The closest fossil localities known to the LACM in alluvial sediments are located approximately 6.4 km (4 miles) southwest of the project area. At LACM 1023, near the intersection of Workman Street and Alhambra Avenue, turkey (*Meleagris californicus*), saber-toothed cat (*Smilodon fatalis*), horse (*Equus*), and deer (*Odocoileus*) were collected from an unstated depth (McLeod, 2018). Near this site, around the intersection of Mission Road and Daly Street, fossil specimens of pond turtle (*Clemmys mamorata*), ground sloth (*Paramylodon harlani*), mastodon (*Mammut americanum*), mammoth (*Mammuthus imperator*), horse (*Equus*), and camelid (*Camelops*) were collected from a depth of 6 to 10.6 m (20–35 feet) below the surface at LACM 2032 (McLeod, 2018). The LACM records search results letter is included here as Attachment A.

7.2 Paleontological Sensitivity

The review of the literature and the records of the LACM indicate that older alluvium found at the surface of the project area, as well as the Fernando and Puente formations, which are likely present in the subsurface, have high paleontological sensitivity (Figure 5). All of these geologic units have a record of

preserving significant fossil resources in the Los Angeles Basin, as demonstrated by the review of the scientific literature and the LACM records search conducted for this assessment. To avoid impacts to significant fossil resources that may be present in the project area, paleontological mitigation measures are recommended. The adoption of these measures will avoid significant impacts under CEQA.

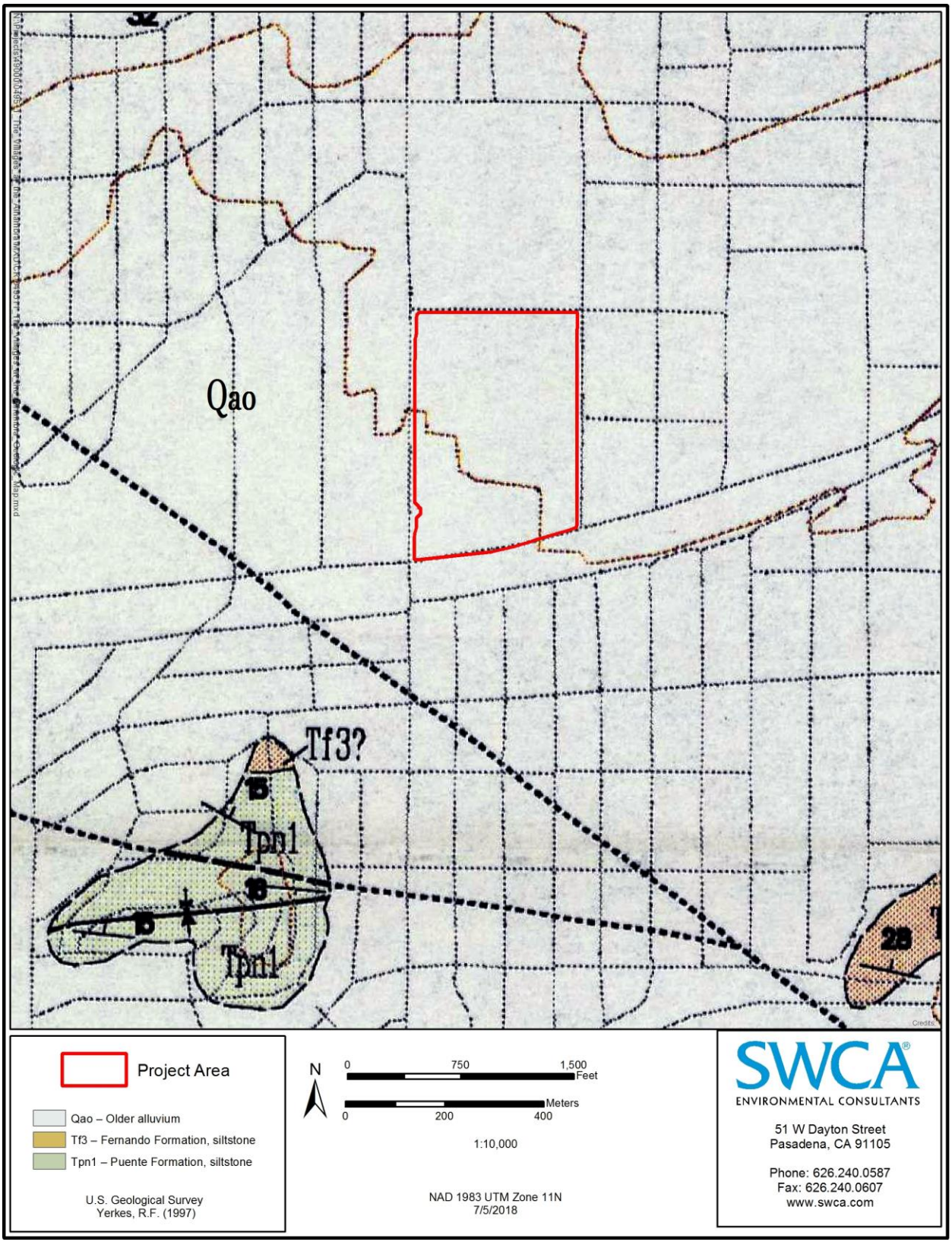

Figure 4. Geology of the project area and vicinity.

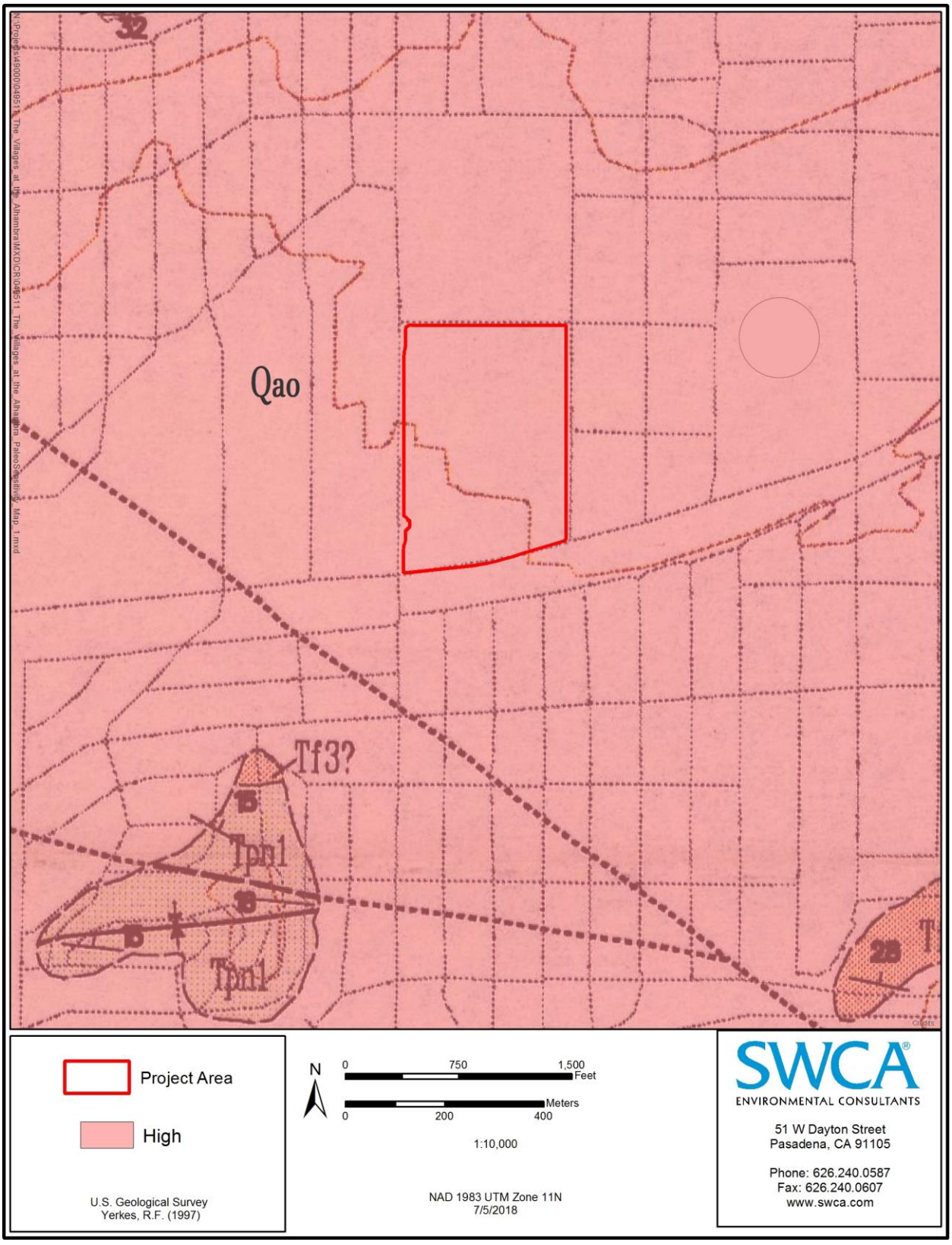

Figure 5. Paleontological sensitivity of the project area and vicinity.

8 RECOMMENDATIONS

To demonstrate CEQA compliance, a response is required to the following question in the Environmental Checklist, based on the results of the paleontological analysis: "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" With the implementation of the following recommendations, construction associated with the project will be mitigated against directly or indirectly destroying unique paleontological resources or sites or unique geologic features. The intent of these recommendations is to ensure that potential adverse impacts to paleontological resources as a result of project implementation are reduced to a less-than-significant level.

The following mitigation measures have been developed in accordance with the SVP (2010) standards and meet the paleontological requirements of CEQA and the guidelines of the City of Los Angeles General Plan. Similar mitigation measures have been used throughout California and have been successful in protecting paleontological resources while allowing timely completion of construction.

Pal-1: A Project Paleontologist (meeting SVP standards) will prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). This plan will address specifics of monitoring and mitigation and comply with the recommendations of the SVP (2010). The Project Paleontologist will also prepare a report of the findings of the monitoring plan after construction is completed.

Pal-2: The Project Paleontologist will develop a Worker's Environmental Awareness Program (WEAP) to train the construction crew on the legal requirements for preserving fossil resources as well as procedures to follow in the event of a fossil discovery. This training program will be given to the crew before ground-disturbing work commences and will include handouts to be given to new workers.

Pal-3: All ground disturbances in the project area that occur in previously undisturbed sediment will require monitoring. Monitoring should be conducted by a Paleontological Monitor meeting the standards of the SVP (2010) and under the supervision of the Project Paleontologist. The Project Paleontologist may periodically inspect construction activities to adjust the level of monitoring in response to subsurface conditions. Full-time monitoring can be reduced to part-time inspections or ceased entirely if determined adequate by the Project Paleontologist. Paleontological monitoring will include inspection of exposed sedimentary units during active excavations within sensitive geologic sediments. The monitor will 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. Paleontological Monitors will record pertinent geologic data and collect appropriate sediment samples from any fossil localities.

Pal-4: In the event of a fossil discovery, whether by the Paleontological Monitor or a member of the construction crew, all work will cease in a 15-m (50-foot) radius of the find while the Project Paleontologist assesses the significance of the fossil and documents its discovery. Should the fossil be determined significant, it will be salvaged following the procedures and guidelines of the SVP (2010). Recovered fossils will be prepared to the point of curation, identified by qualified experts, listed in a database to facilitate analysis, and deposited in a designated paleontological curation facility. The most likely repository is the LACM. A repository will be identified and a curatorial arrangement will be signed prior to collection of the fossils.

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Attachment A.
Natural History Museum of Los Angeles County
Records Search Results

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Paleontological resources can be damaged or destroyed through uncontrolled public disclosure of information regarding their location. This document contains sensitive information regarding the nature and location of paleontological sites that should not be disclosed to the general public or unauthorized persons and has been removed from publicly circulated drafts of this report.

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