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CULTURAL AND PALEONTOLOGICAL RESOURCES ASSESSMENT

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

CULTURAL AND PALEONTOLOGICAL RESOURCES ASSESSMENT MEMO FOR THE CANNON AND SERRANO INTERSECTION WIDENING PROJECT, CITY OF ORANGE, ORANGE COUNTY, CALIFORNIA

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Cogstone Project Number: 4703
Type of Study: Cultural and Paleontological Resources Assessment
Archaeological Sites: none
Paleontological Localities: 6 localities from the Sespe-Vaqueros Formation within ~ 1 mile
USGS Quadrangle: Orange 7.5'
Area: 3.17 acres
Key Words: Negative survey, cultural resources assessment, late Oligocene to early Miocene undifferentiated Sespe-Vaqueros Formation, Pleistocene to Holocene alluvial fans

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

SUMMARY OF FINDINGS

This study was conducted to determine the potential impacts to cultural and paleontological resources during the Cannon Street and Serrano Avenue Intersection Widening Project, City of Orange, California (Project). This memo report complies with the requirements of the California Environmental Quality Act (CEQA) with the City of Orange acting as lead agency.

The proposed Project will add a second dedicated right turn lane on northbound Cannon Street to eastbound Serrano Avenue as well as relocate a portion of the northerly curb on the westbound side of Serrano Avenue to widen the existing right turn lane to Cannon Street.

Project sediments include early Pleistocene to Holocene alluvial fans, and latest Oligocene to latest early Miocene undifferentiated Sespe-Vaqueros Formation sediments. Modern artificial fill is also likely present. The paleontological record search revealed six localities in the undifferentiated Sespe-Vaqueros Formation near the Project Area. Fossils of carnivore, skunk, rabbit, horse, peccary, oreodont, and camel have been recovered from these localities. No fossil localities are known from the Pleistocene deposits within a five-mile radius of the Project Area.

A search for cultural resources records of the Project Area and a one-mile radius was completed at the South Central Coastal Information Center (SCCIC) at the University of California, Fullerton on October 15, 2019. Results of the records search indicated that 23 cultural resources investigations have been completed previously within a one-mile radius of the Project Area, with one historical and three prehistoric cultural resources recorded within a one-mile radius of the Project Area. None of the previous investigations or finds are within the 2.91-acre Project Area.

An Assembly Bill (AB) 52 and a Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on October 29, 2019. On November 14, 2019, the NAHC indicated that a search of the SLF was completed with negative. The NAHC recommended contacting the Gabrieleno, Juaneño, Cahuilla, Diegueno, Luiseño, and Kumeyaay Groups for more information.

An intensive cultural and paleontological resources survey of the Project Area was completed on November 1, 2019. No archaeological or paleontological resources were observed.

If present, modern fill is assigned a very low potential for fossils (PFYC 1). The Pleistocene to Holocene alluvial fan sediments are assigned a low potential for fossils (PFYC 2) due to the lack of fossils in these deposits near the Project Area. Sediments of the latest Oligocene to latest early Miocene undifferentiated Sespe-Vaqueros Formation are assigned a moderate but patchy potential for fossils (PFYC 3a) due to similar deposits producing fossils near the Project Area.

Planned vertical impacts are as much as 18 feet deep into the Sespe-Vaqueros Formation. Based on fossils found in similar sediments nearby, paleontological monitoring is recommended for all impacts to the Sespe-Vaqueros Formation. If unanticipated fossil discoveries are made, all work must halt within 50 feet until an Orange County qualified paleontologist can evaluate the find. Work may resume immediately outside of the 50 foot radius.

Based on the results of the pedestrian survey and the cultural records search, the Project Area has low sensitivity for prehistoric cultural resources. Analysis of these data sources and historical United States Geological Survey (USGS) aerial photographs indicates that the Project Area also has low sensitivity for buried historical archaeological features such as foundations or trash pits. No further work is recommended.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it.

In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the vicinity of the find until all requirements of the health and safety code have been met.

INTRODUCTION

PURPOSE OF STUDY

This study was conducted to determine the potential impacts to cultural and paleontological resources during the Cannon Street and Serrano Avenue Intersection Widening Project, City of Orange, California (Project) (Figure 1). The proposed Project Area is located within the City of Orange (City) which is the lead agency under the California Environmental Quality Act (CEQA).

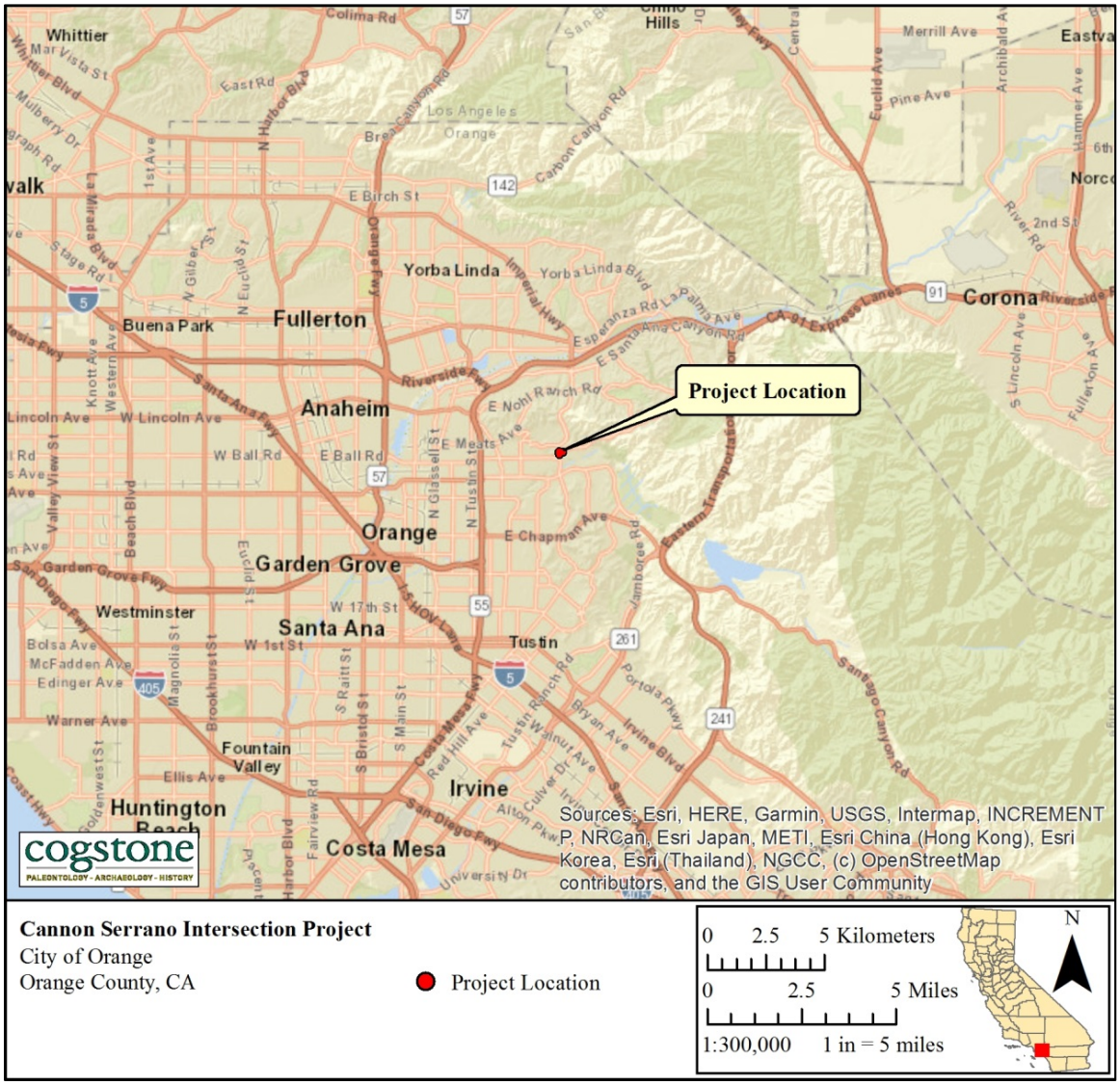

Figure 1. Project Vicinity Map

PROJECT LOCATION

The Project Area is located approximately 2.18 miles south of State Route 91 (SR-91), approximately 4.14 miles east of State Route 55 (SR-55), and 3.64 miles southwest of State Route 241 (SR-241). Cannon Street becomes Imperial Highway/State Route 90 (SR-90) approximately 1.07 mile north of the Project Area. Locally, the Project Area is located at the intersection of Cannon Street and Serrano Avenue.

The Project is located within Township 4 South, Range 9 West, Section 14 of the San Bernardino Base and Meridian. The Project Area is mapped on the United States Geological Survey (USGS) 7.5' Orange topographic map (Figure 2).

PROJECT DESCRIPTION

The Project will add a second dedicated right turn lane on northbound Cannon Street to eastbound Serrano Avenue as well as relocate a portion of the northerly curb on the westbound side of Serrano Avenue to widen the existing right turn lane to northbound Cannon Street by approximately 4 feet. The additional right-turn lane on Cannon Street will aid in accommodating the increase in right turn movements that have been observed in recent traffic data and analysis. The widening of Serrano Avenue is aimed at easing the bottleneck effect which occurs at peak traffic times when the two existing left turn lanes experience congestion. The widening will improve the circulation of the traffic turning right onto northbound Serrano. Associated construction improvements include a ten foot wide paved multi-use sidewalk on the east side of Cannon Street, relocation of traffic signals, curbs, gutters and utilities, and landscaping modifications. All proposed improvements are situated within existing roadway right-of-way and no property acquisition is proposed.

PROJECT AREA

The Project Area totals 3.17 acres (Figures 3 and 4). Most of the excavation will be on the eastern side of Cannon Street and may be up to 18 feet below the current ground surface. Cuts to the northern side of Serrano Avenue will be less than one foot.

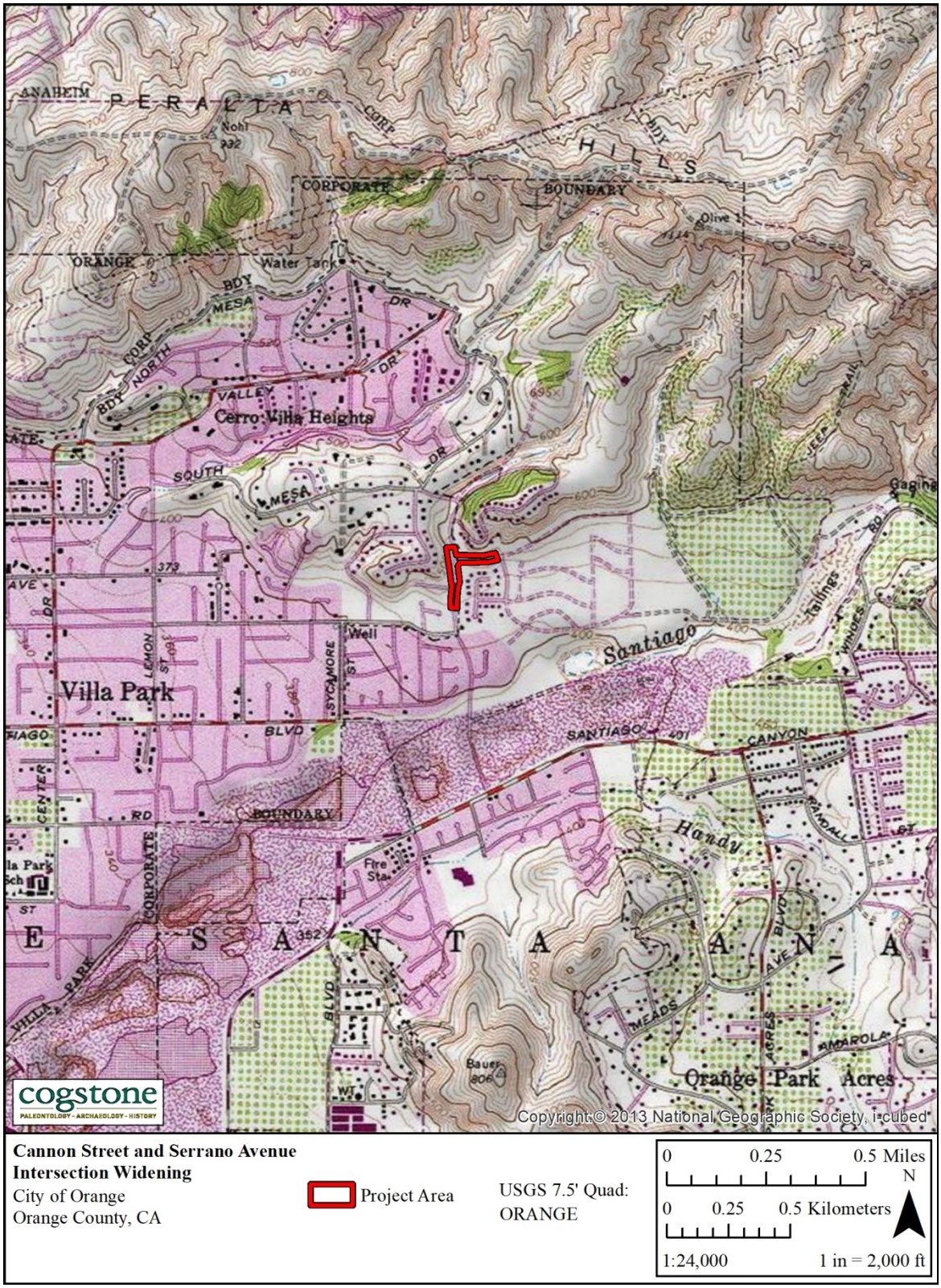

Figure 2. Project Location

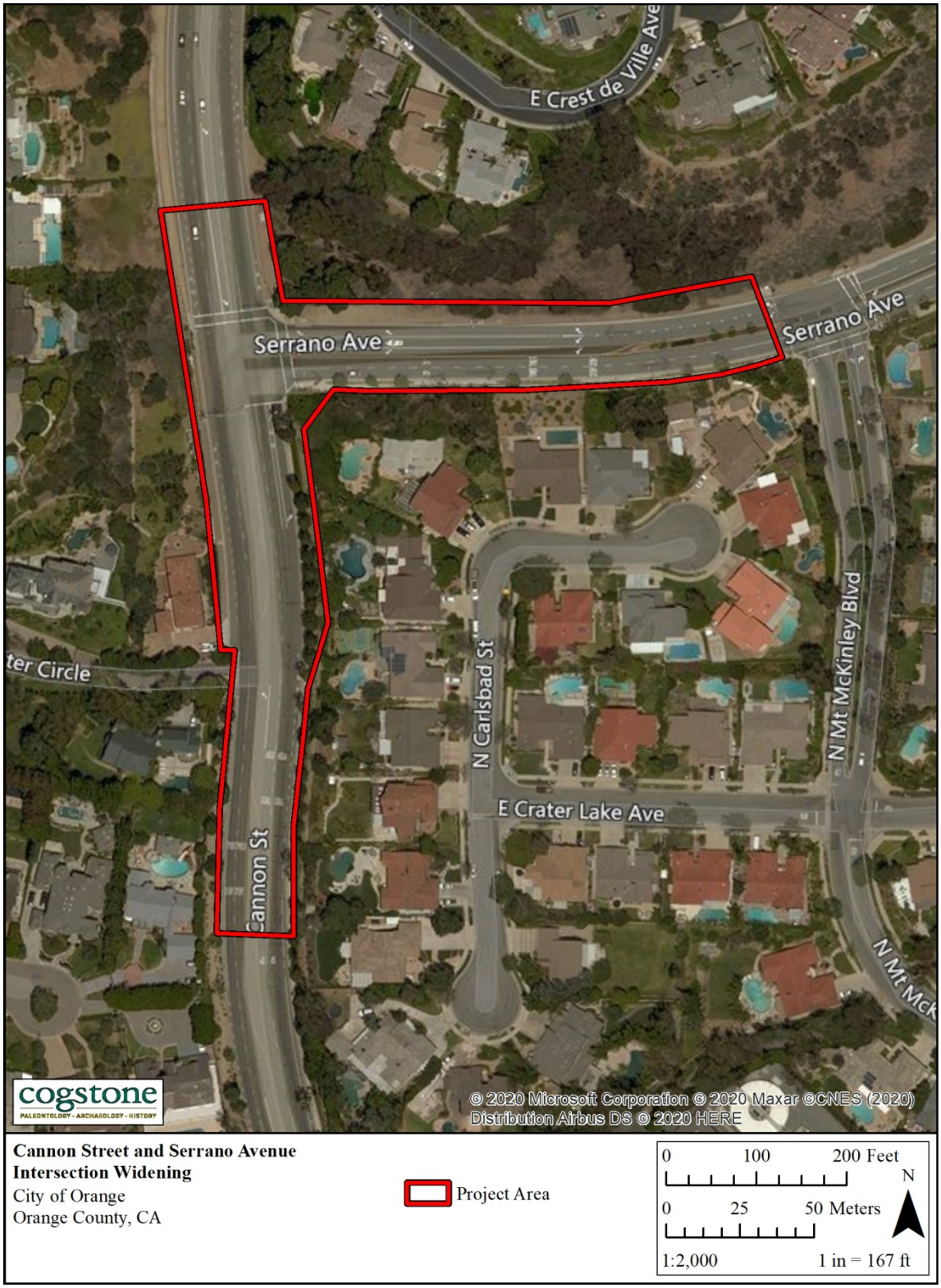

Figure 3. Project Area

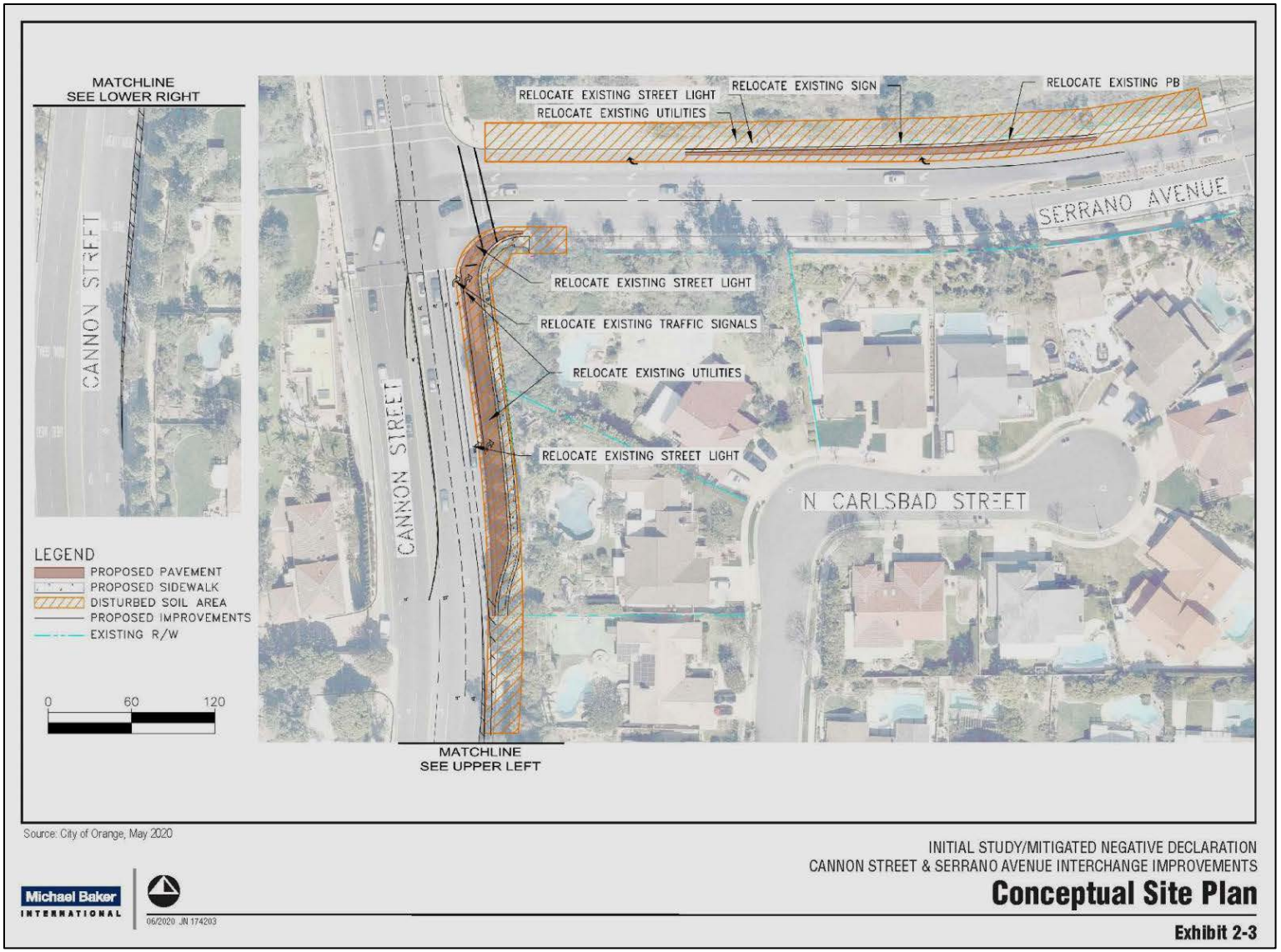

Figure 4. Conceptual Site Plan

PROJECT PERSONNEL

Cogstone conducted the cultural and paleontological resources study. Resumes of key personnel are provided in Appendix A.

- Desireé Martinez served as the Task Manager and Principal Investigator for Archaeology for this Project. Martinez has an M.A. in Anthropology (Archaeology), Harvard University, Cambridge, a B.S. in Anthropology, University of Pennsylvania, Philadelphia, is a Registered Professional Archaeologist (RPA) with over 22 years of experience in archaeology.

- Kim Scott served as the Principal Investigator for Paleontology for the Project and wrote the geological and paleontological portions of this report. Scott has an M.S. in Biology with paleontology emphasis from California State University, San Bernardino, a B.S. in Geology with paleontology emphasis from the University of California, Los Angeles, and over 24 years of experience in California paleontology and geology.

- Logan Freeberg conducted the paleontological record search and prepared the maps. Freeberg holds a B.A. in Anthropology from University of California, Santa Barbara, a GIS Certificate from California State University, Fullerton, and more than 15 years of experience.

- Sandy Duarte conducted the record search, field survey, and authored portions of this report. Duarte holds a B.A. in Anthropology, University of California, Santa Barbara, and more than 15 years of experience in archaeology.

BACKGROUND

The geologic, paleontological, and environmental sections below provides information on the environmental factors that affect cultural and paleontological resources.

GEOLOGIC SETTING

The Project Area is in the northern extent of the California Geomorphic Province known as the Peninsular Ranges. The Peninsular Ranges geomorphic province extends from Mount San Jacinto in the north, through the tip of Baja, Mexico in the south. Subparallel to these ranges on the east is the San Andreas Fault Zone. The northwestwards motion of the Pacific Plate has created these ranges and their corresponding valleys.

STRATIGRAPHY

The Project Area is mapped as late Pleistocene to Holocene (less than 126,000 years old) and early to middle Pleistocene (2.6 million years to 126,000 years old) alluvial fans. The undifferentiated Sespe-Vaqueros Formation sediments, deposited between 23 million and 16 million years ago (Ma) during the latest Oligocene to latest early Miocene, is also present (Morton and Miller 2006). Artificial fill is likely present in areas of previous construction (Figure 5).

Artificial fill, modern

Modern fill is frequently not mapped on geologic maps due to its ubiquitous nature. Although fill is typically less than a few feet thick, it can be substantially thicker in the areas of overpasses, freeways, and other large earthworks. Any fossils that may be encountered therein are not scientifically significant.

Young alluvial fan, late Pleistocene to Holocene

Alluvial fan deposits are deposited into our valleys from local mountains via the mouths of canyons. These sediments consist of unconsolidated to moderately consolidated, poorly sorted, permeable sands (Qya_a). Deposits are poorly consolidated and may be capped by poorly to moderately developed soils. These sediments were deposited by streams and rivers on canyon floors and in the flat flood plains of the area (Morton and Miller 2006).

Very old alluvial fan deposits, early to middle Pleistocene

These sediments are moderately to well indurated, silts to bouldery conglomerates, with slightly to moderately dissected fan surfaces. In much of Peninsular Ranges these sediments are moderately well indurated, orangish brown sand and silt with well dissected fan surfaces (Morton and Miller 2006). Clasts coarsen upstream with boulders up to several meters across being deposited near the mountains during flash floods

Undifferentiated Sespe-Vaqueros Formation, late Oligocene to late- early Miocene

These two formations interfinger in many areas of California. Sespe Formation sediments are generally coarser and redder than those of the Vaqueros Formation. The undifferentiated Sespe-Vaqueros Formation can reach thicknesses between 1,500 and 2,000 feet in the Santa Ana Mountains (McCulloch and Beyer 2004).

Sespe Formation

This red to grey, non-marine mudstone to conglomerate occurs as massive to thick bedded deposits with poorly developed bedforms (Eisentraut and Cooper 2002, Morton and Miller 2006). This terrestrial deposit includes fluvial, floodplain, and alluvial fan deposits. This formation also reflects a major drop in global sea levels (Eisentraut and Cooper 2002, McCulloch and Bayer 2004). Fossils of the late Uintan (middle Eocene - 44.5 Ma to 39.5 Ma) North American Land Mammal Age (NALMA) to latest Hemingfordian (middle Miocene ~17.5

Ma) NALMA are present within the Sespe Formation (Lander 1983, Lucas et al. 1997, Whistler and Lander 2003).

Vaqueros Formation

The shallow marine Vaqueros Formation occurs as greenish-gray to very dark gray, massive- to thick-bedded silty sandstone. Sandstone beds interfinger with thin-bedded siltstone and shale, mudstone, and minor conglomerate (Morton and Miller 2006, McCulloch and Bayer 2004). Deposition of the Vaqueros Formation began about 24 Ma and ended in most of the Los Angeles area between 17.5 Ma and 17.4 Ma based on the dating of volcanics, marine mollusks, benthic foraminifea, magnetic polarity stratigraphy, and other methods (Nagle and Parker 1971, Yerkes and Campbell 1979, Schoellhamer et al. 1981, Blake 1983, Mason and Swisher 1989, Nourse et al. 1998, Prothero et al. 1996, Lucas et al. 1997, Liddicoat 2001, McCulloch et al. 2001, Prothero and Donohoo 2001, McCulloch et al. 2002, Ludtke and Prothero 2003, Lander et al. 2003, Whistler and Lander 2003, McCulloch and Beyer 2004). The appearance of marine sediments after the non-marine Sespe Formation indicates rising global sea levels.

PALEONTOLOGICAL SETTING

The City has a complicated paleoenvironmental history which began at the end of the age of dinosaurs about 66 million years ago. During this time the City transitioned from coastal lowlands during the Paleocene and Oligocene, to shallow marine during the early Miocene, to deep marine during the early to early-late Miocene, back to shallow marine in the latest Miocene through the Pliocene, and finally to increasingly arid terrestrial deposits from the Pleistocene to the Holocene.

During the past 100,000 years or so, southern California's climate has shifted from the cooler and damper conditions of the last glacial period to the warmer and dryer conditions of the Holocene interglacial. While continental ice sheets covered the interior of northern North America, Orange County was ice free. Monterey cypress, Monterey pine (*Pinus radiata*), and Torrey pine grew in the Wilshire District of Los Angeles. Monterey cypress also grew in Costa Mesa. Today the most restricted conifers, Monterey cypress (*Hesperocyparis macrocarpa*) and Torrey pine (*Pinus* sp. cf. *P. torreyana*), only inhabit locations on the coasts with cool, moist summers characterized by abundant sea fog. These locations experience a mean summer high temperature of 70 ºF – 83 ºF (21.1 ºC - 28.3 ºC). Winters are cool and damp with average precipitation of 10.59" - 32.41" (26.90 cm - 82.32 cm). Cold water upwellings due to submarine canyons adjacent to the shore near the relict populations create these conditions (Intellicast 2014, Weather Channel 2014).

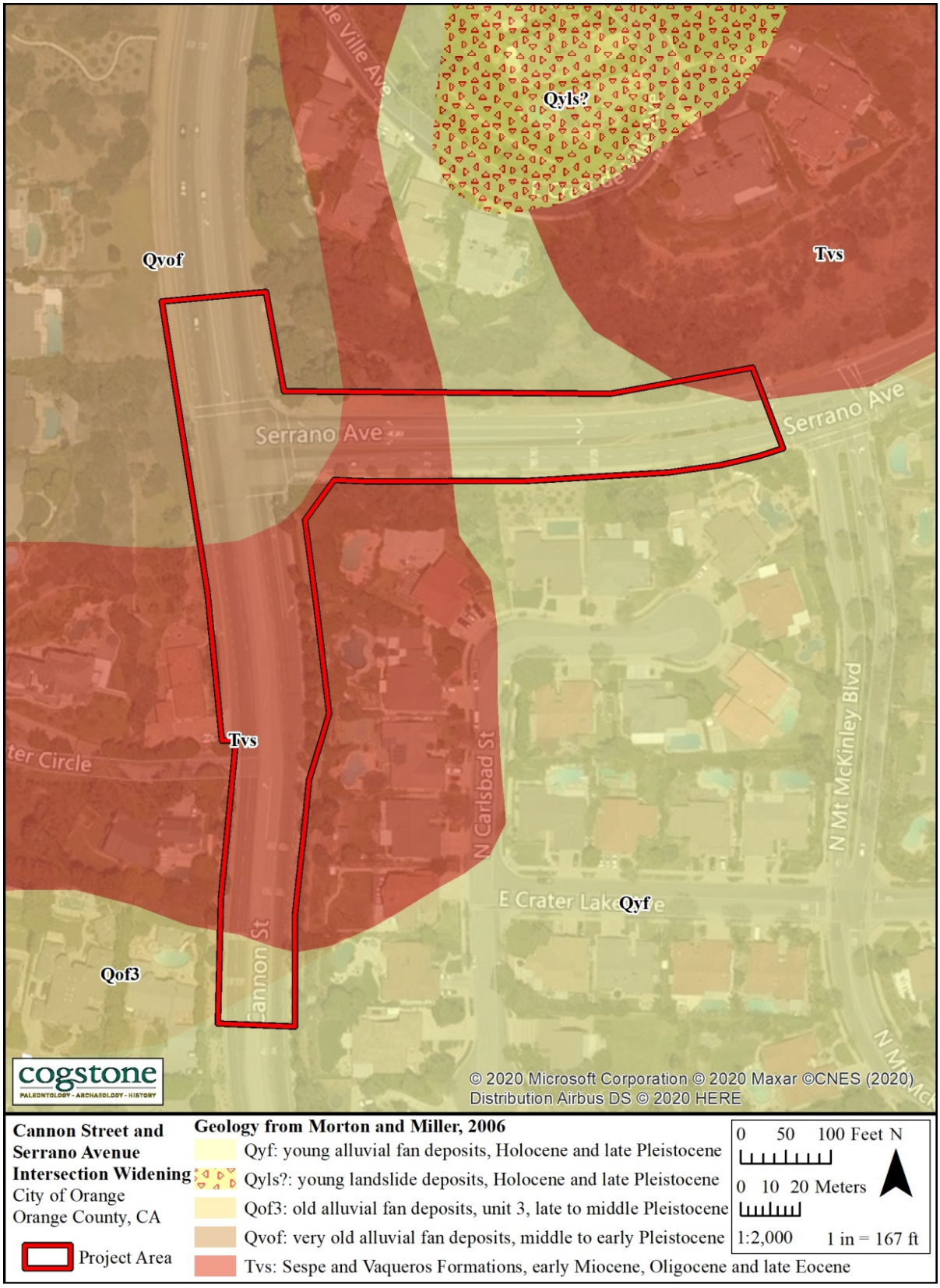

Figure 5. Project Geology

ENVIRONMENTAL SETTING

Located in Orange County, the City of Orange is situated in the northeastern portion of the Tustin Plain. The Santa Ana River flows southwest through the City to the Pacific Ocean. The Santa Ana Mountains, a north-south trending range, and the Cleveland National Forest lie to the east of the City.

The native vegetation consisted of coastal sage scrub but this has largely been removed. Characteristic species of the California coastal sage scrub include California sagebrush (*Artemisia californica*), coyote brush (*Baccharis pilularis* var. *consanguinea*), California buckwheat (*Eriogonum fasciculatum*), lemonade berry (*Rhus integrifolia*), poison oak (*Toxicodendron diversiloba*), purple sage (*Salvia leucophylla*), and black sage (*Salvia mellifera*; Ornduff et al. 2003). Additional common species include brittlebush (*Encelia californica*), chamise (*Adenostoma fasciculatum*), white sage (*Salvia apiana*), Our Lord's candle (*Hesperoyucca whipplei*), and prickly pear cactus (*Opuntia*; Hall 2007).

Modern vegetation in this portion of Orange County includes grasslands and California coastal sage scrub with non-native species such as Russian thistle mixed in. Eucalyptus trees planted at home-sites throughout California dating to the turn-of-the-century were noted in the area. Native fauna of the region includes mule deer (*Odocoileus hemionus*), pronghorn (‡[1]*Antilocapra americana*), bobcat (*Lynx rufus*), mountain lion (*Felis concolor*), coyote (*Canis latrans*), rabbits (*Lepus californicus, Sylvilagus audubonii, Sylvilagus bachmani*), desert tortoise (*Gopherus agassizii*), and numerous other species.

The climate of the Project Area is Mediterranean, ranging from cool, moist winters to dry, hot summers. Mild breezes reach the area from the Pacific Ocean, located west of the Project Area.

LITERATURE REVIEW AND RECORD SEARCHES

PALEONTOLOGICAL RECORD AND LITERATURE SEARCHES

A search for paleontological records was completed by the Natural History Museum of Los Angeles County (LACM; McLeod 2019; Appendix B). Published literature, unpublished paleontological reports, and online databases were also searched for fossil records. Databases included the Natural History Museum of Los Angeles County Invertebrate Paleontology (LACMIP 2019), the Paleobiology Database (PBDB 2019), the San Diego Museum of Natural

[1] ‡ indicates that the species has been from the area.

History (SDNHM 2019), and the University of California Museum of Paleontology (UCMP 2019). Formations are discussed from youngest to oldest.

HOLOCENE AND PLEISTOCENE DEPOSITS

The artificial fill and Holocene sediments do not contain fossil resources due to their age, by nature of their formation, or paleoenvironment. A burn test was performed on two potentially Pleistocene specimens reported by McLeod (2017, 2019). Both the sheep (*Ovis* sp.) recovered from Rio Vista Avenue south of Lincoln Avenue in Anaheim (LACM 1652) and the horse (*Equus* sp.) from Fletcher Avenue east of Glassell Street in Orange between 8 feet and 10 feet deep (LACM 4943) proved to be modern. As such both specimens are removed from consideration.

No other potentially Pleistocene fossils are known from within a five-mile radius of the Project. However, within Orange County Pleistocene terrestrial deposits have produced fossils of ground sloth, short faced bear, American lion, mammoth, mastodon, horses, ancient bison, shrews, reptiles, and amphibians.

SESPE AND VAQUEROS FORMATION

At least 2400 fossils of terrestrial animals and plants have been recovered from 122 localities in the undifferentiated Sespe-Vaqueros Formation in Orange County (OCPC 2019, Whistler and Lander 2003). These localities have produced fossils of canine, bear, weasel, rhinoceros, horse, peccary, pig-like artiodactyl, oreodont, camel, deer-like artiodactyl, musk deer, hedgehog, shrew, pika, rabbit, squirrel, rodent, opossum, and reptile.

Six localities are recorded by the LACM in the undifferentiated Sespe-Vaqueros Formation near the Project Area. Three localities from Santiago Canyon to the east of the Project Area have produced carnivore (†[2] Carnivora) and camel († Camelidae; LACM 5449 – 5451; McLeod 2019). Another three localities to the northeast in the Peralta Hills have produced skunk († Mustelidae), rabbit († Leporidae), horse († *Parahippus* sp.), peccary († Tayassuidae), oreodont († Merycoidodontidae), and camel († Camelidae; LACM 6927-6930; McLeod 2019).

Table 1. Fossils from the Sespe-Vaqueros Formation near the Project

Common Name	Taxon	Locality	Location	Reference
carnivore	† Carnivora	LACM 5449	northern side of Santiago Creek	McLeod 2019
camel	† Camelidae			
camel	† Camelidae	LACM 5450	western side of Santiago Creek	McLeod 2019
camel	† Camelidae	LACM 5451	northern side of Santiago Creek	McLeod 2019
skunk	† Mustelidae	LACM 6727-6930	Peralta Hills	McLeod 2019
rabbit	† Leporidae			
horse	† *Parahippus* sp.			
peccary	† Tayassuidae			
oreodont	† Merycoidodontidae			
camel	† Camelidae			

† = the only taxon that this could represent is extinct although the Family or Genus may still be extant

DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be 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 in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy. Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003, Scott et al. 2004).

CALIFORNIA HISTORIC RESOURCES INFORMATION SYSTEM

Cogstone archaeologist Sandy Duarte conducted a search of the California Historic Resources Information System (CHRIS) located at the South Central Coastal Information Center (SCCIC) at California State University, Fullerton on October 15, 2019. The records search included the entire proposed Project Area as well as a one-mile radius. Results of the record search indicate that 23 previous studies have been completed within one mile of the proposed Project Area (Table 2).

Table 2. Previous Cultural Studies within One Mile of Project Area

Report Number (OR-)	Author(s)	Title	Year
00123	Desautels, Roger J.	Archaeological Survey Report on 7.5 Acres of Land Located in the Orange Park Acres Area of the County of Orange	1976
00162	Desautels, Roger J.	Archaeological Survey Report on One Acre of Property Located in the Orange Park Acres Area of the County of Orange	1977
00163	Desautels, Roger J.	Archaeological Survey Report on Tentative Tract No. 9770- Seven Acres of Land Located in the Orange Park Acres Area of Orange County	1977
00405	Carrico, Richard L.	Archaeological Investigations at Phl-1, Orange, California	1977
00550	Neitzel, Jill	Report on Archaeological Record Search and Field Survey of the Diemer Pipeline	1977
00556	Cottrell, Marie G.	Archaeological Survey Report Approximately 70 Acre Area Located in Orange, Situated North of Bond Ave, East of Alameda St., South of the Santiago Creek, and West of Santiago Blvd., in Orange County	1976
00594	Greenwood, Roberta S.	Cultural Resource Overview for the Serrano Substation to Mira Loma Substation Transmission Route Alternatives Corridor Right-Of-Way	1980
00788	Bouscaren, Stephen	An Archaeological Assessment of the Proposed Valley-Serrano 500 kV Transmission Line Corridor, Orange and Riverside Counties, California	1985
00801	Langenwalter, Paul E. and James Brock	Phase II Archaeological Studies Prado Basin and the Lower Santa Ana River	1985
00913	Hatheway, Roger and Jeanette McKenna	An Intensive Archaeological Survey of the Dasco Project Area, City of Orange, Orange County, California	1988
00920	McKenna, Jeanette A.	An Archaeological Testing Program: The Dasco Site: CA-ORA-1172, Located in the City of Orange, Orange County, California	1988
00949	Brown, Robert S. and Marie G. Cottrell	Tentative Tract 13125: 195.3 Acre Parcel Located in the Peralta Hills, Orange County, California	1988
01116	Bissell, Ronald M.	Excavation of Archaeological Site CA-ORA-1273, Anaheim Hills/ Santiago Creek Area, Orange County, California.	1991
01420	McLean, Deborah K.	Cultural Resources Assessment Tentative Tract No. 14747 Orange California	1994
01635	Jertberg, Patricia R.	Phase I Historic Property Survey Report Serrano Heights City of Orange, Orange County, California	1997

Report Number (OR-)	Author(s)	Title	Year
01740	Brechbiel, Brant A.	Cultural Resources Records Search and Literature Review Report for a Pacific Bell Mobile Services Telecommunications Facility: Cm 388-11 in the City of Orange, California	1998
01965	Taylor, Tom and Theo Mabry	Test-level Investigation Conducted on CA-ORA-369 Orange County, CA	1979
02379	McKenna, Jeanette A.	A Cultural Resources Investigation of the Fieldstone Communities, Inc. Project Area in the City of Orange, Orange County, California	2000
03101	Bonner, Wayne H. and Christeen Taniguchi	Records Search and Site Visit Results for Cingular Telecommunications Facility Candidate Sc-464-01 (Cannon Road) 1425 North Santiago Boulevard, Orange, Orange County, California	2004
03463	Bonner, Wayne H. and Kathleen A. Crawford	Cultural Resource Records Search and Site Visit Results for T-Mobile Candidate Ie24016 (Serrano Water Dist.), Taft Avenue and Sycamore Street, Villa Park, Orange County, California	2007
03527	Wlodarski, Robert J.	Records Search and Field Reconnaissance for Proposed Bechtel Wireless Telecommunications Site OC0189, Villa Park ROW	2009
04090	Gust, Sherri and Veronica Harper	Archaeological Assessment of the Lemon Hill Recreational Trail, Villa Park, California	2008
04288	Maxon, Pat	Draft Initial Study/Mitigated Negative Declaration, Serrano Water District Walter E. Howiler, Jr. WFP and Wells #3 and #5 Modifications Project	2010

The records search also determined there are no previously recorded cultural resources located within the Project Area. However, five cultural resources are located within the one-mile radius. These include three prehistoric archaeological sites, one historical archaeological site, and one historic built environment resource (Table 3).

Table 3. Previously Recorded Cultural Resources within One Mile of Project Area

Primary No. (P-30)	Trinomial No. (CA-ORA-)	Resource Type	Resource Description	Year Recorded	NRHP/CRHR Status	HRI No.	Distance from PA (miles)
000369	000369	Prehistoric Site	Midden with lithic and shell scatter	1972	Unevaluated	None	0.25-0.5
001172	001172	Prehistoric Site	Midden with a lithic scatter	1988	Unevaluated	None	0..5-1
001273	001273	Prehistoric Site	Midden with a dense lithic scatter; ring of stones.	1991	Unevaluated	None	0.5-1
001686	001686H	Historic Archaeological Site	Concrete foundation	2008	Unevaluated	None	0.25-0.5
160083		Historic Built Environment Resource	Single family property, ranch house style, “Smith & Clark Brothers Ranch House,” 1881	1981	1D, 6X, 1S	136424, 136423, 136425, 136427, 039451	0.25-0.5

OTHER SOURCES

In addition to the SCCIC records search, a variety of sources were consulted in October 2019 to obtain information regarding the cultural context of the Project Area (Table 4). Sources included the National Register of Historic Places (NRHP), the California Register of Historic Resources (CRHR), California Historical Resources Inventory (CHRI), California Historical Landmarks (CHL), and California Points of Historical Interest (CPHI). Specific information about the Project Area was obtained from historic-era maps and aerial photographs (BLM GLO 2008, Historic Aerials 2019).

Table 4. Additional Sources Consulted

Source	Results
National Register of Historic Places (NRHP; 1979-2002 & supplements)	Negative
Historic USGS Topographic Maps	The earliest topographic map for the Project Area (PA) is the 1896 Anaheim 15' topographic map which shows no development within the PA. The 1942 Anaheim 15' topographic map shows dirt access roads developed on what would be Cannon Street and Serrano Avenue. The 1950 Orange 7.5' topographic map depicts a drainage in the same direction as Cannon Street. The 1956 Santa Ana 15' topographic map shows a mine just southeast of the PA. The 1964 Orange 7.5' topographic map shows vegetation in the PA, possibly agricultural fields. The 1965 Santa Ana 15' topographic map shows paved roads developed to the west of the PA. The 1974 Orange 7.5' Orthophoto quadrangle shows agricultural fields and dirt access road within the PA. The1981 Orange 7.5' topographic map shows a paved road developed within the PA as well as housing developments to the northeast, west, and southeast of the PA.
Historic US Department of Agriculture Aerial Photographs	The earliest historic aerial photograph dates to 1946 and shows agricultural fields and dirt access roads within the PA. No change in aerials until 1980, when the PA is developed with paved roads and a housing development.
California Register of Historical Resources (CRHR; 1992-2014)	Negative
California Historical Resources Inventory (CHRI; 1976-2014)	Negative
California Historical Landmarks (CHL; 1995 & supplements to 2014)	Negative
California Points of Historical Interest (CPHI; 1992 to 2014)	Negative

Source	Results
Bureau of Land Management (BLM) General Land Office Records	Positive: see Table 5

Table 5. BLM Land Patents

Name	Year	Aliquots T: 4S, R; 9W	Authority
Juan Pablo Peralta, Antonio Yorba, Bernardo Yorba, Heirs of Bernardo Yorba	1851	Total acres: 81855.69	Spanish Mexican Grant

HISTORIC SOCIETY CONSULTATION

Cogstone Architectural Historian Shannon Lopez consulted with the Orange County Archives and Orange Community Historical Society on October 28, 2019. Susan Berumen of Orange County Archives responded October 31, 2019, stating the Project Area in question was used solely as farmland.

NATIVE AMERICAN CONSULTATION

An Assembly Bill (AB) 52 and a Sacred Lands File (SLF) search was requested from the Native American Heritage Commission (NAHC) on October 29, 2019. On November 14, 2019, the NAHC indicated that a search of the SLF was completed with negative. The NAHC recommended contacting the Gabrieleno, Juaneño, Cahuilla, Diegueno, Luiseño, and Kumeyaay Groups for more information (Appendix C).

SURVEY

METHODS

The survey stage is an important part of the project's environmental assessment phase. All undeveloped ground surface areas within the ground disturbance portion of the Project Area were examined. Existing ground disturbances (e.g., cutbanks, ditches, animal burrows, etc.) were visually inspected. Photographs of the Project Area including ground surface visibility and items of interest were taken with a digital camera.

For paleontological resources, the purpose is to confirm that field observations conform to the geological maps of the Project Area. Sediments were assessed for their potential to contain fossils. Additionally, if there are known paleontological resources the survey will verify the

exact location of those resources, the condition or integrity of each resource, and the proximity of the resource to the Project Area.

For cultural resources, the purpose is to verify the exact location of each identified resource, the condition or integrity of the resource, and the proximity of the resource to areas of cultural resources sensitivity, if any. The surveyor searched for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools or fire-affected rock), soil discoloration that might indicate the presence of a cultural midden, soil depressions and features indicative of the former presence of structures or buildings (e.g., postholes, foundations), or historic-era debris (e.g., metal, glass, ceramics).

RESULTS

Cogstone archaeologist and cross-trained paleontologist Sandy Duarte surveyed the Project Area on November 1, 2019. Due to the heavily developed Project Area, the pedestrian survey consisted of 10-meter wide transects. Smaller 1-meter wide transects were utilized in the northern portion of Project Area along the base of the hill. Ground visibility within the Project Area was generally poor (less than 10 percent) due to hardscaping and/or landscaping (Figure 6). Where not landscaped, much of the area was covered in dry grass, weeds, eucalyptus trees, and California pepper trees (Figure 7). Some exposures of the undifferentiated Sespe-Vaqueros Formation were visible as was evident by its red color (Figure 8). All exposures of the alluvial fans had been hardscaped and/or landscaped. No archaeological or paleontological resources were observed within the Project Area during the survey.

Figure 6. Southeast Corner of Cannon Street towards Serrano Avenue, View North

Figure 7. Northwest Corner of Serrano Avenue and Mount McKinley Boulevard, View Southwest

Figure 8. North side of Serrano Avenue. Reddish Brown Sespe Formation Sediments

IMPACT ANALYSIS

PALEONTOLOGICAL SENSITIVITY

A multilevel ranking system was developed by professional resource managers within the Bureau of Land Management (BLM) as a practical tool to assess the sensitivity of sediments for fossils. The Potential Fossil Yield Classification (PFYC) system (BLM 2008; Appendix D) has a multi-level scale based on demonstrated yield of fossils. The PFYC system provides additional guidance regarding assessment and management for different fossil yield rankings.

Fossil resources occur in geologic units (e.g., formations or members). The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in and/or adjacent to the Project Area. The geological setting and the number of known fossil localities help determine the paleontological sensitivity according to PFYC criteria.

Sediments that are close to their basement rock source are typically coarse; those farther from the basement rock source are finer. The chance of fossils being preserved greatly increases once the average size of the sediment particles is reduced to 5 mm in diameter or less. Moreover, fossil preservation also greatly increases after natural burial in rivers, lakes, or oceans. Remains left on the ground surface become weathered by the sun or consumed by scavengers and bacterial activity, usually within 20 years or less. Thus, the sands, silts, and clays of rivers, lakes, and oceans are the most likely sediments to contain fossils.

Using the PFYC system, geologic units are classified according to the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts within the known extent of the geological unit. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment.

If present, modern fill is assigned a very low potential for fossils (PFYC 1). The lack of fossils from Pleistocene sediments near the Project Area indicates that sediments of this age locally have a low potential for fossils (PFYC 2). This includes both the late Pleistocene to Holocene alluvial fans and the early to middle Pleistocene alluvial fans. Sediments of the latest Oligocene to latest early Miocene undifferentiated Sespe-Vaqueros Formation are assigned a moderate but patchy potential for fossils (PFYC 3a) due to similar deposits producing fossils near the Project Area.

CULTURAL SENSITIVITY

Based on the results of the pedestrian survey and the cultural records search, the Project Area has low sensitivity for prehistoric cultural resources. Analysis of these data sources and historical USDA aerial photographs indicates that the Project Area also has low sensitivity for buried historical archaeological features such as foundations or trash pits. No further work is recommended.

CONCLUSIONS AND RECOMMENDATIONS

PALEONTOLOGY

Project sediments include modern fill, early Pleistocene to Holocene alluvial fans, and latest Oligocene to latest early Miocene undifferentiated Sespe-Vaqueros Formation. The record search revealed no fossil localities from within the Project Area or immediate vicinity, however localities are known from the same sediments as found within the area near the Project.

If present, modern fill is assigned a very low potential for fossils (PFYC 1). The Pleistocene to Holocene alluvial fan sediments are assigned a low potential for fossils (PFYC 2) due to the lack of fossils in these deposits near the Project Area. Sediments of the latest Oligocene to latest early Miocene undifferentiated Sespe-Vaqueros Formation are assigned a moderate but patchy potential for fossils (PFYC 3a) due to similar deposits producing fossils near the Project Area.

Planned vertical impacts are as much as 18 feet deep into the Sespe-Vaqueros Formation. Based on fossils found in similar sediments nearby, paleontological monitoring is recommended for all impacts to the Sespe-Vaqueros Formation. If unanticipated fossil discoveries are made, all work must halt within 50 feet until an Orange County qualified paleontologist can evaluate the find. Work may resume immediately outside of the 50 foot radius.

CULTURAL

No cultural resources were identified within the Project Area during survey or during any previous investigations. The CHRIS and SLF searches conducted in support of the Project indicate that no cultural or tribal resources have been previously recorded within the Project Area. These negative findings, in addition to those of desktop research, suggest that the potential for subsurface cultural resource deposits is low.

Based on the results of the pedestrian survey and the cultural records search, the Project Area has low sensitivity for prehistoric cultural resources. Analysis of these data sources and historical USDA aerial photographs indicates that the Project Area also has low sensitivity for buried historical archaeological features such as foundations or trash pits. No further work is recommended.

In the event of an unanticipated discovery, all work must be suspended within 50 feet of the find until a qualified archaeologist evaluates it.

In accordance with California Health and Safety Code Section 7050.5, the County Coroner must be notified if potentially human bone is discovered. The Coroner will then determine within two working days of being notified if the remains are subject to his or her authority. If the Coroner recognizes the remains to be Native American, he or she shall contact the Native American Heritage Commission (NAHC) by phone within 24 hours, in accordance with Public Resources Code Section 5097.98. The NAHC will then designate a Most Likely Descendant (MLD) with respect to the human remains. The MLD then has the opportunity to recommend to the property owner or the person responsible for the excavation work means for treating or disposing, with appropriate dignity, the human remains and associated grave goods. Work may not resume in the vicinity of the find until all requirements of the health and safety code have been met.

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APPENDIX A. QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

DESIREÉ RENEÉ MARTINEZ
Task Manager and Principal Investigator

EDUCATION

1999 M.A., Anthropology (Archaeology), Harvard University, Cambridge
1995 B.A., Anthropology, University of Pennsylvania, Philadelphia

SUMMARY QUALIFICATIONS

Ms. Martinez is a qualified archaeologist with 22 years of experience in archaeological fieldwork, research, and curation. She has expertise in the planning, implementation, and completion of all phases of archaeological work and has participated in archaeological investigations as a crew member, tribal monitor, and principal researcher. She meets national standards in archaeology set by the Secretary of Interior's *Standards and Guidelines for Archaeology and Historic Preservation* and the standards outlined in Attachment 1 to Caltrans Section 106 Programmatic Agreement with the FHWA. Her experience also includes compliance with CEQA, NEPA, NAGPRA, SB 18 and other cultural resource laws. In addition, Ms. Martinez has vast experience in lab analysis and museum collections management. Ms. Martinez also has extensive experience consulting with Native American leaders and community members in a variety of contexts.

SELECTED PROJECTS

I-10 Grove Avenue Interchange and Grove Avenue Corridor Improvements, Caltrans District 8, Ontario, San Bernardino County, CA. Managed literature and Sacred Lands searches, Native American consultation, pedestrian survey for the 22.6 acre APE and preparation of an Archaeological Survey Report (ASR) and Paleontological Identification Report (PIR) on behalf of the City. CEQA and NHPA Section 106 compliance. 2015-2017

SR 138 Crowder Canyon Realignment Data Recovery, Caltrans District 8, Hesperia, San Bernardino County, CA. Project Manager. The project involves realignment of a ~2-mile segment of SR 138 including construction of three bridges, one lane in each direction, drainage construction and demolition of the existing segment. Cogstone participated in data recovery at two archaeological sites. All work was performed in compliance with the Caltrans SER and NEPA, CEQA, and Section 106 of NHPA. Tasks included Native American coordination, manual and mechanical excavation, backfilling, and controlled destruction. 2016-2017

Longboat Solar Photovoltaic, EDF Renewable Energy, Barstow and Lenwood, San Bernardino County, CA. Project Manager/Principal Investigator. The project was construction of a new solar facility. Managed the cultural resources assessment including Phase I and Extended Phase I studies to support MND for this ~235-acre site. Managed archaeological monitoring, Native American coordination, Phase II testing, and was co-author of the treatment plan and compliance report. 2015-2017.

Fisher House and Golf Course, Veterans Affairs Long Beach Healthcare System, Long Beach, Los Angeles County, CA. Principal Investigator. The project was preconstruction testing and monitoring for two new constructions projects. In compliance with the Historic Property Treatment Plan preconstruction work included ground penetrating radar and magnetometry, truck mounted auger testing and mechanical excavation units. One historic refuse area was defined and recorded. Monitoring recovered additional cultural materials. Co-author of compliance reports. 2015-2017.

High Desert Corridor/ SR-138 Widening Project, Caltrans District 7 On-Call (07A3145)/LA Metro, Los Angeles and San Bernardino Counties, CA. Co-Principal Investigator. This project proposed by Caltrans and Metro involves construction of a new, approximately 63-mile long, east-west freeway/expressway and rail line between SR-14 in Los Angeles County and SR-18 in San Bernardino County. Phase II/III testing and data recovery at the three sites that will be directly impacted by the project. Analyzed lithic material. Compliance with Section 106 of the NHPA and CEQA are required. 2015.

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

KIM SCOTT
Principal Investigator for Paleontology

EDUCATION

2013 M.S., Biology with a paleontology emphasis, California State University, San Bernardino
2000 B.S., Geology with paleontology emphasis, University of California, Los Angeles

SUMMARY QUALIFICATIONS

Scott has more than 24 years of experience in California paleontology. She is a qualified geologist and field paleontologist with extensive survey, monitoring and fossil salvage experience. In addition, she has special skills in fossil preparation (cleaning and stabilization) and preparation of stratigraphic sections and other documentation for fossil localities. Scott serves as company safety officer and is the author of the company safety and paleontology manuals.

SELECTED PROJECTS

Coto de Caza EIR Subdivision, Coto de Caza, Orange County, CA. The project proposes the subdivision of an existing large estate for development of 28 new residential lots on approximately 50-57 acres of land. Proposed residential lots will be a minimum of one acre in size. Prepared a Paleontological Assessment Report. Contracted to Bill Lyon. Co-Principal Paleontologist/Report Co-author. 2015.

Little Corona, Newport Beach, Orange County, CA. The project is part of the Newport Coast Watershed Management Plan and proposes the diversion of water from Buck Gully Creek into a subsurface infiltration gallery in which the Creek water will be percolated through the sand in order to improve beach conditions. Prepared the Archaeological and Paleontological Assessment Report. Contracted to Michael Baker RBF. Co-Principal Paleontologist/Report Co-author. 2015.

Center Avenue, Huntington Beach, Orange County, CA. The project consisted of constructing an underground parking structure. Sub to Avalon Bay. Supervised archaeological and paleontological field work and prepared the Archaeological and Paleontological Monitoring report. Field and Laboratory Director/ Report Co-author. 2014.

Gene Autry Way, Caltrans District 12, Anaheim, Orange County, CA. Project consisted of extending Gene Autry Way westward from 2,400 feet east of Interstate 5 to Haster Street (6 lanes wide), widening approximately 1,575 feet of Haster Street (520 feet south of Katella Avenue to 600 feet north of Orangewood Avenue) from 4 to 6 lanes plus a center turn lane, and completion of the Gene Autry Way overpass. Prepared a Paleontological Monitoring Report. Contracted to C. C. Myers. Field and Laboratory Director/Report Co-author. 2011-2012.

State Route 57 Northbound Widening Project, Caltrans District 12/ Orange County Transportation Authority (OCTA), Fullerton, Orange County, CA. Caltrans widening to State Route 57 between Lambert and Yorba Linda Avenue. Supervised paleontological monitoring and prepared the Paleontological Monitoring report. Under contract to CC Myers. Field and Laboratory Supervisor/Report Co-author. 2011-2012.

Interstate 5 and Ortega Highway Interchange, San Juan Capistrano, Orange County, CA. The project consisted of reconfiguring the interchange. Sub to ECORP Consulting. Co-authored Paleontological Literature Review. Field and Laboratory Director/ Report Co-author. 2006.

Central Park West Project, Irvine, Orange County, CA. The project consisted of building a housing development with underground parking. Supervised archaeological and paleontological field work and co-authored the Archaeological and Paleontological Assessment and monitoring reports. Sub to Lennar Communities. Field and Laboratory Director/ Report Co-author. 2005-2010.

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

SANDY DUARTE
Archaeologist

EDUCATION

2002 B.A., Cultural Anthropology, University of California, Santa Barbara

SUMMARY QUALIFICATIONS

Ms. Duarte is an archaeologist and cross-trained in paleontology with over 15 years of experience in paleontological and archaeological monitoring, surveying, and excavation in southern California. Duarte has experience with Native American consultation as required by Section 106 of the National Historic Preservation Act (NHPA) and under Senate Bill 18 for the protection and management of cultural resources. Beginning in 2006, Duarte worked for the U.S. Forest Service in the Biology, Timber, and Geology Department as an archaeologist, including serving as a trained wild-land firefighter to preserve archaeological sites forest fires. Additional skills include paleontological identification, fossil preparation, artifact identification and preparation, and final report preparation.

SELECTED PROJECTS

Parkside Estates, City of Huntington Beach, Orange County, CA. The project consisted of an approximately 50-acre development. Services included monitoring during all excavations, identifying and collecting cultural artifacts, and Native American coordination with Juaneño and Gabrielino groups. LSA Associates. March 2016-September 2019

State Route 74 Improvements, Caltrans District 12, Orange County, CA. This project consisted of the widening of SR-74 and adding a shoulder lane. Duties included monitoring the installation of ESA fencing along culturally sensitive areas along SR-74 and widening of shoulder lane. LSA Associates. Archaeological Monitor. April-June 2018

Perris Gateway Commerce Center, City of Perris, San Bernardino County, CA. The proposed project included the demolition of existing uses at the project site and the construction and operation of a 380,000 square-foot high-cube warehouse to be constructed on 21.63 acres, 0.27 acres of which will be provided for purposes of street dedication, and the remainder of the site to be developed with 205,000 square feet of landscaping, 225 passenger vehicle parking stalls, 98 trailer parking stalls, and two detention basins. Conducted monitoring during all ground disturbing activities. Archaeological Monitor. March 2018

La Pata Avenue 1.8-mile Gap Closure and Camino del Rio Extension, Orange County Public Works, City of San Juan Capistrano, Orange County, CA. This project was a massive undertaking of 14.8 million cubic yards of earth material being removed. Duties included identifying and collecting groundstone artifacts in alluvium, and identifying and collecting fossils in bedrock. Ms. Duarte also prepared numerous pinniped fossils specimens with zip scribes. LSA Associates. Lead Archaeological Monitor. March 2014 - March 2017

Planning Area 40 East/East Rough Grading and Pipeline Trenching, Cities of Lake Forest and Irvine, Orange County, CA. LSA conducted paleontological resources monitoring for the rough grading of PA 40 East/East for the development of a new residential community. Ms. Duarte served as paleontological and archeological monitor during all earth-disturbing activities on site. LSA Associates. January-April 2016

On-Call Environmental Mitigation Program, OCTA, Orange County, CA. This project consisted of 6 open space properties and 11 restoration project areas selected for mitigation of impacts from the Measure M2 freeway program. Prior to any work taking place, each area had to have an environmental assessment to determine the presence of both historic and prehistoric resources. Duties included leading transects using ArcGIS on a smartphone and assisting in identifying and recording artifacts. LSA Associates. Lead Archaeological Monitor. March-June 2014

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

LOGAN FREEBERG
GIS Technician

EDUCATION

2018 Geographic Information Systems (GIS) Certificate, California State University, Fullerton
2003 B.A., Anthropology, University of California, Santa Barbara

SUMMARY QUALIFICATIONS

Mr. Freeberg has over 15 years of experience in cultural resource management and has extensive experience in field surveying, data recovery, monitoring, and excavation of archaeological and paleontological resources associated with land development projects in the private and public sectors. He has conducted all phases of archaeological work, including fieldwork, laboratory analysis, research, and reporting. Mr. Freeberg also has a strong grounding in conventional field and laboratory methods and is skilled in the use of ArcGIS.

SELECTED PROJECTS

Laguna Beach Fire Department Fire Breaks, City of Laguna Beach, Orange County, CA. This project included the areas adjacent to homes and businesses requiring vegetation removals to create new fire breaks. conducted a pedestrian survey of the natural landscape and slopes located along the eastern and western sides of the SR-133 highway, south of El Toro Road to Pacific Coast Highway. Archaeological monitor. 2019

Prime Deshecha Landfill Expansion, City of San Juan Capistrano, Orange County, CA. Assisted in the survey, data recovery and lab work for sites. Performed field STP and unit excavations, participated in post processing lab work cataloging recovered artifacts, and created fieldwork maps and report figures. Cultural Resources Analyst. 2018-2019

Avenida La Pata Extension, District 12, Cities of San Clemente and San Juan Capistrano, Orange County, CA. This project was initiated to construct a roadway to connect La Pata Avenue to Antonio Parkway San Juan Capistrano running through the Prima Deshecha Landfill. Served as a field technician for the preconstruction archaeological surveying and data recovery for this project, as well as the archaeological and paleontological monitoring of this project. Prepared numerous pinniped specimens with zip scribes. Technician & Monitor. 2014

Measure M2 Freeway Environmental Mitigation Program, Orange County, CA. This project consisted of 6 open space properties and 11 restoration project areas selected for the mitigation of impacts from the Measure M2 Freeway Environmental Mitigation Program. Lead Archaeologist. 2014

Planning Area 5B, City of Irvine, Orange County, CA. The project intended for the construction of residential housing for the Irvine Company. Performed a preconstruction archaeological survey, archaeological and paleontological monitoring, and prepared final survey report. Archaeologist/Co-Author. 2013

Southern California Gas (SCG) Line 85 and Line 225 Repair, unincorporated community of Los Angeles County, CA. SCG was repairing Line 85 and Line 225 pipelines (both 26-inch natural gas transmission lines that run through the Angeles National Forest). Mr. Freeberg was the lead archaeological and paleontological monitor and was in charge of the in-field cultural resource awareness training of all construction crew members working in the area. In addition, he monitored the work of the construction crew. Other duties included videotaping the Old Ridge Route (ORR) before and after construction activities, recording all vehicles that drove on and off the ORR, protecting the National Forest Inn, enforcing the speed limit on the ORR, enforcing the Transportation Plan, and ensuring that no damage was done to the ORR. Lead Archaeological & Paleontological Monitor/WEAP Trainer. 2007-2008, 2012-2013

APPENDIX B. PALEONTOLOGICAL RECORDS SEARCH

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

25 October 2019

Cogstone Resource Management, Inc.
1518 West Taft Avenue
Orange, CA 92865-4157

Attn: Logan Freeberg, GIS Technician

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed Cannon Serrano Intersection Project, Cogstone Project # 4703, in the City of Orange, Orange County, project area

Dear Logan:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Cannon Serrano Intersection Project, Cogstone Project # 4703, in the City of Orange, Orange County, project area as outlined on the portion of the Orange USGS topographic quadrangle maps that you sent to me via e-mail on 7 October 2019. We do not have any vertebrate fossil localities that lie directly within the proposed project area boundaries, but we do have localities nearby from the same sedimentary deposits that occur in the proposed project area, either at the surface or at depth.

Surficial sediments in the entire proposed project area consist of Quaternary terraces, derived as alluvial fan deposits from the more elevated terrain to the north and east via Santiago Creek that currently flows just south of the proposed project area. Our closest vertebrate fossil locality in Quaternary sediments is LACM 4943, west-northwest of the proposed project area in the City of Orange between the Newport Freeway (Highway 55) and the Santa Ana River near the intersection of Glassell Street and Fletcher Avenue, that produced fossil horse, *Equus*, at a depth of 8-10 feet below the surface, although it might be of Recent age.

Immediately to the west of the proposed project areas there are exposures of the marine middle Miocene Topanga Formation that may occur at relatively shallow depth in the proposed

project area. Our closest vertebrate fossil localities from the Topanga Formation are LACM 3891 and 4008-4009, all south-southeast of the proposed project area in the El Modena foothills, that produced fossil specimens of four-legged marine mammals, *Desmostylus*, sirenians, Dugongidae, and whales, Cetacea. Farther to the southeast of the proposed project area, along Santiago Canyon Road west of the Santiago Reservoir, our Topanga Formation locality LACM 6292 produced a fossil specimen of dog shark, *Mustelus*.

Immediately to the north of the proposed project area there are exposures of undifferentiated deposits of the Oligo-Miocene Sespe / Vaqueros Formations that have marine and non-marine components. These deposits may also occur at relatively shallow depth in the proposed project area. Just east-southeast of the proposed project area, on the north side of Santiage Creek, our locality LACM 5449 from these deposits produced fossil specimens of undetermined carnivore, Carnivora, and camel, Camelidae. Our localities LACM 5450, due east of the proposed project area on the western side of Santiago Creek, and LACM 5451, at the base of the hills east-northeast of the proposed project area, are also from the Sespe / Vaqueros undifferentiated Formations and produced fossil specimens of undetermined camel, Camelidae. Higher in elevation and just northeast of locality LACM 5451, northeast of the proposed project area in the lower reaches of the Peralta Hills, we have the additional vertebrate fossil localities LACM 6927-6930. These localities are all from the terrestrial facies of the Sespe / Vaqueros undifferentiated Formations and produced fossil specimens of skunk, Mustelidae, rabbit, Leporidae, horse, *Parahippus*, peccary, Tayassuidae, oreodont, Merycoidodontidae, and camel, Camelidae.

Any excavations in the exposures of the Quaternary terrace deposits, the Topanga Formation, or the undifferentiated Sespe / Vaqueros Formations, may well encounter significant fossil vertebrate remains. Any substantial excavations in the proposed project area, therefore, should be closely monitored to quickly and professionally collect any specimens without impeding development. Also, sediment samples should be collected and processed to determine the small fossil potential in the proposed project area. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

APPENDIX C. NATIVE AMERICAN CONSULTATION

Local Government Tribal Consultation List Request

Native American Heritage Commission

1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691
916-373-3710
916-373-5471-FAX
nahc@nahc.ca.gov

Type of List Requested

☒ **CEQA Tribal Consultation List (AB 52)** – ***Per Public Resources Code § 21080.3.1, subs. (b), (d), (e) and 21080.3.2***

☐ **General Plan (SB 18)** - ***Per Government Code § 65352.3.***

Local Action Type:

___ General Plan ___ General Plan Element ___ General Plan Amendment

___ Specific Plan ___ Specific Plan Amendment ___ Pre-planning Outreach Activity

Required Information

Project Title: Cannon Serrano Intersection Project

Local Government/Lead Agency: City of Orange

Contact Person: Ashley Brodkin, Associate Planner, Community Development Department

Street Address: 300 E Chapman Ave

City: Orange

Zip: 92866

Phone: 714-744-7238 Fax:

Email: abrodkin@cityoforange.org

Specific Area Subject to Proposed Action

County: Orange City/Community: Orange Project Description:

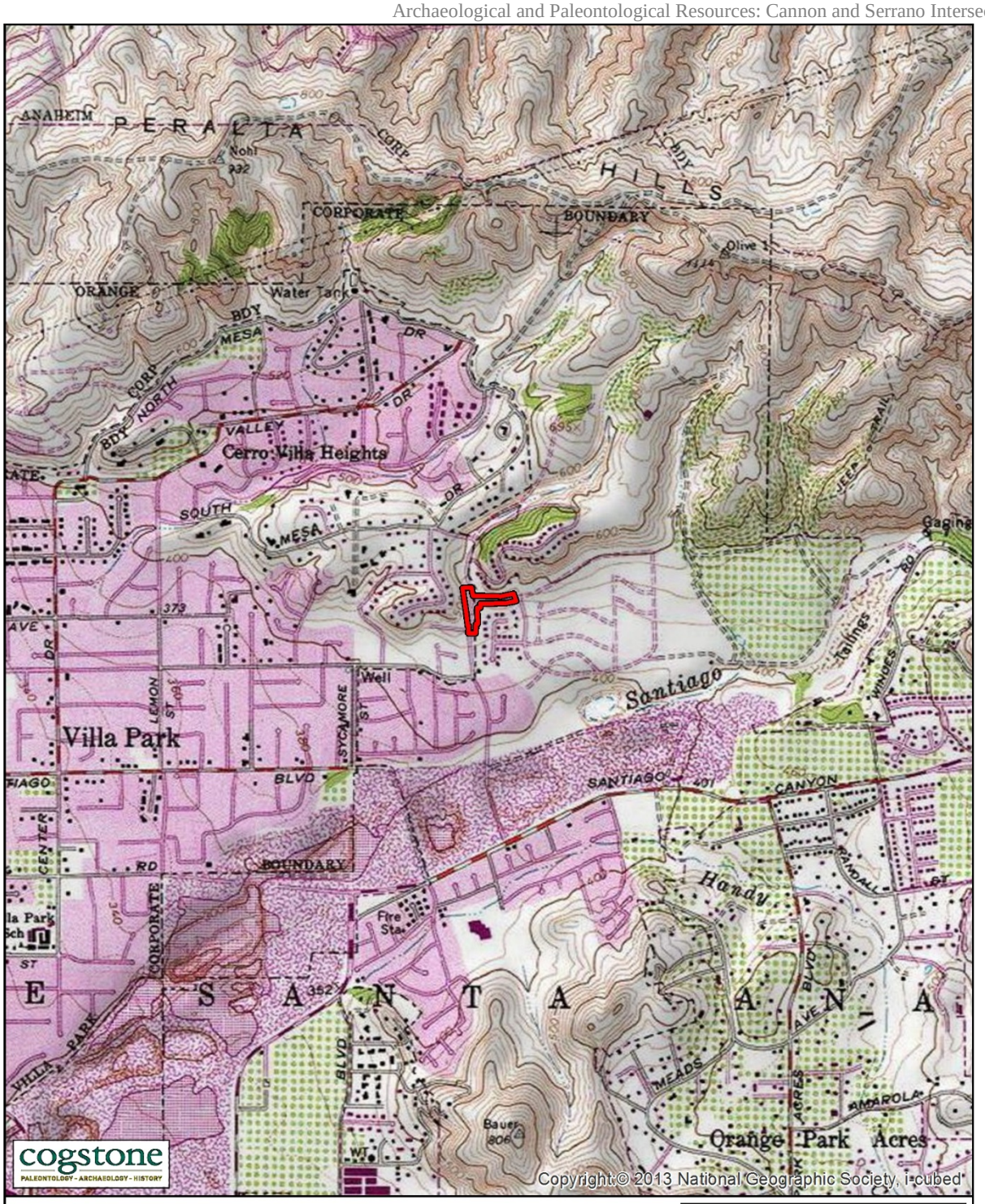
The project proposes to add a second dedicated right turn lane on northbound Cannon Street to eastbound Serrano Avenue, and to extend the right turn lane on the northbound side of Serrano Avenue to accommodate right-turn movements further east than the existing condition.

Additional Request

☒ **Sacred Lands File Search - *Required Information:***

USGS Quadrangle Name(s):____Orange 7.5'_____
_____

Township:_____4 South_____ Range:_____9 West_____
Section(s):_____14_____



Cannon Street and Serrano Avenue Intersection Widening
City of Orange
Orange County, CA

Project Area

USGS 7.5' Quad:
ORANGE

0 0.25 0.5 Miles
N
0 0.25 0.5 Kilometers
1:24,000 1 in = 2,000 ft

STATE OF CALIFORNIA **GAVIN NEWSOM, Governor**

NATIVE AMERICAN HERITAGE COMMISSION
Cultural and Environmental Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691 Phone: (916) 373-3710
Email: nahc@nahc.ca.gov
Website: http://www.nahc.ca.gov

November 14, 2019

Ashley

Brodkin City

of Orange

VIA Email to: abrodkin@cityoforange.org

RE: Native American Tribal Consultation, Pursuant to the Assembly Bill 52 (AB 52), Amendments to the California Environmental Quality Act (CEQA) (Chapter 532, Statutes of 2014), Public Resources Code Sections 5097.94 (m), 21073, 21074, 21080.3.1, 21080.3.2, 21082.3, 21083.09, 21084.2 and 21084.3, Cannon Serrano Intersection Project, Orange County

Dear Ms. Brodkin:

Pursuant to Public Resources Code section 21080.3.1 (c), attached is a consultation list of tribes that are traditionally and culturally affiliated with the geographic area of the above-listed project. Please note that the intent of the AB 52 amendments to CEQA is to avoid and/or mitigate impacts to tribal cultural resources, (Pub. Resources Code §21084.3 (a)) ("Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource.")

Public Resources Code sections 21080.3.1 and 21084.3(c) require CEQA lead agencies to consult with California Native American tribes that have requested notice from such agencies of proposed projects in the geographic area that are traditionally and culturally affiliated with the tribes on projects for which a Notice of Preparation or Notice of Negative Declaration or Mitigated Negative Declaration has been filed on or after July 1, 2015. Specifically, Public Resources Code section 21080.3.1 (d) provides:

> Within 14 days of determining that an application for a project is complete or a decision by a public agency to undertake a project, the lead agency shall provide formal notification to the designated contact of, or a tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, which shall be accomplished by means of at least one written notification that includes a brief description of the

proposed project and its location, the lead agency contact information, and a notification that the California Native American tribe has 30 days to request consultation pursuant to this section.

The AB 52 amendments to CEQA law does not preclude initiating consultation with the tribes that are culturally and traditionally affiliated within your jurisdiction prior to receiving requests for notification of projects in the tribe's areas of traditional and cultural affiliation. The Native American Heritage Commission (NAHC) recommends, but does not require, early consultation as a best practice to ensure that lead agencies receive sufficient information about cultural resources in a project area to avoid damaging effects to tribal cultural resources.

The NAHC also recommends, but does not require that agencies should also include with their notification letters, information regarding any cultural resources assessment that has been completed on the area of potential effect (APE), such as:

1. The results of any record search that may have been conducted at an Information Center of the California Historical Resources Information System (CHRIS), including, but not limited to:

- A listing of any and all known cultural resources that have already been recorded on or adjacent to the APE, such as known archaeological sites;

- Copies of any and all cultural resource records and study reports that may have been provided by the Information Center as part of the records search response;

- Whether the records search indicates a low, moderate, or high probability that unrecorded cultural resources are located in the APE; and

- If a survey is recommended by the Information Center to determine whether previously unrecorded cultural resources are present.

2. The results of any archaeological inventory survey that was conducted, including:

    - Any report that may contain site forms, site significance, and suggested mitigation measures.

    All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for public disclosure in accordance with Government Code section 6254.10.

3. The result of any Sacred Lands File (SLF) check conducted through the NAHC was negative.
4. Any ethnographic studies conducted for any area including all or part of the APE; and
5. Any geotechnical reports regarding all or part of the APE.

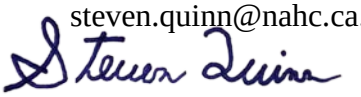
Lead agencies should be aware that records maintained by the NAHC and CHRIS are not exhaustive and a negative response to these searches does not preclude the existence of a tribal cultural resource. A tribe may be the only source of information regarding the existence of a tribal cultural resource.

This information will aid tribes in determining whether to request formal consultation. In the event that they do, having the information beforehand will help to facilitate the consultation process.

If you receive notification of change of addresses and phone numbers from tribes, please notify the NAHC. With your assistance, we can assure that our consultation list remains current.

If you have any questions, please contact me at my email address:

steven.quinn@nahc.ca.gov. Sincerely,



Steven Quinn

Associate Governmental

Program Analyst Attachment

Native American Heritage Commission
Tribal Consultation List
Orange County
11/14/2019

Agua Caliente Band of Cahuilla Indians
Jeff Grubbe, Chairperson
5401 Dinah Shore Drive
Palm Springs, CA, 92264
Phone: (760) 699 - 6800
Fax: (760) 699-6919
Cahuilla

Campo Band of Diegueno Mission Indians
Ralph Goff, Chairperson
36190 Church Road, Suite 1
Campo, CA, 91906
Phone: (619) 478 - 9046
Fax: (619) 478-5818
rgoff@campo-nsn.gov
Diegueno

Ewiiaapaayp Tribe
Robert Pinto, Chairperson
4054 Willows Road
Alpine, CA, 91901
Phone: (619) 445 - 6315
Fax: (619) 445-9126
wmicklin@leaningrock.net
Diegueno

Ewiiaapaayp Tribe
Michael Garcia, Vice Chairperson
4054 Willows Road
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Phone: (619) 445 - 6315
Fax: (619) 445-9126
michaelg@leaningrock.net
Diegueno

Gabrieleno Band of Mission Indians - Kizh Nation
Andrew Salas, Chairperson
P.O. Box 393
Covina, CA, 91723
Phone: (626) 926 - 4131
admin@gabrielenoindians.org
Gabrieleno

Gabrieleno/Tongva San Gabriel Band of Mission Indians
Anthony Morales, Chairperson
P.O. Box 693
San Gabriel, CA, 91778
Phone: (626) 483 - 3564
Fax: (626) 286-1262
GTTribalcouncil@aol.com
Gabrieleno

Gabrielino /Tongva Nation
Sandonne Goad, Chairperson
106 1/2 Judge John Aiso St., #231
Los Angeles, CA, 90012
Phone: (951) 807 - 0479
sgoad@gabrielino-tongva.com
Gabrielino

Gabrielino Tongva Indians of California Tribal Council
Robert Dorame, Chairperson
P.O. Box 490
Bellflower, CA, 90707
Phone: (562) 761 - 6417
Fax: (562) 761-6417
gtongva@gmail.com
Gabrielino

Gabrielino-Tongva Tribe
Charles Alvarez,
23454 Vanowen Street
West Hills, CA, 91307
Phone: (310) 403 - 6048
roadkingcharles@aol.com
Gabrielino

Jamul Indian Village
Lisa Cumper, Tribal Historic Preservation Officer
P.O. Box 612
Jamul, CA, 91935
Phone: (619) 669 - 4855
lcumper@jiv-nsn.gov
Diegueno

Jamul Indian Village
Erica Pinto, Chairperson
P.O. Box 612
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Phone: (619) 669 - 4785
Fax: (619) 669-4817
epinto@jiv-nsn.gov
Diegueno

Juaneno Band of Mission Indians
Sonia Johnston, Chairperson
P.O. Box 25628
Santa Ana, CA, 92799
sonia.johnston@sbcglobal.net
Juaneno

This list is current only as of the date of this document. Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and section 5097.98 of the Public Resources Code.

This list is only applicable for consultation with Native American tribes under Public Resources Code Sections 21080.3.1 for the proposed Cannon Serrano Intersection Project, Orange County.

Juaneno Band of Mission Indians Acjachemen Nation - Belardes
Matias Belardes, Chairperson
32161 Avenida Los Amigos — Juaneno
San Juan Capisttrano, CA, 92675
Phone: (949) 293 - 8522
kaamalam@gmail.com

Juaneno Band of Mission Indians Acjachemen Nation - Romero
Teresa Romero, Chairperson
31411-A La Matanza Street — Juaneno
San Juan Capistrano, CA, 92675
Phone: (949) 488 - 3484
Fax: (949) 488-3294
tromero@juaneno.com

La Jolla Band of Luiseno Indians
Fred Nelson, Chairperson
22000 Highway 76 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 3771

La Posta Band of Diegueno Mission Indians
Gwendolyn Parada, Chairperson
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
LP13boots@aol.com

La Posta Band of Diegueno Mission Indians
Javaughn Miller, Tribal Administrator
8 Crestwood Road — Diegueno
Boulevard, CA, 91905
Phone: (619) 478 - 2113
Fax: (619) 478-2125
jmiller@LPtribe.net

Manzanita Band of Kumeyaay Nation
Angela Elliott Santos, Chairperson
P.O. Box 1302 — Diegueno
Boulevard, CA, 91905
Phone: (619) 766 - 4930
Fax: (619) 766-4957

Mesa Grande Band of Diegueno Mission Indians
Michael Linton, Chairperson
P.O Box 270 — Diegueno
Santa Ysabel, CA, 92070
Phone: (760) 782 - 3818
Fax: (760) 782-9092
mesagrandeband@msn.com

Pala Band of Mission Indians
Shasta Gaughen, Tribal Historic Preservation Officer
PMB 50, 35008 Pala Temecula Rd. — Cupeno, Luiseno
Pala, CA, 92059
Phone: (760) 891 - 3515
Fax: (760) 742-3189
sgaughen@palatribe.com

Pauma Band of Luiseno Indians
Temet Aguilar, Chairperson
P.O. Box 369 — Luiseno
Pauma Valley, CA, 92061
Phone: (760) 742 - 1289
Fax: (760) 742-3422
bennaecalac@aol.com

Pechanga Band of Luiseno Indians
Mark Macarro, Chairperson
P.O. Box 1477 — Luiseno
Temecula, CA, 92593
Phone: (951) 770 - 6000
Fax: (951) 695-1778
epreston@pechanga-nsn.gov

Rincon Band of Luiseno Indians
Jim McPherson, Tribal Historic Preservation Officer
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
vwhipple@rincontribe.org

Rincon Band of Luiseno Indians
Bo Mazzetti, Chairperson
One Government Center Lane — Luiseno
Valley Center, CA, 92082
Phone: (760) 749 - 1051
Fax: (760) 749-5144
bomazzetti@aol.com

San Luis Rey Band of Mission Indians
San Luis Rey, Tribal Council
1889 Sunset Drive — Luiseno
Vista, CA, 92081
Phone: (760) 724 - 8505
Fax: (760) 724-2172
cjmojado@slrmissionindians.org

San Pasqual Band of Diegueno Mission Indians
Allen Lawson, Chairperson
P.O. Box 365 — Diegueno
Valley Center, CA, 92082
Phone: (760) 749 - 3200
Fax: (760) 749-3876
allenl@sanpasqualtribe.org

Soboba Band of Luiseno Indians
Scott Cozart, Chairperson
P. O. Box 487 — Cahuilla
San Jacinto, CA, 92583 — Luiseno
Phone: (951) 654 - 2765
Fax: (951) 654-4198
jontiveros@soboba-nsn.gov

Sycuan Band of the Kumeyaay Nation
Cody Martinez, Chairperson
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Fax: (619) 445-1927
ssilva@sycuan-nsn.gov

Viejas Band of Kumeyaay Indians
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Phone: (619) 445 - 3810
Fax: (619) 445-5337

APPENDIX D. PALEONTOLOGICAL SENSITIVITY RANKING CRITERIA

PFYC Description (BLM 2008)	PFYC Rank
Very Low. The occurrence of significant fossils is non-existent or extremely rare. Includes igneous or metamorphic and Precambrian or older rocks. Assessment or mitigation of paleontological resources is usually unnecessary.	1
Low. Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils. Includes rock units too young to produce fossils, sediments with significant physical and chemical changes (e.g., diagenetic alteration) and having few to no fossils known. Assessment or mitigation of paleontological resources is not likely to be necessary.	2
Potentially Moderate but Undemonstrated Potential. Units exhibit geologic features and preservational conditions that suggest fossils could be present, but no vertebrate fossils or only common types of plant and invertebrate fossils are known. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3b
Moderate Potential. Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered and of low abundance. Common invertebrate or plant fossils may be found. Surface-disturbing activities may require field assessment to determine appropriate course of action.	3a
High. Geologic units containing a high occurrence of significant fossils. Fossils must be abundant per locality. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability. If impacts to significant fossils can be anticipated, on-the-ground surveys prior to authorizing the surface disturbing action will usually be necessary. On-site monitoring or spot-checking may be necessary during construction activities.	4
Very High. Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils. Vertebrate fossils or scientifically significant invertebrate fossils are known or can reasonably be expected to occur in the impacted area. On-the-ground surveys prior to authorizing any surface disturbing activities will usually be necessary. On-site monitoring may be necessary during construction activities.	5