Appendix F –
Archaeological and Paleontological Resources Assessment Update
Prepared by Cogstone dated January 2013

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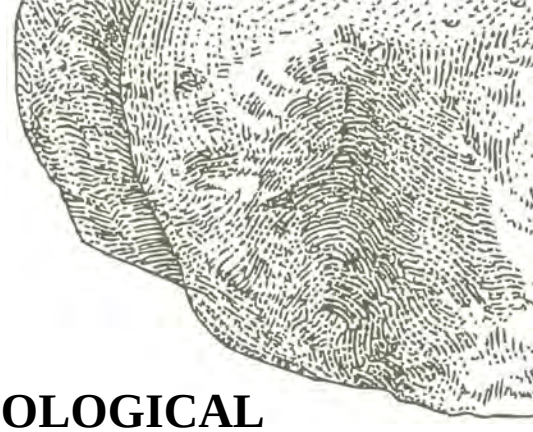
PALEONTOLOGY - ARCHAEOLOGY - HISTORY



ARCHAEOLOGICAL AND PALEONTOLOGICAL RESOURCES ASSESSMENT UPDATE FOR THE ESPERANZA HILLS PROJECT, UNINCORPORATED ORANGE COUNTY, CALIFORNIA

Prepared for:
Yorba Linda Estates, LLC

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Cogstone Project Number: 2530
Type of Study: Paleontological and archaeological assessment (Phase I) update
Fossil Localities: None
Archaeological Sites: None
USGS Quadrangle: Yorba Linda 1964, photorevised 1981, Prado Dam 1967, 1981
Area: 468.9 acres
Key Words: Monterey Formation, Sycamore Canyon Formation, Quaternary older alluvium, Quaternary alluvium, Quaternary Landslide Debris, Miocene, Pliocene, Pleistocene, Gabrielino/Tongva, historic ranching, historic oil industry use

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EXECUTIVE SUMMARY

The purpose of this study was to determine the potential effects on paleontological, archaeological and historic resources of the proposed Esperanza Hills Project in unincorporated Orange County, California. The project proposes to construct 340 single family residential units on 468.9 acres. The project will consist of a gate-guarded community with low density residential and estate lots. The project will retain approximately 230 acres of open space including undisturbed natural open space and landscaping as part of a fuel modification plan.

The eastern Puente Hills, also known as the Chino Hills, of the project area are comprised of middle Miocene to early Pliocene (16-3.6 million years old) marine sedimentary rock units overlain in some areas by Pleistocene Epoch (1.8 million to 10 thousand years old) terrestrial sediments. The project area is within the traditional tribal territory of the Gabrielino/Tongva.

No fossils are known within the project area or a one mile radius. Fossils are known nearby from some of the same rock units that occur in the project area. These include Miocene and Pliocene marine fishes in addition to marine mammals and plants. Pleistocene fossils of the last ice age are also known.

The archaeological and historical records search determined that there are no known cultural resources within the project area boundaries. A total of 18 cultural resources have been documented previously within a one-mile radius of the project area. Prehistoric resources number 16 and include 9 isolates and 7 sites. In addition a historic resource consisting of power lines, towers and a substation is known along with a historical archaeological resource consisting of remnants of pipes and basins of a cattle watering station. None of the previously-recorded resources were determined eligible for the National Register of Historic Places.

Native American consultation for this project was conducted in 2008. The Native American Heritage Commission reported no sacred lands known in the vicinity. The Commission recommended a dozen individuals or tribes be consulted for further information. Letters were sent to all in June 2008. Two responses were received. Neither offered specific information about resources within the project area but stated concerns about sensitivity and requested Native American monitoring.

An intensive pedestrian survey of the project area for archaeological and paleontological resources was conducted in 2008 and no resources were observed (Drover et al. 2008). Portions of five other surveys occurred on portions of the project; all with negative results.

Impact analysis determined that there is no evidence of historical resources, archaeological resources or human burials within the project boundaries. The project proposes to cut as deep as 200 feet below the current surface of hills. This deep cutting into Miocene formations known to produce significant vertebrate paleontological resources nearby has potential to adversely impact fossils that may contribute information new to science. Recommendations include an unanticipated cultural resources discovery protocol and a paleontological resources mitigation plan. Full implementation of the protocol and plan will reduce adverse impacts to an insignificant level.

INTRODUCTION

PURPOSE OF STUDY

The purpose of this study was to determine the potential effects on paleontological, archaeological and historic resources of the proposed Esperanza Hills Project in unincorporated Orange County, California (Figure 1). The study was requested by the County of Orange to meet their responsibilities as the lead agency under CEQA.

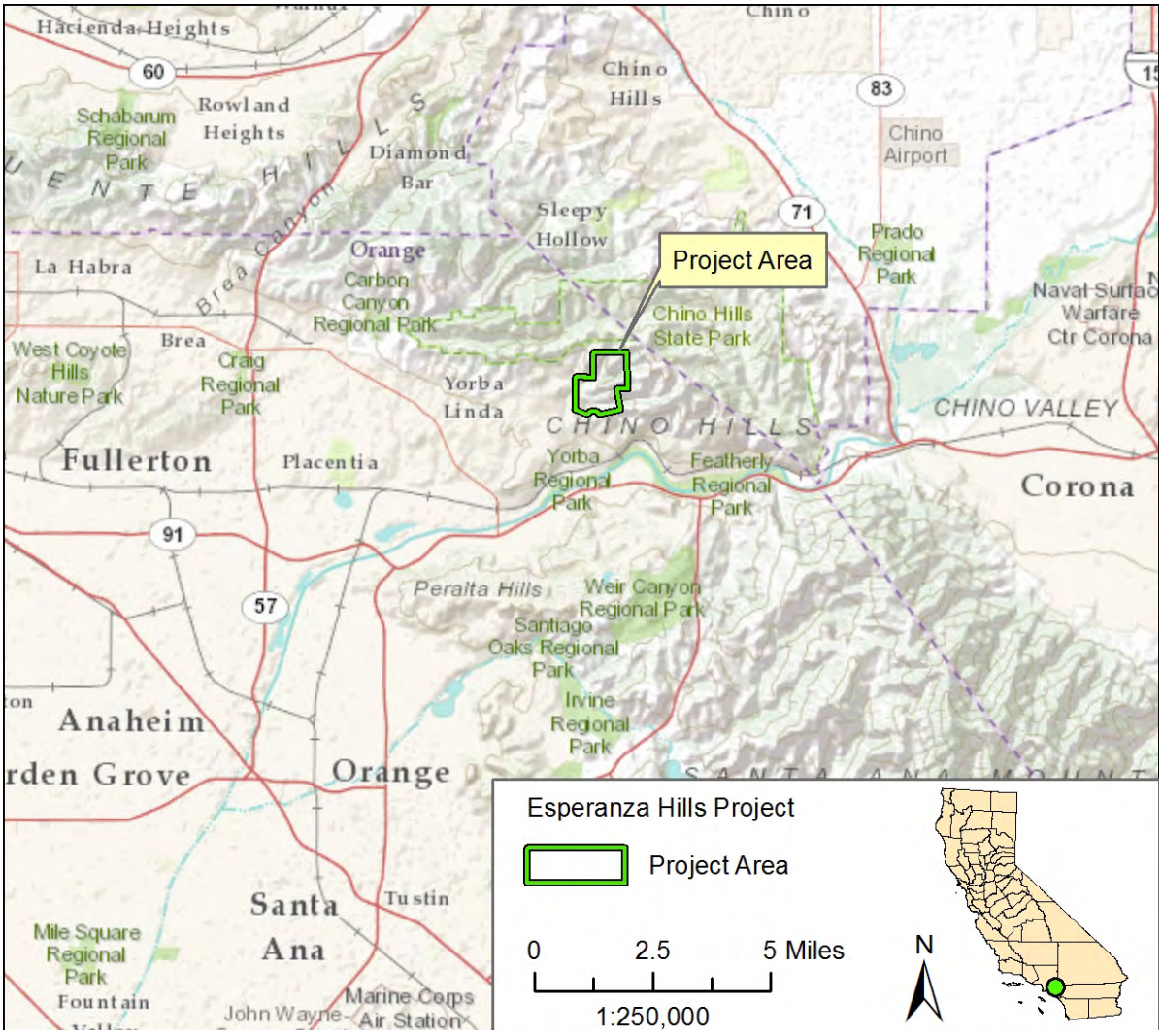

Figure 1. Project vicinity

PROJECT DESCRIPTION

The proposed project consists of approximately 468.9 acres of vacant land located north and east of the City of Yorba Linda in unincorporated Orange County. Chino Hills State Park is located to the north and east of the site (Figure 2). The proposed project is located on the Yorba Linda and Prado Dam 7.5 minute quadrangles in Sections 17, 18, 19, 20, Township 3S, Range 8W, San Bernardino Base and Meridian.

The Esperanza Hills Project proposes to construct 340 single family residential units on 468.9 acres (Figure 3). The project will consist of a gate-guarded community with low density residential and estate lots. Project components will include active and passive parks and approximately seven miles of trails. The trails will include pedestrian, bicycle and equestrian trails with linkages to permit non-vehicular access to the Chino Hills State Park and the surrounding open space areas. The project will retain approximately 230 acres of open space including undisturbed natural open space and landscaping as part of a fuel modification plan. As a private community, a Homeowners' Association will be formed to manage and maintain streets, landscaping, parks and other amenities.

Fuel modification areas have been identified and emergency access/evacuation plans have been defined in cooperation with the Orange County Fire Authority. Two underground water reservoirs will be constructed on the site and will provide water to gravity flow hydrants to fight fires. In addition, and in cooperation with the Yorba Linda Water District, adequate on- and off-site redundant water supply is being designed for normal residential and emergency use. Extensive water runoff and water quality treatment measures will be included in the project including the use of bio-retention basins.

Two options for access to the project have been proposed as follows:

> Option 1 - primary access via Stonehaven Road with emergency access through the adjacent Cielo Vista property via an easement with the property owner
>
> Option 2 - primary access via Aspen Way with emergency access on Stonehaven

The current General Plan Land Use designation for the property is Open Space (5) and the Zoning is A1 General Agriculture and A1 (O) General Agriculture/Oil Production. The proposed project would change the General Plan Land Use designation from Open Space (5) to Suburban Residential (1B) to allow for the 340 proposed residential units. In addition to a General Plan Amendment (GPA) a Specific Plan (SP) is proposed to replace the existing A1 (General Agriculture) and A1(O) (General Agriculture/Oil Production) zoning designations to regulate and guide development of the property. A Specific Plan (SP) for Esperanza Hills will include detailed development regulations and design guidelines and will serve as the policy document for future development.

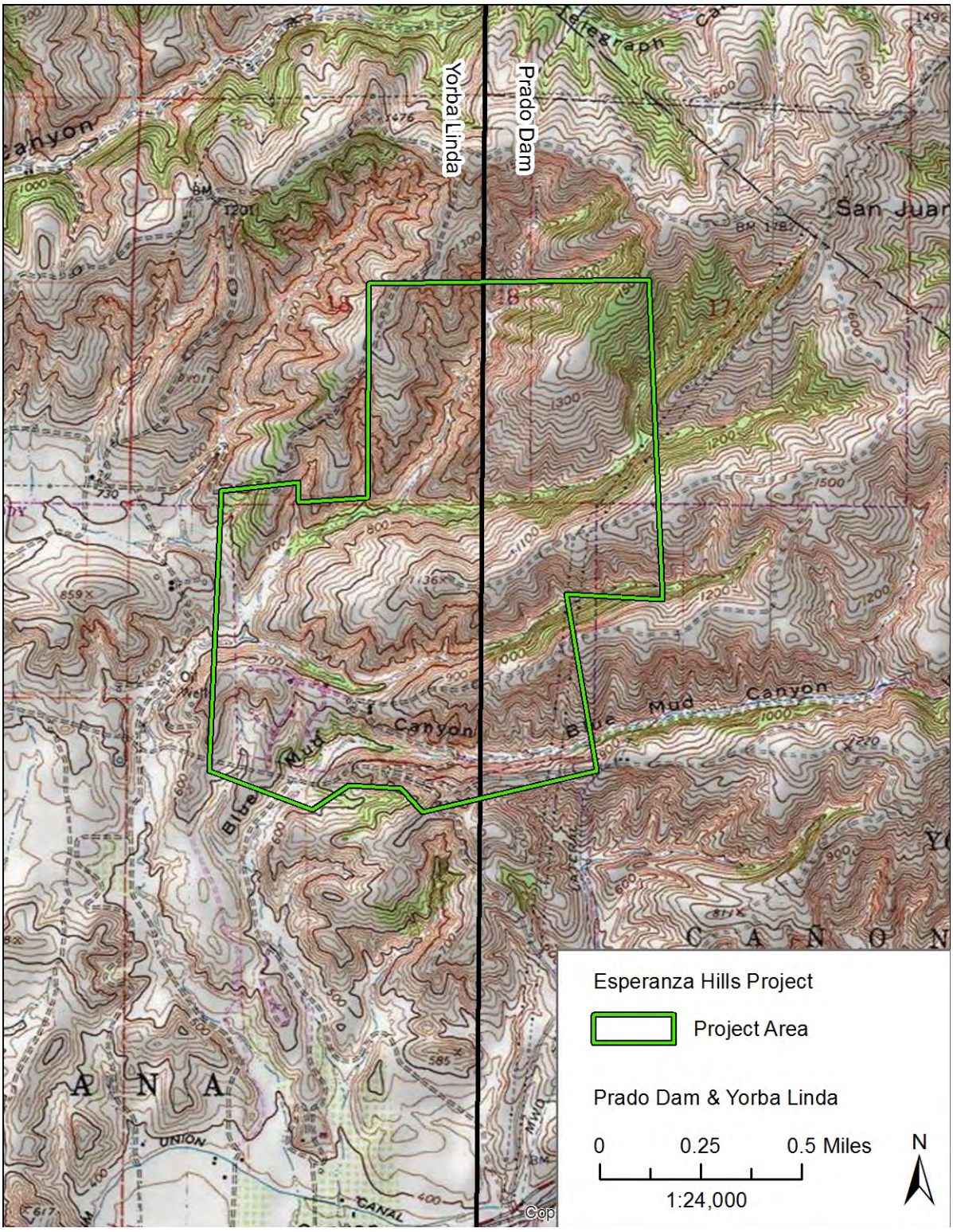

Figure 2. Project area

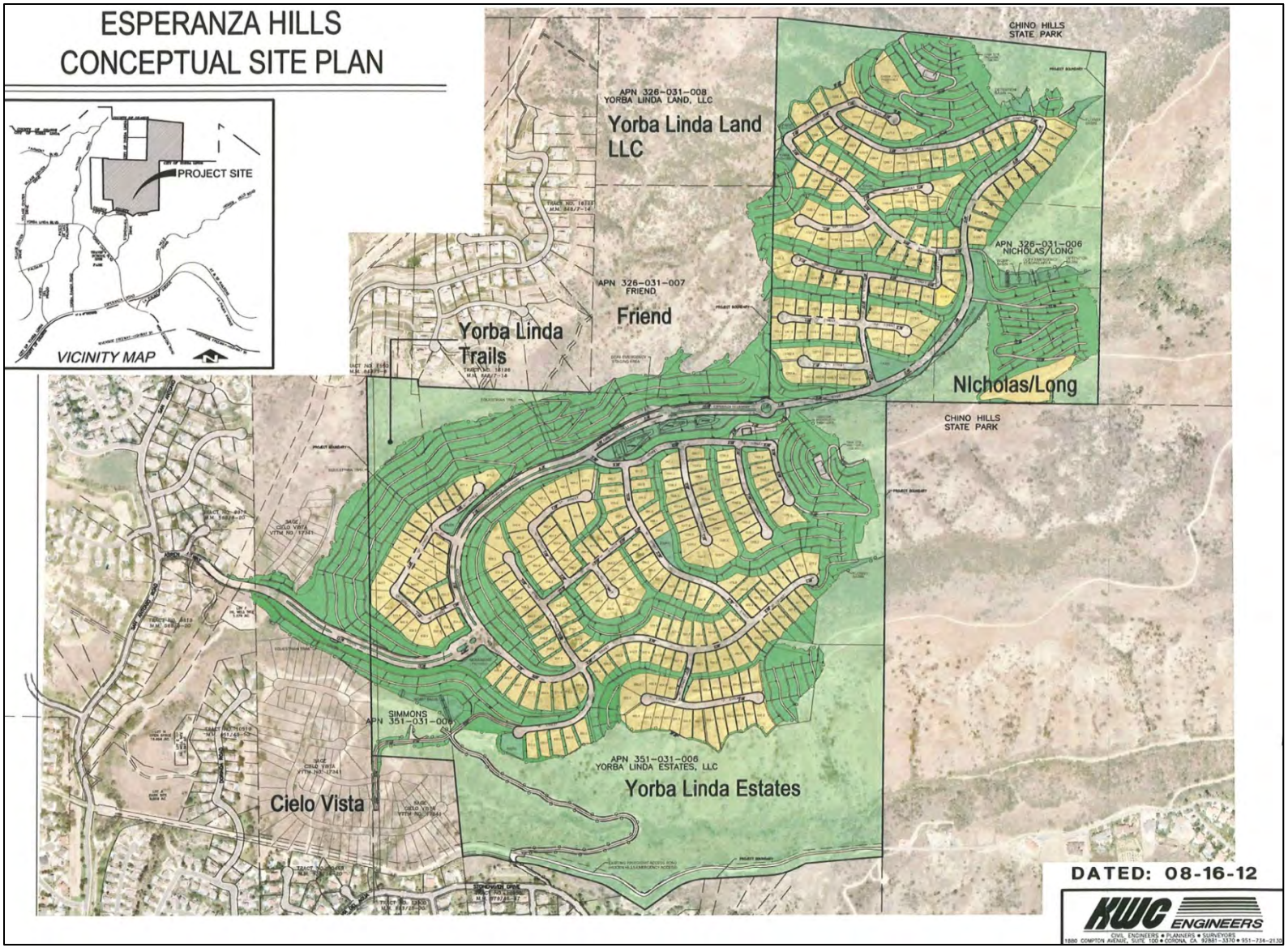

Figure 3. Esperanza Hills site plan

PROJECT PERSONNEL

Cogstone Resource Management Inc. (Cogstone) conducted the cultural resources studies. Sherri Gust served as the Principal Investigator for the project, conducted the updated survey, supervised all work, wrote portions of the paleontology sections, the prehistoric setting and the conclusions and recommendations. Gust is a Qualified Principal Paleontologist and Registered Professional Archaeologist. She has a M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California at Davis and over 30 years of experience in California.

Molly Valasik prepared the maps and wrote portions of the report. Valasik has a M.A. in Anthropology from Kent State University in Ohio and over four years of experience in Southern California archaeology. Julia Carajal performed the archaeological records search. She has a B.A. in Anthropology from California State Polytechnic University and over a year of experience in Southern California archaeology. Qualifications of key Cogstone personnel listed above are provided in Appendix A.

REGULATORY ENVIRONMENT

This project is subject to state and local regulations regarding archaeological and paleontological resources. The following discussion of applicable state laws has been excerpted and reordered from the California Department of Transportation's (Caltrans) on-line Environmental Handbook (http://www.dot.ca.gov/ser/envhand.htm); more specifically, this information summarizes the regulatory section of Volume 1, Chapter 8 on Paleontology (2012) and Exhibit 3 of Volume 2, Cultural Resources (2001).

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1970

CEQA declares that it is state policy to "take all action necessary to provide the people of this state with...historic environmental qualities." It further states that public or private projects financed or approved by the state are subject to environmental review by the state. All such projects, unless entitled to an exemption, may proceed only after this requirement has been satisfied. CEQA requires detailed studies that analyze the environmental effects of a proposed project. In the event that a project is determined to have a potential significant environmental effect, the act requires that alternative plans and mitigation measures be considered.

CEQA includes historic and archaeological resources as integral features of the environment. If paleontological resources are identified as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects.

CALIFORNIA REGISTER OF HISTORICAL RESOURCES

The register is listing of all properties considered to be significant historical resources in the state. The California Register includes all properties listed or determined eligible for listing on the National Register, including properties evaluated under Section 106, and State Historical Landmarks from No. 770 on. The criteria for listing are the same as those of the National Register. The California Register statute specifically provides that historical resources listed, determined eligible for listing on the California Register by the State Historical Resources Commission, or resources that meet the California Register criteria are resources which must be given consideration under CEQA (see above). Other resources, such as resources listed on local registers of historic registers or in local surveys, may be listed if they are determined by the State Historic Resources Commission to be significant in accordance with criteria and procedures to be adopted by the Commission and are nominated; their listing in the California Register is not automatic.

Resources eligible for listing include buildings, sites, structures, objects, or historic districts that retain historic integrity and are historically significant at the local, state or national level under one or more of the following four criteria:

1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2) It is associated with the lives of persons important to local, California, or national history;
3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition to having significance, resources must have integrity for the period of significance. The period of significance is the date or span of time within which significant events transpired, or significant individuals made their important contributions. Integrity is the authenticity of a historical resource’s physical identity as evidenced by the survival of characteristics or historic fabric that existed during the resource’s period of significance. Alterations to a resource or changes in its use over time may have historical, cultural, or architectural significance.

Simply, resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the California Register,

if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

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. Paleontological remains are recognized as nonrenewable resources significant to the history of life (Scott and Springer 2003).

BACKGROUND

GEOLOGICAL SETTING

The eastern Puente Hills, also known as the Chino Hills, of the project area are comprised of middle Miocene to early Pliocene (16-3.6 million years old) marine sedimentary rock units overlain in some areas by Pleistocene Epoch (1.8 million to 10 thousand years old) terrestrial sediments. Beginning about 23 million years ago, the ocean extended well past the modern shoreline and covered the project area (Figure 4). The Miocene and early Pliocene sediments were deposited as submarine fans (Figure 5) at bathyal (1000-4000 meters or 3,300-13,000 feet) depths (Rumelhart and Ingersoll 1997). Tectonic events about 5 million years ago including uplift of local mountains and subsidence of valleys resulted in withdrawal of the ocean and beginning of river and stream cutting of channels into the exposed sediments.

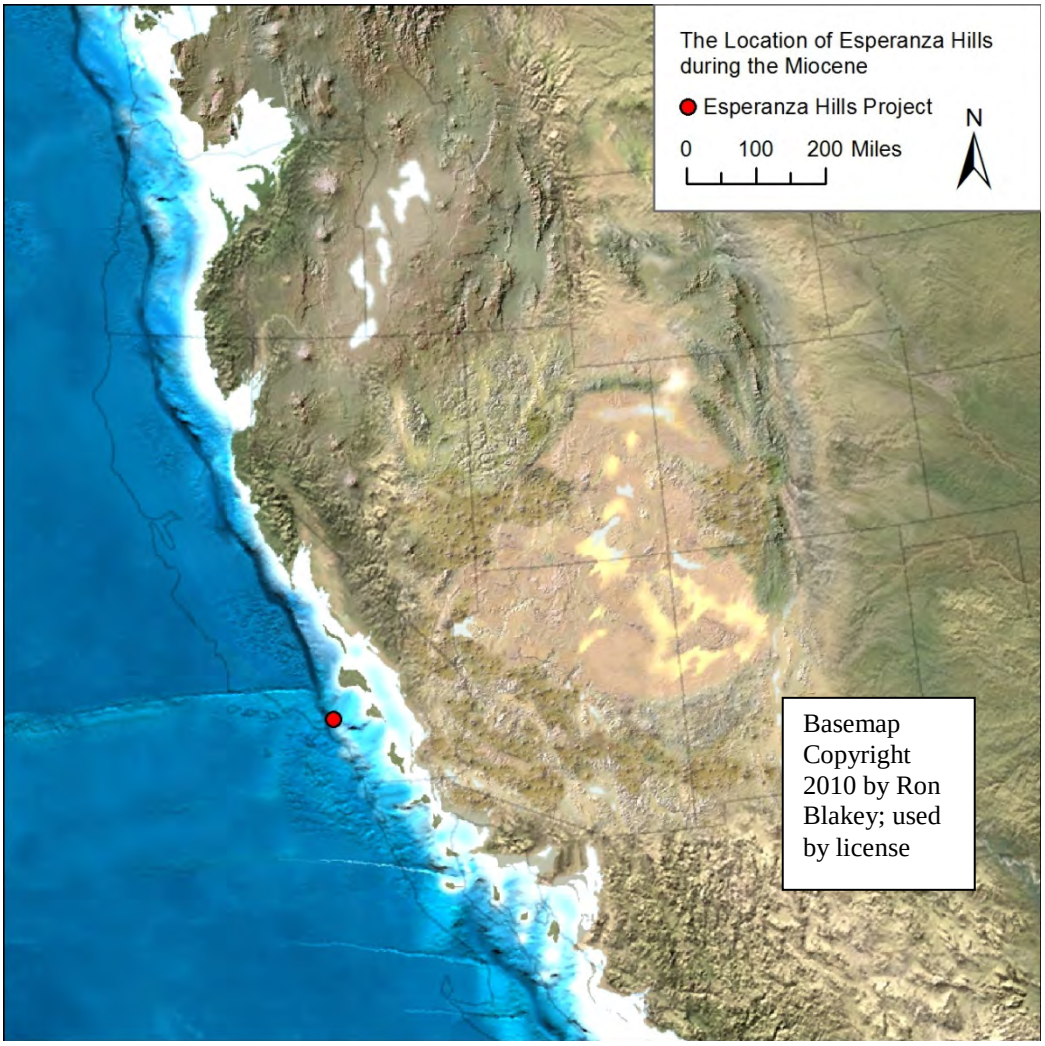

Figure 4. Miocene Paleoenvironment

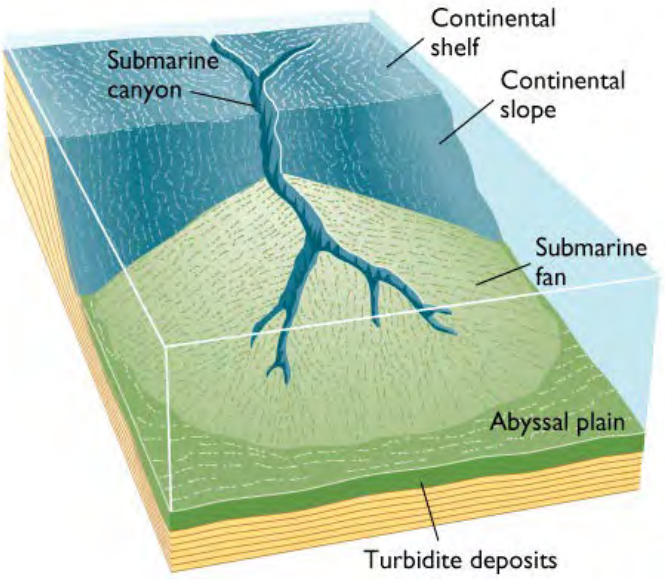

Figure 5. Submarine fan components

From
http://earth.geol.ksu.edu/sgao/g100/plots/

STRATIGRAPHY

The project area is mapped as mostly as Monterey Formation, with smaller components of Sycamore Canyon Formation, Quaternary Older alluvium, Quaternary alluvium and Quaternary landslide deposits (Dibblee 2001).

MONTEREY FORMATION

The lowest member of the Monterey Formation is the La Vida Member (Tmlv). The La Vida Member is exposed in the northern portion of the property (Figure 6). The La Vida is characterized by soft gray micaceous siltstone, hard, platy, locally laminated calcareous siltstone, and thin isolated beds of silty medium-grained sandstone (Durham and Yerkes 1964; Schoellhamer et al. 1981).

The Soquel Sandstone Member (Tmss) overlies the La Vida Member and primarily consists of thick sequences of biotite-bearing feldspathic sandstone and conglomerate, with occasional thin beds of shale and sandstone (Schoellhamer et al. 1981). This unit is exposed in the northern portion of the property (Figure 6).

Overlying the Soquel Sandstone Member is the Yorba Member (Tmy). The Yorba Member consists of thinly bedded and occasionally diatomaceous siltstone, with interbeds of sandstone and limestone (Schoellhamer etal. 1981). This unit is exposed in the central portion of the property (Figure 6). Durham and Yerkes (1964) and Schoellhamer et al. (1981) reported fish and

microfossils from this unit, the latter from which they deduced that the Yorba Member was deposited in water greater than 1,800 feet deep.

Dibblee (2001) recognized a clay shale facies (Tmc) and an unassigned sandstone (Tms) as units that crop out in the southeastern corner of the PSA, south of the Whittier Fault. The age and any fossils that might occur in these units are unknown.

SYCAMORE CANYON FORMATION

The Sycamore Canyon Formation (Tscs) is exposed at the surface in the southwestern portion of the property, south of the Whittier Fault. It is mostly moderately indurated marine clastic sediments (Dibblee 2001). In the project area, Dibblee (2001) describes the Sycamore Canyon Formation as coarse to fine-grained, arkosic, and occasionally conglomeratic. Schoellhamer et al. (1981) describe the basal Sycamore Canyon Formation as coarse-grained, poorly sorted, feldspathic, micaceous sandstone. Higher in the section, the Sycamore Canyon Formation is finer-grained, and contains interbeds of siltstone and sandy siltstone.

QUATERNARY OLDER ALLUVIUM

Pleistocene Epoch Quaternary Older Alluvium (Qoa) is mapped at the surface in the vicinity of the drainages (Figure 5). Analysis indicates that the alluvial sediments consist of decomposed Monterey and Sycamore Canyon Formation rocks of the local area (Dibblee 2001).

QUATERNARY ALLUVIUM

Holocene Epoch Quaternary alluvium (Qa) are surficial deposits in the southwestern portion of the project composed of alluvial gravel, sand, and silt (Dibblee 2001).

QUATERNARY LANDSLIDE DEBRIS

Holocene Quaternary landslide (Qls) sediments are comprised of mixed soil, rubble, and displaced bedrock blocks resulting from slope failure (Dibblee 2001).

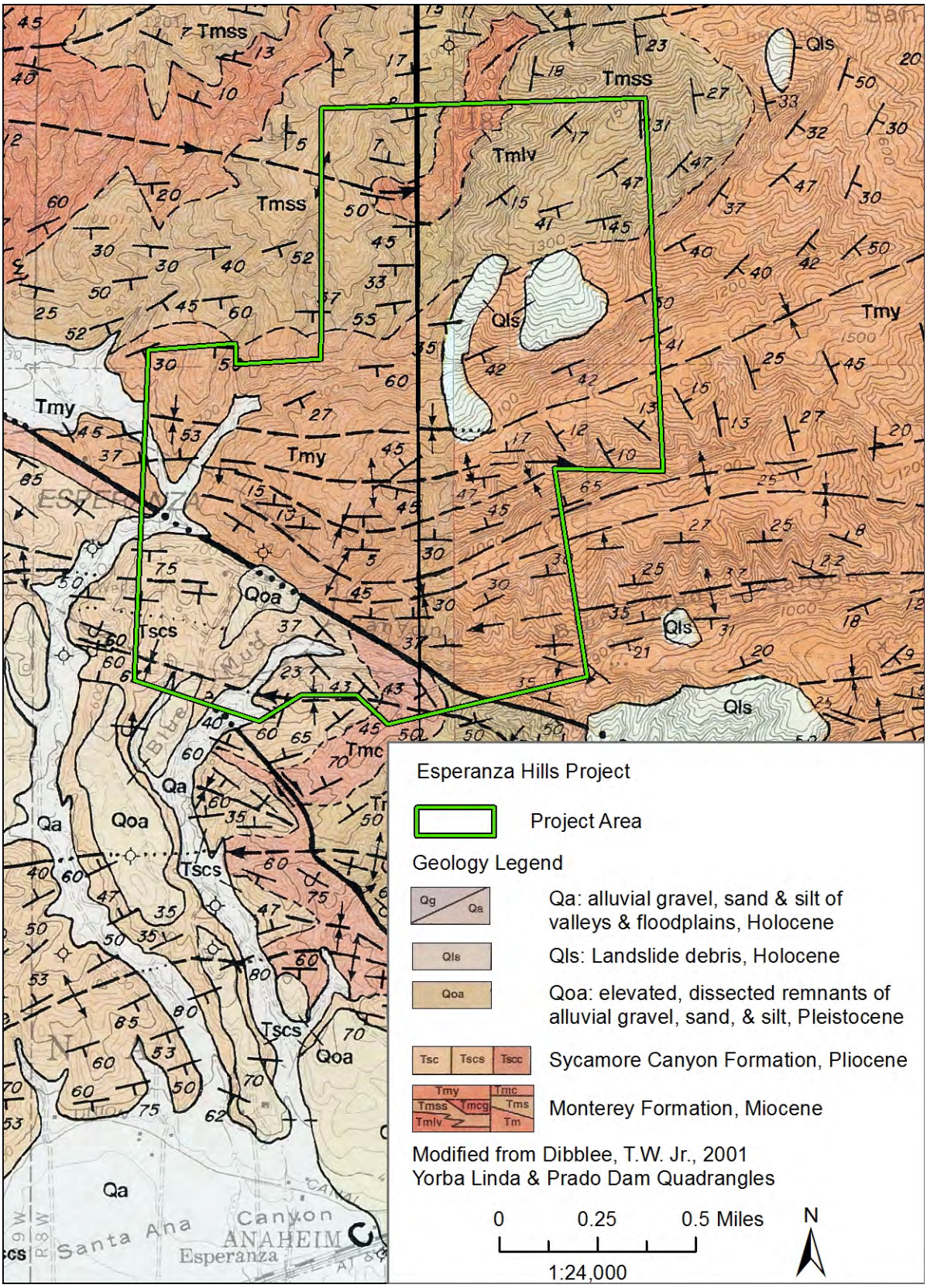

Figure 6. Project Geology

PREHISTORIC SETTING

Approaches to prehistoric frameworks have changed over the years from being based on material attributes to radiocarbon chronologies to association with cultural traditions. Archaeologists defined a material complex consisting of an abundance of milling stones (for grinding food items) with few projectile points or vertebrate faunal remains dating from about seven to three thousand years before the present as the "Millingstone Horizon" (Wallace 1955). Later, the "Millingstone Horizon" was redefined as a cultural tradition named the Encinitas Tradition (Warren 1968) with various regional expressions including Topanga and La Jolla. Use by archaeologists varied as some adopted a generalized Encinitas Tradition without regional variations, some continued to use "Millingstone Horizon" and some used "Middle Holocene" (the time period) to indicate this observed pattern (Sutton and Gardner 2010:1-2).

Recently the fact that generalized terminology is suppressing the identification of cultural, spatial and temporal variation and the movement of peoples throughout space and time was noted. These factors are critical to understanding adaptation and change (Sutton and Gardner 2010:1-2).

The Encinitas Tradition characteristics are abundant metates and manos, crudely made core and flake tools, bone tools, shell ornaments, and very few projectile points with subsistence focusing on collecting (plants, shellfish, etc.). Faunal remains vary by location but include shellfish, land animals, marine mammals, and fish (Sutton and Gardner 2010:7).

The Encinitas Tradition has been redefined to consist of four patterns (Sutton and Gardner 2010: 8-25). These are (1) Topanga in coastal Los Angeles and Orange counties, (2) La Jolla in coastal San Diego County, (3) Greven Knoll in inland San Bernardino, Riverside, Orange and Los Angeles counties and (4) Pauma in inland San Diego County.

About 3,500 years before present the Encinitas Tradition was replaced by a new archaeological entity, the Del Rey Tradition, in the greater Los Angeles Basin. This new entity has been generally assigned to the Intermediate and Late time periods. The changes that initiated the beginning of the Intermediate Period included new settlement patterns, economic foci and artifact types that coincided with the arrival of a new, biologically distinctive population. The Intermediate and Late periods have not been well-defined. However, many have proposed that the beginning of the Intermediate marked the arrival of Takic groups (from the Mojave Desert, southern Sierra Nevada and San Joaquin Valley) and that the Late Period reflected Shoshonean groups (from the Great Basin). Related cultural and biological changes occurred on the southern Channel Islands about 300 years later (Sutton 2010).

The Del Rey Tradition replaces the Intermediate and Late designations for both the southern California mainland and the southern Channel Islands. Within the Del Rey Tradition are two

regional patterns named Angeles and Island. The Del Rey Tradition represents the arrival, divergence, and development of the Gabrielino in southern California (Sutton 2010).

PROJECT AREA CULTURES

The latest cultural revisions for the project area define traits for time phases of the Greven Knoll pattern of the Encinitas Tradition applicable to inland Orange County (Sutton and Gardner 2010; Table 2). This pattern is replaced in the project area by the Angeles pattern of the Del Rey Tradition later in time (Sutton 2010; Table 1). Each pattern has subdivisions as identified by specific changes in cultural assemblages through time. Phases are identified by their archaeological signatures in components within sites.

Greven Knoll sites tend to be in valleys such as the project area. These inland peoples did not switch from manos/metates to pestles/mortars like coastal peoples (c. 5,000 years before present); this may reflect their closer relationship with desert groups who did not exploit acorns. The Greven Knoll toolkit is dominated by manos and metates throughout its extent. In Phase I other typical characteristics were pinto dart points for atlatls or spears, charmstones, cogged stones, absence of shell artifacts and flexed position burials (Table 1). In Phase II, Elko dart points for atlatls or spears and core tools are observed along with increased indications of gathering (Table 1). In addition, the Greven Knoll populations are biologically Yuman (based on skeletal remains) while the later Angeles populations are biologically Shoshonean (Sutton and Gardner 2010, Sutton 2010).

The Angeles pattern generally is restricted to the mainland and appears to have been less technologically conservative and more ecologically diverse, with a largely terrestrial focus and greater emphases on hunting and nearshore fishing. In Angeles Phase I Elko points for atlatls or darts appear, small steatite objects such as pipes and effigies from Catalina are found, shell beads and ornaments increase, fishing technologies increase including bone harpoons/fishhooks and shell fishhooks, donut stones appear, and hafted micro blades for cutting/graving wood or stone appear. In addition, several Encinitas (Topanga) traits, such as discoidals, cogged stones, plummet-like charm stones and cairn burials (see Sutton and Gardner 2010: Table 1) virtually disappear from the record. Mortuary practices changed to consist of primarily flexed primary inhumations, with extended inhumations becoming less common. Settlement patterns made a shift from general use sites being common to habitation areas separate from functional work areas. Subsistence shifted from mostly collecting to increased hunting and fishing (Sutton 2010).

TABLE 1. CULTURE CHANGE CHRONOLOGY

Pattern	Phase	Dates (BP)	Material Traits	Other Traits
Encinitas	Greven Knoll I	8,500 to 4,000	Abundant manos and metates, Pinto dart points for atlatls or spears, charmstones, cogged stones and discoidals rare, no mortars or pestles, general absence of shell artifacts	No shellfish, hunting important, flexed inhumations, cremations rare
	Greven Knoll II	4,000 to 3,000	Abundant manos and metates, Elko dart points for atlatls or spears, core tools, late discoidals, few mortars and pestles, general absence of shell artifacts	No shellfish, hunting and gathering important, flexed inhumations, cremations rare
Angeles	Angeles I	3,500 to 2,600	Appearance of Elko dart points and an increase in the overall number of projectile points from Encinitas components; beginning of large-scale trade in small steatite artifacts (effigies, pipes, and beads) and *Olivella* shell beads from the southern Channel Islands; appearance of single-piece shell fishhooks and bone harpoon points; Coso obsidian becomes important; appearance of donut stones	appearance of a new biological population (Takic proto-Gab/Supan language), apparent population increase; fewer and larger sites along the coast; collector strategy; less overall dependence on shellfish but fishing and terrestrial hunting more important; appearance of flexed and extended inhumations without cairns, cremations uncommon
	Angeles II	2,600 to 1,600	Continuation of basic Angeles I material culture with the addition of mortuary features containing broken tools and fragmented cremated human bone; fishhooks become more common	continuation of basic Angeles I settlement and subsistence systems; appearance of a new funerary complex
	Angeles III	1,600 to 1,250	Appearance of bow and arrow technology (e.g., Marymount or Rose Spring points); changes in *Olivella* beads; asphaltum becomes important; reduction in obsidian use; Obsidian Butte obsidian largely replaces Coso	larger seasonal villages; flexed primary inhumations but no extended inhumations and an increase in cremations; appearance of obsidian grave goods; possible expansion into eastern Santa Monica Mountains, replacing Topanga III groups
	Angeles IV	1,250 to 800	Cottonwood points appear; some imported pottery appears; birdstone effigies at the beginning of the phase and "spike" effigies dropped by the end of the phase; possible appearance of ceramic pipes	change in settlement pattern to fewer but larger permanent villages; flexed primary inhumations continue, cremations uncommon; expansion into the San Gabriel Mountains, displacing Greven Knoll III groups

Pattern	Phase	Dates (BP)	Material Traits	Other Traits
	Angeles V	800 to 450	Trade of steatite artifacts from the southern Channel Islands becomes more intensive and extensive, with the addition or increase in more and larger artifacts, such as vessels and comals; larger and more elaborate effigies	strengthening of ties, especially trade, with southern Channel Islands; expansion into the northern Santa Ana Mountains and San Joaquin Hills; development of mainland dialects of Gabrielino
	Angeles VI	450 to 150	Addition of Euroamerican material culture (e.g., glass beads and metal tools), locally made pottery, metal needle-drilled *Olivella* beads	change of settlement pattern, movement close to missions and ranches; use of domesticated species obtained from Euroamericans; flexed primary inhumations continue, cremations uncommon to the north (nearer the Chumash) but somewhat more common to the south (nearer the Luiseño); apparent adoption of Chingichngish religion

The Angeles Phase II is identified primarily by the appearance of a new funerary complex, with other characteristics similar to Angeles I. The complex features killed (broken) artifacts including manos, metates, bowls, mortars, pestles, points and others plus highly fragmented cremated human bones and a variety of faunal remains. In addition to the cremains, the other material also often burned. None of the burning was performed in the burial feature (Sutton 2010).

The Angeles III Phase is the beginning of what has been known as the Late Period and is marked by several changes from Angeles I and II. These include the appearance of small projectile points, steatite shaft straighteners and increased use of asphaltum all reflecting adoption of bow and arrow technology, obsidian sources changed from mostly Coso to Obsidian Butte and shell beads from Gulf of California species began to appear. Subsistence practices continued as before and the geographic extent of the Angeles Pattern increased (Sutton 2010).

Angeles Phase IV is marked by new material items including Cottonwood points for arrows, Olivella cupped beads and Mytilus shell disks, birdstones (zoomorphic effigies with magico-religious properties) and trade items from the Southwest including pottery. It appears that populations increased and that there was a change in the settlement pattern to fewer but larger permanent villages. Presence and utility of steatite vessels may have impeded the diffusion of pottery into the Los Angeles Basin. The settlement pattern altered to one of fewer and larger permanent villages. Smaller special-purpose sites continued to be used (Sutton 2010).

Angeles V components contain more and larger steatite artifacts, including larger vessels, more elaborate effigies and comals. Settlement locations shifted from woodland to open grasslands. The exploitation of marine resources seems to have declined and use of small seeds increased. Many Gabrielino inhumations contained grave goods while cremations did not. [Sutton 2010]

The Angeles VI phase reflects the ethnographic mainland Gabrielino of the post-contact (i.e., post-A.D. 1542) period. One of the first changes in Gabrielino culture after contact was undoubtedly population loss due to disease, coupled with resulting social and political disruption. Angeles VI material culture is essentially Angeles V augmented by a number of Euroamerican tools and materials, including glass beads and metal tools such as knives and needles (used in bead manufacture). The frequency of Euroamerican material culture increased through time until it constituted the vast majority of materials used. Locally produced brownware pottery appears along with metal needle-drilled *Olivella* disk beads. [Sutton 2010]

The ethnographic mainland Gabrielino subsistence system was based primarily on terrestrial hunting and gathering, although nearshore fish and shellfish played important roles. Sea mammals, especially whales (likely from beached carcasses), were prized. In addition, a number of European plant and animal domesticates were obtained and exploited. Ethnographically, the mainland Gabrielino practiced interment and some cremation. [Sutton 2010]

ETHNOGRAPHY

Early Native American peoples of the project area are poorly understood. They were replaced about 3,500 years ago by Native Americans now known as the Gabrielino (Tongva). The Gabrielino speak a language that is part of the Takic language family. Their territory encompassed a vast area stretching from Topanga Canyon in the northwest, to the base of Mount Wilson in the north, to San Bernardino in the east, Aliso Creek in the southeast and the Southern Channel Islands, in all an area of more than 2,500 square miles (Bean and Smith 1978, McCawley 1996) (Figure 7). At European contact, the tribe consisted of more than 5,000 people living in various settlements throughout the area. Some of the villages could be quite large, housing up to 150 people.

The Gabrielino are considered to have been one of the wealthiest tribes and to have greatly influenced tribes they traded with (Kroeber 1976:621). Houses were domed, circular structures thatched with tule or similar materials (Bean and Smith 1978:542). The best known artifacts were made of steatite and were highly prized. Many common everyday items were decorated with inlaid shell or carvings reflecting an elaborately developed artisanship (Bean and Smith 1978:542).

Figure 7. Prehistoric Gabrielino/Tongva Communities near Esperanza Hills

The main food zones utilized were marine, woodland and grassland (Bean and Smith 1978). Plant foods were, by far, the greatest part of the traditional diet at contact. Acorns were the most important single food source. Villages were located near water sources necessary for the leaching of acorns, which was a daily occurrence. Grass seeds were the next most abundant plant food used along with chia. Seeds were parched, ground and cooked as mush in various combinations according to taste and availability. Greens and fruits were eaten raw or cooked or sometimes dried for storage. Bulbs, roots and tubers were dug in the spring and summer and usually eaten fresh. Mushrooms and tree fungus were prized as delicacies. Various teas were made from flowers, fruits, stems and roots for medicinal cures as well as beverages. [Bean and Smith 1978:538-540]

The principal game animals were deer, rabbit, jackrabbit, woodrat, mice, ground squirrels, antelope, quail, dove, ducks and other birds. Most predators were avoided as food, as were tree squirrels and most reptiles. Trout and other fish were caught in the streams, while salmon were available when they ran in the larger creeks. Marine foods were extensively utilized. Sea mammals, fish and crustaceans were hunted and gathered from both the shoreline and the open ocean, using reed and dugout canoes. Shellfish were the most common resource, including abalone, turbans, mussels, clams, scallops, bubble shells and others. [Bean and Smith 1978:538-540]

HISTORIC SETTING

Juan Cabrillo was the first European to sail along the coast of California in 1542 and was followed in 1602 by Sebastian Vizcaino (Bean and Rawls 1993). Between 1769 and 1822 the Spanish had colonized California and established missions, presidios and pueblos (Bean and Rawls 1993).

In 1821 Mexico won its independence from Spain and worked to lessen the wealth and power held by the missions. The Secularization Act was passed in 1833, giving the vast mission lands to the Mexican governor and downgrading the missions' status to that of parish churches. The governor then redistributed the former mission lands, in the form of grants, to private owners. Ranchos in California numbered over 500 by 1846, all but approximately 30 of which resulted from land grants (Bean and Rawls 1993; Robinson 1948).

California was granted statehood in 1850 and although the United States promised to honor the land grants, the process of defining rancho boundaries and proving legal ownership became time consuming and expensive. Legal debts led to bankruptcies and the rise in prices of beef, hide and tallow. This combined with flooding and drought, was detrimental to the cattle industry. Ranchos were divided up and sold inexpensively (Hampson 1993).

The southern portions of the project area lies within the boundaries of the former Rancho Canon de Santa Ana (Figure 8), a land grant issued to Bernardo Yorba in 1834. Bernardo and his brothers utilized the land as a ranch. In 1866 the grant was recognized by the United States and patented to Bernardo Yorba. In 1868 the Yorba ranch lands were divided among the descendants (Tino-Sandoval 2005).

The northern portion of the project area has been passed down among members of the Carrillo family since the 19th century. Most past use of the proposed project area has been cattle ranching. There has been 20th century oil exploration, drilling and pumping in addition.

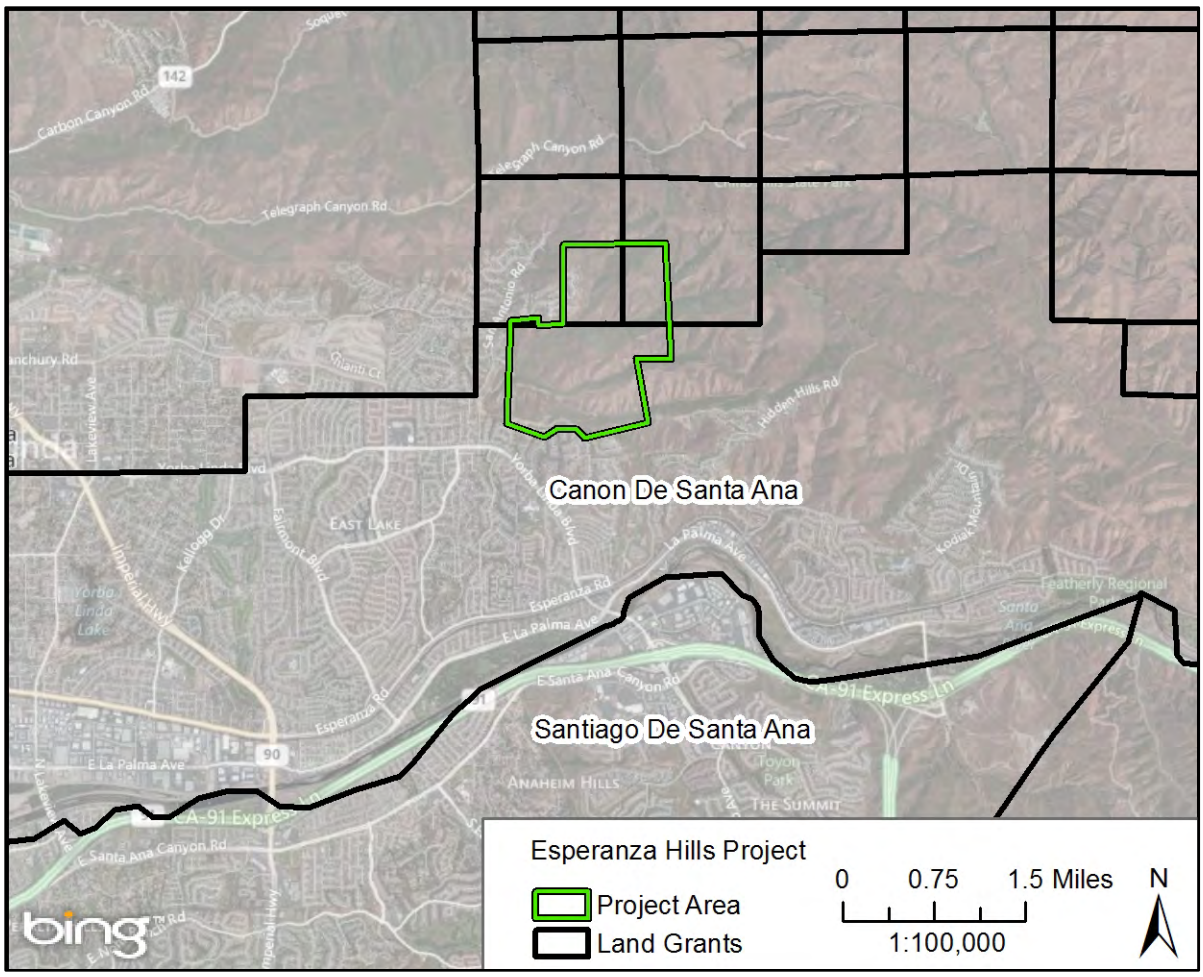

Figure 8. Land Grant Map

KNOWN RESOURCES INVENTORIES

PALEONTOLOGY

A record search was conducted by staff of the Natural History Museum of Los Angeles County for resources within one mile the project area (McLeod 2008, Appendix B). In addition, known records within ten miles from other sources were also checked (Gust 2011). The latter includes records held by Chino Hills Historical Museum, Loma Linda University, California State University San Bernardino, and San Bernardino County Museum.

No fossils are known within the project area or a one mile radius. Fossils known nearby are from some of the same rock units that occur in the project area and were recovered during subsurface excavations for development in the City of Chino Hills to the east (Table 2; includes all known records including those from McLeod 2008).

Fossils known from the middle Miocene Monterey Formation include a wide variety of birds, marine mammals, boney fishes, cartilagenous fishes, invertebrates and both marine and terrestrial plants. The marine mammals are mostly whales and dolphins plus seals and sea lions. The boney fishes include sabertoothed salmon, cod, herrings and sardines, bonito, mackerel, croaker, barracuda and many types of deep water species such as dragonfish, viperfish, lanternfish and others. Cartilagenous fishes include white, mako and basking sharks. Invertebrates include many types of snails, clams, scallops and barnacles. Marine plants are various types of seaweed, kelp and algae. The terrestrial plants are mostly leaves that were washed into the ocean by streams and rivers. They include a wide variety including oak, laurel, willow, fan palm, sycamore, maple, alder, birch, walnut, fig, avocado and grasses.

Fossils known from the Pliocene Sycamore Canyon Formation represent an assemblage similar to that of the Monterey Formation. However the sample is much smaller and thus no significance can be assigned to the reduced number of fossil animals and plants known in the younger rock unit.

Fossils known from the Pleistocene Quaternary older alluvium include mammoth, ground sloths, giant horse, western horse, bison, deer and rodents. Prior to discovery of giant horse in Chino Hills in 2008, all previous occurrences were in the California deserts. The other known species are relatively common in the Pleistocene of the greater Los Angeles area (Harris and Jefferson 1985).

TABLE 2. FOSSIL LOCALITIES NEARBY

Scientific Name	Quaternary older alluvium	Pliocene Sycamore Canyon Formation	Miocene Monterey Formation	Common Name
Mammals				
Bison antiquus	x			bison
cf. *Equus giganteus*	x			giant horse, extinct
Equus occidentalis	x			horse, extinct
Mammuthus columbi	x			mammoth
Nothrotheriops shastense	x			Shasta ground sloth, extinct
Odocoileus	x			deer
Paramylodon harlani	x			Harlan's ground sloth, extinct
Rodentia	x			rodent
Birds				
Aves			x	birds
Marine Mammals				
Atocetus angulii			x	Chino Hills dolphin, extinct
Balaenopteridae		x	x	rorqual whale
Cetacea			x	whale
Delphinidae			x	dolphin
Mysticeti			x	baleen whale
Otariid			x	eared seal
Physeteridae			x	sperm whale
Pinnipedia			x	seals and sea lions
Pithanotaria starri			x	fur seal
Boney Fishes				
Acanthopterygii			x	spiny-finned fish
Alepocephalidae			x	slickheads
Anarrhichthys			x	wolf-eel
Araeosteus (cf.)		x	x	bony fish
Araeosteus rothi			x	prow fish, extinct
Argentinoidei		x	x	smelt
Argyropelecus bullockii			x	hatchetfish, extinct
Argyropelecus		x		hatchetfish, extinct
Atherinidae		x	x	silverside/grunion
Bathylagidae		x	x	deep sea smelt
Belonidae			x	needlefish
Carangidae		x	x	jack
Chauliodus eximius			x	viperfish, extinct
Clupeidae			x	herring/sardine
Cyclothone			x	bristlemouth
Decapterus			x	scad, extinct
Eclipes		x	x	hake
Etringus			x	herring
Gadiformes		x	x	cod
Ganoessus			x	extinct sardine

Scientific Name	Quaternary older alluvium	Pliocene Sycamore Canyon Formation	Miocene Monterey Formation	Common Name
Ganoessus clepsydra			x	sardine
Ganolytes		x	x	sardine
Hemirhamphid or Exocetid			x	gliding or flying fish
Hipposyngnathus impocitor			x	extinct pipefish
Lompoquia		x	x	croaker
Myctophidae		x	x	lantern fish
Oncorhynus rastrosus			x	saber-toothed salmon, extinct
Perciformes			x	perch-like fish
Pleuronectiformes			x	flat fishes, halibut
Pseudoseriola			x	bluefish
Sarda		x	x	bonito
Scomber		x	x	mackerel
Scomberesox		x	x	needle nose gar
Scombridae		x	x	mackeral
Scorpenidae			x	rockfish
Sparidae			x	porgies
Sphyraena			x	barracuda
Stomias			x	scaly dragonfish
Syngnathus			x	pipefish
Thyrsocles		x	x	knife fish, extinct
Xyne grex		x	x	herring
Zaphlegidae				snake mackeral
Cartilagenous Fishes				
Carcharocles			x	white shark, extinct
Cetorhinus			x	basking shark
Elasmobranchii		x	x	shark
Isurus			x	mako shark
Invertebrates				
Acila			x	bivalve
Amusium			x	paper scallop
Argobuccinum		x		triton
Astrea cf. *undosa*			x	turban conch
Balanus			x	barnacle
Brachiopoda		x	x	brachiopod
Brachyura			x	crab
Cardium		x	x	heart cockle
Delectopecten		x	x	mud scallop
Lepas		x	x	goose-neck barnacle
Lucinidae		x	x	lucine clams
Mollusca		x	x	molluscs
Mytilus			x	mussel
Nassarius		x		mud snail
Ostrea			x	oyster
Pectinidae			x	scallop

Scientific Name	Quaternary older alluvium	Pliocene Sycamore Canyon Formation	Miocene Monterey Formation	Common Name
Pelecypoda		x	x	bivalve
Polinices			x	moon snail
Pulmonata			x	fresh water snails
Tellina		x	x	wedge clam
Turritella		x	x	turret snail
Venus		x	x	venus clam
Marine Plants				
Chondrites ramulosa			x	red algae
Chondrites recurva			x	red algae
Codium			x	green algae
Cystoseirites			x	brown algae
Fucales			x	brown algae
Laminariales		x	x	kelp
Paleohalidrys occidentalis			x	brown algae
Phaeophyta			x	brown algae
Rhodophyta		x	x	red algae
Thallophyia		x	x	seaweed
Terrestrial Plants				
Acer		x	x	maple
Alnus		x	x	alder
Amelanchier		x	x	juneberry
Arbutus		x	x	madrone
Betula		x	x	birch
Ceanothus		x	x	shrub
Cercis		x	x	red bud
Cercocarpus			x	mountain mahogany
Commelinidae			x	reed
Dicot			x	flowering plant
Ficus		x	x	fig
Juglans		x	x	walnut
Juniperus			x	juniper
Lauracea			x	laurel
Leguminosea		x	x	legume
Magnolia		x	x	magnolia
Palmae		x	x	palm
Persea		x	x	avocado
Pinus		x	x	pine
Plantae		x	x	leaf
Platanus		x	x	sycamore
Poaceae		x	x	grasses
Populus		x	x	poplar
Quercus		x	x	oak
Rhus		x	x	sumac
Robinia		x	x	locust

Scientific Name	Quaternary older alluvium	Pliocene Sycamore Canyon Formation	Miocene Monterey Formation	Common Name
Sabal		x	x	fan palm
Sabalites			x	palm
Salix		x	x	willow
Sassafras		x	x	sassafras
Typha			x	cattail
Umbellularia		x	x	California laurel

ARCHAEOLOGY AND HISTORY

A search for archeological and historical records was completed by Julia Carvajal of Cogstone on October 29 and 30, 2012 at the South Central Coast Information Center (SCCIC), California State University at Fullerton. The record search included the project boundaries and a one mile radius around the project boundaries. Sources consulted include the National Register of Historical Places, California Register of Historic Resources, California Inventory of Historic Resources, California Historical Landmarks, and California Points of Historical Interest.

The records search determined that there are no known cultural resources within the project area boundaries. A total of 18 cultural resources have been documented previously within a one-mile radius of the project area (Table 3; note P-30 numbers are in Orange County, P-36 numbers are in San Bernardino County). Prehistoric resources number 16 and include 9 isolates and 7 sites. In addition a historic resource consisting of power lines, towers and a substation is known along with a historical archaeological resource consisting of remnants of pipes and basins of a cattle watering station. None of the previously-recorded resources were determined eligible for the National Register of Historic Places.

An intensive pedestrian survey of the project area was conducted in 2008 and no resources were observed (Drover and Roeder 2008). Twenty-two additional cultural resources investigations have been completed within a one-mile radius of the project area (Table 4). Of these, 5 other investigations were conducted within parts of the project boundaries (all negative), 5 studies were conducted within a ¼-mile radius, 6 were conducted within a ½-mile radius, and another 5 studies were completed within a 1-mile radius of the project area.

TABLE 3. RECORDED SITES WITHIN A ONE MILE RADIUS

Primary No.	Site Type	Date Recorded	USGS Quad Name	Distance from area
P-30-000848	Prehistoric milling stone site, containing of manos, hammerstones, and lithic flakes	1979	Yorba Linda	Within ¼ mile
P-30-001650	Prehistoric groundstone scatter	2005	Yorba Linda	Within 1 mile
P-30-100116	Prehistoric handstone isolate	n/a	Yorba Linda	Within 1 mile
P-30-100117	Prehistoric handstone isolate	n/a	Yorba Linda	Within 1 mile
P-30-100118	Prehistoric handstone isolate	n/a	Yorba Linda	Within 1 mile
P-30-100119	Prehistoric handstone isolate	n/a	Yorba Linda	Within 1 mile
P-30-100120	Prehistoric handstone isolate	n/a	Yorba Linda	Within 1 mile
P-30-100314	Prehistoric discoidal isolate	1978	Yorba Linda	Within ¼ mile
P-30-100315	Prehistoric bifacial handstone isolate	1978	Yorba Linda	Within ¼ mile
P-30-120007	Prehistoric boulder and cobble outcrops with surface scatter. Update could not relocate previous artifacts.	1976	Prado Dam	Within ½ mile
P-30-120008	Prehistoric boulder and cobble outcrops with surface scatter. Update could not relocate previous artifacts.	1980	Prado Dam	Within ½ mile
P-30-120009	Prehistoric boulder and cobble outcrops with surface scatter. Update could not relocate previous artifacts.	1980	Prado Dam	Within ¾ mile
P-30-120010	Prehistoric boulder and cobble outcrops with surface scatter. Update reported that any prehistoric material was destroyed during mining activities.	1980	Prado Dam	Within 1 mile
P-30-179857 and P-36-013627	Historic power lines, towers, and substation	2007	Prado Dam/Yorba Linda	Within ½ mile
P-36-012493	Prehistoric site consisting of milling artifacts, FAR, and bone.	2005	Prado Dam	Within 1 mile
P-36-019847	Historic watering station for cattle consisting of pipes and basins	2008	Prado Dam	Within 1 mile
P-36-060007	Prehistoric quartz chopper isolate	1983	Prado Dam	Within 1 mile
P-36-060008	Prehistoric mano isolate	1983	Prado Dam	Within 1 mile

TABLE 4. PREVIOUS ARCHAEOLOGICAL STUDIES WITHIN A ONE MILE RADIUS

Author	Ref (OR-)	Title	Date	Quad	Distance from area
Drover, C., K. Drover and M. Roeder	Not on file at time of record search; submitted by Cogstone	Cultural Resources Inventory Mitigated Negative Declaration Castle and Cook Yorba Linda Geotechnical Access Roads, Yorba Linda, California	2008	Yorba Linda and Prado Dam	Within project area
Romani, Gwendolyn R.	2300	Archaeological survey report: Los Angeles-San Diego Fiber Optic Project: Mesa Substation to Chino Hills State Park segment	2000	Prado Dam/Yorba Linda	Within project area
McGuire, Pamela J. and Nancy Evans	1159	Inventory of features Cultural Resources Chino Hills State Park	1984	Prado Dam/Yorba Linda	Within project area
Greenwood, Roberta S.	594	Cultural Resource Overview for the Serrano Substation to Mira Loma Substation Transmission Route Alternatives Corridor Right of way	1980	Prado Dam	Within project area
Anonymous	468	Archaeological Test Report (ORA-848) on a portion of Tentative Tract 10731 located in Yorba Linda	1979	Yorba Linda	Within project area
Anonymous	266	Archaeological/paleontological Survey Report on approximately 482 acres of land located in the Yorba Linda area of the County of Orange	1978	Yorba Linda	Within project area
Anonymous	1361	Screencheck Draft Environmental Impact Report for the Central Pool Augmentation and Water Quality Project	n/a	Prado Dam	Within project area
Unknown	3777	Confidential Cultural resources specialist report for the Tehachapi Renewal Transmission Project	2009	Yorba Linda	Within ¼ mile
Brechbiel, Brant A.	1782	Cultural Resources Survey report for a Pacific Bell Mobile Services Telecommunications facility: Cm 270-02 in the city of Yorba Linda, California	1997	Yorba Linda	Within ¼ mile
Demcak, Carol R.	1525	Report of Archaeological Survey for L.A. Cellular Site #36.1, 4680 ½ Greencrest Drive, Yorba Linda, Orange County	1996	Prado Dam	Within ¼ mile
Langenwalter, Paul E. and James Brock	801	Phase 1 Archaeological Studies Prado Basin and the Lower Santa Ana River	1985	Prado Dam	Within ¼ mile
Unknown	605	Archaeological/historical/paleontological survey report and assessment on Shorb Rivas, TT 10144 located in the Yorba Linda area of the County of Orange	1980	Yorba Linda	Within ¼ mile

Author	Ref (OR-)	Title	Date	Quad	Distance from area
Desautels, Roger J.	183	Archaeological/ paleontological Survey Report on the Travis Ranch- A 285+ parcel of land located in the Yorba Linda Area of the County of Orange	1977	Yorba Linda	Within ¼ mile
Bonner, Wayne H.	3549	Cultural Resources records search and site visit results for T-Mobile candidate IE25875D (Tennis Court), 20550 Paseo De Las Palomas, Yorba Linda, Orange County, California	2008	Yorba Linda	Within ½ mile
Wlodarski, Robert J.	3211	Records Search Results for Bechtel Candidate Lsanca3062 (East Lake Village Center)	2006	Yorba Linda	Within ½ mile
Duke, Curt	2606	Cultural Resource Assessment Cingular Wireless Facility No. Sc 121-01 Yorba Linda, Orange County, California	2003	Yorba Linda	Within ½ mile
Duke, Curt	2391	Cultural Resouce Assessment AT&T Wireless Services Facility No. 13100a Orange County, California	2002	Yorba Linda	Within ½ mile
Duke, Curt	2459	Cultural Resource Assessment Cingular Wireless Facility No. Cm 131-04 Orange County, California	2001	Yorba Linda	Within ½ mile
Lorna, Billat	3548	New Tower Submission Packet: Tennis Court IE-25875D	2008	Yorba Linda	Within 1 mile
Bonner, Wayne H.	3216	Cultural Resources Records search results and site visit for Cingular Wireless site Oc-009-01 (O'Connell), 20540 Cassia Lane, Yorba Linda, Orange County, California	2005	Yorba Linda	Within 1 mile
Laska, Robin, E.	2257	Cultural Resource Assessment of the Proposed Relocation and / or protection of the Santa Ana River Interceptor, Orange and San Bernardino Counties, California	2001	Prado Dam	Within 1 mile
Cultural Resources Division	642	An Archaeological Assessment and Historical Review of the Shorb Wells property, Orange County, California	1982	Yorba Linda	Within 1 mile
Leonard, Nelson N. III and Mathew C. Hall	270	Description and Evaluation of Cultural Resources within the US Army Corps of Engineers Santa Ana River Project	1975	Prado Dam	Within1 mile

ADDITIONAL SOURCES

In addition to the records at the SCCIC, a variety of sources were consulted by Valasik in November 2012 to obtain information regarding the project area (Table 5). Specific information about the project area, obtained from historical maps (Meriam Library 2010) and aerial photographs, is presented above in Project Area History.

TABLE 5. ADDITIONAL SOURCES CONSULTED

Source	Results
National Register of Historic Places (1979-2002 & supplements)	Negative
Historic United States Geological Survey topographic maps	Shows late 20th/ early 21st century agriculture.
Historic United States Department of Agriculture aerial photos	Shows late 20th/early 21st century agriculture
California Register of Historical Resources (1992-2010)	Negative
California Inventory of Historic Resources (1976-2010)	Negative
California Historical Landmarks (1995 & supplements to 2010)	Negative
California Points of Historical Interest (1992 to 2010)	Negative
California Department of Transportation Historic Bridge Inventory (Caltrans 2007)	Negative
Local Historical Register Listings	Negative
Bureau of Land Management General Land Office Records	Shows 4 land owners

A search of the Bureau of Land Management General Land Office Records available on the Internet revealed that 3 individuals and the Southern Pacific Railroad had obtained land patents for portions of the project area from 1866 to 1904 (Table 6; BLM n.d.).

TABLE 6. BLM LAND PATENTS FOR PROPOSED PROJECT AREA

Name	Date	Aliquots	Section	T	R
Southern Pacific Railroad	1897	N ½ S ½ , W ½ NW ¼ , SE ¼ NW ¼	17	3S	8W
Bacon, E F	1904	NE ¼ SE ¼	18	3S	8W
Bond, Pelatiah	1898	NE ¼	18	3S	8W
Yorba, Bernardo	1866	All parts	19 & 20	3S	8W

NATIVE AMERICAN CONSULTATION

A sacred lands record search was requested from the Native American Heritage Commission in 2008. The Commission replied on June 18, 2008 that there were no records within half a mile of the proposed project area. The Commission requested that 12 individuals or tribes be contacted for potential knowledge of the project area. Letters were sent to all 12 on June 26, 2008. Two responses were received. Anthony Morales, Gabrieleno/Tongva San Gabriel Band of Indians, expressed concerns about the sensitivity of the area and requested a Native American monitor for ground disturbance. Anita Espinoza Cruz, Juaneño Band of Mission Indians, also expressed concerns about ground disturbance.

SURVEY UPDATE

An intensive pedestrian survey of the entire project area was conducted in 2008 for both archaeology and paleontology (Drover et al. 2008). This survey occurred after a fire in the area so it was clear of vegetation. No paleontological, prehistoric or historical archaeological or historic (built environment) resources were observed. Portions of the project area have been surveyed by five additional surveys (see previous section); no resources were observed by any of these archaeologists.

A survey update was performed in October 2012 by Sherri Gust. Most of the project area consists of slopes of more than 45 degrees covered only with sparse vegetation and no resources were visible. The canyons between the three hills of the project were densely vegetated and impassible.

Filled-in locations of nine large geotechnical fault testing trenches were clearly visible in canyon areas consisting of Quaternary alluvium underlain by Quaternary older alluvium. These trenches revealed no paleontological or archaeological resources. Radiocarbon dates from the bottom of these trenches were as old as 14 thousand years before the present representing the late Pleistocene. Geotechnical borings into the marine sediments of the slopes will occur in January of 2013. [Jeff Hull, personal communication, 2012]

IMPACT ANALYSIS

The project will involve cutting of slopes to approximately 200 feet below current surface and filling of canyon areas. In addition, some cutting will occur in canyons to permit installation of drainage features prior to filling. The two project options have slightly different cut and fill maps (Figure 9, 10). Based on the information in this report and previous reports for the project area, the CEQA checklist is evaluated below:

Will the proposed project cause a substantial adverse change in the significance of a historical resource? There are no known historical resources.

Will the proposed project cause a substantial adverse change in the significance of an archaeological resource? There is no evidence of prehistoric or historical archaeological resources within or adjacent to the project boundaries.

Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? The proposed deep cutting into Miocene formations known to produce significant vertebrate paleontological resources nearby has potential to adversely impact fossils that may contribute information new to science.

Will the proposed project disturb any human remains, including those interred outside of formal cemeteries? There is no indication of human remains within or adjacent to the project boundaries.

RECOMMENDATIONS

If unanticipated cultural resources are discovered during ground-disturbing activities, work in that location shall be temporarily diverted a minimum of 25 feet away until a qualified archaeologist can evaluate the find. Compliance with any further work recommended by the archaeologist and approved by the county, will serve to reduce adverse impacts on cultural resources to an insignificant level.

Implementation of the following paleontological resources mitigation plan will serve to reduce adverse impacts on vertebrate fossils to an insignificant level. The plan requires (1) paleontological resources awareness training for all earthmoving personnel, (2) monitoring of excavations more than five feet below the current surface (not for shallow excavations), (3) adjustments by the principal paleontologist to monitoring requirements based on fossil yield, depth and location of impacts and (4) recovery and curation of fossils meeting the significance criteria established.

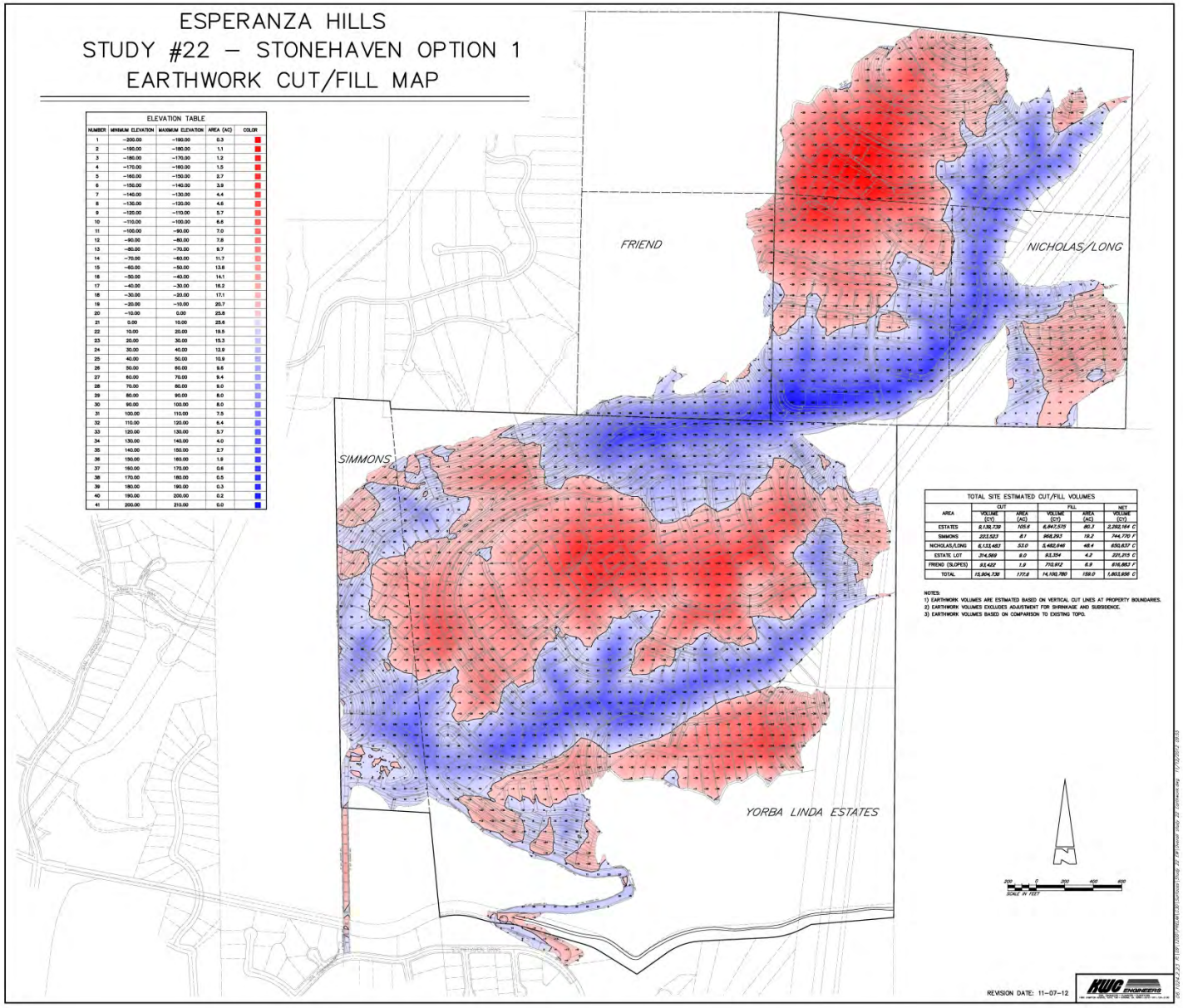

Figure 9. Stonehaven Option Cut and Fill Map

Depths
Cuts (red)
Fill (blue).

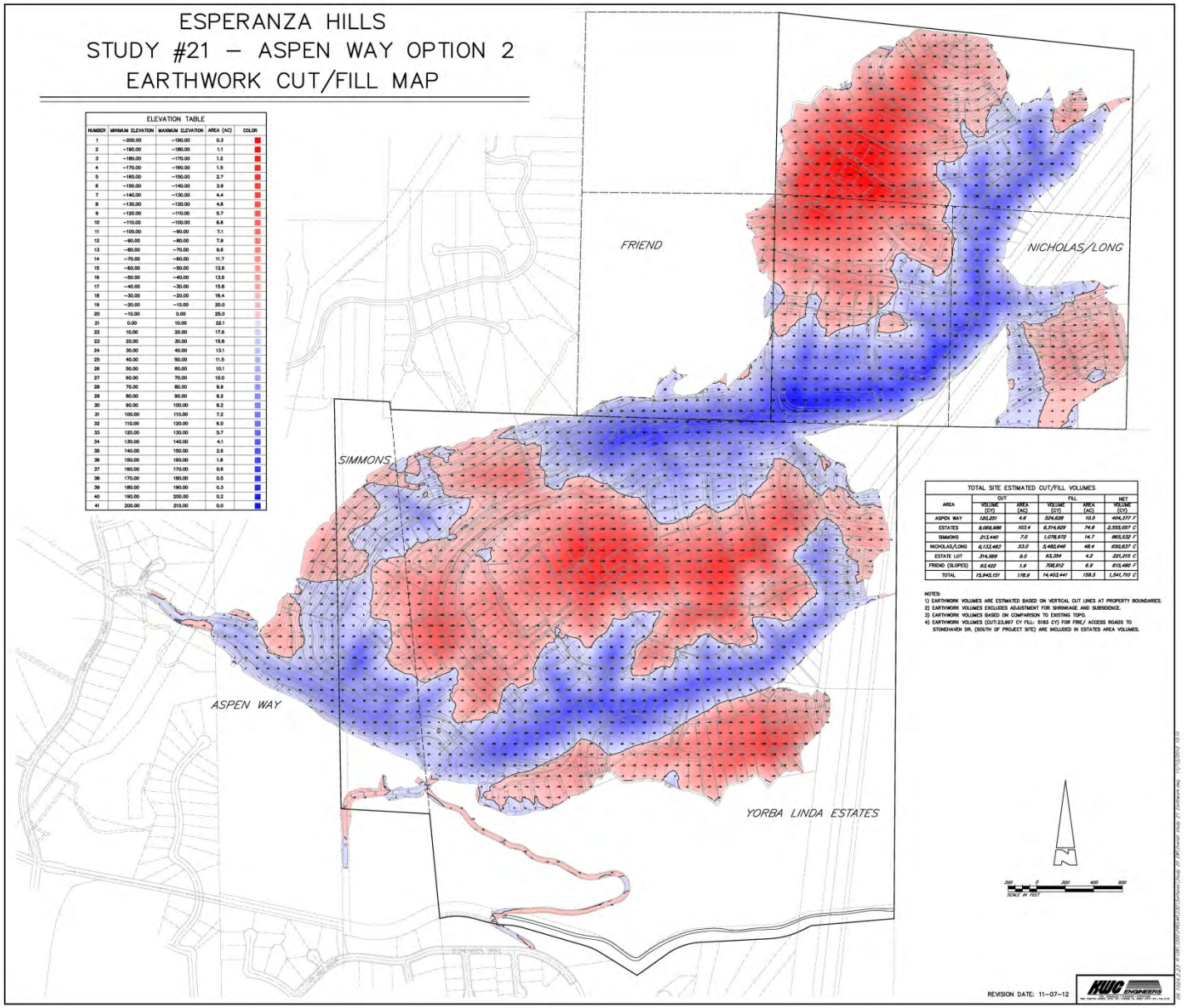

Figure 10. Aspen Option Cut and Fill Map

Depths
Cuts (red)
Fill (blue).

PALEONTOLOGICAL MITIGATION PLAN

PALEONTOLOGICAL RESOURCES SENSITIVITY TRAINING

All project management, supervisory and earth-moving personnel, including construction workers, inspectors and supervisors, will receive Paleontological Resources Sensitivity Training prior to commencement of any ground-disturbing activity. The training will include instruction on: (1) the possibility of unearthing fossils; (2) the types of fossils that may be unearthed; (3) the importance of, and legal basis for, the protection of significant resources; and (4) the requirement that they immediately halt work within 25 feet of fossil discoveries. All attendees will sign to verify that they understand the project cultural mitigation requirements and will be issued hard-hat stickers. New personnel commencing work on the project must receive the training prior to start of work. Presentations for field construction crews will be conducted in the field as tailboard flipbook presentations.

PERSONNEL

Qualifications

The Principal Paleontologist will have a graduate degree (master's or Ph D) and more than ten years of experience as a principal investigator. Qualified monitors will have a minimum of bachelor's degree, verifiable training and one year of experience monitoring. These requirements also apply to other crew members that may be necessary for evaluation, recovery or lab work.

Monitor Authority and Responsibilities

Cultural monitors have the authority to initiate a temporary work stoppage of monitoring construction activities if they need to assess and/or recover a potentially significant discovery. It is important that all earthmoving contractor personnel recognize the authority of the monitor to temporarily redirect project construction activities. The monitor will attempt to minimize schedule impacts.

The monitor is responsible to complete daily documentation of monitoring activities including the location of monitoring activities throughout the day, observations of sediment type and distribution, observations regarding resources, collection of resources and other information (Daily Field Monitoring Summary and Daily Fossil Collection Log). The monitor is responsible to photograph activities, sediments and resources for documentation purposes and to fill out a Photograph Record Sheet for each digital roll. Paperwork and photographs will be submitted at the end of each week along with the monitor's timesheet.

Reporting

The monitor's records and the field notes will be used to prepare a monthly letter report. The monthly reports will summarize the monitoring activities of the previous period, discoveries made, progress of lab work, incidents and actions taken.

Upon conclusion of ground-disturbing activities, a final monitoring compliance report will be prepared. The final report will include the inclusive dates of monitoring, personnel utilized including qualifications, a summary of the monitoring effort and coverage using text and maps, documentation of paleontological localities/archaeological sites discovered, resources identified, and interpretation.

MONITORING REQUIREMENTS AND ADJUSTMENTS

Full-time monitoring is required for all excavations more than five feet below the current ground surface. Shallow excavations of less than five feet do not require monitoring. The principal paleontologist may adjust the monitoring level during construction excavations based on fossil yield and depth and location of impacts.

FOSSIL DISCOVERY AND TREATMENT

Fossil Discovery and Recovery

Fossils observed will be treated differently depending on type and circumstance. Generally, discovery of identifiable invertebrate (shells, crustaceans, etc.) fossils requires a scientifically significant sample be collected for identification and analysis and that the locality be documented (see below). Similar procedures are followed for microvertebrates such as rodents. Current professional standards call for testing of 200 pound samples (10 half-full, five gallon buckets) from each locality followed by processing of up to 6000 pounds of matrix if significant fossils are recovered by testing. Documentation of localities is required.

Larger fossils observed must be evaluated to determine their condition. Generally the monitor will be able to quickly determine if the fossils are sufficiently well-preserved to meet preliminary significance criteria. If necessary, the monitor will cordon off the immediate area around the fossil to permit a safe work zone to recover the fossil and notify the construction foreman and Principal Investigator. The monitor will also immediately notify the field supervisor and/or Principal Investigator if assistance is needed and sufficient personnel to perform the work will be fielded. Documentation of localities is required.

Discovery of a bone bed or other type of fossil sites containing multiple large fossils will likely require a work stoppage for an undetermined amount of time. The monitor will cordon off the

area until evaluation occurs. The Principal Investigator will consult with the client and lead agency regarding the amount of time necessary. This type of discovery requires a detailed field map, a sedimentary structure analysis, one or more stratigraphic columns and data for taphonomic analysis.

Depending on the potentially impacted formations additional samples collected may include specimens for dating analyses or materials for microfossil, botanical or pollen analyses.
All fossils and specimens are accompanied by a field tag with project and locality information including a unique number.

Locality Documentation

Every fossil locality requires a standard set of data be taken. This includes one or more UTM readings using a global positioning system unit, an accurate elevation measurement if possible, the depth below surface, a lithology and true north reading. Additional information collected may include one or more stratigraphic columns, sedimentary structure analysis, taphonomic analysis and photographs of the fossil in situ. Depending on the potentially impacted formations additional samples collected may include specimens for dating analyses or materials for microfossil, botanical or pollen analyses.

Fossil Preparation

Many fossils require only cleaning and stabilization through the use of hardeners. Others require lab excavation of plaster jackets with gradual cleaning and hardening. Sometimes larger fossils require a “cradle”, usually a form-fitted plaster lined with acid-free cloth to provide support and prevent breakage during storage or transport. Fossils found in bedrock formations may require more tedious preparation using mechanical devices such as zip scribes.

Processing of matrix samples for microvertebrates varies depending on the nature of the sediments and may be washed using water, may require chemical agents to break apart the rock or may require floatation using heavy liquids.

Fossil Identification

All fossils will be identified by experts. All identifications will be as specific as possible and include element, portion, side, sex, age, taphonomy and notes. Cataloging, including identification information, is entered into a computer database. Each specimen in maintained with a tag specifying the provenience and identification information.

Fossil Analyses

Analyses conducted depend to a great extent on the number of fossils recovered and their condition. Guild analysis (relative number of carnivores, herbivores and omnivores of various body weights in an ecosystem), demographic analysis (age and sex structure of populations),

habitat analysis (certain types of animals indicate grasslands as opposed to deserts for example), paleoecology (use of botanical and/or pollen analysis to reconstruct the paleoenvironment) and comparative analysis (comparison to other faunas of the same time period regionally) are the most typical. Geological context analyses include stratigraphy of the fossil deposits, dating (to narrow the time range of the fossils), taphonomy (history of alteration of the fossils by scavengers, water transport, etc.) and other ancillary studies.

Fossil Repository

The John D. Cooper Center will be the repository for significant fossils recovered in addition to project documents and reports. Funds for curation will be the responsibility of the client. The Principal Investigator is authorized to submit fossils with accompanying deeds of gift for curation on behalf of the client.

REFERENCES CITED

Bean, L.J. and C.R. Smith
1978 "Gabrielino." In *Handbook of North American Indians*, Volume 8. *California*, volume edited by Robert F. Heizer, pp. 538-549 (W. T. Sturtevant, general editor). The Smithsonian Institution, Washington, D.C.

Bean, W. and J.J. Rawls
1993 *California: An Interpretive History*. 4th Edition. McGraw Hill, New York.

BLM GLO (Bureau of Land Management Government Land Office)
2008 Land Grant Records Search Tool. Available online at http://www.glorecords.blm.gov/PatentSearch/Default.asp, last accessed December 7, 2011.

Caltrans (California Department of Transportation)
2001 Caltrans Environmental Handbook. Available online at http://www.dot.ca.gog/ser/envhand.htm, last accessed December 8, 2011.

2003 Paleontology, Online Environmental Handbook, Vol. 1, Chapter 8. Available online at http://www.dot.ca.gov/ser/vol1/sec3/physical/Ch08Paleo/chap08paleo.htm, last accessed December 8, 2011.

Dibblee, T. W.
2001 Geology of the Yorba Linda and Prado Dam Quads. Dibblee Foundation, Santa Barbara.

Drover, C., K. Rover and M. Roeder
2008 Cultural Resources Inventory Mitigated Negative Declaration Castle and Cook Yorba Linda Geotechnical Access Roads, Yorba Linda, California. On file, South Central Coastal Archaeological Center.

Gust, S.
2011 Paleontological and Cultural Resources of Chino Hills for the General Plan Update, City of Chino Hills, California. On file, South Central Coastal Information Center, Fullerton.

Kroeber, A.L.
1976 *Handbook of Indians of California*. Reprint of 1925 original edition, Dover Publications, New York.

McCawley, W.
1996 *The First Angelinos: The Gabrielino Indians of Los Angeles*. Malki Museum Press/Ballena Press, Banning, California.

Meriam Library, California State University, Chico
2010 California Historic Topographic Map Collection. Available online at http://cricket.csuchico.edu/maps/topo_search.html, last accessed December 7, 2011.

Rumelhart, P.E. and R.V. Ingersoll
1997 Provenance of the upper Miocene Modelo Formation and subsidence analysis of the Los Angeles basin, southern California: Implications for paleotectonic and paleogeographic reconstructions. *Geological Society of America Bulletin* 109(7):885-899

Scott, E. and K. Springer
2003 CEQA and fossil preservation in southern California. *The Environmental Monitor*, Winter: 4-10, 17.

Sutton, M.
2010 The Del Rey Tradition and its Place in the Prehistory of Southern California. *Pacific Coast Archaeological Society Quarterly* 44(2):1-54.

Sutton, M. and J. Gardner
2010 Reconceptualizing the Encinitas Tradition of Southern California. *Pacific Coast Archaeological Society Quarterly* 42(4):1-64.

Tino-Sandoval, Cindy
2005 *Yorba Linda*. Arcadia Publishing

Wallace, William J.
1955 A Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11(3):214-230.

Warren, Claude N.
1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In Archaic Prehistory in the Western United States, edited by C. Irwin-Williams, pp. 1-14. *Eastern New Mexico University Contributions in Anthropology* 1(3).

APPENDIX A: QUALIFICATIONS

cogstone
PALEONTOLOGY - ARCHAEOLOGY - HISTORY

SHERRI GUST

Project Manager & Principal Investigator, Paleontology and Archaeology

EDUCATION

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles
1979 B. S., Anthropology (Physical), University of California, Davis

SUMMARY QUALIFICATIONS

Gust has more than 30 years of experience in California, acknowledged credentials for meeting national standards, and is a certified/qualified principal archaeologist and paleontologist in all California cities and counties that maintain lists. Gust is an Associate of the Natural History Museum of Los Angeles County in the Vertebrate Paleontology and Rancho La Brea Sections. She is a Member of the Society of Vertebrate Paleontology, Society for Archaeological Sciences, Society for Historical Archaeology, the Society for California Archaeology and others. She has special expertise in the identification and analysis of human, animal and fossil bone. Gust is a Riverside County Certified Archaeologist (No.116) and is also a Riverside County Certified Paleontologist.

SELECTED PROJECTS

WECC Path 42 Transmission Line Upgrades, Palm Springs area. Supervised cultural and paleontological resources Phase I studies for 14.5 mile segment on BLM and private lands on behalf of SCE. Project Manager and Principal Archaeologist and Paleontologist. 2011-2012

San Juan Capistrano Town Center Master Plan Update, San Juan Capistrano. Supervised archaeological and paleontological record searches, research, and survey plus Native American consultation for 31 acre town center. Also evaluation of resources including updated site records and impact assessment. Principal Archaeologist and Paleontologist and Project Manager. 2011

City of Chino Hills General Plan Update. Cultural and paleontological resources programmatic technical study with recommendations for entire City. Principal Archaeologist and Paleontologist. 2011

Mojave Water Agency Ground Water Replenishment Project. Cultural and Paleontological Resources Management Plan was prepared, including an updated assessment, and submitted to SHPO. Cultural resources sensitivity training provided to all construction personnel and both archaeological and paleontological monitoring performed. Principal Archaeologist and Paleontologist and Project Manager. 2010-2012

Falcon Ridge Substation and Transmission Lines. Archaeological survey, assessment and recording of historical archaeological features on 287 acres in Fontana and Rialto, San Bernardino County, A. Principal Archaeologist and Paleontologist and Project Manager. 2010

El Casco Transmission Project. Conducted preconstruction mitigation measures and prepared Paleontological Resources Treatment Plan for new SCE transmission project in Riverside County. Project Manager and Principal Paleontologist. 2009

Chuckwalla Valley Raceway. Paleontological assessment, Paleontological Mitigation Plan and Paleontological Monitoring Compliance Report for 1100 acres in Riverside County, CA. Project Manager and Principal Paleontologist. 2009-2010

San Bernardino County Road Improvement Projects. (Caltrans District 8 On-Call Contract). Paleontology subconsultant to Applied Earthworks. Prepared portions of Paleontological Identification Reports, Paleontological Evaluation Reports and Paleontological Mitigation Plan for projects including I10, SR58, SR138, SR247. Supervised paleontological monitoring for SR138, recovered significant fossils and prepared Paleontological Mitigation Report. Field and Lab Director. 2005-present

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PALEONTOLOGY - ARCHAEOLOGY - HISTORY

MOLLY VALASIK
Qualified Archaeologist/ Cross-Trained Paleontologist
GIS Specialist

EDUCATION

2009 M.A., Anthropology, Kent State University, Kent, Ohio

2006 B.A., Anthropology, Ohio State University, Columbus, Ohio

SUMMARY QUALIFICATIONS

Ms. Valasik is a Registered Professional Archaeologist with both professional and academic archaeological field and research experience. She is GIS proficient including trimble technology and use of advanced trimble software. Valasik has more than four years of experience in California and works as a supervisor for fieldwork, site records and report writing. She has completed more than 32 hours of paleontological training.

SELECTED PROJECTS

Caltrans District 6 On-Call – Paleontology Field Technician/GIS Specialist. Currently conducting field work, construction monitoring and associated GIS mapping for the SR 99 widening project at Arboleda Drive in Merced.

Caltrans District 7 On-Call – Archaeology Technician/GIS Specialist. Participated in two task orders under subcontract to Galvin Preservation Associates for the LOSSAN North Rail Improvements Project, Ventura County Segment (Caltrans Division of Rail and the Federal Railroad Administration). Conducted archaeological record search, digitized cultural site locations in GIS, georeferenced 8 geologic maps, and created Paleontology sensitivity maps based on the Potential Fossil Yield Classification (PFYC) scale.

California High Speed Rail, Bakersfield to Palmdale Segment - Paleontology Field Technician/GIS Specialist. Performed pedestrian survey of roughly 59 miles, recorded survey area with Trimble GeoXH, produced weekly updates, and geo-referenced Dibblee maps (geology formations).

State Route 178 Widening, Kern County, CA. (Caltrans D6). Performed four-day intensive archaeological and paleontological survey of the 8-mile project area and associated GIS mapping. Relocated previously recorded lithic scatter and determined the site to be destroyed by construction activities.

Wildrose Road, Death Valley National Monument. Archaeological field technician and GIS specialist. Assessment of construction activities on potential resources in Inyo County, requested by National Park Service. Performed 5-mile pedestrian survey identified previously recorded sites, recorded new site information with Trimble GeoXH, updated site records, and participated in associated GIS mapping. 58 hours on project.

APPENDIX B: PALEONTOLOGY RECORD 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
Fax: (213) 746-7431
e-mail: smcleod@nhm.org

23 July 2008

Mark A. Roeder
1731 New Hampshire Drive
Costa Mesa, California 92626

Attn: Mark A. Roeder

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed Castle and Cook Yorba Linda project, near Yorba Linda, Orange County, project area

Dear Mark:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Castle and Cook Yorba Linda project, near Yorba Linda, Orange County, project area as indicated on the sections of the Yorba Linda and Prado Dam USGS topographic quadrangle maps that you provided on 3 July 2008. We do not have any vertebrate fossil localities that lie directly within the proposed project boundaries, but we do have localities nearby from the same deposits that occur in the proposed project area.

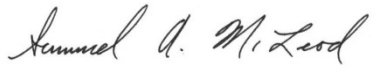
Surficial deposits in the drainages in the southwestern portion of the proposed project area consist of younger Quaternary Alluvium. These younger Quaternary Alluvium deposits usually do not contain significant vertebrate fossils, at least in the uppermost layers. The Whittier Fault runs more or less through the canyon that divides the southwestern portion of the proposed project area. into a northern elevated portion and a slightly smaller southern elevated portion. South of the Whittier Fault in the southwestern portion of the proposed project area there are some exposures of older Quaternary Alluvium. Our closest fossil vertebrate locality in similar older Quaternary deposits is LACM 7508, due north of the proposed project area between Soquel Canyon and Carbon Canyon, that produced fossil specimens of ground sloth, *Nothrotheriops*, and horse, *Equus giganteus*.

Bedrock of the elevated portions of the rest of the proposed project area consist of marine deposits of the late Miocene Puente Formation, with the younger Sycamore Canyon Member occurring south of the Whittier Fault and the older Yorba, Soquel and La Vida Members of the Puente Formation occurring north the of it (these rocks units may also be referred to as the Yorba Shale, the Soquel Sandstone and La Vida Shale Members of the Monterey Formation and the Sycamore Canyon Formation in this area). Our closest localities in the Puente Formation, all from the Yorba Member, are northeast of the proposed project area southeast of Los Serranos. These numerous localities from the Yorba Member of the Puente Formation include LACM 6307-6336, 7266-6267, 7269-7270, and 7272-7284. These localities have produced a suite of fossil fish including herring, *Ganolytes cameo* and *Xyne grex*, cod, *Eclipes*, mora, Moridae, lantern fish, Myctophidae, jacks, *Decapterus* and *Pseudoseriola*, snake mackerel, *Thyrsocles kriegeri*, croaker, *Lompoquia*, mackerel, *Sarda* and *Scomber*, grouper, Serranidae, deep sea smelt, Bathylagidae, salmon, *Oncorhynchus*, rockfish, Scorpaenidae, viperfish, *Chauliodus eximius*, and hatchetfish, *Argyropelecus*, as well as marine mammals including sea lion, *Pithanotaria*, rorqual whale, Balaenopteridae, porpoise, Phocoenidae, and sperm whale, *Scaldicetus*. Directly north of the proposed project area in the Puente Hills west of Chino we also have the vertebrate fossil localities LACM 7490-7492 from the Yorba Member of the Puente Formation that produced fossil specimens of herrings, *Ganolytes cameo* and *Etringus scintillans*, deep-sea smelt, Bathylagidae, snake mackerel, *Thyrsocles kriegeri*, croaker, *Lompoquia*, jack, *Decapterus*, and mackerel, *Scomber*.

Grading or shallow excavations in the younger Quaternary Alluvium in the drainages in the the southwestern portion of the proposed project area are unlikely to encounter significant vertebrate fossils. Deeper excavations in those areas, however, as well as any excavations in the older Quaternary Alluvium in the southwestern portion of the proposed project area and any excavations in the bedrock marine deposits of the late Miocene Puente Formation found in the elevated portions of the rest of the proposed project area, may well uncover significant fossil vertebrate remains, and thus the paleontological sensitivity of the proposed project areas is rated high . Therefore, any substantial excavations in the proposed project areas should be closely monitored to quickly and professionally collect any vertebrate fossil remains without impeding development. 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, Ph.D.
Vertebrate Paleontology

enclosure: invoice