CLASS III CULTURAL RESOURCE SURVEY FOR THE WHITEWATER RIVER GROUNDWATER REPLENISHMENT FACILITY – BUREAU OF LAND MANAGEMENT RIGHT-OF-WAY GRANT PROJECT, RIVERSIDE COUNTY, CALIFORNIA

USGS White Water and Desert Hot Springs 7.5' Quadrangles
BLM Permit No. CA-15-29; BLM Fieldwork Authorization No. 66.66 17-10

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MANAGEMENT SUMMARY

The Coachella Valley Water District (CVWD) proposes to renew and amend a Right-of-Way (ROW) grant from the Bureau of Land Management (BLM) for the Whitewater River Groundwater Replenishment Facility, located near the community of Whitewater, Riverside County, California. Applied EarthWorks, Inc. (*Æ*) was retained to conduct a cultural resources investigation of the Project Area of Potential Effects (APE) in accordance with Section 106 of the National Historic Preservation Act (NHPA), as well as the California Environmental Quality Act (CEQA).

This study was conducted under *Æ*'s California State BLM Cultural Resources Use Permit No. CA-15-29 and the BLM Palm Springs-South Coast Field Office Fieldwork Authorization No. 66.66 17-10 executed on February 15, 2017. *Æ* developed the scope of work in consultation with Luke Stowe of CVWD and George Kline, BLM archaeologist, which included defining an APE, background research, and a Class III cultural resources study.

A cultural resources literature and records search was performed at the Eastern Information Center (EIC) of the California Historical Resources Information System on March 24, 2017. The records search indicated that 54 cultural resources are present within a one-mile radius of the Project APE; five of these resources have been previously recorded within the boundaries of the Project APE (three water conveyance sites [CA-RIV-4873H/33-004873, CA-RIV-6379H/33-009496, and CA-RIV-6380H/33-009497]; the Southern Pacific Railroad [CA-RIV-6381H/33-009498]; and a historic cobble-lined trail [CA-RIV-9292H/33-018090]). *Æ* also contacted the Native American Heritage Commission (NAHC) for a review of the Sacred Lands File (SLF), which was completed with negative results.

The Class III cultural resource survey of the 940-acre (ac) Project APE was completed between April 13 and 20, 2017 by *Æ* archaeologists, Patrick Moloney, Renee Elder, William Blodgett, and Evan Mills. The five previously recorded cultural resources (three water conveyance sites [CA-RIV-4873H/33-004873, CA-RIV-6379H/33-009496, and CA-RIV-6380H/33-009497], the Southern Pacific Railroad [CA-RIV-6381H/33-009498], and a historic cobble-lined trail [CA-RIV-9292H/33-018090]) and eight newly identified cultural resources (two transmission lines [CA-RIV-12627H and CA-RIV-12630H], asphalt road [CA-RIV-12628H], water conveyance feature [CA-RIV-12629], prehistoric habitation site [CA-RIV-12631], prehistoric artifact scatter [CA-RIV-12632], and two prehistoric isolated finds [33-026898 and 33-026897]), were identified in the APE and documented as a result of the survey.

All cultural resources within the Project APE (nine historic-period cultural resources [6 archaeological sites and 3 built-environment resources], two prehistoric archaeological sites, and two isolated finds) were evaluated for historical significance during this study. The results of the evaluation indicate that that the only known historic properties/historical resources present within the Project APE include a segment of a stone-lined ditch known as McCallum's Ditch (CA-RIV-4873H/33-004873) and two prehistoric sites (CA-RIV-12631 and CA-RIV-12632).

Avoidance of cultural resources is preferred and recommended. However, if avoidance is not a feasible option, Phase III data recovery would be required to mitigate adverse effects to historic properties under NRHP Criterion D.

Field notes documenting the current investigation are on file at Æ's Hemet office. A copy of this report will be filed with the Palm Springs-South Coast BLM office and the EIC at the University of California, Riverside.

1
INTRODUCTION

The Coachella Valley Water District (CVWD) proposes to renew and amend a Right-of-Way (ROW) grant from the Bureau of Land Management (BLM) for the Whitewater River Groundwater Replenishment Facility, located near the community of Whitewater, Riverside County, California. This report, prepared by Applied EarthWorks, Inc. (*Æ*), summarizes the methods and results of a Class III cultural resources investigation for the Whitewater River Groundwater Replenishment Facility – Bureau of Land Management Right-of-Way Grant Project (hereafter "Project") Area of Potential Effects (APE).

1.1 SCOPE AND PURPOSE OF INVESTIGATION

The Project area is located at the northern edge of the Coachella Valley, south of Interstate 10 (I-10) and north of Highway 111 (Hwy 111) near the community of Whitewater, Riverside County, California (Figure 1). Specifically, the Project APE is located on the Whitewater and Desert Hot Springs, CA 7.5' USGS quadrangle maps within Township 3 South, Range 3 East (T3S/R3E), Sections 14, 23, and 24 and Sections 20, 28, and 30, San Bernardino Baseline and Meridian (S.B.B.M.) (Figure 2). Elevations within the Project APE range from approximately 366 to 244 meters (m) (1,200 to 800 feet [ft]) above mean sea level (amsl)

The majority of the Project APE is located within public land administered by the BLM and requires federal approval and permitting. Therefore, the Project is considered an "undertaking" under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The BLM has assumed the role of lead federal agency for Section 106.

This study was performed under *Æ*'s California State BLM Cultural Resources Use Permit No. CA-15-29 and more specifically, the BLM Palm Springs-South Coast Field Office Fieldwork Authorization No. 66.66 17-10 executed on February 15, 2017. *Æ* developed the scope of work in consultation with Luke Stowe of the CVWD and George Kline of the BLM, which included defining the Project APE, background research, and performing the Class III cultural resource survey. Vanessa Mirro, M.A., RPA, served as *Æ*'s Principal Investigator, Joan George as the Project Manager and co-author, and Justin Castells, M.A. as co-author. Patrick Moloney served as the field supervisor for the Class III cultural resource survey.

The Whitewater River Groundwater Replenishment Facility is operated and maintained by CVWD and Desert Water Agency (DWA). The purpose of the facility is to replenish the Whitewater River Subbasin with Colorado River Aqueduct Water via the Whitewater River. Both agencies have a combined allocation of 194,100 acre-feet per year of water from the State Water Project (SWP). However, the Coachella Valley does not have a direct connection to the SWP, so CVWD and DWA have an exchange agreement with Metropolitan Water District (MWD). MWD receives CVWD and DWA's SWP water and, in exchange, MWD delivers CVWD and DWA Colorado River water at the Colorado River Aqueduct Turnout. The Colorado River water flows down the existing Whitewater River until it reaches the Whitewater River Groundwater Replenishment Facility.

Figure 1 Project vicinity map.

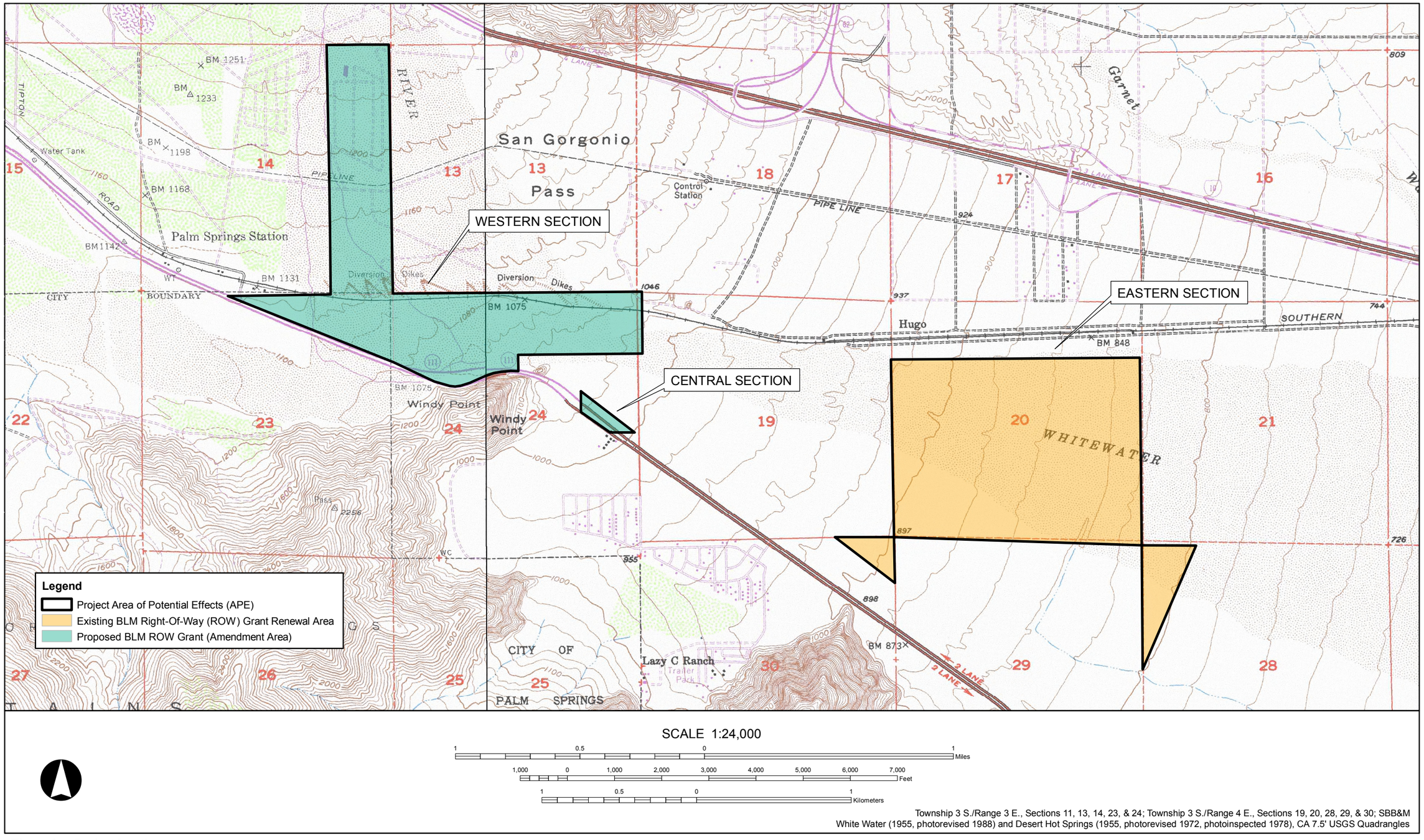

Figure 2 Project location map.

The ROW grant request to the BLM for the Project consists of a renewal area and an amendment area. CVWD does not propose any construction within the renewal or amendment areas. These areas are identified in Figure 2 and described below.

The renewal area consists of approximately 206 hectares (ha) (509 acres [ac]) that is currently developed with a series of dikes, levies, spillways, and 19 replenishment ponds (to replenish the Whitewater River Subbasin with Colorado River Aqueduct water via the Whitewater River). Annual maintenance that occurs in this area includes ripping the ground with a bulldozer and removing sediment as needed. Other maintenance also includes armoring and repairing dikes and maintaining service roads around the replenishment ponds.

The amendment area consists of approximately 174 ha (431 ac) and would be used as access to existing facilities to perform operation and maintenance activities. Operation and maintenance activities would include monitoring and checking the Whitewater River conveyance and ensuring that NO TRESSPASSING signs are posted adjacent to the Whitewater River and maintenance of the existing berms within the area (i.e., sloping, shaping, and restoring the berm where it has been washed out or eroded by water).

1.2 REGULATORY CONTEXT

1.2.1 National Historic Preservation Act (NHPA)

As previously stated, the proposed Project is considered a federally licensed undertaking per 36 CFR § 800.2 (o) and subject to compliance with Section 106 of the NHPA of 1966, as amended. Under these guidelines, federal agencies are required to identify cultural resources that may be affected by project actions, assess the significance of these resources and their eligibility for inclusion on the National Register of Historic Places (NRHP) as per 16 USC 470w (5), and consult with the Advisory Council on Historic Preservation (ACHP) regarding project effects on significant resources. Eligibility is based on criteria defined by the Department of the Interior. Generally, districts, archaeological sites, buildings, structures, and objects that possess integrity are potentially eligible for inclusion on the NRHP under the following criteria:

A) that are associated with events that have made a significant contribution to the broad patterns of our history; or

B) that are associated with the lives of persons significant in our past; or

C) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D) that have yielded, or may be likely to yield, information important in prehistory or history. [36 CFR § 60.4]

If a cultural resource is determined to be an eligible historic property under 36 CFR § 60.4, then Section 106 requires that the effects of the proposed undertaking be assessed and considered in planning the undertaking.

1.2.2 California Environmental Quality Act (CEQA)

As currently proposed, the Project is also subject to compliance with CEQA, as amended. Therefore, cultural resource management work conducted as part of the proposed Project shall comply with the CEQA Statutes and Guidelines (California 2016), which directs lead agencies to

first determine whether cultural resources are "historically significant" resources. A project with an effect that may cause a substantial adverse change in the significance of a historical resource is a project that may have a significant effect on the environment (California Code of Regulations [CCR], § 15064.5[b]). Generally, a cultural resource shall be considered "historically significant" if the resource is 45 years old or older, possesses integrity of location, design, setting, materials, workmanship, feeling, and association, and meets the requirements for listing on the California Register of Historical Resources (CRHR) under any one of the following criteria (Title 14 CCR, § 15064.5):

1) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2) Is associated with the lives of persons important in our past;

3) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or,

4) Has yielded, or may be likely to yield, information important in prehistory or history [Title 14 CCR, § 15064.5].

The cited statutes and guidelines specify how cultural resources are to be managed in the context of CEQA-approved projects such as the Whitewater River Groundwater Replenishment Facility – Bureau of Land Management Right-of-Way Grant Project. Briefly, archival and field surveys must be conducted, and identified cultural resources must be inventoried and evaluated in prescribed ways. Prehistoric and historical archaeological resources, as well as built-environment features, such as standing structures deemed "historically significant" must be considered in project planning and development.

1.3 AREA OF POTENTIAL EFFECTS

It was necessary to define an APE, or the geographic area within which the Project has the potential to directly or indirectly cause alternations to historic properties per 36 CFR § 800.16(d). In defining the APE, both direct and indirect impacts anticipated by the Project were considered. As the Project consists of operation and maintenance activities on existing facilities, berms, and channels, indirect effects, such as visual intrusion or noise are considered temporary. Thus, the Project APE is defined as the 206 ha (509 ac) encompassing the renewal area (Eastern section) and the 174 ha (431 ac) encompassing the amendment area (Western and Central sections) (see Section 1.1 and Figure 2). As noted above, CVWD does not propose any new construction within the Project APE and ground-disturbing activities will be limited to operation and maintenance activities on existing dikes, levies, spillways, replenishment ponds, service roads, and berms within the Project APE.

1.4 REPORT ORGANIZATION

This report documents the results of a Class III cultural resource investigation of the Project APE for the Whitewater River Groundwater Replenishment Facility – Bureau of Land Management Right-of-Way Grant Project. Chapter 1 introduced the scope of the work and stated regulatory context. Chapter 2 synthesizes the natural and cultural setting of the Project APE and surrounding region. Chapter 3 presents the results of the background research, which included a cultural resources literature and records search conducted at the Eastern Information Center

(EIC) of the California Historical Resource Information System (CHRIS), housed at the University of California, Riverside, as well as a *Sacred Lands Files* (SLF) search with the Native American Heritage Commission (NAHC). The cultural resource survey methods employed during this investigation are outlined in Chapter 4, and findings are discussed in Chapter 5. Evaluations of resources located within the Project APE are provided in Chapter 6. Chapter 7 provides management recommendations, followed by bibliographic references in Chapter 8, and appendices.

2
SETTING

The prehistoric and ethnographic cultural settings of the area around the Project APE contextualize the nature and significance of cultural properties within the Coachella Valley region. Importantly, the nature and distribution of human activities, both prehistorically and ethnographically, in the region have been affected by such factors as topography, the availability of water, and biological resources. Therefore, prior to a discussion of the cultural setting, the environmental setting of the area is summarized below.

The following sections summarizing Lake Cahuilla and the prehistoric setting are drawn heavily from Chapter 2 and Chapter 6 of the *Data Recovery at Prehistoric Site CA-RIV-6896/6897 (33-011573/33-011574), Comprehensive Final Report of Archaeological Investigations for the I-10/Jefferson Street Interchange Improvement Project and the Varner Road/Jefferson Street Improvement Projects in the City of Indio, Riverside County, California* report (Moratto and McDougall 2017).

2.1 ENVIRONMENTAL SETTING

The Project area is situated east of the Peninsular Ranges in the northern portion of the Coachella Valley (see Figure 1). The Coachella Valley is bordered to the southwest by the San Jacinto and Santa Rosa Mountains (part of the Peninsular Ranges) and to the northeast by the low, rolling Indio Hills and Mecca Hills. From the steep slopes of the San Jacintos surmounted by San Jacinto Peak (3,274 m [10,804 ft] amsl), the desert floor descends sharply eastward to sea level at the City of Indio, some 43 kilometers (km) (27 mile [mi]) southeast of the Project area.

To the south, elevations gradually drop to 90 m (300 ft) below mean sea level (bmsl) at the Salton Sea Basin. This basin has filled periodically throughout the Pleistocene and Holocene when the Colorado River shifted its course near its mouth at the Gulf of California, flowing north into the basin, forming a large freshwater lake commonly known as Lake Cahuilla (see below). A major water source flowing through the central valley is the Whitewater River, which, prior to the development of the Coachella Valley, has drained the southern slope of the San Bernardino Mountains for thousands of years (Laflin 2001), flowing in a generally south-southeast direction 80.5 km (50 mi) toward the Salton Sea. The Whitewater River was likely the largest perennial stream that entered the Salton Basin during prehistoric time, replenishing the underground aquifer during nonlacustrine intervals. A few small streams, such as Snow, Chino, Tahquitz, and Andreas creeks, form high on the San Jacinto and Santa Rosa mountains, descending into the northern end of the Coachella Valley. Several minor drainages of ephemeral streams coming off the Mecca Hills are also evidenced across the landscape east of the Project area. Additionally, numerous springs are located along the San Andreas Fault zone at the southwestern base of the Indio Hills. These are usually marked by native fan palm oases.

The climate of the Coachella Valley is characterized by low relative humidity, very low rainfall, high summer temperatures of up to 52° C (125° F), and mild winters. During the spring and late fall, high winds are common and are accompanied by blowing sand and dust. Precipitation occurs primarily during the winter months and varies radically from one area to another. However, rain also falls during the summer months as surges of moisture from both the Gulf of

Mexico and the Gulf of California are drawn into the area by the desert monsoon. Within the lower elevation desert areas, the average annual rainfall is as sparse as 6 centimeters (cm) (2.5 inches [in.]) per year; however, at the higher elevations in the San Jacinto Mountains the average annual precipitation may range from 25 cm (10 in.) to as much as 76 cm (30 in.) per year.

As the climate of the region is largely determined by topographic features, climate, in turn, largely dictated the character of the biotic environment exploited by native populations. Bean and Saubel (1972) describe three primary life zones that were exploited by the Cahuilla, known ethnographically to have occupied the Coachella Valley: Lower Sonoran, Upper Sonoran, and Transitional. Characteristic plants and animals found in these life zones are listed below.

The Lower Sonoran life zone, which extends from the desert floor to approximately 1,067 m (3,500 ft) amsl, is characterized by low rainfall (about 10 cm [4 in.] per year), fine-textured alluvial to sandy soils, and xerophytic plant communities. Creosote bush (*Larrea tridentata*) and bur-sage (*Ambrosia dumosa*) are the dominant plants, replaced by saltbush (*Atriplex* spp.) in areas of more saline or alkaline soils. Adjacent to washes and ephemeral streams, desert willow (*Chilopsis linearis*), smoke tree (*Dalea spinosa*), palo verde (*Cercidium floridum*), desert ironwood (*Olneya tesota*), and catclaw (*Acacia greggii*) are found; California fan palm (*Washingtonia filifera*), mesquite (*Prosopis juliflora*), screwbean (*Prosopis pubescens*), and arrowweed (*Pluchea sericea*) occur adjacent to more permanent water sources and in areas with a very shallow groundwater table. Frost-sensitive plants such as ocotillo (*Fouquieria splendens*), barrel cactus (*Ferocactus splendens*), cholla (*Opuntia* spp.), century plant (*Agave deserti*), creosote bush, and Mojave yucca (*Yucca schidigera*) exist on the well-drained slopes adjacent to the desert floor. Approximately 40 percent of the plant species exploited by the Cahuilla are found in this biotic region; the fruits of the fan palm and the flowers and pods of mesquite and screw bean were highly favored (Bean and Saubel 1972:13). Economically important animals found in this life zone include kangaroo rats (*Dipodomys*), ground squirrels (*Citellus*), wood rats (*Neotoma*), desert cottontail (*Sylvilagus audubonii*), and black-tailed jackrabbit (*Lepus californicus*). Desert bighorn sheep (*Ovis canadensis*) are found at the upper reaches of this life zone.

Warm summers and cold winters with rainfall averaging 38 cm (15 in.) annually characterized the Upper Sonoran life zone which ranges from 1,067 to 1,524 m (3,500 to 5,000 ft) amsl. Dominant plant species of this zone include the Pinyon pine (*Pinus monophylla, P. quadrofolia*) and California juniper (*Juniperus californica*). Species occurring in lesser abundance include red shank or ribbon wood (*Adenostoma sparsifolium*), chamise (*A. fasciculatum*), ironwood, antelope bush (*Purshia glandulosa*), scrub oak (*Quercus dumosa*), ocotillo (*Fouquieria splendens*), manzanita (*Arctostaphylos* spp.), buckthorn (*Rhamnus* spp.), and barrel cactus. Approximately 45 percent of the food plant species used by the Cahuilla are found in this life zone, including the highly favored pinyon pine nuts, manzanita, and elderberry. Important animal resources found in this life zone include wood rat, kangaroo rat, black-tailed jackrabbit, ground squirrel, desert bighorn sheep, and mule deer (*Odocoileus hemionus*).

In contrast to the Upper Sonoran life zone, relatively cool summers and cold winters with an annual precipitation of 50–76 cm (20–30 in.) characterized the Transitional life zone which ranges from 1,524 to 2,134 m (5,000 to 7,000 ft) amsl. Coniferous forests containing scattered oak (*Quercus* spp.) groves dominate this zone while willows (*Salix* spp.) and cottonwood (*Populus* spp.) occur along stream courses. Common species include ponderosa pine (*Pinus ponderosa*), Jeffery pine (*P. jeffreyi*), incense cedar (*Calocedrus decurrens*), bigcone spruce

(*Pseudotsuga macrocarpa*), manzanita, mountain mahogany (*Cercocarpus* spp.), and elderberry (*Sambucus* spp.). Probably the most important plant food species from this life zone are the black oak (*Q. kelloggii*), manzanita, and elderberry. Approximately 15 percent of the plants utilized by the Cahuilla are found in this life zone. Important animal resources found in this life zone include mule deer and ground squirrel.

2.1.1 Lake Cahuilla

Environmental conditions in the Colorado Desert area have changed greatly during the millennia of human occupation. Probably the most important environmental change in the Colorado Desert in the past 2,000 years was the formation of Lake Cahuilla, also known geologically as Lake Le Conte and historically as Blake's Lake. Lake Cahuilla formed numerous times throughout the Pleistocene and Holocene in response to the western diversion of the Colorado River into the Salton Trough. During each filling of Lake Cahuilla, water was impounded north of the barrier created by the Colorado River Delta. The lake continued to fill until the water reached an altitude of 12 m (40 ft), the minimum crest of the delta at Cerro Prieto, where excess discharge would overflow into the Gulf of California (Waters 1983:374). Wilke (1976) calculated that about 12 to 20 years would be required to fill Lake Cahuilla to an altitude of 12 m (40 ft) if the lake were to receive the entire flow of the Colorado River; as well, Wilke determined that 60 years would be required to completely desiccate the lake without input from the Colorado River.

Utilizing radiocarbon assays, historical accounts, and cross dating of artifacts found along the former Lake Cahuilla shoreline, Wilke (1976:90–93) posited three lacustrine intervals in the Salton Basin representing an unknown number of stands of Lake Cahuilla during the past 2,000 years. The earliest of these was dated to approximately 2,100 to 1,400 years ago, the second occurred between 1,100 to 750 years ago, and the final lake stand occurred between 700 and 500 years ago.

More recent archaeological research by Waters (1983) in the Salton Basin has further refined Wilke's original estimates of the Lake Cahuilla lacustrine intervals. Based on additional radiocarbon assays, historical evidence, Late Holocene sedimentological history of the Gulf of California, and interpretation of sedimentation rates, Waters (1983) refined Wilke's timing of lacustrine intervals of Lake Cahuilla; this research suggested that there were four lacustrine intervals that reached the 12 m (40 ft) shoreline during the last 1,500 years (Waters 1983:382–385). The first and earliest of these events has been dated to A.D. 700–890, apparently followed by a gradual, but complete, desiccation of the lake by about A.D. 950. The second interval began shortly after A.D. 950, and peaked at approximately A.D. 965–1150; again, this was followed by a gradual, but complete, desiccation of the lake at A.D. 1210. The third interval began shortly after A.D. 1210 and peaked between A.D. 1225 and 1360. The third interval was followed by a gradual desiccation of the lake to an altitude of 40 m (132 ft) below sea level by A.D. 1450, although the lake was still approximately 50 m (165 ft) deep at this time. This desiccation was quickly reversed shortly after A.D. 1450, resulting in the fourth interval which lasted until approximately A.D. 1520. By A.D. 1580, Lake Cahuilla had once again dried up completely.

Additional archaeological research by Cleland (1999), Laylander (2006), and Schaefer (1986) suggests that a fifth, more recent lacustrine interval of Lake Cahuilla occurred sometime between the Spanish explorations of the region in 1540 and again in 1775; radiocarbon dating indicates that this high stand may have occurred between 1685 and 1740 (Cleland 1999:13). The Lake Cahuilla chronology in calendar years before present (1950; cal B.P.) corrected for variations in

^{14}C is as follows: Lacustrine Interval 5: 330–270 cal B.P.; Lacustrine Interval 4: 520–370 cal B.P.; Lacustrine Interval 3: 740–580 cal B.P.; Lacustrine Interval 2: 1010–740 cal B.P.; and Lacustrine Interval 1: 1250–1010 cal B.P. It should be noted that the dates for the duration of the lake high stands represent maximum spans. The stratigraphic record reveals that the next oldest lacustrine intervals are associated with radiocarbon assays from two distinct sedimentary strata dating to approximately 2285 and 2300 cal B.P. The stratigraphic continuity evident between these older late Holocene lacustrine sediments and the overlying unit representing Lacustrine Unit 1, above, indicates that there were no Lake Cahuilla episodes between about 2300 and 1250 cal B.P. (Waters 1983).

The lacustrine chronology is important not only for understanding occupational sequences and changing land-use, settlement, and subsistence strategies in Coachella Valley prehistory, but also for determining when volcanic glass was available from the Obsidian Butte source (Hughes 1986) near the southern end of the Salton Sea in Imperial County. In late prehistoric times, especially after A.D. 1000, toolstone from Obsidian Butte was used widely in southern California. However, the source was inundated and its glass was inaccessible whenever Lake Cahuilla's surface elevation was higher than -40 m (-131 ft) (Schaefer and Laylander 2007). Thus, whether expanding or receding, the lake would have prevented access to Obsidian Butte glass whenever the water level stood between 40 m bmsl and 12 m amsl.

Significant new information about the late Holocene chronology of Lake Cahuilla has recently come to light as a result of a paleoseismic study by a team of geologists from the California Institute of Technology, University of Oregon, and U.S. Geological Survey. Three benched trenches totaling more than 950 m (3,116 ft) in length were excavated in 2006 across the San Andreas Fault zone in the city of Coachella. Although the primary purpose of this work was to investigate the nature and frequency of past earthquakes, the excavations also revealed stratified lacustrine, fluvial, and shoreline deposits that, together with numerous radiocarbon dates, elucidate the late Holocene fluctuations of ancient Lake Cahuilla (Philibosian et al. 2009:1).

The observed strata indicate five or six high stands of ancient Lake Cahuilla since ca. A.D. 800. The age and duration of each interval were obtained "by projecting the thickness of the lake sediment through the date-constrained sedimentation rate" (Philibosian et al. 2011:33). As reconstructed by Philibosian et al. (2011:Figure 18), the highstand chronology of Lake Cahuilla at the 9-m site in Coachella is as follows:

- Lake Interval 1: A.D. 1650–1710
- Lake Interval 2: A.D. 1500–1610
- Lake Interval 3: A.D. 1390–1470
- Lake Interval 4: A.D. 1100–1180
- Lake Interval 5: A.D. 950–1050
- Lake Interval 6: A.D. 850–920

Philibosian et al. (2011:34–35) compare their lacustrine sequence with chronologies developed by other researchers elsewhere at higher and lower elevations in the Salton Trough and find general correspondence among the chronologies when allowances are made for local geologic conditions and archaeometric factors. Interestingly, it would appear that the basin was not completely dry during the two periods (ca. A.D. 1470–1500 and A.D. 1610–1650 separating the

three most recent high stands (supra), and that a body of water similar to the Salton Sea remained in the lower part of the basin during those periods (Brothers 2009; Philibosian et al. 2011:34).

In summary, the shoreline of the most recent documented stands of Lake Cahuilla extended from about 20 mi south of the international border with Mexico to just northwest of the town of Indio. Inundating the entire lower portion of the Coachella Valley, Lake Cahuilla was approximately 115 mi long, about 34 mi wide, and nearly 320 ft deep; during these periods (circa [ca.] 1,500 years ago), the elevation of the lake was 40 ft amsl (Wilke 1976:53). When inflow from the Colorado River was sufficient to maintain a relatively stable lake level, extensive marshes would have formed around its margins and freshwater fish and shellfish populations would have flourished. Thus, Lake Cahuilla offered an especially productive environment for aboriginal populations of the western Colorado Desert. When filled, Lake Cahuilla was on the Pacific Flyway for migratory birds; hence, ducks, geese, and other migratory birds would have been available. Wilke (1976:15) estimated that an annual loss by evaporation of approximately 5.5 ft of surface elevation would have dried Lake Cahuilla within 60 years, assuming that no renewed inflow from the Colorado River occurred. Thus, it is likely that 30 years of progressive recession, or lowering the surface of the lake by approximately 60 ft, would have sufficiently altered the chemical and ecological balance of the lake to all but eliminate its economically important plant and animal resources. However, as Lake Cahuilla gradually desiccated, the expansion of mesquite thickets followed the retreating shoreline, resulting in different resource exploitation patterns by the prehistoric inhabitants of the region (Smith and Brock 1998).

2.2 PREHISTORIC SETTING

General overviews of archaeological research and prehistory in southeastern California have been compiled by various scholars, notably Arnold et al. (2004), Cleland (1999), Jertberg (1982), Sutton (2011), Sutton et al. (2007), Wallace (1962), Warren (1984), and Weide and Barker (1975). For the Coachella Valley specifically, archaeology and prehistory have been summarized by Dahdul (2013), Kaldenberg et al. (2013), Love and Dahdul (2002), McDougall and Mirro (2012), Schaefer (1994), Schaefer and Laylander (2007), Waters (1982), and Wilke (1976, 1978). Recently, Laylander (2010) published a detailed examination of linguistic prehistory as it relates to the Archaic-to-Late Period transition in this area (see also Golla 2011:254–256). The following sections provide a brief synthesis of cultural chronology in southeastern California with emphasis on late prehistoric developments in the Coachella Valley.

2.2.1 Cultural Chronology

Excluding various controversial claims of human activity in the California deserts 20,000 to more than 100,000 years ago (see the critical assessments by Moratto [1984:39–49] and Taylor et al. [1985]), scholars have not yet determined when people first entered the Colorado Desert. Based upon the facts that: (1) fluted Clovis points and “Clovis-like” bifaces have been found throughout much of North America, including at dozens of sites in California (Dillon 2002; Moratto 1984; Rondeau 2015), (2) such artifacts evidently were produced as early as approximately 13,250–12,800 cal B.P. (Waters and Stafford 2007:1123), and (3) evidence for pre-Clovis occupation has been found widely in South and North America (Adovasio and Pedler 2013; Collins et al. 2013; Graf et al. 2013; Jenkins et al. 2013; Waters et al. 2011), it seems quite probable that humans first arrived in southeastern California more than 130 centuries ago.

People who lived in this area witnessed great environmental changes. During the Pleistocene-to-Holocene transition, temperatures became warmer, precipitation declined, evapotranspiration

increased, and desert conditions spread northward from Mexico into the American Southwest. Preceding or coincident with these changes, the great Rancholabrean animals ("megafauna") vanished, and a host of smaller, desert-adapted creatures came to occupy the emerging arid environments (Grayson 2016; Kurtén and Anderson 1980; Martin 2005). By middle Holocene times, the earlier steppe and woodland landscapes featuring numerous pluvial lakes had given way to xerophytic vegetation, dry lakebeds (playas), and sere desert landscapes.

However, the environmental changes were neither permanent nor unidirectional. Rather, they fluctuated throughout the Holocene epoch. As a result of variable climatic regimes and geomorphic conditions: droughts came and went; lakes appeared, filled, and receded; the species composition, density, and distribution of vegetation were dynamic; and the availability of faunal resources (mollusks, fish, reptiles, waterfowl, upland birds, and game animals) varied concomitantly. These environmental changes significantly affected human adaptive strategies and demographic patterns. Thus, the archaeological record of late Pleistocene and early-through-middle Holocene prehistory is one of "punctuated equilibrium," characterized by abrupt cultural change separating intervals of relatively stable adaptation. Many of the cultural and environmental shifts seem to be correlated, and some of the former may reflect not only the advent of new adaptive modes but also the replacement of older populations by new arrivals.

Many attempts have been made over the years to relate, classify, and determine the age of archaeological cultures in the California deserts (see Altschul 1993; Hall 2000; Laylander 2010; McDonald 1992; Rogers 1966; Schaefer 1994, 1995; Schaefer and Laylander 2007; Sutton 1996, 2011; Sutton et al. 2007; Warren 1984; Weide 1976). Without delving into minute details of local sequences, the following broad "periods" are employed in this report:

- **Historic Period** (A.D. 1540–1850). The initial date for this period varies from one locality to another, depending on when contacts between Native Americans and outsiders actually began.

- **Late Prehistoric Period** (circa [ca.] A.D. 700–1800). Various local cultural manifestations are recognized. In the Coachella Valley, Patayan I–III phases (previously called Yuman I–III) are assigned to this period. Recently, Sutton (2011) has defined Peninsular I, II, and III phases of the Palomar Tradition within what was previously called Patayan III.

- **Late Archaic Period** (ca. 2500 B.C.–A.D. 700). This interval coincides more or less with the Gypsum, Newberry, and Amargosa periods (see Sutton 2011:Figure 2).

- **Early Archaic Period** (ca. 6500–2500 B.C.). This is largely synonymous with the Pinto period as used elsewhere in the deserts of southeastern California (see Schroth 1994).

- **Late Paleoindian Period** (ca. 10,800–6500 B.C.). This period coincides with the Western Pluvial Lakes Tradition in interior southern California (and in the Great Basin) and the related, perhaps entailed, San Dieguito Complex.

- **Middle Paleoindian Period** (ca. 11,300–10,800 B.C.). The Clovis cultural tradition was widespread in North America during this period. Early manifestations of the Western Stemmed Point Tradition also appeared during this interval.

- **Early Paleoindian Period** (pre-11,300 B.C.). This is a as yet undefined Pre-Clovis period as indicated by the discovery of pre-Clovis cultural remains elsewhere in North (as well as South) America (cf. Graf et al. 2013; Waters et al. 2011).

2.2.2 Late Prehistory

The Late Prehistoric Period in the Colorado Desert and far western Arizona is marked by certain kinds of artifacts and technological innovations, and is defined as the Patayan Pattern (Cleland 1999; Cordell 1997; Cultural Systems Research, Inc. [CSRI] 1986; Reid and Whittlesey 1997:111–130; Schaefer 1994, 1995) or the Palomar Tradition, including Patayan I, II, and III, and Peninsular I, II, and III phases of the Palomar Tradition within what was previously referred to as Patayan III (cf. Sutton 2011). This period is characterized by the introduction of ceramics, including Tizon Brown Ware from the Peninsular Range, Colorado Buff Wares from the Colorado River region, and the use of Salton Buff Ware from the Lake Cahuilla shoreline (Schaefer 1995; Waters 1982). New projectile point types, including Desert Side-notched and Cottonwood Triangular points, signify the advent of the bow and arrow (Justice 2002). Floodplain horticulture also appears along the Colorado River at about the same time as ceramics. Additionally, mortuary practices changed from extended burial to cremation, with the burned remains sometimes buried in ceramic vessels. Typical of the Hohokam culture in southern Arizona (cf. Haury 1976), these traits were introduced to the Colorado River inhabitants and gradually spread west to the Peninsular Range and coastal plains of southern California. Only agriculture remains a problematic trait in regard to its uncertain spread beyond the Colorado River and Imperial Valley in late prehistoric times (CSRI 1986:35).

The Patayan Pattern or Palomar Tradition (Sutton 2011) is typified by several different settlement and economic systems (Schaefer 1995). Along the Colorado River, dispersed seasonal settlements featured *jacal* structures, semisubterranean pit houses, *ramadas*, or brush huts, depending on the season, type of settlement, and resources available locally. Occupants of larger villages would disperse to upper terraces of the Colorado River and to special collection areas during the summer months, coinciding with the flood phase of the river, and return to the lower terraces for crop harvesting. At the eastern base of the Peninsular Range, the settlement pattern was typified by dispersed villages situated at the mouths of canyons with perennial streams, at the base of alluvial fans near springs, or where wells could be dug (e.g., at Indian Wells). In addition to such villages, specialized sites were located in microenvironmental zones that were exploited seasonally. Archaeologically, the sites range from bedrock mills and pot-drops along trails, to toolstone quarries and workshops, to temporary camps containing bone, shell, ceramics, flaked and ground stone tools, and ornamental items such as beads and pendants as well as other occupational debris.

Three phases of Patayan are generally recognized in addition to the pre-ceramic phase (Schaefer 1995). These are defined by changes in pottery frequencies and by the cultural and demographic effects of the filling and desiccation of ancient Lake Cahuilla. The Patayan I phase appears to have been confined to the Colorado River vicinity and began approximately 1,200 years ago with the introduction of pottery. The artifacts typical of this phase bear the closest similarity to those of the Hohokam (cf. Cordell 1997; Haury 1976; Schaefer 1995; Waters 1982).

The Patayan II phase, beginning about 950 years ago, is contemporary with Lacustrine Interval 5 of Lake Cahuilla (see above). Attracted to highly productive microenvironments along the Lake Cahuilla shoreline, people on both its eastern and western shores were making pottery by the

time the lake was full. New ceramic types indicate that sedimentary, non-marine clays from the Peninsular Range were being selected.

The final phase, Patayan III, began approximately 500 years ago, coinciding with Lake Cahuilla Lacustrine Interval 2. This phase, encompassing Sutton's (2011) Peninsular I–III phases, is characterized by new pottery types that reflect changes in settlement patterns, as well as intensified communication among tribes of the Colorado River and Peninsular Range. Long-distance travel increased as people living around the former Lake Cahuilla shore dispersed to their base territories, and the Imperial and Coachella Valleys became increasingly xeric (Schaefer 1995). Wilke (1976) has postulated that, by approximately 250 years ago with the final desiccation of Lake Cahuilla prior to the twentieth century, the native occupants of its shores began moving westward into areas such as Anza-Borrego, Coyote Canyon, the Upper Coachella Valley, the Little San Bernardino Mountains, the San Jacinto Valley, and Perris Plain. The Patayan III phase continued into the early historic period, ending in the late nineteenth century when Euro-American incursions disrupted the traditional culture. The Patayan III peoples include the Cahuilla who occupied the western Colorado Desert region, as well as the Quechan, Mojave, and Cocopa of the Colorado River region.

Recently, Sutton (2011) proposed that the proto-Cahuilla cultures occupying the Peninsular Range and northern Coachella Valley during the Late Prehistoric Period resulted from an eastward movement of people of Yuman ethnicity speaking Takic (a branch of Uto-Aztecan) languages from the inland valley areas of coastal Orange County and northern San Diego County. Sutton (2011:6) proposed that the impetus for this migration was the filling of Lake Cahuilla after ca. 1,070 B.P. Sutton identifies this eastward movement of people, and the concomitant introduction of new technologies and ideas into the region, as Peninsular I, II, and III phases of the Palomar Tradition (Sutton 2011:1–74).

The Peninsular I phase, dating from ca. 900 to 750 B.P., reflects: the initial movement of people into the northern Coachella Valley from the interior valleys as Lake Cahuilla filled; the establishment of major villages along the Lake Cahuilla shoreline; and the adoption of a lacustrine-based subsistence system. The arriving Peninsular I groups would have encountered existing Yuman (Patayan I) groups and either "absorbed or replaced them" (Sutton 2011:21). Material culture traits associated with Peninsular I groups include: the introduction of Cottonwood (arrow) points, augmenting the existing bow and arrow technology (e.g., Desert Side-notched points) in the northern Coachella Valley; arrow shaft straighteners; the retention of existing Patayan II pottery (Tumco Buff and Salton Buff); few stone ornaments and/or stone pipes; the appearance of shell ornaments; use of obsidian from the Coso Volcanic Field, Obsidian Butte, Bagdad, and unknown sources; bedrock milling slicks but few mortars and pestles; and addition of technology related to lucustrine-based adaptations. The principal mortuary practice of Peninsular I groups involved primary pit cremation (Sutton 2011:5, 21).

Groups associated with the Peninsular II phase in the northern Coachella Valley, dating from ca. 750 to 300 B.P., are thought to have been the proto-Cahuilla (Sutton 2011:5). Peninsular II is "proposed to reflect the changes in settlement and subsistence that were instituted to adapt to the fluctuations of Lake Cahuilla, prior to its 'final' desiccation" (Sutton 2011:42). Peninsular II material culture traits include: the addition of Tizon Brown pottery, ceramic pipes, and few ceramic figurines; increased usage of Tumco Buff and Salton Buff pottery in lakeshore sites; use of glass from the Coso Volcanic Field, Obsidian Butte, and some unknown sources; and the addition of stone fish traps along the fluctuating shoreline of Lake Cahuilla. Additionally, the

Peninsular Funerary Complex (PFC) appeared during this phase, with secondary cremations placed in "containers," as did associated with mourning ceremonies. The Peninsular II phase ended with the final desiccation of Lake Cahuilla about 300 BP (Sutton 2011:5, 42).

The Peninsular III phase, dating from ca. 300 to 150 B.P., represents the historic Cahuilla who were encountered by the first European explorers to visit the region. With the final desiccation of Lake Cahuilla, lacustrine-based subsistence strategies were abandoned, and terrestrial-based subsistence systems adopted. Critical economic resources (e.g., cultigens) may also have been obtained from Yuman groups along the Colorado River and from Euroamericans. Additionally, with the demise of the lake, some people may have moved westward into the northern Peninsular Ranges and/or into areas such as Anza-Borrego, Coyote Canyon, the Upper Coachella Valley, the Little San Bernardino Mountains, the San Jacinto Valley, and Perris Plain (see Patayan III discussion above). Cultural traits associated with the Peninsular III phase include: continued use of Desert Side-notched and Cottonwood arrow points and Tizon Brown pottery; the absence of Tumco Buff and Salton Buff, and addition of Colorado Buff pottery; primary use of Obsidian Butte glass; the addition of new figurine types; and the introduction of Euroamerican artifacts (e.g., glass beads and metal tools). Primary pit cremation once again became the preferred mortuary practice, with the retention of mourning ceremonies (Sutton 2011:5).

2.2.3 Interpreting Variability in Mortuary Patterns

Concerning the periodic infilling of the Salton Basin by Lake Cahuilla and how human populations may have adapted to the cyclical changes in the ecological conditions of the basin, Dahdul (2013) recently examined the data from mortuary remains and habitation sites to investigate questions concerning hunter-gatherer adaptations to this dynamic environment. More specifically, Dahdul's research explores the "relationship between funerary practices and three broader issues: mobility, resource competition and social differentiation" (Dahdul 2013:ix).

In the past, two models have been developed to explain the effects of the periodic filling of the Salton Basin by Lake Cahuilla on hunter-gatherer settlement and subsistence systems. The first model suggests that lacustrine events were of short duration and marked by frequent fluctuations that resulted in unproductive and unpredictable subsistence bases (e.g., D. Weide 1976; M. Weide 1976). To cope with such unstable conditions, populations would have had to maintain flexible mobility strategies that could rapidly adapt to the ecological conditions within the basin. Under this scenario, Dahdul hypothesized that the entire shoreline would have been exploited by residentially mobile groups "who buried the dead in temporary camps, resulting in the occurrence of isolated burials amidst habitation debris in the vicinity of the lake margin" (Dahdul 2013:235).

The second model assumes that at least some high lake stands were sufficiently stable and of long enough duration to establish highly productive freshwater marshes at the northwest end of the lake where the topographic contours would have resulted in relatively shallow, gradually sloping shoreline depths. Consequently, this marsh zone would have been occupied by more sedentary, logistically mobile groups than those groups occupying less productive (i.e., steeper, rockier) shoreline areas (Wilke 1978:39-40). Under this scenario, Dahdul hypothesized that logistically mobile populations living near the marsh zone "would have buried the dead within or near long-term settlements, resulting in clusters of burials," and that such groups exploiting relatively large catchment areas would transport the already-cremated remains of at least some of the deceased back to the primary residential sites for final interment, resulting in the presence of secondary burials as well as primary ones (Dahdul 2013:235).

To conduct her research, Dahdul (2013) compiled the mortuary and settlement/subsistence data from 47 sites in the vicinity of Lake Cahuilla's shorelines spanning from Late Archaic to Ethnohistoric times. Most of these sites were located near the marsh zone at the northwestern end of the lake. Nearly all of the mortuary features identified in the study consisted of cremation remains. Two sites in particular, CA-RIV-3013 (Love et al. 2000; Hogan et al. 2005) and CA-RIV-5211/H (McDougall and Mirro 2012), contributed especially important data concerning mortuary practices within the basin.

For settlement data, Dahdul obtained information pertaining to site structure, food remains, and artifact types. These data were then used to extrapolate the type of settlement represented by the cultural evidence. The data collected from mortuary deposits and features included information on spatial location, the physical structure of cremation facilities, and grave associations of funerary items. Skeletal data included age and sex of the deceased, total cremated bone weight, pattern of burning on bone, and any visible osteopathology. This data were then used to define the distribution and organization of mortuary sites in relation to settlement types (Dahdul 2013:ix-x).

The results of Dahdul's in-depth research indicate that groups in the northern Salton Basin practiced both logistical and residential mobility throughout the period studied, *regardless of whether a lake stand was present*, and that the number of mortuary features present at a site was not dependent on the type of settlement, but rather the duration of occupation and/or recurrence of use at a location. Further, the data examined from two formal cemeteries (i.e., CA-RIV-3013 and CA-RIV-5211/H) indicated to Dahdul that these two cremation grounds were established and maintained by corporate groups as a means of legitimizing and maintaining use-rights of critical resources, and that the uniformity in burial treatment and paucity of prestige goods accompanying the deceased at these two sites indicate that these corporate groups "maintained an ethos of egalitarianism" (Dahdul 2013:x, 234-241).

2.2.4 Lake Cahuilla and Laguna Macuata: Alternative Models of Cultural Ecology

In discussing the cyclical filling of the Salton Basin by Lake Cahuilla and its effects on the settlement and subsistence strategies of the prehistoric groups occupying this portion of the Colorado Desert, a brief discussion of Laguna (Lake) Macuata and its role in Colorado Desert prehistory also seems warranted. The Laguna Macuata basin lies immediately south of the U.S./Mexican border and the Yuha Desert, and is situated between the Sierra Juárez on the west, and the Sierra Cucapá and its southern extension, the Sierra Mayor, on the east. [820 square mi], similar to that of the modern-day Salton Sea at 890 square kilometers (km) [344 square mi]), Laguna Macuata's floor extends below sea level, and evidence indicates that the basin was periodically flooded by fresh water from the Colorado River, and possibly also by sea water penetrating north and inland from the Gulf of California (Laylander et al. 2016:27–29).

Accounts by early explorers attest to the periodic flooding of the Laguna Macuata basin by water from the Colorado River and/or the Gulf of California. During the Oñate expedition in 1604–1605, Francisco de Escobar concluded that the Gulf of California extended much farther to the north beyond the mouth of the Colorado River, around the southern end of the Sierra Mayor, and into the Laguna Macuata basin. In September 1771, Francisco Garcés, traveling west from the Colorado River delta, reached the Sierra Cucapá where he was told of Indians near a large body of water three days west of the mountains. The people, or water (or both?) were referred to as Maqueque, or Maquete. Garcés never did reach the lake during the expedition in 1771, but did reach the northern edge of the Laguna Macuata basin in 1774, which he described as a dry lake

with the remains of many fish of various sizes on the beach. From the sizes of the larger fish, Garcés concluded that these were saltwater fish that must have entered the basin when it had been open to the Gulf of California. Observations of the Laguna Macuata basin made by others in 1785, 1796, 1828, 1890, 1893, 1905, and 1907 recount the basin as dry, full, or partially inundated (Laylander et al. 2016:30–33).

Ethnographically, the Laguna Macuata basin was occupied by the Cocopa, Tipai, and Paipai. During times when the basin was partially flooded with fresh water the Cocopa planted crops. Travel to the delta at the southern end of the basin provided the Tipai and Paipai access to its agricultural products. During an interview conducted between 2013 and 2015, Antonio Porcayo Michelini was told by one Cocopa man, Rosario García González (Don Chayo)—a fisherman on Laguna Macuata, that the lake provided an inexhaustible supply of fish that were taken by the Cocopa for food (Laylander et al. 2016:33-34).

Prehistoric archaeological sites within the Laguna Macuata basin can be found both at the mouths of the major canyons that enter the basin from the surrounding mountains, and also along the lake's high shoreline contours. While the shoreline sites likely evince use during times when the basin was inundated, the canyons provided their own sources of fresh water and biotic resources, and sites found at these locations could have been occupied when the lake was either present or absent (Laylander et al. 2016:29). However, the full spectrum of prehistoric use and occupation of the Laguna Macuata basin has yet to be determined. Most sites identified thus far appear to date to either the Late Prehistoric Period, or to an earlier, as yet undated period. The latter consist mostly of lithic scatters containing highly-patinated and weathered artifacts suggesting considerable antiquity, possibly dating to the early Holocene and associated with the San Dieguito Complex (cf. Moratto 1984; Warren 1984). The late sites typically contain Patayan pottery (i.e., Colorado Buff, Tizon Brown, Salton Brown, and Tumco Buff) associated with a variety of flaked and ground stone artifacts and, in some cases, marine shellfish remains and anthropic sediments.

Other archaeological manifestations around the basin include bedrock milling features, rock art panels (both pictographs and petroglyphs), cleared ("sleeping") circles, and aboriginal trails. Lithic materials used for flaked stone artifacts include silicified rhyolite, wonderstone, and glassy scoria—materials available locally in the mountains and canyons surrounding the basin and on desert pavement surfaces along the edges of the basin. Obsidian from a number of sources is present, as well. Glass from the Lágrimas de Apache (Apache Tears) source in the Sierra Las Pintas along the basin's southern margin is present at a number of sites; however, within the northern portion of the basin that source is displaced by glass from the Obsidian Butte source in the Salton Basin. A type of glass used extensively in prehistoric Baja California whose precise geological source has yet to be determined, identified as Unknown Santa Catalina, can also be found at sites around the basin (Laylander et al. 2016:34–38).

Research into how prehistoric groups adapted to the periodic infilling and evaporation of Laguna Macuata is ongoing. However, by comparing the similarities and differences between Laguna Macuata and ancient Lake Cahuilla, some inferences in its role in the lives of the prehistoric inhabitants of the Colorado Desert can be made.

Size differences between the two lakes were likely responsible for differing adaptive strategies. Lake Cahuilla might have taken one human generation to fill and several generations to evaporate completely after the Colorado River diverted itself away from the Salton Basin (see

above). In stark contrast, the infilling of Laguna Macuata by the river might have taken only a few months, and it might have disappeared again after about six years, assuming complete diversion of the river. Because of Lake Cahuilla's much larger volume and longer period of evaporation, recessional shorelines could be successively occupied, perhaps for several decades. Because the much shallower depth of Laguna Macuata (14 m versus 96 m at Lake Cahuilla) tended to make the lake's cycles much shorter than Lake Cahuilla, use during recessional periods was probably minimal. The shorter cycles of Laguna Macuata also may have prohibited the development of sustainable populations of freshwater fish and extensive stands of shoreline vegetation like those at Lake Cahuilla. This may be evinced archaeologically; whereas stone fish traps are common along Lake Cahuilla's western high stand and recessional shorelines, no similar features have been reported at Laguna Macuata (Laylander et al. 2016:39). However, it is conceivable that fish may have been captured at Laguna Macuata using techniques that have not yet been identified in archaeological contexts or may not be amenable to preservation, such as nets or weirs.

These differing environmental conditions are likely responsible for differing settlement strategies. Whereas the longer cycles of Lake Cahuilla likely made it possible for longer-term occupations at shoreline residential sites, due to a comparatively rapid evaporation rate once the Colorado River returned to its original course the shorter lake cycles of Laguna Macuata may not have been conducive to long-term, shoreline residential occupations. Alternatively, if the Gulf of California extended into the Laguna Macuata basin for extended periods of time, more permanent residential sites may have been established where fresh water was available from springs, or rivers and streams debouching into the basin from the adjacent mountain ranges. It is also possible that higher, more prolonged periods of freshwater run-off from the nearby mountains during the late Pleistocene resulted in a much slower evaporation rate of Laguna Macuata, creating a more permanent freshwater lake more conducive to the establishment of sustainable biotic resources and longer-term residential occupations (Laylander et al. 2016:40).

As discussed above, two models have been offered to explain the effects of the periodic infilling of the Salton Basin by Lake Cahuilla on hunter-gatherer settlement and subsistence systems. The first model suggests that lacustrine events were of short duration and marked by frequent fluctuations that resulted in unproductive and unpredictable subsistence bases (e.g., D. Weide 1976; M. Weide 1976), and to cope with such unstable conditions, populations would have had to maintain flexible strategies, including mobility, that could rapidly adapt to changing conditions within the Salton Basin. The data suggest that Laguna Macuata's cycles were much briefer but more frequent than those of Lake Cahuilla's. If the data are correct, then human responses to the briefer and more frequent fillings of Laguna Macuata may have preconditioned the prehistoric inhabitants of the Colorado River delta and parts of the Peninsular Ranges to respond more rapidly and with a greater degree of success to the much more productive environmental conditions and bio-diversity afforded by Lake Cahuilla, and to the challenges of adapting to the lake's cycles of filling, recession, and desiccation (Laylander et al. 2016:41).

2.3 ETHNOGRAPHIC SETTING

2.3.1 Cahuilla Socio-political Organization

The Cahuilla occupied the San Jacinto and Santa Rosa mountains, territories farther west in the Hemet and Perris regions, San Gorgonio Pass, and the Coachella Valley. Bean (1978) has estimated the total population of the three Cahuilla divisions—the Mountain, Pass, and Desert divisions—at between 6,000 and 10,000 people at Spanish contact in the late eighteenth century.

The Cahuilla were grouped into clans or sibs that were organized on the basis of patrilineal descent. Individuals related to a common male ancestor by descent through the male line belonged to the same clan, whether they were males or females. All Cahuilla clans, whether of the Mountain Cahuilla, Pass Cahuilla, or Desert Cahuilla divisions of this native language-culture group, belonged to one of two moiety divisions—Wildcat or Coyote. This moiety system regulated marriage, such that clans that belonged to the Coyote moiety division had to seek a spouse belonging to a clan belonging to the Wildcat moiety division. This moiety system was found among the neighboring Serranos to the west and north as well.

The Cahuilla and the Serranos appear to have differed, however, in how their clans functioned. Among the Serrano, the clan appears to have been the basic territorial unit that occupied a winter village site and surrounding territory. Constituent lineages making up a clan were not independently identified political units that had their own village sites. In the case of the Cahuilla, clans were made up of a number of subsidiary lineages that each could have a politically important independent existence. Independent lineages occupying their own village sites were discussed at length by Cahuilla consultants who were interviewed by anthropologists in the twentieth century. The occupation of independent settlements by these lineages does not appear to have been simply a product of the disruptions caused by the foreign invasion of native California. Thus, we find mentioned in Franciscan Mission records the names of independent Cahuilla lineage villages that form part of a larger clan. This we definitely do not find with the neighboring Serrano (Earle 2004a).

Individual Cahuilla clans were led by a chief or *Net*, who acted as both a political and ceremonial leader. The *Net* had charge of the sacred house (dance house) and sacred bundle, *maswut*. This sacred bundle consisted of matting, originally of seagrass, which was wrapped around ritual paraphernalia and items sacred to the clan. This bundle was a sacred expression of the identity of the clan. It was kept in a special enclosure at the back of the sacred house, which also served as a dance house, and originally as a residence of the *Net*. Among many clans, the *Net* was assisted by a *Paha*, a ritual assistant or "master of ceremonies," also found among other Takic groups. This office may have been absent among some of the most southerly Desert Cahuilla clans. In addition, among the Mountain and Pass Cahuilla in particular, a ritual assistant at the Mourning Ceremony called the *Takwa* was in charge of the ritual division of food among guests. In addition, the *hauinik* or singer helped the *Net* with the important responsibility of remembering and reciting sacred songs associated with the clan. This pattern of political and ritual "offices" is generally similar to that of the Serrano, Cupeño, and Luiseño. Of particular importance here is the idea that fully independent clans can be identified by their having their own sacred bundle, sacred house, and *Net*. Subsidiary lineages belonging to a particular clan were patrilineally related to one another, and could not marry one another. The individual lineages, however, lacked their own sacred bundle, sacred house, and *Net*. Sometimes the individual lineages might leave to gather at a particular location, but sometimes they lived at separate named localities. Even if they lived separately, however, they were dependent on the *Net*, or clan ritual and religious leader. As Strong pointed out, the *Pūalem*, the shamans or wizards of the Cahuilla, played an important role in Cahuilla culture but were not officers or political or ritual leaders of the individual clans. Their enterprise was individual rather than corporate (Bean 1972, 1978; Hooper 1920).

2.3.2 Cahuilla Religion and Ritual

Like neighboring Takic groups, the Cahuilla held public gatherings for the naming of children, for marriage, for male and female initiation, for the installation of *Nets*, for the Eagle-Killing Ceremony, and for the mourning ceremony, held annually as necessary.

Like other interior Takic groups, the Cahuilla cremated their dead and also burned many belongings of the deceased, in a ceremony that was separate from the mourning ceremony. The latter was held collectively for all those deceased since the last ceremony. The mourning ceremony was the most important ritual and alliance-building undertaking held by the clan, and involved the stockpiling of both food and valued goods such as beads for distribution to visiting groups. The mourning ceremony and other public rituals involved sacred dancing as well as the singing of sacred songs. Relations of reciprocal cooperation between clans of opposite moiety affiliation, linked by marriage ties, were reaffirmed by the presentations of food and valued goods that took place during the mourning ceremony.

Cremation was associated with a version of the "dying God" creation story found in California and the Southwest. This involved the creation of the world and the first "people/animals" by a deity who is slowly poisoned supernaturally to death by an animal daughter, and then cremated. This cremation includes the actions of various "people/animals," including Coyote, who steals the "dying God's" heart. This cremation provides a charter for the later cultural practice. Both this creation story about the "dying God" and stories about the later creation of cultural institutions by two brothers, one good and one evil, are shared with Yuman-speaking groups of the lower Colorado River.

Cahuilla religious traditions can perhaps be characterized as part of an "eastern complex" in southern California. Blackburn and Hudson have identified what they have called the "Northern Complex" of beliefs among the mainland Chumash, the southern Valley Yokuts, and the Kitanemuk, involving elements such as the annual *peón* game between the sun and Eagle, and the complex of seven deities, and on the recruitment of animal familiars through the ingestion of toloache (*Datura*) (Hudson and Blackburn 1978). A second religious tradition we might call the "southern complex" was associated with the Channel Islands Chumash, with Santa Catalina, and with the coastal Gabrielino and Juaneño. This "southern complex" involved elements of the historically late religion of *Chingichnich* and the exclusive *'Antap* cult, with its emphasis on the esoteric rituals of powerful coastal and island wizards, shielded from public view, and elaborations of the toloache ritual. Among the Juaneño and Luiseño nearer to the coast, this "southern complex" was overlain over an earlier "eastern complex" also found among the Cahuilla and Serrano.

This "eastern complex" emphasized the "dying God" and dueling creator-brother theogonies, cremation, and also complex ritual song cycles involving the narration of supernatural travel across the southern California and Southwestern desert sacred landscape. The concept of *Chingichnich* and his avenging familiars, and the importance of the toloache cult are missing in the "eastern complex." All of these "eastern complex" elements are associated with the Yuman cultures of the lower Colorado River. Certain song cycles were shared between the Cahuilla and Serrano, on the one hand, and the Mojave and Quechan on the other. However, among the Desert Cahuilla, for example, the use of toloache was reported to be unknown. The "eastern complex" was distinguished, however, from the religious institutions of the Yuman groups, among other things, by its greater emphasis on community hortatory ritual, by the absence of the

Mostamho tradition, and particularly by its lesser degree of emphasis on the *sine qua non* of the Colorado River groups, individual interaction with the supernatural realm through dreaming.

2.3.3 Cahuilla Subsistence Practices and Settlement

The three Cahuilla divisions would appear, at first glance, to be focused on two distinct patterns of subsistence, with the Mountain and Pass Cahuilla following a more typically "Californian" subsistence regime emphasizing acorns, salvia, islay, yucca and agave, pinyon and other mountain and foothill resources, and the desert division focusing on mesquite, cactus, and hard seeds (Bean and Saubel 1972). In fact, the distinction was not quite so clear cut. The groups inhabiting settlements in the Coachella Valley in the nineteenth century often retained gathering areas in the Santa Rosa Mountains or in other upland environments. Foothill zones on the west side of the valley produced cacti, agave, and hard seeds for the desert-dwellers, and pinyon was found further upslope. Agave and hard seeds were also an important resource in the mountains on the east side of the valley. Within the valley itself, mesquite and screwbean woodland provided important staples.

Kelly (1977) has distinguished between what he called the "agave desert" of the Coachella Valley and the west side of the Salton Sea and the Imperial Valley, and the "severe desert" lying to the south and east of these areas. He characterized both the desert division of the Cahuilla and Kamia/Kumeyyay/Diegueño of the western edge of the Imperial Valley as adapted to the "agave desert," implying seasonal movements from the desert floor up into the mountain foothills to obtain resources such as agave. This pattern is one of "desert margin" adaptation that can be observed from the western edge of the Imperial Valley northwestwards along the desert side of California's interior mountain ranges to Owens Valley and beyond. Hard seeds, pinyon, agave/yucca, and even acorns (from canyon live oak, for example) are typical resources available to inhabitants of this zone. Kelly maintained that even the Desert Cahuilla were not adapted to exploiting the "severe desert" environment found in areas like the Chocolate Mountains.

2.3.4 Cahuilla Horticulture

By the time the Romero expedition in 1824 visited the Coachella Valley, the Cahuilla's valley floor oasis settlements were producing at least small quantities of cultivated products similar to those grown on the Colorado River—maize, beans, squashes, pumpkins, melons, and wheat (Bean and Lawton 1973). These were produced by way of irrigation, a system completely different from the flood farming of the Colorado River groups. There have been arguments made that this production pre-dated the Spanish presence in Alta California. In fact, prehistoric horticultural plant remains have been found in Cahuilla archaeological sites. However, Strong (1929:38) noted that he had been told by Francisco Nombre that his grandfather had told him that Cahuilla cultivation of maize and other crops was relatively recent and that the Cahuilla had formerly obtained maize from the "Yumas" via exchange. It is worthy of note that other cases of recent oasis horticulture appear in the California deserts in the early nineteenth century, as discussed by Earle (2004b:74–75, 121).

The exchange system mentioned by Nombre's grandfather would appear to have operated along the lines of similar exchange circuits between foraging groups with access to mountain products and lower Colorado riverine horticulturalists. The exporting of maize from the Colorado River westward implies considerable foot traffic on the trails heading westward to the Coachella Valley.

A comparison of the accounts of Estudillo in 1823–1824 and Blake and others in 1853–1863 describing the Desert Cahuilla suggests that horticultural production had expanded at the desert oases. By the 1850s, not only were oasis gardens being cultivated as major contributors of foodstuffs, but gardens existed in some of the canyons as well (Bean et al. 1995). One of the major questions surrounding the late prehistoric archaeology and ethnohistory of the Desert Cahuilla is how ancient the oasis gardening practiced in the Coachella Valley may have been, and whether it indeed had increased in importance during the early nineteenth century.

2.4 HISTORICAL SETTING

The history of the California desert region has been reviewed in detail by von Till Warren et al. (1981:85–105). A brief summary of the historical background of the Coachella Valley region is provided below.

Very little is presently known about the history of the Coachella Valley prior to 1820. However, in 1821, a party of Cocomaricopa Indians arrived at the San Gabriel Mission, announcing they had traveled from the Colorado River in only six days using the Cocomaricopa trail (von Till Warren et al. 1981:85). This Indian trail began east of Blythe and likely approximated the present route of I-10 across the Chuckwalla Valley, traversing the Mecca-Indio area and Coachella Valley to the San Gorgonio Pass. In the early 1850s, the Maricopa-Bradshaw route, paralleling the old Cocomaricopa trail, was established to serve the mining camps developing near La Paz, Arizona (von Till Warren et al. 1981:85). Also in the 1850s, the U.S. Government strongly promoted the establishment of a railroad route to connect the east and west coasts. The Southern Pacific Railroad did not transect the western Colorado Desert until 1877 due to competing economic and political considerations (von Till Warren et al. 1981:89). This route connected the San Gorgonio Pass to the town of Yuma via the eastern shore of the Salton Sea.

The process of surveying and mapping the Colorado Desert began in 1852, when Henry Washington and a small party of surveyors ascended the San Bernardino Mountains and established the San Bernardino Baseline and Meridian (S.B.B.M.). From 1854 to 1857, Washington extended this line though uncharted territory to the Colorado River (von Till Warren et al. 1981:94). Also in the 1850s, the U.S. Government sent Indian Commissioners into southern California deserts. Although not authorized to make any commitments to the Native Americans, the Commissioners illegally set aside large tracts of land for reservations (von Till Warren et al. 1981:94). Most of these areas never fully developed into reservations, although the Torres Martinez and Agua Caliente (Palm Springs) reservations were eventually set aside from the larger reserves delineated by these Indian Commissioners. Once the reservations confined the Indian populations, the remaining land was made available for mining, ranching, and other uses.

The Coachella Valley's first permanent Anglo settler was John Guthrie McCallum, a San Francisco attorney and former State Legislator who arrived in Agua Caliente with his wife Emily and their five children in the spring of 1884. A typhoid epidemic five years earlier had left the McCallums' eldest son, Johnny, with tuberculosis; the family doctor had advised that the boy's only hope for recovery was to relocate to a warm, dry climate. The family initially moved to Los Angeles, but while traveling through the San Gorgonio pass to the Cahuilla village of Agua Caliente, McCallum was inspired to purchase 64 ac of railroad land to start a ranch.

The Tahquitz Ditch had long been a feature of Native American life by the time McCallum established his adobe and ranch in 1884. He expanded the Tahquitz Ditch, increasing its flow by tapping into one of the canyon's springs. McCallum began using water from the ditch to irrigate his ranch, and, as new settlers came, they availed themselves of the water provided by the Tahquitz Ditch. This became increasingly problematic for the Agua Caliente as settlers continued to arrive in Palm Springs. Although McCallum had significantly increased the output of the Tahquitz Ditch, its resources were far from enough to accommodate the influx of new settlement he hoped to generate. In 1887, after forming the Palm Valley Water Company, McCallum embarked on the creation of an extensive new canal that would carry water from the Whitewater River for over 8 mi across the rugged desert until it reached the McCallum ranch. Completed in the fall of 1887, the stone-lined Whitewater Ditch had the capacity to carry a thousand miner's inches of water into Palm Springs (Historic Resources Group 2015).

In 1893, a torrential rain lasting 21 days destroyed McCallum's Ditch. When the downpour stopped, an 11-year drought followed and most of the water dried up. McCallum died in 1897 and soon after his death, his wife Emily was forced to sell her shares in the Palm Valley Water Company (Brown 2015).

Until the passage of the Taylor Grazing Act of 1934, however, no control was exercised over the California desert lands. Because of the extreme aridity of the California deserts and subsequent lack of grazing land, this Act had virtually no practical impact on the region until the BLM assumed control of range lands in 1946. Since that time, the BLM has been involved in evaluating lands for various "uses," and classifying them for different types of management (von Till Warren et al. 1981:95).

The paucity of water in many areas of the Colorado Desert discouraged farming, and subsequently agricultural development flourished only when water was imported in significant quantities. However, because of the relatively high water table in the Coachella Valley, the agricultural industry began to develop prior to the importation of water by means of drilling artesian wells. Beginning in the first decade of the twentieth century, Coachella Valley farmers planted extensive date, fig, and grape orchards. Towns that grew with the agricultural development include Thermal, Mecca, Indio, and Coachella. These developments led to dropping groundwater levels and plans to export Coachella Valley groundwater to Imperial Valley led local farmers to create the Coachella Valley County Water District in 1918. Following passage of the Boulder Canyon Project Act of 1928, CVWD and Imperial Irrigation District developed the All-American Canal and Coachella Valley Extension to harness the waters of the Colorado River for the development of agriculture in Imperial and Coachella valleys. Branching off from the All-American Canal, the Old Coachella Canal extends 199 km (123.5 mi) north to the northern Coachella Valley, bringing the first imported irrigation water to the valley in 1949 (Nordland 1978).

2.4.1 Homestead Development in the Coachella Valley

Development of the Coachella Valley region under various government land programs occurred since at least the 1880s. The Homestead Act of 1862 established a three-fold homestead acquisition process: filing an application, improving the land, and filing for deed of title. Any U.S. citizen, or foreign emigrant intending citizenship, who had never borne arms against the U.S. Government could file an application and lay claim to 160 ac of surveyed government land. For the next five years, the homesteader had to live on the land and improve it by building a 12-by-14 dwelling and growing crops. After 5 years, the homesteader could file for patent (or deed

of title) by submitting proof of residency and demonstrating the improvements to a local land office. Valid claims were granted patent to the land free and clear, except for a small registration fee. Title could also be acquired after a 6-month residency and trivial improvements, provided the claimant paid the government $1.25 per ac. After the Civil War, Union soldiers could deduct the time they served from the residency requirements.

The Desert Land Act of 1877 was designed to encourage and promote the economic development of the arid and semiarid public lands of the western United States. Individuals could apply for a desert-land entry to reclaim, irrigate, and cultivate arid and semiarid public lands. The act offered 640 ac of land to an adult married couple who would pay $1.25 per ac and promise to irrigate the land within three years. A single man would only receive half of the land for the same price. Individuals taking advantage of the act were required to submit proof of their efforts to irrigate the land within three years. A cattle rancher could receive title to the land any time within the three years upon proof of compliance with the law and payment of one additional dollar per ac.

One of the last of the federal government's homestead acts, the Small Tract Act was approved by Congress on June 1, 1938. It was enacted in response to requests by citizens in the early 1930s who wanted to move out to the desert for health and recreational purposes, but who were not interested in acquiring large acreages for agricultural use, as with the earlier homestead acts. Los Angeles District land office manager Paul Witmer brought the idea to Congress in 1932, but was rejected for many years (Ainsworth 1955:7–11; Stringfellow 2009a:14). News of the possibility of the idea becoming law spurred some people to seek out their favorite tract of unclaimed land early, and therefore, it is a real possibility that some Small Tract cabins were built prior to President Franklin Delano Roosevelt signing the law (House Resolution 8008) on June 1, 1938.

Rationing of gasoline and a lack of available construction materials during the years of World War II slowed the prosperity of Small Tract Act homesteading. Subsequently, during the post-war development boom, southern Californians began looking for small acreage in the desert to get away from the smog and bustling population centers. As much of this land was viewed by many as being unsuitable for agriculture due to poor soils and inadequate groundwater, many felt the Small Tract Act was designed to dispose of "useless" federal lands, eliminating it from the public domain; others viewed it as a way to claim their own stake on a piece of land (Stringfellow 2009b). Rights to oil, gas, and mineral deposits, together with the right to prospect, mine, or remove the same were reserved by the United States government on parcels distributed under the Act. ROWs not exceeding 50 ft in width were retained for roadways and public utilities along the boundaries of the parcel.

The provisions of the Act provided "for the purchase of public lands for home and other sites" and authorized the lease of up to 5 ac of public land for recreational purpose or use as a "home, cabin, camp, health, convalescent, or business site" to able-bodied U.S. citizens (Stringfellow 2009a:14). If the applicant made the necessary improvements to his or her claim by constructing a small dwelling within three years of the lease, the applicant could file for a patent after purchasing the parcel for the appraised value (as little as $10 to $20 an ac) at the regional land office. Infrastructure such as water, power, and other utilities was often non-existent in the areas eligible for claim. During the early years, filers were only required to construct a cabin of at least 192 square ft within one to three years (Stringfellow 2009a:24). It was not until after July 1, 1955, that filers were required to construct cabins at a minimum of 400 square ft.

Sometimes county requirements were more stringent; such as in Riverside County, the construction requirement was 480 square ft. By the 1950s, various construction companies began carrying the plans for manufacturing inexpensive model cabins that were assured to meet all the requirements of BLM and county building codes. This streamlined the building process and made it easier for would-be filers to build a small cabin.

By the mid-1950s, the BLM was receiving more than 100 applications per day (Rimmington 1992:30). In 1957, the *Los Angeles Times* reported that the BLM became inundated with filings for desert land after the 1954 amendment to the Small Tract Act, which allowed the disposal of classified lands for weekly auction, selling for as low as $100 for a 2.5-ac tract, to as much as $700 for a 5-ac tract (*Los Angeles Times* 1957:B1). At that time, there were estimated to be 16 million ac of federal land in California, and the BLM had taken in some 50,000 leases for Small Tracts thus far. The *Los Angeles Times* called the demand for small desert tracts under the Act the greatest land rush since the famed Oklahoma Land Rush of 1889. Due to the popularity of the Small Tract Act, the BLM's work force had become substantially burdened from the paperwork involved. To combat this problem, in 1959 the BLM began selling tracts directly to the public at fair market value without the building requirement (Stringfellow 2009a:30). By March 1961, in order to process a backlog of nearly 60,000 applications for Small Tract Act homestead patents, the BLM placed an 18-month moratorium on new filings (Robbins 1962:14). The moratorium was lifted in November 1962, and the Act had again been amended to make no requirements for improvement of the land or construction of a building. An estimated 4,000 tracts of southern California land were then made available for purchase at local auctions, prices on 5-ac parcels ranging from $175 to $2,500. By the time the Small Tract Act was repealed in 1976 through the Federal Land Policy and Management Act, a total of 27,880 Small Tract Act homestead patents had been issued in California alone (Stringfellow 2009a:31).

2.4.2 Electricity in the Coachella Valley

At the turn-of-the-twentieth century, the Edison Electric Company of Los Angeles, alongside its primary competitors, the San Joaquin Power & Light Company and Pacific Gas & Electric, served as the pioneering commercial entities for electrical distribution in California. At the inception of electrical transmission technology, power was distributed via wood poles and later iron poles, but was limited to short spans carrying a low voltage. The development of hydroelectric power at the end of the nineteenth century set a precedent for the demands of commercial electrical needs of the twentieth century, and led to the installation of electrical transmission lines spanning great distances from generating facilities at California's river banks, through mountain ranges and deserts, before terminating within the urbanizing communities of Southern California (Southern California Edison 2014). The Palm Springs area is serviced by Southern California Edison. The electrical needs of the Coachella Valley were initially serviced by small, independent power systems until they were consolidated by the Southern Sierras Power Company in 1916 (SCV History 2017). The Southern Sierra Power Company became the California Electric Power Company in 1941 and was absorbed into California Edison Company in 1964 (Southern California Edison 2014).

As a property type, overhead transmission lines were erected as early as 1873 when European experiments were conducted to transmit electrical current from one machine working as a generator to a second machine working as a motor drive pump. In 1891, the San Bernardino Light & Power Company constructed a 5 kilovolt (kV) (5,000 volts) transmission line that spanned 28 mi from its powerhouse in Pomona to San Bernardino. In Riverside, the first commercial three-phase alternating current (AC) transmission line was installed in 1892 along a

23-mi-long span from Riverside to Mill Creek at an operating capacity of 10 kV (10,000 volts). By 1904, the common voltage capacity of transmission lines was 66 kV or 66,000 volts, which was considered the minimum voltage necessary for lighting plants in major United States cities (Southern California Edison 2014).

Significant technological advancements occurred in the carrying capacity of transmission lines at voltages above 60,000 (60 kV) in 1908 with the introduction of high-tension transmission lines and development of suspension type insulators that allowed for higher voltage currents to flow through the lines (Southern California Edison 2014). Most transmission line operators in California, including Southern California Edison, were not installing facilities at high-voltages until the early decades of the twentieth century, having been informed by such early high-voltage (10kV/10,000-volts) transmission lines as those spanning between Pomona and San Bernardino, Mill Creek and Riverside, and at the Sacramento Hydroelectric Project (11 kV over 25 mi in 1895). In 1898, Edison Electric Company of Los Angeles introduced a new high-voltage electric power conveyance system with its Santa Ana No. 1 Transmission Line that spanned 82 mi over wooden poles at a capacity of 33 kV to the company's Los Angeles 2nd Street Substation (Southern California Edison 2014).

Since the mid-to-late-nineteenth century, iron and then steel lattice construction was utilized for electrical transmission and distribution lines. Prior to the use of iron and steel structures, early electrical transmission lines built in the United States conveyed low voltages and were supported by wooden poles. As voltage capacity increased and transmission spans were lengthened, utility providers recognized the need to install stronger support structures to carry the increased weight load from heavier or more wires, larger insulators, and associated structure bracing components. Wooden poles continued to be used for local distribution of power and are commonly used into the present (Southern California Edison 2014).

2.4.3 Community of Whitewater

The Community of Whitewater is located at the east end of the San Gorgonio Pass where it enters the Coachella Valley just east of the Whitewater River. The Whitewater River was so named for its milky whiteness, caused by lime silicates that are suspended in the water (Gunther 1984:570). Spanish and Mexican explorers referred to the river as Agua Blanco, and early American surveyors called it "White River" or "White Water". Mining activity first occurred along the banks of the Whitewater River where it emerges from Whitewater Canyon in the early 1870s (Gunther 1984:570). Focused primarily on gold, silver, copper and tin, none of the claims ever produced any profit. Whitewater Point was a stage stop along the Bradshaw Trail beginning in 1866. Whitewater Ranch and Stage Station, once located at Windy Point, operated as a stop along the Bradshaw Trail in the 1860s and 1870s. The Southern Pacific Railroad built a railway station on the east bank of the Whitewater River in 1876 (Gunther 1984:571). Known for its windy weather, an article in the Redlands Citrograph, dated October 1, 1887 reported that Whitewater is "a pleasant place most of the year, but the brakemen have to lie face downward on top of the boxcars to keep the wind from blowing them off the train while it is in motion, and to keep the sand and gravel from putting their eyes out" (Gunther 1984:571). The Whitewater Post Office was established on May 3, 1926, on the bank of the river where it leaves the mountains.

In the 1920s, the American Telegraph and Telephone Company (AT&T) began a massive program of construction to use "Long Lines," as they were called, to connect all parts of the country. One such line connected southern California with Arizona by the way of Whitewater, and was completed between 1928 and 1930 (*Los Angeles Times* 1930:A13). AT&T's Pueblo

Revival-style Whitewater repeater station, located along the north side of U.S. Highway 60 and west of the town of Whitewater, was completed in 1930 as an integral part of the Long Line from Los Angeles to Phoenix (Figure 3).

In 1950, the community of Whitewater was a small settlement on the west bank of the Whitewater River, with very few buildings or residents (Figure 4). In that year the repeater station was considered to be the second largest such station in southern California, with a minimum 15 employees at the station including clerks, equipment operators and repairmen (*Pacific Telephone Magazine* 1950:18). The station continued in operation until new technology rendered it obsolete.

Figure 3 Whitewater Repeater Station, 1930 (Courtesy of AT&T Archives and History Center).

By the 1960s, Interstate 10 had been completed to replace the previous alignment of U.S. Highway 60 as the primary thoroughfare across the region. The community at Whitewater, although situated along the freeway, never prospered from its location, and has remained a small community. In 1962, Al Bankus opened a quarry operation and quartzite landscaping rock business at the Whitewater exit (Whitewater Rock & Supply Company 2012). Known as the Whitewater Rock & Supply Company, today it covers over 40 ac, and is one of southern California's largest rock product suppliers.

Figure 4 Whitewater, 1950 (Courtesy of AT&T Archives and History Center).

3
SOURCES CONSULTED

Background research for the Project was composed of a cultural resource literature and records search, a review of historical maps, and a search of the Sacred Lands Files housed at the Native American Heritage Commission (NAHC). A summary of the results obtained from these work efforts is provided below.

3.1 CULTURAL RESOURCES LITERATURE AND RECORDS SEARCH

Prior to the Phase I archaeological survey of the Project APE, a cultural resources literature and records search was conducted on March 24, 2017, at the EIC, housed at the University of California, Riverside. The objective of this records search was to determine whether any prehistoric or historical resources had been recorded previously within, or within a one-mile radius of, the Project APE. The results of this search indicate that no fewer than 71 prior cultural resources studies have been conducted previously within a one-mile radius of the Project APE; 13 of these studies specifically involved a portion of, or were immediately adjacent to, the Project alignment (Table 1). In addition, five cultural resources overview studies were provided. Approximately 40 percent of the Project APE has been previously surveyed as a result of these studies.

Table 1
Previous Cultural Studies within One-Mile of Project APE

Author(s)	Date	EIC Reference #	Title	Summary of Work
Bowles, Larry	1979	RI-00100	Archaeological Assessment Form, Riverside County Planning Department	110 acres surveyed, no resources
Williams, S.R.	1973	RI-00101	Archaeological Survey at Windy Point	57 acres surveyed, no resources
Mortland, Carol	1973	RI-00107	Letter Report – 20 Acres near Palm Springs	20 acres surveyed, no resources
Greenwood, Roberta S.	1975	RI-00161[1]	Paleontological, Archaeological, Historical, and Cultural Resources – West Coast-Midwest Pipeline Project, Long Beach to Colorado River	No acres surveyed, overview of project area
Swenson, James D.	1978	RI-00497	Environmental Impact Evaluation: An Archaeological Assessment of 79 Acres near Windy Point, Riverside County, California (Mountain Shadows Mobile Home and Recreational Vehicle Park)	79 acres surveyed, no resources
Lando, Richard	1979	RI-00652[1]	Cultural Resources Reconnaissance (Stage II) of Flood Control Alternatives for the Whitewater River Basin, Riverside County, California	1,380 acres surveyed, 1 resource

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
Rector, Carol and Philip J. Wilke	1980	RI-01004[1]	Devers to Valley and Valley to Serrano 500 kV Transmission Route and Serrano to Villa Park 220 kV Transmission Route, San Gorgonio Pass Addendum, Riverside County, California	200 acres surveyed, 7 resources
Self, William	2000	RI-01220[1]	Letter Report: Inspection of Pipeline Relocation Area in Union Pacific Railroad Corridor, Line Section, Riverside, California	20 acres surveyed, no resources
Ritter, Eric W.	1981	RI-01277	Initial Archaeological Field Investigations for the San Gorgonio Pass Wind Program, California	600 acres surveyed, 6 resources
Swenson, James D.	1981	RI-01329[1]	Environmental Impact Evaluation: An Archaeological Assessment of the Proposed Snow Creek Hydro-Electric Project, Riverside County, California	35.79 acres surveyed, 3 resources
Wagstaff and Brady and Robert Odland Associates	1982	RI-01473	San Gorgonio Wind Resource Study: Environmental Impact Report/Environmental Impact Statement (Cultural Resource Portion Only)	2,349 acres surveyed, no resources
Love, Bruce and Bai "Tom" Tang	2000	RI-01474	Phase II Cultural Resources Study: Seawest Catellus 1 Windfarm Project (WECS 103 EIR), Significance Evaluation of Archaeological Site CA-RIV-6379H, Riverside County, California	no acres surveyed, 1 resource
Love, Bruce, Bai "Tom" Tang, Harry Quinn, and Natasha Johnson	2000	RI-01475	Historical/Archaeological Resources Survey Report: Seawest Catellus Project, Near Whitewater River and Interstate 10, Riverside County, California	600 acres surveyed, 2 resources
Taylor, Thomas T.	1983	RI-01678[2]	Report of an Intensive Archaeological Survey of Various Private and Public Land Parcels for the San Gorgonio Pass Wind Program, Riverside County, California	2,800 acres surveyed, no resources
McCarthy, Daniel F.	1983	RI-016292	An Archaeological Assessment of 345 Acres of Land near Desert Hot Springs, Riverside County, California (Change of Zone 3955)	345 acres surveyed, no resources
Taylor, Thomas T.	1983	RI-01715	Report of an Archaeological Survey of the southern California Edison Company and San Gorgonio Farms, Inc. Grant Whitewater Hill, Riverside County, California	35 acres surveyed, no resources
Swenson, James	1984	RI-01766	A Cultural Resources Survey of Portions of Section 17, Township 3 South, Range 4 West, Near West Garnet, Riverside County, California	203 acres surveyed, 1 resource
Drover, Christopher E.	1984	RI-01784	An Archaeological Assessment of Proposed Installation of Wind Driven Electrical Generators near Snow Creek, Riverside County, California	3 resources
Bouscaren, Stephen, and Daniel McCarthy	1984	RI-01837	An Archaeological Assessment of the Proposed Devers-Valley 500 kV Transmission Line and Corridor and the Proposed Valley-Auld-Skylark 115 kV T/L Corridor, Riverside County, California	225 acres surveyed, 13 resources

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
Swenson, James D.	1985	RI-01903	A Cultural Resource Survey of the NE ¼ of Section 17, T3S, R4E, near west Garnet, Riverside County, California	no resources
Swenson, James D.	1985	RI-01967	A Cultural Resource Survey of Portions of Section 11, T.3S, R.3E, Near Whitewater, Riverside County, California	150 acres surveyed, no resources
Compton, Bruce	1985	RI-01999	Negative Archaeological Survey Report: Route 111, P.M. L-5722	0.5 acres surveyed, no resources
Schmidt, James J.	2000	RI-02036	Letter Report: Dillon 12kV Transmission Line, Riverside County, California	no resources
Cornett and Associates	1983	RI-02058	An Archaeological Assessment of Two Parcels of Land on the Chino Canyon Alluvial Fan, Palm Springs, California	no resources
Foster, John M., and R.S. Greenwood	1985	RI-02071[2]	Class 1 Cultural Resources Investigation for the Pacific Texas Pipeline Project – State of California	No acres surveyed, no resources
Underwood, J., J. Cleland, C.M. Wood, and R. Apple	1986	RI-02210	Preliminary Cultural Resources Survey Report for the US Telecom Fiber Optic Cable Project, from San Timoteo Canyon to Socorro, Texas: The California Segment	no acres surveyed, 13 resources
Mitchell, Mike	1988	RI-02232[1]	BLM Cultural Inventory Report Form	240 acres surveyed, no resources
Apple, R.M. and J.E. Wooley	1988	RI-02350[1]	MCI Rialto to El Paso Fiber Optics Project – Intensive Cultural Resource Survey – San Bernardino and Riverside Counties, California	400 acres surveyed, 11 resources
Keller, Jean A.	1990	RI-02921[2]	An Archaeological Assessment of Tentative Parcel Map 25910, Riverside County, California	no resources
Duffield, Anne and Gale Broeker	1990	RI-02966	I-10/HWY 62 and Devers Hill Land Exchange Parcels Sections 4 and 18, T3S R4E, SBBM	65 acres surveyed, no resources
Conkling, Steven and Bradley Sturm	1994	RI-02967	Cultural Resources Assessment – Sea West Wind Energy Facility, Riverside County, California	550 acres surveyed, 2 resources
Love, Bruce	2000	RI-02968	Letter Report: Historical/Archaeological Resources Review; Windfarm Alexander Project, near the Intersection of State Highway 62 and Interstate I-10, Portions of Section 18 and 19, T3S R4W, SBBM, Riverside County, California	1 resource
Love, Bruce, Bai "Tom" Tang, Michael Hogan, Adrian Sanchez Moreno, and Kathryn Wright Bouscaren	2000	RI-02969[1]	Identification and Evaluation of Historic Properties: WECS 107 Windfarm Project near the Community of Whitewater, Riverside County, California	451 acres surveyed, 2 resources
Duffield, Anne, and Gale Broeker	1990	RI-02974[1]	Grant Right-of-Way CA 15549 – White Water Wind Park	5 acres surveyed, no resources

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
Schneider, Joan, Linda Thieran, Gwyn Alcock, Andrea Maestrojuan, and Tom Tang	1992	RI-03054[2]	Cultural Resources, Palm Springs Annexation EIR	No acres surveyed, no resources
Duffield, Anne and Gale Broeker	1990	RI-03063[1]	Letter Report: CA-19136 Right-of-Way for Windustries/U.S. Wind Farms Wind Park Site	80 acres surveyed, no resources
Everson, Dicken and Kevin Hallaran	1991	RI-03217	Cultural Resources Assessment, Tentative Tract 26686, Palm Springs, Riverside County	223 acres surveyed, 1 resource
Hogan, Michael	1992	RI-03534	Phase II Archaeological Test Excavations at Site CA-RIV-4165/H, Tentative Tract 26686, Palm Springs, Riverside County, California	no acres surveyed, 1 resource
Hogan, Michael	1992	RI-03536	Cultural Resources Assessment, 26+ Mile Segment of the AT&T Fiber-Optics Line Replacement Project, Whitewater to Coachella, Riverside County, California	155 acres surveyed, 1 resource
Taskiran, Ayse, and B. Tom Tang	1992	RI-03557[1]	Phase I Survey and Phase II Test Excavations, Snow Creek Power Project Located in the Palm Springs Area of Riverside County, California	10 acres surveyed, 1 resource
Hogan, Michael	1992	RI-03561[2]	Cultural Resources Overview, Mid-Valley Parkway Project, Palm Springs, Riverside County, California	Cultural resources overview
Brock, James and William A Sawyer	1998	RI-04107	Phase I Cultural Resources Assessment for a 82.16 Acre Property in the North Palm Springs Area of Unincorporated Riverside County, California	82.16 acres surveyed, 2 resources
McKenna, Jeanette A.	1999	RI-04165	Letter Report: Willow Springs Road Addendum Studies (Letter Report)	no resources
Robinson, Mark C.	2001	RI-04484	Cultural Resources Survey and Assessment of Approximately 67 Acres: Mars Construction Company Project at Garnet Avenue and Diablo Road, near North Palm Springs, Riverside County, California	67 acres surveyed, no resources
Raschkow, Wanda	2000	RI-05704	Heritage Resources Inventory Summary for Project Mountain View Power Partners Pole Line Basement	0.8 acres surveyed, no resources
Dahdul, Mariam, Daniel Ballester, and Teresa Woodard	2002	RI-05885	Historical/Archaeological Resources Survey Report, Mt. View II Windfarm Project, near the City of Palm Springs, Riverside County, California	388.5 acres surveyed, 1 resource
Sander, Jay K., Roger D. Mason, Evelyn N. Chandler, and Cary D. Cotterman	2003	RI-06071	Final Cultural Resources Inventory for the Coachella Valley Management Plan, Riverside County, California	4,358 acres surveyed, 71 resources
Chambers Group	2006	RI-06258	Cultural Resources Survey Report, Union Pacific Railroad, Fingal-Thermal Phase II Expansion, Riverside County, California	597 acres surveyed, 4 resources
Hogan, Michael, Bai Tang, Matthew Wetherbee, and Daniel Ballester	2005	RI-06381	Identification and Evaluation of Historic Properties, Sewer Main Extension to Tract No. 26686, City of Palm Springs, Riverside County, California	no acres surveyed, 1 resource

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
Hogan, Michael	2005	RI-06383	Letter Report: Archaeological Data Recovery, Preservation Supervision, and Monitoring at Site CA-RIV-4165, Tract No. 26686, The Cove at Palm Springs, City of Palm Springs, Riverside County, California	no acres surveyed, 1 resource
Tang, Bai "Tom", Michael Hogan, Zachary X. Hruby, Daniel Ballester, and Laura Hensley Shaker	2006	RI-06583[1]	Identification and Evaluation of Historic Properties, Mountain View IV Windfarm Project, in the City of Palm Springs, Riverside County, California	990 acres surveyed, 1 resource
Hogan, Michael, Bai Tang, Josh Smallwood, and Daniel Ballester	2005	RI-06584	Identification and Evaluation of Historic Properties, Sewer Main Extension to Tract No. 26686, City of Palm Springs, Riverside County, California	no acres surveyed, 1 resource
Tang, Bai "Tom", Michael Hogan, Zachary X. Hruby, Josh Smallwood, Daniel Ballester, and Laura Hensley Shaker	2006	RI-06585	Identification and Evaluation of Historic Properties, Sewer Main Extension to Tract No. 26686, City of Palm Springs, Riverside County, California	33.94 acres surveyed, 1 resource
Tang, Bai, Michael Hogan, Laurie Taylor, and Robert Porter	2006	RI-06587	Historical/Archaeological Resources Survey Report, Assessor's Parcel Nos. 522-200-016 and -017, near the City of Palm Springs, Riverside County, California	5.4 acres surveyed, no resources
Tang, Bai "Tom", Michael Hogan, Clarence Bodmer, Lisa Hunt, and Laura H. Shaker	2006	RI-06588	Historical/Archaeological Resources Survey Report, Tentative Tract Map No. 34468, Near the City of Palm Springs, Riverside County, California	2 acres surveyed, no resources
Pollock, Katherine H. and Michael K. Lerch	2005	RI-06853	Archaeological Survey of the Stubby and Townhall Transmission Lines, Banning to Desert Hot Springs, Riverside County, CA	No acres surveyed, 9 resources
Tsunoda, Koji	2007	RI-07223	Archaeological Survey Report for southern California Edison Company Environment Project, Riverside County, CA	16.4 acres surveyed, no resources
Rosenberg, Seth A., and Brian F. Smith	2005	RI-07648	A Cultural Resources Survey for the Riverside County Harris Cellular Tower Project: High 111 and Tipton Road, Palm Springs, California, Site ID# CA 8425; APN 522-070-006; Project No. CES-05-040	0.08 acres surveyed, no resources
Smith, Brian F. and Dylan S. Amerine	2005	RI-07736	A Cultural Resources Survey for the Silver Cell Site, 59901 Highway 111, Palm Springs, California	0.04 acres surveyed, no resources
Hogan, Michael	2008	RI-07763	Letter Report: WECS 114-Garnet Energy Project Near the City of Palm Springs, Riverside County. CRM TECH Contract #1961	70 acres monitored, no resources
George, Joan	2008	RI-07834	Phase I Cultural Resources Investigation of Five Acres Near Whitewater, Riverside County, CA	5 acres surveyed, 1 resource
Earth Touch Inc.	2009	RI-08030	Lake Genus Hill	no acres surveyed, no resources

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
Bonner, Wayne H., and Arabesque Said	2009	RI-08316	Letter Report: Cultural Resource Records Search and Site Visit Results for Royal Street Communications California, LLC Candidate LA3600A (Off Road Rentals), 59901 Highway 111, Palm Springs, Riverside County, California	0.22 acres surveyed, no resources
Schmidt, James J.	2010	RI-08523	Letter Report: Toll 4kV & Linda Vista 12kV Deteriorated Pole Replacement Project (WO 6079-4800, 1-4810 & 1-4842), Riverside County, California	no resources
Strauss, Monica, Damien Tietjen, and Madeleine Bray	2010	RI-08567	BLM Santa Rosa & San Jacinto Mountains National Monument	394 acres surveyed, 1 resource
Eckhardt, William T., Stacie Wilson, Karolina Chmiel, and Carol Serr	2009	RI-08574	Final Cultural Resources Inventory of the Proposed SCE Devers to Valley Substation Project, Riverside County, CA	1008.7 acres surveyed, 5 resources
Brodie, Natalie	2010	RI-08576	Letter Report: Purchase Order No. 45001559911, CWA No. 87; SCE WO 6079-4800, 1-4809; Cultural Resources Study of Three Poles on the Poerson 33kV Transmission Line in Riverside County, California; BLM Fieldwork Authorization No. 66.24-10-36 (LSA Project No. SCE0801V)	no acres surveyed, no resources
George, Joan and Vanessa Mirro	2012	RI-08844[1]	Phase I Cultural Resources Assessment for the Whitewater Groundwater Replenishment Facility, Intake Structures and Diversion Channel Design Project, Palms Springs, Riverside County, California	no resources
Jones, Wendy and Evelyn Chandler	2011	RI-08876	Cultural Resources Inventory of a Proposed Pole Replacement in the City of Palm Springs, Riverside County, California (TD543773)	no resources
DeCarlo, Matthew M.	2013	RI-08978	Cultural Resources Inventory of Late Engineering Construction Components, Southern California Edison (SCE) Devers-Palo Verde 2 (DPV2) Project, Riverside County, California	no resources
DeCarlo, Matthew M., Scott C. Justus, and William T. Eckhardt	2013	RI-08981	Summary Class III Cultural Resource Inventory, Proposed Southern California Edison Devers-Palo Verde 2 500kV Transmission Line Project, Riverside County, California	22 resources
McLean, Roderic, Natalie Brodie, Jacqueline Hall, Shannon Carmack, Phil Fulton, Ingri Quon, Erin Martinelli, Richard Erickson, and Jay Michalski	2013	RI-09167	Cultural Resources Assessment and Class III Inventory Volume I West of Devers Project, San Bernardino and Riverside Counties, California	49 resources

Table 1 (continued)

Author(s)	Date	EIC Reference #	Title	Summary of Work
DeCarlo, Matthew M. and Diane L. Winslow	2015	RI-09385	Engineering Refinement Survey and Recommendation of Eligibility for Cultural Resources with Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, California	no resources
Ward, Christine and Scott H Kremkau	2015	RI-09451	Class III Cultural Resources Inventory of the Southern California Gas Company Pipeline Safety Enhancement Plan Line 2000C Hydrotest Project, Riverside County, California	no resources
Ward, Christine and Scott H Kremkau	2015	RI-09491	Class III Cultural Resources Inventory of the Southern California Gas Company Pipeline Safety Enhancement Plan Line 2000W-C Hydrotest Project, Riverside County, California	no resources
DeCarlo, Matthew M., Diane L. Winslow, Audry Williams, and Andrew Belcourt	2015	RI-09570	Cultural Resource Impact Assessment and Evaluation Status Report for Southern California Edison Company's West of Devers Upgrade Project, Riverside and San Bernardino Counties, California	no resources

[1] Projects that intersect the Project APE; [2] overview studies

The records search also indicated that 54 cultural resources have been recorded within a one-mile radius of the Project APE (Table 2). These include 40 archaeological resources and 14 built-environment resources. A total of 31 archaeological resources date to the historic period and include refuse scatters, building foundations and homestead ruins, water conveyance features, adits and mines, dirt trails, a presumed pet cemetery, a historic grave, and four isolated finds (cans and bottle fragments). Eight prehistoric archaeological resources have also been documented within a one-mile radius including bedrock milling sites, a village site, an ethnographic placename, and two isolated artifacts (mortar and pottery sherds). Finally, one multicomponent site consisting of a prehistoric bedrock milling features and rock cairns and a historic structure foundation was documented within a one-mile radius of the Project APE.

Fourteen built-environment resources are documented within one-mile of the Project APE. These consist of a USGS benchmark, concrete bridges, a water tower, roads, a transmission line, the Union Pacific Railroad, and the Whitewater Repeater Station. Five of these resources extend into the Project APE: three water conveyance sites (CA-RIV-4873H/33-004873, CA-RIV-6379H/33-009496, and CA-RIV-6380H/33-009497); the Southern Pacific Railroad (CA-RIV-6381H/33-009498); and a historical cobble-lined trail (CA-RIV-9292H/33-018090). These resources are described further below. Additional sources consulted during the archaeological literature and records search include the *National Register of Historic Places*, the *Office of Historic Preservation Archaeological Determinations of Eligibility*, and the *Office of Historic Preservation Directory of Properties in the Historic Property Data File*. There are no listed historic properties, historical resources, or historic landmarks recorded within or near the Project APE.

Table 2
Cultural Resources within One-Mile of the Project APE

Primary	Trinomial	Resource Type	Description
P-33-000178	CA-RIV-178H	Site	Historical foundations associated with the Palm Springs Station
P-33-000198	CA-RIV-198	Site	Prehistoric village site
P-33-002774	CA-RIV-2774	Isolated artifact	Prehistoric mortar
P-33-004165	CA-RIV-4165H	Site	Historical homestead remains and associated features
P-33-004873*	CA-RIV-4873H	Site	Historical stone lined ditch and concrete pipeline
P-33-007582	-	Built Environment	Historical water tower for the Palm Springs Station
P-33-009496*	CA-RIV-6379H	Site	Historical water conveyance system and associated features
P-33-009497*	CA-RIV 6380H	Site	Historical water conveyance features
P-33-009498*	CA-RIV 6381H	Built Environment	Union Pacific Railroad
P-33-009744	CA-RIV-6492H	Site	Historical homestead remains and associated features
P-33-013738	-	Isolated artifact	Two ceramic pottery sherds
P-33-014800	-	Site	Historical adit/mine and associated concrete pad
P-33-014801	-	Site	Historical adit/mine and associated concrete pad
P-33-015035	-	Built Environment	Historical Hayfield-Chino 220kV Transmission Line
P-33-015295	CA-RIV-8080H	Site	Historical refuse scatter
P-33-015297	-	Isolated artifact	Historical amethyst bottle glass fragment
P-33-015975	-	Site	Prehistoric bedrock milling feature
P-33-015978	-	Site	Prehistoric bedrock milling features and rock cairns
P-33-015979	-	Site	Prehistoric bedrock milling features and rock shelter and historic structure foundation
P-33-015980	-	Site	Historical foundation remnant, refuse scatter, and water conveyance features
P-33-015981	-	Site	Four historical structure remnants
P-33-016769	-	Site	Prehistoric ethnographic placename: Kish Chowl
P-33-017153	-	Built Environment	Historical Whitewater Repeater Station
P-33-017280	CA-RIV-8983	Site	Prehistoric bedrock milling feature
P-33-017281	CA-RIV-8984	Site	Prehistoric bedrock milling feature
P-33-017587	-	Site	Historical refuse scatter
P-33-017595	-	Site	Historical levee segment
P-33-018090*	CA-RIV-9292H	Site	Historical cobble-lined dirt trail
P-33-018091	CA-RIV-9293H	Site	Historical rock wall features and refuse scatter
P-33-018092	-	Site	Historical refuse scatter
P-33-018642	-	Isolated artifact	One historical brown glass medicinal bottle
P-33-018767	CA-RIV-9600H	Site	Historical homestead remains and associated refuse scatter
P-33-018768	CA-RIV-9601H	Site	Historical grave
P-33-018769	CA-RIV-9602H	Site	Historical refuse scatter and presumed pet cemetery
P-33-018770	CA-RIV-9603H	Site	Historical fence alignment
P-33-020876	CA-RIV-10800H	Site	Historical refuse scatter
P-33-020877	CA-RIV-10801H	Site	Historical refuse scatter
P-33-020880	CA-RIV-10804	Built Environment	Historical concrete bridge
P-33-020881	CA-RIV-10805	Built Environment	Historical concrete bridge
P-33-020889	CA-RIV-10813	Built Environment	Historical concrete bridge
P-33-022307	-	Built Environment	USGS Benchmark
P-33-022333	-	Isolated artifact	One historical metal sanitary food can
P-33-022334	-	Isolated artifact	One historical metal beverage can
P-33-022363	CA-RIV-11413	Site	Historical refuse scatter
P-33-022364	CA-RIV-11414	Site	Historical structure foundation
P-33-022365	CA-RIV-11415	Site	Historical refuse scatter
P-33-022383	CA-RIV-11435	Site	Historical refuse scatter
P-33-022385	CA-RIV-11437	Site	Historical refuse scatter

Table 2 (continued)

Primary	Trinomial	Resource Type	Description
P-33-024706	CA-RIV-12231	Built Environment	Historical unpaved dirt road segment; Cristen Road
P-33-024707	CA-RIV-12232	Built Environment	Historical paved road segment; Cooper Street
P-33-024708	CA-RIV-12233	Built Environment	Historical unpaved road segment; King Road
P-33-024709	CA-RIV-12234	Built Environment	Historical unpaved road segment; Adkins Road
P-33-024710	CA-RIV-12235	Built Environment	Historical unpaved road segment; Anita Road
P-33-024711	-	Built Environment	Historical unpaved road segment; Gas Line Road

* Resources reported within the Project APE

3.1.1 CA-RIV-4873H (33-004873)

CA-RIV-4873H was recorded in 1992 by Taskiran and Torres as an abandoned stone-lined ditch (McCallum's Ditch) and cement pipe (Taskiran and Torres 1992). According to the Department of Parks and Recreation (DPR) form, McCallum's Ditch was built in 1887 and is the earliest irrigation system from the Whitewater River to Palm Springs (Taskiran and Torres 1992:2). While Taskiran and Torres recommended that the portion of the ditch and the pipeline they identified be preserved, they made no formal NRHP or CRHR eligibility recommendations (Taskarian and Torres 1992). The segment of CA-RIV-4873H within the Project APE lies within the Central section of the Project APE.

3.1.2 CA-RIV-6379H (33-009496)

CA-RIV-6379H first recorded by Johnson and Quinn (2000) as an abandoned water conveyance system that runs northwest-southeast for approximately 4,500 feet. The DPR form states that the structure was built in 1927. A flood in 1928 destroyed several portions of the water line which were reconstructed in 1939. The resource was recommended as not eligible for the NRHP; the resource was not evaluated for listing on the CRHR (Johnson and Quinn 2000). The DPR form was updated by Harper, Hoffman, and Covert (2010a) to include a further "1050 feet of pipeline." They noted several names and dates inscribed on concrete including "Panchito Lopez," "Margarita Lopez," "Delorez," "Rancho Lopez Nov 22 1939," and "Raul Lopez Nov. 22, 1939." Harper and others recommended that this resource did not meet the minimum criteria for NRHP listing. They did note that the eligibility may change if it is shown that the pipeline was constructed in associated with canals commissioned by John Guthrie McCallum and built by Cahuilla labor in the late nineteenth century. They also noted that if the Lopez family is associated with significant historical events or persons, then the resource may be eligible for the NRHP. They recommended additional research and/or site testing to confirm the significance of the resource (Harper, Hoffman, and Covert 2010a). The segment of CA-RIV-6379H within the Project APE lies within the Western section of the Project APE.

3.1.3 CA-RIV-6380H (33-009497)

CA-RIV-6380H was recorded in 1999 by Natasha Johnson as an abandoned water conveyance system with multiple features (Johnson 1999). This resource was described as a historical rock and concrete-lined canal with a rock-lined basin or catchment area and a spillway. Johnson also noted a concrete joint pipeline in the vicinity and a concrete pad but could not determine if these features were associated with the canal. The concrete pad had a date stamp from 1922. Johnson made no recommendations of NRHP or CRHR eligibility for this resource (Johnson 1999). The portion of CA-RIV-6380H within the Project APE is located within the Western section of the Project APE.

3.1.4 CA-RIV-6381H (33-009498)

CA-RIV-6381H was originally recorded in 1999 by S. Ashkar and has been updated at least twice over the last 15 years (Taniguchi 2005; Wilson and Chmiel 2009; see Appendix A for condensed DPR forms). The Southern Pacific Railroad (SPRR) connected California and other Western states to the Midwest and Eastern United States following the Civil War, serving as a major transportation route for the transportation of goods and people. The segment in the Coachella Valley, completed in 1876, was part of the Yuma Main line, which connected Los Angeles, California to Yuma, Arizona. By 1883, it became part of the Sunset line, connecting San Francisco, California to New Orleans, Louisiana. Now known as the Union Pacific Railroad (UPRR), the original single track has been updated to a modern double track laid in 1988. A segment of the UPRR, further to the southeast in the Coachella Valley, was found ineligible for NRHP or CRHR inclusion because it no longer retained sufficient levels of historic integrity (i.e., it has been modified and altered beyond recognition) (Taniguchi 2005). The SPRR/UPRR intersects the Project APE west to east through the Western section of the Project APE.

3.1.5 CA-RIV-9292H (33-018090)

CA-RIV-9292H was recorded in 2010 by Harper, Hoffman, and Covert of SWCA Inc. as a four-foot-wide, north-south trending trail lined by medium- to large-sized granite cobbles extending 0.5 mi in four segments (Harper, Hoffman, and Covert 2010b). The trail does not appear on any historical maps of the area; the age of the resource is not known. Harper, Hoffman, and Covert made no NRHP or CRHR eligibility recommendations for this resource. The segment of CA-RIV-9292H within the Project APE is located within the Western section of the Project APE.

3.2 HISTORICAL MAP REVIEW

A number of historical maps were examined as part of the Class III study. These include the 1901 San Jacinto 30' USGS Quadrangle, the 1940 Palm Springs 15' USGS Quadrangle, the 1957 Palm Springs 15' USGS Quadrangle, the 1955 Whitewater 7.5' USGS Quadrangle, the 1972 Whitewater 7.5' USGS Quadrangle, and the 1955 Desert Hot Springs 7.5' USGS Quadrangle. The 1901 San Jacinto 30' USGS Quadrangle map depicts the SPRR/UPRR, but no other human activities are shown in the vicinity of the Project APE. The map depicts the natural course of the Whitewater River prior its channelization and development. The Palm Springs, CA (1940) 15' USGS Quadrangle shows the Palm Springs Station and several buildings along the Railroad in the southwest quarter of Section 14 and the northeast quarter of Section 23, T3S/R3E, SBBM. Most of these buildings are no longer present on the Whitewater, CA (1972) 7.5' USGS Quadrangle. None of the buildings are located within the current Project APE. No other buildings, structures, roads, or other features of interest are shown within, or within the vicinity of, the Project APE. It should be noted that the historical alignment of the SPRR/UPRR is present on all of the examined maps.

Additional maps were acquired on the Bureau of Land Management General Land Office (GLO) website (http://www.glorecords.blm.gov). Surveyor General John C. Hays approved the first survey within T3S/R3E S.B.B.M in 1856. No buildings are depicted within Sections 14, 23, and 24; however, an east-west running road is shown through portions of Section 13 and 14. An updated survey of T3S/R3E was approved by Surveyor General William S. Green in 1897. The survey recorded the “old channel of whitewater creek” within Section 13. Portions of the SPRR/UPRR alignment extend east-west through Sections 14 and 24. Whitewater Station is shown along the SPRR alignment within Section 14. A trail is depicted that extends south through Section 14 into Section 24 where it follows an east-west alignment before continuing to

the southeast. A telegraph line is located along the SPRR/UPRR alignment within the NE ¼ of Section 24. An updated survey of Section 24 depicts the subdivision of the section that was approved by Cadastral Engineering Staff Officer Earl G. Harrington in 1956. The survey map shows the highway and powerline right-of-ways situated within the NE ¼ of the section (GLO 2017).

A search of the BLM historical index pages noted that within Section 14, the NW and SW quarters of the SE ¼ and the NW and SW quarters of the NE ¼ were issued as a cash entry patent in 1913. The holder of that patent is not identified. There appears to have been a transfer of ownership of the NE quarter of the NE ¼ of Section 23 in 1930 and in 1956, but the records do not indicate to whom the property was sold and for what purpose. Within Section 24, parcels 1, 2, 7, 8, and 9 were transferred in 1921, but the records do not indicate to whom each parcel was sold and for what purpose. A Federal Power Commission ROW granted in parcels 4 and 5 in 1929 but was revoked in 1937. Parcels 1–4 were partially restored in 1932. In the NE and NW quarters of the NW ¼ of Section 24, a "water spreading" ROW was granted in 1937. A telephone/telegraph ROW was granted in parcels 1 and 5 through 8 in 1938 with proof of construction in 1941. A pipeline ROW was granted in 1952 for the NW quarter of the NE ¼ and the NE and NW quarters of the NW ¼. An oil and gas lease was granted in 1955 for parcels 3 and 4 (BLM 2017).

3.3 SACRED LANDS SEARCH

Æ requested a *Sacred Lands File* search of the Project area from the NAHC located in Sacramento, California on February 9, 2017. The NAHC responded on February 15, 2017 stating that the SLF search was completed with negative results. The NAHC provided a list of Native American individuals and organizations to be contacted to elicit information and/or concerns regarding cultural resource issues related to the proposed Project. Results of the NAHC SLF search and Native American contact list were turned over to the BLM to assist with their government-to-government consultation requirements under Section 106. The NAHC file search is included as Appendix B.

4
SURVEY METHODS

Æ archaeologists Patrick Moloney, Renee Elder, William Blodgett, and Evan Mills completed an intensive Class III cultural resource pedestrian survey of the 940-ac Project APE between April 13 and 20, 2017. The Project APE consists of three separate sections: a Western, Central and Eastern section. The Western and Central sections comprise the amendment area (see Figure 2) and were surveyed by walking parallel transects spaced at 15 m (49 ft) intervals. The Eastern section (i.e., the renewal area) was surveyed using a combination of windshield surveys in areas that consisted of existing graded water infiltration ponds and 15 m (49 ft) pedestrian transects. All areas likely to contain or exhibit archaeologically or historically sensitive cultural resources, such as landforms and natural features (i.e., bedrock outcrops), were inspected carefully to ensure that visible, potentially significant cultural resources were discovered and documented. Additionally, surveyors investigated any contours, soil changes, road cuts, drainages, and other potential cultural site markers. A Daily Work Record was completed by field supervisor Patrick Moloney, which documented survey personnel, hours worked, weather, ground surface visibility, vegetation, soils, exposure/slope, topography, natural depositional environments, and identified cultural resources.

When cultural resources are encountered during a Class III survey, systematic efforts are made to characterize and define the areal extent of each cultural resource. For purposes of this Project, one or more cultural features or three or more artifacts greater than 50 years of age within a 30-m (98-ft) radius was deemed to constitute a site. Cultural features or clusters of artifacts more than 30 m away from the nearest known cultural resource were considered a separate site. Fewer than three prehistoric or historical artifacts within a 30-m radius, but outside of a known site, were classified an isolated find, and recorded as such.

When encountered, any newly identified cultural resources were recorded on State of California DPR Primary Records and Archaeological Site Forms (DPR 523). Cultural resource locations were plotted on the appropriate 1:24,000 scale USGS 7.5' quadrangle using a Trimble GeoXH hand-held GPS unit using real-time satellite based augmentation system (SBAS) corrections achieving sub-meter accuracy. If archaeological sites were discovered, the GPS unit was also used to determine and document the precise locations and UTM coordinates of any/all activity loci, cultural features, and temporally or functionally diagnostic artifacts. Sketch maps of each archaeological site were drawn to scale, indicating the location of activity loci, features, and temporally or functionally diagnostic artifacts. Digital site overview photographs were also taken; in addition to digital overview photographs of each activity locus, cultural feature, and temporally or functionally diagnostic artifacts. All cultural features were documented fully, inventoried, and mapped by UTM coordinates. The Class III survey was a non-collection study.

As part of the fieldwork effort, Æ personnel also re-identified the five cultural resources (three water conveyance sites [CA-RIV-4873H/33-004873, CA-RIV-6379H/33-009496, and CA-RIV-6380H/33-009497]; the Southern Pacific Railroad [CA-RIV-6381H/33-009498]; and a historic cobble-lined trail [CA-RIV-9292H/33-018090]) that had been previously recorded within the Project APE. As part of the revisit, the character and current condition of each resource was assessed. For any resource where conditions have changed (e.g., erosion, alluvial deposition, new features or artifacts observed), DPR forms were updated.

5
FINDINGS

As mentioned above, the Project APE consists of three separate sections: a Western, Central and Eastern section. The Western section totals approximately 171 ha (423 ac) and traverses the Whitewater River alluvial floodplain; this section comprises 98 percent of the amendment area (see Section 1.1). The floodplain runs generally northwest-southeast between the Peninsular Range's San Jacinto Mountains to the south, and the Transverse Ranges San Bernardino mountains to the north. The alluvial floodplain ranges from a wash-incised, granitoid/gneissic boulder field in the north to mixed, wash-incised, gravely terraces and drifting sand dunes in the south. The area is fully exposed with ground surface visibility ranging from good to excellent (85–100%). Vegetation is creosote bush/California desert scrub with creosote bush (*Larrea tridentate*), bladder pod (*Isomeris arborea*), white rhatany (*Krameria grayi*), cheesebush (*Ambrosia salsola*), sweetbush (*Bebbia juncea var. aspera*), brittlebush (*Encelia farinosa*), desert willow (*Chilopsis linearis ssp. arcuata*), four-wing saltbush (*Atriplex canescens*), California juniper (*Juniperus californica*), Russian thistle (*Salsola damascena*), white bursage (*Ambrosia dumosa*), desert sage (*Salvia dorrii var. incana*), desert lavender (*Hyptis emoryi*), desert needle (*Palafoxia arida var. arida*), desert heron's bill (*Erodium texanum*), desert sand verbena (*Abronia villosa var. villosa*), desert needle grass (*Stipa speciosa*), desert dandelion (*Malacothrix glabrata*), desert star (*Monoptilon bellidiforme*), chia (*Salvia columbariae*), buckwheat (*Fagopyrum esculentum*), desert trumpet (*Eriogonum inflatum*), heliotrope (*Heliotropium curassavicum*), forget-me-not (*Myosotis scorpioides*), purple mat (*Nama demissum*), Freemont pincushion (*Chaenactis fremontii*), jimson weed (*Datura stramonium*), California ephedra (*Ephedra californica*), and silver lake daisy (*Leucosyris arida*) all present. Fauna noted during the survey included black-tiled jackrabbit (*Lepus californicus*), Nightjar (*Caprimulgus europaeus*), American crow (*Corvus brachyrhynchos*), western side-blotched Lizard (*Uta stansburiana elegans*), desert iguana (*Dipsosaurus dorsalis*), and western diamondback rattlesnake (*Crotalus atrox*).

The Central section is also part of the amendment area (see Section 1.1) and measures approximately 3.2 ha (8 ac) in area. The Central section is confined to a 150-m-long by 50-m-wide (492 x 164 ft) corridor that incorporates the median, northbound roadway, and shoulder of the Highway 111 alignment. Much of the Central section has been substantially disturbed by highway construction and consists of a level surface of both imported and native sandy gravels; therefore, ground surface visibility was excellent. Vegetation is sparse pioneer plants including creosote bush (*Larrea tridentate*), cheesebush (*Ambrosia salsola*), sweetbush (*Bebbia juncea var. aspera*), and brittlebush (*Encelia farinosa*).

The Eastern section is the renewal area and measures approximately 206 ha (509 ac) in area. As mentioned in Section 1.1, the renewal area is currently developed with a series of dikes, levies, spillways, and 19 replenishment ponds. The entire Eastern section has been extensively bulldozed and graded and is almost entirely denuded of vegetation; therefore, ground surface visibility was excellent.

A total of 13 cultural resources was located within the Project APE. In the Western section, the previously recorded resources of two water conveyance sites (CA-RIV-6379H/33-009496 and CA-RIV-6380H/33-009497), the Southern Pacific Railroad (CA-RIV-6381H/33-009498), and a

historic cobble-lined trail (CA-RIV-9292H/33-018090) were re-identified, along with six newly identified resources (four historic-period resources consisting of two transmission lines [CA-RIV-12627H and CA-RIV-12630H], an asphalt road [CA-RIV-12628H], and water conveyance feature [CA-RIV-12629] and two prehistoric resources consisting of a habitation site [CA-RIV-12631] and an artifact scatter [CA-RIV-12632]) and two newly identified prehistoric isolated finds (two ceramic sherds [33-026898] and two flakes [33-026897]). One known resource in the Central section (water conveyance site [CA-RIV-4873/33-004873]) was also re-identified. No newly identified resources were documented within the Central and Eastern sections.

The five previously recorded and eight newly identified resources situated within the Project APE are depicted on Figure 5, summarized below, and discussed in detail in the archaeological site records included in Appendix A.

5.1 CA-RIV-4873H (33-004873)

As previously discussed, CA-RIV-4873H was originally recorded by Taskiran and Torres (1992) as McCallum's Ditch, a historical stone-lined ditch and cement pipe. A revisit to CA-RIV-4873H found that the site was as described by Taskiran and Torres in 1992 with no changes noted in the condition of the resource. CA-RIV-4873H lies within the Central section of the Project APE.

5.2 CA-RIV-6379H (33-009496)

First recorded by Johnson and Quinn (2000), CA-RIV-6379H consists of a historical water conveyance system, constructed in 1927, that runs northwest-southeast for approximately 4,500 ft. The site record was updated by Harper, Hoffman, and Covert (2010a) to include a further "1050 feet of pipeline." A revisit to CA-RIV-6379H found that the previous resource descriptions were fairly accurate. As the result of the Class III survey, an additional 85-ft-long section of previously unrecorded 20-in. diameter, jointed concrete pipeline was documented within the Project APE (Figure 6). As a result of this finding, the southern boundary of CA-RIV-6379H was expanded (see Appendix A). The condition of the site does not appear to have noticeable changed since 2010 and the pipeline appears to largely retain its integrity. The segment of CA-RIV-6379H documented during the current study lies within the Western section of the Project APE.

5.3 CA-RIV-6380H (33-009497)

Recorded in 1999 by Natasha Johnson, CA-RIV-6380H consists of multiple features associated with early twentieth-century water conveyance (Johnson 1999). During the Class III survey, the rock and concrete-lined canal (having a rock-lined basin or catchment area on the west end and an irregularly shaped spillway on the east end), the remains of a concrete jointed pipeline (located southeast of the canal), and a concrete pad (south of the canal) were re-identified. The Class III survey also documented a 616-ft-long section of previously unrecorded concrete pipeline along the eastern site boundary. An examination of the features that compose CA-RIV-6380H found that the conditions of the site have remained largely unchanged since its 1999 recordation and the site continues to retain its integrity. The portion of CA-RIV-6380H documented during the current study is located within the Western section of the Project APE.

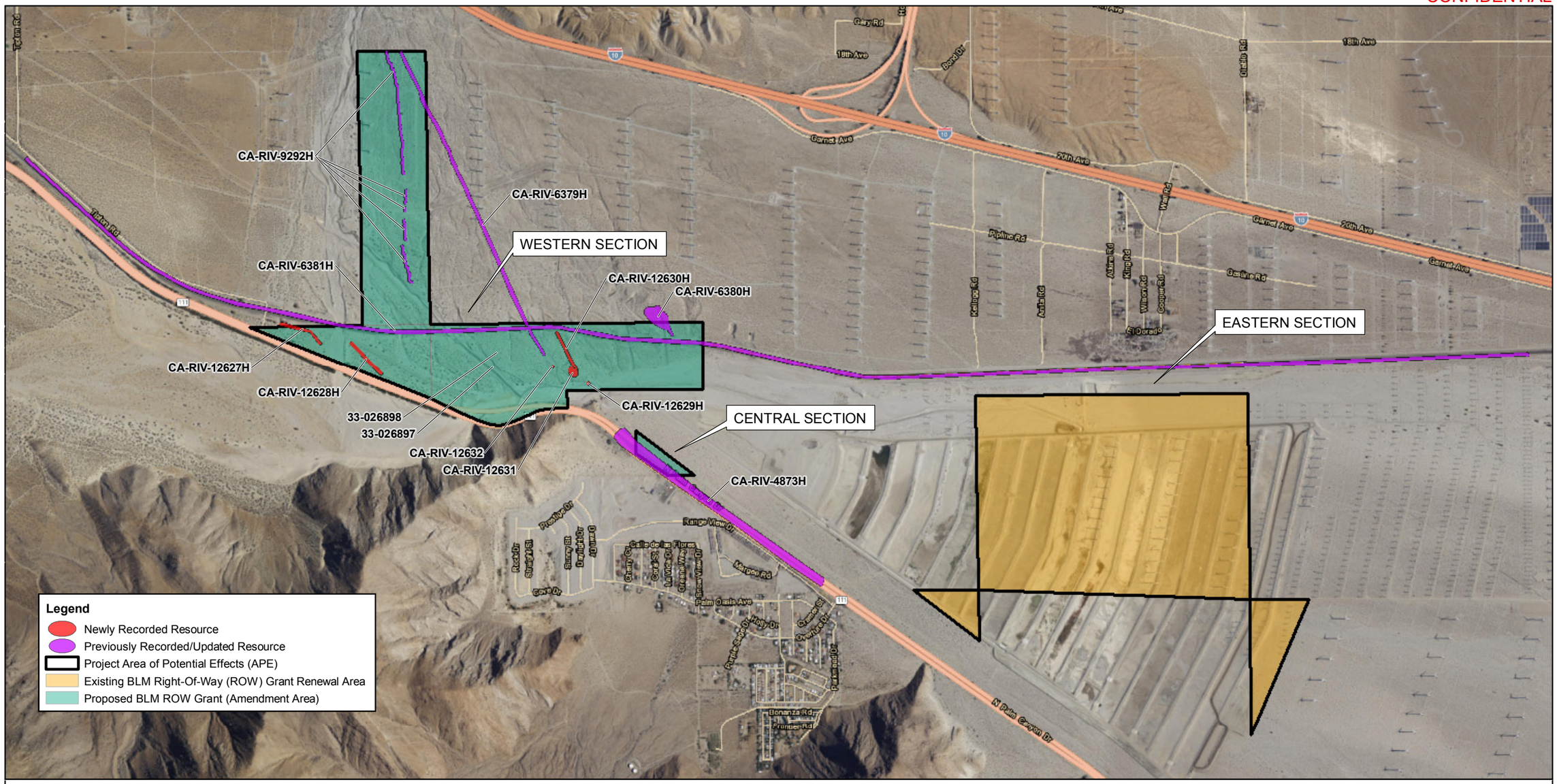

Figure 5 Cultural resources within the project APE.

Figure 6 Overview of newly documented segment of CA-RIV-6379H (view to the east).

5.4 CA-RIV-6381H (33-009498)

CA-RIV-6381H was originally recorded in 1999 by S. Ashkar and has been updated multiple times over the last 18 years. The current survey included a segment of the railroad that measures approximately 7,154 ft in length. This segment of the railroad consists of two parallel standard-gauge tracks and is part of an active railroad line that exhibits regular operation and maintenance activities. The SPRR/UPRR intersects the Project APE west to east through the Western section of the Project APE.

5.5 CA-RIV-9292H (33-018090)

CA-RIV-9292H was recorded in 2010 by Harper, Hoffman, and Covert of SWCA Inc. as a 4-ft-wide, north-south trending trail of unknown age lined by medium to large granite cobbles (Harper, Hoffman, and Covert 2010b). A revisit to CA-RIV-9292H found that the description provided in the DPR form was fairly accurate. The Class III survey resulted in the identification of an additional 150 ft of trail north of the previously recorded northern boundary. The trail appears to continue farther north for an unknown distance outside of the Project APE. CA-RIV-9292H now measures 4,600 ft in length. The site appears to retain its integrity with no disturbance noted within the expanded site boundary. The segment of CA-RIV-9292H documented during the current study is located within the Western section of the Project APE.

5.6 TRANSMISSION LINE (CA-RIV-12627H)

An approximate 900-ft-long segment of a transmission line was documented within the Western section of the Project APE (see Figure 5). The transmission line runs in a northwest-southeast direction north of Highway 111. The subject segment of the transmission line consists of four wooden utility poles (Figure 7). Date nails showing pole construction dates range from 1935–1970. Three poles appear to have been replaced between 2005 and 2010. Inspection tags show the line is still in use.

Figure 7 Overview of CA-RIV-12627H (view to the northwest).

Archival research found little information on the construction date of the transmission line. A review of an aerial photograph dating to the early 1970s does not depict the transmission line (NETR Online 1972). No evidence of the transmission line was observed on any of the USGS topographic quadrangle maps of the area.

5.7 ASPHALT ROAD (CA-RIV-12628H)

CA-RIV-12628H, located within the Western section of the Project APE, is an 870-ft-long, approximately 15-ft-wide, historic-period asphalt paved road (Figure 8). The road runs in a southeast-northwest direction from its southeast extreme in a highly disturbed area within the Caltrans Highway 111 ROW to its northwest extreme where it becomes obscured by drifting sand dunes. The roadbed ranges from six to eight inches in thickness and constructed of a course aggregated tarmac base with one or more gritted asphalt toppings. No historic-period signage or other historical roadway features were observed along this road segment.

The road is depicted on the 1944 and 1955 historic topographic maps (USGS 1944, 1955) and is visible in the 1977 historic aerials (NETR Online 1977). Historical topographic maps show that by 1944 the road did not appear to extend much farther than what was observed and documented by Æ archaeologists during the pedestrian survey. The road appears to have been a short spur road that extended in the northwest direction from Highway 111. Natural erosion and mechanical demolition appear to have significantly impacted the integrity of the road alignment.

Figure 8 Overview of CA-RIV-12628H (view to the southeast).

5.8 WATER CONVEYANCE FEATURE (CA-RIV-12629H)

CA-RIV-12629H is a 4-ft-wide, 2-ft 6-in.-high, cemented-cobble catchment sump with cement foundation. The site also includes a currently detached, 12-in.-diameter, welded rolled steel pipe that protrudes horizontally south from the sump (Figure 9). The site is located within the Western section of the Project APE.

Archival research found little information on the construction date of the water conveyance feature. A review of an aerial photographs dating to the early 1970s did not depict the water conveyance feature (NETR Online 1972). No evidence of the water conveyance feature was observed on any of the USGS topographic quadrangle maps of the area. Site integrity is good. The site is relatively undisturbed other than some disturbance from natural erosion.

5.9 TRANSMISSION LINE (CA-RIV-12630H)

An approximately 827-ft-long segment of a 1940s power transmission line was documented within the Western section of the Project APE (see Figure 5). The transmission line runs in a northwest-southeast direction north of Highway 111. The subject segment of the transmission line consists of five wooden utility poles (Figure 10). Date nails showing pole construction dates range from 1940–1959. Inspection tags show the line is still in use.

Figure 9 Overview of CA-RIV-12629 (view to the southwest).

Figure 10 Overview of CA-RIV-12630H (view to the north).

Archival research found little information on the construction date of the transmission line. However, the location of this resource corresponds with a ROW corridor granted by the BLM in 1938. As previously noted, archival sources indicate that the transmission line was built in 1941 (BLM 2017).

5.10 PREHISTORIC HABITATION SITE (CA-RIV-12631)

CA-RIV-12631, located within the Western section of the Project APE, is a large (57 by 37 m [NW-SE by E-W]) prehistoric habitation site. The resource is situated on a mixed gravel terrace and drifting sand dune surface of the Whitewater River alluvial floodplain. The site consists of a surface scatter consisting of more than 300 lithic artifacts (including three projectile points), two pottery sherds, one metate fragment, two manos, two mano/hammerstones, three biface tools (two choppers one scraper), seven cores, and seven fire-affected rocks (Figure 11).

Site integrity is generally intact. The site is relatively undisturbed other than parts of the site being obscured by sand dunes. Considering the density and diversity of artifacts, the presence of fire-altered rocks, and the location of the site within sand dunes, there appears to be a high potential for buried cultural deposits at the site.

Figure 11 Overview of CA-RIV-12631 (view to the north).

5.11 PREHISTORIC ARTIFACT SCATTER (CA-RIV-12632)

CA-RIV-12632 is located within the Western section of the Project APE. The site consists of a discrete (9.5 by 8 m [N-S by E-W]) prehistoric ceramic scatter of 14 pottery sherds. At least three separate vessels are represented (Figure 12).

Site integrity is good. However, parts of the site have been obscured by sand dunes. Considering the site type and the location of the site within sand dunes, there appears to be a moderate potential for buried cultural deposits at the site.

Figure 12 Overview of CA-RIV-12632 (view to the north).

5.12 ISOLATED ARTIFACTS

Two prehistoric isolated artifacts were identified and documented within the Western section of the Project APE. The isolated artifacts consist of ceramic sherds and flakes (Table 3).

Table 3
Isolated Artifacts Documented within the Project APE

Primary #	Material Type	Description	Photograph
33-026898	Ceramic	Two ceramic sherds	
33-026897	Obsidian and Basalt	One obsidian secondary flake & one basalt tertiary flake	

6
RESOURCE EVALUATIONS

The intensive-level Class III cultural resource survey of the Project APE resulted in the discovery of five previously documented cultural resources and eight newly identified cultural resources. These resources include nine historic-period cultural resources (6 archaeological sites and 3 built-environment resources), two prehistoric archaeological sites, and two isolated finds. The two isolated finds (33-026898 and 33-026897) by definition, lack immediate cultural context and therefore lack the data potential that would be required to be considered eligible for NRHP or CRHR inclusion. The remaining 11 resources are each evaluated for historical significance below and summarized in Table 4.

Table 4
Eligibility Recommendations for Cultural Resources within the Project APE

Primary/ Trinomial	Description	Project Area	CRHR Eligibility	NRHP Eligibility
33-004873/ CA-RIV-4873H	Water conveyance	Central section	Recommended eligible under Criteria 1 & 2	Recommended eligible under Criteria A & B
33-009496/ CA-RIV-6379H	Water conveyance	Western section	Recommended ineligible	Recommended ineligible
33-009497/ CA-RIV-6380H	Water conveyance	Western section	Recommended ineligible	Recommended ineligible
33-009498/ CA-RIV-6381H	Southern Pacific/Union Pacific Railroad	Western section	Recommended ineligible	Recommended ineligible
33-018090/ CA-RIV-9292H	Cobble-lined trail	Western section	Recommended ineligible	Recommended ineligible
CA-RIV-12627H	Transmission line	Western section	Recommended ineligible	Recommended ineligible
CA-RIV-12628H	Asphalt paved road	Western section	Recommended ineligible	Recommended ineligible
CA-RIV-12629H	Water Conveyance	Western section	Recommended ineligible	Recommended ineligible
CA-RIV-12630H	Transmission line	Western section	Recommended ineligible	Recommended ineligible
CA-RIV-12631	Prehistoric habitation site	Western section	Recommended eligible under Criterion 4	Recommended eligible under Criterion D
CA-RIV-12632	Prehistoric ceramic scatter	Western section	Recommended eligible under Criterion 4	Recommended eligible under Criterion D
33-026898	Isolated Find - Two prehistoric ceramic sherds	Western section	Recommended ineligible	Recommended ineligible
33-026897	Isolated Find - Two prehistoric flakes	Western section	Recommended ineligible	Recommended ineligible

6.1 CA-RIV-4873H (33-004873)

CA-RIV-4873H is a historical stone-lined ditch and cement pipe known as McCallum's Ditch. Based on field observations, the current condition of CA-RIV-4873H appears relatively unchanged since the 1992 recordation of the resource. Taskarian and Torres (1992) identified

this resource as a portion of McCallum's Ditch, an important water conveyance system that was integral to the early non-indigenous settlement of the region. Therefore, this resource appears to be eligible under NRHP Criterion A/CRHR Criterion 1 for its association with the early development of the Palm Springs area. McCallum's Ditch is directly associated with John Guthrie McCallum, an important figure to the establishment of Palm Springs. Therefore, this resource appears to be eligible for the NRHP under Criterion B/ CRHR Criterion 2. While CA-RIV-4873H is a relatively early regional example of a water conveyance system, the resource does not represent a particularly distinctive design or departure from common water conveyance design during the late nineteenth- and early twentieth- centuries. It is essentially similar to other water conveyance resources of this type throughout California. In addition, it appears to have been modified to accommodate later water conveyance systems including the cement pipeline. As such, the resource is not considered eligible under NRHP Criterion C/ CRHR Criterion 3. Finally, this resource is unlikely to yield information important in history or prehistory or broaden our understanding of water conveyance systems (NRHP Criterion D/ CRHR Criterion 4).

6.2 CA-RIV-6379H (33-009496)

CA-RIV-6379H consists of a historical water conveyance system constructed in 1927. Based on field observations and historic research, Æ concurs with the 2000 (Love et al. 2000) and 2010 (Harper, Hoffman, and Covert 2010a) recommendations that this resource does not appear to be eligible for listing on the NRHP or the CRHR. Research has yielded no information to suggest the route of this resource is located within canals commissioned by McCallum to convey water from the Whitewater River to his adobe in the nineteenth century. The water conveyance feature appears to be consistent with mid-twentieth century construction and there is no indication that it was constructed earlier. Nor is there any other indication that this resource is associated with important historical events (NRHP Criterion A/ CRHR Criterion 1). Research has also yielded no information that suggests that Panchito Lopez, Margarita Lopez, Delorez, or Raul Lopez are persons of local, state, or national historical significance or that other persons of important historical significance are associated with this resource (NRHP Criterion B/ CRHR Criterion 2). This resource does not represent a particularly distinctive design or departure from common water conveyance design during the twentieth century and is essentially similar to other water conveyance resources of this type throughout California (NRHP Criterion C/ CRHR Criterion 3). This resource is a fairly common property type and it is unlikely to yield information important in history or prehistory or broaden our understanding of water conveyance systems (NRHP Criterion D/ CRHR Criterion 4).

6.3 CA-RIV-6380H (33-009497)

CA-RIV-6380H consists of multiple historical features associated with early twentieth century water conveyance. Based on field observations and historic research, this resource does not appear to be eligible for listing on the NRHP or the CRHR. This water conveyance feature appears to be consistent with mid-twentieth century construction and there is no indication that it was constructed earlier. Nor is there any other indication that this resource is associated with important historical events (NRHP Criterion A/ CRHR Criterion 1). Research has also yielded no information that suggests that persons of important historical significance are associated with this resource (NRHP Criterion B/ CRHR Criterion 2). This resource does not represent a particularly distinctive design or departure from common water conveyance design during the twentieth century and is essentially similar to other water conveyance resources of this type

throughout California (NRHP Criterion C/ CRHR Criterion 3). This resource is a fairly common property type and it is unlikely to yield information important in history or prehistory or broaden our understanding of water conveyance systems (NRHP Criterion D/ CRHR Criterion 4).

6.4 CA-RIV-6381H (33-009498)

CA-RIV-6381H is the historical Southern Pacific Railroad, now known as the Union Pacific Railroad. Based on field observations, historic research, and previous eligibility recommendations for CA-RIV-6381H, Æ recommends that the segment of this resource within the Project APE does not appear to be eligible for listing on the NRHP or the CRHR. For a similar segment of the UPRR, farther to the southeast in the Coachella Valley, Taniguchi concluded in 2005, that the particular segment she documented does not qualify for NRHP or CRHR inclusion because it no longer retains sufficient levels of historic integrity (i.e., it has been modified and altered beyond recognition) (Taniguchi 2005). Along with other portions of the rail line, the segment within the Project APE was updated to a modern double track in 1988. In addition, the rail line is in current use and subject to standard operation and maintenance activities. Due to the general lack of integrity, the UPRR segment within the Project APE would not contribute to the overall significance of the entire line, should the resource be found eligible in the future.

6.5 CA-RIV-9292H (33-018090)

CA-RIV-9292H is a cobble-lined trail of unknown age. Based on a review of historical maps, no trail is recorded on the 1856 GLO Map of the area (GLO 1856). However, a trail is depicted on the 1897 GLO map that appears to roughly follow the alignment of this resource. The trail is not named on the GLO map, but does connect to the east-west oriented "Road from Banning to Desert Queen Mine" in the north and the east-west oriented "Road from banning to White Water Station" in the south (GLO 1897). CA-RIV-9292H does not appear on historical topographic maps and research has yielded no further information regarding the trail. Based on field observations and available research, this trail does not appear to be eligible for the NRHP or the CRHR. Research has yielded no information to suggest that the trail is associated with important historical events (NRHP Criterion A/ CRHR Criterion 1). The alignment appears on the 1897 GLO map as an unnamed trail and is one of many identified in the area on the 1897 map. No information has been discovered that indicates the trail is specifically associated with the lives of significant persons of or past (NRHP Criterion B/ CRHR Criterion 2) nor does this trail represent a distinctive design or significant departure from trail construction. It is similar to numerous other trails throughout California and the United States (NRHP Criterion C/ CRHR Criterion 3). Field observations identified no surface artifacts associated with the trail and no indications of subsurface deposits. It is unlikely that this resource has yielded or is likely to yield information important in history or prehistory (NRHP Criterion D/ CRHR Criterion 4).

6.6 TRANSMISSION LINE (CA-RIV-12627H)

CA-RIV-12627H is a historical transmission line constructed between 1935 and 1970. Inspection tags show the line is still in use. This resource is one of many utility lines constructed throughout the Coachella Valley, California, and the United States during the mid-twentieth century. Research has yielded no information to suggest that this utility line is the first or among the earliest constructed in the region or that it was important to the development of the region. While the general expansion of electrical service was a historical trend during the mid-twentieth

century, utility lines such as this are an extremely common property type. It does not specifically appear to be associated with events that have made significant contributions to our history (NRHP Criterion A/ CRHR Criterion 1). Research yielded no information to suggest that this resource is specifically associated with the lives of significant persons in our past (NRHP Criterion B/ CRHR Criterion 2). These utility poles are an extremely common property type that does not represent a departure from standard utility pole construction or are unique in any way (NRHP Criterion C/ CRHR Criterion 3). Finally, further study of the transmission line is unlikely to yield information important in history or prehistory (NRHP Criterion D/ CRHR Criterion 4).

6.7 ASPHALT ROAD (CA-RIV-12628H)

CA-RIV-12628H is an 870-ft-long historic-period asphalt paved road. The road is depicted on the 1944 and 1955 historic topographic maps (USGS 1944, 1955) and is visible in the 1977 historical aerials (NETR Online 1977). Historical topographic maps show that by 1944 the road did not appear to extend much farther than what was observed by Æ archaeologists during the field survey. The road was likely a short spur road that extended in the northwest direction from Highway 111. Research has yielded no information to suggest that this road is associated with important historical events. While it appears to have been a spur road off Highway 111, there is no indication that this segment of road was important to the original highway alignment or the development of the area (NRHP Criterion A/ CRHR Criterion 1). Research has yielded no information to suggest that this portion or road is specifically associated with the lives of significant persons of or past (NRHP Criterion B/ CRHR Criterion 2). The road is made of asphalt, as were many roads constructed in the twentieth century, and displays no distinctive features that differentiate it from other twentieth century roads (NRHP Criterion C/ CRHR Criterion 3). Field observations identified no surface artifacts associated with the road and no indications of subsurface deposits. It is unlikely that this resource will yield information important in history or prehistory (NRHP Criterion D/ CRHR Criterion 4).

6.8 WATER CONVEYANCE FEATURE (CA-RIV-12629H)

CA-RIV-12629H is a historical cemented-cobble catchment sump on a cement foundation with a welded rolled steel pipe protruding horizontally south from the sump. Based on field observations and historic research, this resource does not appear to be eligible for listing on the NRHP or the CRHR. This water conveyance feature appears to be consistent with mid-twentieth-century construction and there is no indication that it was constructed earlier. Nor is there any other indication that this resource is associated with important historical events (NRHP Criterion A/ CRHR Criterion 1). Research has also yielded no information that suggests that persons of important historical significance are associated with this resource (NRHP Criterion B/ CRHR Criterion 2). This resource does not represent a particularly distinctive design or departure from common water conveyance design during the twentieth century and is essentially similar to other water conveyance resources of this type throughout California (NRHP Criterion C/ CRHR Criterion 3). This resource is a fairly common property type and it is unlikely to yield information important in history or prehistory or broaden our understanding of water conveyance systems (NRHP Criterion D/ CRHR Criterion 4).

6.9 TRANSMISSION LINE (CA-RIV-12630H)

CA-RIV-12630H is an approximate 827-ft-long segment of a 1940s power transmission line. Inspection tags show the line is still in use. The location of this resource corresponds with a ROW granted by the BLM in 1938 that was confirmed built in 1941 (BLM 2017). It is one of many utility lines constructed throughout the Coachella Valley, California, and the United States during the mid-twentieth century. Research has yielded no information to suggest that this utility line is the first or among the earliest constructed in the region or that it was important to the development of the region. While the general expansion of electrical service was a historical trend during the mid-twentieth century, utility lines such as this are an extremely common property type. It does not specifically appear to be associated with events that have made significant contributions to our history (NRHP Criterion A/ CRHR Criterion 1). Research yielded no information to suggest that this resource is specifically associated with the lives of significant persons in our past (NRHP Criterion B/ CRHR Criterion 2). These utility poles are an extremely common property type that does not represent a departure from standard utility pole construction or are unique in any way (NRHP Criterion C/ CRHR Criterion 3). It is unlikely that this resource will yield information important in history or prehistory (NRHP Criterion D/ CRHR Criterion 4).

6.10 PREHISTORIC HABITATION SITE (CA-RIV-12631)

CA-RIV-12631 is a large prehistoric habitation site consisting of more than 300 pieces of flaked stone debitage, two pottery sherds, one metate fragment, two manos, two mano/hammerstones, three biface tools (two choppers one scraper), seven cores, and seven fire-affected rocks. Site condition and integrity is generally good; primary disturbances are attributed to natural erosional and weathering processes. In addition, the site is located within an alluvial, depositional environment with undetermined soil depth, and there is some potential for intact subsurface cultural deposits.

Based on field observations, it is likely that this resource will yield information important in prehistory (NRHP Criterion D/ CRHR Criterion 4). If this site cannot be avoided during Project development, Phase III data recovery would be required to mitigate adverse effects to historic properties under NRHP Criterion D.

6.11 PREHISTORIC ARTIFACT SCATTER (CA-RIV-12632)

CA-RIV-12632 is a discrete prehistoric ceramic scatter consisting of 14 pottery sherds from at least three separate vessels. Site condition and integrity is generally good; primary disturbances are attributed to natural erosional and weathering processes. In addition, the site is located within an alluvial, depositional environment with undetermined soil depth, and there is some potential for intact subsurface cultural deposits.

Based on field observations, it is likely that this resource will yield information important in prehistory (NRHP Criterion D/ CRHR Criterion 4). If this site cannot be avoided during Project development, Phase III data recovery would be required to mitigate adverse effects to historic properties under NRHP Criterion D.

7
MANAGEMENT RECOMMENDATIONS

The results of this study indicate that the only known historic properties/historical resources present within the Project APE include a segment of a historical stone-lined ditch known as McCallum's Ditch (CA-RIV-4873H/33-004873) and two prehistoric archaeological sites (CA-RIV-12631 and CA-RIV-12632). All historic properties/historical resources identified within the Project APE will be avoided through Project redesign. If avoidance proves infeasible (e.g., due to extreme topography), Phase III data recovery would be required to mitigate adverse effects to historic properties under NRHP Criterion D.

If human remains are encountered during Project construction on **federal** lands, the following protocol must be adhered to. The Native American Graves Protection and Repatriation Act (NAGPRA), as implemented by 43 CFR Sections 10.4–10.6, presents the procedures for the treatment of human remains, associated funerary objects, sacred objects, and objects of cultural patrimony located on federal land. As the lead federal agency on the Project, the BLM should be notified immediately. The BLM will be responsible for government-to-government consultation with affected Native American Tribes concerning all potential NAGPRA issues.

If human remains are encountered during Project construction in a location other than a dedicated cemetery on **non-federal lands**, the steps and procedures specified in Health and Safety Code §7050.5, *State CEQA Guidelines* 15064.5(d), and PRC §5097.98 must be implemented. Specifically, in accordance with PRC §5097.98, the Riverside County Coroner must be notified within 24 hours of the discovery of potentially human remains. The Coroner must 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 must contact the NAHC by phone within 24 hours, in accordance with PRC §5097.98. The NAHC then designates a Most Likely Descendant (MLD) with respect to the human remains within 48 hours of notification. The MLD will then have the opportunity to recommend to the Project proponent means for treating or disposing of, with appropriate dignity, the human remains and associated grave goods within 24 hours of notification.

Finally, if the Project APE is expanded to include areas not covered by this survey or other recent cultural resources studies, additional cultural resources studies may be required.

8
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APPENDIX A

CONFIDENTIAL ARCHAEOLOGICAL SITE RECORDS

APPENDIX B

NAHC SACRED LANDS FILE SEARCH