

5.3 Cultural Resources

This section discusses the potential effects of the Redondo Beach Energy Project (RBEP) on cultural resources. Section 5.3.1 describes the project setting and Section 5.3.2 describes the cultural resources environment that might be affected by the RBEP. Section 5.3.3 provides a discussion of the research design of the cultural resources inventory and Section 5.3.4 summarizes the inventory results. Section 5.3.5 presents an environmental analysis of project construction, demolition and operation. Section 5.3.6 discusses cumulative effects and Section 5.3.7 presents mitigation measures that will be implemented to avoid project-related impacts. RBEP is not anticipated to require mitigation measures for cultural resources once it is operational. Section 5.3.8 discusses the laws, ordinances, regulations, and standards (LORS) applicable to the protection of cultural resources. Section 5.3.9 lists the agencies involved and agency contacts, and Section 5.3.10 discusses permits. Section 5.3.11 lists reference materials used in preparing this section.

This section is consistent with state regulatory requirements for cultural resources pursuant to the California Environmental Quality Act (CEQA). Cultural resources include prehistoric and historic archaeological sites¹; districts and objects; standing historic structures, buildings, districts, and objects; locations of important historic events, and sites of traditional/cultural importance to various groups.² The study scope was developed according to the California Energy Commission's (CEC) cultural resources guidelines and complies with *Instructions to the California Energy Commission Staff for the Review of and Information Requirements for an Application for Certification* (CEC, 1992) and *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007). This study was conducted by Gloriella Cardenas, M.A., RPA; Natalie Lawson, M.A., RPA; and Clint Helton, M.A., RPA, Cultural Resource Specialists (CRS) who meet the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (U.S. National Park Service [NPS], 1995). Lori Durio-Price, M.A., Secretary of Interior-qualified Architectural Historian, conducted all research related to historic architecture.

Per CEC Data Adequacy requirements, Appendix 5.3A provides copies of agency consultation letters. Appendix 5.3B provides the Cultural Resources Inventory Report, including California Department of Parks and Recreation (DPR) 523 forms for newly recorded resources. Appendix 5.3C provides archival research material, including copies of historic maps and aerial photographs of the project and a complete copy of the California Historical Resources Information System (CHRIS) literature search results, which include copies of previous technical reports occurring within 0.25 mile of the project and DPR 523 forms for previously recorded resources occurring within 1 mile of the project. (Appendix 5.3B and 5.3C will be submitted separately to the CEC under a request for confidentiality.) RBEP does not include any offsite linear facilities, so the requirements for documenting and analyzing cultural resources within 0.5 mile of linear facilities are not required for the project. Appendix 5.3D provides names and qualifications of personnel who contributed to this study. Appendix 5.3E contains a map of all resources recorded during the cultural resources assessment.

¹ Site is defined as "The location of a significant event, a prehistoric or historic occupation or activity, or a building or structure...where the location itself possesses historic, cultural, or archeological value." (NPS, 1998: 5).

² The federal definitions of cultural resource, historic property or historic resource, traditional use area, and sacred resources are reviewed below and are typically applied to non-federal projects.

A cultural resource may be defined as a phenomenon associated with prehistory, historical events, or individuals or extant cultural systems. These include archaeological sites, districts, and objects; standing historic structures, districts, and objects; locations of important historic events; and places, objects, and living or non-living things that are important to the practice and continuity of traditional cultures. Cultural resources may involve historic properties, traditional use areas, and sacred resource areas.

Historic property or historic resource means any prehistoric district, site building, structure, or object included in, or eligible for, inclusion in the National Register of Historic Places (NRHP). The definition also includes artifacts, records and remains that are related to such a district, site, building, structure or object.

Traditional use area refers to an area or landscape identified by a cultural group to be necessary for the perpetuation of the traditional culture. The concept can include areas for the collection of food and non-food resources, occupation sites and ceremonial and/or sacred areas.

Sacred resources applies to traditional sites, places or objects that Native American tribes or groups, or their members, perceive as having religious significance.

The RBEP study area referred to in this section includes the survey areas for both archaeological and architectural resources (see Figure 5.3-1). The archaeological survey area includes the approximately 50-acre existing Redondo Beach Generating Station site on which RBEP and all construction laydown and parking areas will be located, as well as a 200-foot buffer comprising an additional 81 acres, for a total of 131 acres. The total acreage of new ground disturbance for RBEP is approximately 50 acres. Excavations are expected to reach depths of approximately 10 feet below the surface with the exception of pilings for foundations. Piles will be driven to depths of approximately 40 feet or more depending on the final engineering design requirements. The architectural survey area includes the existing Redondo Beach Generating Station, as well as a buffer around the plant site consisting of at least one additional parcel deep on all sides, as per CEC requirements for a project in an urban setting. With the implementation of the proposed mitigation strategies contained herein, the project will have no significant negative environmental impacts regarding cultural resources and will comply with all applicable laws, ordinances, regulations, and standards.

5.3.1 Setting

RBEP is a 496-megawatt³ natural-gas-fired power plant, consisting of one 3-on-1 combined-cycle gas turbine power block. The power block includes three combustion turbine generators (CTG), three supplemental-fired heat recovery steam generators (HRS), one steam turbine generator (STG), an air-cooled condenser, and related ancillary equipment. RBEP will be constructed entirely within the existing approximately 50-acre Redondo Beach Generating Station site in Redondo Beach, California. The project will use the existing onsite potable water, natural gas, stormwater, process wastewater, and sanitary pipelines and electrical transmission facilities. No offsite linear developments are proposed as part of the project.

RBEP will use potable water, provided by the California Water Service Company, for construction water and for operational process and sanitary uses. During RBEP operation, stormwater and process wastewater will be discharged to a retention basin and then ultimately to the Pacific Ocean via an existing permitted outfall. Sanitary wastewater will be conveyed to the Los Angeles County Sanitation District via the existing City of Redondo Beach sewer connection. A new onsite 230-kilovolt (kV) transmission interconnection will connect the RBEP power block to the existing onsite Southern California Edison (SCE) 230-kV switchyard.

Construction and demolition activities at the project site are anticipated to last 60 months, from January 2016 until December 2020. The first activities to occur onsite will be the dismantling and partial removal of existing Units 1–4. The major generating equipment including steam turbines, generators, boilers, and duct work will be removed, leaving the administration building and western portion of the building that houses Units 1–4 intact. These buildings will be left standing temporarily to provide screening between the construction site of the new power block and Harbor Drive. Construction of the new power block will begin in the first quarter of 2017 and continue through to the end of the second quarter 2019, when it will be ready for commercial operation. Although operational, construction will continue through 2019 including construction of the new control building and the relocation of the Wyland Whaling Wall. The existing Units 5–8 and auxiliary boiler No. 17 will remain in service until the second quarter of 2018. Units 5-8 and auxiliary boiler No. 17 will be demolished starting the first quarter of 2019 through the fourth quarter of 2020. During the demolition and removal of Units 5–8, the Wyland Whaling Wall will be dismantled and moved to a new location directly in front of the new power block. Finally, the remaining buildings and structures left standing will be demolished and removed by the end of 2020.

All laydown and construction parking areas will be located within the existing Redondo Beach Generating Station fence line, as shown in Figure 2.1-1. Approximately 17 acres onsite will be used for construction laydown and parking. All construction equipment and supplies will be trucked directly to the site.

³ Referenced to site ambient average temperature (SAAT) conditions of 63.3°F dry bulb and 58.5°F wet bulb temperature.

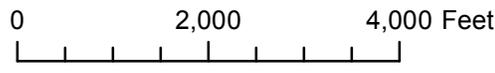
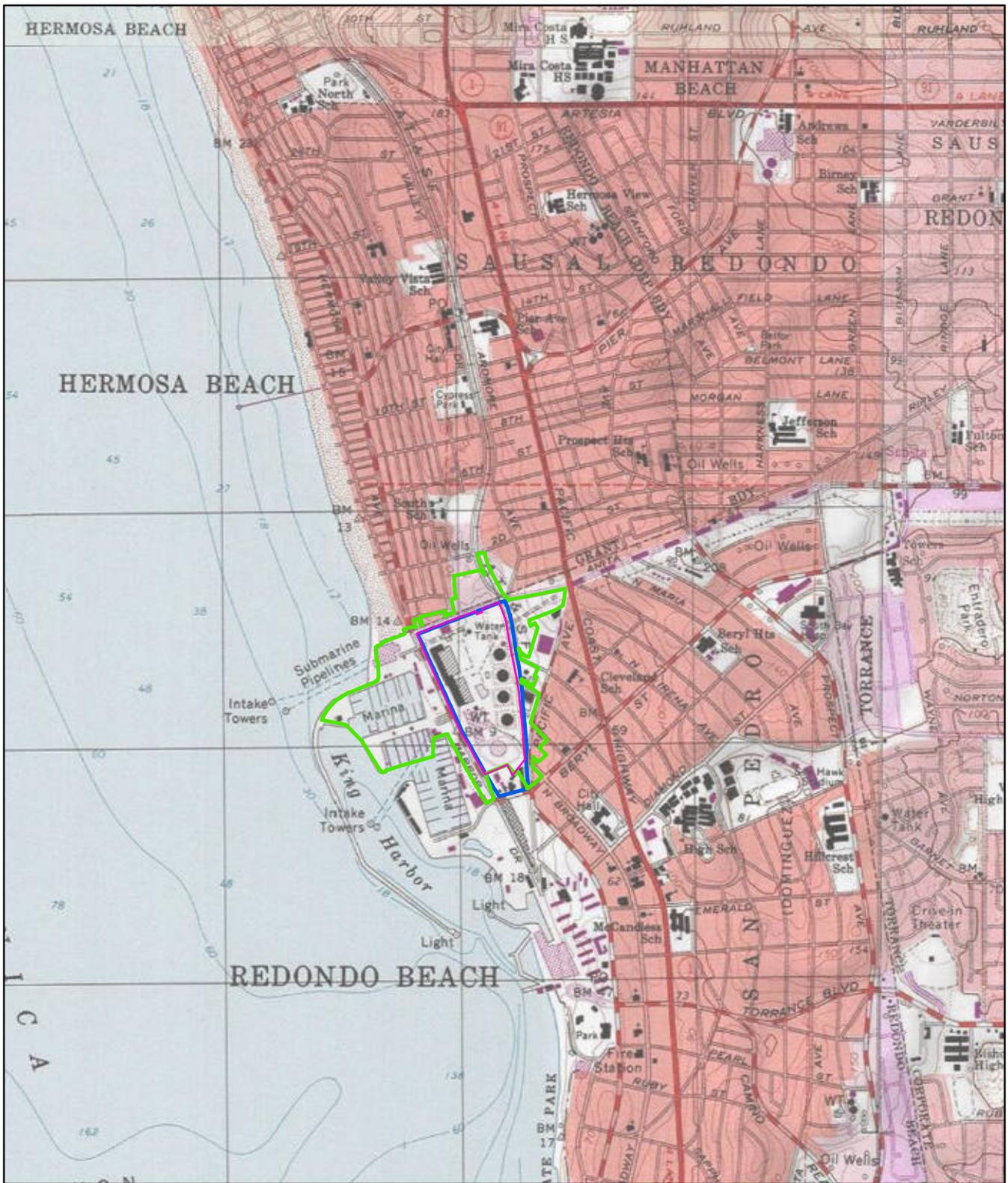


Figure 5.3-1a
Archaeological and
Historic Architectural
Survey Area
 AES Redondo Beach Energy Project
 Redondo Beach, CA

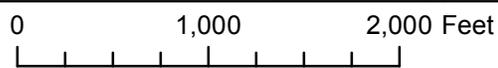
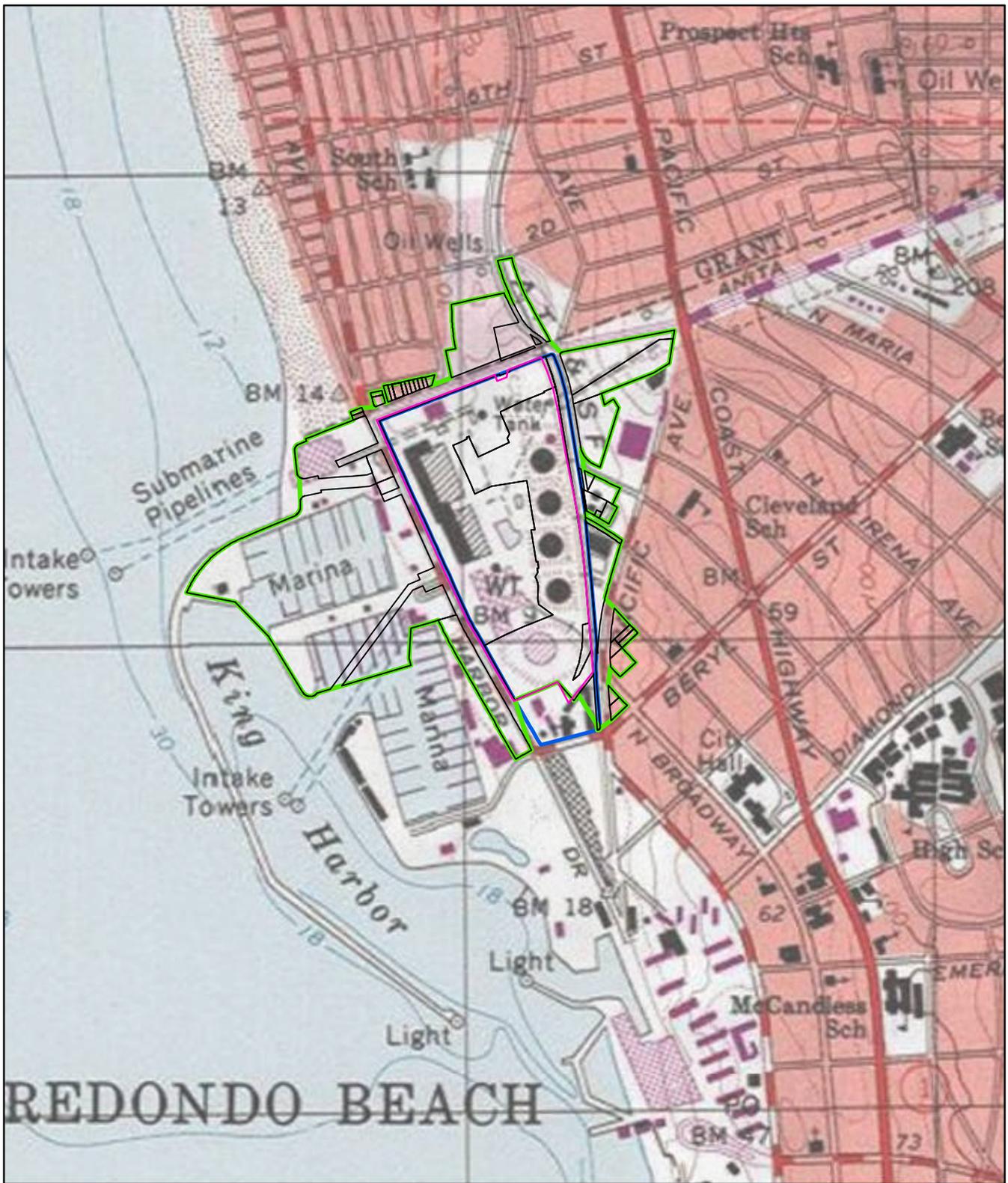


Figure 5.3-1b
Archaeological and
Historic Architectural
Survey Area

AES Redondo Beach Energy Project
 Redondo Beach, CA

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5.3.2 Affected Environment

The RBEP property is located along the Pacific Coast, adjacent to North Harbor Drive, across from the King Harbor Marina, in the city of Redondo Beach. The property is in a relatively industrialized, developed setting where existing natural habitats have been largely displaced by industrial and commercial developments. Prior to development, the project area was within wetlands with a diverse ecology that supported various species of flora, fauna and marine resources.

The climate in the project area is defined by warm, dry summers with average highs of 80 degrees Fahrenheit (°F) and mild winters with average temperatures of 40°F. Rainfall averages 12 inches annually (City of Redondo Beach n.d; City of Hermosa Beach, 2011). Precipitation usually occurs in the form of winter rain.

Redondo Beach is situated on a coastal flood plain in southwestern Los Angeles County. The sediments are primarily from Quaternary deposits from the Holocene and Pleistocene geological periods, with the oldest Pleistocene geological unit, San Pedro Sand. The Pleistocene sediments typically are found in the form of marine terrace strata and the same geological formations are found along the shoreline from Santa Monica Bay to the Palos Verdes Peninsula (Department of Conservation, 1998). Younger sand dune deposits and artificial fill are found in lowland areas, intermixed with Pleistocene and Holocene sand dune deposits (Department of Conservation, 1998).

The RBEP study area, which includes the plant site and the 200-foot buffer, was originally partially occupied by a large salt lake, fed by a salt spring and adjacent marshes. See Figure 5.3-2. The Pacific Salt Works was established and built within the study area in the mid 1850s (City of Redondo Beach, n.d.; Gnerre, 2010). The salt works buildings were torn down in the early 1900s. At that time, the Pacific Light and Power Corporation built a power plant at this site. Historical aeriels and photographs show this first power plant located at the edge of the Salt Lake in 1940. This plant was demolished in the mid 1940s and replaced with the first Redondo Beach Generating Station. The current Redondo Beach Generating Station is the third power plant to sit within the study area. Construction of the current Redondo Beach Generating Station severely impacted the Salt Lake. A 1952 geotechnical study reported that the lake had been filled with approximately 4 to 16 feet of fill for the construction of the Redondo Beach Generating Station (Ninyo & Moore, 2011). Other disturbances to the RBEP study area include various pipelines. Triton Oil Company personnel noted that there are at the least eight Triton Oil Company oil, gas, and utility pipelines situated within the adjacent Atchison, Topeka and Santa Fe Railway right-of-way, located just east of the Redondo Beach Generating Station along the eastern boundary of the site. Several lateral lines extend from these main pipelines. Property owners of parcels adjacent to the Redondo Beach Generating Station have reported that Francisca Road, adjacent to the Redondo Beach Generating Station, was noted as 1 to 2 feet lower prior to World War II and a small hill that was once extant between the Triton Oil yard and Francisca Road was graded down some time after World War II (Romani, 1990).

AES Southland Development, LLC (AES-SLD) staff have indicated that the present Redondo Beach Generating Station was constructed on fill. This concurs with two subsurface geotechnical surveys that were conducted by URS in 2001 and by Ninyo & Moore in 2011. Ninyo & Moore (2011) indicate that the RBEP study area is underlain by artificial fill, younger dune sand deposits, marsh deposits, and older dune sand deposits. Artificial fill was encountered at depths ranging from approximately 1 to 8 feet below ground surface (bgs). URS (2001) stated that fill ranges from 2 to 10 feet thick, and up to 20 feet thick in some places. Younger dune sand deposits primarily consisting of loose to dense, sand, silty sand, and clayey sand were encountered below the artificial fill to the depths ranging from approximately 15 to 33 feet bgs.

5.3.2.1 Regional Setting

The project is located within the existing Redondo Beach Generating Station site in a developed area of Redondo Beach comprising residential, industrial, and commercial developments. The Redondo Beach Generating Station is a natural-gas-fired steam electric generating facility located in Redondo Beach, Los Angeles County, owned and operated by AES Redondo Beach, LLC. The facility site occupies approximately 50-acres along the Pacific Ocean, directly across from the King Harbor Marina and adjacent to North Harbor Drive.

The project site lies within a region characterized by flat floodplains and terraces and very gently sloped alluvial fans with small areas of marine terraces (USDA, 1997). The site is approximately 900 feet inland from the Pacific Ocean and historically, the predominant natural plant community of the area was salt marsh, which surrounded the Old Salt Lake (USDA, 1997). Prior to the modern era, the area would have offered not only maritime resources from the nearby littoral zone and Pacific Ocean, but also various land animals and plants.

The project area has a mean annual temperature ranging from about 53°F to 72°F and is moderated by marine influences. Mean annual precipitation is about 12 inches, with most of the rainfall occurring during the winter months between November and March.

During the prehistoric and historic eras, the RBEP site was located within the southern coastal salt marsh environment. Southern coastal salt marsh occurs in areas subject to regular tidal flooding by salt water such as sheltered inland bays, estuaries, and lagoons. The distribution of plant species within the salt marsh is often in distinct zones based on the frequency and duration of tidal flooding. Vegetation in these areas is characterized by pickleweed with other salt tolerant species such as saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), alkali weed (*Cressa truxilensis*), California seablite (*Suaeda californica*), marsh jaumea (*Jaumea carinosa*), and saltwort (*Batis maritima*). Open unvegetated salt pannes and tidal channels are also present in some areas. Several avian species utilize salt marsh, including the Belding's savanna sparrows, western snowy plover, the California least tern (*Sternula antillarum browni*), the California brown pelicans, and other various water fowl. Harvest mice and shrews are found in coastal salt marsh environments, as well.

The development of a regional chronology marking the major stages of cultural evolution in the southern California area has been an important topic of archaeological research. In general, cultural developments in southern California have occurred gradually and have shown long-term stability; thus, developing chronologies and applying those to specific locales have often been problematic. The following chronology is based on Byrd and Raab's (2007) updated synthesis of the southern bight cultures, an area that encompasses the California coast from Point Conception in the north to the American/Mexican border in the south.

Abundant evidence exists that humans were present in North America for at least the past 11,500 years. Also fragmentary, but growing, evidence exists that humans were present long before that date. Linguistic and genetic studies suggest that human colonization of North America may have occurred 20,000 to 40,000 years ago. Evidence of this earlier occupation is not yet conclusive but is beginning to be accepted by archaeologists. The Meadowcroft Rockshelter in Pennsylvania, Saltville and Cactus Hill in Virginia, and the Topper site in South Carolina for instance, are sites that have produced apparently reliable dates as early as 12,500 years before present (Goodyear, 2005).

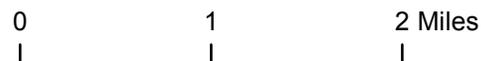
Ancient sites are known in southern California. In January 1936, WPA workers digging a storm drain along the Los Angeles River (north of Baldwin Hills) recovered human bones from an ancient stream bed (Moratto, 1984:52-53). In March 1936, imperial mammoth teeth were exposed at the same depth as the human remains (Moratto, 1984:53). The next oldest site in southern California where both human skeletal remains and artifacts occur is the La Brea Tar Pits (CA-LAN-159). The Arlington Spring site on Santa Rosa Island has provided occupation dates as early 13,000 years old; the discovery of Arlington Spring Man is the second find in North America that has dated to this period (NPS, 2008). Evidence for Paleo-Indian occupation in California exists, particularly along the coast of southern California, but remains scant (Byrd and Raab, 2007).

5.3.2.1.1 Early Holocene (9600 cal B.C. to 5600 cal B.C.)

The first groups to inhabit California (for which there is significant evidence) are described as hunters and gatherers with specialized bifacial projectile points, well-made scrapers, knives, and many other tools designed for subsistence related tasks (food processing). They adapted to a number of environments and developed a variety of secondary subsistence strategies that enabled them to live in a changing environment (Pleistocene to Holocene). As the (Wisconsin) Ice Age ended, previously stable water sources began to dry up in inland California, prompting migrations to the coast. California's islands were occupied as early as 9600 to 9000 cal B.C., as indicated by the oldest levels at Daisy Cave on San Miguel Island. Southern California dwellers exploited a wider range of plants and animals, and the archaeological record shows that a greater emphasis was placed on



Source: 1899 30' Redondo, California USGS Topographical Quadrangle Map



Legend

 AES Redondo Beach Energy Project

Figure 5.3-2
The RBEP Area in 1899
 AES Redondo Beach Energy Project
 Redondo Beach, California

gathering wild grasses and seeds, rather than on hunting large mammals. Coastal groups, including those living on the islands off of California's coast, utilized marine resources such as shellfish, fish, sea lions, and dolphins. Shell midden sites of the early Holocene are characterized by cobble tools, basin metates, manos, discoids, and flexed burials (Byrd and Raab, 2007).

5.3.2.1.2 Middle Holocene (6000 cal B.C. to cal A.D. 500)

At the start of the Middle Holocene, millingstone cultures appeared throughout central and southern California. The Millingstone Horizon represents an adaptive subsistence shift indicated by the first occurrence of millingstones (mano and metate), which were used to process hard seeds like *Salvia* sp. (sages) and *Eriogonum fasciculatum*. Sites from this period are characterized by the majority of artifacts being manos and metates suggesting the importance of vegetal resources. Most of these sites are located in grassland and sagebrush communities where these hard seeds could support small populations on a yearly basis. Late fall and winter were difficult seasons when vegetal foods were scarce and their diet had to be supplemented with deer and small mammal hunting and shellfish collecting (Byrd and Raab, 2007).

Middle Holocene cultures are quite diverse. Large middle Holocene sites have been well documented along the coast as well as inland. Archaeological evidence of extensive trade networks between southern California and the Southwest has been found. Rare artifact types, including the marine purple olive shell, indicate trade networks that extend from Catalina Island through the Mojave Desert and into Oregon extant in the Middle Holocene (Byrd and Raab, 2007).

Temporary settlements for a few nuclear families (10 to 25 individuals) have been recorded. These sites were seasonal campsites for exploiting yucca and acorns from April through September. The seasonal pattern has been documented as regional variations in the Millingstone Horizon sites in southern California (King, 1971). These sites are characterized by plant processing tools (scraper planes, an absence of hunting implements, millingstones, and earth ovens—necessary to prepare yucca). Peoples intensively exploited their environment with reliance on no particular food resource. Characteristic features of this period include (Wallace, 1955:219-221): crude chopping tools, large projectile points, manos and metates, *Olivella* shell beads, quartz crystals and cog stones, few ornaments, earth roasting pits, extended posture burials, reburials (secondary interment), and rock cairns. The first evidence of cemeteries are recorded during this period and based on the relative absence of non-utilitarian artifacts, an egalitarian social system was likely to have been in operation. Recent evidence indicates that the first permanent villages may have been erected during the Middle Holocene on San Clemente Island (Byrd and Raab, 2007). The presence of daub at Middle Holocene coastal sites indicates that at least some of the villages along the coast may have had permanent structures (Strudwick, 2005). Testing of archaeological materials in the Redondo Beach and neighboring Hermosa Beach, have resulted in occupation dates extending beyond 5,000 years old (Romani, 1990).

5.3.2.1.3 Late Holocene (cal A.D. 500 to Historic Contact)

The Late Holocene is characterized by a larger number of more specialized and diversified sites. Population increased substantially and is reflected in a greater number of sites recorded during this time period. This period is characterized by: large village sites, tightly flexed burials, bow and arrow, arrowshaft straighteners, *ollas* (jars) and *comals* (cooking flats), personal ornaments, pottery vessels, circular shell fishhooks, an extensive trade network, a wide variety of ritual objects, and large stone bowls (Wallace, 1955:223-226). Elaborate mortuary artifacts are recovered from sites of this period.

Villages occur in the same general locations as they did in earlier time periods, but they increased in size and decreased in their frequency; base camps were often associated with villages. There was also an increase in the number of specialized and/or diversified sites. Trade was extensive during this period and long distances are reflected in artifacts recovered from the American Southwest (pottery) in California sites, while steatite objects and Pacific Coast seashells occur in American Southwest sites. During the Late Period, many more classes of artifacts are found in the archaeological record and they reveal a higher order of workmanship. Larger and more extensive settlement systems are evident, likely a byproduct of a more intensive subsistence base exploiting all of

the available food resources. The bow and arrow was introduced along with other aspects of their culture being expanded (population growth, more complex social system and trade network).

New studies indicate that culture change in southern California may have been rapid, rather than gradual. Overexploitation of resources may have caused shifts to new resources that occurred in greater amounts (Byrd and Raab, 2007). On the coast, intensified fishing and small sea mammal hunting replaced hunting of large sea mammals and shellfish collection. Fish resources were concentrated on smaller near-shore species, rather than on deep sea resources. Vegetal resources focused on grasses rather than acorns and direct evidence for acorn use is minimal at Late Holocene sites. Changes in subsistence strategies in prehistoric California appear to be related to overexploitation of preferred resources, leading to a shortage of the desired resource, followed by shifts to more costly resources (Byrd and Raab, 2007).

Coastal village sites that have yielded important information about this period are the village sites recorded at Goleta Slough located near Santa Barbara, California: Helo, Saxpilil, Geliec, and Alcas. In southern California and in the general vicinity of the RBEP site, important coastal village sites include the Palmer-Redondo site (CA-LAN-127) and the Old Salt Lake village site, also known as Engva.

5.3.2.2 Ethnohistory

The Native Americans living in what is now Redondo Beach and specifically, within the RBEP study area, were the Gabrieleño, or Tongva. The study area, found in the South Bay, is situated within an area that appears to have been heavily influenced by the Gabrieleño village, Chowigna.

5.3.2.2.1 Gabrieleño

The Gabrieleño's language belongs to the Takic sub-family of the Uto-Aztecan language stock. The territory of the Gabrieleño comprised inland valleys and coastal plains, and spanned from Topanga Canyon (Los Angeles County) in the north to El Toro (Orange County) in the south, and included Catalina, San Clemente and San Nicolas Islands in the Channel Islands, and the San Gabriel and San Bernardino inland valleys in the east (McCawley, 1996).

Pre-European contact population numbers are difficult to assess because of discrepancies in the record; in 1852, Scottish born Los Angeles resident Hugo Reid published letters about the Gabrieleño lifeways and he believed there were some 68 villages, 28 of which he identified in Los Angeles County (McCawley, 1996:25). Each village was reported to have contained an average of 100 people and McCawley (1996) offers an estimate of over 5,000 Gabrieleños at the time of contact.

The pre-contact Gabrieleño practiced a patrilineal lineage system. Members of the lineage were given access to diverse resources held by the families within their lineage, allowing the Gabrieleño to exploit multiple ecologies. The heavily hierarchical Gabrieleño social system comprised elites, commoners, middle-class, poor, and slaves. The elites were the only ones to possess access to religious items and the middle-class supported the elites.

Distribution of settlements did not fall into a consistent pattern throughout the Gabrieleño territory, due in large part to the diverse ecological zones within Gabrieleño territory, which comprised the coast, islands, valleys, and foothills. Their settlement pattern appears to be centered upon a central village, with satellite villages used for resource acquisition. They built large, circular houses large enough to house several families, with thatched, domed roofs. Ceremonial buildings were often found scattered throughout the village, each with specialized uses, such as sweatlodges, menstrual huts, or meeting rooms. The level of use of these satellite campsites was in direct response to population and village size as well as distance from the main village to the campsite (Earle and O'Neal, 1994).

The Gabrieleño's subsistence strategies incorporated seasonal procurement of resources, both terrestrial and marine. Throughout the year, individual Gabrieleño families would move to temporary encampments for hunting, harvesting, and collecting; depending on the season and resources that could be harvested, travel would occur through various ecological zones. In the interior, where primary habitation was thought to take place in the summers, hunting of deer and rabbit was a significant resource amongst the Gabrieleño, who were expert hunters (McCawley, 1996). In spring and summer, temporary camps would be established in order to gather roots, seeds, and bulbs; in the fall, acorns and other wild seeds were gathered as staples in their diet. In coastal areas that were

less exposed, such as in the RBEP area, wintertime villages were occupied; satellite or temporary campsites would be erected near the shore to collect shellfish and other marine resources. In addition to being expert terrestrial hunters, the Gabrieleño were adept at maritime subsistence and procurement, building planked canoes that were sealed with pine pitch or asphalt, and hunting sea otters and other marine mammals with harpoons, as evidenced in the archaeological record from sites such as CA-LAN-2616 (Langenwalter et al., 2001).

Ethnographies have not consistently documented the indigenous groups of southern California. Often various tribes, such as the Chumash, Gabrieleño, Juaneño, and Luiseño have been intertwined so that it becomes difficult for the researcher to distinguish one from the other in the written record. Due to this discrepancy, architecture for the southern groups and the documentation of the use of space is virtually unknown (Ciolek-Torrel, 1998). What is known is that domestic structures for southern California groups were constructed of reeds, grass, and tule. The Gabrieleño houses were semi-subterranean structures built by erecting a pole at the center of an approximately 2.5-foot-deep circular pit; postholes would have been dug around its circumference where willow reeds would be placed and leaned toward the center and secured, then covered in tule and grasses. While neighboring groups covered their houses in daub (a mud mixture), it is reported that the Gabrieleño did not; however, their sweatlodges were covered in daub after construction (Bean, 1974; Ciolek-Torrel, 1998; McCawley, 1996).

Bean writes of the Gabrieleño as:

The most powerful of the Shoshonean groups and were probably very influential in the diffusion of ideas to inland peoples. The powerful military competency of the Gabrieleño undoubtedly limited territorial expansion of the Cahuilla.
(Bean, 1974:70)

Neighbors of the Gabrieleño were the Chumash to the north, the Serrano to the east, the Cahuilla to the southeast, and the Luiseño and Juaneño to the south.

Four important prehistoric village sites are documented along the stretch of coast between Hermosa Beach and the Palos Verdes Peninsula. Research and excavations at Malaga Cove, Palmer-Redondo, Hollywood Riviera, and Engva have contributed to the understanding of prehistoric settlement and life in the South Bay area. The village of Chowigna was noted in ethnohistories of the South Bay area from the earliest European explorations. The accounts are not clear on which site was Chowigna (Wallace, 2008).

Several consistencies are noted among these four sites. Each dates into the Late Prehistoric. Small leaf-shaped and triangular projectile points, mortars, pestles, items manufactured from steatite, bone tools, and fish hooks are noted at all sites. Shell middens and fish bone are noted, as well. The people who resided in these villages or visited these sites depended on the ocean. Located less than one mile south of the RBEP study area, the Palmer-Redondo site is a dense midden site and Native American cemetery. Complex mortuary goods, including “pelican stones,” effigies carved from steatite, have been recorded at this site (Wallace, 2008). The mortuary practices at the Palmer-Redondo site appear to date the site to A.D. 500 at the earliest and continue into historic times, placing the site into the Late Holocene (Wallace, 1984). Palmer-Redondo is a unique site in the south coastal area. No other sites yet documented reflect a similar high quality of grave goods. Throughout other sites along the southern California coast, graves contain few, simple objects (Wallace, 2008). No non-aboriginal items were found at Palmer-Redondo, unlike at Engva or Malaga Cove. Artifacts such Spanish-type glass beads, an iron fishhook and a copper knife blade were found at Malaga Cove.

Engva was also known as Engnovangna, or “Place of the Salt.” This name is related to a site or small series of sites located just northwest and partially within the RBEP study area. Although included as a known Gabrieleño community, Engva seems to have been a resource procurement and processing site. Artifacts found at this site indicate that Native Americans only came to Engva to camp temporarily and procure salt (Wallace, 1984). Wallace (1984) conducted some limited excavations within Engva in 1960 before the site was destroyed by the construction of an apartment complex, the expansion of the Southern California Edison Company steam plant, and a street extension. According to Wallace (1984), these activities “almost totally eliminated Engva.” Within this site, Wallace recorded a number of small middens with little depth. Materials observed included core tools,

hammerstones, pestles, mortar fragments, flake tools, convex based projectile points, tarring pebbles, a carved steatite object, bone tools, partial fish hooks, fish-hook blanks, shell beads, flakes, fire-affected rock, shellfish fragments, and fresh water turtle shells. Engva appears to have survived into the historic era. Glass beads, similar to those found at Malaga Cove, were found at this site.

The primary purpose of Engva appears to have been salt production (McLeod, n.d.). The Gabrieleño harvested salt with carved wooden shovels designed to excavate the salt from the lake bottom. The salt was then laid out to dry and was occasionally sifted to allow for air flow and to optimize drying (McLeod, n.d.). Another method involved water collection from the lake. The water was placed in large wooden bowls to allow evaporation, leaving behind a salt residue (McLeod, n.d.). After European expansion, during Missionization, the salt lake was occupied by the Spanish and was known as the *Las Salinas*. Early Spanish chronicles report episodes of local Native Americans harvesting salt in the area prior to their removal (Romani, 1990). The salt lake was also described as the terminus for a very old route which led inland (Romani, 1990).

Each of these four important sites was severely impacted or destroyed by 1972. Malaga Cove was leveled in 1955 for houses, Hollywood Riviera was essentially capped by a Torrance County Beach parking lot in 1964, and Palmer-Redondo was destroyed by the construction of apartments, streets, and houses. The construction of an apartment complex post 1970, as well as the expansion of facilities at the Southern California Edison Company steam plant, almost totally eliminated Engva (Wallace, 2008).

5.3.2.3 Historic Setting

Generally the historic period begins with the first documented entrance by a European into a specific region; however, due to known contact in other parts of California by Russians, Chinese, Spanish, and Portuguese, some chronologies terminate the late prehistoric for all California in 1542, when the first documented European entered the territory now known as California. This period is termed the Protohistoric Period. In 1542, Juan Rodriguez Cabrillo explored the California coast by ship, entering San Diego Bay and claiming Alta California for Spain. Cabrillo landed near Point Magu in the same year. Sixty years later, Sebastian Vizcaino sailed into San Diego Bay. Exploration of the land was slower to come. Don Gaspar de Portola searched Alta California for suitable mission sites in 1769.

In California, the historic era is generally divided into three periods: the Spanish or Mission Period (1769 to 1834), the Mexican or Rancho Period (1821 to 1848), and the American Period (1848 to present).

5.3.2.3.1 Spanish/Mission Period (1769 to 1834)

Gaspar de Portola was appointed as the first governor of California in 1767 and his first command by the Viceroy of Mexico was to expel the Jesuits from Baja California. This prompted the launch of military and Franciscan expeditions from Baja California into the region, and with it, the official start of the historic period in California. Following the expulsion of the Jesuits from Baja California, Spanish Colonial military outposts were established in Alta California, the first of which was El Presidio Real de San Diego in 1769 with Pedro Fages as its commander. Military outposts continued to be built as expeditions travelled north. The Portola expedition of 1769 reached Orange County on July 22, was in the San Gabriel Valley by August 2 and was passing through what would become Ventura County by the end of that month (Beebe and Senkewicz, 2001).

The following is a summary of local missions from the California Missions Resource Center (n.d.) and the California Missions Foundation (2008). During this period, 21 missions would be built in California, lined up from south to north along the El Camino Real, the first of which was San Diego de Alcalá, founded by Father Junipero Serra. Mission San Gabriel Arcángel, established by Father Pedro Cambon and Father Angel Somera in the San Gabriel Valley on September 8, 1771, was the fourth mission in southern California. In 1776 Santa Ana River floods destroyed much of the mission and it was relocated from Montebello, California, to what is now the city of San Gabriel, California. Along with rebuilding the mission, 27 outlying *estancias* (ranchos) were established to supply this mission with meat, hay, grain, vegetables, and fruits. The seventh mission, Mission San Juan Capistrano was founded on November 1, 1776, by Father Juniper Serra. This introduced the era of Missionization; a period of forced conversion of the Native Americans who occupied the region. Captured and removed from their villages,

the indigenous peoples were brought to the missions and into servitude. Many perished due to ill treatment, and more from the introduction of European diseases, ultimately decimating the Native American populations.

The Spanish government was awarding *ranchos* (land grants) to soldiers and other Spanish Californios by the 1790s; vast tracts of land were used for livestock and farming. In 1784, 43,000 acres, including the area currently occupied by the RBEP, was awarded as a land grant to Juan Jose Dominguez and became known as Rancho San Pedro (City of Redondo Beach, n.d.; Redondo Beach Historical Society, n.d.). Upon Juan Jose's death in 1809, the Rancho was inherited by his nephew, Cristobal Dominguez (Dominguez Rancho Adobe Museum, n.d.). The land had not been formally surveyed before Cristobal took ownership of the Rancho, so in 1817 he requested a re-granting from the Spanish government and the first official survey was undertaken; re-granting was accomplished by 1823. Upon Cristobal's death, his wife and children inherited the rancho but it was primarily overseen by his eldest son, Manuel Dominguez (Dominguez Rancho Adobe Museum, n.d.).

The last mission to be founded was San Francisco Solano in 1823. Further attempts to construct additional missions were thwarted by Spain itself due to the costly endeavor each new mission posed. Later, as Spain lost its rule over New Spain and secularization was sought by the new government, the mission system was disbanded in 1834 (Weber, 2006).

5.3.2.3.2 Mexican/Rancho Period (1821 to 1848)

Mexico became independent of Spain in 1821 and the Decree of Secularization, passed in 1834, effectively ended the Mission Period in California. The following years were marked by the proliferation of cattle ranching throughout the region, as the Mexican governor, Pio Pico, granted vast tracts of land to Mexican (and some American) settlers. The former mission lands were then opened for grants by the Mexican government to citizens who would colonize the area and develop the land, generally for grazing cattle and sheep (Lech, 2004).

The newly appointed Mexican government demanded that all who had received land grants from Spain, show proof of land ownership; the Dominguez family was recognized by the Mexican government as valid landowners in 1826 (Dominguez Rancho Adobe Museum, n.d.). In 1828, Manuel Dominguez was elected mayor of the Pueblo de Los Angeles. As hostilities grew between Mexico and United States, conflicts over land, specifically for control of California, resulted in battles and skirmishes, including the Battle of Rancho Dominguez (Dominguez Rancho Adobe Museum n.d.).

To the north of the project area, a rancho was part of a land grant awarded to Antonio Ygnacio Avila in 1837 and was known as the Rancho Sausal Redondo; the neighboring Ranch Aguaje de la Centinela, located in the modern city of Inglewood, was granted to Ygnacio Machado in 1844 (LAWA, 2011). The Rancho Sausal Redondo occupied an area that stretched from what is currently Playa del Rey to Redondo Beach and extended east from the coast into the city of Inglewood. By 1845, Bruno Avila, brother of Antonio Ygnacio Avila, had acquired Machado's Rancho adding to the Avila's land for a total of 25,000 acres (LAWA, 2011).

5.3.2.3.3 American Period (1848 to Present)

In 1848 gold was discovered in California, and by 1849 the Gold Rush was in effect with many speculators from the eastern United States and European countries flocking to California to make their fortune. The rapid growth of the region was substantial; it is estimated that as many as 300,000 people arrived in the region during this period, heralding the start of industry, transportation, and changes in legislature.

Following the signing of the Treaty of Guadalupe Hidalgo in 1848, the United States took possession of California. The treaty bound the United States to honor the legitimate land claims of Mexican citizens residing in captured territories. On September 9, 1850, California became the thirty-first state in the Union. The Land Act of 1851 established a board of Land Commissioners to review and adjudicate land claims, and charged the Surveyor General with surveying confirmed land grants. In order to investigate and confirm titles of California, American officials acquired the provincial records of the Spanish and Mexican governments that were located in Monterey. Those records, most of which were transferred to the U.S. Surveyor General's Office in San Francisco, included land deeds and sketch maps (Gutierrez et al., 1998).

From 1852 to 1856, a board of Land Commissioners determined the validity of grant claims. In 1858, Manuel Dominguez received a land patent, securing the ownership of the Rancho Dominguez and becoming the first land patent to be granted in California by the U.S. government (Dominguez Rancho Adobe Museum, n.d.).

Old Salt Lake

Located approximately 600 feet from the King Harbor Marina and within the Redondo Beach Generating Station property, is the Old Salt Lake, a California State Landmark marker. Once, the Old Salt Lake extended partially into the RBEP study area. This now gone, spring-fed salt lake had a long history of use. The Gabrieleño village Chowigna was noted as located near the Old Salt Lake by early European explorers, although the specific location remains under debate (Thirtieth Street Architects, Inc., 1986). Gabrieleño settlements situated immediately adjacent to the Salt Lake were referred to as Engva or Engnovangna. Engva either designated a Gabrieleño village site, or as is more commonly surmised, a series of temporary prehistoric salt harvesting camps which were located around the salt lake (Romani, 1990, Wallace, 1984).

Following European control of the region, missionaries who initially settled in the area took ownership of the salt lake and continued to harvest its salt as the Gabrieleño had done previously.

From 1784 well into the twentieth century, the South Bay area consisted of farming and ranching communities (Redondo Beach Historical Society, n.d.). The RBEP study area was a part of the Rancho San Pedro, which belonged to the Dominguez family. By 1854, conflicts over land control and court costs for legitimizing ownership of the Rancho forced Manuel Dominguez to sell off portions of his land; he sold the spring-fed salt lake, measuring approximately 600 by 1,800 feet, to Henry Allenson and William Johnson, who then established the Pacific Salt Works (City of Redondo Beach, n.d.; Gnerre, 2010). Competition from the Liverpool Salt Works, located at the Salton Sea, eventually forced Allenson and Johnson to sell their salt company. The railway had not been established in this part of the coast, and it was costly to transport goods by wagon; the Liverpool Salt Works could transport their merchandise far more effectively by train and could reach greater markets. Francis Mellus, who purchased the Pacific Salt Works from Allenson and Johnson, was later bought out by the Liverpool Salt Works in 1881—who, in turn, shut down the Pacific Salt Works altogether (Gnerre, 2010). The land that was formerly the Pacific Salt Works remained largely in disuse and finally, in 1924, the abandoned structures were torn down (Gnerre, 2010).

Railroad

The Atchison, Topeka, and Santa Fe (known most commonly as the Santa Fe) railroad was chartered in Kansas in February 1859 and broke ground in Topeka in October 1868. The Santa Fe's first section of track was opened in April 1869 and it reached the Kansas/Colorado border on December 23, 1873. The first Santa Fe train entered New Mexico in December 1878 through the Raton Pass. The Santa Fe extended west into San Diego by the 1880s. On September 21, 1995, the Santa Fe merged with the Burlington Northern Railroad to form the current Burlington Northern and Santa Fe Railway (BNSF).

The Southern Pacific Railroad (SPRR) was the most extensive railroad in California, with several lines that traversed the state; a main line traveled north into Oregon and another traveled east as far as Illinois. The line from the Colorado Desert via the San Geronio Pass into Los Angeles was completed in 1876, reaching the California coast in 1877.

In 1887, the Redondo Beach Company acquired 1,400 acres of Rancho San Pedro in an attempt at private development. The proposed development and the existing industrial use of the area were dependent on accessibility to and from the area. In 1888, the Santa Fe opened a rail line from Inglewood to Redondo Beach and by 1889 the Redondo Railway Company was founded by J.C. Ainsworth and R.R. Thompson (City of Redondo Beach, n.d.; Lee, 1990; Thirtieth Street Architects, Inc., 1986). The Redondo Railway Company added additional lines that would reach the Redondo Beach wharf for freight transport. Ainsworth and Thompson then built three wharves that would connect to the railroad lines to facilitate the delivery of lumber and other goods; the first wharf, Wharf Number One, was built in 1889 (Lee, 1990). The Redondo Railway, along with the Santa Fe, ran regular weekly passenger and freight schedules from Los Angeles into Redondo Beach (City of Redondo Beach, n.d.; Lee, 1990).

Henry Edwards Huntington is credited with laying the foundation that helped shaped the future of southern California's coastal cities. He was born in Oneonta, New York in 1850 and was nephew to Collis P. Huntington, one of the founders of the Transcontinental Central Pacific Railroad and later, the SPRR (Greenstein, 1999). Henry believed southern California afforded great opportunities for railroad development; he came to Los Angeles and formed a syndicate for railroad construction and improvements in 1898. In 1901, Henry Huntington formed the Pacific Electric Railway, and on July 4, 1902, the Pacific Electric Railway ran its first Big Red Car line from Los Angeles to Long Beach (Greenstein, 1999). Systematically, railway lines were added, resulting in 1,100 miles of track that linked much of southern California by way of over 900 Big Red Cars; this was the largest interurban railway in the entire county (ERHA, n.d.; Greenstein, 1999). The Red Cars of the Pacific Electric Railway allowed commuters from Redondo Beach to be in downtown Los Angeles within fifty minutes; from the train station at Redondo Beach, travel could be easily made to Redlands, the San Fernando Valley, or to Newport Beach (Knutson, n.d.). The Red Cars are credited with encouraging the growth of Los Angeles and Orange counties (Orange County Register, 2010).

Lumber

By the 1890s, the Redondo Beach port had become the official port of Los Angeles, handling over 60 percent of shipping commerce for the region. Four times per week, on the run from San Diego to San Francisco, ships would stop at one of the Redondo Beach piers (City of Redondo Beach, n.d.). The primary shipping product brought to Redondo was lumber from the Pacific Northwest. It is estimated that twenty-five percent of shipping cargo consisted of lumber brought from Oregon and Washington (Lee, 1990). In addition to domestic use, it is estimated that over 40 foreign ships made regular stops at Redondo with a scheduled delivery of goods.

Imported from Oregon and Washington states via steamship, the lumber was loaded onto train cars in Redondo and delivered to the rest of southern California. Consequently, the RBEP area was an important center for lumber companies (City of Redondo Beach, n.d.). In the 1890s, the dominant company in the area was the Willamette and Frazier; by 1906 it had been surpassed by the Montgomery and Mullen and Ganahl Lumber Companies (Van Wormer, 1990). No other lumber company, however, was more powerful than the Redondo Planing Mill, owned and operated by City Councilman A. B. Steel (Lee, 1990; Van Wormer, 1990).

A.B. Steel was a British engineer who came to America and went to work for the SPRR. In 1905, Steel already owned the mill but he purchased additional property on Pacific Avenue to expand the yard (Lee, 1990). The Redondo Planing Mill was believed to be the largest lumber manufacturing company in the area (Van Wormer, 1990).

The company underwent some changes and by the late 1920s it had been incorporated with the Patten-Davis Lumber Company. By the late 1930s, some of its previous facilities were utilized by Weddle Woodcraft, an early home improvement manufacturer (Van Wormer, 1990). Patten-Davis Lumber Company was closed in 1983.

Redondo Beach

Facilitated by steamships and the railroad, commerce and tourism shaped the look of the future Redondo Beach area as it underwent several phases of urban and industrial development. The railroads and steamships brought thousands of people into the area, creating steady continued growth. As a result of demand, the Hotel Redondo opened in 1890 (City of Redondo Beach, n.d.). The Hotel Redondo offered lush accommodations with 225 rooms, a golf course, tennis courts, and gardens. Near to the Hotel Redondo, for those who could not afford a luxury hotel, there was Tent City. For \$3 per week, one could rent a space with wooden floors and electricity (City of Redondo Beach, n.d.).

Redondo Beach was incorporated on April 29, 1892, with a population of almost 1,000 (Thirtieth Street Architects, Inc., 1986). The city's economy was fueled by tourism, commerce, and trade as the area served as the main port to Los Angeles and the railroad afforded easy transportation of goods and travelers to inland communities.

There were many attractions that brought people to Redondo Beach. In 1909, Huntington built the Redondo Beach Plunge, a Moorish-style, four-story building containing three heated salt water pools; the main pool had a tower, two diving boards, and a trapeze. Power for heating and light was supplied by Huntington's Pacific Light

and Power Plant. Moon Stone Beach, located between Diamond Street and Hermosa Beach, attracted collectors of semi-precious gemstones. Carnation Gardens offered lush flower gardens that occupied almost an entire 12-acre area. Built in 1913, the Redondo Beach Lightning Racer was a roller coaster with cars that operated on a track that was 6,000 feet long; two parallel tracks gave riders the impression of being able to “race” those in other cars. In addition, Redondo Beach afforded tourists the Casino and the Dance Pavilion.

By 1909, Redondo Beach had an established high school, a women’s club, a library, a Chamber of Commerce, and a City Hall. But after the opening of the San Pedro Port in 1912, the city began to fall into a slow decline. The Pacific Steamship Company had already stopped running to Redondo Beach by 1912, and by 1926, the railroad had ceased its operations as well (City of Redondo Beach, n.d.). In the 1920s, attempts to reestablish a stable economy included different enterprises such as building a Salvation Army facility, starting the American Savings and Loan Company, and reconstructing piers that had been damaged by heavy storms in the 1910s (Thirtieth Street Architects, Inc., 1986).

Prohibition greatly affected the city and its commerce. In 1925, the Hotel Redondo, which had cost \$250,000 to build, was forced to shut its doors and was sold for scrap for \$300 (City of Redondo Beach, n.d.). To add to the city’s decline, during the Depression and well into the 1940s, blatant gangster activity, gambling, and shootings were taking place with local police aware of the criminal activities:

Chip games, bingo parlors, and a casino were run in full view of the law between 1936 and 1940. For a fare of 25 cents, a water-taxi would transport a visitor to the gambling ship Rex which operated three miles off shore (City of Redondo Beach, n.d.).

Storms between the 1930s and 1950s damaged and in some cases obliterated areas of Redondo Beach; rebuilding of the piers took place, only to have them damaged or destroyed by the following storm. In 1956 improvements were made and construction of the marina, today known as King Harbor, was begun (City of Redondo Beach, n.d.).

During the late 1950s, Redondo Beach experienced revitalization and there was a population boom that extended into the 1960s. Today, Redondo Beach has a population of about 66,000 and, as one of the beach cities in Los Angeles County, continues to be viewed as a resort town and tourist destination (City of Redondo Beach, n.d.; U.S. Census, 2010).

5.3.2.3.4 Steam Generation Plants in California

The first commercial electrical central generating stations were the Pearl Street Station in New York and the Holborn Viaduct power station in London, both of which opened in 1882 (Parsons, 1940). Both of these stations used reciprocating steam engines, but the development of the steam turbine allowed larger and more efficient central generating stations to be built. Turbines offered higher speeds, more compact machinery, and stable speed regulation. British designer Sir Charles Parsons built the first multi-stage reaction steam turbine in 1884 and patented it in 1885 (Cambridge, 2000). Almost immediately, he and others began making improvements upon his original concept. By 1893 Parsons had a 300-kilowatt turbine generator (Skrabec, 2006). George Westinghouse, Jr. bought the U.S. rights to the Parsons turbine in 1896 and improved the Parsons technology and increased its scale (Skrabec, 2006). In 1903, Aegidius Elling of Norway built the first successful experimental gas turbine that was able to produce more power than it needed to run its own components. It used both rotary compressors and turbines, and is recognized as the first applied method of injecting steam into the combustion chambers of a gas turbine engine (Encyclopaedia Britannica, 1995). By the beginning of the twentieth century, power plants with steam turbines began to replace the original steam engine power plants, and turbines entirely replaced reciprocating engines in large central stations after about 1905 (Parsons, 1940). In less than thirty years, the technology of engines capable of supplying power and electricity had improved greatly.

In the early stages of steam turbine power plant development, the materials needed to withstand the high temperatures of modern turbines were not yet available. Technology and improvements for steam turbine engines continued to advance throughout the 1920s and 1930s, leading to a generation of more efficient turbine power plants in the 1950s.

In 1920, hydroelectric power accounted for 69 percent of all electrical power generated in California. By 1930, that figure had risen to 76 percent; by 1940 it was up to 89 percent (Williams, 1997; Herbert and Brookshear, 2006). But after 1941, new thermal or steam-electric generating units accounted for most of the new power capacity in the state. By 1950, hydroelectricity accounted for only 59 percent of the total, falling to 27 percent in 1960 (Williams, 1997; Herbert and Brookshear, 2006).

Pacific Gas and Electric Company (PG&E) and SCE, California's largest electrical utility providers, made efforts to build large-scale steam generation plants as early as the 1920s. James Williams, a historian of energy policies and practices in California, noted that the decision by PG&E and SCE to build steam plants in the 1920s may be attributed to three things. First, a persistent drought in California from 1924 through the mid-1930s caused the major utilities to question the viability of systems that relied heavily on hydroelectricity. Second, new steam generation power plants on the East Coast were achieving far greater efficiencies than had previously been possible. Between 1900 and 1930, for example, the fuel efficiency of steam plants, measured in kilowatts per barrel of oil, increased more than nine-fold. Third, new natural gas lines were completed in the late 1920s that could bring new gas supplies to both northern and southern California from the San Joaquin Valley (Williams, 1997).

SCE began constructing its steam generation plant at Long Beach on Terminal Island in 1911. The Los Angeles Department of Water and Power (LADWP) constructed a steam station at Seal Beach consisting of two units installed in 1925 and 1928. PG&E built a steam plant in Oakland in 1928. In 1929, the Great Western Power Company (which was absorbed by PG&E in 1930) built a large steam plant on San Francisco Bay, near the Hunters Point shipyard (Herbert and Brookshear, 2006).

The years following World War II were a time of expansive growth in southern California. The population swelled in response to business and industrial development. Housing expanded into formerly agricultural areas, creating suburbs around Los Angeles and San Diego. The increased population and industry made greater power generation crucial and California's utility providers expanded their capacity to meet the demand. At this point, most of the more favorable hydroelectric sites in California had already been developed, and as previously noted, the viability of hydroelectricity had been called into question during the drought of the 1920s and 1930s. The technology of steam generation had progressed and abundant natural gas resources to help run them were now available. "Steam turbine power plants were cheaper and quicker to build than hydroelectric plants, so utilities companies moved away from hydroelectricity, establishing steam turbine power as the generator of choice" (Herbert and Brookshear, 2006). The "momentum for steam had been established by war, by drought, and by a positive history of increased thermal power plant development" (Williams, 1997).

Starting in the 1950s, dozens of new steam generation plants were built throughout California. In a detailed article in 1950 in *Civil Engineering*, I. C. Steele, chief engineer for PG&E, summarized the design criteria of four major steam plants the company had under construction at that time: Moss Landing, Contra Costa, Kern, and Hunters Point in San Francisco. The criteria were the same in all cases: build the facility close to load centers to reduce transmission costs, close to fuel supplies, near a water supply, and on a site where land was inexpensive and could support a good foundation (Steele, 1950; Herbert and Brookshear, 2006).

Between 1950 and 1970, steam generating capacity in California saw its greatest expansion. During this period, SCE built a series of similar steam plants in the Los Angeles basin and in San Bernardino County. In 1952, the company began work on Redondo No. 2, which was adjacent to an earlier plant at Redondo Beach. In 1953, the Etiwanda plant went online, followed in 1955 by El Segundo, Alamitos in 1956, and Huntington Beach and Mandalay in 1958. By 1960, all SCE plants either had multiple units or had additional units in the planning stages. In 1950, PG&E operated 15 steam electric plants in California. Between 1950 and 1960 they added several new plants and expanded older ones. Chief among these were Contra Costa (1951-53), Moss Landing (1950-52), Morro Bay (1955), Hunters Point (addition 1958), Humboldt Bay (1956-58), and Pittsburg (1959-60) (Herbert and Brookshear, 2006).

Although SCE and PG&E were the major players, smaller utility companies also grew their facilities. The LADWP system consisted of five steam electric power plants by 1962: Seal Beach Plant (1925-28), Harbor Plant on Los Angeles Harbor (1943), Valley Plant in the San Fernando Valley (1954), Scattergood (1958), and Haynes (1961).

San Diego Gas & Electric Company had three steam electric power plants by 1960: Silver Gate (1943), Encina (1954), and South Bay (1960). By the late 1970s, there were more than 20 fossil fuel thermal plants in California, clustered around San Francisco Bay, Santa Monica Bay, and in San Diego County, along with a few interior plants in San Bernardino, Riverside, and Imperial counties, as well as a few plants on the Central Coast (Herbert and Brookshear, 2006).

Southern California Edison Company

The history of SCE dates to 1886, when a company called Holt and Knupps illuminated Visalia, California, with street lights. They became known as Visalia Electric Light & Gas Company, the earliest of several companies that became SCE (Edison International, 2012). In 1896, a group of investors, including Elmer Peck and George Baker, established the West Side Lighting Company to provide electricity to Los Angeles and bought the franchise to operate the city's power system (Edison International, 2012; Myers, 1983). But that same year the city passed an ordinance prohibiting most overhead line construction because the city streets had become a maze of overhead lines (Lundsten and Flick, 2012). The ordinance established the "conduit district" in which new wiring had to be laid underground (Myers, 1983). West Side Lighting decided that the best technology available was the Edison three-wire conduit technology, and that they needed this technology to continue to grow their business. But Los Angeles Edison Electric, formed in 1894, owned the rights to the Edison name and patents (Lundsten and Flick, 2012). The two companies came together and formed Edison Electric Company of Los Angeles in 1897 (Slade et al., 2012). Edison Electric then purchased several smaller utility companies, including Visalia Electric Light & Gas Company, San Bernardino Electric Company, Santa Barbara Electric Light Company, and Ventura Land & Power. They also began to build new plants and transmission lines, and became the first company to install Edison-type DC-power underground conduits in the Southwest. The Los Angeles No. 2 substation opened in 1898, distributing power throughout the city of Los Angeles via the new conduit system (Myers, 1983). Continuing to expand, they purchased the Southern California Power Company that same year (Myers, 1983).

In 1899, their Santa Ana River No. 1 hydroelectric plant began operation, transmitting power to Los Angeles over the Santa Ana River Line, at the time the world's longest power line at 83 miles long (Edison International, 2012). The power line was the first to use "transposition" technology which has been used ever since for long-distance transmission lines (Myers, 1983). In 1907 the company surpassed this achievement when their Kern River-Los Angeles Transmission Line began operation. At 118 miles and 75 kV, it was the world's longest, and highest voltage, power line and the first transmission line in the nation to be supported entirely by steel towers (Edison International, 2012). The company continued to expand and on July 6, 1909, changed its name from Edison Electric Company of Los Angeles to Southern California Edison to reflect its expanded service area (Edison International, 2012).

In 1917, SCE purchased the Pacific Light and Power Corporation, the Ventura County Power Company, and the Mount Whitney Power & Electric Company, making it the fifth-largest central-station power company in the United States (Slade et al., 2012). The acquisition of Pacific Light and Power gave SCE the Big Creek Project, at the time the world's largest hydroelectric plant, energized in 1913 (Edison International, 2012). By 1929, the eight powerhouses at Big Creek generated a total of 360,000 kilowatts, half of SCE's total power capacity (Slade et al., 2012).

In 1912, the City of Los Angeles decided to develop its own power distribution system, known as the Los Angeles Department of Water and Power (LADWP). It was enshrined in the Charter of the City of Los Angeles in 1925, and by 1939 had become the sole general distributor of electric energy in Los Angeles (Lundsten and Flick, 2012). SCE had to sell its Los Angeles distribution system to the Los Angeles City Council in 1922 (Slade et al., 2012). But it continued to grow outside of the city limits, expanding its steam plants in Long Beach during the 1930s to include eleven new generators (Slade et al., 2012).

After World War II, SCE grew substantially and installed its one millionth meter in 1951 (Slade et al., 2012). By the early 1950s SCE was the fifth-largest investor-owned power company in the United States. Its service area covered 18,500 square miles and contained about 225 communities with a combined population of almost three million. SCE built 11 fossil-fuel powered stations between 1948 and 1973. They also expanded into nuclear power. In July 1957, at the Santa Susana Experimental Station, SCE became the first investor-owned utility to

generate non-military nuclear power (Slade et al., 2012). They broke ground on the San Onofre Nuclear Generating Station in 1963, and it began operation in 1968 (Edison International, 2012). In January 1964, the California Electric Power Company, which served 450,000 people, merged with SCE (Slade et al., 2012).

In 1988, SCE formed a parent holding company, which became known as Edison International in 1996. SCE sold Redondo Beach Generating Station to The AES Corporation in 1998. Founded in 1981, The AES Corporation built its first power plant in 1985 in Texas. They now operate on five continents and in 27 countries. They engage in power generation and distribution, and also operate utility companies. The AES Corporation operates three power plants: AES Huntington Beach, AES Redondo Beach, and AES Alamosa.

Redondo Beach Generating Station

Henry Huntington formed the Pacific Light and Power Company in 1902 to provide steam-generated electricity to run the streetcars of his Los Angeles Railway Company (Gnerre, 2011). The success and growth of the railway, and the resulting population increase in the area, created a demand for more power. Pacific Light and Power decided to build a new steam-generated electric power plant, sited between the ocean and the old salt lake. The plant occupied part of the site of the current Redondo Beach Generating Station. “In March 1906, a contract was awarded for the construction of a large \$1.25 million steam-generated electric power plant in Redondo Beach. At the time, it was described as the largest steam-power plant to be built west of Chicago” (Gnerre, 2011). Construction began in May 1906, and the plant was operational by early 1907. To keep up with demand, the plant expanded in 1910 (Gnerre, 2011). In November 1913, a water pipe at the plant burst, flooding the facility and crippling many of the city’s streetcars. This helped spur the decision to switch to power from the large, new hydroelectric plant at Big Creek, California. As Pacific Light and Power began to rely more heavily on hydroelectric generation, the Redondo Beach plant was placed on standby.

Pacific Light and Power continued to grow—by 1913 it was providing 20 percent of the power to the city of Los Angeles as well as power for other cities in the San Gabriel Valley (Friedricks, 1987). In 1917, Pacific Light and Power was purchased by SCE, including the Redondo Beach plant, but the plant was only used as a back-up facility. In 1933, the Redondo Beach plant was shut down, and the machinery was dismantled in 1935. The buildings and smokestacks remained until they were demolished in August 1946 (Gnerre, 2011).

In 1946, SCE announced that it would build a new plant on the site, at a cost of \$38 million. The contract was awarded to the firm of Stone & Webster, and the first unit came online February 26, 1948. The second and third units became operational in April and August of that year, and the fourth unit in October 1949 (Gnerre, 2011). To keep up with the huge population growth of southern California in the 1950s and 1960s, SCE expanded the plant twice. Units 5 and 6 were constructed in 1956, and Units 7 and 8 in 1968 (Gnerre, 2011).

Since its construction, the facility has seen numerous changes. The facility was originally designed and built as dual fuel steam boilers (fuel oil and natural gas). By the late 1980s, the plant was converted to natural gas only. The AES Corporation acquired the Redondo Beach Generating Station plant from SCE in 1998. Starting in 1999, AES began to dismantle some of the facility and removed three of the exhaust stacks. In 2006, five large fuel tanks on the property were removed. Currently the plant contains four operating power units, four retired units, and a standby boiler (Morino, 2011).

5.3.3 Research Design for the Cultural Resources Inventory

5.3.3.1 Research Objective

This section provides the research design used by CH2M HILL to guide the records and archival search and subsequent fieldwork phase of the cultural resource inventory for RBEP. Given identified themes for this project, property types and survey expectations were defined. The methods used both during the records and archival search and the fieldwork phase were planned to meet or exceed the CEC requirements according to the *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007), as well as California Archaeological Resource Management (ARMR) reporting and California Environmental Quality Act (CEQA) requirements for analyzing potential impacts to historical resources.

The initial goal was to identify any cultural resources located within the project area so that effects of the project could be assessed. To accomplish this goal, background information was examined and assessed, the study area was defined, and a field survey was conducted to identify cultural remains. Reviews of the records search results, previous work in the project area and vicinity, and a historical map check indicated that cultural resources within the study area were likely to be mostly prehistoric or historic remains related to salt collection and refinement and historic structures related to the 1940s-era Redondo Beach Generating Station.

The fundamental goals of an intensive pedestrian survey are to identify and document previously unrecorded cultural resources and analyze cultural materials, not only to better characterize potential project effects, but also to attempt to confirm or elaborate on our current understanding of the prehistory and history of the region. From a management perspective, the ability of specific resources to address research questions provides a basis to evaluate California Register of Historic Resources (CRHR) and National Register of Historic Places (NRHP) eligibility. Methods for conducting the field survey and inventory are described below.

5.3.3.2 Research Questions

The literature review and search results suggest that the project area has a low to moderate archaeological sensitivity. A portion of the prehistoric village site called Engva was located within the RBEP site, but appears to have been destroyed or buried during the construction of the historic Salt Works and the power stations. Other prehistoric and historic period archaeological resources are known in the vicinity.

Pertinent research questions that are applicable to the project site are discussed below:

1. The study area is located in an area near the ocean and its various resources, particularly the salt lake, would indicate the general area is a favorable one for prehistoric resource procurement. Historically, RBEP is situated at least partially within the prehistoric site known as Engva, which was either a habitation site or extensive resource procurement site. Several associated smaller resource procurement and resource processing sites are located near the Old Salt Lake. The Salt Lake also marked the terminus of an old trail from the inland settlements (Johnston, 1962).

Research Question: Are there any remaining areas around the plant site or within the 200-foot buffer that remain intact enough to contain archaeological remains? Is there evidence of resource procurement or processing? Could such sites be related to larger habitation sites such as Malaga Cove or Redondo-Palmer near the present-day RBEP? If there are remains, do they indicate that Engva was a habitation site or an extensive resource processing site?

2. The Spanish called the salt lake, "Las Salinas." Early explorers recorded Gabrieleño salt collection techniques when they first arrived in the area. Some explorers described the Gabrieleño as pouring water from the lake into large ceramic bowls and letting the water evaporate while others reported that the Gabrieleño dug the salt from the lake bottom with shovels (Johnson, 1965).

Research Question: If any remains of prehistoric salt collecting are found, do they support these ethnohistoric accounts? Is there any evidence that one technique was preferred over another technique?

3. The study area was continuously occupied during the historic era by the Rancho Dominguez during the Mexican Era, and by the Pacific Salt Works and then, the Redondo Beach Generating Station, during the American Era. One historic site, the remains of three historic buildings and a rail spur, were identified within the study area. More than 500 historic structures were identified within a 1-mile buffer of the study area. The area is disturbed and much of the study area is paved. If any remains are identified in the study area, they could be related to any number of different activities, including historic salt production, ranching, industrial building construction, or household dumping.

Research Question: Does any evidence remain of the various historic activities in the study area? If so, to what time period do the remains date? Is there any evidence of household dumping from nearby residences that would add to the knowledge of early historic life in Redondo Beach?

4. The Old Salt Lake has been the site of continuous salt production, beginning in the prehistoric era and continuing into the late historic era. Although the area is quite disturbed, historic photos show much of the Old Salt Lake intact during the 1940s, despite the presence of an SCE plant. If any historic remains are identified in the study area, they could be related to the salt works.

Research Question: Is there any evidence left of the prehistoric era salt collection? Is there evidence that early historic salt collection techniques differed from prehistoric techniques? Do any later remains offer evidence of any different ethnic groups among the laborers who may have been involved in salt production at the Salt Works?

5. Redondo Beach was fairly notorious during Prohibition as a mecca for gambling and accessible alcohol. The study area, situated near the old wharves, could contain evidence of these illegal activities.

Research Question: Does any evidence remain in the study area of illegal activities from the historic period?

6. Starting in the 1950s, dozens of new steam generation plants were built throughout California. The Redondo Beach Generating Station is one among several of these plants constructed in the greater Los Angeles area during the years following World War II and the subsequent expansive growth in southern California.

Research Question: Does the plant have any unique features or employ any different technologies that other steam generation plants lacked which were constructed at the same time in the greater Los Angeles area?

7. After World War II, the population in southern California swelled in response to both business and industrial development. Housing expanded into formerly agricultural areas, creating suburbs around Los Angeles and San Diego. The increased population and industry made greater power generation crucial and California's utility providers expanded their capacity to meet the demand.

Research Question: Are there any extant buildings directly adjacent to the Redondo Beach Generating Station that appear to be directly related to the construction of the plant? If so, are these buildings commercial or residential? Do the commercial buildings directly relate to the Redondo Beach Generating Station?

5.3.3.3 Survey Expectations

The study area is a contrast of high occupation and use in the prehistoric, historic, and modern eras and extreme disturbances related to these activities. The level of disturbance at the Redondo Beach Generating Station, the built nature of the plant site, and the literature search that revealed that the entire area had been previously surveyed, indicates that the likelihood of finding archaeological resources within the study area during the field survey were low to moderate.

RBEP is located in a disturbed area; however, prehistoric archaeological sites that may be found in undisturbed or open areas of the project vicinity, including the 200-foot buffer, could include shell middens, lithic scatters, or habitation sites. Historic period sites could include trash dumps or the remains of buildings and rail spurs.

The Redondo Beach Generating Station was constructed beginning in the 1940s and it was expected that at least some of the buildings on the site would date to the 1940s.

The archaeological sensitivity of the project study area is expected to be low to moderate; however, the likelihood of identifying historic buildings within the study area is expected to be high.

Many of the sites known in the vicinity of RBEP are no longer extant and not mapped on the literature search results. Although specific site dimensions are not known, general site descriptions are included in several reports reviewed during the literature search. These site descriptions were reviewed to determine potential site types in the RBEP area. This review found descriptions for both small and large prehistoric sites.

Because at least some of the site descriptions found in various reports described smaller sites, transect spacing and observation strategies allowed for the detection of small sites (fewer than five artifacts or features). The survey methodology for prehistoric and historic archaeological resources was performed using pedestrian transects spaced at 10- to 15-meter intervals throughout the entire surveyed area. Additionally, other surveys in

the area also utilized a 10-meter interval methodology and therefore, a 10- to 15-meter interval was determined sufficient for the RBEP archaeological survey.

5.3.4 Resources Inventory

A cultural resources inventory, which included archival research, architectural reconnaissance, and a surface pedestrian survey, was conducted for RBEP. The RBEP study area was determined in accordance with the latest *CEC Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007) for assessing potential impacts on archaeological and architectural resources. The results of the resource inventory are presented in the following sections. Figure 5.3-1 shows the RBEP site and the archaeological and the architectural survey areas. The archaeological survey area includes the existing Redondo Beach Generating Station site and the 200-foot buffer around the site. The architectural survey area includes the existing Redondo Beach Generating Station site and a buffer of at least one additional parcel deep on all sides of the site.

5.3.4.1 Archival Research

CH2M HILL requested a literature search from CHRIS staff, South Central Coastal Information Center (SCCIC), searching within a 1-mile buffer zone around the RBEP site on August 30, 2011. This search radius encompasses the entire research area required by the CEC for archaeological and architectural resources.

The CHRIS literature and records review included a review of all recorded archaeological sites and all known cultural resource survey and excavation reports. Other sources examined included the NHRP, the CRHR, California Historical Landmarks, and California Points of Historical Interest. Historical maps consulted included 1896 and 1944 Redondo Beach, California 15-minute U.S. Geological Survey (USGS) topographic quadrangle map. State and local listings were consulted for the presence of historic buildings, structures, landmarks, points of historical interest, and other cultural resources via the California State Parks Office of Historic Preservation (OHP) website and the City of Redondo Beach Planning Division website

The property owner was contacted and provided specific information on the history, design, and construction of the Redondo Beach Generating Station facilities. Historic photographs of the site before, during, and after construction were obtained from the Huntington Digital Library.

According to information available in the CHRIS files, four previous cultural resource studies, primarily cultural resource survey reports, have been prepared within the RBEP plant site, and an additional 31 studies have been prepared within 1 mile of the RBEP site (Table 5.3-1). The entire study area has been previously subject to cultural resources studies. A complete copy of the CHRIS records search is provided as Appendix 5.3C, which has been provided under a request for confidentiality.

TABLE 5.3-1
Cultural Resources Studies Conducted in the Literature Search Area

Report Authors and Date	CHRIS Catalogue NADB Numbers
Studies within the RBEP study area:	
McKenna – 1991	LA-2499
Stickel – 1993	LA-2904
Romani – 1990	LA-5251
Dreizler et al. – 1986	LA-10852
Studies within a 1-Mile Radius:	
Hecto - 1976	LA-206
Dillon – 1980	LA-858
Woodward – 1987	LA-1624
Wallace – 1984	LA-2101
Demcak – 1990	LA-2189
Van Wormer – 1990	LA-2190
Romani – 1990	LA-2197
Greenwood – 1990	LA-2201

TABLE 5.3-1
Cultural Resources Studies Conducted in the Literature Search Area

Report Authors and Date	CHRIS Catalogue NADB Numbers
Hathway – 1983	LA-3265
McManus – 1996	LA-3544
Bucknam – 1974	LA-3583
Hatheway – 1983	LA-3265
McManus – 1996	LA-3544
Bucknam – 1974	LA-3583
Maxwell – 1991	LA-4171
Gray – 1999	LA-4765
Unknown - 1983	LA-5166
Strum – 1987	LA-5167
Dillon – 1985	LA-5250
Mason – 2001	LA-5915
Duke – 2001	LA-5917
Pletka – 2003	LA-6205
McKenna – 2003	LA-6206
Duke – 2002	LA-6207
Bonner – 2002	LA-6208
McKenna – 2002	LA-6990
Billat – 2006	LA-8058
Bonner – 2007	LA-8799
Bonner – 2007	LA-9157
Bonner – 2009	LA-9875
Carmack and Marvin – 2004	LA-10068
Wlodarski – 2005	LA-10069
McKenna – 2009	LA-10333
Wallace – 2008	LA-10652
Kaufman – 1976	LA-105*
Hastey – 1992	LA-3588*
Duncan-Abrams and Milkovich – 1995	LA-3609*
Gallegos – 1994	LA-3891*
Hill – 1985	LA-4323*
Stickel – 1993	LA-5741*
PCR – 2005	LA-10065*

Source: CHRIS SCCIC. See Appendix 5.3C for full bibliographic references. Reports marked with an asterisk (*) intersect the RBEP.

Review of the 1896 *Redondo Beach* 15-minute USGS topographic quadrangle map identified the following: the Redondo Beach branch of the Santa Fe Railroad, the Salt Pond, which was operated by the Pacific Salt Works during this period, roads, and several buildings. Review of the 1944 *Redondo Beach* 15-minute USGS topographic quadrangle map identified the following: Pacific Electric rail lines, the Edison Intake Pier (now the location of King Harbor), paved roads, and several buildings.

These studies have resulted in the identification of two archaeological sites within the RBEP study area: Site No. 19-001872 and Site No. 19-186114, also known as California Historical Landmark (CHL) No. 373. Site No. 19-001872 is not considered eligible for the CRHR or the NRHP. Site No. 19-186114, as CHL No. 373, is listed in the CRHR. These two sites are described in further detail below. Three built structures were identified within the RBEP study area. These are also discussed below.

An additional six cultural resources were identified by the SCCIC as located in the 1-mile buffer. Two of these additional resources are archaeological resources. Another resource is the Redondo Beach Townsite Historic District, which includes numerous buildings and features. These two archaeological resources and the Redondo Beach Townsite Historic District are discussed in further detail below. The remaining three resources are built environment sites and are discussed in the next paragraph with the buildings listed on the Historic Properties Directory (HPD) maintained by the OHP. The following resources, shown on Table 5.3-2, were located within the literature search area; additional information about resources located within the study area is provided below.

A total of 532 historical built resources were identified within the literature search area. Six structures were identified by a review of the maps at the SCCIC, and the remaining structures are listed in the OHP HPD. See Attachment A in Appendix 5.3B. These structures include residences of different historic styles as well as commercial and industrial buildings dating from the early 1900s and into the post World War II era. Thirteen of these structures are listed in the NRHP and the CRHR. A total of 28 structures listed in the HPD are considered eligible for listing in the NRHP/CRHR. Four structures are considered eligible for listing in the CRHR and one structure is listed in the CRHR and considered eligible for listing in the NRHP. Thirty of these structures are listed in the NRHP/CRHR as contributing elements to the Redondo Beach Townsite Historic District. Forty-seven structures are noted on the HPD as needing re-evaluation. Thirty-five structures are not eligible for listing in the NRHP or the CRHR. The remaining 374 structures located within the literature search area have not been evaluated for inclusion in any register. Of the buildings listed in the HPD, only three are in the architectural survey area. None of these buildings are located in the study area. Additional information for these three structures, as well as the Redondo Beach Townsite Historic District, is included below.

TABLE 5.3-2
Cultural Sites within the RBEP Study Area

Site Number	Site Type	Site Description	Evaluation/Year
Sites within 1-Mile Radius			
Archaeological Resources:			
P-19-000127	Prehistoric	Prehistoric Palmer-Redondo Site	Not evaluated
P-19-000383	Prehistoric	Prehistoric Site	Not evaluated
Built Resources:			
P-19-177669	Historic	Redondo Beach Townsite Historic District	Listed/1988
Sites within the RBEP Study Area			
P-19-001872	Prehistoric/historic	Prehistoric, historic, built resource	Not evaluated
P-19-186114	Prehistoric/historic	Old Salt Lake	CHL/1941
516 North Broadway	Historic	Built structure	Not evaluated
606 North Catalina	Historic	Built structure	Not evaluated
732 North Catalina	Historic	Built structures	Not evaluated

Source: CHRIS SCCIC. See Appendix 5.3C for full bibliographic references.

5.3.4.1.1 Sites within the RBEP Study Area

Site forms and specific locational information for all of the archaeological sites discussed below can be found in confidential Appendix 5.3C.

Site P-19-001872

This site is located in the RBEP study area, specifically in the 200-foot buffer. It is a prehistoric and historic site. This site is a part of the Old Salt Lake site (P-19-186114), described below, and the Gabrieleño settlement of Engva.

The site was originally recorded in 1990. The prehistoric portion of the site is described as two cores, 200+ shellfish fragments, one core tool, chert and obsidian flakes, charcoal, and weathered bone fragments scattered in three different loci. Pebbles of various colors, noted as similar to the gaming stones found at Malaga Cove were

identified. The historic portion of this site was described as three circa 1880s commercial buildings and narrow-gauge tracks which run into two of the buildings. Historic artifacts include bricks, opalized glass, oxidized metal fragments, ceramic tiles, sun-colored amethyst glass, slate flooring, and a pearl button. The remains of an armchair were also noted (Demcak, 1990; Foster, 1990).

Demcak (1990) suggested that the prehistoric portion of this site represented remains of the historic era settlement of the Gabrieleño village, Engva. Both components of this site were recommended eligible for the NRHP under Criterion A and Criterion D (Demcak, 1990; Van Wormer, 1990).

In 1990, a total of 37 shovel test pits and one 1x3 meter block excavation were completed at each of the three loci within Site P-19-001872. Creosoted wood was found in one shovel test pit at approximately 88 to 98 cm below the surface. A 1x1 meter unit was opened to explore this deposit and the remains of a creosoted wooden structure with wire nails were identified. The structure was determined likely historic. The function of the building was not clear. Additional excavations to 237 cm below the surface found no additional cultural material at this location. Shovel test pit and auger excavations throughout the site extended to 180 cm below the surface. Shell and limited artifacts were found to depths of 120 cm below the surface. Intrusive debris, including historic and modern debris, and disturbed soil was noted to depths that extended to 180 cm below the surface. The majority of the shovel test pits indicated very disturbed deposits. One area, near the three historic structures, appeared to be less disturbed than the rest of the site. Shovel test pits at this location, Locus B, identified shell deposits which extended to 100 cm below the surface while intrusive debris was only noted to 60 cm below the surface. Monitoring was recommended in the vicinity of this locus (Romani, 1990). In 1996, additional excavations were conducted at Site P-19-001872 in the vicinity of Locus B. An initial survey showed that the area was very disturbed due to bulldozing activities, sheet wash, and erosion. One 1x0.5 meter test unit and five 50 cm shovel test pits were excavated to a maximum depth of 55 cm below the surface. All prehistoric items recovered during these excavations were found in association with a mix of historic and modern trash. Additionally, interviews with local residents, patrons of the nearby shops, workers at the different businesses, and other assorted individuals who are frequently in the area, indicated that the property had been used by construction companies for soil storage. Thus, at least some deposition at the site was considered to have been from offsite sources. No further work was recommended at this site (Compass Rose, 1996). The location of the recorded site is currently occupied by a mini storage facility and the site appears to have been destroyed.

Site P-19-186114

This site is a marker for the Old Salt Lake. The site that this marker designates is partially located within the study area, and essentially encompasses the site discussed above, P-19-001872. The Old Salt Lake was designated California Historical Landmark No. 373 in 1940, and thus is listed in the CRHR. The site was not formally recorded until 1980 by J. Arbuckle. The marker was erected in March 27, 1955, by the Tierra Del Rey Parlor #300 Native Daughters of the Golden West and denotes the salt harvesting site of the Native American and early European settlers.

The location of this site was a salt lake, which was fed from a salt spring, rather than the Pacific Ocean. The Old Salt Lake Road and the New Salt Lake Road are noted on maps drawn by Major George W. Kirkman circa 1930s (Fuller, 1940). Major Kirkman also noted the remains of an old Indian village at the site. This old Indian village is better known as Engva. Salvage excavations were conducted at Engva by volunteers in 1960 (Wallace, 1984). Specific depths or specific locations of these excavations are not available or published. A number of small middens with little depth were found during these excavations. An unknown number of these middens were stated to have been found by Wallace within the Southern California Edison Plant site. Artifacts found during these excavations include core tools, hammerstones, pestles, mortar fragments, flake tools, convex based projectile points, tarring pebbles, a carved steatite object, bone tools, partial fish hooks, fish-hook blanks, shell beads, flakes, fire-affected rock, shellfish fragments, and fresh water turtle shells. These excavations indicate that the area was used for salt harvesting and temporary camps were occupied at different locations throughout the dunes during these harvesting activities (Wallace, 1984; Romani, 1990). Wallace (2008) notes that part of this site was destroyed by the construction of an apartment complex, road expansion, and expansion of the Redondo Beach Generating Station.

516 North Broadway, APN 7503-012-901

This commercial/industrial building is listed on the OHP HPD but was not previously evaluated. It was constructed in 1923 and is located in the one-parcel buffer.

606 North Catalina Avenue, APN 7503-012-026

This commercial building is listed on the OHP HPD but was not previously evaluated. It was constructed in 1923 and is located in the one-parcel buffer.

732 North Catalina Avenue, APN 7503-012-010

This commercial/industrial building is listed on the OHP HPD but was not previously evaluated. It was constructed in 1911 and is located in the one-parcel buffer.

5.3.4.1.2 Sites within the 1-Mile Buffer

Site forms and specific locational information for all of the archaeological sites discussed below can be found in confidential Appendix 5.3C.

Site P-19-000127

This site is a prehistoric site originally discovered in 1903 during the road widening of Catalina Avenue. The initial study of the site was conducted by Dr. Frank M. Palmer, an amateur archaeologist, who excavated and collected grave goods from the site. Dr. Palmer's excavation notes describe several human burials with various grave goods, a midden, and the remains of a village site. Additional excavations were conducted in 1932 by the Los Angeles County Museum; in 1937 by Dr. F.A. Racer, a relic hunter; and in 1956 by the University of California. The site was formally recorded in 1951 by the Los Angeles County Museum (Walker, 1951). The site appears to have been completely destroyed in 1970 by the construction of an underground garage for an apartment complex.

Site P-19-000383

This site is prehistoric site consisting of chipped stone, unidentified large mammal bones, groundstone, and shell midden. The site was originally recorded in 1969 as approximately 10 acres with a depth of about 48 inches (Mayhew, 1969). Recordation of the site was based on J. Stitt's excavation notes archived by the Pacific Coast Archaeological Society (Mayhew, 1969). The site appears to have been destroyed by urban and commercial development.

Site P-19-177669

This site number represents the Redondo Beach Original Townsite Historic District. The Historic District comprises Craftsman, Colonial Revival, Neo-Classical row houses, and Mission-style structures with a period of significance from 1906 to 1925. The Redondo Beach Original Townsite Historic District was listed in the NRHP on June 30, 1988.

5.3.4.2 Archaeological Field Survey

A cultural resources survey of the RBEP study area was conducted on September 28, 2011, by Gloriella Cardenas, M.A., RPA, a CRS who meets the qualifications for Principal Investigator stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (NPS, 1995). This field survey included the plant site.

As per the latest CEC *Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007), in addition to the plant site and the construction laydown and/or parking area, a 200-foot minimum buffer was surveyed for cultural resources around this facility. A total of 131 acres surveyed for the archaeological survey; no archeological resources were identified.

The cultural survey area is predominately located within the Redondo Beach Generating Station boundary, which includes plant facilities, structures, roads, and paved areas. Ground visibility throughout the plant boundaries was generally zero, except where eroded asphalt or ungravelled patches had exposed soils and where fuel tanks were removed. Within the 200-foot buffer, the survey area included streets, sidewalks, a concrete-lined canal, and a

small open area in the southeastern corner. This open area was completely surveyed in 10-meter transects. The few open areas were opportunistically assessed.

Disturbances to the survey area have affected 100 percent of the horizontal and a significant percentage of the vertical. A 1940 aerial photograph shows the Old Salt Lake within the RBEP study area near the power plant which was extant on the property at that time. By 1947, however, the original power plant had been removed, and the lake had been filled (Ninyo & Moore, 2011). Test excavations conducted within the adjacent site show that the area is very disturbed (Romani, 1990; Compass Rose, 1996). Additionally, interviews with local informants indicated that the property had been used by construction companies for soil storage. Thus, at least some deposition at the site was considered to have been from offsite sources (Compass Rose, 1996). A 1952 geotechnical report concurs with these observations (Ninyo & Moore, 2011). There are at the least eight Triton Oil Company oil, gas, and utility pipelines situated within the ATSF railroad ROW, just east of the Redondo Beach Generating Station and several lateral lines extend from these main pipelines. Current AES-SLD staff has indicated that the present Redondo Beach Generating Station was constructed on fill. This concurs with two subsurface geotechnical surveys that were conducted by URS in 2001 and by Ninyo & Moore in 2011. Ninyo & Moore (2011) encountered artificial fill at depths ranging from approximately 1 to 8 feet below ground surface (bgs) and URS (2001) stated that fill ranges from 2 to 10 feet thick, and up to 20 feet thick in some places. It is possible that excavations could extend beyond the fill into potentially undisturbed deposits below the fill. Project-related pile driving could reach approximately 40 feet below the surface. Given the scope of previous ground disturbance in the area, the depth of the artificial fill at the site, and the proposed depths of the excavations for the RBEP, archaeological sensitivity of the surface soils of the RBEP study area is considered low to moderate.

5.3.4.3 Architectural Survey

A cultural resource survey of the built environment of the existing Redondo Beach Generating Station study area was conducted on September 28, 2011, by Lori Price, a CRS who meets the qualifications for Architectural Historian, as stated in the Secretary of the Interior's standards and guidelines for archaeology and historic preservation (NPS, 1983). To assess potential impacts on the historic built environment, CH2M HILL examined the RBEP site (as no offsite facilities are proposed), and, in accordance with *CEC Rules of Practice and Procedure & Power Plant Site Certification Regulations* (CEC, 2007), at least one parcel deep from the project site.

Construction dates were obtained from the Los Angeles County Assessor's Office. Based on the assessor's information, review of historical aerial photographs, and the field survey, the Redondo Beach Generating Station plant site and ten additional parcels contained properties that met those criteria.

Following the guidance provided in the OHP *Instructions for Recording Historical Resources* (1995), the Redondo Beach Generating Station, as a large and complex landscape, was recorded as a district due to its concentration of buildings and structures united historically and functionally by plan and physical development. DPR forms, including a Primary Record, Location Map, and District Record, were prepared to document the district as a whole. Each component of the district was documented separately on a Primary Record. DPR forms (Primary Record and Building, Structure, Object form) were prepared for each of the properties on Edison Avenue. All DPR forms prepared are included in Attachment B in Appendix 5.3B.

The present built environment is primarily a mix of commercial and residential. Redondo Beach Generating Station is to the west of Highway 1 and east of North Harbor Drive. Urban development surrounds the site to the north at Herondo Street, east at North Catalina Avenue and south at West Beryl Street. The King Harbor Marina and Hermosa Beach (public beach owned by the City of Hermosa Beach) are located to the west of the Redondo Beach Generating Station.

Eleven built resources were recorded. These eleven resources consist of the Redondo Beach Generating Station district, which is located within the RBEP study area, and ten built structures located within a one-parcel buffer. All of these built structures are older than 45 years (see Table 5.3-2).

TABLE 5.3-2
Properties Documented during the Architectural Survey

Street Number	Street Name	Type/Style	Year Built
Within the RBEP Study Area:			
1100	North Harbor Drive	Redondo Beach Generating Station	1948
Within 1-Parcel Buffer:			
2	Hermosa Avenue	Commercial/Residential	1959
121	Herondo Street	Commercial/Industrial	1964
516	North Broadway	Commercial/Industrial	1923
600	North Catalina Avenue	Commercial	1946/1962
606	North Catalina Avenue	Commercial	1923
732	North Catalina Avenue	Commercial/Industrial	1911, 1957, 1961
604-606	North Francisca Avenue	Commercial/Industrial	1923, 1925
610	North Francisca Avenue	Commercial/Industrial	1946
831	North Harbor Drive	Commercial	1957
1021	North Harbor Drive	Commercial/Industrial	1947

5.3.4.3.1 Within RBEP Study Area

1100 North Harbor Drive – Redondo Beach Generating Station, APN 7503013820, 7503013819, 7503013015, 7503013014

The Redondo Beach Generating Station was recorded and evaluated as a district with multiple components. In addition, individual components were evaluated to determine if they could be individually eligible. Redondo Beach Generating Station began operation in 1948, and components have various dates from 1948 to 1968. The district is irregularly shaped and encompasses the Redondo Beach Generating Station property, approximately 50 acres. The district boundaries are the parcel boundaries of the four contiguous parcels that make up the Redondo Beach Generating Station property (parcel numbers 7503013820, 7503013819, 7503013015, 7503013014). It is roughly bounded by North Harbor Drive, Herondo Street, North Francisca Avenue, North Catalina Avenue, and Beryl Street. The boundaries include all of the relevant features of the Redondo Beach Generating Station.

Redondo Beach Generating Station is composed of eight power generating units (four operating power units and four retired units), an auxiliary boiler, an administration building, a guard house, five exhaust stacks, a switchyard, transmission line towers, and various support facilities such as water tanks, a fuel pump house, a service water house, a paint shop, a switchyard oil transfer system building, garages, and a gas service building.

In 1991, the artist Robert Wyland painted a life-sized mural known locally as the “Whaling Wall” on the structure that shields Units 7 and 8. The mural wraps around the south and west elevations and is highly visible along North Harbor Drive. The mural, officially titled “Gray Whale Migration,” is 650 feet long by 89 feet high, and was dedicated on June 24, 1991. Wyland returned to do some restoration work on the mural in 2011 for its 20-year anniversary. The mural was number 31 in Wyland’s campaign to paint 100 life-sized public marine murals with a goal of increasing “appreciation and understanding for aquatic habitats and the life within” (Wyland Foundation, 2012). In 2008, Wyland completed his 100 Whaling Walls campaign, which took 27 years and covered “5 continents, 13 countries, and 79 cities” (Wyland Foundation, 2012). Several of the murals no longer exist, and some have been relocated from their original locations, but the majority of them remain intact. While the Redondo Beach mural is a notable public icon, it does not meet the minimum age criteria of 45 years to be considered as a historic resource. It does not qualify as an exception for resources that have attained significance within the last 50 years because it lacks the level of extraordinary importance necessary, and is one of many surviving murals from this series.

The Redondo Beach Generating Station does not appear to be a historic resource for the purposes of CEQA. The generating station does not appear to be significant in the context of the history of SCE, the history of steam generation of electricity, or the history of post-World War II steam generation plants (Criteria A and 1).

As discussed previously, Redondo Beach Generating Station was one of several steam generating plants built by SCE in the mid-twentieth century. It was part of a trend for all electric companies in California to build steam generation plants to keep up with growing demand from new development and higher customer usage. The short time-frame for construction of these plants, and their similar technologies and designs, suggests that they were all being planned and designed at about the same time. These plants and their steam generation technology were the result of the exhaustion of available hydroelectric sites coinciding with a growing need for electricity. Together, the plants affected the nature of power generation in southern California, overshadowing the importance of any single plant. As of 2008, 21 once-through cooling, steam generation units remained in southern California, including Redondo Beach Generating Station, all dating from the same general time period, with an average age of 40 years. More than 1,200 steam-generating units use this cooling method in the United States (TetraTech, 2008). Placed in the context of the time and of other power plants, Redondo Beach Generating Station does not appear to be unique.

Redondo Beach Generating Station does not appear to be associated with the life of a historically significant person (Criteria B and 2), nor is it significant under Criterion D and 4 as a potential source of data on human history. This property is well-documented through company records and construction documents and does not appear to be a principal source of important information. The plant has had minor alterations, yet as a whole it retains integrity of location, design, setting, materials, workmanship, feeling, and association.

This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and does not appear to be a historical resource for the purposes of CEQA.

5.3.4.3.2 Within One-Parcel Buffer

The following properties are located within the one-parcel-deep buffer required by CEC regulations for an architectural survey. More complete descriptions of these properties can be found in the Cultural Resources Inventory Report in Appendix 5.3B.

2 Hermosa Avenue, APN 4188-015-037

This two-story commercial building, built in 1959, has a commercial business on the ground floor and residential units on the second floor. The ground floor houses Dawn to Dusk Liquor. Both the front and rear of the building contain paved parking lots. The building is undistinguished architecturally, and lacks integrity due to changes in siding and in openings. It does not appear to be associated with the early founding of Hermosa Beach or Redondo Beach, or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The Dawn to Dusk Liquor building does not appear to meet the CRHR criteria.

121 Herondo Street, APN 4188-015-040

Originally two commercial/industrial buildings from 1964, this site is now multiple residential units. The rear part of the building now has an address of 120 Lyndon Street. The building is undistinguished architecturally, and has been extensively altered. It does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not

associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The building at 121 Herondo Street, including 118-120 Lyndon Street, does not appear to meet the CRHR criteria.

516 North Broadway, APN 7503-012-901

This commercial/industrial building houses the County of Los Angeles Department of Beaches and Harbors Warehouse. It was constructed in 1923, with renovations that give it an effective date of 1938. No visual evidence of the 1923 structure remains. The building has been heavily altered and lacks integrity. It does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The Beaches and Harbors Warehouse does not appear to meet the CRHR criteria.

600 North Catalina Avenue, APN 7503-012-025

This commercial site contains two buildings, one constructed in 1946 and one in 1962. A former gas/service station, it now houses a retail establishment called Triathlon Lab. The buildings do not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. They do not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The buildings are not likely to yield information important to understanding prehistory or history. The Triathlon Lab building does not appear to meet the CRHR criteria.

606 North Catalina Avenue, APN 7503-012-026

This one-and-a-half-story commercial building, constructed in 1923, is currently occupied by the corporate offices of Dive n' Surf. The Assessor's records list this address as 606 North Catalina Avenue, but the building is physically numbered as 610 North Catalina. It displays the Polynesian Pop style of architecture, popular in southern California in the 1950s and 1960s. Nothing from the 1923 building is still visible. The current appearance likely dates from the 1960s, when the building was a tiki bar where local bands played, known as the Flying Jib (Los Angeles Free Press, 1965). The building is surrounded by an asphalt-paved parking lot. While the building does represent a distinctive 1960s style, the original 1923 building has been completely obscured, and the Polynesian Pop renovation has lost integrity through subsequent alterations, including additions and the replacement of the character-defining roof shingles. In addition, there are better examples in the area of this distinctive style. The building does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The Dive n' Surf building does not appear to meet the CRHR criteria.

732 North Catalina Avenue, APN 7503-012-010

This commercial/industrial building is actually composed of three buildings that have been joined together, with construction dates of 1911, 1957, and 1961. It is occupied by three commercial entities. South Bay Door and Window has the primary space, Beaches Roofing has the small middle space, and Car Doctor has the large garage area at the rear. The building has been heavily altered through additions and changes to openings, and lacks integrity. It does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values.

The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The South Bay Door and Window building does not appear to meet the CRHR criteria.

604-606 North Francisca Avenue, APN 67503-021-023, 67503-021-024

This wood-framed, commercial/industrial building is composed of two buildings, built in 1923 and 1925, that have been joined together. It contains an art gallery and studios known as Cannery Row. The larger part of the building is on the eastern end of the site and contains the gallery space. Originally a lumber mill and then a commercial warehouse, it has been a gallery and studio since 1990 (Moilanen, 2010). While the building may have been associated with the early lumber industry of Redondo Beach, it has been severely altered and lacks integrity of design, materials, setting, and workmanship. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The Cannery Row building does not appear to meet the CRHR criteria.

610 North Francisca Avenue, APN 7503-021-022

This one-story, commercial/industrial building, constructed in 1946, appears to be used for storage, and may be associated with the Cannery Row studio buildings next door. The property appears to be in poor condition. The building is undistinguished architecturally, and lacks integrity due to removal of doors and windows. It does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The building at 610 North Francisca Avenue does not appear to meet the CRHR criteria.

831 North Harbor Drive, APN 7503-003-900

This commercial building houses the King Harbor Marine Center. Assessor's records list the address as 665 North Harbor Drive, and do not delineate a parcel for the building separate from the overall marina parcel. The building is physically numbered as 831 North Harbor Drive, and this is the address that is used commercially by the facility. An exact construction date is unavailable, but it likely dates to the construction of the King Harbor Marina circa 1957. The building is undistinguished architecturally, but retains good integrity. It does not appear to be associated with the early founding of Redondo Beach or with the construction of the Redondo Beach Generating Station. It does not have distinctive characteristics of a type, period, region, or method of construction, or represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The King Harbor Marine Center building does not appear to meet the CRHR criteria.

1021 North Harbor Drive, APNs 7503013821, 7503013822

This commercial/industrial building was originally constructed in 1947 to serve the Redondo Beach Generating Station facility as a pump house. It was no longer needed for Redondo Beach Generating Station after 1986, and has been used for marine research since then. The Assessor's records provide no information on the building. It is currently occupied by SEA Lab. Most of the building is two stories, but the northern section, which contains the

entry, is one story. The building reflects the same understated Classical Moderne style as the Redondo Beach Generating Station Unit 1 across the street. Originally the structure held the circulating water pumps that pumped ocean water to cool the steam used in the turbines of Redondo Beach Generating Station Unit 1. It also had several smaller water pumps for miscellaneous system needs. The gates to control the direction of the ocean water flow were located in the rear section. Beginning in 1974, the pump house was also the site of the Edison Marine Research Laboratory to develop a new fish protection system. When Unit 1 was retired in 1986, the pump house was no longer needed, and SCE converted it into a coastal science education center. Although it no longer serves its intended function and is no longer a working component of the Redondo Beach Generating Station, the building retains good integrity. It is not associated with the early founding of Redondo Beach. While it represents the Classical Moderne style, it is not particularly distinctive, and does not represent the work of an important creative individual, or possess high artistic values. The property is not associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States, and it is not associated with any persons important to local, California, or national history. The building is not likely to yield information important to understanding prehistory or history. The SEA Lab building does not appear to meet the CRHR criteria.

5.3.4.4 Discussion of Survey Expectations and Research Questions

The purpose of this section is to relate the findings of the investigation to the research questions posed above. No areas within the RBEP study area were left undisturbed by the construction of the Redondo Beach Generating Station or other modern construction. No archaeological sites of any type were found. Therefore, only the research questions pertaining to built environment will be discussed below.

Research Question 6. The Redondo Beach Generating Station is one among several of these plants constructed in the greater Los Angeles area during the years following World War II and the subsequent expansive growth in southern California. The Redondo Beach Generating Station was one of many plants that followed a trend for all electric companies in California to construct steam generation plants to provide power for the rapid post World War II development in the state. These facilities were constructed at approximately the same time and were likely developed and designed at about the same time. The Redondo Beach Generating Station was only one of more than 1,000 similar power plants built in the United States and does not have any unique features or employ any unique technologies which were not used at any of these numerous other plants.

Research Question 7. Nine structures were identified within the one-parcel -deep buffer and are located adjacent to the Redondo Beach Generating Station. None of these structures appears to be related to the construction or operation of the plant. One building was constructed nearly two decades prior to the Redondo Beach Generating Station, while the other building was constructed after the Redondo Beach Generating Station. Thus, there do not remain any extant buildings, either commercial or residential, that appear to relate to the Redondo Beach Generating Station.

5.3.4.5 Native American Consultation

CH2M HILL contacted the Native American Heritage Commission (NAHC) by letter on August 26, 2011, to request information about traditional cultural properties such as cemeteries and sacred places in the RBEP study area. The NAHC responded on August 31, 2011, with a list of Native Americans interested in consulting on development projects. Each of these individuals/groups was contacted by letter on September 2, 2011. Follow up phone calls were made on March 16, 2012. Anthony Morales, Chairmen for the Gabrieleño Band of Mission Indians telephoned on September 21, 2011, requesting additional information about the project's proposed actions. A return phone call was made on September 23, 2011, to Mr. Morales, but he was occupied and did not have time to go over his data needs. It was suggested that Mr. Morales email his requests at his earliest convenience; no further response have been received to date. Mr. Sam Dunlap, Chairperson of the Gabrieleño Tongva Nation, requested that the letter be resent to his email address; this was done on March 16, 2012. Mr. Andrew Salas, Chairperson for the Gabrieleño Band of Mission Indians, requested for the letter to be resent to his email address, this was done on the same date. For all other contacts, voicemail messages were left as there was no answer.

No other responses have been received as of the date of this report. Copies of the letters are provided in Appendix 5.3 A. Also, a detailed summary table of the results of consultations with the individual Native American organizations on the NAHC contact list is included in Appendix 5.3A.

The NAHC record search of the Sacred Lands file did not indicate the presence of Native American cultural resources in the immediate RBEP study area. The records search conducted at the CHRIS SCCIC also did not indicate the presence of Native American traditional cultural properties.

5.3.4.6 Local Historical Societies

CH2M HILL contacted the Redondo Beach Historical Society, the Historical Society of Southern California, the Department of Regional Planning of Los Angeles, and the City of Redondo Beach Planning Division on August 29, 2011.

The City of Redondo Beach Planning Division stated that they hold an online listing of Historic Properties for Redondo Beach. Review of the online listings on August 29, 2011 revealed no historic properties within the study area. The listing included five NRHP properties within the 1-mile buffer. All of these properties were identified by the SCCIC and are reported in Section 5.3.4.1.

No responses from any of the historical societies have been received as of the date of this report. A summary of these contacts is provided in Appendix 5.3A.

5.3.5 Environmental Analysis

This section describes the environmental impacts of project construction, demolition, and operation. CH2M HILL conducted a complete cultural survey of the RBEP study area.

5.3.5.1 Significance Criteria

Appendix G, Environmental Checklist Form of the CEQA guidelines, addresses significance criteria with respect to cultural resources (Public Resources Code Sections 21000 et seq.). Appendix G (V)(a, b, d) indicates that an impact would be significant if the project will have the following effects:

- Cause a substantial adverse change in the significance of a historical resource
- Cause a substantial adverse change in the significance of an archaeological resource
- Disturb any human remains, including those interred outside formal cemeteries

Project investigations included archival research; review of all cultural resource investigation reports within the RBEP study area; contacts with all other interested agencies, Native American groups, and historic societies; and a complete field survey. These studies indicated no significant prehistoric or historic archaeological remains, or traditional cultural properties in the RBEP study area. Therefore, no impacts on cultural resources are expected.

5.3.5.2 Construction and Demolition Impacts

The literature search and pedestrian inventories did not locate any significant prehistoric or historic sites within the existing Redondo Beach Generating Station site.

The literature search and pedestrian inventory have shown no significant prehistoric or historic sites located within the RBEP study area. Eleven resources were recorded during the survey of the built environment, including the Redondo Beach Generating Station Historic District, which is located within the RBEP study area. This district, however, is not considered eligible for the CRHR and is not a historical resource.

Demolition of the Redondo Beach Generating Station will require implementation of mitigation measures to reduce cultural resource impacts to below significant levels. Given the extensive disturbance to the study area from decades of commercial development, the previously documented depth of the artificial fill at the site, and the proposed relative depths of the excavations for the RBEP, it is anticipated that RBEP construction impacts have a low to moderate potential to impact buried cultural resources that have not previously been disturbed or destroyed. With the incorporation of mitigation described in Section 5.3.7, construction and demolition impacts on cultural resources will be less than significant.

5.3.5.3 Operation Impacts

No ground disturbance will be required during RBEP operations or maintenance activities; therefore, impacts to cultural resources are not anticipated during RBEP operations or maintenance activities. Maintenance of RBEP facilities will not cause any effects outside the initial construction area of impact. No significant impacts on cultural resources will result from operations or maintenance.

5.3.6 Cumulative Effects

A cumulative impact refers to a proposed project's incremental effect together with other closely related past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Public Resources Code Section 21083; California Code of Regulations, Title 14, Sections 15064(h), 15065(c), 15130, and 15355). Cumulative projects are described in more detail in Section 5.6, Land Use. Although environmental analyses for most of these cumulative projects have not been completed at the time this Application for Certification (AFC) was prepared, standard mitigation measures exist to reduce impacts on cultural resources to less-than-significant levels, and it is anticipated that impacts on cultural resources from the cumulative projects, if any, would be mitigated to less-than-significant levels. The RBEP is unlikely, therefore, to have impacts that would combine cumulatively with other closely related past, present, and reasonably foreseeable future projects. Therefore, with the incorporation of mitigation described in Section 5.3.7, the project will not contribute to a cumulatively considerable impact on cultural resources.

5.3.7 Mitigation Measures

No significant archaeological and historical sites were found during the survey for the RBEP site. There is a low to moderate probability that subsurface construction activities could encounter buried archaeological remains. Because the probability is low to moderate that project activities could encounter intact subsurface deposits, RBEP will include measures to mitigate any potential adverse impacts that could occur if there were an inadvertent discovery of buried cultural resources. These measures include, but are not limited to: (1) designation of a CRS to investigate any cultural resource finds made during construction, (2) implementation of a construction worker training program, (3) limited monitoring during initial clearing of the of the RBEP site and excavation at the project site, (4) procedures for halting construction in the event that there is an inadvertent discovery of archaeological deposits or human remains, (5) procedures for evaluating an inadvertent archaeological discovery, and (6) procedures to mitigate adverse impacts on any inadvertent archaeological discovery determined significant.

Once RBEP is operational and the Redondo Beach Generating Station is demolished, it is anticipated that no additional disturbance will occur at the RBEP site as no additional excavations are anticipated once construction/demolition activities are concluded and therefore no mitigation measures are required for RBEP operations or maintenance.

5.3.7.1 Designated Cultural Resources Specialist

The Project Owner will retain a designated CRS who will be available during the earth-disturbing portion of the RBEP construction periods to inspect and evaluate any finds of buried archaeological resources that might occur during the construction phase. If there is a discovery of archaeological remains during construction, the CRS, in conjunction with the construction superintendent and environmental compliance manager, will make certain that construction activity stops in the immediate vicinity of the find until the find can be evaluated. The CRS will inspect the find and evaluate its potential significance in consultation with CEC staff and the CEC compliance project manager (CPM). The CRS will make a recommendation as to the significance of the find and any measures that would mitigate adverse impacts of construction on a significant find.

The CRS will meet the minimum qualifications for Principal Investigator on federal projects under the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation. The CRS will be qualified, in addition to site detection, to evaluate the significance of the deposits, consult with regulatory agencies, and plan site evaluation and mitigation activities.

5.3.7.2 Construction Worker Training

The Project Owner will prepare a construction worker sensitivity training program to ensure implementation of procedures to be followed if cultural resources are discovered during construction. This training will be provided to each construction worker as part of their environmental, health, and safety training. The training will include photographs of various types of historic and prehistoric artifacts and will describe the specific steps to be taken in the event of an unanticipated discovery of cultural material, including human remains. It will explain the importance of, and legal basis for, the protection of significant archaeological resources. The training also will be presented in the form of a written brochure.

5.3.7.3 Monitoring

Excavations at the RBEP site are expected to reach depths of up to 10 feet for building foundations. Major structures would require piles and pile driving is expected to reach depths of up to 40 feet.

RBEP is located in a disturbed area; however, if undisturbed soils are identified during construction, full-time monitoring may be required. The Project Owner will retain a qualified archaeologist to conduct limited monitoring during the initial grading and excavation activities, including geotechnical testing activities prior to construction, to identify previously undisturbed soils that may be sensitive for cultural resources. If archaeological material is observed by the monitoring archaeologist, ground-disturbing activity will be halted in the vicinity of the find so that its significance (CRHR eligibility) can be determined. If evaluated as significant, mitigation measures (avoidance or data recovery) will be developed in consultation with the CEC.

Pile driving is expected to reach below the fill and into native soil; however, pile driving would not require monitoring, even though it could reach into native soil as the nature of pile driving does not allow for the observation of the soils.

5.3.7.4 Emergency Discovery

If the archaeological monitor, construction staff, or others identify archaeological resources during construction, they will immediately notify the CRS and the site superintendent, who will halt construction in the immediate vicinity of the find, if necessary. The archaeological monitor or CRS will use flagging tape, rope, or other means as necessary to delineate the area of the find within which construction will halt. This area will include the excavation trench from which the archaeological finds came and any piles of dirt or rock spoil from that area. Construction will not occur within the delineated find area until the CRS, in consultation with the CEC staff and CEC CPM, can inspect and evaluate the find.

5.3.7.5 Site Recording and Evaluation

The CRS will follow accepted professional standards in recording any find and will submit the standard Form DPR 523 and location information to the CHRIS SCCIC.

If the CRS determines that the find is not significant and the CEC CPM concurs, construction will proceed without further delay. If the CRS determines that further information is needed to determine whether the find is significant, the designated CRS will, in consultation with the CEC, prepare a plan and a timetable for evaluating the find.

5.3.7.6 Mitigation Planning

If the CRS and CPM determine that the find is significant, the CRS will prepare and conduct a mitigation plan in accordance with state guidelines. This plan will emphasize the avoidance, if possible, of significant archaeological resources. If avoidance is not possible, recovery of a sample of the deposit from which archaeologists can define scientific data to address archaeological research questions will be considered an effective mitigation measure for damage to or destruction of the deposit.

The mitigation program, if necessary, will be carried out as soon as possible to avoid construction delays. Construction will resume at the site as soon as the field data collection phase of any data recovery efforts is completed. The CRS will verify the completion of field data collection by letter to the project owner and the CPM so that they can authorize construction to resume.

5.3.7.7 Curation

The CRS will arrange for curation of archaeological materials collected during an archaeological data recovery mitigation program. Curation will be performed at a qualified curation facility meeting the standards of the California OHP. The CRS will submit field notes, stratigraphic drawings, and other materials developed as part of the data recovery/mitigation program to the curation facility along with the archaeological collection, in accordance with the mitigation plan.

5.3.7.8 Report of Findings

If a data recovery program is planned and implemented during construction as a mitigation measure, the CRS will prepare a detailed scientific report summarizing results of the excavations to recover data from an archaeological site. This report will describe the site soils and stratigraphy, describe and analyze artifacts and other materials recovered, and draw scientific conclusions regarding the results of the excavations. This report will be submitted to the curation facility with the collection.

5.3.7.9 Inadvertent Discovery of Human Burials

If human remains are found during construction, project officials are required by the California Health and Safety Code (Section 7050.5) to contact the Los Angeles County Coroner. If the coroner determines that the find is Native American, he or she must contact the NAHC. The NAHC, as required by the Public Resources Code (Section 5097.98), determines and notifies the Most Likely Descendant with a request to inspect the burial and make recommendations for treatment or disposal.

5.3.8 Laws, Ordinances, Regulations, and Standards

Among the local LORS discussed in this section are certain ordinances, plans, or policies of the City of Redondo, Los Angeles County, and the State of California. Federal LORS will be applicable because the project will require a Prevention of Significant Deterioration (PSD) permit, Clean Water Act permit, or other federal authorization. A summary of applicable LORS is provided in Table 5.3-3.

5.3.8.1 Federal LORS

Federal protection for significant archaeological resources would apply to RBEP if any construction or other related project impacts take place on federally managed lands, or if certain federal entitlements were required. Because a PSD permit under the federal Clean Air Act is expected for the project, the construction of RBEP is considered a federal undertaking.

The National Historic Preservation Act (NHPA) requires federal agencies to take into consideration the effects of their undertakings on historic properties, defined as properties (buildings, districts, sites, structures, objects) that meet the criteria for listing in the NRHP (36 CFR Part 60). The agencies' responsibilities under the NHPA are described in Section 106 of the Act and in federal regulations at 36 CFR Part 800. Federal agencies are enjoined to (1) determine an undertaking's study area on historic properties, (2) inventory potential historic properties within the study area, (3) evaluate properties identified to determine their eligibility for listing in the NRHP, (4) assess the potential effects of the undertaking on properties determined to meet NRHP criteria, and (5) if the effects would be adverse, avoid or mitigate those effects. In this case, the U.S. Environmental Protection Agency (EPA) would likely be the federal agency with Section 106 compliance responsibilities. As the lead federal agency, it is the responsibility of the EPA to conduct the State Historic Preservation Officer consultation regarding the permit undertaking's effects on historic properties. The Project Owner has submitted this AFC cultural resources assessment to the EPA with the PSD permit application to facilitate Section 106 compliance.

TABLE 5.3-3
Laws, Ordinances, Regulations, and Standards for Cultural Resources

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
Section 106, National Historic Preservation Act	The project requires a federal permit (a PSD permit). The lead federal agency must take into account the effect of issuing the permit on significant cultural resources	California Office of Historic Preservation/ Environmental Protection Agency	Section 5.3.8.1
State			
CEQA Guidelines	Project construction may encounter archaeological and/or historical resources	CEC	Section 5.3.8.2
Health and Safety Code Section 7050.5	Construction may encounter Native American graves; coroner calls the NAHC	State of California	Section 5.3.8.2
Public Resources Code Section 5097.98	Construction may encounter Native American graves; NAHC assigns Most Likely Descendant	State of California	Section 5.3.8.2
Public Resources Code Section 5097.5/5097.9	Would apply only if some project land were acquired by the state (currently no state land)	State of California	Section 5.3.8.2
Local			
City of Redondo Beach Historic Preservation Plan	Provide a proactive means of planning for the continued protection of the character and heritage of Redondo Beach, teach and inform citizens of Redondo Beach about the city's history as reflected in the built environment, increase the community's awareness of preservation issues, provide a guideline for growth and development, create a plan for the continued identification and designation of historic properties, develop new incentives for preservation, strengthen the support for preservation policies, and promote Redondo Beach as a city sensitive to the preservation of historical resources for the future	City of Redondo Beach	Section 5.3.8.3

5.3.8.2 State LORS

CEQA requires review to determine whether a project will have a significant effect on archaeological sites or a property of historic or cultural significance to a community or ethnic group eligible for inclusion in the CRHR (CEQA Guidelines). CEQA equates a substantial adverse change in the significance of a historical resource with a significant effect on the environment (Section 21084.1 of the Public Resources Code) and defines substantial adverse change as demolition, destruction, relocation, or alteration that would impair historical significance (Section 5020.1). Section 21084.1 stipulates that any resource listed in, or eligible for listing in, the CRHR⁴ is presumed to be historically or culturally significant.⁵

⁴ The CRHR is a listing of "...those properties which are to be protected from substantial adverse change." Any resource eligible for listing in the CRHR is also to be considered under CEQA.

⁵ A historical resource may be listed in the CRHR if it meets one or more of the following criteria: "(1) is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; (2) is associated with the lives of persons important to local, California, or national history; (3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or (4) has yielded or has the potential to yield information important in prehistory or history (...of the local area, California, or the nation)" (Public Resources Code §5024.1, Title 14 CCR, Section 4852). Automatic CRHR listings include NRHP-listed and determined eligible historic properties (either by the Keeper of the NRHP or through a consensus determination on a project review), State Historical Landmarks from number 770 onward, and Points of Historical Interest nominated from January 1998 onward. Landmarks prior to 770 and Points of Historical Interest may be listed through an action of the State Historical Resources Commission.

Resources listed in a local historic register or deemed significant in a historical resource survey (as provided under Section 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not.

A resource that is not listed in or determined to be eligible for listing in the CRHR, is not included in a local register of historic resources, or is not deemed significant in a historical resource survey may nonetheless be historically significant (Section 21084.1; see Section 21098.1).

CEQA requires a lead agency to identify and examine environmental effects that may result in significant adverse effects. Where a project may adversely affect a unique archaeological resource,⁶ Section 21083.2 requires the lead agency to treat that effect as a significant environmental effect and prepare an environmental impact report. When an archaeological resource is listed in or is eligible to be listed in the CRHR, Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

Other state-level requirements for cultural resources management appear in the California Public Resources Code Chapter 1.7, Section 5097.5 (Archaeological, Paleontological, and Historical Sites), and Chapter 1.75, beginning at Section 5097.9 (Native American Historical, Cultural, and Sacred Sites) for lands owned by the state or a state agency.

The disposition of Native American burials is governed by Section 7050.5 of the California Health and Safety Code and Sections 5097.94 and 5097.98 of the Public Resources Code, and falls within the jurisdiction of the NAHC.

If human remains are discovered, the county coroner must be notified within 48 hours and there should be no further disturbance to the site where the remains were found. If the coroner determines the remains to be Native American, the coroner is responsible for contacting the NAHC within 24 hours. The NAHC, pursuant to Section 5097.98, will immediately notify those persons it believes to be most likely descended from the deceased Native American so they can inspect the burial site and make recommendations for treatment or disposal. The project will comply with these requirements related to cultural resources through the implementation of the mitigation measures described in Section 5.3.7.

5.3.8.3 Local LORS

The City of Redondo Beach Historic Preservation Plan (date unknown) includes the following goals regarding archaeological resources and historic resources: provide a proactive means of planning for the continued protection of the character and heritage of Redondo Beach, teach and inform citizens of Redondo Beach about the City's history as reflected in the built environment, increase the community's awareness of preservation issues, provide a guideline for growth and development, create a plan for the continued identification and designation of historic properties, develop new incentives for preservation, strengthen the support for preservation policies, and promote Redondo Beach as a city sensitive to the preservation of historical resources for the future. Policies regarding these preservation goals include the identification of historically and archaeologically significant resources in Redondo Beach, encouragement to owners of eligible historic income producing properties to use the tax benefits provided by the Mills Act, and the development of Redondo Beach's Historic Context Statement (1995).

RBEP will comply with the Cultural Resources LORS for the City of Redondo Beach and Los Angeles County.

⁶ Public Resources Code 21083.2 (g) defines a unique archaeological resource to be: An archaeological artifact, object, or site, about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria: (1) contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information; (2) has a special and particular quality such as being the oldest of its type or the best available example of its type; or (3) is directly associated with a scientifically recognized important prehistoric or historic event or person.

5.3.9 Agencies and Agency Contacts

Table 5.3-4 lists the state agencies involved in cultural resources management for the project and a contact person at each agency. These agencies include the NAHC and, for federal undertakings, the California OHP.

TABLE 5.3-4

Agency Contacts for Cultural Resources

Issue	Agency	Persons Contacted
Native American traditional cultural properties	Native American Heritage Commission	Dave Singleton Associate Governmental Program Analyst Native American Heritage Commission 915 Capitol Mall, Room 364 Sacramento, CA 95814 (916) 653-4082
Federal agency NHPA Section 106 compliance	California Department of Parks and Recreation Office of Historic Preservation	Milford Wayne Donaldson State Historic Preservation Officer 1416 9th Street, Room 1442 Sacramento, CA 95814 (916) 653-6624
Archival Research, Local Register Listings for Historical Resources	Department of Regional Planning General Plan Development Section	Connie Chung 320 W. Temple Street Los Angeles, CA 90012 (213) 974-6417
Archival Research, Local Register Listings for Historical Resources	City of Redondo Beach Planning Division	Alex Plascendia 415 Diamond Street Redondo Beach, CA 90277 (310) 318-0637

5.3.10 Permits and Permit Schedule

Other than certification by the CEC, no state, federal, or local permits are required by the project for the management of cultural resources. Consultation with the State Historic Preservation Officer would be required under Section 106 of the NHPA as a PSD permit is required. AES-SLD will submit the cultural resource assessment to the EPA with the Greenhouse Gas PSD permit application. The expected schedule for the EPA to issue a draft PSD permit is within 180 days after issuing the application completeness determination letter. During this 180-day permit processing period, EPA will consult with the State Historic Preservation Officer to determine if the project will affect historic or cultural resources. The draft PSD permit application will undergo a public notice/comment period. A reasonable estimate for the public notice/comment period, EPA to response to comments, and preparation and issue the final PSD permit is 7 to 12 months.

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