APPENDIX L
CULTURAL RESOURCES TECHNICAL REPORTS

Appendix L1
Archaeological Reconnaissance, Marsh Landing Generating Station, Contra Costa County, California
(Submitted Separately Under the Rules of Confidentiality)

Appendix L2
Historical Resources Inventory and Evaluation Report MLGS

HISTORIC RESOURCES INVENTORY AND EVALUATION REPORT

Mirant Marsh Landing Generating Station

PREPARED FOR

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SUMMARY OF FINDINGS

URS Corporation contracted with JRP Historical Consulting, LLC (JRP) to prepare this Historical Resources Inventory and Evaluation Report for historic buildings, structures, and objects located within the study area for the Mirant Corporation's proposed Marsh Landing Generating Station (MLGS) electrical power plant project near Antioch, California. The proposed MLGS consists of new natural-gas–fired generation facilities and ancillary systems to be constructed within the existing Contra Costa Power Plant (CCPP) site. **Appendix A** includes project vicinity and location maps and study area map showing reference numbers for the individual resources located within the study area.

The purpose of this document is to comply with the California Environmental Quality Act (CEQA), as it pertains to historical resources, and to assess whether the architectural resources located within the project study area should be considered historical resources for the purposes of CEQA; that is, whether they are listed in, determined eligible for, or appear eligible for listing in the California Register of Historical Resources (CRHR). This study was conducted 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 Appendix B (g) of the California Energy Commission "Rules of Practice and Procedure and Power Plant Site Certification Regulations." Surveyed resources were also evaluated for potential eligibility for the National Register of Historic Places (NRHP).

The site of the proposed MLGS is on the south bank of the San Joaquin River about 2 miles east of Antioch on a 114-acre parcel north of Wilbur Avenue. A steam generation electrical power plant, CCPP, currently occupies the site (Map Reference #1 on Figure 3). The area is generally industrial, but is immediately surrounded by a vacant parcel to the west, a marina to the east, and a mixture of commercial and open land to the south. The existing built environment in and around the study area dates to the twentieth century, and most buildings and structures were constructed after World War II. No other parcels within the study area contained buildings more than 45 years old. The DPR 523 forms for the evaluated plant property are provided in **Appendix B**. The proposed water supply and discharge pipeline component of the project is about 4,500 feet long and passes through similar industrial areas and under Highway 160, east of the study area. The linear routes were subject to reconnaissance survey and required no further study.

This report concludes that CCPP at 3201 Wilbur Avenue (Map Reference #1) does not meet the criteria for listing in the CRHR or NRHP. Furthermore, none of the resources subject to reconnaissance survey along the proposed linear features of the project appeared to be historically sensitive, and they required no further study. None of the resources surveyed is considered a historical resource for the purposes of CEQA.

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ATTACHMENTS

1. PROJECT DESCRIPTION

The proposed Marsh Landing Generating Station (MLGS) will consist of new natural-gas–fired generation facilities and ancillary systems. The new units are to be constructed wholly within the existing Contra Costa Power Plant (CCPP) site.

Two approximately 1-mile-long offsite linears will be constructed to bring reclaimed water from and return wastewater to Delta Diablo Sanitation District's Bridgehead Lift Station. Potable water will be supplied by the City of Antioch. The MLGS will use natural gas that will be delivered via an existing gas supply pipeline that runs adjacent to the CCPP site.

Figure 1 shows the project location in relation to the surrounding area. The MLGS will be located within the existing CCPP site, Assessor's Parcel Number (APN) 051-031-014, in unincorporated Contra Costa County, California. The MLGS site is located on Section 16, Township 2 North, Range 2 East, on the U.S. Geological Survey (USGS) Antioch North Topographic Quadrangle Map TCA 0820. The MLGS site is located about 1/10 mile from the City of Antioch limits. The site is surrounded by industrial uses to the south, east and west, and the San Joaquin River to the north. When completed, the MLGS will occupy approximately 27 acres in the western portion of the CCPP property, generally within the footprint of the area occupied by five fuel oil tanks and an area to the east. The fuel oil tanks will be demolished to site the new generation facility. The balance of the CCPP site, 87 acres, will remain unchanged. Figure 2 shows an aerial photograph of the plant site.

2. RESEARCH AND FIELD METHODS

The study area for historic architectural resources for this project includes the CCPP site. JRP conducted an intensive survey of the property within the study area, and a reconnaissance level survey of the parcels adjacent to the survey area and along the linear features of the proposed project. The steps taken to identify possible historical resources, and conduct research and evaluation of historical resources follow California Environmental Quality Act (CEQA) Guidelines Section 15064.5.

JRP examined standard sources of information that list and identify known and potential historical resources to determine whether any buildings, structures, objects, districts, or sites had been previously recorded or evaluated in or near the project study area. JRP reviewed the current listings for National Register of Historic Places (NRHP), California Register of Historical Resources (CRHR), California Historical Landmarks, California Points of Historical Interest, and the California Office of Historic Preservation (OHP) Directory of Properties in the Historic Property Data File.[1] The data file listed the Marsh Landing Site (Primary #07-000878) as OHP status code 7, "not evaluated." This resource is the site of a former wharf, or ship landing established in about 1838. Because there is no extant structure at the site, the resource was addressed in the technical report for archeological resources prepared for this project.[2]

URS Corporation conducted a records search at the Northwest Center of the California Historical Resources Information Center at Sonoma State University for this project on February 13, 2008 (RS 07-0955) and provided the results to JRP. The search found that within the general vicinity of the MLGS study area, there are five known cultural resources (all historic properties) that have been identified and 19 additional cultural resources surveys that have been completed. These include the former Southern Pacific Railroad (now Union Pacific), the former Atchison, Topeka & Santa Fe Railroad (AT&SF) (now Burlington Northern Santa Fe), and CCPP. The previous inventory and evaluation of the plant was prepared in 2000 and required re-evaluation for this project.[3] It is addressed in the following report and attached DPR523 forms. None of the other previously evaluated resources have been found historically significant, and none appear eligible for the NRHP or CRHR. The railroad context and general historic status is discussed in Section 3. The summary descriptions and historic status of these properties are found in Section 4 and the previous evaluation form appears in **Appendix B**.

JRP conducted fieldwork on November 29, 2007, and March 19, 2008, and inventoried and evaluated the resource within the study area on the attached DPR 523 forms (Appendix B). JRP also conducted the reconnaissance survey of the linear features of the project during the March

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[1] National Park Service, National Register Information System, online database: <http://www.nr.nps.gov/> (accessed November 2007); Office of Historic Preservation, *California Historical Landmarks*, (Sacramento: California State Parks, 1996); and Office of Historic Preservation, *California Points of Historical Interest*, (Sacramento: California State Parks, May 1992); California Office of Historic Preservation, "Directory of Properties in the Historic Property Data File for Contra Costa County," December 3, 2004, 18.

[2] Mark Hale, 2008. "Archeological Reconnaissance, Marsh Landing Generating Station, Contra Costa County, California" Prepared for Mirant, California LLC. URS Corporation. San Francisco OHP, "… Historic Property Data File for Contra Costa County," December 3, 2004.

[3] Fredric L. Quivik, "Determination of Eligibility for the Contra Costa Power Plant," prepared for URS/Dames & Moore, 18 October 2000.

2008 field visit. No further historic architectural investigation was required for historic architectural resources that were less than 45 years old. Based upon the results of the background investigation and the field survey, JRP conducted research at a variety of libraries and repositories, including: Contra Costa County Historical Society, California State Library, Sacramento; and Shields Library, University of California, Davis, as well as reviewing data collected from the Water Resources Center Archives, and Earth Sciences Map Library, at the University of California, Berkeley.

JRP used the research data collected to prepare a historic context to address the property types and pertinent themes of industrial development in the study area, including steam generated power technology and general land use history. The historic themes are discussed in Section 3 of this report. Property descriptions and evaluations are summarized in Sections 4 and 5. JRP evaluated the resources within the study area 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 (PRC), and also under NRHP and CRHR criteria, on the DPR 523 forms included in Appendix B. Refer to Section 6 for JRP staff professional qualifications, and to the references listed in Section 7 for a complete listing of materials consulted.

3. HISTORIC OVERVIEW

The following section provides historical background regarding the general transportation and development of the general project area, with specific focus upon the land use history of the study area and parcels immediately adjacent to the study area. This information provides the appropriate historical context within which to evaluate the historical significance of historic architectural resources surveyed.

3.1. Early Settlement and Industry: 1830s -1900

Contra Costa County was one of the original California counties established in 1850. It takes its name, meaning "the opposite coast," from its location on the other side of the bay from San Francisco. When California was under the governance of Mexico, Governor Jose Castro granted Rancho Los Meganos (sand dunes), in eastern Contra Costa County, to Jose Noriega in 1835. The tract encompassed 17,000 acres of land, including the study area for this project, south of the San Joaquin River. In 1837 Noriega sold this rancho to John Marsh, one of the first American residents of Mexican California.[4] Marsh established a home and a working ranch on the grant. During the gold rush, Marsh had some success mining gold, but also profited by supplying wheat, fruit, beef, and pork produced on this Los Meganos ranch to miners from a landing on the river.[5]

John Marsh arrived in California in 1836 after winding his way through Massachusetts as a student at Harvard University, an Indian Agent and a tutor for an army Colonel's children in Minnesota, and as a shopkeeper in Missouri. His purchase of Rancho de Los Meganos, a 12- by 10-mile area adjacent to the San Joaquin River, made him among the first Americans to settle in the San Joaquin Valley. He practiced medicine, treating the sick and injured out of his adobe, as well as farming and raising cattle. He built the first wharf in the area and used it to ship his cattle, excess grain, and vegetables to Antioch, where they continued on to market in San Francisco (see figures below). A smokehouse, blacksmith shop, and a warehouse were also located at the landing. When gold seekers began to pass through the area on their way to the gold fields, Marsh built a long pier at his landing to accommodate larger vessels and he sold his products to miners and trading vessels. Marsh's Landing was also the site of the first mail delivery to Antioch; mail was dropped off at the landing and then delivered in town. By 1850 he was one of the wealthiest and most influential men in California. The landing was located on the waterfront of the CCPP parcel (Map Reference #1).[6]

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[4] Mae Fisher Purcell, *History of Contra Costa County* (Berkeley: Gillick Press, 1940), 91.

[5] Donovan Lewis, *Pioneers of California* (San Francisco, CA: Scottwall Associates, 1993), 322-334; *History of Contra Costa County, California* (1882: reprint, Oakland, CA: Brooks-Sterling Company, 1974), 480.

[6] Dave Weinstein, "Who Was John Marsh?" San Francisco Chronicle, (December 7, 2002), HO-1; Ann Wolfe, "John Marsh," East Contra Costa Historical Society and Museum, accessed online at http://www.theschoolbell.com/history/early/marsh.html, November 9, 2007; "Marsh Landing," The History Center: Contra Costa County Historical Society, (October 25, 2007); Southern Energy, "Section 8.3 Cultural Resources," *Application for Certification: Contra Costa Power Plant Unit 8 Project*, (April 2000), 9.

Marsh's Landing, ca. 1853. Detail from: [Map of the Rancho Los Meganos, n.d.], Land Case No. 107, by J. E. Whitcher. U.S. District Court, Northern District California, Bancroft Library, UC Berkeley.

The gold rush brought additional settlers who saw the area as ideal for river commerce. In early 1849, two brothers, William W. and Joseph Smith, founded the town of Smith's Landing, which was later renamed Antioch.[7] Its location on a navigable waterway allowed commercial, shipping, and industrial concerns to develop quickly, catering to prospectors traveling to the gold mines, as well as local ranchers and farmers. Eventually several wharves dotted the waterfront and provided landings for incoming freight and for the exportation of local products from such businesses as J.C. McMaster's Albion Pottery, the Antioch distillery, and the Antioch Lumber Company.[8] Coal mining in the vicinity of Mount Diablo contributed to the growth of Antioch in the 1870s, but the mines gave out by the 1880s. Paper milling, an industry that would endure in the area into the 1990s, began with M.D. Keeney's mill established in 1889 in downtown Antioch.[9] In the early twentieth century, industry continued to expand in Antioch with the location of several large industrial plants. The biggest were the California Paper and Board Mill, California Packing Corporation, Fulton Shipyards, and Hickmont Canning Company. Adding to the industrial potential of the area was the construction of the first Antioch Bridge in 1926 across

[7] Purcell, *History of Contra Costa County*, 704-705; George Emanuels, *California's Contra Costa County: An Illustrated History* (Fresno, California: Panorama West Books, [n.d.]), 214; Antioch Chamber of Commerce, *This is Antioch* ([Antioch]: Chamber, 1952).

[8] Robert Daras Tatam, *Old Times in Contra Costa* (Pittsburg, CA: Highland Publishers, 1993), 28, 59; *History of Contra Costa County, California* (1882: reprint, Oakland, CA: Brooks-Sterling Company, 1974), 483; Boyson, *Some Historical Highlights of the History of Pittsburg* (Pittsburg, Ca: n.p. 1964), 3; Emanuels, *California's Contra Costa County*, 227.

[9] Emanuels, *California's Contra Costa County*, 213, 214, 218; Tatam, *Old Times in Contra Costa*, 66; Moran, "For Over 100 Years," Emanuels, *California's Contra Costa County*, 219.

the San Joaquin River. The 1926 bridge was replaced in 1978 by the existing bridge, built at the same location. The span is just east of the study area.[10]

Antioch was not only advantageously located along a navigable waterway, it was also favored by railroad engineers seeking a route to San Francisco. The Southern Pacific Railroad laid tracks which passed about two miles south of the study area in 1878, and, in 1900, the AT&SF line crossed the area just south of the study area.[11]

3.2. Development within the Study Area: 1900-present

Available waterfront land, access to the railroad, and general growth in California eventually encouraged Antioch industries to expand eastward, but this development was slow during the late nineteenth and early twentieth centuries. Most of Section 16, T2N/R2E (the site of the power plant, Map Reference #1) was owned by Henry F. Beede by 1900, and appears to have remained in his ownership, or that of his estate, until Pacific Gas and Electric (PG&E) acquired the parcel for development of its new electric power generating plant in the late 1940s. Beede was a longtime resident of the area, an early employee and later owner of a longtime lumber company that owned waterfront property in Antioch. By 1900, and perhaps earlier, Henry Beede, his wife Margritte, and eight of their children were living at the property, which was still held by owner Mr. Peabody. Beede acquired the land within the next few years and was shown as the owner on a 1908 county map that also clearly shows Marsh's Landing on the waterfront of the parcel in Section 16 (see below). The Beede family retained the property until at least the late 1930s.[12] During this period, the land between Antioch and Oakley in the general vicinity of the study area was devoted to apricot, olive, and almond orchards, as well as vineyards.[13]

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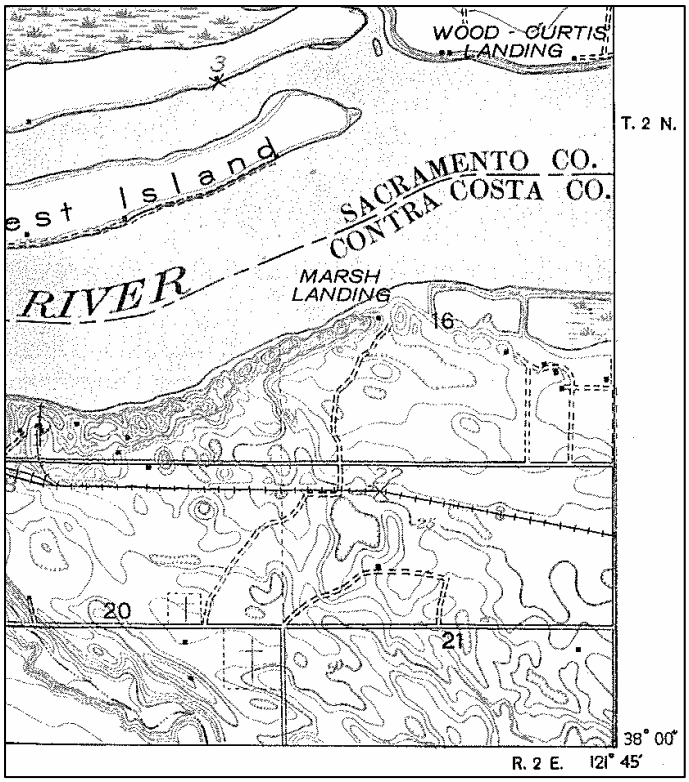
[10] Sanborn Insurance Company, *Antioch, Contra Costa County* (New York: Sanborn Insurance Company, 1926); Antioch Historical Society, *Antioch* (San Francisco: Arcadia, 2005), 95-96, 118.

[11] Keith L. Bryant, *History of the Atchison, Topeka and Santa Fe Railway* (New York: Macmillan, 1974), 173-181; L.L. Waters, *Steel Trails to Santa Fe* (Lawrence: University of Kansas Press, 1950), 133-140; Richard B. Rice, William Bullough, and Richard Orsi, *The Elusive Eden: A New History of California* (New York: Alfred A. Knopf, 1988), 217-236; J. L. Brown, *The Mussel Slough Tragedy*, ([n.p.], 1958), 123-125.

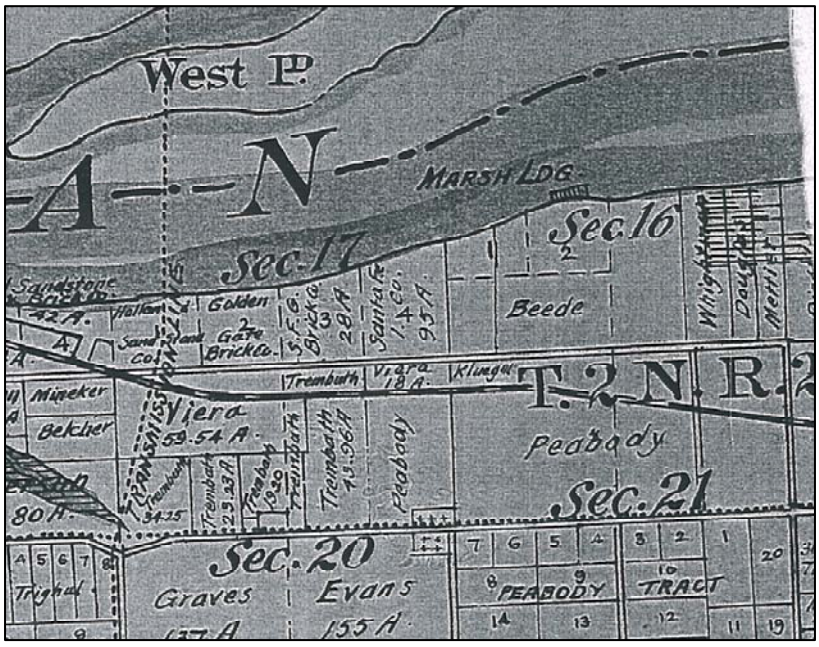
[12] Frederick J. Hulaniski, *The History of Contra Costa County, California* (Berkeley, CA: Elms Publishing Co., 1917), 570-572; Harry Stoll, "One of the Last Antioch Pioneers," *The Brentwood Press* (02 February 2007); U.S. Census Bureau, "Contra Costa County," Population Schedules, 1870, 1880, 1900, 1910; *Plat showing approximate location of the S.F. and S.J.V.R.R. in the vicinity of Antioch, Contra Costa Co.* [s.l., s.p.], 1902; T.A. McMahon, *Official Map of Contra Costa County* (s.l.: T.A. McMahon, 1908); P.A. Haviland, *Contra Costa County, California* (Oakland: Oakland Blueprint Co., 1915); Contra Costa County Title Company, *Industrial, Agricultural and Road Map of Contra Costa County* (Oakland: Thomas Brothers, 1930).

[13] U.S. Census Bureau, "Contra Costa County," Population Schedules, 1900, 1910, 1920, and 1930; Contra Costa County Title Company, *Industrial, Agricultural and Road Map of Contra Costa County* (Oakland: Thomas Brothers, 1930).



Marsh's Landing, 1906.

Detail from: U.S. Geological Survey, *California Sacramento Valley*. Sheet Q (USGS, 1906).



Beede Property and Marsh's Landing, 1908.

Detail from: T. A. McMahon, *Official Map of Contra Costa County* (1908).

The study area for this project is located within an industrial corridor that developed extensively after World War II. Prior to the mid-1940s, the study area was rural and contained only a few small buildings. The land immediately adjacent to the river was sandy and unfit for cultivation, while south of Wilbur Avenue land remained agricultural for the next 30 years.[14] The Antioch area developed enormously during World War II. The U.S. Army established Camp Stoneman east of Pittsburg and local industries boosted production to meet wartime needs. The economic boom persisted after the war as industry boosted production to meet the desires of the American consumer, and expanded their facilities or found open land for new plants. Antioch had inexpensive open land, a strong industrial tradition, available water, and access to rail, water, and highway transportation.[15] Rather than building in Antioch proper, however, industries located outside the city limits to avoid city fees and taxes. The waterfront west of Antioch was marshland, so the shoreline to the east, along Wilbur Avenue, grew into a post-war industrial and commercial zone. In the decade after the war, a second Fibreboard paper mill, the PG&E power plant (see Map Reference #1), a Crown Zellerbach paper mill, and a Kaiser Cement and Gypsum facility were all built on Wilbur Avenue between Antioch and the Antioch Bridge. Large plants became so prevalent on Wilbur Avenue that it became known locally as "Industrial Row." The industries thrived for several decades until salt water intrusion, increased environmental regulations, and changes in consumer demand and market conditions began to affect operations and diminish profits.[16]

Modern industrial development of the proposed project site occurred in 1949 when PG&E built a steam generated electrical power plant, known as the CCPP, at 3201 Wilbur Avenue. PG&E chose the location near Antioch for its proximity to residential and industrial customers, access to cooling water, and transportation. Operation began in the summer of 1951 and two additional generating units at the plant came on line in 1953.[17]

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[14] USGS, *Antioch Quadrangle*, 15 minute, 1:62,500 (Washington: USGS, 1908; Contra Costa County Title Company, *Industrial, Agricultural and Road Map of Contra Costa County* (Oakland: Thomas Brothers, 1930); Contra Costa County Development Company, *Contra Costa County* (Richmond, California: Contra Costa County Development Company, 1943); Richmond Martinez Title Company, *Map of Antioch and Vicinity* (Martinez, California: Richmond Martinez Title Company, 1952).

[15] Antioch Chamber of Commerce, *This is Antioch*; Emanuels, *California's Contra Costa County*, 219; *Antioch, California: Gateway to the Delta*, 8-9; Tatam, *Old Times in Contra Costa*, 43; *Antioch Ledger*, April 7, 1953.

[16] Antioch Historical Society, *Antioch* (San Francisco: Arcadia, 2005), 95-96; USGS *Antioch North Quadrangle*, 7.5 minute, 1:24,000 (Washington: USGS, 1953); Antioch Chamber of Commerce, *This is Antioch.*

[17] Edgar J. Garbarino, A.M. ASCE, "Design Saves Construction Dollars on Contra Costa Power Plant," *Civil Engineering* (May 1953), 31-33; Coleman, *PG&E of California*, 335; I.C. Steele, "Steam Power Gains on Hydro in California," *Civil Engineering* (January 1950), 17-18.

Aerial photograph of the Contra Costa Steam Plant, showing construction in progress for Units 4 and 5. Cooling water intake structure in the river is north of the boiler building for Units 1, 2 and 3. Cooling water discharge is shown immediately above fuel oil tanks. *Photograph by P. G. & E. News Bureau, November, 1951.*

By the time that the CCPP facility opened, steam powered generation already had a long history in California. These plants had been the first electric generating facilities in California. British designer Sir Charles Parsons built the first steam turbine-generator in 1884, and almost immediately others began making improvements upon his original concept, but the earliest steam generating plants were little more than steam engines converted to drive a generator rather than a locomotive. By the beginning of the twentieth century, engineers designed steam turbines to replace the original steam engine power plants. Aegidius Elling of Norway is credited with creating the first applied method of injecting steam into the combustion chambers of a gas turbine engine in 1903-04, and within a relatively short time the technology and capacity of these engines to supply power and electricity grew by leaps and bounds. These advances soon brought electricity to a wide range of industrial and domestic applications, but the materials needed to withstand the high temperatures of modern turbines were not available in the beginning stages of steam turbine development. Technology and improvements for steam turbine engines advanced throughout the 1920s and 1930s, leading to a generation of more efficient turbine power plants by the 1950s, when the CCPP was originally designed and built. During this time, utilities also

retired or replaced many of the older steam-electric plant generating units and constructed more modern units.[18]

Steam power generation was part of California's power production throughout the twentieth century, although the role of steam generation diminished considerably during the pre-World War II era when massive hydroelectric generating plants came on line throughout the state. As early as 1920, hydroelectric power accounted for 69 percent of all electrical power generated in California. In 1930, that figure had risen to 76 percent; and by 1940 hydroelectric sources provided 89 percent of California's electricity. Rapid construction of new thermal or steam-powered electric generating units, however, accounted for most of the new generation capacity in the state after World War II. By 1950, hydroelectricity accounted for only 59 percent of the total power generated, falling to 27 percent in 1960. Some new hydroelectric plants were built during the 1960s, chiefly associated with federal and state water projects, but by 1970, hydroelectric plants accounted for only 31 percent of all electricity generated in California.[19]

These statistics, however, tend to obscure the work of PG&E and Southern California Edison (SCE), California's largest electrical utility providers, which both built 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 may be attributed to several converging trends in the mid- to late-1920s. First, a persistent drought in California caused the major utilities to begin to question the dependability of systems relying so heavily upon hydroelectricity. This drought began in 1924 and continued, on and off, for a decade. At about the same time, new power plants on the East Coast (where steam had always played a more important role than in California) achieved 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 ninefold. In addition, new natural gas lines were completed that could bring new supplies to both Northern and Southern California in the late 1920s, tapping large reserves in the San Joaquin Valley. Natural gas has played an important role in steam electric power generation in California since that time.[20]

The confluence of these various factors – a drought, new steam generator technologies, and new supplies of natural gas – induced PG&E, SCE, and other utilities to begin construction of large steam plants during the late 1920s and early 1930s. In 1929, the Great Western Power Company (absorbed by PG&E in 1930) built a large steam plant on San Francisco Bay, near the Hunters Point shipyard, fitted with two 55-MW generators.[21] PG&E also built a steam plant in Oakland in 1928, called Station C, and a few years later a PG&E vice-president for engineering wrote:

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[18] Heinz Termuehlen, *100 Years of Power Plant Development: Focus on Steam and Gas Turbines as Prime Movers* (New York: ASME Press, 2001), 11, 21-28; Douglas Stephen Beck and David Gordon Wilson, *Gas Turbine Regenerators* (New York: Chapman & Hall, 1996), 30; William A. Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company* (Glendale, CA: Trans-Anglo Books, 1984), 8.

[19] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: University of Akron Press, 1997), 374.

[20] Williams, *Energy and the Making of Modern California*, 278; Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company* (New York: McGraw-Hill, 1952), 306.

[21] This plant still exists. It was fitted with new units in 1948, at the same time that the Kern Power Plant was being constructed (Coleman, *PG&E of California*, 298).

"under the circumstances which now prevail, it is natural to question the future of hydro in California." [22]

But it was in response to the demands of post-World War II growth in California that PG&E built new steam generation plants throughout the state. Wartime increases in population continued after the end of hostilities and general statewide economic expansion spurred rapid growth in the residential, commercial, and industrial sectors. The need to generate power was imperative and PG&E expanded their systems along with the rest of California's energy industry. Because most of the more favorable hydroelectric sites in California had already been developed, and the cost of steam generating facilities had been reduced by technological developments in design and abundant natural gas resources, steam plants became the more favorable option. Steam turbine power plants were cheaper and quicker to build than hydroelectric plants and utility companies moved away from hydroelectricity during this period—steam turbines became the generator of choice. Such plants conserved water and kept costs down for the business and the consumer.[23]

PG&E steam generation plants built during the postwar period relied upon proven technologies and were assembled quickly and inexpensively relative to earlier plants. In a detailed article in 1950 in *Civil Engineering*, PG&E Chief Engineer I. C. Steele summarized the design criteria that went into construction of four major steam plants the company had under construction at that time, at Moss Landing, Contra Costa, Kern, and Hunters Point in San Francisco. These plants had much in common with each other and with other steam plants under construction in the state. The site selection criteria were the same in all cases: close to load centers to reduce transmission costs; accessibility to fuel supplies; near a water supply; in a location where land was inexpensive; and on land that could provide a good foundation. By the mid 1950s, Walter Dickey, an engineer from Bechtel, touted recent design innovations that improved the economics of steam plant construction even more. These plants, he argued, could be built economically by minimizing the structural material, chiefly by creating semi-outdoor turbo-generator units. Furthermore, virtually all of these plants were designed to be expanded if market conditions warranted, and most of them were.[24]

The decades between 1950 and 1970 were the years of peak expansion of steam generating capacity for PG&E, SCE, and other utility companies. PG&E operated 15 steam electric plants in California in 1950, and during the following decade added several new plants and expanded older ones. Chief among these were the Kern plant (1948-50), Contra Costa (1951-53), Moss Landing (1950-52), Morro Bay (1955), Hunters Point (addition 1958), Humboldt Bay (1956-58), and Pittsburg (1959-60). The Pittsburg plant was at the time of its construction the largest steam station in the west, with a capacity of more than 1,300,000 kW in 1960. By the late 1970s, there were more than twenty fossil fuel thermal plants in California owned by various power

[22] "1928 Steam Plants Account for 45 Percent of New Generating Capacity," *Electrical West* (February 2, 1929): 80-81; R.W. Spencer, "Cooling Water For Steam Electric Stations in Tidewater, "*Transactions of the American Society of Civil Engineers* 126 (1961): 294, 300; Williams, *Energy and the Making of Modern California*, 279.

[23] Myers, *Iron Men and Copper Wires*, 200; Williams, *Energy and the Making of Modern California*, 277-78, 282-83.

[24] I. C. Steele, "Steam Power Gains on Hydro in California," *Civil Engineering* (January 1950): 17-21; Edgar J. Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," *Civil Engineering* (May 1953): 31-33; Walter L. Dickey, "The Design of Two Steam Electric Plants," *ASCE Transactions* (1956): 253-273.

companies and clustered around San Francisco Bay, the greater Los Angeles area, and in San Diego County, along with a few interior plants in San Bernardino, Riverside, and Imperial counties, and a few on the Central Coast.[25]

Most of the oil- or gas-fired steam plants currently in use in California were installed in the period from about 1950 through 1970. After 1970, the major utilities began to look for alternative energy sources, ranging from nuclear power to wind, geothermal, and other "green" energy sources, other than traditional thermal or hydroelectric systems. Despite these efforts, however, fossil fuel steam generation remains the backbone of electrical generating capacity in California and there are currently 34 steam turbine power plants in California of a variety of ages and locations.[26]

Modern industrial development of the plant site in Contra Costa (Map Reference #1) occurred in 1949 when PG&E built a steam generated electrical power plant, known as CCPP. As PG&E Chief Engineer I. C. Steele explained, the company chose this location near Antioch for its proximity to residential and industrial customers, and ready access to cooling water and transportation. Initial construction consisted of the semi-outdoor boilers, turbines, and generators for Units 1, 2, and 3; four fuel-oil storage tanks; a 230,000 volt switchyard; and water supply and discharge treatment equipment. Operation began in the summer of 1951 with the three generating units producing 330 kilowatts of power. Even before this date, construction was underway on two additional generating units at the plant (Units 4 and 5), each with a capacity of 120 kilowatts (see aerial photograph, below). These went into service in October 1953, giving the Contra Costa plant a total generating capacity of 570 kilowatts.[27] The plant continued to grow in the following decade with generating Units 6 and 7, each with a capacity of 330 megawatts, going on line in 1964. PG&E added three new fuel-oil storage tanks in the 1970s.[28] The company shut down Units 1 through 5 in 1994 and sold the CCPP to Southern Energy California in 1999. Southern Energy used Units 4 and 5 as synchronous condensers for Units 6 and 7. Mirant Delta, LLC (now Mirant California, LLC) acquired Southern Energy by early 2001 and continues to operate the plant. Recent improvements and changes at the facility include installation of low nitrogen oxide burners on Unit 6 in early 2001, and selective catalytic reduction equipment designed to reduce air emissions on Unit 7 in December 2001. A new metal-frame metal-sided warehouse was constructed east of Units 6 and 7 in 2002. The turbines,

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[25] Annual Reports of the Southern California Edison Company, various years; Spencer, "Cooling Water For Steam Electric Stations in Tidewater," 280-302; Steele, "Steam Power Gains on Hydro in California," 17-19; Dickey, "The Design of Two Steam Electric Plants," 253-255; "Haynes Steam Plant Will Grow With Demand," *Southwest Builder and Contractor* (October 12, 1962): 24-27; Williams, *Energy and the Making of Modern California*, 257.

[26] The California Energy Commission retains figures on the fuel type for all electricity used in the state, even if the power is generated out of state. In 1999, natural gas-fired generators were responsible for 31 percent of all electricity used in the state, compared with 20 percent for hydroelectricity. Coal-fired steam plants, all of them out of state, accounted for 20 percent of the total. "Green" sources accounted for 12 percent. The percentage of in-state natural gas-fired steam electricity is much larger than 31 percent, since all of the coal and much of the hydroelectric power is generated out of state. See www.energy.ca.gov/electricity/system_power.

[27] Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," 31-33; Coleman, *PG&E of California*, 335; Steele, "Steam Power Gains on Hydro in California," 17-18.

[28] Steele, "Steam Power Gains on Hydro in California," 17-21; "Power Plants & Substations," *Southwest Builder and Contractor* (January 5, 1962); Frederic L. Quivik, "Determination of Eligibility for the Contra Costa Power Plant," prepared for URS/Dames & Moore, 18 October 2000, 2-5.

boiler house, and stacks for Units 4 and 5 were retired in December 2007 and the associated transmission lines and towers were removed in early 2008.[29]

3.3. Other Development in the Vicinity of the Study Area

The land outside the study area to the east and west was also developed as part of the Wilbur Avenue industrial corridor and waterfront during the mid to late twentieth century. The waterfront and land immediately adjacent to the river was sandy and was home to a few wharves and marinas, as well as a lumberyard. Land south of Wilbur Avenue was more agricultural (mostly vineyards and fruit orchards), and remained so through the early 1950s when the CCPP was constructed.[30]

The parcel just outside the study area to the east was developed in late 1930s by the Sportsmen Yacht Club. Founded in 1930, the club leased a plot of land along the San Joaquin River in 1932 and purchased the ferryboat *Sausalito* from Learner and Rosenthal of Oakland in 1934 for use as a clubhouse. The *Sausalito* was designed for the North Pacific Railroad Company by J.W. Dickie and was built in 1894 at the Fulton Iron Works in San Francisco. As the first successful oil-burning ferry in the area, it carried passengers during the day and railroad freight cars at night. Her narrow-gauge tracks were removed in 1903, adding 200 seats to the 1,300 seating capacity. The ferry remained in service until 1930 and was sold to Learner and Rosenthal in 1933. The club purchased the waterfront site on Wilbur Avenue in 1939 and built a 100 by 300-foot land-locked harbor for the clubhouse and towed the ferryboat to the site.[31]

The first large industry to move into the parcel immediately west of the study area was the San Joaquin Division of Fibreboard Incorporated. Fibreboard had been operating a paper mill in the city of Antioch (the California Paper and Board Mill) for more than 20 years. In 1946, the company began a 10-year, $50 million expansion program that involved acquiring timberland, railroads, logging roads, and receiving yards located throughout California. Fibreboard purchased the vacant parcel west of the CCPP at 2603 Wilbur Avenue as part of this expansion and built a state of the art paper-packaging mill. The $20 million plant began limited production on July 28, 1949, and full production in 1950. The mill produced nine-point corrugated cardboard for boxes, and bleached kraft board used in food and milk containers. When it opened, it was the largest such plant on the West Coast, and the only kraft mill in California.[32] The company's three facilities in Antioch dominated the local economy, employing more than

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[29] Quivik, "Determination of Eligibility for the Contra Costa Power Plant," prepared for URS/Dames & Moore, 18 October 2000, 2-5; Chuck Hicklin, Engineering Manager, Mirant California, LLC, communication with M. Bunse and S. Riem, JRP Historical Consulting, LLC, March 18, 2008.

[30] USGS, *Antioch Quadrangle,* 15 minute, 1:62,500 (1908); Contra Costa County Title Company, *Industrial, Agricultural and Road Map of Contra Costa County* (1930); Contra Costa County Development Company, *Contra Costa County* (1943); Richmond Martinez Title Company, *Map of Antioch and Vicinity* (1952).

[31] Kathie Hammer, "Sportsmen Yacht Club History," *Sportsmen Yacht Club*, accessed online at http://www.sportsmenyc.org/, March 3, 2008.

[32] Donnan, "New Paper Board Mill for California;" *Map of Antioch and Vicinity* (Martinez, California: Richmond Martinez Title Company, 1952); "All Wrapped Up," *Fortnight: The Newsmagazine of California* 8, No. 11 (1950): 20; *Antioch Ledger,* 28 July 1949, p.1; *Antioch Ledger* (29 December 1950): 1; E.S. Pladwell, "Double Production Lines," *Pacific Factory: The Plant Management and Production Magazine of the West* 73, no. 6 (1950): 21, 46.

half of its residents in the 1950s. Paper milling continued on this parcel until 1991. The plant was demolished in stages, beginning in the late 1990s and continuing through about 2006.[33]

Land south of Wilbur Avenue across from the CCPP site tended to be agricultural properties transected by the railroad alignments and local roadways. At the turn of the twentieth century, the land south of Wilbur Avenue was generally held in large parcels of a few hundred acres, often devoted to orchard and vineyard crops. Several families in the area were of first and second generation Portuguese ancestry, like the Manuel and Elizabeth Vierra family who farmed on the south side of Wilbur Avenue between about 1910 and the late 1930s.[34] Topographic maps and aerial photographs indicate that the former Vierra holdings were largely cleared of trees by the early 1950s, while a small portion of the orchard or vineyard existed on the southern portion of the lot at 3000 Wilbur Avenue. The rectangular footprint of what is now the commercial building on the lot is visible in both 1950 and 1959 aerial photographs, with a row of small dwellings to the east, located on an adjacent parcel. By this time, the land had been subdivided and within the next two decades went out of production as an orchard or vineyard. Land in this area is now open pasture and roadside commercial.[35]

[33] Antioch Historical Society, *Antioch* (San Francisco: Arcadia, 2005), 95-96; Sam Richards, "Antioch Pulp Mill to be Sold Piecemeal," *Contra Costa Times*, 9 November 1992; Mike Moran, "Gaylord Won't Try To Reopen East Mill," *Contra Costa Times*, 20 July 1991; Department of Toxic Substances Control, "Cleanup Status at Nine Gaylord Container Corporation Sites" (August 2005), online at: http://www.dtsc.ca.gov/HazardousWaste/Projects/.

[34] T.A. McMahon, *Official Map of Contra Costa County*, 1908, Bancroft Library, University California, Berkeley; P.A. Hawland, Contra Costa County, 1915, #3, sheet 2 Bancroft Library, University California, Berkeley ; Thomas Brothers, *Industrial, Agricultural and Road Map of Contra Costa County* (Martinez, CA: Contra Costa County Title Company, 1930); U.S. Census Bureau, "Contra Costa County," Population Schedules, 1910, 1920, and 1930; Ralph R. Arnold, *Official Map of Contra Costa County* (Martinez, California: n.p., 1938); Contra Costa County Title Company, *Industrial and Agricultural Map of Contra Costa County* (Oakland: Thomas Brothers, 1928); Charles F. Metsker, *Metsker's Map of Contra Costa County* (San Francisco: Charles F. Metsker, 1939).

[35] Aerial Maps, BUU3G52 and BUU3952, 1950, University of California, Berkeley, Bancroft Library, Map collection; Richmond Martinez Title Company, *Map of Antioch and Vicinity*, January 1952, University of California, Berkeley, Bancroft Library, Map collection; U.S. Agricultural Stabilization and Conservation Service, "Aerial Photographs of Part of Eastern Contra Costa County" (Salt Lake City, Utah : ASCS, 1950); USGS, "Antioch North," *7.5' Topographic Series*, (Washington, D.C.: USGS, 1953 and photorevised 1968); U.S. Agricultural Stabilization and Conservation Service, "Contra Costa County" (Sacramento: Cartwright & Company, 1958-1959); U.S. Agricultural Stabilization and Conservation Service, "Contra Costa County" (Salt Lake City, Utah: ASCS, 1966); Contra Costa County Assessor, Property Records, APN 051-032-011.

4. DESCRIPTION OF RESOURCES

The area along Wilbur Avenue in and around the study area is east of the City of Antioch on the south bank of the San Joaquin River. It is primarily a mixed industrial and agricultural area with some small commercial properties. The study area is comprised of the CCPP site north of Wilbur Avenue (Map Reference #1). Some buildings or structures more than 45 years old are located in the general vicinity, but are outside of the project APE boundaries and did not require further study. The remainder of the APE and the reconnaissance area along the linear features of the project contained buildings or structures less than 45 years old that did not require further study. Map Reference #1 was fully inventoried and evaluated on the attached DPR523 forms (Appendix B).

Map Ref Number	Parcel Addresses	APN	Date of Construction
MR #1	3201 Wilbur Avenue	051-031-014	1951/1953/1964
n/a	3050 Wilbur Avenue	051-032-013	2000
n/a	Delta Diablo Sanitation District Bridgehead Lift Station	051-051-023, 051-051-024	ca. 2000

4.1. 3201 Wilbur Avenue, Map Reference #1

CCPP was evaluated in 2000 and described in detail in the DPR 523 form prepared at that time (see Appendix B). This facility was field checked as part of the current project and remains largely the same since the previous survey of the property. Initial construction in the early 1950s consisted of the semi-outdoor boilers, turbines, and generators for Units 1, 2, and 3; four fuel-oil storage tanks; a 230,000 volt switchyard; and water supply and discharge treatment equipment. Generating Units 1 through 3 produced 110 MW of power each when they started operating in 1951, and Units 4 and 5 added a capacity of 120 MW each in 1953.[36] The plant was expanded to include generating Units 6 and 7, each with a capacity of 330 MW, in 1964, and three new fuel-oil storage tanks in the 1970s.[37] PG&E shut down Units 1 through 3 in 1994 and sold the CCPP to Southern Energy Delta (now known as Mirant Delta in 1999. Prior to Mirant Delta's acquisition of the CCPP in 1999, PG&E converts Units 4 and 5 from electric generation units to synchronous condensers to support the transmission system. Those elements of the plant that have been altered since the 2000 survey include the installation of low nitrogen oxide burners on Unit 6 in early 2001 and Selective Catalytic Reduction equipment, designed to reduce air emissions, installed on Unit 7 in December 2001. A new metal frame, metal sided warehouse was constructed east of Units 6 and 7 in 2002, however, this portion of the CCPP parcel has been subdivided and sold to PG&E as a part of the Gateway Generating Station. Units 4 and 5 were retired from synchronous condenser service in December, 2007 and the associated transmission lines and towers were removed in early 2008.[38]

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[36] Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," 31-33; Coleman, *PG&E of California*, 335; Steele, "Steam Power Gains on Hydro in California," 17-18.

[37] Steele, "Steam Power Gains on Hydro in California," 17-21; "Power Plants & Substations," *Southwest Builder and Contractor* (January 5, 1962); Frederic L. Quivik, "Determination of Eligibility for the Contra Costa Power Plant," prepared for URS/Dames & Moore, 18 October 2000, 2-5.

[38] Chuck Hicklin, Engineering Manager, Mirant California, LLC, communication with M. Bunse and S. Riem, JRP Historical Consulting, LLC, March 18, 2008.

5. FINDINGS AND CONCLUSIONS

5.1. Evaluation Criteria

JRP evaluated the properties in the study area using the criteria for the CRHR to determine if they are historical resources of the purposes of CEQA and also evaluated resources for potential eligibility for the NRHP. The State of California references cultural resources in CEQA, PRC Division 13, Sections 21000-21178); archaeological and historical resources are specifically treated under Sections 21083.2 and 21084.1, respectively. California PRC 5020.1 through 5024.6 (effective 1992) created the CRHR and set forth requirements for protection of historic cultural resources. The criteria for listing properties in the CRHR are in Section 15064.5(a)(2)-(4) of the CEQA Guidelines, which provide the criteria from Section 5024.1 of the California PRC. The CRHR is in the California Code of Regulations Title 14, Chapter 11.5.

The CRHR is modeled after the NRHP, and OHP's instructions for interpreting and applying the California criteria include directions to use the National Park Service, *National Register Bulletin 15*, "How to Apply the National Register Criteria for Evaluation," and other National Register bulletins.[39] Eligibility for listing in the CRHR rests on twin factors of significance and integrity. A property must have both significance and integrity to be considered eligible. Loss of integrity, if sufficiently great, will overwhelm historical significance a property may possess and render it ineligible. Likewise, a property can have complete integrity, but if it lacks significance, it must also be considered ineligible.

Historic significance is judged by applying CRHR Criteria 1 through 4. Properties may be significant at the local, state, or national level:

- Criterion 1: association with events or trends significant in the broad patterns of our history;
- Criterion 2: association with the lives of significant individuals;
- Criterion 3: a resource that embodies the distinctive characteristics of a type, period, or method of construction, represents the work of a master, or that possesses high artistic values;
- CRHR Criterion 4: has yielded, or is likely to yield, information important to history or prehistory.[40]

In addition to meeting one or more of the four eligibility criteria, properties considered for the CRHR must also retain *integrity*, which means "…the authenticity of an historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's

[39] The most widely accepted guidelines are contained in U.S. Department of the Interior, National Park Service, *Guidelines for Applying the National Register Criteria for Evaluation*, National Register Bulletin 15 (Washington D.C.: U.S. Government Printing Office, 1991).

[40] California Office of Historic Preservation, *California Office of Historic Preservation Technical Assistance Bulletin #10 – California State Law and Historic Preservation: Statues, Regulations, and Administrative Polices Regarding Historic Preservation and Protection of Cultural and Historical Resources* (Sacramento: California Department of Parks and Recreation, May 23, 2001), 69-70.

period of significance."[41] In other words, the significant physical features of a property must remain intact in order to communicate its significance under one or more of the significance criteria. Seven aspects of integrity are considered: location, design, setting, workmanship, materials, feeling, and association. These seven aspects can be roughly grouped into three types of integrity considerations. Location and setting relate to the relationship between the property and its environment. Design, materials, and workmanship relate to construction methods and architectural details. Feeling and association are the least objective of the seven criteria, pertaining to the overall ability of the property to convey a sense of the historical time and place in which it was constructed.

Historic buildings, structures, and objects are rarely found eligible under NRHP Criterion D (CRHR Criterion 4). Although these properties can occasionally be recognized for the important information they might yield regarding historic construction or technologies, most are otherwise well documented and the properties themselves are not principal sources of important information.

Under CEQA Guidelines, Section 15064.5 (a), a "historical resource" includes:

- A resource listed in or eligible for the CRHR;
- A resource listed in a local register of historical resources, as defined in Section 5020.1(k) of the PRC or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the PRC;
- Any object, building, structure, site, area, place, record, or manuscript that a lead agency determines historically significant, provided the determination is supported by substantial evidence in light of the whole record;
- A resource so determined by a lead agency as defined in PRC Sections 50203.1(j) or 5024.1.
- Historical resources listed in, or determined eligible for, the NRHP are automatically listed in the CRHR, Section 5024 (d)(1)(2) of the PRC.

5.2. Evaluation

All buildings or structures in the study area around the proposed MLGS project location more than 45 years old received evaluation in accordance with Section 15064.5(a) (2)-(3) of the CEQA guidelines, using the criteria outlined in Section 5024.1 of the California PRC. None of the more recently constructed buildings appear to require an evaluation as exceptionally significant. None of the built environment resources surveyed meet the criteria for listing in either the NRHP or CRHR, and none are historical resources for the purposes of CEQA. The evaluation of the resources is summarized below, and is also included in the attached DPR 523 forms (Appendix B).

[41] California Office of Historic Preservation, *California Office of Historic Preservation Technical Assistance Bulletin #10*, 69-70.

Map Reference #1, 3201 Wilbur Avenue

CCPP does not appear to meet the eligibility criteria for listing in the NRHP or the CRHR, and it is not a historical resource for the purposes of CEQA, because it is not significant within the context of the development of electrical generation, steam power plants, or PG&E (NRHP Criterion A, CRHR Criterion 1). Instead, the plant was one of many such plants built to meet the burgeoning post World War II demand for electricity. Companies throughout California—including PG&E, Southern California Electric, San Diego Gas and Electric, and others—built many plants like the facility at Contra Costa to meet the need. California electrical companies chose to build steam power plants because of the dwindling number of available hydroelectric sites, the lower cost for construction of this type of plant compared to hydroelectric, and the ready supply of oil and gas. These plants were built within a short period of time and with standardized plans. CCPP was completed in 1953 and was neither the first nor the last of such plants built by PG&E whose other facilities included the Kern plant (1948-50), Moss Landing (1950-52), Morro Bay (1955), the Hunters Point addition (1958), Humboldt Bay (1956-58), and Pittsburg (1959-60). These PG&E plants joined many other plants built by SCE in the greater Los Angeles area, and still more built across the state by other power companies. The CCPP cannot be singled out as individually significant within either the PG&E projects, or other systems of the 1950s. Each of the plants was important to the area it served, providing power for the increasing demands of new technology and development. Nevertheless, within the context of postwar growth, and the evolution of power generation during this time, CCPP does not embody any unique significance.

The buildings and structures within the plant complex are also not significant for their design or construction (NRHP Criterion C, CRHR Criterion 3). PG&E built the CCPP as part of a systemwide program to increase its number of steam power plants, and its similarity to others built during the same era was reported in trade publications. This coverage did not indicate any historically significant attributes of the plan in terms of its type, period, or method of construction, nor has the plant been identified by subsequent histories of the evolution of power generating technology. The plant is of the "semi-outdoor" variety which became common in California during this period. The turbines of the five original units are housed in a steel frame, brick-clad building, but the steel framing around the boilers and appurtenant equipment were left open—a design that allowed the plant to be built faster and more economically, and to be easily maintained. The semi-outdoor plan and the systems installed at Contra Costa were typical of technology popular at the time and the facility and its components are not significant within this context.

CCPP does not have direct important associations with the life of a historically significant person (NRHP Criterion B, CRHR Criterion 2), nor is it significant under NRHP Criterion D or CRHR Criterion 4, as a potential source of information. This property is well-documented through trade publications, company records, and construction documents and is not a principal source of important information.

6. PREPARERS' QUALIFICATIONS

JRP Partner Meta Bunse served as Project Manager for the preparation of this Technical Report, developed the study area in coordination with the project team and CEC staff, managed the identification and survey of historic architectural resources, conducted fieldwork and resource evaluations, and prepared the report. Ms. Bunse received a M.A. in Public History from California State University, Sacramento and has more than 18 years of experience in public history and historic preservation. Based on her level of education and experience, she qualifies as a historian and architectural historian under the United States Secretary of the Interior's Professional Qualification Standards (as defined in 36 CFR Part 61).

Shawn Riem is a Research Assistant III at JRP Historical Consulting Services, LLC. Mrs. Riem received an M.A. in Public History from California State University Sacramento in 2007 and has worked at JRP since 2006. She has contributed to numerous cultural resources management projects, land use studies, and water resource investigations. Mrs. Riem has conducted field surveys throughout the Bay Area and has conducted research at public and private repositories in California, Nevada, and Idaho. Mrs. Riem meets the Secretary of the Interior's Standards for historian and her contribution to this project has been in fieldwork, research, report writing, DPR 523 form preparation, resource evaluation, and report production.

Research Assistant Marta Knight (M.A. Public History), also conducted field survey, and assisted with research and report preparation. Production Technician Rebecca Flores prepared mapping and illustrations, and assisted in report production.

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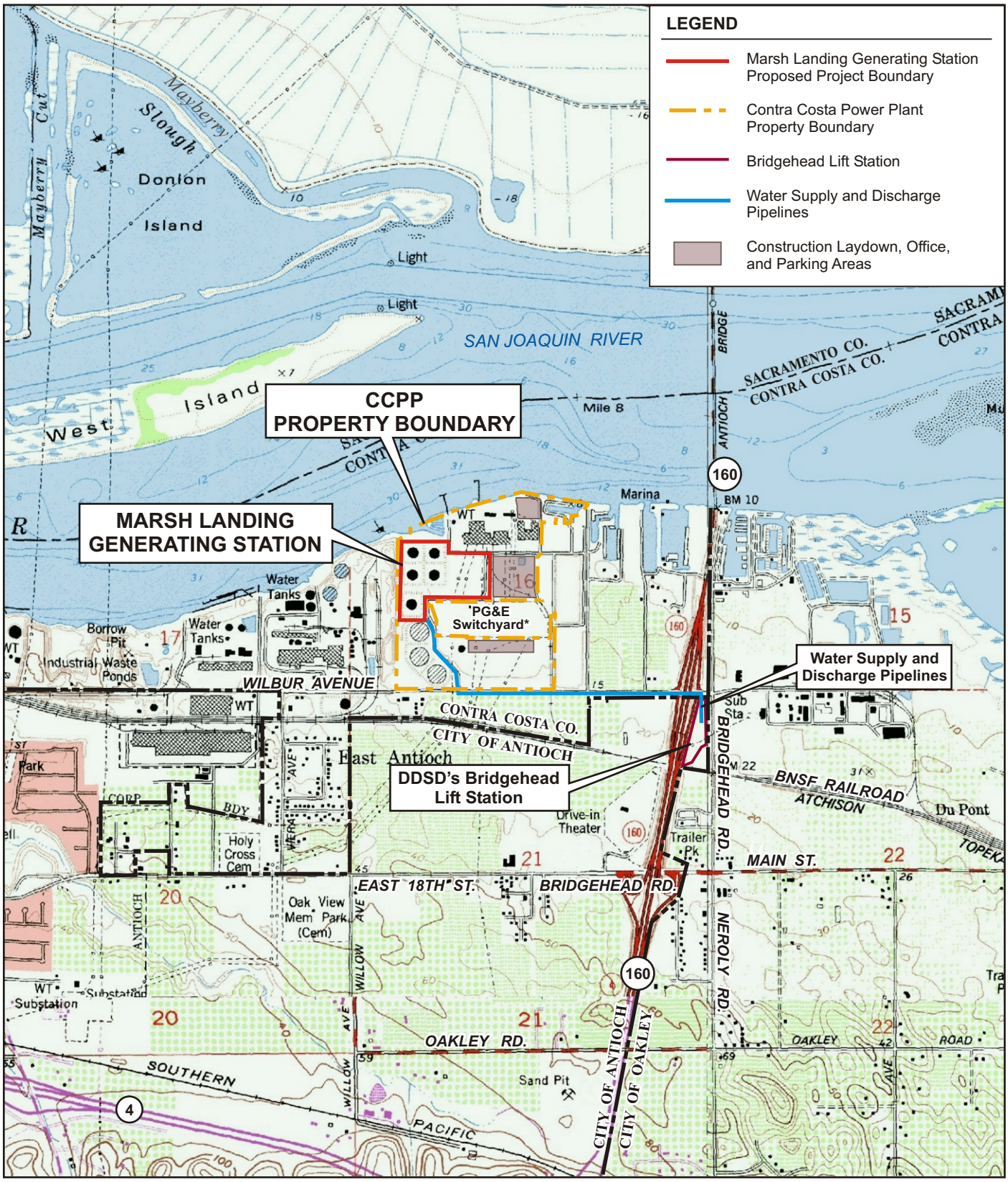
Wolfe, Ann. "John Marsh." East Contra Costa Historical Society and Museum. Accessed online at http://www.theschoolbell.com/history/early/marsh.html. November 2007.

U.S. Census Bureau. "Contra Costa County." Population Schedules. 1910, 1920, and 1930.

U.S. District Court, Northern District California, [Map of the Rancho Los Meganos, n.d.], by J. E. Whitcher. Land Case No. 107, filed 1853, pages 137-140. John Marsh, claimant. Land case map B-249. Bancroft Library, UC Berkeley.

APPENDIX A:

Figures



Source:
USGS Topographic Maps, 7.5 Minute Series:
Antioch North, California, 1978
Antioch South, California, 1980
Jersey Island, California, 1978
Brentwood, California, 1978

* The PG&E Switchyard and PG&E Gateway Project are not part of the Mirant Property.

0 2000 4000

Scale in Feet
1:24,000

N

PROJECT LOCATION MAP

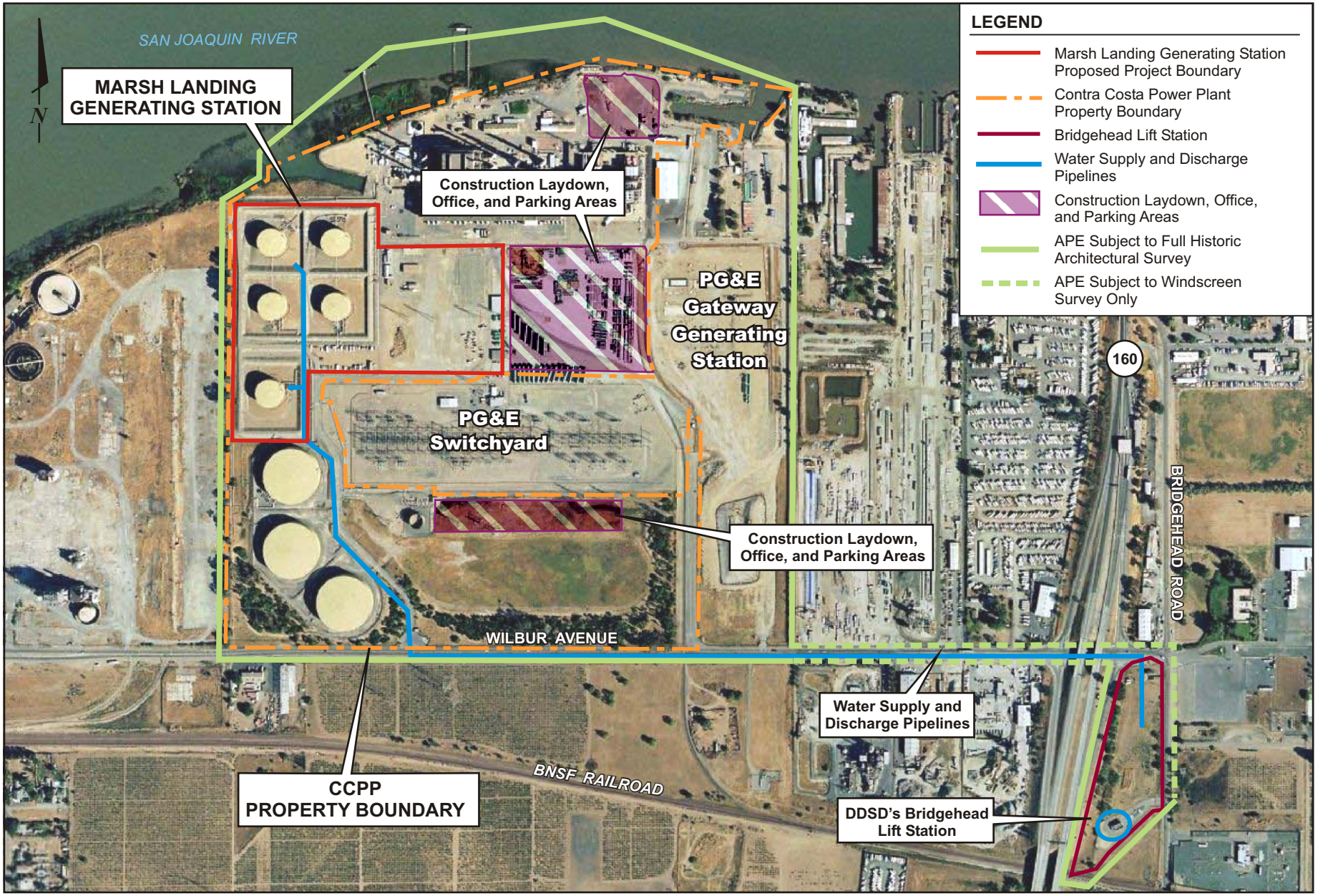
Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

May 2008
28067344

URS

FIGURE 1

5/21/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\7.03 Cultural\Fig 1_historic_proj loc.cdr



Source: Google Earth 2006

0 500 1000

Approximate Scale in Feet

5/21/08 vsa ..T:\Mirant Contra Costa-Marsh Landing\Graphics\7.03 Cultural\Fig 2_site loc+historic APE.cdr

SITE LOCATION AND HISTORIC ARCHITECTURAL AREA OF POTENTIAL EFFECTS

May 2008
28067344

Marsh Landing Generating Station
Mirant Marsh Landing, LLC
Contra Costa County, California

URS

FIGURE 2

APPENDIX B:

DPR 523 Forms

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
UPDATE SHEET

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z

 ***Resource Name or #** (Assigned by recorder) Map Reference #1
***Recorded by** Rebecca Meta Bunse/Cheryl Brookshear *Date November 29, 2007 ☐ Continuation ☑ Update

P1. Other Identifier: c. Address 3201 Wilbur Avenue City Antioch Zip 94509
e. Other Locational Data: APN: 051-031-014

P3a. Description (continued): This facility has been field checked and remains largely the same since the previous survey of the property was conducted in 2000. A copy of the previous inventory and evaluation form for this building prepared by Fredric L. Quivik, sub-contractor to URS Dames & Moore, for the "Determination of Eligibility for the Contra Costa Power Plant" is attached. Photographs of the facility taken in November 2007 are in this update. Only those elements of the plant that have been altered since the previous survey are listed below. For a complete description of the plant, please see the attached 6 October 2000 DPR523 form.

Low nitrogen oxide burners were installed on unit 6 in early 2001 and selective Catalytic Reduction equipment, designed to reduce air emissions, was installed on unit 7 in December 2001. Photographs 6 through 10 are views of Units 6 and 7. A new metal frame, metal sided warehouse was constructed east of units 6 and 7 in 2002 (Photograph 18). Turbines, boiler house, and stacks for units 4 and 5 were retired in December, 2007. The associated transmission lines and towers were removed in early 2008.[1]

P5a. Photographs: See below for photographs taken during November 29, 2007, site survey.

Sketch Map: See Continuation Sheet.

***P8. Recorded by:** M. Bunse and C. Brookshear, JRP Historical Consulting, LLC, 1490 Drew Ave., Suite 110, Davis, CA 95618

***P9. Date Recorded:** November 29, 2007

***P11. Report Citation:** JRP Historical Consulting, LLC, Historic Resources Inventory and Evaluation Report: Mirant Marsh Landing Generating Station, Prepared for URS Corporation, March 2008.

B10. Significance:

The site was previously surveyed in 2000 by Fredric L. Quivik who evaluated the buildings and structures on the Contra Costa Power Plant site at 3201 Wilbur Avenue and concluded that a portion of the site was eligible for listing on the National Register of Historic Places (Criterion A) and the California Register of Historic Resources (Criterion 1) for its association with post-war population growth in California and PG&E's efforts to meet the resulting energy demands. A period of significance of 1945 to 1953 was identified under the theme of Post-WW II Economic Development. This finding is being re-evaluated to account for the California Energy Commission Decision regarding the previous survey, to account for the passage of time since the previous survey was completed, and to include update evaluation analysis of the potential significance of the plant. The CEC found that "the link between the broad general development in California after World War II and the Contra Costs Power Plant is weak," because CEC staff felt that the previous evaluation did not demonstrate that this particular facility was important within the theme of California's postwar expansion. The CEC recognized that the plant facility had relatively high integrity, "and if a clearer link could be established the property would meet the requirements for eligibility for the National Register of Historic Places," but no such link has been made because

[1] Chuck Hicklin, Engineering Manager, Mirant California, LLC, communication with M. Bunse and S. Riem, JRP Historical Consulting, LLC, March 18, 2008.

this property does not appear to be important within this context.[2] This property has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria in Section 5024.1 of the California Public Resources Code, and the property does not meet the significance criteria as outlined in these guidelines.

Historic Context

Steam plants were the first electric generating facilities in California. British designer Sir Charles Parsons built the first steam turbine-generator in 1884, and almost immediately others began making improvements upon his original concept. The earliest steam generating plants were little more than steam engines converted to drive a generator rather than a locomotive. By the beginning of the twentieth century, engineers designed steam turbines to replace the original steam engine power plants. Aegidius Elling of Norway is credited with creating the first applied method of injecting steam into the combustion chambers of a gas turbine engine in 1903-04 and within a relatively short time, the technology and capacity of these engines to supply power and electricity grew by leaps and bounds. These advance soon brought electricity to a wide range of industrial and domestic applications, however the materials needed to withstand the high temperatures of modern turbines were not available in the beginning stages of steam turbine development. Technology and improvements for steam turbine engines advanced throughout the 1920s and 1930s, leading to a generation of more efficient turbine power plants by the 1950s, when the Contra Costa Power Plant was originally designed and built. During this time, utilities also retired or replaced many of the older steam-electric plant generating units and constructed more modern units.[3]

Steam power generation was part of California's power production throughout the twentieth century, although the role of steam generation diminished somewhat during the pre-World War II era when massive hydroelectric generating plants came on line throughout the state. As early as 1920, hydroelectric power accounted for nearly 10% of all electrical power generated in California. In 1930, that figure dropped to just over 8%; it rose again to 9% in 1940. Rapid construction of new thermal, or steam-powered electric generating units, however, accounted for most of the new generation capacity in the state after World War II. By 1950, hydroelectricity accounted for only 59% of the total power generated, falling to 27% in 1960. Some new hydroelectric plants were built during the 1960s, chiefly associated with federal and state water projects, but by 1970, hydroelectric plants accounted for only 31% of all electricity generated in California.[4]

These statistics, however, tend to obscure the work of Pacific Gas & Electric Company (PG&E) and Southern California Edison (SCE), California's largest electrical utility providers, which both built 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 may be attributed to several converging trends in the mid- to late-1920s. First, a persistent drought in California caused the major utilities to begin to question the reliability of systems relying so heavily upon hydroelectricity. This drought began in 1924 and continued, on and

[2] California Energy Commission, "Commission Decision: Contra Costa Unit 8 Power Project: Application for Certification (00-AF-1) Contra Costa, California" (May 2001), 79.
[3] Heinz Termuehlen, *100 Years of Power Plant Development: Focus on Steam and Gas Turbines as Prime Movers* (New York: ASME Press, 2001), 11, 21-28; Douglas Stephen Beck and David Gordon Wilson, *Gas Turbine Regenerators* (New York: Chapman & Hall, 1996), 30; William A. Myers, *Iron Men and Copper Wires: A Centennial History of the Southern California Edison Company* (Glendale, CA: Trans-Anglo Books, 1984), 8.
[4] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: University of Akron Press, 1997), 374.

off, for a decade. At about the same time, new power plants on the East Coast (where steam had always played a more important role than in California) achieved 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. In addition, new natural gas lines were completed which could bring new supplies to both Northern and Southern California in the late 1920s, tapping large reserves in the San Joaquin Valley. Natural gas has played an important role in steam electric power generation in California since that time.[5]

The confluence of these various factors – a drought, new steam generator technologies, and new supplies of natural gas – induced PG&E, SCE, and other utilities to begin construction of large steam plants during the late 1920s and early 1930s. In 1929, the Great Western Power Company (absorbed by PG&E in 1930) built a large steam plant on San Francisco Bay, near the Hunters Point shipyard, fitted with two 55 MW generators.[6] PG&E also built a steam plant in Oakland in 1928, called Station C, and a few years later a PG&E vice-president for engineering wrote: "under the circumstances which now prevail, it is natural to question the future of hydro in California."[7]

But it was in response to the demands of post-World War II growth in California that PG&E built new steam generation plants throughout the state. Wartime increases in population continued after the end of hostilities and general statewide economic expansion spurred rapid growth in the residential, commercial, and industrial sectors. The need to generate power was imperative and PG&E expanded their systems along with the rest of California's energy industry. Because most of the more favorable hydroelectric sites in California had already been developed, and the cost of steam generating facilities had been reduced by technological developments in design and abundant natural gas resources, steam plants became the more favorable option. Steam turbine power plants were cheaper and quicker to build than hydroelectric plants and utility companies moved away from hydroelectricity during this period -- steam turbines became the generator of choice. Such plants conserved water and kept costs down for the business and the consumer.[8]

PG&E steam generation plants built during the postwar period relied upon proven technologies and were assembled quickly and inexpensively relative to earlier plants. In a detailed article in 1950 in *Civil Engineering*, PG&E Chief Engineer I. C. Steele summarized the design criteria that went into construction of four major steam plants the company had under construction at that time, at Moss Landing, Contra Costa, Kern, and Hunters Point in San Francisco. These plants had much in common with each other and with other steam plants under construction in the state. The site selection criteria were the same in all cases: close to load centers to reduce transmission costs; accessibility to fuel supplies; near a water supply; in a location where land was inexpensive; and on land that could provide a good foundation. By the mid 1950s, Walter Dickey, an engineer from Bechtel, touted recent design innovations that improved the economics of steam plant construction even more. These plants, he argued, could be built economically by minimizing the structural material, chiefly by creating semi-

[5] Williams, *Energy and the Making of Modern California*, 278; Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company* (New York: McGraw-Hill, 1952), 306.
[6] This plant still exists. It was fitted with new units in 1948, at the same time that the Kern Power Plant was being constructed (Coleman, *PG&E of California*, 298).
[7] "1928 Steam Plants Account for 45 Percent of New Generating Capacity," *Electrical West* (February 2, 1929):. 80-81; R.W. Spencer, "Cooling Water For Steam Electric Stations in Tidewater, "*Transactions of the American Society of Civil Engineers* 126 (1961): 294, 300; Williams, *Energy and the Making of Modern California*, 279.
[8] Myers, *Iron Men and Copper Wires*, 200; Williams, *Energy and the Making of Modern California*, 277-78, 282-83.

outdoor turbo-generator units. Furthermore, virtually all of these plants were designed to be expanded if market conditions warranted, and most of them were.[9]

The decades between 1950 and 1970 were the years of peak expansion of steam generating capacity for PG&E, SCE, and other utility companies. PG&E operated 15 steam electric plants in California in 1950, and during the following decade added several new plants and expanded older ones. Chief among these were the Kern plant (1948-50), Contra Costa (1951-53), Moss Landing (1950-52), Morro Bay (1955), Hunters Point (addition 1958), Humboldt Bay (1956-58), and Pittsburg (1959-60). The Pittsburg plant was at the time of its construction the largest steam station in the west, with a capacity of over 1,300,000 kW in 1960. By the late 1970s, there were more than twenty fossil fuel thermal plants in California owned by various power companies and clustered around San Francisco Bay, the greater Los Angeles area, and in San Diego County, along with a few interior plants in San Bernardino County and Riverside and Imperial Counties, and a few on the Central Coast. [10]

Most of the oil- or gas-fired steam plants currently in use in California were installed in the period from about 1950 through 1970. After 1970, the major utilities began to look for alternative energy sources, ranging from nuclear power to wind, geothermal, and other "green" energy sources, other than traditional thermal or hydroelectric systems. Despite these efforts, however, fossil fuel steam generation remains the backbone of electrical generating capacity in California and there are currently 34 steam turbine power plants in California of a variety of ages and locations.[11]

Modern industrial development of the plant site in Contra Costa occurred in 1949 when Pacific Gas and Electric (PG&E) built a steam generated electrical power plant, known as the Contra Costa Steam Plant. As PG&E Chief Engineer I. C. Steele explained, the company chose this location near Antioch for its proximity to residential and industrial customers, and ready access to cooling water and transportation. Initial construction consisted of the semi-outdoor boilers, turbines, and generators for units 1, 2, and 3; four fuel-oil storage tanks; a 230,000 volt switchyard; and water supply and discharge treatment equipment. Operation began in the summer of 1951 with the three generating units producing 330 kilowatts of power. Even before this date, construction was underway on two additional generating units at the plant (units 4 and 5), each with a capacity of 120 kilowatts (see aerial photograph, below). These went into service in October 1953, giving the Contra Costa plant a total generating capacity of 570 kilowatts.[12] The plant continued to grow in the following decade with generating units 6 and 7, each with a capacity of 330 megawatts, going online in 1964. PG&E added three new fuel-oil storage tanks in the

[9] I. C. Steele, "Steam Power Gains on Hydro in California," *Civil Engineering* (January 1950): 17-21; Edgar J. Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," *Civil Engineering* (May 1953): 31-33; Walter L. Dickey, "The Design of Two Steam Electric Plants," *ASCE Transactions* (1956): 253-273.

[10] Annual Reports of the Southern California Edison Company, various years; Spencer, "Cooling Water For Steam Electric Stations in Tidewater," 280-302; Steele, "Steam Power Gains on Hydro in California," 17-19; Dickey, "The Design of Two Steam Electric Plants," 253-255; "Haynes Steam Plant Will Grow With Demand," *Southwest Builder and Contractor* (October 12, 1962): 24-27; Williams, *Energy and the Making of Modern California*, 257.

[11] The California Energy Commission retains figures on the fuel type for all electricity used in the state, even if the power is generated out of state. In 1999, natural gas-fired generators were responsible for 31% of all electricity used in the state, compared with 20% for hydroelectricity. Coal-fired steam plants, all of them out of state, accounted for 20% of the total. "Green" sources accounted for 12%. The percentage of in-state natural gas-fired steam electricity is much larger than 31%, since all of the coal and much of the hydroelectric power is generated out of state. See www.energy.ca.gov/electricity/system_power.

[12] Garbarini, "Design Saves Construction Dollars on Contra Costa Power Plant," 31-33; Coleman, *PG&E of California*, 335; Steele, "Steam Power Gains on Hydro in California," 17-18.

1970s.[13] The company shut down units 1 through 5 in 1994 and sold the Contra Costa Steam Plant to Southern Energy California in 1999. Southern Energy used units 4 and 5 as synchronous condensers for units 6 and 7. Mirant Delta, LLC (now Mirant California, LLC) acquired Southern Energy by early 2001 and continues to operate the plant. Recent improvements and changes at the facility include: Installation of low nitrogen oxide burners on unit 6 in early 2001 and selective catalytic reduction equipment designed to reduce air emissions on unit 7 in December 2001. A new metal frame, metal sided warehouse was constructed east of units 6 and 7 in 2002. The turbines, boiler house, and stacks for units 4 and 5 were retired in December 2007 and the associated transmission lines and towers were removed in early 2008. [14]

Aerial photograph of the Contra Costa Steam Plant, showing construction in progress for Units 4 and 5. Cooling water intake structure in the river is north of the boiler building for Units 1, 2 and 3. Cooling water discharge is shown immediately above fuel oil tanks. *Photograph by P. G. & E. News Bureau, November, 1951.*

[13] Steele, "Steam Power Gains on Hydro in California," 17-21; "Power Plants & Substations," *Southwest Builder and Contractor* (January 5, 1962); Frederic L. Quivik, "Determination of Eligibility for the Contra Costa Power Plant," prepared for URS/Dames and Moore, 18 October 2000, 2-5.

[14] Quivik, "Determination of Eligibility for the Contrra Costa Power Plant," prepared for URS/Dames and Moore, 18 October 2000, 2-5; Chuck Hicklin, Engineering Manager, Mirant California, LLC, communication with M. Bunse and S. Riem, JRP Historical Consulting, LLC, March 18, 2008.

Evaluation

The Contra Costa Power Plant does not appear to meet the eligibility criteria for listing in the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR), and it is not a historical resource for the purposes of CEQA, because it is not significant within the context of the development of electrical generation, steam power plants, or PG&E (NRHP Criterion A, CRHR Criterion 1). Instead, the plant was one of many such plants built to meet the burgeoning post World War II demand for electricity. Companies throughout California -- including PG&E, Southern California Electric, San Diego Gas and Electric, and others -- built many plants like the facility at Contra Costa to meet the need. California electrical companies chose to build steam power plants because of the dwindling number of available hydroelectric sites, the lower cost for construction of this type of plant compared to hydroelectric, and the ready supply of oil and gas. These plants were built within a short period of time and with standardized plans. The Contra Costa Power Plant was completed in 1953 and was neither the first nor the last of such plants built by PG&E whose other facilities the Kern plant (1948-50) and Moss Landing (1950-52), as well as Morro Bay (1955), the Hunters Point addition (1958), Humboldt Bay (1956-58), and Pittsburg (1959-60). These PG&E plants joined many other plants built by SCE in the greater Los Angeles area, still more built across the state by other power companies. The Contra Costa plant cannot be singled out as individually significant within either the PG&E projects, or other systems of the 1950s. Each of the plants was important to the area it served, providing power for the increasing demands of new technology and development. Nevertheless, within the context of postwar growth, and the evolution of power generation during this time, the Contra Costa Power Plant does not embody any unique significance.

The buildings and structures within the plant complex are also not significant for their design or construction (NRHP Criterion C, CRHR Criterion 3). PG&E built the Contra Costa facility as part of a system-wide program to increase its number of steam power plants, and its similarity to others built during the same era was reported in trade publications. This coverage did not indicate any historically significant attributes of the plan in terms of its type, period, or method of construction, nor has the plant been identified by subsequent histories of the evolution of power generating technology. The plant is of the "semi-outdoor" variety which became common in California during this period. The turbines of the five original units are housed in a steel frame, brick-clad building, but the steel framing around the boilers and appurtenant equipment were left open – a design that allowed the plant to be built faster and more economically, and to be easily maintained. The semi-outdoor plan and the systems installed at Contra Costa were typical of technology popular at the time and the facility and its components are not significant within this context.

Contra Costa Power Plant does not have direct important associations with the life of a historically significant person (NRHP Criterion B, CRHR Criterion 2), nor is it significant under NRHP Criterion D or CRHR Criterion 4, as a potential source of information. This property is well-documented through trade publications, company records, and construction documents and is not a principal source of important information.

***B14. Evaluator:** Meta Bunse and Shawn Riem

***Date of Evaluation:** March 2008

Sketch Map:

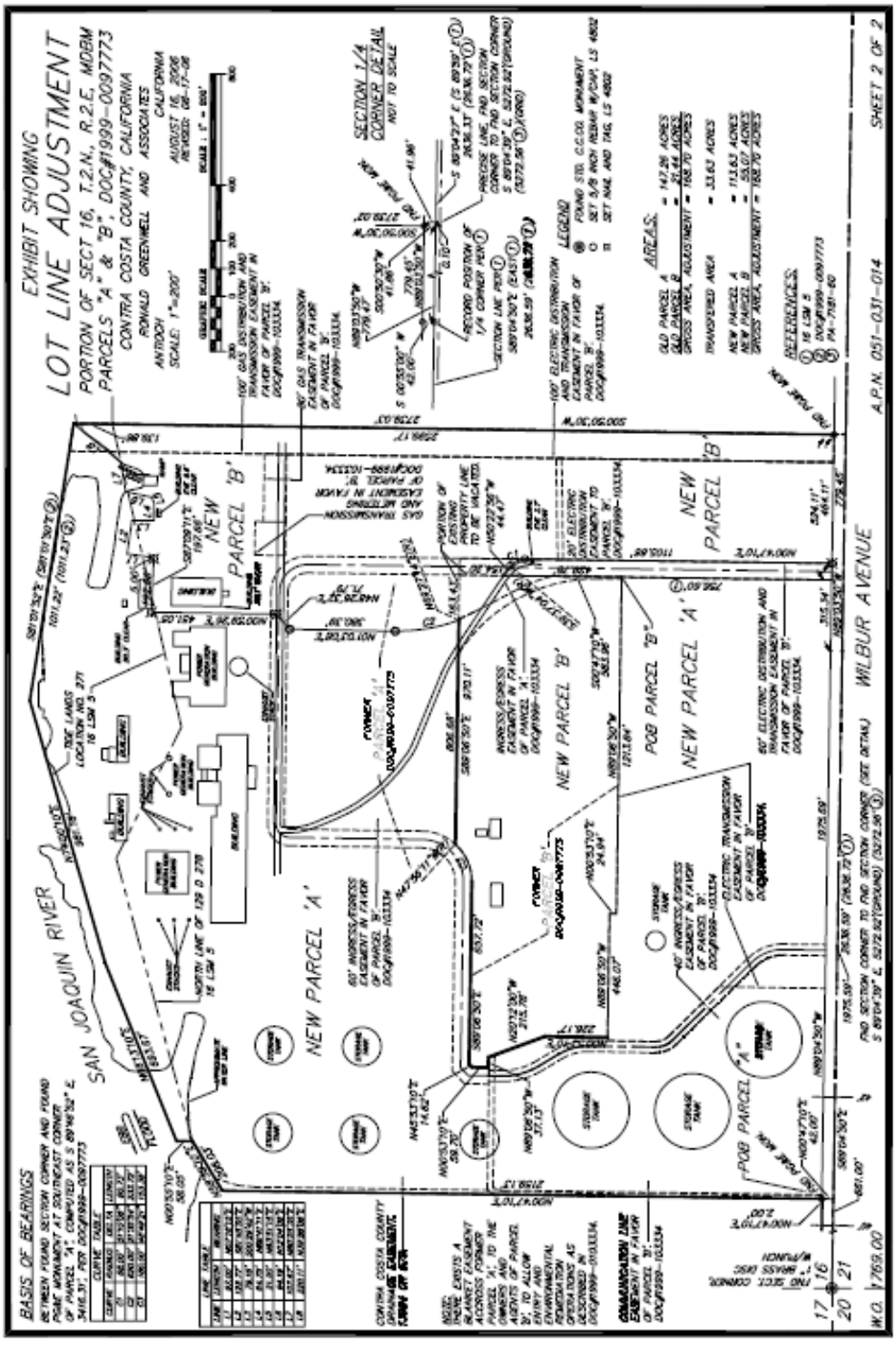


EXHIBIT SHOWING
LOT LINE ADJUSTMENT
PORTION OF SECT 16, T.2.N., R.2.E., MDB&M
PARCELS "A" & "B", DOC#1999-0097773
CONTRA COSTA COUNTY, CALIFORNIA
RONALD GREENWELL AND ASSOCIATES
ANTIOCH CALIFORNIA
AUGUST 16, 2006
REVISED: 06-17-06
SCALE: 1"=200'
SECTION 1/4 CORNER DETAIL
NOT TO SCALE
LEGEND
AREAS
REFERENCES
BASIS OF BEARINGS
SAN JOAQUIN RIVER
NEW PARCEL 'A'
NEW PARCEL 'B'
POB PARCEL 'A'
POB PARCEL 'B'
WILBUR AVENUE
A.P.N. 051-031-014
SHEET 2 OF 2
W.O. 7769.00

P5a. Photographs continued:

Photograph 1: turbine building, fuel tank on left, camera facing northeast. November 29, 2007.

Photograph 2: turbine building for units 1-5, camera facing northwest. November 29, 2007.

Photograph 3: south side of turbine building for units 1-5, camera facing northeast. November 29, 2007.

Photograph 4: east end of turbine building, camera facing northwest. November 29, 2007.

Photograph 5: entrance at west end of turbine building, camera facing east. November 29, 2007.

Photograph 6: North side of units 4-5 at right, and units 6-7 at left, camera facing southwest. November 29, 2007.

Photograph 7: Units 6 and 7, camera facing southeast. November 29, 2007.

Photograph 8: units 6-7 stack, camera facing northeast. November 29, 2007.

Photograph 9: Base of units 6-7 stack, (units 1-5 to rear), camera facing northwest. November 29, 2007.

Photograph 10: units 6 and 7, camera facing northwest. November 29, 2007.

Photograph 11: water tower, water tanks, water treatment works, and stacks for boilers 1-3 with units 1-3 in the background, camera facing northeast. November 29, 2007.

Photograph 12: discharge canal for units 1-5, water tower, camera facing north. November 29, 2007.

Photograph 13: Quonset Hut, camera facing northwest. November 29, 2007.

Photograph 14: warehouse, camera facing west. November 29, 2007.

Photograph 15: pump house for units 4 and 5, camera facing northwest. November 29, 2007.

Photograph 16: chlorination house, camera facing northeast. November 29, 2007.

Photograph 17: control house, camera facing north. November 29, 2007.

Photograph 18: warehouse built 2002, camera facing southwest. November 29, 2007.

Photograph 19: Storage/fabrication shops (left), fuel oil tanks 2 through 4, camera facing west. November 29, 2007.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 11 *Resource Name or #: (Assigned by recorder) Contra Costa Power Plant

P1. Other Identifier:
P2. Location: ☐ Not for Publication ☒ Unrestricted
*a: County Contra Costa and (P2c,P2e, and P2b or P2d. Attach Location Map as necessary.)
*b. USGS 7.5' Quad Antioch North Date 1978 T 2N; R 2E; 5 ½ of Sec 16 ; B.M.
c. Address 3201 Wilbur Ave. City Antioch Zip 94509
d. UTM: (Give more than one for large and/or linear resources) Zone 2; 4,207,710 mE/ mN See cont. sheet
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

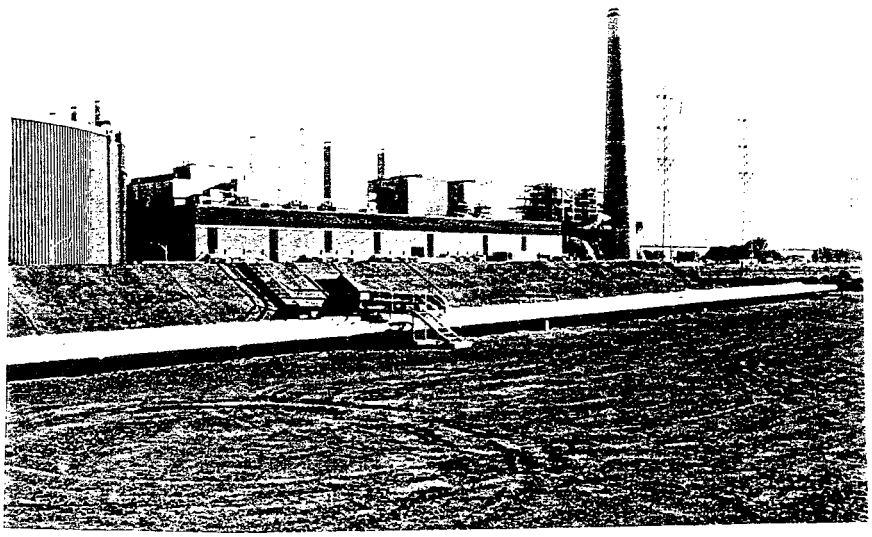
*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

The Contra Costa Power Plant is a district located along the south bank of the San Joaquin River just east of Antioch, California. The entire site is flat, open terrain with little vegetation. There are industrial facilities of comparable scale neighboring the site both up- and downstream. The boilers, turbines, generators associated with the generation of electrical power are located in a row along the north end of the site. The original power plant structure, housing units 1-3 and built in 1951, is at the west end of the row. Units 4 and 5 were under construction even before units 1-3 went into service. They comprise an eastern extension to units 1-3 and went into service in 1953. Each of units 1-5 has its own 200-foot steel stack. Adjacent to the north side and the west end of units 1-5 are several small structures associated with the operation of the power plant that date from 1951. Units 6 and 7 are housed in a distinct structure at the east end of the row and went into service in 1964. The 450-foot concrete stack serving both units 6 and 7 is the most visible feature on the site. An entrance road runs near the east boundary from Wilbur Avenue on the south boundary to the generating units at the north. There is a security gate about 1,000 feet north

See continuation sheet

*P3b Resource Attributes: (List attributes and codes) (HP9) Public Utility Buildings
*P4. Resources Present: ☒ Building ☒ Structure ☐ Object ☐ Site ☒ District ☐ Element of District ☐ Other (isolates, etc.)

P5a



P5b. Description of Photo: (view, date, accession #) south elevation of units 1-5, view to north, 3 October 2000, roll #1, frame 33

*P6. Date Constructed/Age and Source:
☒ Historic ☐ Prehistoric
☐ Both
1951, units 1-3 complete
1953, units 4 & 5 complete

*P7. Owner and Address:
Southern Energy California,
1350 Treat Blvd., Suite 500,
Walnut Creek, CA 94596

*P8. Recorded by:
(Name, affiliation, and address)
Fredric L. Quivik
2830 Pearl Harbor Road
Alameda, CA 94501
sub-contractor to URS Dames & Moore

*P9. Date Recorded: 6 October 2000

*P10. Survey Type: (Describe) Intensive Survey, completed as part of Southern Energy's permitting process prior to building proposed unit 8

P11. Report Citation*: (Cite survey report and other sources, or enter "none".) Fredric L. Quivik, PhD, "Determination of Eligibility for the Contra Costa Power Plant," October 2000, prepared for URS Dames & Moore

*Attachments: ☐ NONE ☒ Location Map ☒ Continuation Sheet ☐ Building, Structure and Object Record
☐ Archaeological Record ☒ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ☒ Photograph Record ☒ Other (List) Report

P2.d. UTM (continued)

UTMs for the entire Contra Costa Power Plant:

A.	609,990 E	4,207,710 N
B.	608,360 E	4,207,710 N
C.	608,360 E	4,208,400 N
D.	609,990 E	4,208,530 N

UTMs for the proposed Contra Costa Power Plant historic district (see location and sketch maps):

C.	609,360 E	4,208,400 N
E.	609,850 E	4,208,570 N
F.	609,850 E	4,208,330 N
G.	609,580 E	4,208,330 N
H.	609,580 E	4,208,120 N
I.	609,470 E	4,208,120 N
J.	609,470 E	4,208,040 N
K.	609,360 E	4,208,040 N

P3.a. Description (continued)

of Wilbur Avenue. Large fuel-oil tanks are located along the entire west side of the site. The five northern-most tanks date from the early 1950s, and the three souther tanks were built after 1970. A large electrical switchyard is located near the center of the site, extending from the tanks east almost to the entry road. Large steel transmission towers carry wires from the generating units to the switchyard. Units 1-5, the small buildings clustered around the units, and the five older fuel-oil tanks comprise a distinct cluster of historic buildings with excellent integrity. They contribute to the significance of the Contra Costa Power Plant district. Units 6 and 7, the larger tanks, and the switchyard are non-contributing elements.

*NRHP Status Code

*Resource Name or # (Assigned by recorder) Contra Costa Power Plant

D1. Historic Name: Contra Costa Power Plant D2. Common Name: Contra Costa Power Plant

*D3. **Detailed Description** (Discuss overall coherence of the district, its setting, visual characteristics, and minor features. List all elements of district):

The potential Contra Costa Power Plant Historic District occupies a portion of the Contra Costa Power Plant site, a nearly rectangular parcel of land along the south bank of the San Joaquin River in East Antioch, Contra Costa County, California. The east, south, and west boundaries of power plant site are orthogonal to the cardinal directions, while the north boundary follows the river bank and is irregular. The east boundary measures about 2,850 feet, the south boundary measures about 2,850 feet, and the west boundary measures about 2,300 feet. The site accommodates seven steam-powered electric generating units. The historic portion of the power plant site is in the northwest corner of the parcel, where units 1-5 are located. It includes the turbine building, boiler buildings, several water tanks and small ancillary buildings, and five fuel oil tanks. Following descriptions of buildings and important features in the potential historic district:

See continuation sheet

*D4. **Boundary Description** (Describe limits of district and attach map showing boundary and district elements.):

The proposed historic district boundary embraces the buildings from the period of significance, which are located at the northwest corner of the property. See location and sketch maps for details.

*D5. **Boundary Justification:**

The district boundary encompasses those elements at the Power Plant that date from the period of signif.

See update sheets for revised conclusion

D6. **Significance: Theme** ~~Post-WW II Economic Development~~ **Area** ~~California~~
Period of Significance ~~1945-1953~~ **Applicable Criteria** ~~A~~
(Discuss district's importance in terms of its historical context as defined by theme, period of significance, and geographic scope. Also address the integrity of the district as a whole.)

The Contra Costa Power Plant is eligible listing in for the National Register of Historic Places and the California Register of Historic Resources for its association with the postwar expansion of California's economy, which was a major factor in the new character of the nation's economy in the second half of the twentieth century. California's population grew an estimated 43% during World War II as hundreds of thousands of people moved to the state to work in agriculture and manufacturing in support of the war effort. The population continued to grow in the late 1940s and much of the state's wartime industrial growth converted to a permanent economic footing based especially on the aeronautics and electronics industries. Increased population and industry and the absence of wartime restrictions yielded tremendous additional demand for energy, to which Pacific Gas & Electric (PG&E) responded by embarking on the largest program for constructing new electrical generating capacity of any utility in the nation's history, spending more

See continuation sheet

*D7. **References** (Give full citations including the names and addresses of any informants, where possible):

See continuation sheet

*D8. **Evaluator:** Fredric L. Quivik, PhD **Date:** 6 October 2000
Affiliation and Address: 2830 Pearl Harbor Road, Alameda, CA 94501, working under subcontract to URS Dames & Moore for Southern Energy Company

D3. Description (continued)

Turbine Building: This is a flat-roof, steel-frame building on an elevated concrete base. It is about 160 feet wide and about 660 feet long. The turbine building has brick masonry curtain walls along the south side and west end and corrugated asbestos sheathing on the east end. The boiler buildings are along the north side. The brick curtain walls are pierced periodically with groups of narrow, vertical window bands. The turbine building was actually built in two stages. The west half houses the turbines and generators for units 1-3 and was built in 1951. The east half houses the turbines and generators for units 4 and 5 and was built in 1953. The brick curtain wall of the section housing units 4 and 5 is identical to the original. A vertical construction joint just east of the service delivery entrance shows the dividing line between the two sections.

The major pieces of equipment are at the third-floor level of the turbine building, which is called the operating level. Three bays extend the length of the building from west to east. The turbine-generator units are located along the south-side bay, which is called the turbine bay. Unit 1 is at the west end and unit 3 at the east end of the original segment. Each generator is rated at 110 megawatts. They are each rated at 120 megawatts. The center bay, called the auxiliary bay, houses boiler feed pumps and house turbines, which could generate electricity for the plant if it were ever "islanded," i.e. cut off from the rest of the grid. The main control room is located midway along the northern bay, which is called the control bay. It is situated between the turbine building and the boilers, which are located in the adjacent building to the north. The control room houses three sets of control panels and meter panels, one set for each unit. A slight westward projection of the facade at the northwest corner of the building identifies the location of the main office for the power plant staff, located on third floor in the control bay at that corner. A low cantilevered canopy along the projection identifies the entrance to the main office. Virtually all the equipment in the building is original to beginning of the power plant's operation in 1951. A significant exception is turbine no. 1, which was replaced in the 1970s. It appears nearly identical to the turbines for units 2 and 3.

Units 4 and 5 are located along the turbine bay of the addition. The boiler feed water pumps are located in the turbine bay between unit 4 and unit 5. The control room for units 4 and 5 is located in the control bay of the addition and provides access to the boiler house for units 4 and 5. The configuration of equipment in the addition is somewhat different that the configuration in the original section, but it is nevertheless consistent with design conventions of the early 1950s. The turbine building, including both the 1951 and 1953 sections, is a primary contributing feature of the power plant district.

Boiler House for Units 1-3: The boiler house for units 1-3 is of the semi-enclosed type. The steel-frame structure enclosing the boilers themselves is sheathed in corrugated Transite (a composite material of cement and asbestos) and has several horizontal bands of industrial steel sash windows. There are six boilers, arranged with three on each side of a central firing aisle on a north-south axis. The boilers were designed and constructed by the Combustion Engineering Superheater, Inc. of New York. Each has a capacity to produce 550,000 pounds of steam per hour at a temperature of 950° F and a pressure of 1550 lb./sq. in. They were designed to be fired either by fuel oil or natural gas.

All six boilers were fired when the three turbine-generator units were operating at full capacity. Piping from the boilers to the turbines is arranged so that each of the boilers could serve any of the three turbines. Many of ducts for delivering supply air to the boilers and conveying combustion gases to the stacks are exterior to the building. Each boiler has a fan for forcing draft to the boiler and another fan for inducing draft and drawing exhaust gases from the boiler to the stack. The fan housings are all exterior to the boiler house structure. There are six steel stacks, each standing adjacent to its boiler. Thus there are three stacks to the east of the structure and three to the west. The boiler house sits along the north side of the turbine house, and the firing aisle between the boilers leads directly into the control room in the turbine building. The units 1-3 boiler house is a primary contributing feature of the power plant district.

Stacks for Unit 1-3 Boilers: There are six steel stacks for units 1-3, one for each boiler. There is a row of three stacks along the east side of the boiler house and a row of three along the west side. Each stack is about 200 feet tall. The six stacks are primary contributing features of the power plant district.

D3. Description (continued)

Boiler House for Units 4 and 5: The boiler house for units 4 and 5 is also of the semi-enclosed type. The steel-frame structure enclosing the boilers is also sheathed in corrugated Transite. It is located along the north side of the addition to the turbine building. Unlike the original boiler house, which houses two boilers for each turbine, this boiler house has only two boilers. Their orientation is 90° from that of the original six boilers. Thus the burner front of each boiler faces south toward the turbine building. The ducts for supply air and combustion gases are on the north side of the boiler house. Fan housings are outside the structure. The units 4 and 5 boiler house is a primary contributing feature of the power plant district.

Stacks for Units 4 and 5 Boilers: There are two steel stacks for units 4 and 5, one for each boiler. They stand on the north side of the boiler house. Each stack is about 200 feet tall. The stacks for units 4 and 5 are primary contributing features of the power plant district.

Boiler Water Tank: This steel cylindrical tank sits just west of stack for the middle boiler on the west side of the units 1-3 boiler house. It is original to the power plant and is a contributing feature of the power plant district.

Distilled Water Storage Tanks: There are three steel water tanks sitting in a row extending west of the stack for the southern-most boiler on the west side of the units 1-3 boiler house. The two nearest the boiler house are original to the power plant and are contributing features of the power plant district. The western-most tank is a later addition and is a non-contributing feature in the district.

Water Treatment Apparatus: West of the stack for the northern-most boiler on the west side of the units 1-3 boiler house is a grouping of equipment used to treat river water before it was sent to the boilers. The equipment is a later addition o the power plant and is a non-contributing feature.

Water Tower: An elevated water tank stands at the northwest corner of the site on the small peninsula created by the discharge channel. The water tower is original to the power plant and is a contributing feature of the power plant district.

Quonset Hut: Located at the east end of the row of service buildings along the north side of the site, the Quonset Hut (so named by a signed over its door) serves as a storage and shop building for the power plant. Although it does not appear on an original plot plan for the site, it does appear in a 1952 photo showing construction of units 4 and 5.

Warehouse: The warehouse is due west of the Quonset Hut. It is a steel-framed building with gable roof and corrugated asbestos siding. It is original to the power plant and is a contributing feature of the power plant district.

Water Intake Works: Built on the same axis as the firing aisle of the units 1-3 boiler house, the cooling water intake tubes extend out into the San Joaquin River below the surface of the water and are therefore not visible. All that is visible above the surface is the walkway on timber piling that extends from the river bank out to a platform directly over the intake end of the tubes. The landward end of the tubes couples to the screenwell structure, described below. The water intake works is original to the power plant and is a contributing feature of the power plant district.

Screenwell Structure: From the perspective of pavement between the unit 1-3 boiler house and the river, this structure appears to be little more than a concrete slab-on-grade next to water's edge. It houses the screens for cleaning cooling water drawn from the river through the intake tubes. Four steel housings sit atop the structure, enclosing the equipment used from raising the screens. When units 4 and 5 were built, the screenwell structure was enlarged to the east. A construction joint in the concrete is visible distinguishing the original screenwell structure from the addition. Because the addition is was built than 45 years ago, the entire screenwell structure contributes to the power plant district.

Units 4 and 5 Cooling Water Pump House: The pumps for delivering cooling water to the six boilers for units 1-3 are located inside the plant, whereas the pumps for units 4 and 5 were designed to be housed next to the screenwell structure. The pump house is a steel-framed building with a gable roof and corrugated siding. It contributes to the power plant district.

D3. Description (continued)

Chlorinator House: Just south of the original section of the screenwell structure is the small house for the chlorination equipment. It is a steel-framed structure with a gable roof and corrugated siding.

Control House: Just west of the screenwell structure is the control house for the intake works. It is a steel-framed structure with a gable roof and corrugated siding.

Discharge Works: At the northwest corner of the site, there is a short channel the conveys water--after it has been converted to steam, run through the turbines, and condensed to water--back into the river. The water is discharged through simple culvert openings into the channel. The discharge works is original to the power plant and contributes to the power plant district.

Fuel-Oil Tanks 1-5: The fuel-oil tanks are located along the west edge of the site. The four that are original to the power plant are west-southwest of units 1-3 are arranged in a quad pattern. The fifth tank, built shortly after the power plant went into service, is located just south of the western-most pair of original tanks. Each of the five tanks is about 140 feet diameter and is surrounded by an earthen embankment, rectangular in plan, meant contain leaks. Three newer, larger tanks are located at the southwest corner of the site. Tanks 1-5 are contributing features of the power plant district.

PG&E Switchyard: East of tank no. 5 and about 1100 feet south of the turbine building is the PG&E switchyard. The original switchyard extended as far east as east end of the units 1-3 turbine building. The switchyard now extends as far east as units 6 and 7. Although much of the truss structure for the switchyard is original to the site, the insulators and transformers have been significantly altered in the intervening years. Although the switchyard is an essential part of the power plant complex, it has lost its historic integrity. It is therefore a non-contributing feature in the power plant district.

Units 6 and 7: Built in 1964, the boilers, turbines, and generators for units 6 and 7 are set within an unenclosed structure, representing the evolution of design characteristics for power plants in the second half of the twentieth century. Each unit has a capacity of 330 megawatts, representing the trend toward ever larger generating units. The boilers are on the south side of the structure and the turbines and generators are on the north side, which is the opposite as the configuration of units 1-5. A single stack, 450 feet tall, rises from the center of the south side of the structure, serving both boilers. Units 6 and 7 are non-contributing features of the power plant district.

Transmission Towers: There are several steel transmission towers that carry wires between the generating units and the switchyard. The two towers south of the units 1-5 turbine building are likely original to the site and are contributing features. The towers south of units 6 and 7 are of more recent construction and do not contribute.

D6. Significance (continued)

See update sheets for revised conclusion

than a billion dollars between the end of the war and 1953. At the end the expansion, PG&E had made a transition from being a utility that depended primarily on hydropower sources for its electrical energy to being a utility that drew a large majority of its electricity from steam generating plants.

The Contra Costa Power Plant, with an initial capacity of 330 megawatts, represents this expansion of generating capacity. Although shortly after the war PG&E built two smaller new steam plants, the Contra Costa Power Plant, completed in 1951, launched the utility's program of large steam plant construction. As California's economy continued to grow, PG&E made immediate plans to expand the Contra Costa plant, even as it was building other new power plants as well. The 240,000 megawatt addition went into service in 1953. Although PG&E again expanded the Contra Costa plant's capacity in 1964, the original 1951-1953 components were unchanged. Concentrated in the northwest corner of the property, the original components retain excellent integrity, both in terms of architecture and in terms of the boilers, turbines, generators, and other equipment housed in the original buildings.

D7. References (continued)

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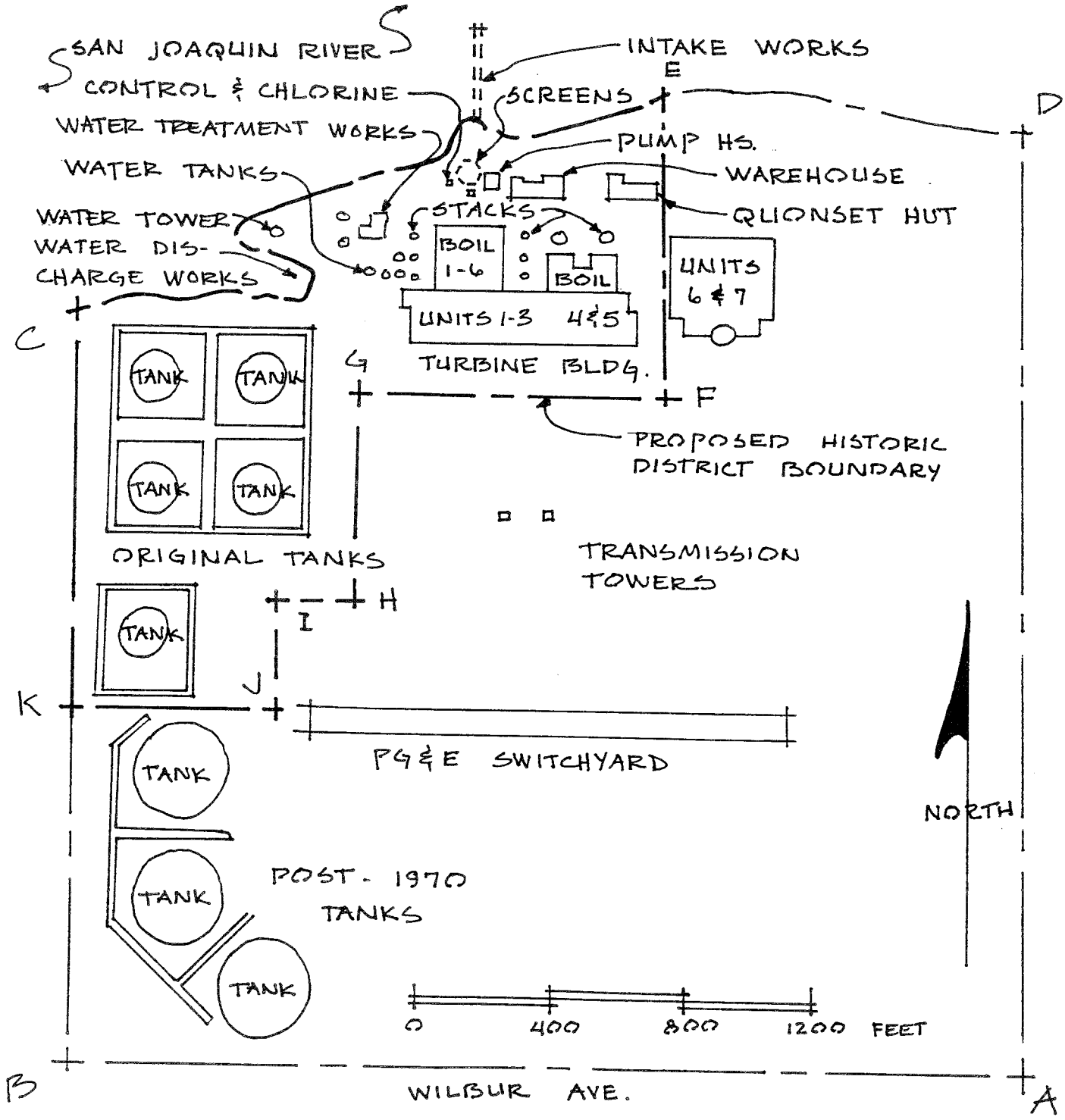
White, Richard. *"It's Your Misfortune and None of My Own:" A New History of the American West*. Norman: University of Oklahoma Press, 1991.

Wollenberg, Charles. *Golden Gate Metropolis: Perspectives on Bay Area History*. Berkeley: Institute of Governmental Studies, University of California, 1985.

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # _____
HRI# _____
Trinomial _____

Page 9 of 11 *Resource Name or # (Assigned by recorder) CONTRA COSTA POWER PLANT
*Drawn by: FREDRIC L. QUIVIK *Date of map: 10-6-00



NOTE: Include bar scale and north arrow.

State of California -- The Resources Agency
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PHOTOGRAPHIC RECORD

Primary # _____
HRI# _____
Trinomial _____

Page 10 of 11 Project Name: CONTRA COSTA POWER PLANT Year 2000
Camera Format: 35 mm Lens Size: 28 mm p.c.
Film Type and Speed: KODAK T-MAX 400 Negatives Kept at: URS DAMES & MOORE

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
10	3	07:35	1	boiler no. 6 (left) and its control panel	SE	
10	3	07:35	2	boiler no. 6 (left) and its control panel	SE	
10	3	07:37	3	boiler control panel (left) and boiler no. 5	SE	
10	3	07:39	4	boiler no. 4	E	
10	3	07:39	5	boiler no. 4	E	
10	3	07:42	6	control room for units 1-3	NE	
10	3	07:50	7	house generator for units 1-3	NE	
10	3	07:51	8	boiler water feed pump for units 1-3	NE	
10	3	07:55	9	turbine/generator unit no. 1	SE	
10	3	08:02	10	boiler water feed pumps for units 4 and 5	SW	
10	3	08:05	11	control room for units 4 and 5	S	
10	3	08:09	12	boiler no. 7 for turbine/ generator units 4 and 5	NE	
10	3	08:19	13	view along south side of turbine bldg. for units 1-5, stack for units 6 and 7 in background	NE	
10	3	08:19	14	ditto	NE	
10	3	08:19	15	ditto	NE	
10	3	08:25	16	view of south side of turbine bldg. showing constr. joint betw. 1951 & 1953 bldgs.	N	
10	3	08:29	17	view of E. end of turbine bldg.	NW	
10	3	08:34	18	boiler house for units 4 and 5	SW	
10	3	08:36	19	Quonset Hut	NW	
10	3	08:38	20	stack for boiler no. 7 (for units 4 and 5) foreground & stacks for boilers 4-6 (for units 1-3) in background	WSW	
10	3	08:42	21	warehouse	NW	
10	3	08:44	22	pump house for units 4 and 5	NW	
10	3	08:47	23	water supply works in San Joaquin River	N	
10	3	08:51	24	moveable screen housings on screenwell structure	NNW	
10	3	08:53	25	chlorination house	NW	
10	3	08:54	26	control house	NW	
10	3	09:03	27	west elevation turbine bldg.	E	
10	3	09:12	28	water discharge works (foregr.) and water tower	N	

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PHOTOGRAPHIC RECORD

Primary # _____
HRI# _____
Trinomial _____

Page 11 of 11 Project Name: CONTRA COSTA POWER PLANT Year 2000
Camera Format: 35 MM Lens Size: 28 MM p.c.
Film Type and Speed: KODAK T-MAX 400 Negatives Kept at: URS DAMES & MOORE

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
10	3	09:13	29	water tanks, water treatment works, & stacks for boilers 1-3 west of boiler house	NE	
10	3	09:17	30	three of the original fuel-oil tanks	W	
10	3	09:26	31	PG&E switchyard	S	
10	3	09:31	32	view toward turbine building, showing fuel tank on left	NE	
10	3	09:35	33	so. elevation of turbine bldg.	N	
10	3	09:42	34	units 6 and 7	NW	
10	3	09:44	35	units 1-5 (left) and units 6 and 7 (right)	NW	
10	3	09:55	36	turbine/generator unit no. 3	SE	

Appendix L3
Cultural Resources Record Search
(Submitted Separately
Under the Rules of Confidentiality)