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

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code 6Z
Other Listings _____
Review Code _____ Reviewer _____ Date _____

***Resource Name or #** (Assigned by recorder) Panoche-Substation

P1. Other Identifier: Panoche Substation

***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Fresno

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad** Chaney Ranch **Date** 1971 **T** 15S; **R** 13E; ____ ¼ **of Sec** 5; MD **B.M.**

c. Address Panoche Road. City Firebaugh Zip 43622

d. UTM: (give more than one for large and/or linear resources) Zone _____; _____mE/ _____mN

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)

Panoche Substation is at the intersection of two long distance transmission lines, one runs northwest - southeast and the other runs east-west to the substation. The eastern portion of the substation serves local lines and the western portion has two metal structures running north to south supporting wires. This is connected to a wide metal structure which lowers the elevation of the wires. Near the center of the substation are three rectangular transformers which are connected to the western portion of the substation. A fourth transformer is on site but not connected. On the east side are another set of metal support structures carrying the local lines. The local lines enter the substation through four metal towers arranged along the east edge. The wires are then brought down to a lower elevation on wide metal structures west of the towers. Six cylindrical transformers are just west of those structures. All of the equipment and structures are on concrete footings in the gravel-covered yard. (See Continuation Sheet.)

***P3b. Resource Attributes:** (List attributes and codes) HP9 Public utility

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photo of Drawing (Photo required for buildings, structures, and objects.)

P5b. Description of Photo: (View, date, accession #) Photograph 1. Substation, camera facing east, January 22, 2007.

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
ca. 1950, with continuous additions: Aerial photography.

***P7. Owner and Address:**
Pacific Gas and Electric

***P8. Recorded by:** (Name, affiliation, address)
Steven Melvin/ Cheryl Brookshear
JRP Historical Consulting, LLC
1490 Drew Ave, Suite 110,
Davis, CA 95618

***P9. Date Recorded:** January 22, 2007

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.")JRP Historical Consulting LLC, HRIER for the Panoche Energy Center, Fresno County, California, June 2006.

***Attachments:** ☐ None ☐ Location Map ☐ Sketch 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) _____

***NRHP Status Code** 6z

***Resource Name or #** (Assigned by recorder) Panoche Substation

B1. Historic Name: Panoche Substation
B2. Common Name: Panoche Substation
B3. Original Use: Substation B4. Present Use: Substation
***B5. Architectural Style:** Industrial/ Utilitarian
***B6. Construction History:** (Construction date, alteration, and date of alterations) 1st stage built after 1937 complete by 1950, expansion between 1950 and 1957, equipment yard date unknown, and southeast equipment added post 1998.

***B7. Moved?** ☒ **No** ☐ **Yes** ☐ **Unknown** **Date:** _____ **Original Location:** _____
***B8. Related Features:** _____

B9. Architect: unknown b. Builder: unknown
***B10. Significance: Theme** n/a **Area** n/a
Period of Significance n/a **Property Type** n/a **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

The Panoche Substation does not appear to be a historical resource for the purposes of CEQA. The substation was built between 1937 and 1950, probably during the late 1940s. It has been expanded regularly is not associated with events that have made a significant contribution to the history of the local area, region or state (Criterion A and 1). The property does not appear to have been associated with a person who made significant contributions to local, state or national history (Criterion B and 2). The structure does not embody characteristics of a type, period, region or method of construction and it is not the work of a master and does not have high engineering value (Criterion C and 3). Rarely, structures can provide information about historical methods of construction (Criterion D and 4) however, information on this structure is recorded elsewhere and it does not appear to be a primary source in this regard. This property has been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using the criteria outlined in Section 5024.1 of the California Public Resources Code, and it does appear to be a historical resource for the purposes of CEQA. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)
***B12. References:** USGS, *Chaney Ranch Quad,* 1955; Aerial Photographs 1937, 1950, 1957;.CEC, *CEC California Power Plants Database* 2005; CEC, *CEC California Substation Database* 2005; Charles M. Coleman, *PG&E of California: The Centennial Story of Pacific Gas and Electric Company 1852-1952* (New York: McGraw Hill) 1952; James C. Williams, *Energy and the Making of Modern California* (Akron, OH: University of Akron Press) 1997.

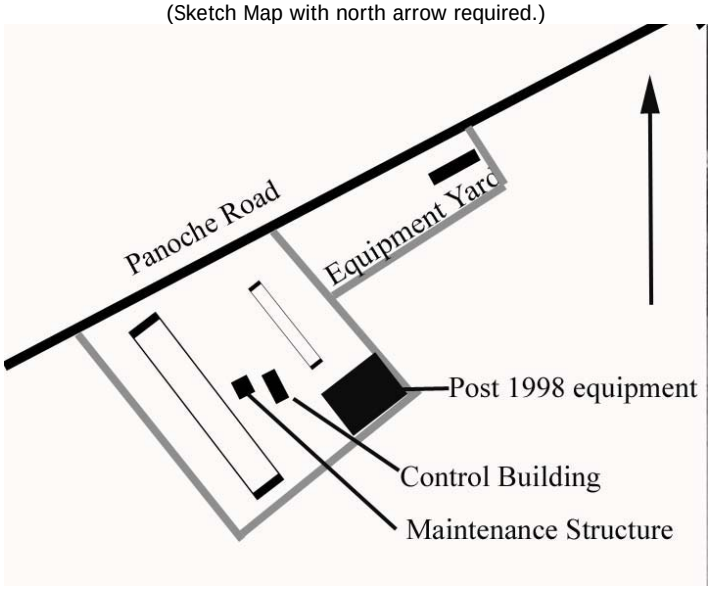
B13. Remarks:

***B14. Evaluator:** Steven Melvin/ Cheryl Brookshear

***Date of Evaluation:** January 2007

(This space reserved for official comments.)

(Sketch Map with north arrow required.)



Pa3. Description (continued):

In the center of the compound are two buildings. Just west of the large rectangular transformers is a two story tall rectangular maintenance building of slab concrete with a flat roof. The building has a large metal overhead door on the east side. Outside of the building is a large rectangular frame with a crane in the center. It is the appropriate size to lift the rectangular transformers. (Photograph 2)

Photograph 2 Maintenance Structure with crane on left, camera facing south.

Photograph 3. Control Building, camera facing southwest.

At the south end of the central drive is a poured board formed concrete building one story tall with a flat roof. The building has double metal doors on the north and five, three by six windows on the east. (Photograph 3) In the southeast corner of the substation is a complex of tanks and cooling equipment. (Photograph 4) East of the substation is an equipment yard with upright and horizontal mounted tanks and a one story, side gabled maintenance building covered in stucco.

Photograph 4. Equipment in southeast corner, camera facing south.

B10. Significance (continued):

General History of Electrical Transmission in California

California's rugged terrain and often scattered settlement made the transmission of power and important factor in development. Mining settlements and cities quickly used up all easily accessible combustibles for steam power, and bringing in more from other sources was expensive and difficult. Mining communities discovered that nearby water sources could produce electricity that was easily transmitted to rugged isolated sites.[1] The problem was that the first electrical systems popularized by Edison were direct current (DC) and had a limited transmission distance. Most mining communities could find a hydroelectric site within transmission distance, but cities and agricultural settlements often could not.

The nature of this problem and its solution led to the great electrical battle between Westinghouse, building systems around high voltage alternating current (AC), and Edison, building systems around DC electricity. Westinghouse acquired patents for transformers from other inventors and a very important patent for poly-phase alternating current generators and motors from Nicola Tesla. The system his engineers devised used transformers to increase or "step up" the voltage, and at this higher voltage electricity could be transmitted longer distances with less loss. At the receiving end, another transformer would decrease or "step down" the voltage to a level suitable for use. Edison countered that the high voltages were unsafe and took the battle to the public with demonstrations of electrocutions. The two firms battled it out in public and the academic press and contract bids for the Columbia Exposition in Chicago and engineering and equipment bids for the proposed plant at Niagara Falls. While the battle raged over safety in the east, in the west there was no question of suitability.

California was introduced to AC by former Brush Electric Company engineer Almerian Decker. Decker came to California in 1891 for his health and became involved in a southern California electrical project. Decker and his partners, Cyrus G. Baldwin and Henry Harbison Sinclair, opened the San Antonio Light and Power Company in 1892 using Westinghouse technology to transmit power over 14 miles to Pamona. Decker then went on to design Mill Creek, the first commercial American three phase power plant.[2] In 1895 the Folsom power plant, designed by James Lighthipe of General Electric, supplied power to Sacramento 22 miles away. These projects were all completed before the eastern states recognized the value of long distance transmission demonstrated by the Niagara project.[3]

California electrical companies, especially Eugene J. de Sabla and John Martin's companies, continued to increase transmission voltages and distances. Bay Counties Power Company, owned by de Sabla and Martin, broke records in 1901 when they transmitted power generated in the Sierra-Nevada to San Francisco. Throughout the early 20th century California companies developed the hydropower resources of the mountains and transmitted the power across the state.

The shortage of oil and increasing demands for electricity during World War I challenged electrical companies to make more energy available without building more plants. The California State Railroad Commission and the Committee on Petroleum of the State Council on Defense suggested in 1917 that the companies integrate their transmission lines. These integrated lines would allow unused power from one source to be used elsewhere where generating capacity was not as large. This idea of interconnected generating pools was adapted both in the northeast and in neighboring western states following the California model.[4]

[1] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: University of Akron Press, 1997) p.173.
[2] James C. Williams, *Energy and the Making of Modern California*, 175.
[3] James C. Williams, *Energy and the Making of Modern California*, 176-7.
[4] James C. Williams, *Energy and the Making of Modern California*, 245.

The post-World War II era was a time of rapid growth in California. Housing and populations swelled along with the business and industrial concerns. Fueled by wartime defense industries, California grew rapidly. Northern California utility Pacific Gas & Electric (PG&E) began a program of generation growth that included both hydroelectric and steam power. Steam turbine power plants were cheaper and quicker to build than hydroelectric plants and utilities companies moved away from hydroelectricity, establishing steam turbine power as the generator of choice. Such plants conserved water and kept costs down for the business and the consumer.[5] The design criteria were the same in all cases: build the facility close to load centers to reduce transmission costs; locate near fuel supplies; locate near a water supply; and select a site where land was cheap and could support a good foundation. Even with these advance in technology and despite being closer to population centers, steam plants still needed transmission facilities and substations were constructed throughout the service area to connect the new power plants.[6]

Development of the San Joaquin Light and Power Company/ PG&E

The San Joaquin Power Company was formed from the failed San Joaquin Electric Company in 1902.[7] The promoters of this young company negotiated a division of territory with the larger California Gas and Electric Corporation to avoid destructive competition.. The San Joaquin Power Company would be undisturbed in the territory south of Stanislaus County. The company brought San Joaquin Powerhouse No. 1, built by the failed San Joaquin Electric Company, into profitability and expanded it. Power from the hydroelectric plant was transmitted to Fresno and the surrounding area. Albert G. Wishon, one of the founders, encouraged the use of electricity to pump water for irrigation and because of this vision the company served rural areas as well as towns. But in order to expand into new territory and aid the farmers of the San Joaquin Valley the company needed capital. The company was reorganized at the San Joaquin Light and Power Company in 1905 with increased capital. The company began acquiring small local companies and connecting them to the larger hydroelectric system. The San Joaquin Light and Power Company became a corporation and extended its service as far as Bakersfield in 1910. Operations in Bakersfield supported oil pumping and were also the first intercompany transmission connections in 1913. San Joaquin Light and Power Corporation later connected with PG&E to the north to create an integrated system from southern California to southern Oregon.[8] In 1912 the company expanded to the coast with the purchase of gas and electric works serving Paso Robles, Pismo and other small towns. Increasing needs led to the construction of more hydroelectric facilities and a steam plant at Midway near Buttonwillow, west of Bakersfield, in 1921.[9]

Despite being a growing and profitable company, San Joaquin Light and Power was not large enough to avoid purchase. In 1924 Great Western Corporation purchased the corporation. Great Western Corporation operated a system in northern California and connected to its newly acquired system via a transmission line constructed from Brighton substation near Sacramento, to the Wilson substation outside of Merced. Both companies became a part of the North American Company that had holdings that extended across the nation. In a later stock deal the North American Company turned control of the San Joaquin Light and Power and Great Western to PG&E and in return, North American received stock in PG&E. As a result, PG&E controlled electric companies throughout most of northern California.[10]

While San Joaquin Light and Power had been deeply involved in irrigation in the valley, PG&E had a different view. PG&E was strongly opposed to governmental run utilities and the new Central Valley Project (CVP) would bring the government into the arena as a producer of electricity. Beginning in 1923, and not settled fully until 1951, PG&E and the government

[5] Myers, *Iron Men and Copper Wires*, 200; James C. Williams, *Energy and the Making of Modern California*, 277-78, 282-83.
[6] James C. Williams, *Energy and the Making of Modern California*, 284, 374.
[7] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company* (New York: McGraw-Hill Book Co., 1952) 189.
[8] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 265.
[9] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 193-196, 265.
[10] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 293, 296.

entered into a period of animosity. After years of conflict and lawsuits, agreements were reached to establish that the government would sell the generated power to PG&E, who would transmit it to customers. "Backbone" transmission lines from Shasta Dam to Tracy were built to distribute the power.[11]

The decades of Depression and World War II saw limited growth of new generation facilities. Following World War II, PG&E began a program of expanded generation to serve the growing post-war population. One billion dollars was spent on new plants among them were Donbass (1946), Kern (1948), Electra (1948), West Point (1948) Moss Landing (1950), and Contra Costa (1951). PG&E was also able to develop new hydroelectric sites that were not available to southern California companies and World War II had also encouraged greater interconnectivity and transmission lines now connected companies from Brittish Columbia to Mexico.[12]

Panoche Substation

As mentioned above, PG&E built numerous new power stations and ancillary structures like transmission lines and substations following World War II. Panoche Substation was among them. It was constructed at the junction of two transmission lines, one traveling east from Moss Landing and the other north from Bakersfield up to Tracy. Moss Landing began operations in 1950 producing 340,000kw. It was expanded in 1952 and 1953. The substation does not appear in a 1937 aerial of the area, but is shown in a 1950 aerial. The most likely construction date for the substation, therefore is ca. 1948-1950. The San Joaquin Light and Power Corporation had built a transmission line along the east side of the valley to connect Bakersfield to its hydroelectric plants after 1910. The Bakersfield area was rich in oil and the San Joaquin Light and Power Corporation developed a steam plant there in the early 1900s. The current line is not the same as this early transmission line. The Kern Power Plant near Bakersfield was completed in 1946 to supply increased power to irrigation projects in the lower San Joaquin Valley. [13] Linking generation systems into a stable network had begun in during World War I as a conservation measure and was again encouraged during World War II. PG&E retained the practice, and the Panoche substation was a link that helped create stability between the coast, southern San Joaquin Valley, and Delta power stations.

By 1950 the substation had two sets of transformers, one on the east and another on the west side of the station, a tall maintenance building and a smaller control building were also on the site. Along the road were four residences.[14] Between 1950 and 1957 the substation's east and west support structures were doubled in size and the control building also doubled. Between 1957 and 1971 the houses along Panoche road in front of the substation were removed and the office in the equipment yard re-built. In 2001 a peaker facility was added on the southeast corner of the substation and a new office was built for the equipment yard.[15]

Evaluation

The Panoche Substation does not appear to be a historical resource for the purposes of CEQA. The substation was built between 1937 and 1950, most likely 1948-1950 and continuously expanded. It does not appear to be significant within the context of the history of San Joaquin Light and Power Company or PG&E, the history of electric transmission, or the history of post World War II electrical transmission (Criterion A and 1). Panoche is located at the junction of two lines, and does not appear to have been par of the original construction of the older north-south line. As a part of the post-war electrical transmission system the two lines intersecting at Panoche are lines serving the local community and connecting to the larger electrical grid. Panoche does not appear to be historically significant within the context of this larger system. Panoche

[11] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 329.
[12] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 265.
[13] Charles M. Coleman, *PG & E of California: The Centennial Story of Pacific Gas and Electric Company,* 334-335, 196, 332.
[14] Aerial Photograph, Madden Library, University of California, Fresno, 1950.
[15] USGS, *Chaney Ranch,* 1955 photorevised 1971.

Substation does not appear to be associated with the life of a historically significant person (Criterion B and 2). Panoche Substation does not embody characteristics of a type or period of construction (Criteria C and3). It consists of standard substation components arranged in a typical fashion. In addition, continuing alterations to the station have affected the integrity of the substation. The station's setting, materials, workmanship and feeling have been altered over time. Nor is it significant under Criterion D and 4, as a potential source of data on human history. This property is well documented through company records and construction documents and does not appear to be a principal source of important information.

The proposed Panoche Energy Center will expand the current structure on the west side of the substation by 150 feet. This will not adversely affect the substation as it does not appear to be a historical resource for the purposes of CEQA and similar additions have been made in the past.