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 _____

Page 1 **of** 7 ***Resource Name or #** (Assigned by recorder) Wilson-Gregg Transmission Line

P1. Other Identifier: Wilson-Gregg Transmission Line
***P2. Location:** ☐ **Not for Publication** ☒ **Unrestricted** ***a. County** Madera
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Herndon **Date** 1978 **T** 12S ; **R** 19E ; ¼ **of Sec** 30,29 ; M.D. **B.M.**
c. Address _____ City _____ Zip _____
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)

This form records a section of the PG&E Wilson-Gregg Transmission line constructed between 1942 and 1946 located in Madera county. The segment includes nine towers progressing northwest from the Gregg Substation. This line is part of a longer line that connects to Panoche and Henrietta Substations in the south, a system of power plants on the Kings River to the east and Brighton Substation in Sacramento to the north.

The line was constructed at some point between 1923 and 1946. The segment being recorded has nine towers not all of which are visible from the public right of way. Two tower styles were observed.

***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, tower 101/675, camera facing northwest.

***P6. Date Constructed/Age and Sources:**
☒ Historic ☐ Prehistoric ☐ Both
1930-1946 Herndon Quad. Company history

***P7. Owner and Address:**
PG&E
77 Beale Street
San Francisco, California 94105

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

***P9. Date Recorded:** February 16, 2007

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

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") None

***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) Wilson-Gregg Transmission Line

B1. Historic Name: _____
B2. Common Name: Wilson-Gregg Transmission Line
B3. Original Use: 230 kVA Transmission line B4. Present Use: 230 kVA Tranmission line
***B5. Architectural Style:** n/a
***B6. Construction History:** (Construction date, alteration, and date of alterations) original construction between 1930 and 1946.

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

B9. Architect: n/a b. Builder: n/a
***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 Wilson-Gregg transmission line does not appear to meet the criteria for listing in the National Register of Historic Places, nor does it appear to be a historical resource for the purposes of CEQA. It does not appear eligible under Criterion A because it has not "made a significant contribution to the broad patterns of our history." Furthermore, it does not appear to qualify for listing under Criterion B because it has no known associations with persons important to our history. Under Criterion C the transmission line does not appear to be eligible because it is not a distinctive or pioneering engineering feature, nor is it the work of a master designer. In rare instances, buildings and structures themselves can serve as sources of important information about historic construction materials or technologies under Criterion D; however, this property is otherwise documented and does not appear to be a principal source of important information in this regard. Furthermore, the transmission line has suffered a loss of historic integrity as a result of upgrades. (See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes) _____
***B12. References:** See Footnotes

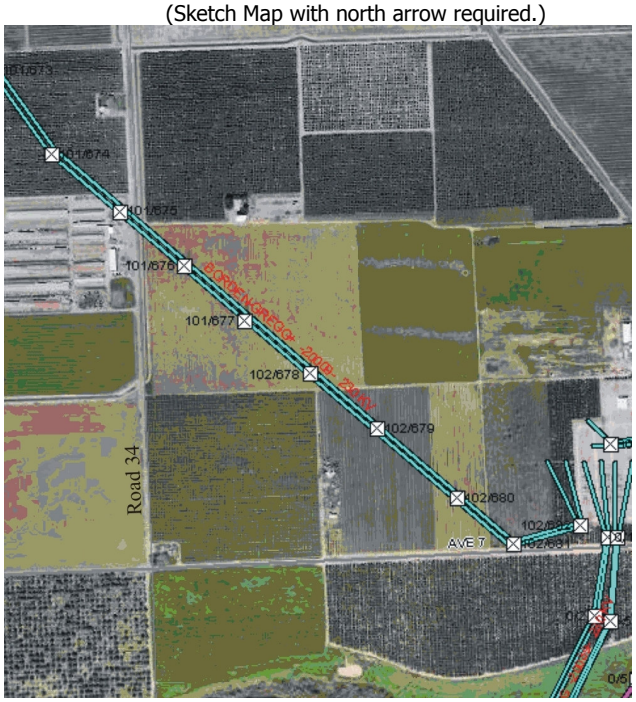
B13. Remarks:

***B14. Evaluator:** Cheryl Brookshear

***Date of Evaluation:** February 2007

(This space reserved for official comments.)

(Sketch Map with north arrow required.)



P3a. Description (continued):

Near the Gregg Substation the towers have four sides. The four main supports angle inwards until about half way up the tower, then they become vertical. Diagonal cross bracing stabilizes the main supports. Small horizontal rods add to the support. Three arms extend from the tower on each side. On the south side of the tower they remain as wide as the tower. The conductor is attached at three points where it enters, where it leaves and from a center insulator that is suspended from the center of the arm. On the north side the arms taper to a point. The conductor is only attached at two points; an insulator where it enters and an insulator where it leaves. Intervening farm fields prevented a full count of towers in this style. The two closest to the power plant are of this style and logically would include five towers labeled 102/678, 102/679, 102/680, 102/681 and 102/682.

The second tower style again had four sides with the base tapering to a vertical tower. Three arms extend to the sides. Each arm narrows to a point from which an insulator hangs. The conductor is attached to the suspended insulator at only one point. The tower has diagonal cross bracing and only three sets or horizontal braces. Four of these towers exist in the segment, 101/674, 101/675, 101/676 and 101/677.

B10. Significance (continued):

Historic Context

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.

[1] James C. Williams, *Energy and the Making of Modern California* (Akron, Ohio: University of Akron Press, 1997) p.173.

Baldwin and Henry Harrison Sinclair, opened the San Antonio Light and Power Company in 1892 using Westinghouse technology to transmit power over 14 miles to Pomona. 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's 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]

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

[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.
[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.

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 government run utilities and the new Central Valley Project (CVP), which it feared would bring the government into the arena as a producer of electricity. PG&E and the government entered into a period of competition beginning in 1923, and not settled fully until 1951. After years of conflict and lawsuit agreements between the federal government and the company established 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 British Columbia to Mexico.[12]

Wilson-Gregg Transmission Line

The Wilson-Gregg Transmission line is part of a system that was constructed in the 1930s and 1940s as the San Joaquin Light and Power Company and PG & E merged. The original line can be traced on USGS quadrangles from the 1940s. The line headed south to Sanger and then west to the Kings River hydroelectric plants. Heading north the system connected west of Merced. A 1940-41 quadrangle *Athlone* shows a 110 KV line and 230 KV line of PG&E connecting south of La Grange in 1939. The financial maneuvers that consolidated the two companies did not occur until 1930 and San Joaquin Power and Light was not fully absorbed until 1938.[13] After 1978 the line was diverted to connect with the Gregg Substation. Previously it had crossed Avenue 7 in a straight line across the San Joaquin River with a small spur connecting it to the Herndon Substation. Today the line turns west at Avenue 7 and connects to the Gregg Substation before continuing across the river.

[8] Charles M. Coleman, *PG & E of California:,* 265.
[9] Charles M. Coleman, *PG & E of California:,* 193-196, 265.
[10] Charles M. Coleman, *PG & E of California:,* 293, 296.
[11] Charles M. Coleman, *PG & E of California,* 329.
[12] Charles M. Coleman, *PG & E of California,* 265.
[13] Charles M. Coleman, *PG& E of California,* 296-7.

Discussion of Significance

The transmission lines do not appear to meet any of the National Register's significance criteria. The potential of the Wilson-Gregg transmission lines to qualify for listing under Criterion A lies with their association with the merger of San Joaquin Light and Power and PG&E in California, and the development of long-distance high voltage electrical transmission systems. As discussed above, pioneering transmission lines were built between 1908 and 1910. This was an active period of hydroelectric development in California, with several companies, including Great Western Power, California G&E, the predecessor of PG&E and the American River Power Company, greatly expanding their transmission systems. The Wilson-Gregg transmission lines do not fall within that time period. Transmission lines that would meet the requirements of Criterion A would need to represent significant events or trends in the development of the electrical industry in California and electric transmission. The Wilson-Gregg line was a part of the lines that connected PG&E and San Joaquin Light and Power. However, throughout the history of electrical companies in California and the nation, power companies have merged and integrated systems. The Wilson-Gregg line is one of numerous facilities that were a result of company mergers.

Furthermore, the Wilson-Gregg Line does not appear to meet the requirements of Criterion C. Transmission lines that would be eligible for listing under this criterion would represent distinctive or pioneering engineering features in the field of long distance power transmission. This does not appear to be the case. The Wilson-Gregg lines were not the first to carry high-voltage electricity over a great distance, nor were they among the first to use steel towers rather than wooden ones. On the contrary, they utilize commonly accepted technology and engineering principles that were the result of more than half a century of development. They are typical examples of manufactured transmission towers for their period that are found in great numbers throughout California.

Also, available evidence does not indicate that the property is associated with any known significant persons (Criterion B). Finally, the resource has not yielded, nor is likely to yield, information important in prehistory or history (Criterion D). The Newark-San Jose transmission line has also been evaluated in accordance with Section 15064.5(a)(2)-(3) of the CEQA Guidelines, using criteria outlined in Section 5024.1 of the California Public Resources Code. It does not appear to be a historical resource for the purposes of CEQA.

Photographs (cont):

Photograph 2. Tower 102/681, camera facing north.