

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

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**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC

Folsom Powerhouse

AND/OR COMMON

Folsom Powerhouse

2 LOCATION

STREET & NUMBER

Jct. Folsom Blvd. & Riley St.,

NOT FOR PUBLICATION 15

CITY, TOWN Folsom Lake State Recreation Area

CONGRESSIONAL DISTRICT

Folsom

VICINITY OF

STATE

California

CODE

06

COUNTY

Sacramento

CODE

067

3 CLASSIFICATION

CATEGORY

OWNERSHIP

STATUS

PRESENT USE

DISTRICT

PUBLIC

OCCUPIED

AGRICULTURE

MUSEUM

BUILDING(S)

PRIVATE

UNOCCUPIED

COMMERCIAL

PARK

STRUCTURE

BOTH

WORK IN PROGRESS

EDUCATIONAL

PRIVATE RESIDENCE

SITE

PUBLIC ACQUISITION

ACCESSIBLE

ENTERTAINMENT

RELIGIOUS

OBJECT

IN PROCESS

YES: RESTRICTED

GOVERNMENT

SCIENTIFIC

BEING CONSIDERED

YES: UNRESTRICTED

INDUSTRIAL

TRANSPORTATION

NO

MILITARY

OTHER

4 OWNER OF PROPERTY Write: Jack Knight, Head, Operations Division

NAME

California Department of Parks & Recreation

STREET & NUMBER

P.O. Box 2390

CITY, TOWN

Sacramento

STATE

California

VICINITY OF

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE,
REGISTRY OF DEEDS, ETC.

Office of the County Recorder

STREET & NUMBER

Sacramento County Courthouse

CITY, TOWN

Sacramento

STATE

California

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Historic Sites Survey; National Register; Historic American
Engineering Record

DATE

1963; 1973; 1975

FEDERAL STATE COUNTY LOCAL

DEPOSITORY FOR
SURVEY RECORDS

Historic Sites Survey; National Register; HAER

CITY, TOWN

Washington

STATE

D.C.

797

7 DESCRIPTION

CONDITION		CHECK ONE	CHECK ONE
<input type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED	<input type="checkbox"/> UNALTERED	<input checked="" type="checkbox"/> ORIGINAL SITE
<input checked="" type="checkbox"/> GOOD	<input type="checkbox"/> RUINS	<input checked="" type="checkbox"/> ALTERED	<input type="checkbox"/> MOVED DATE _____
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPDSED		

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

The two-story, red brick, gable-roofed, canal-fed Folsom Powerhouse has changed remarkably little since it was completed in 1895. The northeast-southwest oriented structure measures 94 feet long and 45 feet high, rests on a granite foundation, features 20- to 30-inch-thick walls, and has a corrugated metal roof. Its canal has been dismantled and filled, but its original 150-by-100-by-12-foot forebay, intake gates, penstocks, McCormick turbines, General Electric generators, and Tennessee-marble-faced control panel remain intact. Included in the inventoried property is a secondary powerplant which was installed below the main facility in 1897 to take advantage of a 26-foot drop between its tailrace and the river. This second plant--an east-west oriented, 69-by-34-foot, metal-clad, wood-frame structure retains its original appearance and 750-kilowatt rope-driven generator as well as various other early features. Formerly some 2,200 feet of continuous-strand hemp rope connected the generator and turbine in this plant. The complex, which is situated on 12 acres within the Folsom Lake State Recreation Area, also includes transformers and a one-story, 54.5-by 12.5-foot, wood-shingle-clad frame office and shop building that rests on a brick foundation a short distance north of the main powerplant. All structures are in generally sound condition.

As the California Department of Parks and Recreation brochure explains,

"Electric current is generated by spinning coils of copper wire - an armature - between magnets. The more coils there are and the faster they spin, the more current is produced by the generator. A turbine, or water-driven engine, is one of several power sources that can be used to impart the spinning motion. A pipeline, or penstock, was built along the bottom of the original dam to lead the water to the turbines in the Folsom Powerhouse, which were set at the lowest possible elevation to wring the maximum energy possible from the falling water.

"The units at Folsom, called reaction turbines, have a series of blades mounted on the turning element, or runner. Water is admitted through a series of fixed guide vanes and strikes all the blades simultaneously. When the water enters through the guide vanes, the direction of its flow is at right angles to the shaft of the turbine; the water is deflected and leaves the runner nearly parallel to the shaft. The great

(continued)

Ibid.

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PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW			
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input type="checkbox"/> SCIENCE
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION
<input checked="" type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input checked="" type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)
		<input type="checkbox"/> INVENTION		

SPECIFIC DATES 1895-1952

BUILDER/ARCHITECTSacramento Elect. P. & L. Co.
H. T. Knight

STATEMENT OF SIGNIFICANCE

According to Carron Garvin of the American Society of Mechanical Engineers, when the Folsom Powerhouse "was placed in service [on the American River] July 13, 1895, it represented a momentous advance in the science of generating and transmitting electricity." The new facility "brought high-voltage alternating current over long distance transmission lines for the first time."¹

California State senator Horatio Gates Livermore began trying to tap the power of the American River in the 1850's, and his sons, Horatio Putnam and Charles Edward Livermore, continued his efforts during subsequent years while changing the scheme of the development from water to hydroelectric power. They planned first to have factories erected near the powerhouse, but reports of electric power transmission experiments in Europe convinced them to attempt transmission between Folsom and Sacramento, a distance of 22 miles. With assistance from various individuals and the General Electric Company, they succeeded and, as the Journal of Electricity observed in 1896, Sacramento became "the first American city to demonstrate the practicability of long distance transmission at high voltage."²

The two-story, brick, canal-fed Folsom Powerhouse has changed remarkably little since 1895. Its canal has been dismantled and filled, but its original forebay, intake gates, penstock, McCormick turbines, General Electric generators, and Tennessee-marble-faced control panel remain intact.³ Included in the inventoried property is a secondary powerplant which was installed below the main facility in 1897 to take advantage of a 26-foot drop between its tailrace and the river. This second plant, a metal structure, retains its original appearance and 750-kilowatt rope-driven generator as well as various other early features.

(continued)

¹Carron Garvin, The Folsom Powerhouse No. 1, 1895 (Sacramento, 1976), 1.

²Quoted in Charles M. Coleman, P.G. & E. of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952 (New York, 1952), 116-17.

³Garvin, The Folsom Powerhouse No. 1, 1895, 9.

9 MAJOR BIBLIOGRAPHICAL REFERENCES

(See continuation sheet.)

10 GEOGRAPHICAL DATA

ACREAGE OF NOMINATED PROPERTY ca. 12 acres

UTM REFERENCES

E|1.0| 615.8|5.2.0| 4.2|8.2|6.4.0

A 1.0| 615.8|7.8.0| 4.2|8.2|9.0.0
ZONE EASTING NORTHING

B 1.0| 615.8|8.4.0| 4.2|8.2|8.2.0
ZONE EASTING NORTHING

C 1.0| 615.8|7.4.0| 4.2|8.2|5.3.0

D 1.0| 615.8|6.6.0| 4.2|8.2|5.0.0

VERBAL BOUNDARY DESCRIPTION

(See last page of description.)

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

STATE	CODE	COUNTY	CODE
STATE	CODE	COUNTY	CODE

11 FORM PREPARED BY

NAME / TITLE

George R. Adams, Director, Historic Landmarks Project

ORGANIZATION

American Association for State and Local History

DATE

June 1978

STREET & NUMBER

1400 Eighth Avenue South

TELEPHONE

615/242-5583

CITY OR TOWN

Nashville,

STATE

Tennessee 37203

12 STATE HISTORIC PRESERVATION OFFICER CERTIFICATION

THE EVALUATED SIGNIFICANCE OF THIS PROPERTY WITHIN THE STATE IS:

NATIONAL

STATE

LOCAL

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law B9-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

TITLE

DATE

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

DATE

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST:

DATE

KEEPER OF THE NATIONAL REGISTER

UNITED STATES DEPARTMENT OF THE INTERIOR
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CONTINUATION SHEET Folsom Powerhouse ITEM NUMBER 7 PAGE one

force exerted on the blades as the water flow changes direction turns the shaft and drives the connected generator shaft.

"When the Folsom plant was in operation, the water was directed to the turbines by inlet pipes each eight feet in diameter. The four pairs of McCormick turbines were run under a head (water pressure) of 55 feet of water and at a speed of 300 revolutions per minute. Waterflow through the turbines was regulated to match the fluctuating demand for electric energy, by opening or closing valves at the turbine-inlet.

"The turbines are directly connected to the six-inch armature shafts of Folsom's generators. In 1895 these units were reported to be the largest three-phase dynamos ever constructed. Each stands 8 feet, 8 1/2 inches and weighs 57,877 pounds. Their combined capacity is 3,000 kilowatts. Brought to California by ship around Cape Horn, the vintage generators are still in place at the powerhouse."

Boundary Justification. The boundary of the inventoried property includes approximately 12 acres, both the 1895 and the 1897 powerhouses, other original out-structures, and all extant elements of the water-flow system, such as penstocks, intake gates, and forebay. There are no modern intrusions.

Boundary Description. As indicated in red on the accompanying sketch maps [(1) U.S.G.S. 7.5' Series, Calif., Folsom Quad., 1967, photorevised 1975, and (2) AASLH Sketch Map, 1978], a line beginning on the south bank of the American River directly beneath the west side of the Folsom Boulevard (or Auburn-Folsom Road) Bridge and extending southwestward approximately 1200 feet along

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said bank to an unmarked point north-northwest of the intersection of Riley Street and Folsom Boulevard; thence, south-southeastward approximately 500 feet along the current western edge of State recreation area property to the southwestern corner of said property; thence, east-southeastward approximately 200 feet along the State property line to the northern edge of the right-of-way of Folsom Boulevard; thence east-northeastward approximately 1,000 feet along said right-of-way to the point of beginning.

Continuation Sheet Folsom Powerhouse Item Number 9 Page one

Coleman, Charles M., P. G. and E. of California: The Centennial Story of Pacific Gas and Electric Company, 1852-1952.
(New York: McGraw-Hill Book Company, Inc., 1952).

"Folsom Powerhouse, Historical Landmark No. 633" (Sacramento: California Department of Parks and Recreation, 1974).

Garvin, Carron, The Folsom Powerhouse No. 1, 1895 (Sacramento: Sacramento-Sierra Nevada Section of the American Society of Mechanical Engineers, 1976).

Pacific Gas and Electric and the Men Who Made It (San Francisco: Leib-Keyston & Company, 1926).

Rice, Archie, "History of Pacific Gas and Electric Company," Pacific Gas and Electric Magazine, I (October, 1909), 180-90.

Welts, Allen W., III, Folsom Powerhouse National Register Inventory-Nomination, 1970.

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History

As a California Parks and Recreation brochure notes, "the Folsom story began with Horatio Gates Livermore, a Maine native who came to California with thousands of other gold seekers in 1850."⁴ Livermore won election to the State senate in 1854, and during his travels to the capital in Sacramento he decided that the American River, which flows out of the Sierra Nevadas and empties into the Sacramento River above the city, could be utilized for logging and industrial purposes. In fact he dreamed of establishing at Folsom, 22 miles upriver from Sacramento, an industrial metropolis similar to Lowell, Mass. Logs, he thought, could be floated down the American to Folsom, where the force of the river would drive sawmills and factories. Livermore soon obtained an interest in a company organized earlier to divert American River water to placer workings in the foothills, and in 1856 his sons, Horatio Putnam and Charles Edward Livermore, joined him in California. By the mid 1860's the Livermores had gained control of the water firm, the Natoma Water and Mining Company, and added to its assets some 9,000 acres of land that had formerly been part of the Rancho de los Americanos. This acquisition gave the Livermores water rights needed for moving logs downstream to Folsom.

Before the Livermores could implement their plans to develop Folsom, they first had to construct a dam at Stony Bar Gorge, above the town, to create a holding area for logs and a storage basin that would insure a constant flow to mills and farmlands. Work began on the project in 1867, and over the next few years the Natoma Company spent some \$119,000 to build a 2-mile railroad from the town to the dam site and to lay a foundation for the dam itself. Meanwhile, in 1858 the California Legislature had provided for the establishment of a new prison, and by 1868 the State Prison Board was considering Folsom as one of two possible locations for its construction. With the hope of minimizing further construction costs, the Livermores succeeded in persuading the board to select Folsom. In a formal contract the entrepreneurs agreed to turn over 350 acres, on the south bank of the river adjacent to the dam, for a prison site in exchange for \$15,000 worth of convict labor to be utilized in completing the Folsom dam and a power canal.

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⁴Folsom Powerhouse, Historical Landmark No. 633" (Sacramento, 1974), n.p.

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Unfortunately for the Livermores, however, the State did not complete the prison until 1880, and so several years passed before convict labor became available. Convicts first went to work on the dam in July 1882, one year after the Livermores converted the Natoma Company into the Folsom Water Power Company. Apparently construction proceeded fairly smoothly under the guidance of engineer-designer H. T. Knight until about 1888, when the company decided that it was entitled to more than \$15,000 worth of convict labor and stopped work. The State then sued in an effort to get the project going again under the original agreement. Eventually the parties reached a compromise that gave the company additional labor--later estimated at a value of more than \$200,000--and granted the prison additional water rights. Construction resumed, and the dam and canal were completed in 1892, the year of Horatio Gates Livermore's death.

By this time Horatio P. and Charles E. Livermore had realized that water power as a direct motive force for mills and factories would soon be superseded by electric power. Horatio P., especially, had observed the application of electric power to California mines and studied reports of electrical transmission in Germany and Italy. Accordingly he decided to erect an hydro-electric powerhouse below the dam and transmit electricity to Sacramento. Apparently few of his contemporaries thought such a venture could succeed, but despite this and the fact that Sacramento already had a battery-powered electric railway company, Livermore obtained a franchise for an electric railcar firm in the city, incorporated the Sacramento Electric Power and Light Company, and commenced seeking assistance for construction of a powerplant and transmission line.

Both the Westinghouse and General Electric Companies responded to Livermore's request for assistance, and both inspected his plan and plant site and submitted construction proposals. Westinghouse emphasized that their proposal was theoretical and experimental, while General Electric apparently showed greater enthusiasm for the project. Eventually Albert Gallatin, president and general manager of Huntington and Hopkins Hardware as well as president of Sacramento Electric, persuaded General Electric to invest \$20,000 in the enterprise and undertake installation of the electrical system. Electrical Securities of Boston, a firm which had close financial ties with General Electric, was persuaded to underwrite a block of the Livermore Company's bonds.

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Work on the powerhouse and an extension of the canal began immediately and Sacramento Electric arranged to purchase street railways from Central Electric Railway. By mid 1895 the Folsom Powerhouse had been completed and tested. It began transmitting power to Sacramento on July 13, 1895, and thus, says Pacific Gas and Electric Corporation historian Charles M. Coleman, "marked a new achievement in long-distance transmission at high voltage."⁵ "Up to that time," says Garvin, "power had never been transmitted more than five miles. This achievement proved that low-cost hydro-electric energy could be carried to distant population centers."⁶

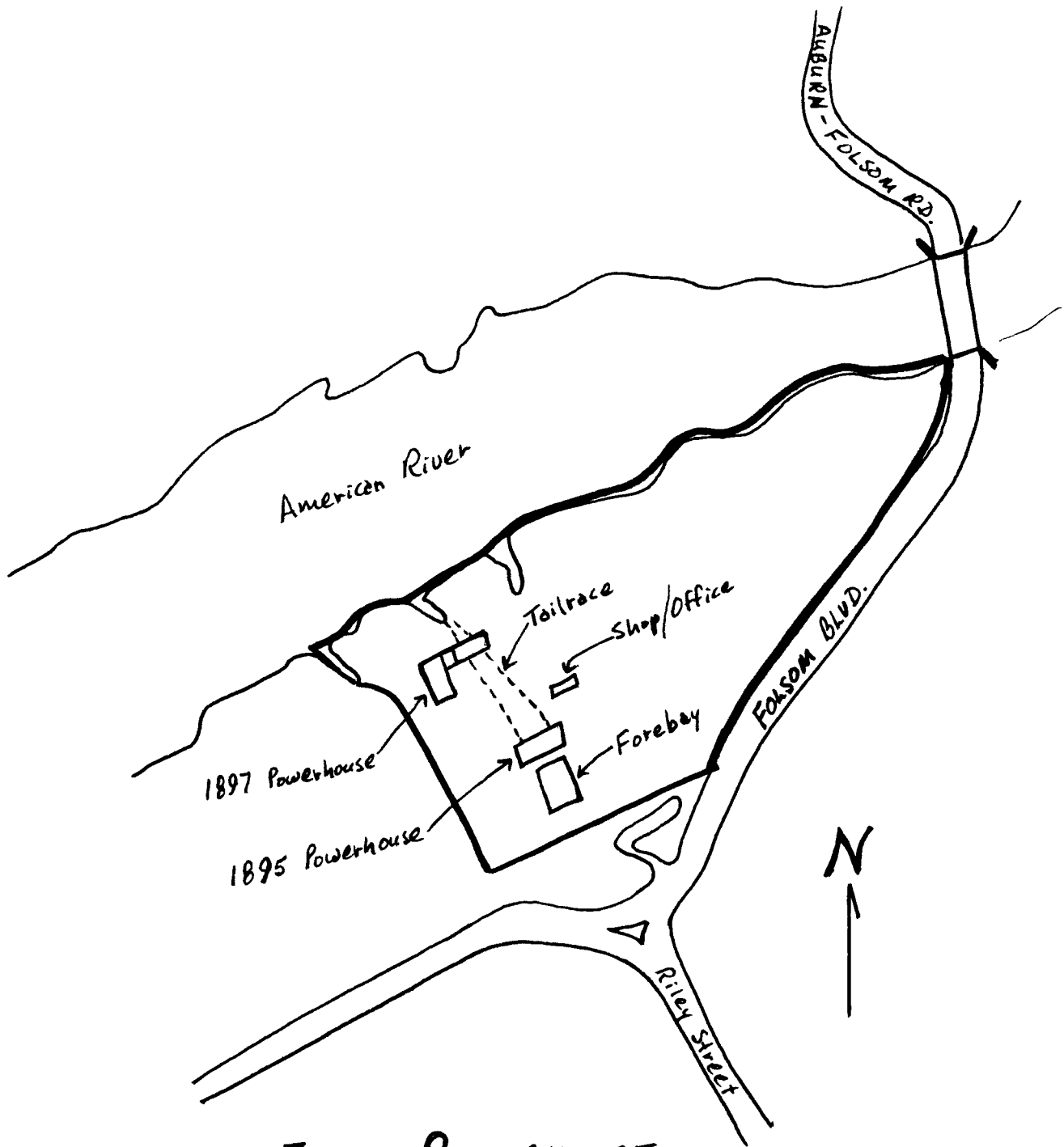
In 1896 the Livermores consolidated all their companies into the Sacramento Electric, Gas and Railway Company. Their long struggle to harness the power of the American River did not end, though. For one thing, they faced stiff competition from another new electric firm, Central California Electric, and an established gas company, Capitol Gas, and were forced to authorize a bond issue of \$1 1/2 million. For another, the years 1896-98 proved extremely dry, leaving waterflow in the river too low to meet all of Sacramento's electric power needs. In 1897 the Livermores and Gallatins constructed a second powerplant below the first to take advantage of an additional 26-foot drop in water returning to the river. Two years later they took over the Capitol Gas Company and contracted with the new Yuba Electric Company to supply additional power to Sacramento. These developments eased but did not solve the Livermores' and Gallatin's financial problems, though, and in 1903 they sold their company and the Folsom Powerhouse complex to the California Gas and Electric Corporation, a new, consolidated firm that was owned by Eugene de Sabla and John Martin and was destined to grow into the now-powerful Pacific Gas and Electric Corporation.

P. G. & E. operated the historic powerhouse until November 1952, when the old Folsom Dam was destroyed and a new one erected farther upstream. In 1958 P. G. & E. presented the complex to the California State Park System for preservation and interpretation. It is presently part of the Folsom Lake State Recreation Area, and since 1976 it has been a National Historic Mechanical Engineering Landmark.

⁵Coleman, P. G. & E. of California, 116.

⁶Garvin, The Folsom Powerhouse No. 1, 1895, 9.

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FOLSOM POWERHOUSE
Folsom, California

AASH Sketch Map
By: G. R. Adams, 1978