

SAN GORGONIO HYDROELECTRIC SYSTEM, TANK NO. 1 AND
PENSTOCK NO. 1
San Bernardino National Forest
Banning vicinity
Riverside County
California

HAER CA-2278-D
HAER CA-2278-D

PHOTOGRAPHS
WRITTEN HISTORICAL AND DESCRIPTIVE DATA
FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
1849 C Street NW
Washington, DC 20240-0001

HISTORIC AMERICAN ENGINEERING RECORD

SAN GORGONIO HYDROELECTRIC SYSTEM, TANK NO. 1 & PENSTOCK NO.1

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Location: Tank No. 1 and Penstock No. 1 are located northeast of Powerhouse No.1 and southwest of the Raywood Flat canal turnout at the northwestern edge of Big Oaks Canyon. They are located in Section 36; T.1S., R.1E. on the San Gorgonio Mountain USGS topographic map. Tank No. 1 was located at latitude: 34.037884, longitude: -116.841163. The coordinate represents the approximate center of the site where Tank No. 1 was originally constructed. Since the feature has since been dismantled an exact location is not possible. This coordinate was obtained on June 30, 2010 using a GPS mapping grade unit accurate to +/- 3 meters after differential correction. The coordinate's datum is North American Datum 1983. The Tank No. 1 location has no restriction on its release to the public.

Significance: Due to the loss of both Tank No. 1 and its Penstock in 1998, the resource cannot be considered a contributing feature to the San Gorgonio Hydroelectric System. However, the system itself was found to form a locally significant district of resources with a high degree of integrity eligible for listing in the National Register of Historic Places under Criteria A and C. The system was found eligible under Criterion A, for its representation of 1920s hydroelectric development in southern California and the system was also found to be eligible under Criterion C for architecture and engineering. In terms of engineering the system is significant for its use of tanks rather than forebays, which represented a departure from typical western hydroelectric systems, using a technique more common to the eastern United States and its utilization of automatic controls which were a new innovation in the 1920s and later became an industry standard. Additionally, in terms of architecture, the two powerhouses were found to be good examples of utilitarian structures influenced by Classical Revival style architecture.

Description: Tank No. 1 and its associated penstock were located between the South Fork Intake and Powerhouse No.1 at an elevation of 6,994 feet. The 123,000 cubic feet capacity steel tank was constructed in 1923 by the San Gorgonio Power Company. Tank No. 1 was constructed of ¼"-½" riveted steel plates and had a height of 38'-3" and a diameter of 64'.⁴⁰ Tank No. 1 functioned in the same way that a typical forebay functions within a hydroelectric system. Forebays, and in this case tanks, are reservoirs usually located at higher elevations than the powerhouse, where the water is gathered before it enters the penstock. While the water gathers within the reservoir, silt and other heavier aggregate particles fall to the base of the reservoir helping to regulate the water before entering the penstock. The higher altitude of the reservoir also helps to increase the pressure of the water as it exits the tank or forebay downhill through the penstock. Before the water entered the penstock from Tank No. 1 it passed through an additional screen box and through an 18" gate valve into the penstock.

⁴⁰ There were two drawings of Tank No. 1 and Tank No. 2 for the San Gorgonio System. Since Tank No. 1 collapsed in 1998 the measurements used in this report were taken from the 1964 drawings rather than the FERC Drawings created in 1999 a year after Tank No. 1 collapsed.

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Penstock No. 1 consisted of 1390' of riveted 18" diameter steel pipe joined with steel drive joints, connected to 1850' of riveted 18" diameter steel pipe with flange joints, connected to 2975'-4-3/16" of welded 18" diameter steel pipe with flange joints, for a total of 6215'-4-3/16" of 18" steel pipe. Penstocks within hydroelectric systems are generally built as vertical as conditions will allow. In the case of Penstock No. 1, it begins at an elevation of approximately 6988.55' at the base of Tank No.1 and ends at an elevation of 5241.59' where the nozzle of Penstock No. 1 enters Powerhouse No.1. This drop in elevation provides the increased water pressure necessary to operate the Pelton impulse water wheel within Powerhouse No. 1.

History: The San Gorgonio Hydroelectric System was constructed between 1911-1923. Tank No.1 and its Penstock were constructed from 1922-1923. Although, the architect and engineer are not known it is most likely that Charles O. Poole, the Chief Engineer for the project oversaw their construction. The contractor was C.D. Sotiras and the Crane Company of Chicago furnished 7,000' of steel pipe for the penstocks.⁴¹ In 1998 Tank No.1 collapsed and as of 2010 has not been rebuilt or replaced. Please see the Historic Context section in the general Historic American Engineering Record for the San Gorgonio Hydroelectric System (HAER No. CA-2278) for additional information.

Sources:

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⁴¹ *Banning Record*, May 24, 1923 p. 1

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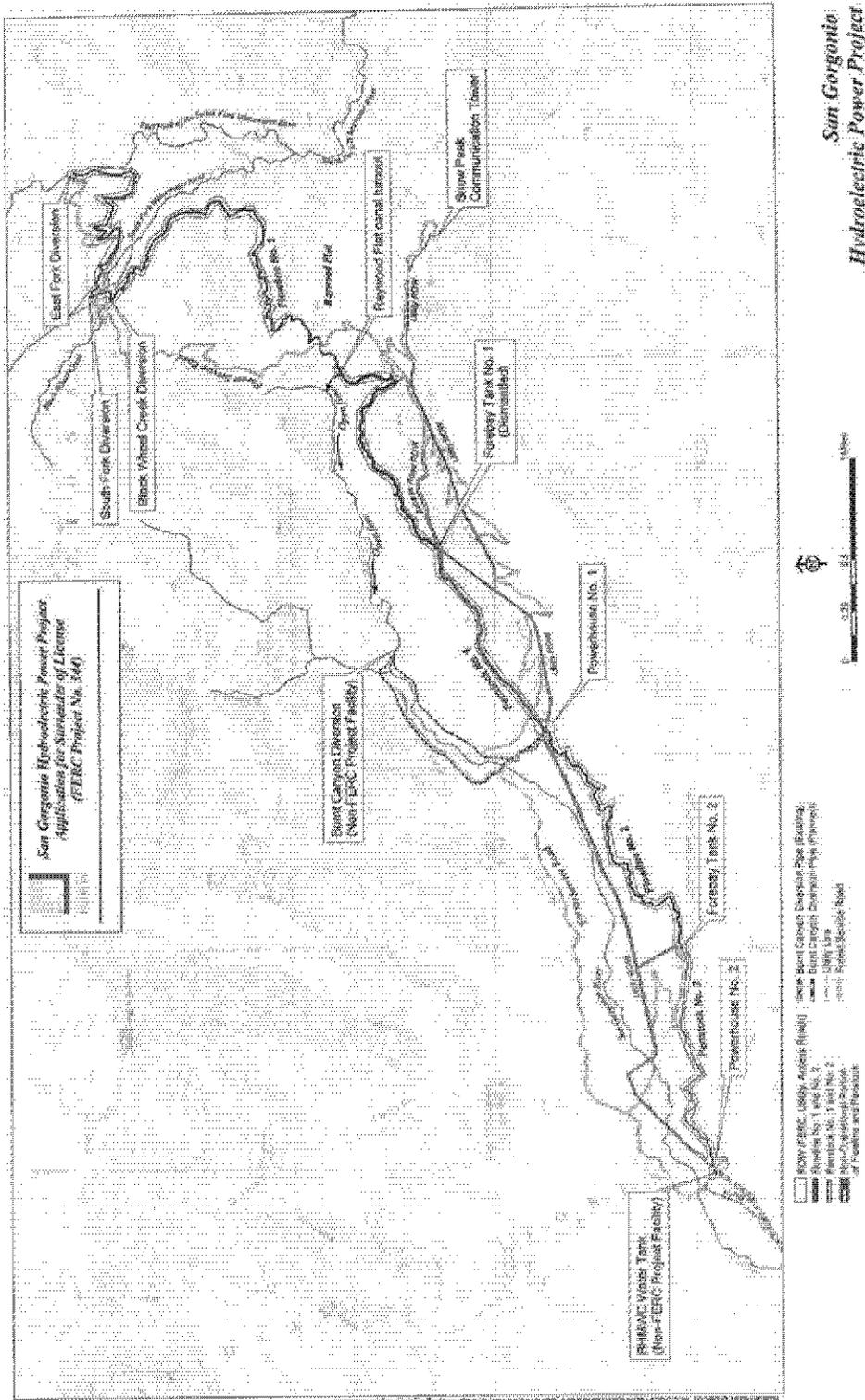
Historian: Ben Taniguchi, Historian, and Nicole Collum, Architectural Historian II, Galvin Preservation Associates, 1611 S. Pacific Coast Highway, #104, Redondo Beach, CA 90277, 2009-2010.

Project Information: SCE is planning to decommission the project's two power plants and part of their appurtenant water conveyance system. Some of the project components are scheduled to be decommissioned and removed, decommissioned and abandoned in place, or transferred to new ownership. The hydroelectric generators and other pieces of hardware and equipment will be removed from the powerhouse buildings, but the buildings will remain. Components slated for removal will be demolished using bulldozers where present access exists and other components will be removed using hand crews where there is no present vehicle access. The San Gorgonio Pass Water Agency plans to acquire those project facilities that are not decommissioned and use these remaining facilities to continue to divert and transport water for domestic and irrigation purposes to customers of the Banning Heights Mutual Water Company and the city of Banning. The transferred facilities would no longer be used for the generation of power. As a result of this project the San Gorgonio Hydroelectric System was documented with Historic American Engineering Records. The entire system was documented in an

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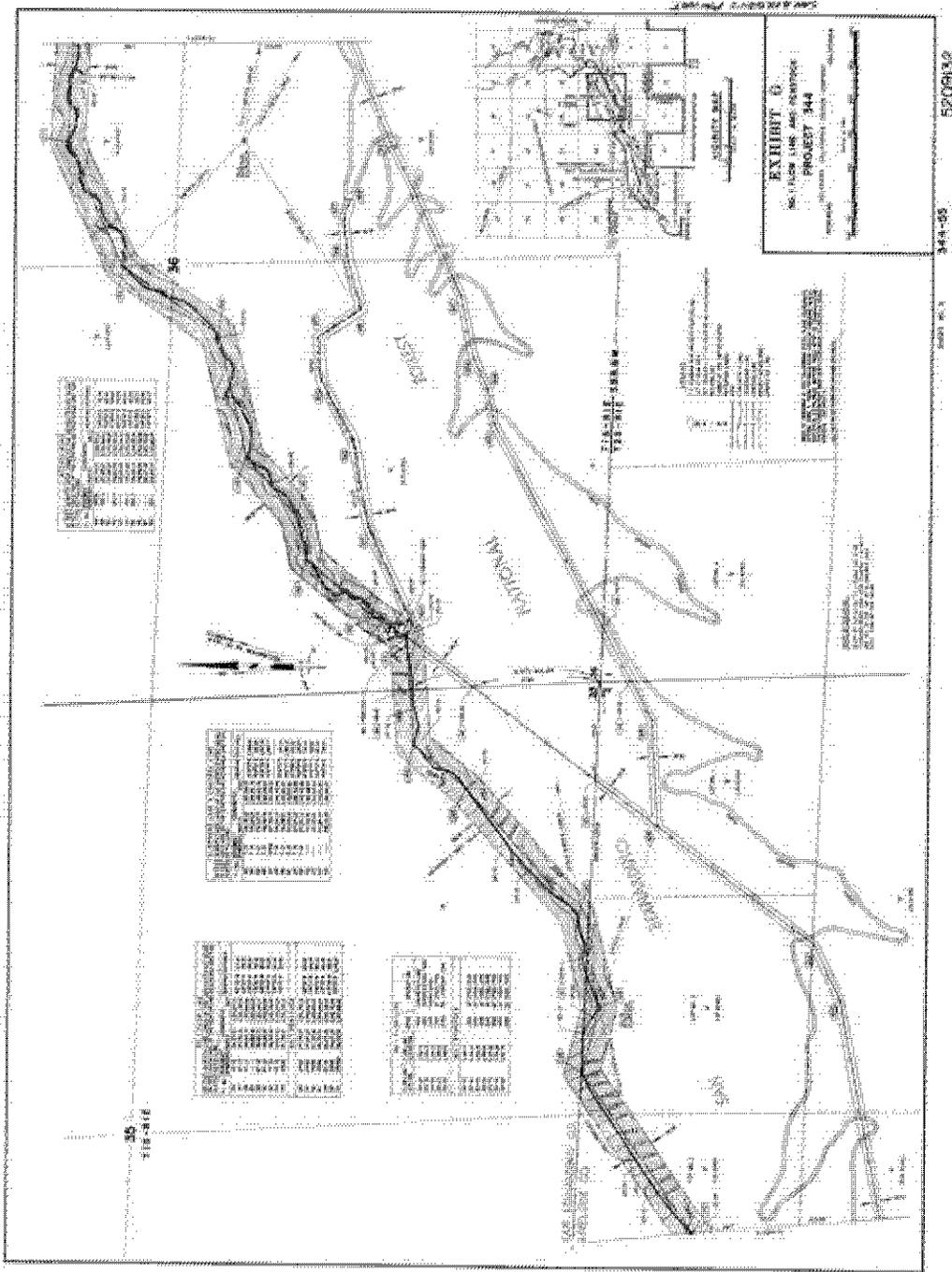
overview report, San Gorgonio Hydroelectric System HAER No. CA-2278 and each contributing element of the system was documented with separate supporting reports as follows: San Gorgonio Hydroelectric System, East Fork Dam and Intake, HAER No. CA-2278-A; San Gorgonio Hydroelectric System, South Fork Dam and Intake, HAER No. CA-2278-B; San Gorgonio Hydroelectric System, Powerhouse No. 1, HAER No. CA-2278-C; San Gorgonio Hydroelectric System, Tank No. 1 and Penstock No. 1, HAER No. CA-2278-D; San Gorgonio Hydroelectric System, Operator's Bungalow, HAER No. CA-2278-E; San Gorgonio Hydroelectric System, Operator's Garage, HAER No. CA-2278-F; San Gorgonio Hydroelectric System, Powerhouse No. 2, HAER No. CA-2278-G; San Gorgonio Hydroelectric System, Flowline No. 2, Tank No. 2, & Penstock No. 2, HAER No. CA-2278-H.

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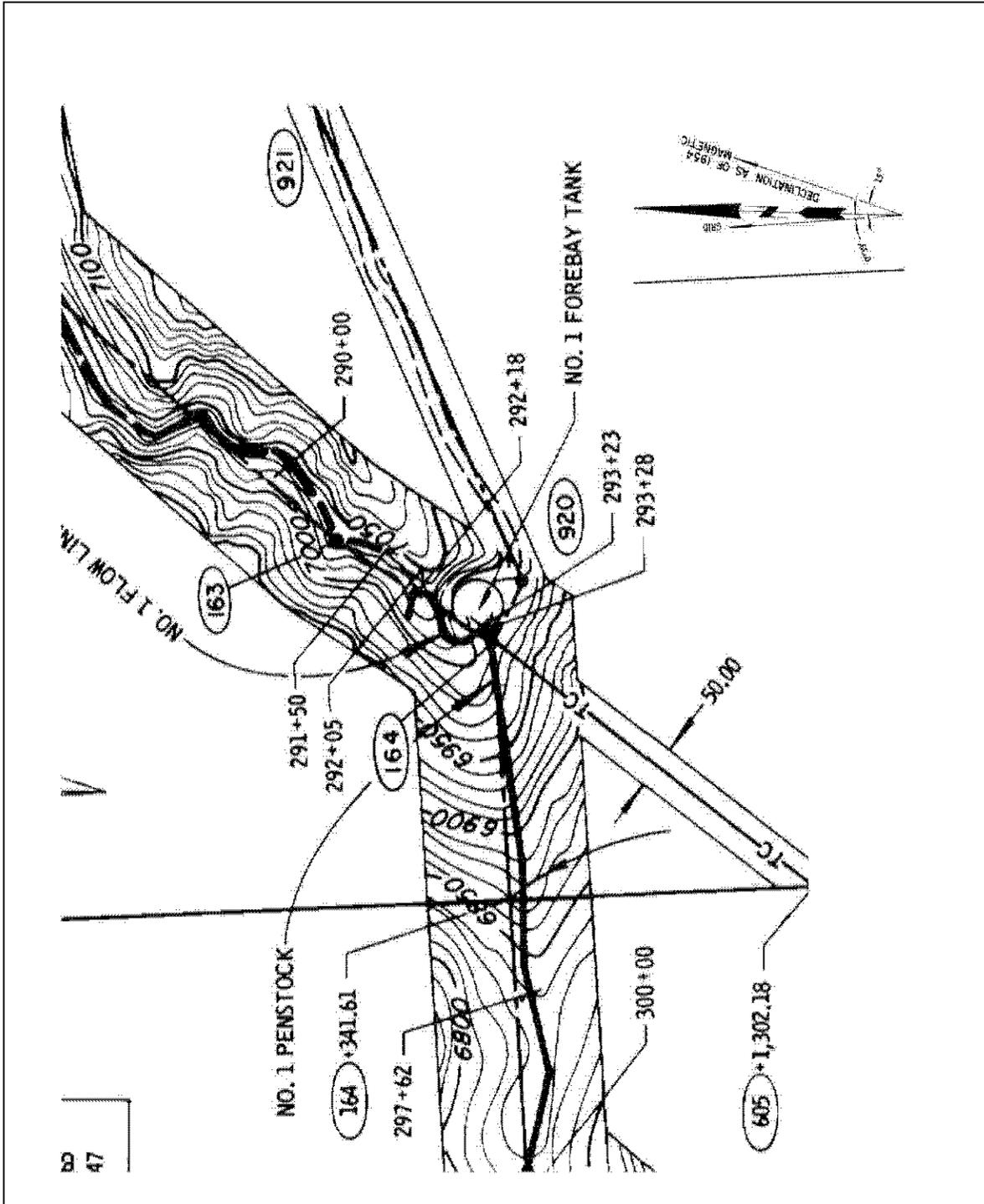
Reduced size overview map of the San Gorgonio Hydroelectric System. Map courtesy of Southern California Edison Company.

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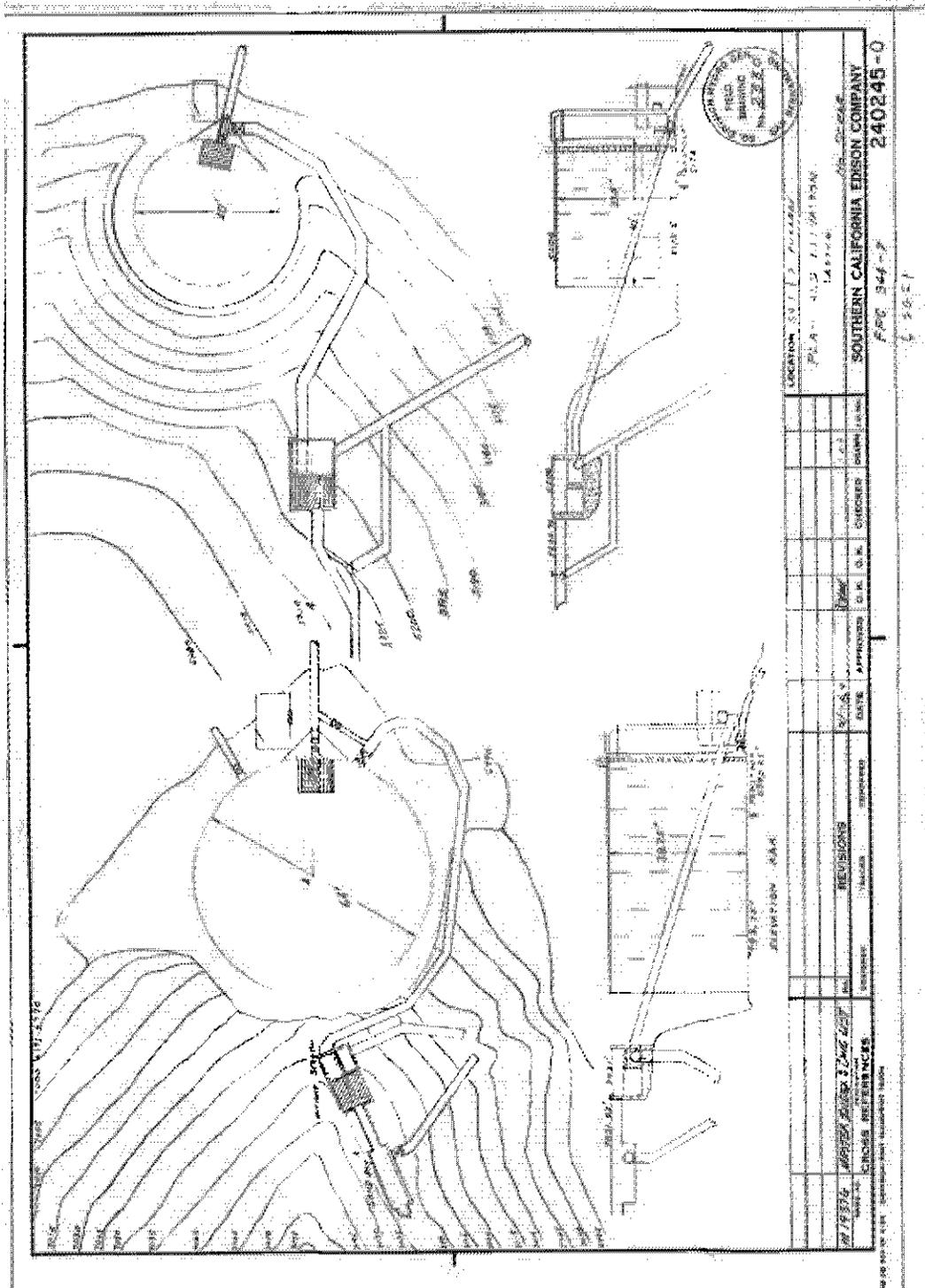
Reduced size plan of Flowline No.1, Tank No.1 and Penstock No.1. Original drawing courtesy of Southern California Edison. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.

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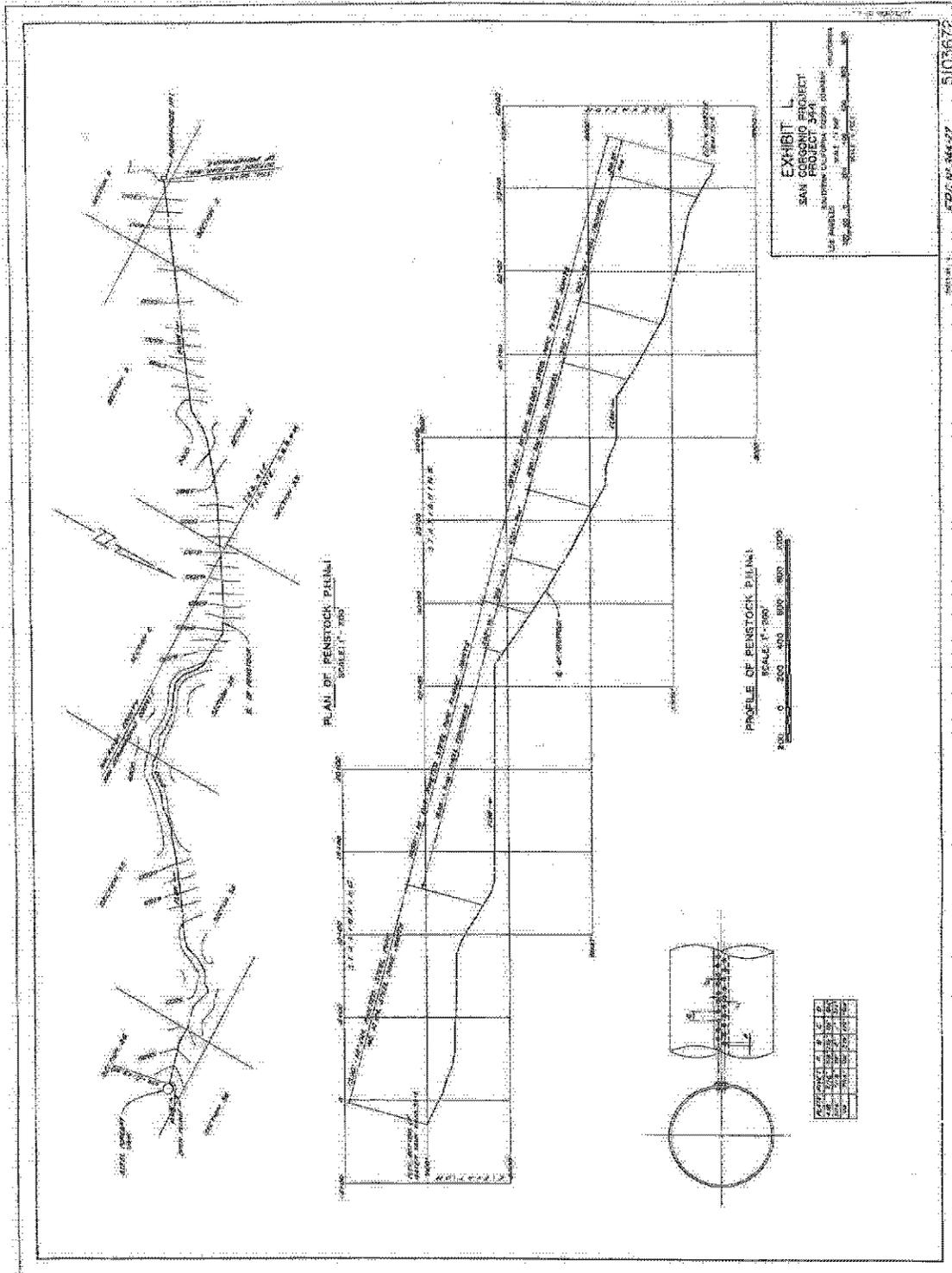
Detail of Tank No.1 and Penstock No.1 taken from previous reduced size plan. Note Tank No.1 is identified as No. 1 Forebay Tank in this plan. Original drawing courtesy of Southern California Edison.

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Reduced size plan and drawings of Tank No.1 and Tank No.2. Original drawing courtesy of Southern California Edison Company. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.

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Reduced size engineering plan for Penstock No.1. Original drawing courtesy of Southern California Edison Company. Full size image available in the Field Records Section of the HAER for the San Gorgonio Hydroelectric System, HAER No. CA-2278.