

STATE OF CALIFORNIA  
GOODWIN J. KNIGHT  
GOVERNOR

PUBLICATION OF  
STATE WATER RESOURCES BOARD

BULLETIN NO. 11

SAN JOAQUIN COUNTY  
INVESTIGATION

Volume I (Text and Plates)

( Seal of )  
( State of )  
( California )

April, 1954

The annual costs included interest, repayment, replacement, operation and maintenance, insurance, and general expenses. In the cost analysis it was shown that annual costs based upon the two per cent interest rate could be met under the schedule of revenues shown in the following tabulation, but that an annual deficit of some \$1,426,000 would occur with the three per cent rate.

<u>Item</u>	<u>Unit charge</u>	<u>Annual revenue</u>
311,000 acre-feet of new water delivered to service area along Feather River	\$ 1.00	\$ 311,000
2,845,000 acre-feet of new water delivered to Delta	1.00	2,845,000
1,670,000,000 kilowatt-hours of electrical energy at terminal substation	0.007	<u>11,690,000</u>
TOTAL		\$ 14,846,000

Based on the foregoing assumptions, the estimated cost of water from the Feather River Project available for export from the Sacramento-San Joaquin Delta to the San Joaquin Area would be about \$1.00 per acre-foot at points of diversion in the Delta.

#### Folsom Project

The probable ultimate supplemental water requirement of the San Joaquin Area could be met under a plan which will provide regulatory storage on the American River, by construction of Folsom Dam and Reservoir about 2-1/2 miles upstream from the town of Folsom and about one-half mile below the confluence of the North and South Forks of the river. A portion of the regulated water supply so made available could be conveyed to the San Joaquin Area by gravity conduit, or could be released to the Sacramento-San Joaquin Delta for pumped diversion to the San Joaquin Area as described in the preceding section in the case of Feather River water.

Folsom Dam and Reservoir, locations of which are shown on Plate 11,

are under construction by the Corps of Engineers, Department of the Army. Folsom Dam and Reservoir were authorized for federal construction in Public Law 534, 78th Congress, 2nd session, and were adopted and authorized by the State of California in Chapter 1514, California Statutes of 1945. Subsequently, the Folsom Project was authorized as a unit of the Central Valley Project by the Congress in Public Law 356, 81st Congress, 1st session. This authorization included Folsom Dam and Reservoir, Folsom Power Plant located below Folsom Dam, Nimbus Dam and Power Plant located about seven miles below Folsom Dam, and the Sly Park Project located in El Dorado County to furnish supplemental water to lands in and adjacent to the El Dorado Irrigation District. Under the legislation the power features and the Sly Park Project are being constructed by the Bureau of Reclamation, Department of the Interior. In addition to the presently authorized development, the Folsom Project contemplates eventual construction of conveyance and distribution systems for the conserved water, which features were not included in the foregoing legislation.

Yield studies presented in a report prepared by the Division of Water Resources pursuant to Senate Concurrent Resolution No. 48, Legislature of 1951, entitled "Feasibility of State Ownership and Operation of the Central Valley Project of California", dated March, 1952, indicate that new seasonal yield of Folsom Reservoir will be about 800,000 acre-feet. This report assumed that the yield of Folsom Reservoir would be used primarily in a service area extending along the east side of the Central Valley from Markham Ravine on the north to Littlejohns Creek on the south, and including the major portion of the San Joaquin Area. In order that this water might be utilized in the service area, it would be necessary to construct canals to convey releases from Folsom Reservoir both to the north and south of the American River.

The main section of Folsom Dam will consist of a concrete-gravity structure across the river channel, with a crest length of 1,400 feet and a height of

280 feet above stream bed. The left and right wings of the main dam, as well as several auxiliary dams, will consist of earth-filled sections. The overpour spillway will be located at the center of the concrete section of the main dam, and will have a capacity of 567,000 second-feet. The storage capacity of Folsom Reservoir will be 1,000,000 acre-feet, and the reservoir area is 11,650 acres. Several county roads will require relocation as well as electric utility distribution lines, and provision will be necessary for maintenance and operation of flooded water supply systems.

The Folsom Power Plant is to be located below Folsom Dam. The installed power capacity of the plant will be 162,000 kilowatts, and the maximum head will be 340 feet. Nimbus Dam and Reservoir will be located about seven miles below Folsom Dam, and this reservoir will serve as an afterbay to re-regulate the power releases from the Folsom Power Plant to a uniform flow. The dam will be a concrete structure with a crest length of 1,170 feet and a height of 45 feet above stream bed, and will create a reservoir with storage capacity of 7,700 acre-feet. The Nimbus Power Plant, located at the dam, will have an installed power capacity of 13,500 kilowatts.

A summary of estimated capital costs of Folsom Dam and Reservoir, and appurtenant features, as furnished by the Bureau of Reclamation and the Corps of Engineers is presented in the following tabulation:

Folsom Dam and Reservoir	\$52,074,000
Folsom power facilities including Nimbus Afterbay Dam and Power Plant	<u>36,741,000</u>
TOTAL	\$88,815,000

The Bureau of Reclamation is presently conducting detailed studies of the alignment and costs of the Folsom South Canal and of the areas which could be served from the canal. Preliminary data and information furnished by the Bureau of Reclamation indicate that water would be diverted into the Folsom South

Canal from the American River at a point below Nimbus Dam. The Folsom South Canal would extend southerly to Littlejohns Creek, a distance of approximately 50 miles. As presently planned, the Folsom South Canal would divert water from the American River at an elevation of about 118 feet and extend southerly, crossing the Cosumnes River at an elevation of about 110 feet, Dry Creek at an elevation of 100 feet, the Mokelumne River at an elevation of 95 feet, the Mokelumne Aqueduct of the East Bay Municipal Utility District at an elevation of about 93 feet, and near the Calaveras River at an elevation of 90 feet. Studies made by the Division of Water Resources indicate that it would probably be desirable to convey the water by gravity in the Folsom South Canal easterly and north of the Calaveras River a distance of about 3.5 miles to an elevation of about 89 feet. At this point the water would then be lifted to an elevation of 132 feet and conveyed easterly by gravity and cross the Calaveras River by means of a siphon immediately above Bellota with water surface at an elevation of about 130 feet. The water would then be conveyed in a southerly direction, skirting the foothills south of Bellota, to Littlejohns Creek. The canal would terminate about two miles upstream from the town of Farmington at an elevation of about 124 feet. This alignment would eliminate the necessity of acquiring expensive rights south of the Calaveras River and, furthermore, would facilitate delivery of water to a larger service area than had the canal continued by gravity from the Calaveras River to Littlejohns Creek. The location of the described Folsom South Canal is shown on Plate 14. Water released from Folsom Reservoir and conveyed in the Folsom South Canal could serve a large portion of the San Joaquin Area by gravity.

In the cited report of the Division of Water Resources on feasibility of state ownership and operation of the Central Valley Project, it was assumed that water released from Folsom Reservoir would be delivered at the intake to the Folsom South Canal for \$1.00 per acre-foot. This assumed rate of revenue from the sale of new seasonal yield from Folsom Reservoir was used in the

financial analyses of the Central Valley Project presented in that report. Since the Bureau of Reclamation is presently conducting detailed studies of the alignment and costs of the Folsom South Canal, and probably will make such information available in the near future, no detailed studies for the Folsom South Canal were made by the Division of Water Resources. However, preliminary estimates of costs made by the Division, based on a preliminary alignment furnished by the Bureau of Reclamation to the Calaveras River and the alignment contemplated by the Division of Water Resources from the Calaveras River to Littlejohns Creek, indicate that capital costs to deliver 609,000 acre-feet of water seasonally to Sacramento and San Joaquin Counties through the Folsom South Canal would be about \$24,650,000. The estimated 609,000 acre-feet of water per season comprises the probable ultimate supplemental water requirement of lands which could be practicably served from the Folsom South Canal, including 303,000 acre-feet in San Joaquin County and 306,000 acre-feet in Sacramento County. Annual costs on a 3 per cent and 4 per cent basis were estimated at \$1,306,000 and \$1,517,000, respectively. Unit annual costs on a comparable basis, and including the assumed value of \$1.00 per acre-foot for water delivered to the intake of the Folsom South Canal, were estimated to be \$3.20 per acre-foot and \$3.50 per acre-foot, respectively.

As has been mentioned, as an alternative to its conveyance in the Folsom South Canal, a portion of the yield of Folsom Reservoir could be released down the American and Sacramento Rivers to the Sacramento-San Joaquin Delta. It could then be conveyed across the Delta in a cross canal, and to the South Fork of the Mokelumne River and the delta channels tributary thereto. From the

delta channels the water could be pumped to and distributed in the San Joaquin Area lying immediately to the east. Preliminary designs and cost estimates for such a conveyance system have not been made. However, based on data and estimates at hand, it is indicated that unit cost of the new/<sup>seasonal</sup>yield from the Folsom Project would be little different than at Nimbus Dam, or about \$1.00 per acre-foot at points of diversion in the Delta, and comparable with the estimated cost of new water from the Feather River Project at the same points.

#### Other Projects Under Consideration

In connection with the State-Wide Water Resources Investigation and the Survey of Mountainous Areas, various plans for development of the water resources of Sierra Nevada streams are under consideration. Among the streams under investigation, in addition to the Feather and American Rivers already discussed in part, are the Cosumnes, Mokelumne, Calaveras, and Stanislaus Rivers, and Dry Creek. All five of these latter streams were considered as possible sources of additional water supply for the San Joaquin Area, as well as for the natural foothill and mountain water service areas of the streams, which service areas are located to the east of the San Joaquin Area, and are shown on Plate 16, "Potential Water Developments". With the exception of small portions of some foothill of the lower/service areas, none can be practicably supplied with water directly from the Central Valley Project, the Feather River Project, or from possible large, low-elevation reservoirs on the five cited tributary streams. Probable ultimate water requirements of the mountain and foothill areas are substantial, and very little water has been developed for use in those areas to date. On the other hand, the waters of the Stanislaus and Mokelumne Rivers, by far the larger of the five streams, have been developed to a considerable degree for the benefit of areas on the Central Valley floor and in the San Francisco Bay Area.

Since the foregoing studies and investigations are in progress, no final conclusions regarding project plans and costs, and allocations of new safe