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MEMORANDUM CH2MHILL

Water Supply Accomplishment Analyses for Red Bank and Thomes-Newville Projects

TO: Mark Cowin, Stein Buer
CALFED

FROM: Ben Everett Ben Everett

DATE: July 18, 1997

Mark:

This memo describes the procedures CH2M Hill used to analyze the water supply accomplishments of the subject projects and to present study results. Results are presented in a manner to allow CALFED to measure the relative yield of 1) the Red Bank Project, and, 2) the Thomes-Newville Project to the Sites-Colusa Project.

The water supply "yield" analysis procedure for the Red Bank Project and Thomes-Newville Project are described below. The Excel spreadsheet model developed by CH2M Hill for the preliminary alternatives analyses was adapted to simulate and determine each project's yield.

Red Bank Project

A water supply yield assessment was made for the Red Bank Project in accordance with the following criteria assumptions:

Physical features.

The features of the Red Bank Project were those described in the April 30, 1997 report to the CALFED Storage and Conveyance Refinement Team. They include: 1) Dippingvat Reservoir on South Fork Cottonwood Creek with a gross storage of 104,000 AF with 72,000 AF of storage allocated to flood control (32,000 AF of active storage), 2) an 800 CFS conveyance facility, to, 3) the 250,000 AF Schoenfield Reservoir, on Red Bank Creek (assume an active storage of 240,000 AF).

Operations

Dippingvat Reservoir was simulated to divert flood flows from South Fork Cottonwood Creek to Schoenfield Reservoir at a rate not to exceed 800 CFS. The operations of the intermediate Lanyan and Bluedoor Reservoirs were not modeled for any regulatory capacity. Carryover storage in Dippingvat was allowed to be maintained at 32,000 AF when Schoenfield was full.

Schoenfield was simulated to regulate Red Bank Creek inflow and flood flow diversions from Dippingvat. Releases to the Sacramento River were assumed to be made down Red Bank Creek at a discharge rate of 2000 CFS.

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Storage in both reservoirs and/or diversions to Schoenfield were only allowed as limited by: 1) excess flow at Wilkins Slough, 2) Delta surplus, and, 3) Delta inflow in excess of that needed to maintain the allowable export/inflow ratio at the south Delta pumps.

Analysis

The measure of the water supply accomplishments of the Red Bank Project were conducted in a manner similar to the more traditional "yield" studies. Water was simulated to be delivered from the project to meet the same un-met CVP/SWP demands used in the January 1997 spreadsheet studies and the FC-OPS 2 analyses (DWRSIM 472B Study). "Yield" values were determined for 1) the 1928-1934 critical period, and 2) the long-term 1922-1992 period. Evaporation losses from Schoenfield Reservoir were included as part of the analysis.

Thomes-Newville Project

A water supply yield assessment was made for the Thomes-Newville Project in accordance with the following criteria assumptions:

Physical features.

The features of the Thomes-Newville Project were those described in the April 25, 1997 report to the CALFED Storage and Conveyance Refinement Team. They included: 1) the Thomes Creek Diversion Dam, 2) a 10,000 CFS conveyance facility to, 3) Newville Reservoir on north fork Stony Creek, and, 4) a 5,000CFS conveyance facility to and from the Sacramento River. Newville was analyzed for gross capacities of 1.84 MAF and 3.08 MAF.

(Note: An accounting was made of daily flows in Thomes Creek to obtain a sensitivity analysis on the frequency of events in excess of 5,000 CFS and 10,000 CFS. None of the monthly averages exceeded 5,000 CFS. The highest was February, 1986, in which the average was 4,400 CFS for the month with a five day period, 2/14 through 2/19, in which the flows exceeded 5,000 CFS each day with a peak of 25,500 CFS (2/17). Using monthly averages "captures" these peaks resulting in slightly overstated yields. For the 1922 through 1992 period, the volume of flow in excess of 5,000 CFS averages 7,600 AF/Yr. For the same period the volume of flow in excess of 10,000 CFS averages 2,000 AF/Yr.. For the critical 1928 through 1934 period these numbers are zero and zero, respectively. The vast majority of the high flow events (e.g. >5,000 CFS) occur at times when Newville Reservoir is full and, thus, the model "leaves" the water in Thomes Creek and it is not a part of the project yield.

Operations

Thomes Creek winter runoff was diverted into the 10,000 CFS conveyance facility and regulated in Newville Reservoir as a first priority. Diversions from Thomes Creek were only allowed as limited by: 1) excess flow at Wilkins Slough, 2) Delta surplus, and, 3) Delta inflow in excess of that needed to maintain the allowable export/inflow ratio at the south Delta pumps.

If reservoir space in Newville existed after diversions from Thomes Creek, excess Sacramento River water was diverted into storage subject to the same pulse flow limitations as assumed in the previous spreadsheet studies. Pumping was allowed only after the

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previous month's flow at Butte City was 1,500 TAF or greater, or after the previous two month's flow was 2,650 TAF or greater. Water was released back to the Sacramento River via the two-way 5,000 CFS conveyance facility.

Analysis

The measure of the water supply accomplishments of the Thomes-Newville Project was conducted in a manner similar to the more traditional "yield" studies. Water was delivered from the project to meet the same un-met CVP/SWP demands used in the January 1997 spreadsheet studies and the FC-OPS 2 analyses (DWRSIM 472B Study). "Yield" values were determined for 1) the 1928-1934 critical period, and 2) the long-term 1922-1992 period. Evaporation losses for Newville Reservoir were considered as part of the analysis.

Results

The "yield" values for each project are presented in the following Table 1. For comparison purposes, a separate "yield" analysis was made for a 3,000,000 acre-foot Sites-Colusa Project using the same Sacramento River spill recovery process and target demand as the Thomes-Newville Project. Graphs of the simulated reservoir storage levels by month are shown in the attached four graphs.

Table 1

Simulated Reservoir Yield (AF/Yr)

Project	Yield	
	71 Year Avg. (22-92)	Critical Period Avg. (28-34)
Red Bank		
Dippingvat: 104,000 AF Schoenfield: 250,000 AF	83,000	25,000
Thomes-Newville		
Newville: 1,840,000 AF	269,000	275,000
Newville: 3,080,000 AF	300,000	298,000
Sites-Colusa		
Storage: 3,000,000 AF	273,000	185,000

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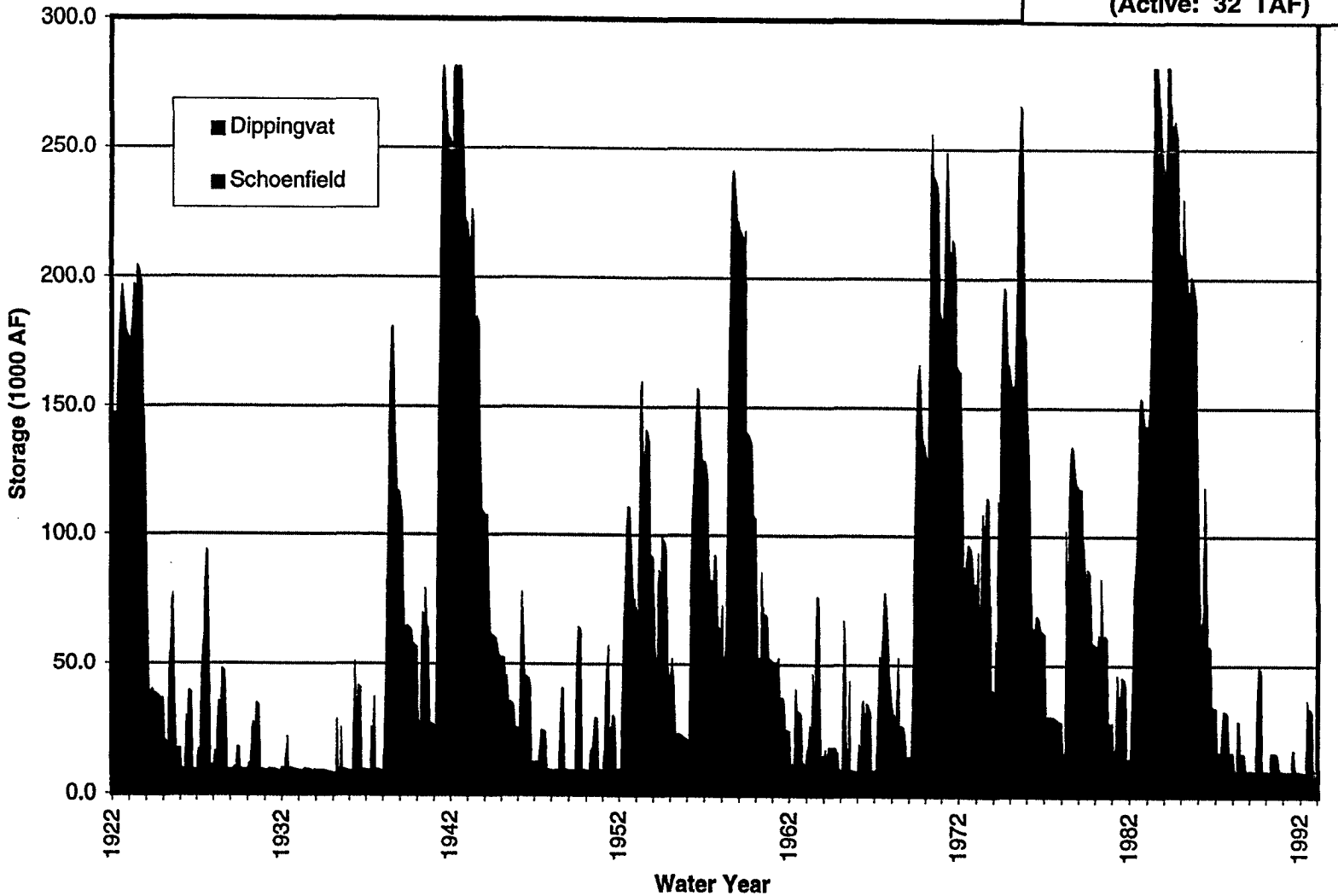
Red Bank Project

Average Yield: 83 TAF/Yr
Dry Period Yield: 25 TAF/Yr

Schoenfield Storage: 250 TAF
(Active: 240 TAF)
Dippingvat Storage: 104 TAF
(Active: 32 TAF)



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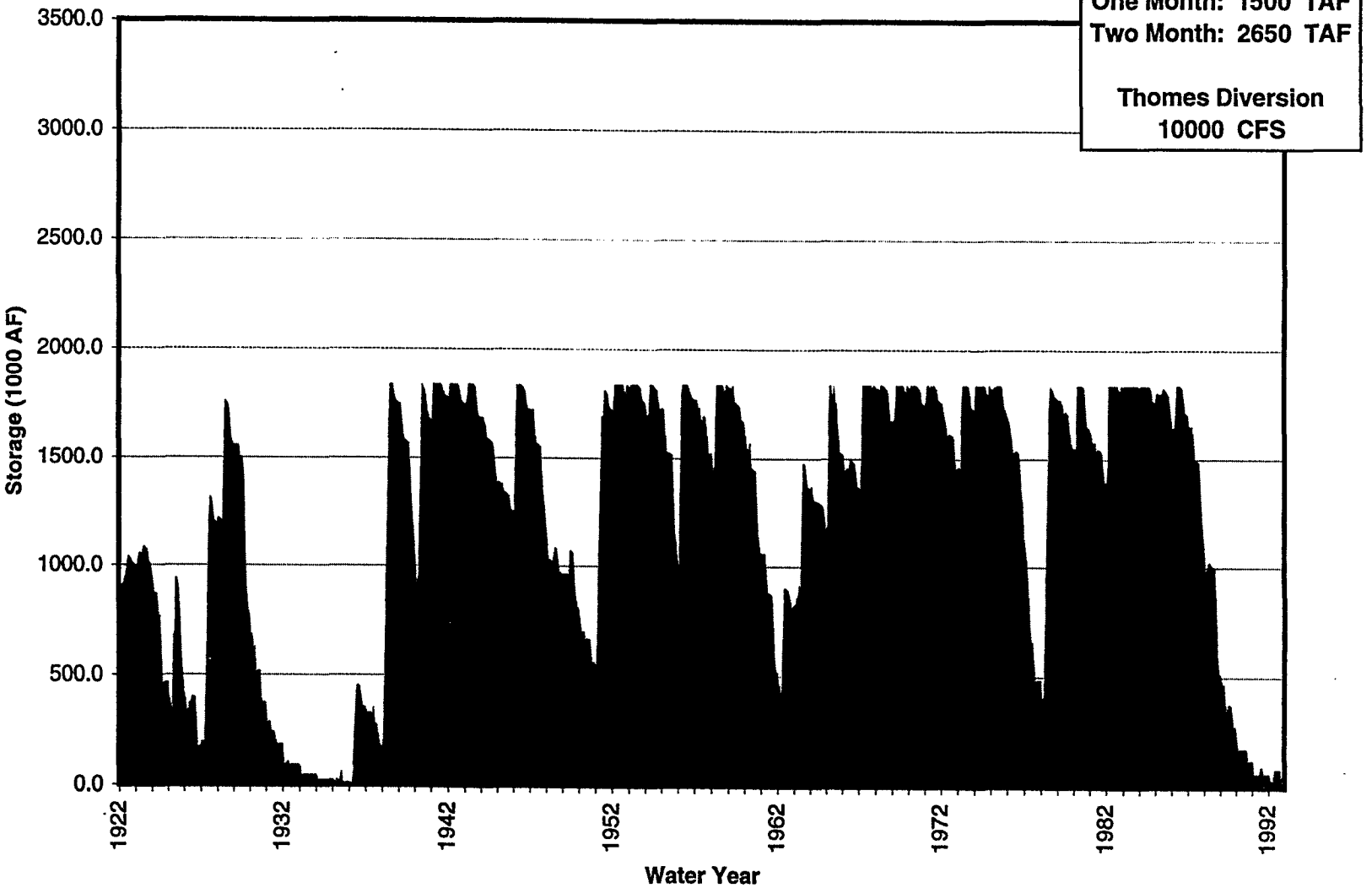
Thomes-Newville Project

Average Yield: 269 TAF/Yr
Dry Period Yield: 275 TAF/Yr

Newville Storage: 1840 TAF

Sacramento River Limit
One Month: 1500 TAF
Two Month: 2650 TAF

Thomes Diversion
10000 CFS



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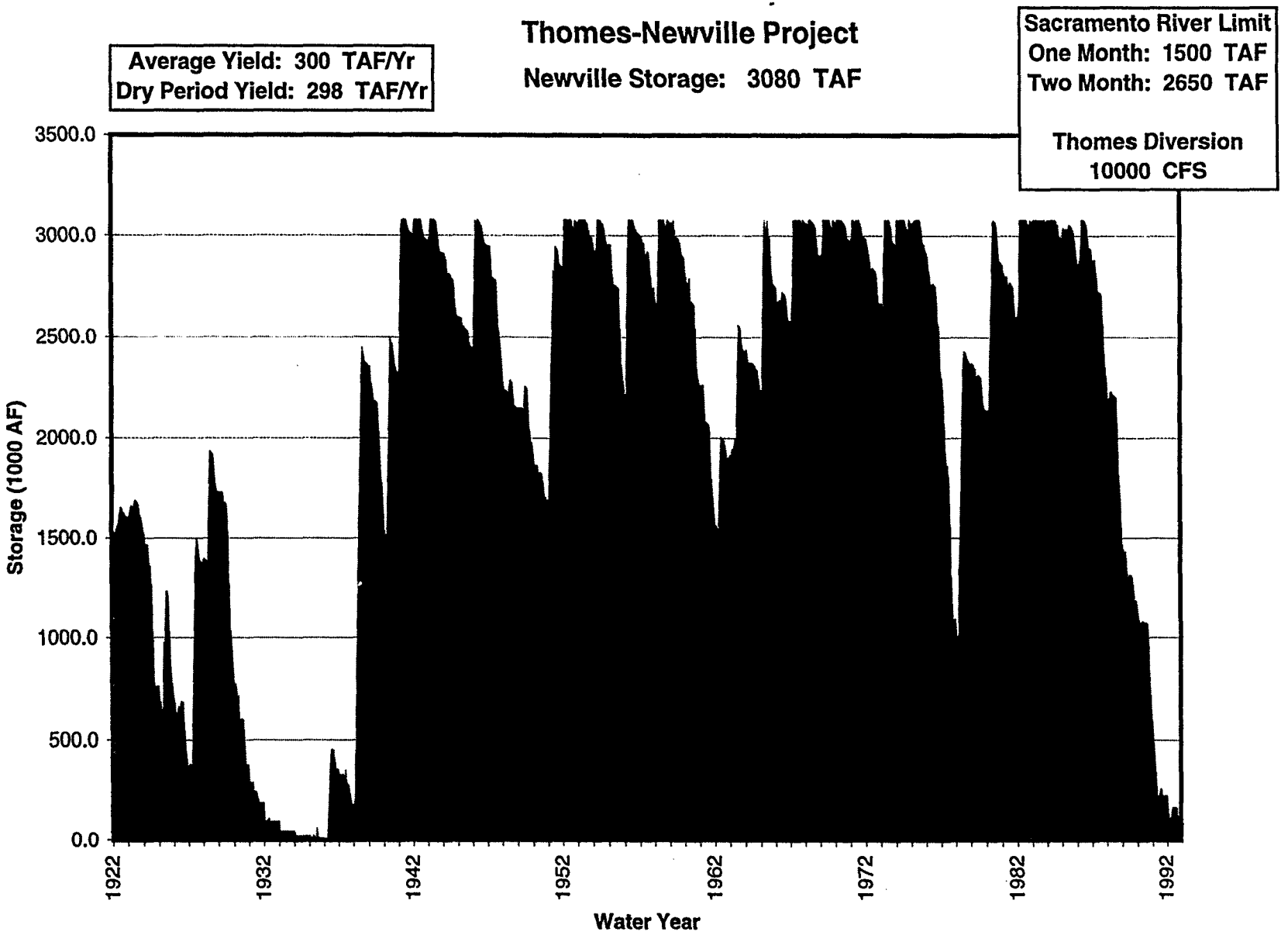

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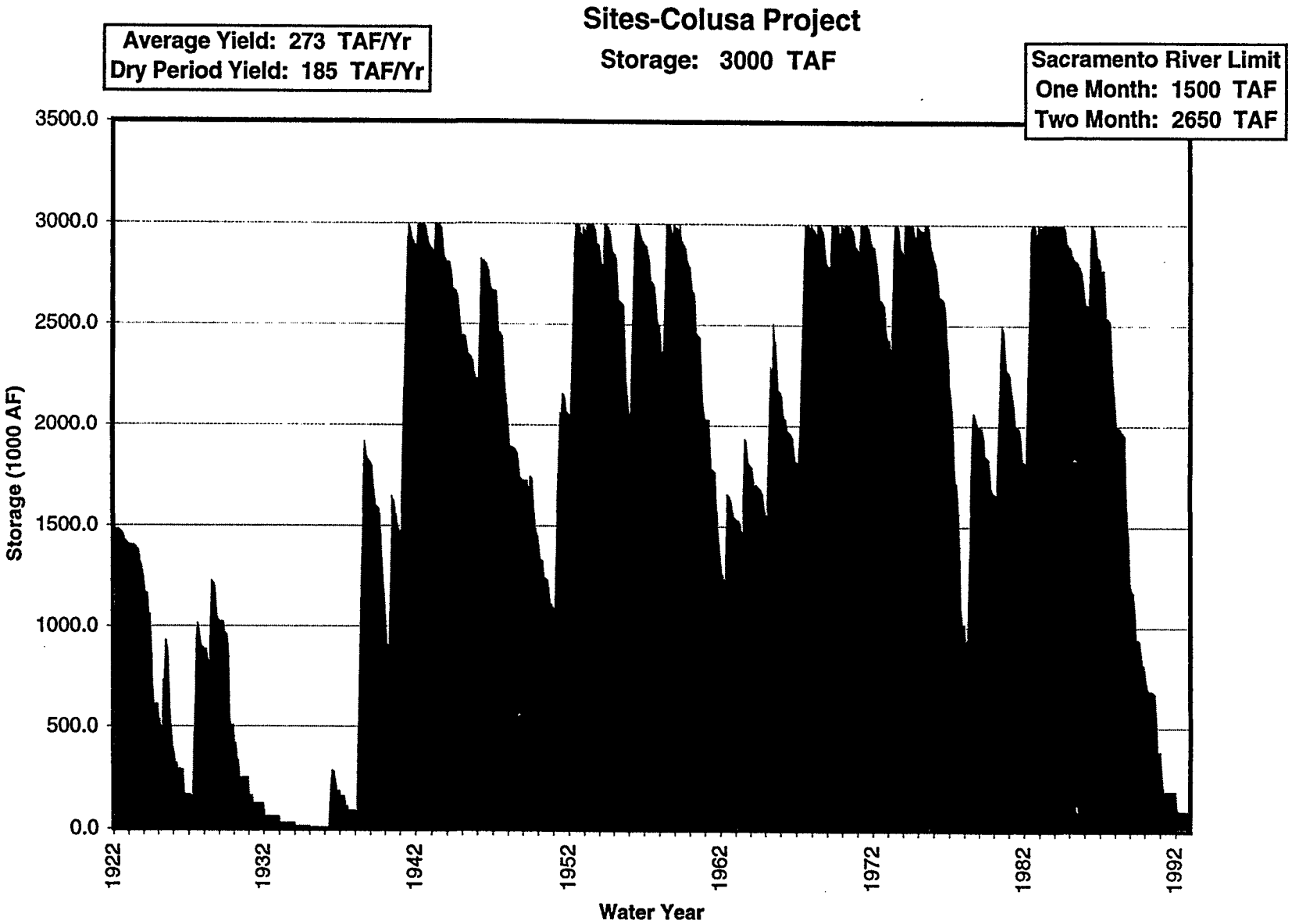

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