STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

PUBLICATIONS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, State Engineer

SACRAMENTO-SAN JOAQUIN
WATER SUPERVISION

REPORT FOR YEAR
1935

JUNE, 1936

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Land owners and water users and the executives, engineers, managers, and water superintendents of the various water organizations throughout the territory covered by this work have cooperated fully in furnishing the many and varied data requested.

For the compilation of pumped diversions the Pacific Gas and Electric Company, San Joaquin Light and Power Corporation and Modesto and Turlock Irrigation Districts have furnished a large number of power consumption records.

Valuable cooperation has been extended by the Water Resources Branch of the United States Geological Survey, Department of the Interior.

The State Division of Highways has cooperated in the expeditious and efficient testing of salinity samples in its testing laboratory.

Valuable assistance on the tabulation of data has been rendered by Works Progress Administration workers assigned under Project Number 2666.

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and

Works Progress Administration Workers
Project Number 2666

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J. J. Haley, Jr.
Administrative Assistant

ADVISORY COMMITTEE

PERMANENT COMMITTEE OF THE SACRAMENTO-SAN JOAQUIN RIVER PROBLEMS CONFERENCE

This Committee, representing the water users and other interests involved, was appointed by the First Sacramento-San Joaquin River Problems Conference in January, 1924. Its continued interest and cooperation and particular activity in the promulgation of effective conservation measures in the seasons of critical water supply have contributed in large measure to the successful prosecution of the Water Supervision work.

Herbert E. White, Chairman, Sacramento

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A. E. Anderson, San Francisco
Aldon Anderson, Sacramento
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CHAPTER I

INTRODUCTION

The purpose of this report is to make of record the measurements made and data collected in connection with the Water Supervision work in the Sacramento-San Joaquin area during 1935.

Origin and History of Work

The work was inaugurated in 1924 through the efforts of the first Sacramento-San Joaquin River Problems Conference and its Permanent Committee working with the former Division of Water Rights. A complete description of the origin, history and conduct of this work will be found in the 1924 and 1926 Biennial Reports of the former Division of Water Rights, in Bulletin Number 4 of the same Division, and in Bulletin Number 23 of the Division of Water Resources. The latter Bulletin brings together all data and measurements obtained in the five year period, 1924 to 1928, inclusive. The Water Supervisor's reports for subsequent years are mimeographed as is the present report.

Objectives and Scope

The work of supervision is a measure of relief in the difficulties attendant upon water supply conditions and the use of water throughout the Sacramento-San Joaquin territory, particularly on the Sacramento River and in the Delta Region. The situation involves the major problem of satisfying the water requirements for irrigation in both the Up-River areas and the Delta, for the control of salinity in the Delta and Upper Bay areas, and for navigation above Sacramento as demanded by the U. S. War Department, when, in nearly every season of the last twelve years, each one of these requirements has exceeded the available Summer flow in the rivers. Pending ulti-

mate relief through the development of reservoir storage this situation has been met through a provisional administration of stream flow and diversions. There has been no adjudication of the water rights under which a water master might definitely and equitably distribute the existing water supply to those entitled to receive it but it seems inevitable that such an adjudication, or a definite schedule of water priorities consummated possibly by mutual agreement, must be developed. Its realization will require however, that there shall be available reliable and accurate data over a long period of years covering all of the actual diversions and uses of water, the stream flow, return flow, salinity, and all pertinent hydrographic data. Looking to this requirement, then, the Division of Water Resources is, concurrently with the provisional stream administration, continuing the investigations and all measurements necessary to complete the record of basic data

In the seasons of severe or extreme water shortage such as 1924, 1926, 1931, and 1934 the Division of Water Resources working in cooperation with the Permanent Committee of the Sacramento-San Joaquin River Problems Conference, was able to effect conservation measures and regulation which were highly successful in tiding over the critical situations of these seasons. Up-River areas were patrolled and waste eliminated, close check kept of river flow, diversions and the advance of salinity into the Delta, and when salinity of dangerous degree threatened, bulletins giving the results of all tests throughout the Delta were given to the water users at weekly or shorter intervals. With deficient stream flow there has been always imminent the threat of conflict between "Up-River" and Delta interests and of drastic action by the War Department to enjoin irrigation diversions in the maintenance of navigation with which it is charged. But in the evidence by the water users of their desire to cooperate and to work

with the Division of Water Resources for utmost conservation, the War Department has been constrained to waive severe action and to assume a course taking cognizance of the needs of irrigation; and the fact that actual conflict and disastrous litigation between Up-River and Delta interests have not developed may, in a large measure, be attributed to the part which the State is taking through the Division of Water Resources in bringing the water users together, in making such adjustments and effecting such measures as the situation will permit and in pursuing the investigation of the facts necessary to a permanent solution of the difficulties.

Investigational Work

During the past year the investigational work has, due to financial limitations, continued under a considerably reduced program but along lines similar to those of previous years, and has comprised: measurements and records of the diversions of water from the Sacramento, Feather, Yuba, American, Merced, Tuolumne, Stanislaus, and San Joaquin rivers on the valley floor and above the Delta; stream flow measurements throughout the territory, largely in cooperation with the Water Resources Branch of the U. S. Geological Survey; measurements and records of waters returned to the Sacramento and San Joaquin rivers; an annual census of irrigated acreages and crops under all diversions recorded; and observations and investigation of the advance and retreat of salinity in the Delta channels and Upper Bays. Lack of finances has, since 1932, made it necessary to omit the annual census of irrigated crops and water consuming areas in the Delta, as conducted in previous years.

History of State and Water Users' Cooperative Financing

When this work was initiated in 1924, the water users and other

interests concerned raised the money for the first year by subscription to the extent of about $17,000. However, at the 1925 legislative session, the Permanent Committee of the Sacramento-San Joaquin River Problems Conference made the plea that due to the widespread character of the work and importance to the public generally, it should, properly, be carried by the State. As a result, provision for continuing this work was made in the budget of what was then the Division of Water Rights and subsequently the Division of Water Resources. This held until June 30, 1933, with an annual expenditure for the work amounting to about $23,000.

With the drastic reduction in budgets at the 1933 legislative session, provision for the work was entirely eliminated from the Division of Water Resources' budget. On June 30, 1933, therefore, this work was entirely suspended. Because a complete cessation of the work meant an irreparable loss in the records as well as probable reversion to the former conditions of litigation and conflict in the utilization of Sacramento River waters, the Permanent Committee of the Sacramento-San Joaquin River Problems Conference appeared before the Governor and Director of Finance on August 10, 1933, to urge an appropriation from the State Emergency Fund to be matched by moneys to be raised by the water users; the total amount not to exceed that necessary to carry on the bare essentials only of the work. It was estimated that $12,500 annually would accomplish this and thereby prevent the greatly disproportionate loss which would be sustained with the work completely abandoned. The Emergency Fund allotment was granted on the condition that the water users would raise their proportionate share, and the work for the 1933 irrigation season was resumed. The Emergency Fund allotment was held up by reference to the Supreme Court and the decision of the latter which approved the allotment was not handed

down until early March, 1934. Pending this decision, the work had again been entirely suspended on November 1, 1933, at the close of the irrigation season, and the compilation of the 1933 report which would ordinarily have occurred during the Winter months was not made. With the Emergency Fund allotment assured, the Permanent Committee immediately began a campaign to secure the necessary subscriptions from the water users, and by the beginning of the 1934 irrigation season it appeared that a substantial amount of money would be raised from this source. Essential items of the work were, therefore, again resumed in April, 1934, and continued throughout the irrigation season. By the first of July 1934 the total subscriptions from the water users amounted to $5500. This was insufficient to match the Emergency Fund allotment but on account of the critical 1934 water supply and the resultant extreme importance of carrying on the water supervision, the Permanent Committee urged that the State should meet the emergency by making available the entire allotment from the Emergency Fund. This was done and there were provided therefore, sufficient funds to complete the 1934 field work and the compilation and publication of the 1933 and 1934 reports.

Provision was made in the budget of the Department of Public Works submitted to the 1935 Legislature for the carrying on of the supervision work and an allotment of $15,000 for the biennium was approved. This money did not become available until July 1, 1935, and the work was not actively resumed until that time. The limited funds available allow the carrying on of only the most essential items of the work. It has been possible however to tabulate records that would ordinarily be filed pending availability of funds because of assistance given by Works Progress Administration workers under Project Number 2666.

Conservation Features

A comparison of the run-off and water supply conditions of the 1935 season with those of previous seasons is indicated in Table 1.

TABLE 1

COMPARATIVE SACRAMENTO-SAN JOAQUIN WATER SUPPLY, 1924 TO 1935

Year	Sacramento San Joaquin Run-off in per cent of Normal *	Minimum Flow in Second-feet				Rice Acreage Served by Sacramento River and Tributaries
		Sacramento River at			San Joaquin River near Vernalis	
		Red Bluff	Colusa	Sacramento		
1924	28	2810	1470	705	391	88500
1925	83	3240	1870	2760	660	94700
1926	57	2980	1030	1330	565	128600
1927	114	3580	1960	3420	1290	123300
1928	80	3400	1960	2510	840	101100
1929	42	3060	1550	2300	565	73700
1930	63	2980	1680	2350	645	88000
1931	29	2480	820	Zero	200	126500
1932	78	2620	1530	1900	965	90700
1933	46	2620	1350	1340	569	87400
1934	40	2400	1320	1050	315	91800
1935	86	2860	1780	2700	850	78100

* Normal taken as 40-year mean (1889-1929) of natural run-off at foothill stations of major tributaries.

CHAPTER II

MEASUREMENTS OF STREAM FLOW

During the irrigation season of 1935, stream flow measurements and records were obtained through cooperation with the Water Resources Branch of the U. S. Geological Survey, for stations on the Sacramento River at Kennett, Red Bluff, Butte City, Colusa, Wilkins Slough, Knights Landing, and Verona; on the Feather River at Nicolaus; on the American River at Fairoaks and H Street Bridge, Sacramento; on the Mokelumne River at Woodbridge, and on the San Joaquin River near Newman and Vernalis.

The above cooperative stations were supplemented by stations maintained by the Division of Water Resources on Lower Butte Creek and Slough, and in connection with the San Joaquin return water measurements (See Chapter IV), by stations as follows: Stanislaus River at Orange Blossom Bridge and Hatmark Ranch, Tuolumne River at Roberts Ferry Bridge, Hickman Bridge and Tuolumne City Bridge, Merced River at Yosemite Valley Railroad Crossing and Hills Ferry Road Bridge (near mouth), Dry Creek at Basso Ranch (near Modesto), and San Joaquin River at Delta Bridge, Fremont Bridge and Grayson (Laird Slough). In addition, many stations maintained on by-pass and drainage channels for the measurement of return water are listed in Chapter IV.

The stations at Kennett, Red Bluff, Verona, Fairoaks, Woodbridge, Vernalis, and Newman are maintained throughout the year but the records are given in this report for the irrigation season only.

Sacramento River at Sacramento

The record of the flow of the Sacramento River at Sacramento as given in this and previous reports, does not represent actual measurements at a station below the City of Sacramento Intake. Because of tidal action,

a gaging station at this point is not maintained. The daily discharge record as given has been computed by using the Verona record and making due allowance for the measured inflow and draft between that station and Sacramento. In this computation it is not practicable and no attempt has been made to allow for the time required for the flow to travel from Verona to Sacramento and to make the various deductions and additions enroute at the exact time that the given Verona flow would have passed the respective points of inflow or draft. During the Summer period the velocities between Verona and Sacramento are low and a given flow may require a day's time or more to travel this distance. Under these conditions, the computed flow at Sacramento may differ somewhat from what would have been found if the actual flow could have been measured. Contributing to this difference also there are the accretions or losses which cannot be measured. In the upper sections of the river the invisible accretions or losses between two points are susceptible of computation as the remaining quantity required to satisfy the equation when the flow at the upper and lower points and all definite intermediate inflows and drafts are known. With no actual measurement of the flow at Sacramento, the invisible accretions or losses between Verona and Sacramento cannot be thus defined and hence they are unaccounted for in the computed flow at Sacramento. From the data presented subsequently in Chapter IV, it would appear that some return flow might be expected in the Verona-Sacramento section but, as indicated in the tabulation of return water (Table 48) no figure for it has been given (except for the measured drains) because it could not be derived without a record of the actual flow at Sacramento.

TABLE 2

DISCHARGE OF SACRAMENTO RIVER AT KENNETT

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	15100	11200	14000	5900	3670	2970	2860	2760
2	13500	11500	13000	5900	3540	2970	2810	2810
3	11700	19200	12500	5720	3540	2970	2810	2860
4	11000	26900	11500	5720	3540	2970	2810	2920
5	9900	29100	11500	5540	3540	2970	2760	2860
6	10300	24400	11700	5360	3670	2920	2760	2860
7	11700	32500	11700	5360	3540	2920	2760	2860
8	10600	42400	11500	5360	3540	2920	2710	2860
9	9680	33000	11200	5360	3540	2970	2760	2810
10	8630	27200	11200	5180	3420	2970	2810	2810
11	8220	22000	10800	5000	3420	2970	2860	2920
12	7820	19400	9900	4830	3420	2970	2810	2970
13	7820	17600	9470	4670	3420	2920	2760	2970
14	7820	17000	9470	4670	3300	2920	2810	3190
15	8220	23000	9470	4670	3300	2920	2920	3420
16	8020	26200	9470	4670	3300	2860	2920	3300
17	8020	21700	9260	4510	3300	2810	2860	3080
18	7820	19400	8840	4360	3300	2810	2810	2970
19	7420	18200	8420	4210	3300	2920	2760	2920
20	7220	17600	8220	4070	3190	2920	2760	2920
21	7220	17000	7820	3930	3190	2860	2810	2920
22	7420	15600	7620	3800	3190	2810	2860	2920
23	8020	14500	7620	3930	3190	2760	2920	2860
24	8020	13800	7420	3930	3190	2760	2810	2810
25	9050	13500	7220	3800	3190	2760	2810	2860
26	12700	12700	7420	3800	3190	2760	2810	2860
27	11700	12500	7030	3800	3080	2810	2760	2760
28	11000	12700	6650	3800	2970	2810	2760	2810
29	10800	15100	6460	3670	3080	2860	2760	2920
30	11000	15400	6270	3670	3080	2860	2760	2920
31	10800		6080		3080	2920		2920
Mean	9621	20080	9378	4640	3330	2888	2806	2924
Ac.Ft. for Month	591600	1195000	576700	276100	204700	177600	167000	179800

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. The record is given here for the period of the irrigation season only.

TABLE 3

DISCHARGE OF SACRAMENTO RIVER NEAR RED BLUFF

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	40400	14100	21100	7510	4070	3180	2940	2860
2	28600	14500	21500	7240	3980	3180	2940	2940
3	20200	19800	17000	6980	3880	3180	2860	2940
4	18200	34000	15500	6980	3880	3180	2860	3100
5	15500	42500	15200	6720	3880	3180	2860	3100
6	15200	36100	15200	6470	3880	3100	2860	3100
7	24000	54200	15500	6470	3980	3020	2860	3100
8	19000	98200	14800	6470	3880	3020	2860	3020
9	16600	57900	14800	6340	3880	3020	2860	3020
10	14100	43100	14800	6220	3790	3020	2860	3020
11	12500	34600	14100	5980	3700	3020	2940	3180
12	11800	28600	13500	5860	3700	3020	2940	3520
13	11200	25400	12500	5640	3700	3020	2860	3440
14	11200	24000	12200	5520	3700	3020	2940	3700
15	11500	33400	12200	5520	3610	3020	3020	4160
16	11200	49900	12200	5410	3520	3020	3100	3980
17	10900	36100	12200	5300	3520	2940	3020	3700
18	10600	30000	11200	5190	3520	2940	3020	3610
19	10300	26700	10900	4980	3520	2940	2940	3520
20	9720	24900	10600	4760	3440	2940	2940	3520
21	10300	24900	10300	4660	3440	2940	2940	3440
22	10000	22800	9720	4460	3440	2940	2940	3440
23	13500	20700	9720	4460	3440	2860	3020	3350
24	12800	19000	9720	4460	3440	2860	3020	3350
25	11500	17800	9150	4260	3440	2860	2940	3350
26	15200	17000	9150	4160	3350	2860	2940	3350
27	15900	16300	9150	4260	3350	2860	2860	3350
28	14500	16300	8590	4260	3260	2860	2860	3260
29	14100	18600	8050	4160	3180	2940	2860	3350
30	14100	23600	8320	4070	3180	2940	2860	3440
31	14100		7780		3180	2940		3440
Mean	15120	30830	12470	5492	3604	2994	2924	3344
Ac.Ft. for Month	929700	1835000	766900	326800	221600	184100	174000	205600

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located near the Iron Canyon damsite, Mile 198.6 above Sacramento. The record is given here for the period of the irrigation season only.

TABLE 4

DISCHARGE OF SACRAMENTO RIVER AT BUTTE CITY

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*3440	2060	1870	2740
2			3280	2060	1870	2810
3			3280	2060	1930	2810
4			3200	2060	1870	2880
5			3120	2060	1870	2960
6			3120	2060	1870	3040
7			3120	2060	1870	3040
8			3120	1990	1870	3120
9			3120	1990	1930	3120
10			2960	1990	1930	3040
11			2960	1990	1930	2960
12			2880	1990	2060	3040
13			2810	1990	2120	3280
14			2740	1990	2120	3520
15			2740	1930	2250	3780
16			2660	1930	2450	4210
17			2590	1930	2520	4120
18			2590	1930	2590	3950
19			2520	1930	2740	3780
20			2450	1870	2740	3700
21			2450	1930	2660	3700
22			2380	1930	2660	3780
23			2380	1930	2740	3780
24			2380	1870	2810	3780
25			2380	1870	2810	3780
26			2320	1810	2740	3780
27			2250	1750	2740	3780
28			2250	1750	2660	3780
29			2120	1810	2740	3700
30			2120	1810	2740	3700
31			2120	1810		3780
Mean			2705	1940	2323	3459
Ac.Ft. for Month			166300	119300	138200	212700

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located near Butte City Bridge, Mile 115.8 above Sacramento.

* Beginning of discharge record for season.

TABLE 5

DISCHARGE OF SACRAMENTO RIVER AT COLUSA

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*3600	2230	1870	2750
2			3500	2230	1870	2750
3			3400	2140	1920	2800
4			3300	2140	1960	2800
5			3300	2100	1920	3000
6			3200	2140	1920	3000
7			3200	2100	1920	3000
8			3200	2050	1920	3100
9			3200	2000	1960	3100
10			3100	2000	2000	3000
11			3000	2100	1960	3000
12			3000	2050	2000	2900
13			2900	2050	2140	3100
14			2900	2050	2230	3400
15			2900	2000	2230	3500
16			2800	2000	2320	4040
17			2750	2000	2460	4150
18			2700	2000	2550	3930
19			2600	1960	2600	3710
20			2600	1960	2700	3600
21			2600	1960	2700	3600
22			2500	1920	2650	3710
23			2460	1870	2700	3710
24			2500	1870	2800	3600
25			2460	1820	2800	3600
26			2410	1780	2800	3600
27			2410	1780	2750	3600
28			2410	1780	2750	3710
29			2320	1780	2700	3600
30			2320	1820	2750	3600
31			2230	1820		3600
Mean			2831	1984	2328	3373
Ac.Ft. for Month			174100	122000	138500	207400

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Colusa Bridge, Mile 89.4 above Sacramento.

* Beginning of discharge record for season.

TABLE 6

DISCHARGE OF SACRAMENTO RIVER BELOW WILKINS SLOUGH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*3000	1500	1200	3000
2			2780	1500	1240	3000
3			2670	1500	1280	3100
4			2670	1450	1360	3160
5			2670	1450	1320	3220
6			2620	1450	1320	3270
7			2620	1440	1320	3320
8			2570	1400	1400	3320
9			2520	1360	1520	3320
10			2470	1320	1600	3270
11			2370	1360	1640	3270
12			2370	1360	1680	3220
13			2270	1360	1810	3220
14			2270	1320	1940	3440
15			2220	1320	1990	3540
16			2170	1280	2080	3840
17			2120	1280	2220	4080
18			2080	1320	2420	4080
19			2040	1320	2470	3900
20			1940	1280	2570	3780
21			1940	1280	2620	3660
22			1900	1240	2620	3660
23			1810	1240	2670	3780
24			1810	1200	2830	3720
25			1760	1200	2940	3720
26			1720	1200	2940	3780
27			1700	1160	2940	3900
28			1650	1160	2940	3840
29			1600	1160	3000	3840
30			1550	1160	3000	3720
31			1550	1160		3780
Mean			2175	1314	2096	3540
Ac.Ft. for Month			133700	80790	124700	217700

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Mile 62.9 above Sacramento, a short distance below Wilkins Slough pumping plant of Reclamation District 108.

* Beginning of discharge record for season.

TABLE 7

DISCHARGE OF SACRAMENTO RIVER AT KNIGHTS LANDING

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*3180	1640	1690	3500
2			3120	1640	1690	3440
3			2980	1640	1640	3500
4			2980	1640	1690	3570
5			2860	1690	1800	3570
6			2860	1640	1920	3570
7			2790	1640	1980	3570
8			2720	1640	1980	3500
9			2660	1580	2100	3500
10			2720	1580	2220	3500
11			2660	1580	2280	3500
12			2600	1640	2400	3440
13			2530	1580	2600	3380
14			2460	1580	2720	3570
15			2400	1640	2720	3700
16			2340	1640	2790	3830
17			2280	1640	2860	4250
18			2220	1690	3120	4250
19			2220	1690	3180	4110
20			2100	1640	3240	3900
21			2100	1640	3310	3900
22			2040	1690	3310	3900
23			1980	1640	3240	3830
24			1920	1640	3380	3830
25			1920	1640	3500	3760
26			1860	1740	3500	3830
27			1860	1690	3500	3900
28			1800	1640	3440	3900
29			1740	1690	3500	3900
30			1690	1640	3570	3830
31			1690	1690		3760
Mean			2364	1645	2696	3725
Ac.Ft. for Month			145300	101100	160400	229100

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of the U.S. Geological Survey. It is located at the Knights Landing R.R. Bridge, Mile 34.0 above Sacramento, below the point of discharge to the river of Colusa Basin drainage via the Back Borrow Pit of Reclamation Districts 108 and 787.

* Beginning of discharge record for season.

TABLE 8

DISCHARGE OF SACRAMENTO RIVER AT VERONA

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	25900	28000	49600	24300	6040	3110	3110	5590
2	37400	29100	49600	23600	5890	3020	2930	5740
3	41400	30200	48900	23200	5590	3020	2760	5890
4	45000	33000	47900	22700	5300	3110	2840	5890
5	47200	39000	46500	22700	5160	3110	3210	5890
6	46500	45500	45000	22500	5020	2930	3410	5890
7	46500	49600	44100	22500	4740	2930	3410	5890
8	48900	52000	44100	22500	4740	3020	3520	5890
9	49600	54900	44300	21900	4610	3020	3520	5890
10	48600	55600	44500	19700	4610	3020	3520	6040
11	46900	55600	44500	18100	4480	3020	3630	6040
12	43800	55100	44100	17700	4480	3020	3740	5890
13	40500	54400	43100	17200	4350	2930	3980	5890
14	36900	53400	41400	15900	4220	2930	4220	6190
15	34200	52000	39500	14400	4220	3110	4100	6350
16	32100	52700	37800	13200	3980	3110	4100	6670
17	30500	53400	36200	12100	3860	3110	4220	7160
18	28600	53700	34200	11500	3860	3110	4610	7160
19	26800	53400	32100	10900	3740	3110	4740	6830
20	25200	52700	30700	10700	3520	3020	4880	6350
21	23800	52000	29800	10100	3520	3020	5020	6190
22	23400	51700	29600	9690	3520	3110	5020	6040
23	23000	51700	29800	9120	3310	3110	5020	5890
24	23800	51300	30200	8380	3210	3020	5020	5890
25	25000	50500	30200	7840	3210	3020	5300	5890
26	25200	49800	30000	7330	3210	2930	5590	5740
27	24300	49300	30200	6830	3110	2840	5440	5740
28	24700	48600	30200	6510	3110	3020	5440	5740
29	26100	48400	29600	6350	3110	3110	5590	5740
30	26800	48600	28400	6190	3020	3110	5590	5740
31	27300		26600		3020	3110		5740
Mean	34060	48510	37830	14850	4121	3037	4249	6047
Ac.Ft. for Month	2094000	2886000	2326000	883900	253400	186800	252900	371800

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Mile 19.6 above Sacramento at the mouth of "Cross Canal" main drain of Reclamation District 1001, and below the mouth of the Feather River. The record is given here for the period of the irrigation season only.

TABLE 9

DISCHARGE OF SACRAMENTO RIVER AT SACRAMENTO

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	28900	32800	60100	32100	7760	3220	3110	5840
2	39900	33900	58500	32600	7440	3160	2880	6000
3	43900	38500	57200	32600	6980	3140	2710	6260
4	47200	47300	55900	32700	6570	3240	2790	6230
5	49600	52000	55000	32900	6280	3150	3160	6340
6	48600	55500	54700	32700	6040	2990	3400	6250
7	52400	61600	56000	32200	5690	3020	3370	6310
8	54400	101900	56200	31200	5620	3080	3510	6290
9	53700	78600	56900	29500	5450	3050	3490	6180
10	52300	70600	56900	26600	5400	3050	3480	6400
11	49700	67700	56000	25000	5260	3030	3610	6320
12	46600	65800	55300	24900	5240	2960	3740	6200
13	43300	64800	53300	23400	5080	2900	4000	6340
14	40400	63600	51600	21600	4940	2930	4320	6650
15	38100	69300	49900	19100	4950	3060	4130	7040
16	35700	74200	48000	17400	4690	3070	4260	7330
17	33900	69400	45400	16300	4570	3060	4310	7920
18	31600	66600	42600	15500	4400	3130	4670	7710
19	29600	65000	40900	14800	4340	3110	4870	7410
20	28000	65600	40300	14600	4080	2980	5010	6850
21	27400	65300	40400	13800	4030	2980	5210	6560
22	27400	63900	42000	13100	4060	3070	5170	6520
23	26900	62500	42300	12300	3830	3050	5170	6370
24	27900	62200	42700	11200	3600	2960	5180	6380
25	28500	60900	41400	10200	3540	2920	5460	6350
26	28400	60100	42300	9490	3560	2860	5780	6250
27	27700	59900	42200	8840	3440	2740	5670	6190
28	28300	60200	41300	8560	3400	2950	5650	6170
29	29700	62100	39900	8240	3340	3050	5740	6230
30	30800	62200	37000	8060	3260	3070	5790	6170
31	31900		33700		3270	3080		6210
Mean	37500	62100	48200	20400	4840	3030	4320	6490
Ac.Ft. for Month	2306000	3697000	2966000	1213000	297900	186600	257100	399200

NOTE: This represents the flow past Sacramento (below the City of Sacramento intake) to the Delta. The discharges of this table have been computed by adding to the measured Verona discharges the measured inflow of return water and American River and subtracting therefrom the measured diversions between Verona and Sacramento. A gaging station is not maintained at Sacramento because of tidal action.

TABLE 10

DISCHARGE OF FEATHER RIVER AT NICOLAUS

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*2700	985	1170	1670
2			2520	1020	822	1850
3			2220	1090	708	1900
4			2030	1170	690	1940
5			1900	1130	1170	1940
6			1800	950	1330	1940
7			1760	985	1250	1850
8			1670	1090	1170	1900
9			1670	1130	880	1980
10			1620	1090	867	2030
11			1580	1130	867	2030
12			1540	1060	1020	1980
13			1450	950	1020	2080
14			1410	1060	950	2170
15			1290	1170	915	2220
16			1170	1250	1020	2620
17			1090	1250	1170	2720
18			1090	1290	1170	2470
19			1020	1210	1170	2220
20			985	1090	1250	2120
21			1060	1210	1250	1980
22			985	1250	1330	1940
23			915	1250	1330	1940
24			915	1170	1370	1900
25			915	1130	1540	1980
26			915	880	1580	1800
27			915	867	1580	1760
28			880	1370	1580	1720
29			874	1370	1620	1800
30			796	1330	1540	1850
31			880	1290		1900
Mean			1373	1136	1178	2006
Ac.Ft. for Month			84430	69850	70070	123400
Diversions Below Nicolaus Acre-feet			980	2610	450	40
Discharge To Sacramento River Acre-feet			83450	67240	69620	123400

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Mile 9.3 above the mouth of the river and 0.1 mile below Nicolaus Bridge.

* Beginning of discharge record for season.

TABLE 13

DISCHARGE OF MOKELUMNE RIVER AT WOODBRIDGE

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	523	476	477	1370	399	177	246	300
2	466	539	462	1370	343	158	172	280
3	478	596	404	1490	298	206	216	41
4	485	719	419	1830	270	253	351	184
5	535	670	412	2350	200	104	338	476
6	558	608	405	2900	236	158	327	416
7	630	580	425	3760	243	264	369	299
8	672	851	368	4350	186	296	340	416
9	630	385	390	3820	214	318	171	470
10	556	756	426	3590	217	300	209	477
11	339	287	936	3130	215	192	341	476
12	502	262	1190	3000	213	84	365	666
13	558	396	1700	3260	218	172	318	552
14	564	380	1950	3140	222	285	371	420
15	564	409	2190	2260	230	309	320	556
16	560	489	2260	1650	222	277	197	737
17	505	596	2130	1160	214	228	300	608
18	314	598	1880	1360	213	158	368	606
19	481	598	1600	1460	208	123	389	604
20	548	553	1860	1410	203	230	395	551
21	566	542	2380	1340	202	324	360	389
22	560	389	2510	1320	198	330	332	381
23	574	488	2550	1230	203	299	187	416
24	542	615	2360	1080	211	240	262	385
25	338	467	1650	837	204	178	330	408
26	466	533	1790	684	204	114	373	400
27	480	567	2410	568	199	193	349	348
28	484	360	2810	597	237	272	323	302
29	489	303	3110	566	204	266	337	367
30	491	547	2910	500	181	252	254	433
31	480		1790		231	236		429
Mean	514	519	1553	1913	227	226	307	432
Ac.Ft. for Month	31610	30860	95510	113800	13960	13880	18270	26560

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located just below dam of Woodbridge Irrigation District. The record is given here for the period of the irrigation season only.

TABLE 14

DISCHARGE OF SAN JOAQUIN RIVER AT DELTA BRIDGE

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		813	877	210			
2		805	891	190			
3		819	858	155			
4		861	781	100			
5	*63	829	725	68			
6	100	704	713	58			
7	150	569	761	45			
8	200	400	829	11			
9	257	249	888	29			
10	545	596	947	24			
11	719	689	1000	20			
12	954	725	1050	18	FLOW	FLOW	FLOW
13	1060	749	1090	16			
14	1090	755	1120	14			
15	1020	755	1120	12			
16	947	719	1080	0			
17	905	674	1020	0			
18	965	614	940	0	NO	NO	NO
19	1030	614	797	0			
20	1090	599	659	20			
21	1120	524	593	20			
22	1070	494	539	20			
23	982	503	563	0			
24	940	539	569	0			
25	919	599	725	0			
26	912	668	569	0			
27	891	719	449	0			
28	872	774	434	0			
29	861	774	330	0			
30	845	838	252	0			
31		864		0			
Mean	**789	672	772	33.2	0	0	0
Ac.Ft. for Month	**40700	41300	45960	2040	0	0	0

NOTE: This is a staff gage station at the county road bridge East of Los Banos, Mile 82.0 above Durham Ferry Bridge. Intermittent gage readings. This station has been referred to previously as "San Luis Island" or "Turner Ranch Bridge". Prior to the time all river flow is diverted above this station, ordinarily in early July, there may be considerable river flow which by-passes the station via Pick Anderson and Salt Sloughs.

*Beginning of record for season.

**26 days.

TABLE 15

DISCHARGE OF SAN JOAQUIN RIVER AT FREMONT BRIDGE

No continous record of discharge

Miscellaneous Measurements as follows:

	Gage Height Feet	Discharge Second-feet
7/30/35	60.42	227
8/28/35	59.53	97
10/4/35	60.23	234
10/29/35	60.19	203

NOTE: This is a staff gage station at the county bridge on the road between Gustine and Stevinson, Mile 52.8 above Durham Ferry Bridge and 5.7 miles above the mouth of the Merced River.

TABLE 16

DISCHARGE OF SAN JOAQUIN RIVER NEAR NEWMAN

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	2060	2110	8110	7450	3500	475	323	394
2	2060	2110	8220	6900	3260	475	361	457
3	2000	2060	8000	6900	2870	430	344	520
4	1950	2110	7670	7230	2590	442	318	555
5	1900	2220	7230	7780	2310	451	321	590
6	1800	2460	6790	8000	2030	442	347	610
7	1800	2740	6680	8110	1890	397	369	610
8	2340	3020	6790	8110	1770	392	383	555
9	3020	4580	7010	8110	1560	372	397	538
10	3180	5030	7120	8000	1380	366	361	538
11	3340	5120	7340	7560	1270	364	341	538
12	3580	5300	7340	6270	1120	352	313	538
13	3660	6370	7230	5770	1020	339	311	538
14	3500	7230	7120	5770	940	336	326	538
15	3180	7780	7010	6370	915	352	378	555
16	2880	8220	6900	6680	868	350	361	590
17	2740	8700	6170	7010	845	350	347	670
18	2740	8820	6570	7010	778	366	339	650
19	2740	8700	6270	6680	710	386	339	572
20	2670	8460	5870	6370	690	366	313	520
21	2530	8340	5770	6070	710	347	339	490
22	2220	8340	5870	5770	845	323	339	460
23	2060	8460	6070	5390	868	306	355	427
24	2060	8580	6370	5120	778	313	355	409
25	2220	8580	6790	4850	755	334	334	412
26	2340	8340	7010	4400	650	361	326	475
27	2220	8110	7230	4060	610	361	341	451
28	2110	8000	7340	3900	572	334	336	433
29	2000	7890	7560	3820	590	326	352	418
30	2000	7890	7670	3740	520	336	372	412
31	2060		7670		490	336		403
Mean	2483	6189	6993	6307	1281	370	345	512
Ac.Ft. for Month	152600	368300	430000	375300	78750	22770	20510	31470

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Hills Ferry Bridge, Mile 47.0 above Durham Ferry Bridge and just below the mouth of the Merced River. The record is given here for the period of the irrigation season only.

TABLE 17

DISCHARGE OF SAN JOAQUIN RIVER NEAR GRAYSON

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*3670	664	476	518
2			3510	668	485	554
3			3390	623	509	631
4			3280	608	455	746
5			2970	605	446	773
6			2580	614	443	813
7			2320	590	443	856
8			2220	566	482	867
9			2040	557	485	826
10			1780	542	479	820
11			1610	530	449	800
12			1490	524	428	829
13			1370	497	395	837
14			1250	464	422	849
15			1250	464	466	853
16			1210	494	540	865
17			1130	515	548	905
18			1090	542	508	968
19			970	554	471	969
20			923	569	449	912
21			923	533	469	855
22			938	494	486	815
23			1050	572	504	770
24			1040	569	478	747
25			958	565	480	723
26			895	561	449	765
27			863	557	421	806
28			828	553	444	817
29			814	516	434	797
30			779	481	457	776
31			688	446		784
Mean			1610	550	467	801
Ac.Ft. for Month			98800	33800	27800	49300

NOTE: This is a recording gage station at Laird Slough Bridge Mile 19.35 above Durham Ferry Bridge.
* Beginning of record for season.

TABLE 18

DISCHARGE OF SAN JOAQUIN RIVER NEAR VERNALIS

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	3540	3620	19800	20800	5810	1080	1100	1650
2	3540	3540	20700	18400	5630	1080	1120	1710
3	3460	3620	19500	17200	5900	1050	1100	1900
4	3380	3940	17500	17200	6170	1050	1080	1970
5	3300	5220	16200	18800	5360	1020	1120	2040
6	3380	8000	15100	20500	4520	1020	1050	2110
7	3460	9400	14400	21800	4040	1020	1080	2110
8	4100	9100	14300	22400	3720	1000	1100	2040
9	6030	10700	14500	22300	3480	975	1120	2040
10	5850	13500	15100	21800	3240	950	1100	2040
11	5130	16600	15700	20600	2950	950	1100	2040
12	4770	17500	16600	19700	2670	950	1080	1970
13	4770	16200	16600	19100	2320	925	1080	2040
14	4860	15000	16000	18400	2040	850	1220	2040
15	4680	14400	15600	18000	1970	850	1500	2040
16	4340	14700	15200	17300	1970	850	1650	2180
17	4100	17300	15000	16300	1770	925	1680	2110
18	3940	22300	14500	15200	1710	1000	1620	2180
19	3860	23000	13800	14600	1590	1050	1560	2180
20	3780	21500	13000	14100	1500	1050	1470	2250
21	3860	20000	12700	14200	1500	1000	1470	2250
22	4020	19500	12800	13900	1530	950	1560	2180
23	3940	19500	13300	12700	1650	925	1590	2040
24	3700	19500	14000	11700	1530	950	1560	2040
25	3780	19800	14800	10600	1440	1000	1560	2040
26	3780	19800	15900	9500	1330	1050	1560	1970
27	3940	19500	16700	8000	1300	1080	1560	2040
28	3940	18800	19100	6660	1300	1080	1560	2040
29	3780	18600	22300	5900	1300	1050	1560	1970
30	3700	18600	23600	5630	1250	1050	1590	1900
31	3620		23600		1150	1050		1900
Mean	4075	14760	16380	15780	2698	995	1350	2033
Ac.Ft. for Month	250600	878200	1007000	938800	165900	61150	80330	125000

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located at Durham Ferry Bridge below the mouth of the Stanislaus River. The record is given here for the period of the irrigation season only.

On May 31st the levee above the gaging station broke and until June 22d considerable water by-passed the station and reentered the river below. The discharge here given includes an estimate of the flow through the break.

TABLE 19

DISCHARGE OF MERCED RIVER AT YOSEMITE VALLEY
RAILROAD CROSSING

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*140	55	63	63
2			137	63	59	67
3			81	63	59	72
4			81	55	55	68
5			63	55	46	68
6			55	63	46	59
7			55	63	46	59
8			55	72	46	55
9			55	72	55	55
10			55	68	55	55
11			55	72	46	50
12			55	72	46	55
13			55	68	46	109
14			55	63	46	109
15			72	63	55	109
16			63	62	55	3
17			63	62	55	3
18			63	62	55	3
19			63	61	63	3
20			63	61	55	3
21			63	60	55	3
22			63	60	55	3
23			63	59	55	3
24			63	59	55	3
25			63	58	50	3
26			63	58	55	3
27			59	57	59	3
28			59	56	59	3
29			63	55	55	3
30			63	63	55	3
31			55	63		3
Mean			66	62	54	36
Ac.Ft. for Month			4090	3810	3180	2180

NOTE: This is a staff gage station. Daily readings.
* Beginning of record for season.

TABLE 20

DISCHARGE OF MERCED RIVER NEAR MOUTH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*750	244	242	281
2			733	232	260	314
3			661	208	245	330
4			608	260	215	364
5			555	272	214	381
6			555	266	250	381
7			504	250	270	364
8			486	236	291	314
9			452	222	292	330
10			417	232	258	314
11			383	234	252	314
12			366	228	213	314
13			366	216	222	322
14			366	220	218	330
15			366	244	220	330
16			349	236	239	364
17			349	238	224	398
18			315	276	226	364
19			298	278	213	314
20			298	264	214	281
21			315	232	216	264
22			349	222	233	248
23			315	206	252	214
24			281	208	253	214
25			281	226	218	231
26			263	228	222	231
27			298	230	224	231
28			298	215	207	214
29			315	222	259	198
30			263	236	261	200
31			238	224		200
Mean			400	236	237	295
Ac.Ft. for Month			24600	14500	14100	18100

NOTE: This is a staff gage station at bridge 1.1 miles above the mouth. Daily readings.
* Beginning of record for season.

TABLE 21

DISCHARGE OF DRY CREEK NEAR MODESTO

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*90	51	55	65
2			88	51	55	119
3			75	52	55	96
4			65	65	55	91
5			60	65	55	93
6			60	65	55	91
7			58	58	56	91
8			56	51	56	83
9			56	51	57	83
10			54	49	63	83
11			51	49	62	80
12			49	48	62	65
13			47	48	61	65
14			50	47	62	68
15			56	47	60	75
16			56	50	62	75
17			56	50	62	75
18			56	50	75	77
19			57	51	75	75
20			57	51	74	75
21			56	49	73	70
22			56	48	73	70
23			55	50	73	65
24			55	57	70	56
25			55	60	70	53
26			58	60	70	53
27			60	58	70	53
28			58	56	70	53
29			57	58	70	49
30			53	57	70	49
31			51	56		50
Mean			58	54	64	72
Ac.Ft. for Month			3590	3290	3820	4450
M.I.D.Spill below Station-Ac.Ft.			524	309	324	68
**Discharge to Tuolumne R. Acre-feet			4110	3600	4140	4520
**Discharge to Tuolumne R. Mean c.f.s.			67	59	70	74

NOTE: This is a staff gage station about two miles above the mouth. Daily readings.

* Beginning of record for season.

** Neglecting seepage return below station.

TABLE 22

DISCHARGE OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1				*39	35	598
2				39	35	603
3				39	35	603
4				39	34	598
5				39	35	608
6				39	36	583
7				38	37	578
8				37	36	588
9				36	35	603
10				35	35	603
11				36	35	573
12				35	69	558
13				34	543	563
14				34	583	558
15				34	588	573
16				36	588	598
17				36	588	603
18				36	495	603
19				35	495	603
20				35	492	608
21				35	583	588
22				35	587	603
23				36	591	598
24				36	595	603
25				37	600	603
26				36	605	598
27				35	609	598
28				34	613	593
29				34	608	598
30				34	608	593
31				35		593
Mean				36	361	593
Ac.Ft. for Month				2220	21500	36400

NOTE: This is a recording gage station.
* Beginning of record for season.

TABLE 23

DISCHARGE OF TUOLUMNE RIVER AT HICKMAN BRIDGE

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1				119	102	698
2				119	102	702
3				122	105	698
4				119	105	702
5				119	102	702
6				116	102	682
7				116	102	674
8				113	99	690
9				110	96	706
10				110	96	706
11				105	96	686
12				102	127	660
13				102	623	670
14				102	678	656
15				102	694	670
16				105	698	698
17			*134	108	702	702
18			134	108	606	698
19			131	108	595	694
20			131	108	595	694
21			131	108	686	678
22			131	108	687	698
23			131	108	688	698
24			128	108	689	698
25			128	108	690	698
26			125	108	692	702
27			119	108	693	702
28			119	105	694	698
29			122	105	698	702
30			119	102	698	702
31			116	102		739
Mean			**127	109	445	694
Ac.Ft. for Month			**3770	6710	26500	42600

NOTE: This is a recording gage station.
* Beginning of record for season.
** 15 days.

TABLE 24

DISCHARGE OF TUOLUMNE RIVER AT TUOLUMNE CITY

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*1200	369	405	892
2			1190	373	409	935
3			1180	377	397	923
4			1170	384	485	909
5			1160	385	424	907
6			1150	379	395	897
7			1040	372	416	864
8			975	364	420	847
9			909	368	421	852
10			843	372	425	853
11			766	373	429	840
12			690	367	429	812
13			613	358	473	794
14			365	366	821	788
15			594	376	862	801
16			507	396	878	810
17			413	394	893	820
18			504	397	896	801
19			420	392	825	787
20			430	396	817	775
21			437	390	810	762
22			496	385	877	744
23			523	382	885	750
24			384	389	885	869
25			410	397	888	726
26			345	403	886	713
27			390	400	881	696
28			420	386	892	682
29			423	383	892	671
30			393	384	896	666
31			381	387		657
Mean			668	382	677	801
Ac.Ft. for Month			41100	23500	40300	49300
Diversions Below Station-Ac.Ft.			57	60	48	14
M.I.D.Spill Below Station-Ac.Ft.			564	400	682	370
**Discharge to San Joaquin River Acre-feet			41600	23800	40900	49700

NOTE: This is a recording gage station 3.35 miles above the mouth.
Periods July 1 to 6 and July 7 to 12 interpolated discharge.
* Beginning of record for season.
** Neglecting seepage return below station.

TABLE 25

DISCHARGE OF STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*420	28	28	28
2			300	28	28	28
3			300	28	28	28
4			128	28	28	28
5			87	28	28	28
6			87	28	28	28
7			87	28	28	28
8			72	28	28	28
9			72	28	28	28
10			72	28	28	28
11			56	28	28	28
12			54	28	28	28
13			28	28	28	28
14			28	28	28	28
15			28	28	28	30
16			28	28	28	33
17			28	28	28	36
18			28	28	28	39
19			28	28	28	43
20			28	28	28	46
21			28	28	28	49
22			28	28	28	52
23			28	28	28	55
24			28	28	28	58
25			28	28	28	61
26			28	28	28	64
27			28	28	28	68
28			28	28	28	72
29			28	28	28	76
30			28	28	28	76
31			28	28		76
Mean			73	28	28	43
Ac.Ft. for Month			4500	1720	1670	2630

NOTE: This station is located 5.7 miles above Oakdale.
The record is from daily staff gage readings.
* Beginning of record for season.

TABLE 26

DISCHARGE OF STANISLAUS RIVER AT HATMARK RANCH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1				*257	255	370
2				257	230	365
3				257	239	358
4				256	241	352
5				256	245	345
6				256	245	350
7				256	245	338
8				239	250	327
9				225	248	311
10				240	247	295
11				247	247	279
12				248	257	253
13				246	268	305
14				244	279	325
15				245	277	345
16				245	277	365
17				245	252	385
18				280	246	405
19				312	244	425
20				292	242	446
21				262	249	456
22				274	233	441
23				250	212	426
24				247	199	411
25				259	205	396
26				262	225	384
27				267	240	377
28				248	251	368
29				257	282	350
30				256	377	330
31				265		310
Mean				256	250	361
Ac.Ft. for Month				15800	14900	22200
Diversions below Station-Ac.Ft.				135	81	30
** Discharge to San Joaquin River-Ac.Ft.				15700	14800	22200

NOTE: This is a recording gage station 5.3 miles above the mouth of the river.

* Beginning of record for season.

** Neglecting seepage return below station.

CHAPTER III

MEASUREMENTS OF DIVERSIONS

Measurements and records of diversions in 1935 have included those from the Sacramento River and its tributaries on the valley floor, those to the Delta Uplands from Cache Slough, Old San Joaquin River, Tom Paine Slough, and San Joaquin River, and those on the Stanislaus, Tuolumne, Merced, and San Joaquin (above Durham Ferry Bridge) rivers as obtained in connection with the return water measurements (See Chapter IV). For 1935 this report records a total of 581 points of diversion, segregated to the various sources as follows: Sacramento River 261, Colusa Trough 9, Back Borrow Pit (carrying drainage water from Colusa Basin along the back levees of Reclamation Districts 108 and 787) 11, Lower Butte Creek and Butte Slough 19, By-Pass and Drainage Channels 39, Feather River 41, Yuba River 11, American River 34, diversions to Delta Uplands from Cache Slough 1, from Old San Joaquin River 13, from Tom Paine Slough 8, and from San Joaquin River (below Vernalis gaging station) 38, San Joaquin River (above Vernalis Gaging Station) 20, Stanislaus River 16, Tuolumne River 11, and Merced River 49. In addition there were twenty-four plants removed or dismantled during 1935.

All of these diversions except five are accomplished by pumping. The five exceptions are gravity diversions, two on the Yuba River, two on the Feather River and one on the Sacramento River, and the records for these are obtained by means of canal ratings. In the case of the pumping diversions there are a few instances where the records are obtained by means of canal ratings but in the main the records are obtained from the relation established between electric power consumption and pump discharge. This is possibly due to the fact that nearly all of the pumping plants are electrically operated.

At a relatively small number of pumps operated by other power, daily operation records are kept. Prior to 1933 all pump operators kept daily operation records on blanks furnished by the Division of Water Resources. These records were collected monthly by the field engineers at the same time that the readings of the electric meters were recorded. Under the reduced program necessitated by the curtailment of funds in the last three seasons, only the larger plants have kept the daily operation records and the monthly power consumption data have been secured from the power distributing agency at the end of the irrigation season in lieu of monthly meter readings by the field engineers. The relation between power input and water pumped is determined from current meter measurements of the discharge and measured kilowatt input. At the larger pumping plants several measurements are made during each season. At the smaller plants a sufficient number of measurements are made initially to determine the rating and thereafter at intervals sufficient to show any changes which may occur in the rating. With the daily operation records available prior to 1933 it was possible to compile from the monthly diversions as computed from the power record, a daily diversion record for each plant, and this was done. However, beginning with 1933, except for the larger diversions, the monthly records only are available.

For 1935 the amount of water diverted by the larger plants was computed, using as a basis, several discharge measurements made at each plant during the season. For the smaller plants, the ratings were assumed to have remained constant from preceding years and these ratings were used as a basis of computation for these plants.

Summaries of the 1935 diversions throughout the Sacramento-San Joaquin territory are shown in Table 27. A segregation is made to show the relative diversions from the various river sources. For each segregation the table shows also the acreage irrigated and the computed seasonal gross duty of water. Table 28 summarizes the diversions between different points on the Sacramento River.

TABLE 27

DIVERSIONS, ACREAGE IRRIGATED AND GROSS SEASONAL DUTY OF WATER IN THE SACRAMENTO-SAN JOAQUIN AREA

Source	Seasonal Diversions Acre-feet	Acreage Irrigated			Gross Seasonal Duty of Water Acre-Ft. per Acre
		Gen'l.	Rice	Total	
Sacramento River, Redding to Sacramento	926160	98493	51090	149583	6.2
Feather River below Oroville	390870	25162	20849	46011	8.5
Yuba River on Valley floor	48850	6535	1552	8087	6.0
American River below Fairoaks	4820	2808	0	2808	1.7
By-Pass and Drainage Channels (Including Lower Butte Creek and Slough, Colusa Trough and Back Borrow Pit)	(1) 75790	12890	4418	(1) 17308	4.4
Total above Sacramento	1446490	145888	77909	223797	6.5
Delta Uplands from Cache Slough, Old River, Tom Paine Slough and San Joaquin River	115530	50504	0	50504	2.3
San Joaquin River from Fremont Bridge to Durham Ferry Bridge	99160	37320	155	37475	2.6
Merced River below Snelling	11840	3305	0	3305	3.6
Tuolumne River below Roberts Ferry Bridge	1990	770	0	770	2.6
Stanislaus River below Orange Blossom Bridge	7790	2076	0	2076	3.8
Total Delta Uplands and Pumping Diversions of San Joaquin River and Tributaries*	236310	93975	155	94130	2.5
Sacramento-San Joaquin Delta**					

(1) All duck club diversions and acreages have been excluded where possible.

* Note that major gravity diversions by canals of Oakdale, South San Joaquin, Modesto, Turlock, Waterford, and Merced Irrigation Districts and Miller and Lux are not included within the scope of these measurements.

** Delta crop census for compilation of Delta consumptive use of water was not taken in 1935. See 1932 and prior reports for acreage irrigated and consumptive use of water in the Delta which vary but little from year to year.

TABLE 28

SUMMARY OF SACRAMENTO RIVER DIVERSIONS
(Acre-feet)

River Section	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Totals
Redding to Red Bluff	0	6500	21520	21534	21417	18975	18164	13864	121974
Red Bluff to Butte City	0	0	70040	85130	84616	85181	48510	12031	385508
Butte City to Colusa	0	0	1120	5969	6334	4678	1319	283	19703
Colusa to Wilkins Slough	0	5464	42020	51698	51954	47637	25492	1437	225702
Wilkins Slough to Knights Landing	0	4676	11770	18356	19034	15464	4541	541	74382
Knights Landing to Verona	0	114	2757	4617	4705	5001	3754	41	20989
Verona to Sacramento	1524	1844	8590	16258	18753	18279	10718	1940	77906
Totals	1524	18598	157817	203562	206813	195215	112498	30137	926164

TABLE 29

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
CITY OF SACRAMENTO	0.8 L	3-20" 1-18"	1455	1463	2125	2859	3031	2980	2352	1753	18018	MUNICIPAL	
— AMERICAN RIVER — MILE 1.1 LEFT													
JOE CORRY	1.2 L				PLANT	REMOVED							
— BACK BORROW PIT RECLAMATION DISTRICT 1000 — MILE 1.3 LEFT													
E. FOURNESS	1.45 R	1-8"				76	32	14	8		130	157	
SUBURBAN HOLDINGS CO. (JONES RANCH)	2.05 L	1-8"			14	16	60	39	29	7	165	125	
— RECLAMATION DISTRICT 1000 DRAIN — MILE 2.1 L													
FRANK CHRISTOPHEL	2.4 L	1-5"			6	13	17	15	18	3	72	44	
H. M. SWALLEY	2.45 L	1-5"				23	32	15	18		88	38	
HAYWARD REED (1)	2.9 L	1-5"				4					(2) 4	(2) 12	
EARL FRUIT COMPANY	3.55 R	1-16"	68			307		209			584	160	
W. E. M. BEARDSLEE	3.75 R	1-5"			8	15	2				25	25	
J. DE ROSA (H. REED) (3)	4.0 R	1-10"			63	155	54				272	76	
REESE AND GREER	4.65 R	1-7"				7	6				13	23	
HARBINSON BROTHERS	5.05 R	1-14"				91	44		8	5	148	75	
R. S. SEYDEL	5.25 R	1-8"			33	82	68		29		212	110	
C. H. MERKELEY ESTATE	5.3 R	1-8"					25				25	54	
A. CASSELMAN	5.5 R	1-6"					6				6	38	
A. A. CASSELMAN	5.55 R	1-6"			2	42	20	5			69	60	
K. L. LOVDAL	5.7 R	1-10"			NO	DIVERSION							
J. E. BANDY	6.0 R	1-6"	1	1	8	18	60	43	28	9	168	83	
RIVERSIDE MUTUAL WATER COMPANY	6.10 L	2-18"			149	1604	1305	1475	927		5460	(4) 1893	
O. A. AND F. L. WHITE	(5) 6.6 R	1-6"			NO	DIVERSION							
E. S. FISK	7.0 R	1-4"			NO	DIVERSION							
CALIFORNIA BANK & TRUST COMPANY	7.5 L	1-8"				23	14	9	8		54	100	
F. L. MARTIN & A.B. CARTER (STAHL)	7.8 L	1-10"			20	58	153	109	100		440	80	
A. MARTY	7.9 R	1-8"				39	79	64	49	22	253	(6)	
M. E. AND R. F. BENNETT	7.9 L	1-10"				7	74	35	8		124	90	
M. MARTY	8.3 R	2-10"			55	70	192	134	98	47	596	(7) 365	
BLAUTH ESTATE (8)	8.5 R	1-7" (9)			25	28	23				76	62	
H. WALDECK	8.7 R	1-6"		1	44	23	22	26	25	10	151	108	
HAZEL GOETHE	8.95 R	1-6"			24	47	53	68	44	17	253	37	
CALIFORNIA LANDS, INC.	9.35 R	1-14"			165	424	198	126	106	10	1029	(10) 520	
R. G. PEARSON AND P. S. DRIVER	9.8 L	1-14"			46	126	200	367	76		815	(11) 362	
CARL CASSELMAN	9.9 R	1-12"				43	42	48	6		139	140	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) FORMERLY ALBERT ELKUS.
(2) ADDITIONAL WATER WAS RECEIVED THROUGH RIVERSIDE MUTUAL WATER COMPANY PLANT AT MILE 6.10 L. THIS PORTION OF THE PROPERTY REPORTED TO HAVE BEEN IRRIGATED FROM RIVER PRIOR TO PLANT FAILURE. A TOTAL OF 23 ACRES WERE IRRIGATED.
(3) FORMERLY W. I. ELLIOT.
(4) INCLUDES 23 ACRES ON REED PROPERTY. SEE PLANT AT MILE 2.9 L.
(5) MILEAGE CORRECTION.
(6) SEE PLANT AT MILE 8.3 R.
(7) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 7.9 L.
(8) FORMERLY JULIUS BLAUTH.
(9) REPLACES 6" UNIT.
(10) INCLUDES 180 ACRES ON ADJOINING MERKELEY PROPERTY.
(11) PEARSON 135 ACRES, DRIVER 227 ACRES.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
E. C. BOOM, TRUSTEE FOR F.W.KIESEL	10.25 L	1-14"			82	195	243	193	112		825	262	
REESE ESTATE	10.75 R	1-12"			145	162	15	1			323	185	
R. F. FIDDYMENT & NATOMAS CO. (1)	10.75 L	1-12"				94		99			193	(2)60	
AMERICAN TRUST COMPANY (3)	11.1 R	1-12"			4	12	18	12	3		49	50	
A. L. WHITE	11.6 L	1-10"				12	70	30	10		122	50	
— ELKHORN FERRY — MILE 11.9													
CONAWAY RANCH	12.0 R	4-36"			1756	3159	4064	3566	2408	42	14995	2510	1700
THOMAS O'CONNOR	12.5 R	1-12"				33	40	68	40	2	183	107	
GERTRUDE BROWN	12.7 R	1-6"			5	11	21	19	13	6	75	65	
JULIUS HAUSER	13.1 R	1-12"			NO	DIVERSION							
J. COLLI (FRANK LAMB) (4)	13.2 R	1-8"					55	31			86	12	
HENRY SCHAEFER	13.25 R	1-10"				96	130	99	98		423	60	
ELKHORN MUTUAL WATER COMPANY	14.1 L	1-24" 1-20"			395	1890	1780	2298	1204		7567	2309	
JOSEPH VERESS	14.25 R	1-10"(5)				2		7			9	(6)	
M. E. DOLE (4)	14.4 R	1-6"						3			3	2	
CALIFORNIA LANDS, INC.	15.15 R	1-10"				82	46	29			157	170	
HARRY HALL	15.7 L	1-6"			NO	DIVERSION							
CENTRAL MUTUAL WATER COMPANY	16.0 L	2-38"		379	2427	2337	2510	2766	1889		(7)12308	885	1245
FRANK FISHER AND HENRY RICH (HERSHEY PLANT)	16.27 R	1-20"				285	228	76	6		595	560 (8)	
H. T. SILVIUS	16.4 R	1-6"			NO	DIVERSION						(9)	
W. B. BEACH	16.62 R	1-6"			2						2	5	
THOMAS J. COX ESTATE	16.7 R	1-14"(10)				8	136				144	133	
FRANK FISHER AND HENRY RICH (4)	17.4 R	1-18"				75	117	37			229	200	
CALIFORNIA WESTERN STATES LIFE INSURANCE COMPANY	17.75 R	1-20"			NO	DIVERSION							
M. AND J. SCHEIBER (L. ASHWANDAN)	18.45 L	1-12"				4	143	57	86	7	297	75	
G. H. LYALL (F. S. MACHADO)	18.7 L	1-8"				30	36	29	13		108	40	
CALIFORNIA TRUST & SAVINGS BANK	18.95 R				PLANT	REMOVED							
NATOMAS COMPANY - RECL.DIST.1001 (11)	19.6 L (11)	2-20"				442	2125	1788	173		4528		1048
NORTHERN MUTUAL WATER CO. (12)	19.6 L (12)	1-24"			987	1129	1164	1290	726		5296		553

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) FORMERLY R. F. FIDDYMENT AND E. J. CAHILL.
(2) ALL FOR NATOMAS COMPANY.
(3) NEW INSTALLATION 1935 AT OLD PUMP LOCATION.
(4) NEW INSTALLATION 1935.
(5) REPLACES 8" UNIT.
(6) PLANT OPERATED TO TEST ONLY.
(7) THERE WAS PRACTICALLY NO FLOW DURING THE IRRIGATION SEASON IN DISTRICT 1000 DRAIN WHICH DISCHARGES TO THE SUMP OF ONE OF THE UNITS OF THIS PUMPING PLANT. WHATEVER SMALL DRAINAGE FLOW MAY HAVE OCCURRED WAS PUMPED TO THE IRRIGATION CANAL AND IS INCLUDED IN THE DIVERSION HERE SHOWN.
(8) INCLUDES 50 ACRES ON ADJOINING SILVIUS PROPERTY (MILE 16.4 R).
(9) SEE FISHER AND RICH PLANT AT MILE 16.27 R.
(10) LISTED AS 16" IN 1934.
(11) CROSS CANAL, THE MAIN DRAIN BETWEEN RECLAMATION DISTRICT 1000 AND 1001, JOINS THE SACRAMENTO RIVER AT MILE 19.6 L. PLANT IS ON NORTH BANK AND 0.75 MILE FROM JUNCTION.
(12) CROSS CANAL - SOUTH BANK - 1.0 MILE FROM JUNCTION.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
— VERONA GAGING STATION — MILE 19.6													
— FEATHER RIVER — MILE 20.9 L													
— SACRAMENTO SLOUGH — MILE 21.2 L													
WEST COAST LIFE INSURANCE COMPANY	21.7 R	1-15"			NO	DIVERSION							
FRANK FISHER AND HENRY RICH (KELLER PLANT)	22.5 R	1-22"			1349	1889	1934	1862	1711		8745	100	650
HERSHEY ESTATE	26.95 R	1-18"			NO	DIVERSION							
MORSE INGLIN	28.2 R	1-6"			23	30	24	18			95	30	
RUSSELL BROTHERS	29.2 R	1-12"				30	70	40	50		190	100	
KENDALL ESTATE	29.7 R	1-8"			NO	DIVERSION							
P. L. TRAGANZA AND K. RUSSELL	29.75 R	1-8"					9	14	1		24	14	
LAURA FREITAS	29.9 L	1-12"					25	40			65	65	
LEO GIOVANETTI	30.2 L	1-3"				5	3	4	1		13	(1)20	
RECLAMATION DISTRICT 1500	30.45 L				PLANT REMOVED								
KENDALL ESTATE	30.6 R	1-12"			NO	DIVERSION							
FLOYD ANDERSON	30.7 R	1-6"				9	8	8	2		27	23	
GEORGE SENF (2)	30.9 L	1-8"			NO	DIVERSION							
A. C. HUSTON	31.5 R	1-12"			16	34	25	4	1		80	47	
M. ALONSO	31.8 L	1-6"			3	12		7	1		23	22	
M. R. RICHARDSON	32.0 R	1-4"(3)			2	5	3				10	(4) 7	
SUTTER MUTUAL WATER COMPANY (PORTUGUESE BEND)	32.0 L	2-24"		114	1238	1746	2446	2219	1288		9051	(5)	(5)
COLLIER BROTHERS	32.5 R	1-10"			5	54	38	29	18		144	(4)67	
R. B. COULTER	33.2 L	1-20"				474		722	681	41	1918	300	
J. G. KNOX (8)	33.35 L	1-8"			14	43	40	33			130	60	
SNOWBALL ESTATE	33.5 R	1-12"			13	284	67				364	(7)371	
FRED LEISER (8)	33.75 L	1-12"			93		11				104	85	
SNOWBALL ESTATE	33.8 R	1-3"			1	2	2	1			6	2	
— KNIGHTS LANDING GAGING STATION — MILE 34.0													
— COLUSA BASIN DRAINAGE — MILE 34.15 R													
MEEK ESTATE	34.2 R	2-16" 1-10"			220	636	697	414	23		1990	(9)390	
RIVER FARMS CO. (TOWNSITE PLANT)	34.25 R	1-24" 1-26" 1-20"		117	100	1171	1076		363	145	2972	955	
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	34.85 L	1-12"				94	202	43			339	120	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) INCLUDES 9 ACRES ON ADJOINING ASHLEY PROPERTY.
(2) OWNER. FORMERLY LISTED AS J. G. GOULART.
(3) 10" UNIT WASHED OUT. 4" IS TEMPORARY INSTALLATION.
(4) SEE ACREAGE NOTE FOR PLANT AT MILE 33.5 R.
(5) SEE PLANT AT MILE 63.75 L.
(6) NEW INSTALLATION 1935.
(7) INCLUDES ACREAGES AS FOLLOWS: COLLIER MILE 32.5 R, 20 ACRES, AND RICHARDSON, MILE 32.0 R, 226 ACRES.
(8) FORMERLY J. G. KNOX AND FRED LEISER.
(9) INCLUDES 25 ACRES ON ADJOINING BURTCHARDT PROPERTY.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
WALTER RAYMOND (1)	35.2 L	1-12"					77				(2) 77	130	
J. H. SCOTT	35.6 L	1-7"					52	9			(3) 61	28	
J. H. DONNELLY (J. G. KNOX)	35.8 L	1-10"				20	22	5	8		55	(4)15	
F. L. BURRELL (J.L.SILLS) (5)	36.2 L	1-16"			250	492	823	735	642	166	3108	40	300
AMEDEO MORONI	36.7 L	1-5"				15	7	8			30	(6)35	
W. W. BOTTIMORE	37.2 L	1-14"			NO	DIVERSION						(7)	
L. W. BUNDOCK	37.75 L	1-8"				18	23	14			55	(8)150	
ADDIE REEL (A. R. KRAMER)	38.4 L	1-10"					43	60			103	100	
CALIFORNIA LANDS, INC.(H.A.KRAMER)	38.8 L	1-10"					48	38	17		103	100	
F. O. EASTMAN	39.4 L	1-12"					74		32		106	80	
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	39.8 L	1-10"				90	21				111	60	
WILLIAM DUFFY, JR.	39.9 L	1-6"				17					17	25	
SUTTER MUTUAL WATER COMPANY (STATE RANCH BEND)	40.6 L	1-24"			1342	2970	2644	2324	959	80	10319	(9)	(9)
BUELL RANCH (JOHN GOULART) (10)	42.2 L	1-6"					21	3	2		26	25	
MATTEOLI AND FRATCHIA (11)	42.3 L	1-8"					100	12	19		131	58	
A. KRAMER	43.1 L	1-12"					165	65	17		247	95	
EL DORADO RANCH	43.1 R	1-18"			80	295	334	243	269	150	1371	540	
RIVER FARMS COMPANY (RECLAMATION DISTRICT 2047 PLANT)	43.1 R	2-50"		3700	2950	3110	3650	4680	300		18390	688	1498
— RECLAMATION DISTRICT 108 DRAIN —	MILE 44.0 R												
JOHN CLAUSS (G. GUISTI)	47.3 L	1-14"			NO	DIVERSION							
P. J. HIATT	48.7 L	1-20"			NO	DIVERSION							
P. J. HIATT	49.7 L	1-14"			NO	DIVERSION							
RECLAMATION DISTRICT 108 (TYNDALL MOUND PLANT)	51.1 R	2-24" 1-36"			1816	2470	2300	2190	390		9166		1100
CALIFORNIA NATIONAL BANK(P.J.HIATT)	51.2 L	2-16"		49	2000	2157	1986	2000	492		8684	320	160
J. F. WHITE	51.5 L	1-8"					27	8	3		38	20	
T. J. CUMMINS RANCH COMPANY	52.0 L	1-16"			135	44	508	22			709	152	
GEO. VAN RUITEN	52.9 L	1-10"			56	289	20				365	(12)220	
GEO. VAN RUITEN	53.9 L	1-12"			21	141	64				226	(13)	
G. W. STRETTER (A. R. WAYBUR)	55.1 L	1-20"					439	164			603	188	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) FORMERLY FRED VAN LEW.
(2) ADDITIONAL WATER ESTIMATED AT 25 ACRE-FEET RECEIVED FROM SCOTT PLANT, MILE 35.6 L.
(3) SEE NOTE (2) FOR PLANT AT MILE 35.2 L.
(4) ALL ON ADJOINING LAND OF A. COSTA.
(5) NEW INSTALLATION 1935.
(6) ALL ON ADJOINING BAILEY LANDS.
(7) SEE NOTE FOR PLANT AT MILE 37.75 L.
(8) INCLUDES 60 ACRES ON ADJOINING BOTTIMORE PROPERTY (MILE 37.2 L).
(9) SEE PLANT AT MILE 63.75 L.
(10) NEW INSTALLATION AT OLD POINT OF DIVERSION. OLD PLANT DISMANTLED IN 1933.
(11) FORMERLY SUTTER BASIN CORPORATION (E. BOZZI).
(12) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 53.9 L.
(13) SEE PLANT AT MILE 52.9 L.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
RECLAMATION DISTRICT 108 (BOYER BEND PLANT)	56.4 R	1-18"											
		1-30"		810	1810	2200	1869	830	588		8107	(1) 749	870
J. M. MILLER	56.65 R	1-12"				70	80	80	70		300	92	
G. W. STRETTER (A. R. WAYBUR)	56.95 L	1-20" (2)			100	468	524	592			1684	410	
J. M. KIRKUP	57.5 L	1-16"				85	12	35			132	40	
H. S. FASIG	58.2 L	1-15"			NO	DIVERSION (3)						(3)	
ALEX GRANT (4)	58.9 L	1-16"			56	141	206	198	62		663	(5) 292	
LAMB BROTHERS	59.8 L	1-14"										245	240
		1-8"			743	736	661	661	283		3084	(6)	(6)
RECLAMATION DISTRICT 108 (STEINER BEND PLANT)	59.85 R	1-16"			88	487					575	200	
F. L. BURRELL (J. L. SILLS)	60.4 L	1-10"					108				108	30	
BLANCHE COULTER BROWN	60.5 L	1-12"			NO	DIVERSION							
SUTTER BASIN CORPORATION (COLES LANDING)	61.3 L	1-12"				55	53				108	58	
FIRST SAVINGS BANK OF COLUSA	61.3 R			PLANT	DISMANTLED								
HINES RANCH	62.3 R	1-10"				27	3	6			36	18	
J. B. SMITH	62.3 L	1-10"				45					45	80	
		1-5"											
WILLIAM BAKER	62.6 R	1-8"			3	13	20	16			52	26	
R. L. YOUNG	62.8 L	1-8"					75	9	2		86	30	
— WILKINS SLOUGH GAGING STATION — MILE 62.9													
RECLAMATION DISTRICT 108 (WILKINS SLOUGH PLANT)	63.2 R	5-42"		1989	9653	9785	8834	9254	4015		43530	1421	5301 (7)
SUTTER MUTUAL WATER COMPANY (TISDALE) AND IMPROVEMENT MUTUAL WATER COMPANY	63.75 L	6-42"		3475	27811	26397	29711	28024	16554	1065	133037 (8)	16116 (9)	7889 (9)
LA ROCA MONTE RANCHO COMPANY	64.3 R	1-12"			16	7	10	16			49	30	
TISDALE IRRIGATION & DRAINAGE CO.	64.4 L	1-12"				475	571	592	483		2121	(10) 1525	
COLUSA DEVELOPMENT CO. (LOHMAN)	64.9 R	1-12" (11)				113	114				227	179	
M. BETTENCOURT	65.1 R	1-10"					26	26	33		85	20	
CALIFORNIA LANDS, INC. (C.F. BROWN)	65.7 L	1-12"					159	25	41		225	60	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) INCLUDES 9 ACRES ON ADJOINING CARL MILLER PROPERTY.
(2) THE 24" UNIT HAS BEEN REMOVED.
(3) SEE ACREAGE NOTE FOR GRANT PLANT AT MILE 58.9 L.
(4) FORMERLY J. R. YOUNG.
(5) INCLUDES 140 ACRES ON ADJOINING FASIG PROPERTY, MILE 58.2 L.
(6) ALL ON ADJOINING LANDS OF RECLAMATION DISTRICT 1500.
(7) INCLUDES 850 ACRES SERVED BY WATER REPUMPED FROM AN INTERIOR DRAIN.
(8) INCLUDES 8188 ACRE-FEET DELIVERED TO IMPROVEMENT MUTUAL WATER COMPANY (IN RECLAMATION DISTRICT 1600).
(9) THESE FIGURES GIVE THE TOTAL ACREAGE IRRIGATED FROM THE PORTUGUESE BEND, STATE RANCH BEND, AND TISDALE PLANTS, MILES 32.0 L, 40.6 L, AND 63.75 L RESPECTIVELY. INCLUDES 2213 ACRES GENERAL CROPS FOR THE IMPROVEMENT MUTUAL WATER COMPANY (IN R. D. 1600) ENTIRELY FROM THE TISDALE PLANT.
(10) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 67.1 L AND INCLUDES 181 ACRES ON LANDS OF D. A. WINSHIP (MILE 67.2 L) SERVED FROM THE PLANT AT MILE 67.1 L.
(11) REPLACES 24" UNIT.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
J. L. BROWNING	66.4 R	1-18"				232	317	301			850	(1)1100	
TISDALE IRRIGATION AND DRAINAGE CO. (WINSHIP PLANT)	67.1 L	1-20" 1-12"			156	949	1035	762	471	19	3392	(2)	
DESMOND A. WINSHIP, ET AL.	67.2 L	1-10"			NO	DIVERSION			(2)			(2)	
MERIDIAN FARMS WATER CO. #6	67.4 L	1-12"			64	101	12	44	70		291	(3)107	
SCOTT F. ENNIS AND E. S. BROWN	67.5 L	2-24"				1985	1801	1915	443		6144	(4)1622	
— RECLAMATION DISTRICT 70 DRAIN — MILE 68.8 L													
MERIDIAN FARMS WATER CO. #5	68.81 L	1-12"			56	226	45	91	27	7	452	242	
J. L. BROWNING	69.0 R	1-24"				1048	300	105			1453	(5)	
FAXON RANCH	69.2 R	1-18"			100	332	264	24			720	383	
— EDDY'S FERRY (GRIMES) — MILE 69.45													
WILBUR JENSEN & MARY CECIL, ET AL.	70.35 R	1-24"			NO	DIVERSION							
HOUCHINS, HOFFMAN, BECKLEY AND RITCHIE (J. M. RITCHIE)	70.4 R	1-20" 1-6"			325	396	41				762	520 (6)	
MERIDIAN FARMS WATER CO. #4 (GRIMES)	71.1 L	1-24"			664	2154	1571	1513	708		6610	1393	250
J. W. BROWNING	71.9 R	1-12"			29	100	51				180	120	
ANTONE STEIDELMEYER	71.9 R	1-12"			NO	DIVERSION							
E. E. VANN (L. B. WESTFALL)	73.6 R	1-12"			NO	DIVERSION							
MERIDIAN FARMS WATER CO. #3 (HEADQUARTERS)	74.8 L	1-18"			227	500	517	10	519		1773	453	
L. B. WESTFALL	75.3 R	1-10"				87	68	10			165	85	
J. H. YATES	76.1 L	1-12"				21	46	22			89	60	
ELLA BLACKMER	76.2 L	1-8"			NO	DIVERSION							
STEIDELMEYER BROTHERS (7)	76.5 R	1-16"				354	92	109	19		574	205	
E. V. JACOBS	77.9 L	1-12"				30	233	34		100	397	190	
SEBIA DAVIS ESTATE	78.8 R	1-36"			1900	1855	1594	1817	500		7666	312	1022
C. E. REISCHE	79.0 L	1-10"			16	130	47	45	10	18	266	(8)164	
E. V. JACOBS	79.5 L	1-8"					31				31	38	
G. W. WOOD	79.7 L	1-10"			7	15	34	20	10	9	95	(9)81	
— MERIDIAN BRIDGE — MILE 79.85													
MERIDIAN FARMS WATER CO. #1 & #2 (MERIDIAN)	80.0 L	1-24" 1-18"			982	2731	2433	2037	1350	100	9633	1966 (10)	
GEORGE P. AHLF	80.3 R	1-8"				156	80	28			264	40	
WONDERLY AND LILIENTHAL	81.5 L	1-16"				10	98	87	18	6	219	(11)35	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 69.0 R.
(2) SEE ACREAGE NOTE FOR PLANT AT MILE 64.4 L.
(3) AN ADDITIONAL 52 ACRES IRRIGATED FROM PLANT AT MILE 67.5 L.
(4) INCLUDES 52 ACRES FOR MERIDIAN FARMS WATER COMPANY, MILE 67.4 L.
(5) SEE ACREAGE NOTE FOR PLANT AT MILE 66.4 R.
(6) DIVIDED AS FOLLOWS (ACRES) HOUCHINS 20; HOFFMAN 300; BECKLEY 165; AND RITCHIE 35.
(7) NEW INSTALLATION 1935.
(8) INCLUDES ACREAGE ON NEIGHBORING LANDS AS FOLLOWS: ROCKHOLT 18; KILGORE 28; STAAS 28 AND LEMOS 30, TOTAL 104.
(9) INCLUDES 46 ACRES ON ADJOINING BURTIS PROPERTY.
(10) AN ADDITIONAL 519 ACRES WERE IRRIGATED FROM PLANT #7 PUMPING FROM AN INTERIOR LAKE SUPPLIED BY DRAINAGE AND SURPLUS WATER FROM PLANTS NOS. 1 AND 2, AND 3.
(11) WONDERLY 17 ACRES, BALANCE ON ADJOINING THRASH PROPERTY.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
STEIDELMEYER BROTHERS	81.9 R	1-20"(1)				281	379	247	68		975	390	
F. T. REISCHE AND L. J. WOOD	82.5 L	1-12"			10	21	35	25	8		99	(2)98	
GEORGE W. KIRKPATRICK	83.3 L	1-14"			NO	DIVERSION							
— BUTTE SLOUGH — MILE 84.0 L													
OAKLAND PRUNE COMPANY	86.1 R	1-12"				40	95	15	96	45	291	105	
J. F. PECK	86.6 L	1-18"				149	222				371	(3)120	
LLOYD SCOGGINS	86.8 L	1-8"				46	27				73	53	
W. P. DWYER (LOWER)	86.9 R	1-16"				158	128	39		19	344	(4)220	
W. P. DWYER (UPPER)	87.4 R	1-15"				67	65	22			154	(5)	
JACOBSEN AND O'ROURKE	87.6 L	1-10"			NO	DIVERSION							
SWINFORD TRACT IRRIGATION COMPANY	87.7 R	1-12"				176	104	11		49	340	132	
EDWARD K. LANGE	88.0 R	1-6"			4	2	4				10	22	
W. D. DEJARNETT (NAGLE & LOCOVITCH)	88.2 L	1-10"					110	32			142	(6)128	
W. D. DEJARNETT	88.7 L	1-14"				23	70	42			135	110	
COLUSA IRRIGATION COMPANY	89.2 R	1-20"				453	491	293	49		1286	658	
PHIL B. ARNOLD	89.25 L	1-8"				93					93	80	
G. A. BERKEY (7)	89.26 L(8)	1-12"					89				89	80	
— COLUSA GAGING STATION (BRIDGE) — MILE 89.4													
T. H. BOGGS AND SISTERS	89.7 L	1-6"				5	7	3	3		18	12	
T. H. BOGGS AND SISTERS	89.8 L	1-12"			NO	DIVERSION							
ROBERTS DITCH COMPANY	90.7 R	2-20"			211	792	683	592	358	144	2780	1035	
GEORGE P. AHLF	92.5 L	1-8"				57	128	34			219	(9)120	
U. W. BROWN	93.0 R	1-12"				28	55				83	(10)95	
GEORGE P. AHLF	93.0 L	1-6"					14	11		23	48	35	
I. G. ZUMWALT	93.2 R	1-36" 1-18"			NO	DIVERSION							
TUTTLE LAND COMPANY	94.3 R	1-15" 1-20"			27	396	394	200	74		1091	295 (11)	
W. E. PINNEY	94.8 R	1-12"				1	174				175	(12)80	
J. W. BROWNING	95.2 L	1-14" 1-20"			NO	DIVERSION							
M. E. HICOK	95.5 L			PLANT	DISMANTLED								
A. N. LEWIS (COLUSA DEVELOPMENT CO.) (13)	95.6 L	1-16" 1-20"					624	447			1071	565 (14)	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) NEW UNIT INSTALLED IN 1935. OLD 16" UNIT REMOVED AND RE-INSTALLED AT MILE 76.5 R.
(2) REISCHE 78 ACRES; WOOD 20 ACRES.
(3) INCLUDES 30 ACRES ON ADJOINING REICHEL PROPERTY.
(4) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 87.4 R.
(5) SEE ACREAGE NOTE FOR PLANT AT MILE 86.9 R.
(6) DE JARNETT 88 ACRES, NAGLE 20 ACRES, LOCOVITCH 20 ACRES.
(7) FORMERLY P. V. BERKEY ESTATE.
(8) CORRECTED MILEAGE.
(9) INCLUDES ACREAGES ON ADJOINING LANDS AS FOLLOWS: COLUSA DEVELOPMENT COMPANY, 45, AND A. G. LAUX, 40.
(10) INCLUDES 40 ACRES ON ADJOINING ARNOLD PROPERTY. SEE ACREAGE NOTE FOR TUTTLE PLANT AT MILE 94.3 R.
(11) INCLUDES 8 ACRES ON U. W. BROWN PROPERTY (MILE 93.0 R).
(12) INCLUDES ACREAGES AS FOLLOWS: MARSH 35 AND DICKSON 5.
(13) FORMERLY A. N. LEWIS ESTATE.
(14) ACREAGE SEGREGATED AS FOLLOWS: (ACRES) LEWIS (MEYER) 460; COLUSA DEVELOPMENT COMPANY 65; AND GRAHAM ESTATE 40.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
I. G. ZUMWALT	95.7 R	1-12"					220				220	216	
BRIDGET GRAHAM ESTATE	95.8 L	1-16" 1-20"			NO	DIVERSION(1)						(1)	
H. HEITMAN	97.7 R	1-12"				20	58	28			106	65	
FRANK BECKLEY	98.0 L	1-10"				23	92	10			125	65	
J. L. ERISEY	98.3 R	1-10"				44	79	54			177	61	
R. A. SPERRY AND COLUSA DEVELOPMENT COMPANY (2)	98.6 L	1-15"			NO	DIVERSION							
D. BOGGS (3)	98.8 L	1-18"			NO	DIVERSION							
CHENEY SLOUGH IRRIGATION COMPANY	99.0 R	1-36" 2-26"			15	488	51	109			663	(4)364	
TERRILL AND SARTAIN	99.2 L	1-20"			NO	DIVERSION						(5)	
DAVE GEORGE	99.8 L	1-16"				60	143	136	25	28	392	(6)173	
J. W. BROWNING	100.8 L	1-20"			NO	DIVERSION							
R. C. WOHLFROM	101.1 R	1-20"				445	183				628	133	
CLARA C. PACKER	102.8 R	1-36" 2-30" 2-18"			747	1179	1138	1288	437	15	4804		380
GLENN-COLUSA CORPORATION (CAUZZA)	103.3 L	1-14"						28			28	24	
AMERICAN COMPANY	103.7 R	1-16"				238	366	194	37	39	874	450	
COMPTON-DELEVAN IRRIGATION DIST.	103.8 R	2-24" 1-36"			NO	DIVERSION(7)						(7)	(7)
E. M. GORDON	103.9 R	1-16" 1-20"			NO	DIVERSION							
B. F. GOULD ESTATE	104.8 L	1-26"			77	520	494	230	130		1451	(8) 473	
THOUSAND ACRE RANCH (H.W.KELLER)	106.0 R	1-14"			3	71	97	55			226	143	
CALIFORNIA LANDS, INCORPORATED	110.0 R	1-12"				69	53	42			164	180	
CALIFORNIA LANDS, INCORPORATED	111.2 R	1-6"				10		11		7	28	27	
— PRINCETON FERRY — MILE 112													
RECLAMATION DISTRICT 1004	112.1 L	1-30" 1-50"				1301	1204	1163	250		3918	300	
PRINCETON-CODORA-GLENN IRR. DIST.	112.4 R	3-24"			NO	DIVERSION		ON (7)				(7)	(7)
A. J. STONE	112.6 L	1-10"				80		17			97	70	
EDWARD L. STEELE	115.5 L	1-12"			40	142	77	26	5	27	317	161	
— BUTTE CITY GAGING STATION — MILE 115.8													
— BUTTE CITY BRIDGE — MILE 115.9													
CALIFORNIA LANDS INCORPORATED	117.8 R	1-10"				130	66	20	16	62	294	152	
J. F. HARBOUR AND E. H. WILEY	118.4 R				PLANT REMOVED								

* MILEAGE ALONG RIVER ABOVE MOUTH.
(1) SEE ACREAGE NOTE FOR PLANT AT MILE 95.6 L.
(2) FORMERLY R. A. SPERRY (JOE BOGGS) AND COLUSA DEVELOPMENT COMPANY.
(3) FORMERLY WILLIAM AND D. BOGGS.
(4) ACREAGE DIVIDED AS FOLLOWS: MITCHELL 80, SEAVER 259, MIDDLECAMP 25.
(5) SEE ACREAGE NOTE FOR PLANT AT MILE 99.8 L.
(6) INCLUDES 40 ACRES ON ADJOINING TERRILL AND SARTAIN PROPERTY (MILE 99.2 L) AND 23 ACRES FOR JOE BOGGS.
(7) SEE PLANT AT MILE 154.8 R.
(8) B. F. GOULD ESTATE 80, J. C. DUNHAM 60, R. G. STANTON 40, J. S. GOULD 68, F. REUSER 60, O'SULLIVAN 40, AND COLUSA DEVELOPMENT CO. COMPANY 125.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSION IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
TOM CROUCH	119.0 L				PLANT REMOVED								
C. T. WHITE	123.7 R	1-6"			NO DIVERSION								
S. TAYLOR	123.8 R				PLANT REMOVED								
PRINCETON-CODORA-GLENN IRR. DIST.	123.9 R	3-24"			NO DIVERSION				(1)			(1)	(1)
PROVIDENT IRRIGATION DISTRICT	124.2 R	4-42" 1-36"			NO DIVERSION				(1)			(1)	(1)
CALIFORNIA LANDS INCORPORATED	124.4 R	1-16"			NO DIVERSION				(1)			(1)	
E. E. CRAMER	129.0 L				PLANT REMOVED								
F. S. REAGER	130.75R	1-6"				1	5	4	5		15	8	
— ORD FERRY — MILE 130.8													
PARROTT-PHELAN ESTATE	141.5 L	5-24"					451	2092	1801		(2)4344	1685 (3)	1147 (3)
— OLD CHICO LANDING RAILROAD BRIDGE SITE — MILE 142.1													
CHICO HOP COMPANY	146.9 L	1-5"			NO DIVERSION								
M. F. ROSE	148.7 R	1-6"							3		3	22	
M. F. ROSE	148.9 R	1-6"			NO DIVERSION								
— GIANELLA BRIDGE — MILE 149.5													
CALIFORNIA LANDS INCORPORATED	150.0 L	1-10"			NO DIVERSION								
JOSEPH GIANELLA	150.0 L(4)	1-10"			NO DIVERSION								
SACRAMENTO RIVER FARMS, LTD.	151.0 R	1-12" 1-16"			259	669	832	606	394	32	2792	1200	
A. HOLECEK	152.2 R	1-5"(5)				22	8	12	1		43	18	
MAAS BROTHERS	154.6 R	1-5"				6	6		2		14	30	
GLENN-COLUSA IRRIGATION DISTRICT	154.8 R (6)	1-100" 4-72" 2-66" 2-50" 1-42" 2-30"			43229	56687	57278	57924	31924	8156	255198 (7)	16982 (8)	17356 (9)
JACINTO IRRIGATION DISTRICT	154.8 R	(10)		(11)	1551	3047	3023	2761	1474	682	12538	(12)5018	
COMPTON-DELEVAN IRR. DISTRICT	154.8 R	(10)			1263	1220	1188	1176	536		5383	50	500

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) SEE PLANT AT MILE 154.8 R.

(2) THIS DIVERSION WAS SUPPLEMENTAL TO GRAVITY DIVERSION FROM BUTTE CREEK FOR THE SAME ACREAGE.

(3) PHELAN 537 RICE, BALANCE OF IRRIGATED AREA ON PARROTT LAND.

(4) PUMP ON NORD SLOUGH OR PINE CREEK LAGOON WHICH JOINS SACRAMENTO RIVER AT MILE 147.0 LEFT. PLANT IS LOCATED THREE MILES UP SLOUGH ON RIGHT BANK OR OPPOSITE MILE 150.0 LEFT, SACRAMENTO RIVER.

(5) FORMERLY LISTED AS 6" UNIT.

(6) THIS IS A COMMON POINT OF DIVERSION FOR THE GLENN-COLUSA, JACINTO, COMPTON-DELEVAN, PROVIDENT, PRINCETON-CODORA-GLENN, AND MAXWELL IRRIGATION DISTRICTS AND CALIFORNIA LANDS INCORPORATED (MILE 124.4).

(7) ADDITIONAL BY GRAVITY FROM STONEY CREEK APRIL 6580 ACRE-FEET, MAY 1325 ACRE-FEET. THE DIVERSION SHOWN INCLUDES WATER FOR C. L. LEONARD AND I. G. ZUMWALT (OUTSIDE DISTRICT) AS FOLLOWS: (ACRE-FEET) LEONARD JUNE 236, JULY 67, AUGUST 54; ZUMWALT MAY 1500, JUNE 860, JULY 492, AUGUST 492, SEPTEMBER 64.

(8) INCLUDES 125 ACRES OF DUCK LAKES; ALSO 78 ACRES FOR C. L. LEONARD OUTSIDE OF DISTRICT, AND 77 ACRES FOR PROVIDENT IRRIGATION DIST.

(9) INCLUDES 295 ACRES FOR I. G. ZUMWALT OUTSIDE OF DISTRICT AND 398 ACRES FOR PROVIDENT IRRIGATION DISTRICT. AN ADDITIONAL 110 ACRES SERVED THROUGH PROVIDENT IRRIGATION DISTRICT.

(10) SAME PLANT AS THAT OF GLENN-COLUSA IRRIGATION DISTRICT.

(11) A DIVERSION OF 99 ACRE-FEET IN APRIL IS A PORTION OF THE 6580 ACRE-FEET MENTIONED IN NOTE (7) GLENN-COLUSA IRR. DIST. 154.8 R.

(12) INCLUDES 50 ACRES FOR PROVIDENT IRRIGATION DISTRICT.

TABLE 29 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
PROVIDENT IRRIGATION DISTRICT	154.8 R	(1)		(2)	11819	9770	9160	8196	4402	403	43750	300 (3)	4901 (3)
PRINCETON-CODORA-GLENN IRR. DIST.	154.8 R	(1)			9837	10686	10025	10112	5943	2311	48914	2512	1880
MAXWELL IRRIGATION DISTRICT	154.8 R	(1)			2025	2550	2152	2112	1930	377	11146		1100
CALIFORNIA LANDS INCORPORATED	154.8 R	(1)				180	221	20			421	322	
— CORNING-VINA BRIDGE — MILE 166.5													
A. F. LANDIS	166.7 R	1-3"			2	6	4	6	5	1	24	5	
LAURA B. CARO	166.8 R	1-2"					2	3	3	2	10	4	
R. A. FOSTER	169.1 R	1-8"			NO	DIVERSION							
E. B. NOBLE	171.2 R				PLANT	REMOVED							
— TEHAMA BRIDGE — MILE 177.5													
TEHAMA RANCH	178.3 R				PLANT	REMOVED							
E. B. NOBLE	184.5 R	1-14"			55	115	107	73	51		401	50	
CONELAND WATER COMPANY	187.6 L	1-12"					32	32			64	152	
E. SLUITERS (4)	188.6 L	1-8"				6	20	23	11		60	22	
— RED BLUFF BRIDGE — MILE 193.45													
S. E. AYER	194.1 R				PLANT	REMOVED							
G. E. SUTTON	196.2 R	1-6"			NO	DIVERSION							
J. A. EDWARDS	196.2 L	1-6"			NO	DIVERSION							
J. C. CANNON (5)	196.4 L	1-8"			PLANT	REMOVED							
BANK OF AMERICA (PETERSON)	196.5 L	1-4"			NO	DIVERSION							
J. ERICKSON	196.6 L	1-5"				31	32	9	9	5	86	29	
C. DROZ	197.0 L	1-8"			NO	DIVERSION							
W. H. FREEMEYERS	197.65L	1-3"				3	4				7	27	
C. DROZ (ALEXANDER)	197.73L	1-2"				1					1	1	
		1-6"											
— RED BLUFF GAGING STATION (IRON CANYON) — MILE 198.6													
C. W. GRIFFIN	206.75L	1-10"			NO	DIVERSION							
— BEND FERRY BRIDGE — MILE 207													
W. E. BONNETT	209.0 L	1-2½"					4	4	1		9	7	
J. F. NUNES	215.5 R	1-7"			NO	DIVERSION							
— JELLEYS FERRY — MILE 215.6													
J. F. NUNES	216.0 R	1-3"			2	3	5	8	6	2	26	10	
W. A. HUNAEUS	216.4 L	1-3"					3	3	2		8	5	
T. A. HAAKONSON	217.5 L	1-5"					11		10		21	20	
J. L. HASKINS	218.0 L	1-5"					22	11	3		36	55	
RIO ALTO RANCHO	221.0 R	1-10"			12	56	48	26	12		154	64	
— BALLS FERRY BRIDGE — MILE 224.5													
— ANDERSON BRIDGE — MILE 232.9													
L. C. SMITH AND G. W. GEORGE	233.0 L	1-6" 1-4"			NO	DIVERSION							

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) SAME PLANT AS THAT OF GLENN-COLUSA IRRIGATION DISTRICT.
(2) A DIVERSION OF 869 ACRE-FEET IN APRIL IS A PORTION OF THE 6580 ACRE-FEET MENTIONED IN NOTE (7) GLENN-COLUSA IRRIGATION DISTRICT MILE 154.8 R.
(3) AN ADDITIONAL 50 ACRES OF GENERAL CROPS SERVED THROUGH JACINTO IRRIGATION DISTRICT, MILE 154.8 R. ALSO AN ADDITIONAL 77 ACRES OF GENERAL CROPS AND 398 ACRES RICE SERVED THROUGH GLENN-COLUSA IRRIGATION DISTRICT. RICE FIGURE INCLUDES 110 ACRES SERVED FOR GLENN-COLUSA IRRIGATION DISTRICT.
(4) THIS PLANT HAS BEEN IN PLACE FOR SEVERAL YEARS BUT NOT PREVIOUSLY REPORTED.
(5) FORMERLY A. W. GIBSON (T. A. CROOK).

TABLE 20 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
WM. MENZEL MEAT COMPANY	240.2 L	1-12"			85		191	113		101	490	120	
GRAF AND GRAF	241.5 L	1-8"					47	51	40	10	148	40	
ADAMS BROTHERS	242.0 R	1-6"				9	18	18	20	10	75	59	
— REDDING-ALTURAS BRIDGE — MILE 242.0													
— REDDING-YREKA BRIDGE — MILE 245													
ANDERSON-COTTONWOOD IRRIGATION DISTRICT	246.0 R	GRAVITY		6500	21390	21390	20999	18654	18000	13719	120652 (1)	13000	
JOHN DIESTELHORST	246.3 R	1-10"			31	76	69	87	70	22	(2) 355	25	
— OLD REDDING-YREKA BRIDGE — MILE 246.4													
			1524	18598	157817	203562	206813	195215	112498	30137	926164	98493	51090

*MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) CONSIDERABLE RETURN WATER FROM THIS DIVERSION REACHES THE SACRAMENTO RIVER AS SEEPAGE OR DIRECT SPILL IN THE DRAINS AND CREEK CHANNELS BETWEEN REDDING AND SOUTH OF COTTONWOOD.

(2) IT IS ESTIMATED THAT AT LEAST ONE-HALF OF THIS DIVERSION IS RETURNED DIRECTLY TO THE RIVER.

TABLE 30

*COLUSA TROUGH DIVERSIONS

WATER USER	**MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	*** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
HATTIE O'HAIR	(1)1.1 L	1-32" BOX			NO	DIVERS	ION					
— COLUSA TROUGH GAGING STATION — MILE 0												
I. G. ZUMWALT	2.2 R	1-14" BOX 1-36"			NO	DIVERS	ION					
A. D. J. LAND COMPANY	3.0 L	1-28" BOX			175	200	200	200	180		955	125
LOUIS BYINGTON	4.3 L	1-8"			NO	DIVERS	ION					
MAXWELL IRRIGATION DISTRICT PLANT #2A	7.0 R	1-15" 1-26" 1-36"			NO	DIVERS	ION	(2)				(2)
MAXWELL IRRIGATION DISTRICT PLANT #3A (3)	7.0 R (3)	1-20"			NO	DIVERS	ION	(2)				(2)
— LATERAL HIGHWAY - BUTTE CITY TO WEST SIDE — MILE 20.5												
RAZOR RANCH	20.7 R	1-6"			NO	DIVERS	ION					
RAZOR RANCH	21.1 R	1-15"			NO	DIVERS	ION					
STEVENS BROTHERS	22.0 R	1-18" BOX		112	524	480	519	697	469	65	2866	320
TOTALS			0	112	699	680	719	897	649	65	3821	445

* MAIN DRAIN OF RECLAMATION DISTRICT 2047.
** MILEAGE ALONG TROUGH ABOVE COLUSA-WILLIAMS HIGHWAY.
*** ALL RICE. NO GENERAL CROPS.
(1) BELOW COLUSA-WILLIAMS HIGHWAY.
(2) SEE MAXWELL IRRIGATION DISTRICT DIVERSION AT MILE 154.8 R.
(3) PLANT IS ON LATERAL E (STONE CORRAL CREEK) AND IS 3/4 MILE WEST OF PLANT #2A (MILE 7.0 R).

TABLE 31

*BACK BORROW PIT DIVERSIONS

WATER USER	**MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
— KNIGHTS LANDING RIDGE CUT JUNCTION — MILE 0.4 R													
FAIRCHILD RANCH	1.3 R	1-12"			NO	DIVERSION							
RIVER FARMS COMPANY	1.45R	1-20"			NO	DIVERSION							
W. P. DWYER (WM. CRAWFORD)	4.35R	1-20"			1721	1700	1638	1622	847		7528		875
RECLAMATION DISTRICT #108	8.8 R	1-14"			NO	DIVERSION							
HERSHEY ESTATE (E. A. JOHNSON)	11.15R	1-14" 1-12"			936	600	561	547	67		2711		1000 (1)
HERSHEY ESTATE (H. T. PETERSON)	13.75R	1-16"			550	900	880	906	177		3413		(2)
B. F. MUMMA	14.75R	1-10"			130	80	86	79	22		397	80	74
— COUNTY LINE BRIDGE — MILE 15.25													
M. T. EMMERT (GEO. YOUNGMARK)	15.75R	1-15"			560	536	403	405	234		2138		378
KATHERINE WEST	18.1 R	2-15"			NO	DIVERSION							
C. R. SUGGET AND GREGORY ESTATE (H. KALFSBEEK)	20.0 R	1-15"			658	645	673	677	347		3000		450
BEAN AND BRINDENBURG	22.15R	1-16"(3)			NO	DIVERSION							
J. W. BROWNING	22.65L			PLANT	DISMANTLED								
— HANNUM BRIDGE — MILE 22.8													
TOTALS			0	0	4555	4461	4241	4236	1694	0	19187	80	2777

* CARRIES RETURN WATER FROM COLUSA BASIN ALONG WEST BORDER OF RECLAMATION DISTRICTS 108 AND 787 AND THENCE TO DISCHARGE TO SACRAMENTO RIVER AT KNIGHTS LANDING OR PARTIAL DIVERSION VIA KNIGHTS LANDING RIDGE CUT.

** MILEAGE ALONG BORROW PIT FROM OUTFALL GATE JUST ABOVE JUNCTION OF BORROW PIT WITH SACRAMENTO RIVER AT KNIGHTS LANDING.

(1) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 13.75 R.

(2) SEE ACREAGE NOTE FOR PLANT AT MILE 11.15 R.

(3) 12" UNIT REMOVED.

TABLE 32

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	(1) GUN CLUB
LOWER BUTTE CREEK													
RECLAMATION DISTRICT 833 (R.C.INGRAM)	2.9 L	36" BOX					368	587	184		1139	650	
WEST BUTTE COUNTRY CLUB	3.85L	1-6"						30	30		60	30	
RECLAMATION DISTRICT 1004 (MOULTON IRRIGATED LANDS COMPANY)	3.9 R	1-15" 1-24"				699	1259	1678	487		4123	1719	
BUTTE LODGE GUN CLUB	4.0 R	1-22"								801	801		700
RECLAMATION DISTRICT 1004	9.3 R	GRAVITY				640	1240	1240			3120	1745	
BUTTE BASIN GUN CLUBS (2)	10	GRAVITY											5000
— BIGGS-AFTON ROAD — MILE 19.4													
GLENN RICE FARMS (BAKER)	(3) 19.8 R	(4) 1-24"			283	552	560	595	202		2192		**200
JOHN HANNAH	20.2 R	1-20"			NO	DIVERSION							
JOHN HANNAH	21.2 R	1-36"			NO	DIVERSION							

* APPROXIMATE MILEAGE FROM JUNCTION WITH SACRAMENTO RIVER.

** RICE.

(1) ONLY DIVERSIONS WHICH OCCURRED PRIOR TO NOVEMBER 1ST ARE GIVEN FOR GUN CLUB ACREAGE. IN MOST INSTANCES THE DIVERSIONS FOR THIS PURPOSE EXTENDED INTO NOVEMBER AND DECEMBER.

(2) IN ADDITION TO GUN CLUBS UNDER OTHER DIVERSIONS LISTED, THIS COMPRISES THE GROUP OF CLUBS DIVERTING BUTTE CREEK WATER BY GRAVITY FROM THE MAIN OR INTERCONNECTING CHANNELS (SANBORN SLOUGH, ETC.) IN THE VICINITY OF MILE 10. THROUGH RECLAMATION DISTRICT 833 CANALS, MOST OF THE CLUBS IN THIS GROUP RECEIVE ALSO, DRAINAGE AND FEATHER RIVER WATER DIVERTED FOR THE CLUBS BY WESTERN CANAL. THESE DIVERSIONS ARE PRINCIPALLY IN THE FALL MONTHS AND THOSE FROM BUTTE CREEK HAVE NOT BEEN MEASURED. FOR DIVERSIONS VIA WESTERN CANAL SEE TABLE OF FEATHER RIVER DIVERSIONS, MILE 59.7 R. THE AREA FLOODED BY THIS GROUP IS ESTIMATED TO BE APPROXIMATELY 5000 ACRES. THE CLUBS INCLUDED ARE WHITE MALLARD, WILD GOOSE, LAST CHANCE, BERRY AND KELLER, TULE GOOSE, BETTENS, GREENHEAD, FIELD AND TULE, NORTH BUTTE, HENSHAW, SACRAMENTO OUTING, ANDERSON, WEST BUTTE, AND COLUSA SHOOTING.

(3) PLANT IS ON HOWARD SLOUGH BUT OPPOSITE THIS MILEAGE ON BUTTE CREEK.

(4) REPLACES 12" UNIT.

TABLE 32 (CONTINUED)

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	(1) GUN CLUB
BUTTE SLOUGH													
BUTTE SLOUGH IRRIGATION COMPANY, LTD. (DIVERSION TO SUTTER BY-PASS) (2)	0.3 WEST	GRAVITY				5136	6260	6469	3938	1594	23397	(3)	
M. MARTY	0.3 WEST	1-12"					95	44			139	57	
G. S. AND D. C. SMITH	1.4 EAST	1-8"						150	34		184	133	
I. E. NALL	3.5 WEST	1-10"				48	66	76	41		231	112	
W. H. ROSS (W. MILLER)	3.7 WEST	1-10"					9	7	7		23	45	
P. A. REISCHE	4.1 WEST	1-12"				48	108	94	20		270	(4) 180	
E. V. JACOBS (G. M. GOMES)	4.8 WEST	1-10"				100	138	81	21		340	110	
A. ARMSTRONG AND COLUSA COUNTY BANK	5.1 WEST	1-10"				53	129	20	6		208	(5) 200	
W. NALL	6.3 WEST	1-7"			NO	DIVERSION							
T. J. HAGEMAN	6.8 WEST	3-8"			NO	DIVERSION							
— LONG BRIDGE — MILE 7.5 WEST													
TOTALS (LOWER BUTTE CREEK AND BUTTE SLOUGH			0	0	283	7276	10232	11071	4970	2395	36227	4981 (6)	5900 (7)

* APPROXIMATE MILEAGE FROM JUNCTION WITH SACRAMENTO RIVER.

(1) ONLY DIVERSIONS WHICH OCCURRED PRIOR TO NOVEMBER 1ST ARE GIVEN FOR GUN CLUB ACREAGE. IN MOST INSTANCES THE DIVERSIONS FOR THIS PURPOSE EXTENDED INTO NOVEMBER AND DECEMBER.

(2) BUTTE SLOUGH IRRIGATION COMPANY MAINTAINS A DAM ON BUTTE SLOUGH JUST ABOVE ITS JUNCTION WITH SACRAMENTO RIVER AND THEREBY DIVERTS WATER VIA BUTTE SLOUGH TO EAST AND WEST BORROW PITS OF SUTTER BY-PASS NEAR "LONG BRIDGE". THE TOTAL WATER SO DIVERTED IS HERE SHOWN. REDIVERSIONS FROM WEST BORROW PIT OF SUTTER BY-PASS WERE MADE AT MILES 28.4, 28.6 AND 29.0 R. (SEE SUTTER BY-PASS DIVERSIONS TABLE 33.)

(3) SEE ACREAGES UNDER REDIVERSIONS AT MILES 28.4 R, 28.6 R, AND 29.0 R., - WEST BORROW PIT SUTTER BY-PASS. A CONSIDERABLE ADDITIONAL BUT INDEFINITE ACREAGE WAS SERVED BY SUB-IRRIGATION AND DIRECT DIVERSIONS FROM FLOW DIVERTED TO EAST BORROW PIT OF SUTTER BY-PASS WHICH IS JOINED BY FEATHER RIVER RETURN FLOW ENTERING VIA WADSWORTH CANAL. SEE EAST BORROW PIT SUTTER BY-PASS DIVERSIONS, TABLE 33, AND FOOTNOTE TABLE 62.

(4) INCLUDES S. E. REISCHE 50; C. P. REISCHE 60; HEMPHILL 20; MESSICK 15; FEITH 4; GRANNEMAN 4.

(5) ARMSTRONG 100; COLUSA COUNTY BANK (PUTNAM) 50; AND ADJOINING HENSEN LAND, 50.

(6) DOES NOT INCLUDE ACREAGE UNDER DIVERSIONS TO SUTTER BY-PASS. SEE FOOTNOTES (2) AND (3).

(7) NOTE THAT THIS INCLUDES AN ESTIMATE OF 5000 ACRES FOR WHICH THE DIVERSIONS ARE NOT REPORTED. ALSO INCLUDES 200 ACRES OF RICE (LOWER BUTTE CREEK, MILE 19.8 R).

TABLE 33

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS

WATER USER	MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
WEST BORROW PIT OF SUTTER BY-PASS													
	(1)												
— WEST BORROW PIT GAGING STATION — MILE 1.4													
— SOUTHERN PACIFIC RAILROAD CROSSING — MILE 2.5													
— KNIGHTS LANDING - MARYSVILLE CAUSEWAY — MILE 12.7													
— WEST BORROW PIT GAGING STATION — MILE 15.7													
STATE RECLAMATION BOARD	16.1 L	1-16"			NO	DIVERSION							
— SOUTH LEVEE TISDALE BY-PASS — MILE 18.9													
— RECLAMATION DISTRICT 1660 GRAVITY RETURN — MILE 19.3													
D. C. SMITH, E. I. MCGRATH AND S. A. MC KEEHAN	27.1 R	1-16"			NO	DIVERSION							
BUTTE SLOUGH IRRIGATION COMPANY, LTD.(2)	28.4 R	GRAVITY		270	1036	2273	2748	1947	848		9122	3810	
S. F. ROBERTSON (2)	28.6 R	1-10"			NO	DIVERSION							
FRYE BROTHERS (2)	29.0 R	1-7"				8	21				29	26	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 29.15													
EAST BORROW PIT OF SUTTER BY-PASS													
	(3)												
C. F. HOLMES AND R. E. HUGHES	0.4S*	1-14"				93	148				241	262	
C. F. HOLMES AND R. E. HUGHES	0.1S*	1-16"			NO	DIVERSION							
C. F. HOLMES AND R. E. HUGHES	0.5N*	1-14"(4)					97				97	300	
E. H. CHRISTENSEN (5)	(6)1.4N	1-12"				809	641	601	474	89	2614		296
A. W. KIMERER	(6)1.4N	1-14"			360	300	900	900	720		3180		300
E. H. CHRISTENSEN (7)	(6)1.4N	1-12"			220	180	540	540	430		1910		200
C. F. HOLMES AND R. E. HUGHES	1.5N*	1-8"					134	38			172	175	
		1-4"											
ARNOLD CHRISTENSEN (8)	2.2N	1-16"			97	1070	758	673	415		3213		400
C. F. HOLMES AND R. E. HUGHES	3.1N*				PLANT REMOVED								
E. H. CHRISTENSEN AND SON	4.3N				PLANT DISMANTLED								

(1) MILEAGE IS GIVEN NORTHERLY FROM DRAINAGE PLANT OF RECLAMATION DISTRICT 1500. MILE 9.15 WEST BORROW PIT IS OPPOSITE CHANDLER.
(2) DIVERSIONS AT MILE 28.4 R, 28.6 R, AND 29.0 R ARE FROM WATER DIVERTED TO THE WEST BORROW PIT FROM BUTTE SLOUGH. THEY ARE INCLUDED IN THE TOTAL DIVERSION TO SUTTER BY-PASS AS LISTED UNDER BUTTE SLOUGH DIVERSIONS — (SEE TABLE 32).
(3) MILEAGE IS GIVEN NORTHERLY OR SOUTHERLY FROM CHANDLER. CHANDLER IS OPPOSITE MILE 9.15 WEST BORROW PIT. PLANTS ARE ON LEFT BANK UNLESS MARKED WITH ASTERISK DENOTING RIGHT BANK.
(4) 12" UNIT HAS BEEN REMOVED.
(5) PLANT REINSTALLED 1935 AT AN OLD POINT OF DIVERSION.
(6) PLANT IS ON DRAIN CANAL WHICH ENTERS BY-PASS AT THIS POINT.
(7) NEW INSTALLATION 1935.
(8) FORMERLY E. H. CHRISTENSEN AND SON.

TABLE 33 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS

WATER USER	MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
EAST BORROW PIT OF SUTTER BY-PASS (CONTINUED)													
— KNIGHTS LANDING — MARYSVILLE CAUSEWAY — MILE 4.4 N	(1)												
C. F. HOLMES AND R.E. HUGHES (A. R.WAYBUR)	4.5 N*	1-14"				50	300				350	265	
STATE RECLAMATION BOARD (E. H.CHRISTENSEN AND SON)	5.8 N*	1-16"				300	300	300	150		1050	800 (2)	
STATE RECLAMATION BOARD (E. H. CHRISTENSEN AND SON)	6.6 N*				PLANT	REMOVED							
STATE RECLAMATION BOARD (E. H. CHRISTENSEN AND SON)	6.95N*	1-12"				708	600	788	684	129	2909	(3)	
—EAST LEVEE OF WADSWORTH CANAL — MILE 16.0 N													
R. L. MOREHEAD	18.75N	1-10"			NO	DIVERSION							
F. W. DE WITT AND GEORGE SMITH	18.8 N*	1-4"			NO	DIVERSION							
MEYER-PLATTER-MOREHEAD-DE WITT BROS.- EPPERSON & MIDDLETON	19.1 N	1-14"				100	602	442	28		1172	643 (4)	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 20.0 N													
SACRAMENTO SLOUGH													
C. F. HOLMES AND R. E. HUGHES	(5) 1.4 R	1-24"				151	168				319	325	
KNIGHTS LANDING RIDGE CUT (6)													
RUSSELL BROTHERS	(7) 2.3 L				PLANT	DISMANTLED							
— RECLAMATION DISTRICT 730 DRAINAGE PLANT #2 — MILE 3.8													
CALIFORNIA NATIONAL BANK (LINNELL)	4.55L	1-12"				82	76				158	240	
HERSHEY ESTATE (A. J. DARNEILLE)	4.7 L	1-15"			64	84	14	140	41		343	250	
SIEBER BROTHERS	4.7 R	1-6"				4	4	7	7	6	28	18	
— WEST LEVEE OF YOLO BY-PASS — MILE 6.3													
FRANK FISHER AND HENRY RICH	6.3 (8)	GRAVITY			NO	DIVERSION							
E. L. WALLACE	6.3 (8)	GRAVITY			NO	DIVERSION							

(1) MILEAGE IS GIVEN NORTHERLY OR SOUTHERLY FROM CHANDLER. CHANDLER IS OPPOSITE MILE 9.15 WEST BORROW PIT. PLANTS ARE ON LEFT BANK UNLESS MARKED WITH ASTERISK DENOTING RIGHT BANK.
(2) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 6.95 N*.
(3) SEE ACREAGE NOTE FOR PLANT AT MILE 5.8 N*.
(4) MEYER, 90; PLATTER, 25; MOREHEAD, 100; DE WITT BROS. AND EPPERSON, 165; DE WITT BROS. AND MIDDLETON, 117; DE WITT BROS. AND MEYER, 146.
(5) MILEAGE IS GIVEN EASTERLY FROM DRAINAGE PLANT OF RECLAMATION DISTRICT 1500 WHICH IS AT HEAD OF SLOUGH.
(6) FLOW IS PRINCIPALLY COLUSA BASIN DRAINAGE DIVERTED TO THE RIDGE CUT BY CHECKING AT THE KNIGHTS LANDING OUTFALL GATES ON THE BACK BORROW PIT OF RECLAMATION DISTRICT 787. SEE TABLE 65.
(7) MILEAGE IS GIVEN SOUTHERLY FROM HEAD IN BACK BORROW PIT NEAR KNIGHTS LANDING.
(8) ANY DIVERSION TO THIS LAND IS BY MEANS OF CANALS HEADING AT WEST LEVEE OF YOLO BY-PASS AND IRRIGATES LAND IN THE BY-PASS.

TABLE 33 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS

WATER USER	MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)													
	(1)												
J. S. BELL (2)	0.8 S	1-10"					23	23			46	(3)102	
JOE VALINE (2)	0.7 S	1-10"					23	29			52	(4)120	
GEORGE SWANSTON (H. C. LUPPE) (2)	0.3 S	1-12"					29	43	29		101	290	
GEORGE SWANSTON (2)	0.1 N*	1-18"						567	250		817	(5)1190	
GEORGE SWANSTON (6)	1.8 N*	1-15"				19	288	180	56		543	(7)	
C. S. LUCE (2)	2.4 N	1-10"				139	49				188	(8)150	
C. S. LUCE (2)	3.4 N	1-8"					59				59	(9)	
— SACRAMENTO-WOODLAND RAILROAD CROSSING — MILE 6.2													
— RECLAMATION DISTRICT 1600 DRAINAGE PLANT — MILE 10.0													
FRANK FISHER AND HENRY RICH	10.1 N*				NO	DIVERSION							
— FREMONT WEIR (EAST END) — MILE 12.3													
BACK BORROW PIT RECLAMATION DISTRICT 1000													
	(10)												
— GAGING STATION — MILE 2.1													
TOTALS — BY-PASS AND DRAINAGE CHANNEL DIVERSIONS													
WEST BORROW PIT OF SUTTER BY-PASS			0	270	1036	2281	2769	1947	848	0	9151	3836	0
EAST BORROW PIT OF SUTTER BY-PASS			0	0	677	3610	5020	4482	2901	218	16908	2645	1196
SACRAMENTO SLOUGH			0	0	0	151	168	0	0	0	319	325	0
KNIGHTS LANDING RIDGE CUT			0	0	64	170	94	147	48	6	529	508	0
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)			0	0	0	158	471	842	335	0	1806	1852	0
BACK BORROW PIT RECLAMATION DISTRICT 1000			0	0	0	0	0	0	0	0	0	0	0
TOTALS			0	270	1777	6370	8522	7418	4132	224	(11)28713	9166	1196

(1) MILEAGE IS GIVEN NORTHERLY OR SOUTHERLY FROM NORTH LEVEE OF SACRAMENTO BY-PASS. ASTERISK INDICATES LAND IRRIGATED IS IN BY-PASS AREA.
(2) NEW INSTALLATION 1935.
(3) ON FOLLOWING LANDS - KIRBY 51, BEARDSLEE 11, NICKERSON 40.
(4) ON FOLLOWING LANDS - NICKERSON 90, DRIVER 30.
(5) THIS IS THE TOTAL AREA SERVED BY THIS PLANT AND THE ONE AT 1.8 N*.
(6) NEW INSTALLATION 1935 AT AN OLD POINT OF DIVERSION.
(7) SEE ACREAGE NOTE FOR PLANT AT MILE 0.1 N*.
(8) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 3.4 N.
(9) SEE ACREAGE NOTE FOR PLANT AT MILE 2.4 N.
(10) MILEAGE IS GIVEN EASTERLY FROM SACRAMENTO RIVER.
(11) INCLUDES 9122 ACRE-FEET INCLUDED ALSO IN DIVERSIONS LISTED UNDER BUTTE SLOUGH. SEE FOOTNOTE (2) WEST BORROW PIT OF SUTTER BY-PASS DIVERSIONS, THIS TABLE, AND FOOTNOTE (2) BUTTE SLOUGH DIVERSIONS, TABLE 32.

TABLE 34

FEATHER RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
SUTTER BASIN CORPORATION	0.6 R	1-16"			NO	DIVERSION							
PUNTER AND RUTZ	1.55 L				PLANT	REMOVED							
SUTTER BASIN COMPANY	2.60 R	1-20"											
		1-26"					853	2482	343		3678	1833	
CALIFORNIA LANDS, INCORPORATED	6.44 L	1-8"				61	20	2	1		84	95	
M. SCHEIBER	7.7 L	1-8"				89	110	128	105	36	468	200	
— NICOLAUS GAGING STATION — MILE 9.3													
— NICOLAUS BRIDGE — MILE 9.4													
GEORGE POLLOCK COMPANY	9.75 R	1-20"			NO	DIVERSION							
GARDEN HIGHWAY MUTUAL WATER COMPANY	13.1 R	1-20"				842	1123	603	538	46	3152	1160	
		1-24"										(1)	
FEATHER RIVER WATER COMPANY	16.35 R	1-14"				280	294	107	149		830	234	
PLUMAS MUTUAL WATER COMPANY	17.5 L	1-22"				874	1657	1800	549	384	5264	1195	
G. C. SHANNON	18.25 R	1-6"			NO	DIVERSION							
G. C. SHANNON	18.75 R	1-6"				33	59	30	26	9	157	67	
OSWALD WATER DISTRICT	21.4 R	1-16"				842	924	526	220	239	2751	537	
ALICIA MUTUAL WATER COMPANY	24.0 L	1-26"											
		1-30"			1163	738	2632	1716	1472		7721	635	185
CUNNINGHAM BROTHERS	25.2 R	(2) 1-10"			NO	DIVERSION							
— MOUTH OF YUBA RIVER — MILE 27.3													
— YUBA CITY-MARYSVILLE BRIDGE — MILE 28.0													
J. L. SULLIVAN	33.9 R	1-10"	214	150		170	85	63	51		733	150	
SUTTER BUTTE CANAL COMPANY (SUNSET PLANT) (3)	38.1 R	2-42"											
		1-26"			NO	DIVERSION (3)						(3)	(3)
PACIFIC HIGHWAY ORCHARDS TRACT (CHARLES COTTRELL)	43.7L (4) H.SL.0.4L	1-8"			NO	DIVERSION							
OGDEN ESTATE (5)	43.7L (4) H.SL.0.7L	1-4"				6	7	1	2		16	13	
MOZNETT-WETMORE SUBDIVISION No. 1 (CHARLES ST. CLAIR)	43.7L (4) H.SL.1.2L	1-10"			35	90	140	86	50		401	190	
MANUEL A. BARBA	43.7L (4) H.SL.1.25L	1-8"			16	28	34	35	21	15	149	55	

* MILEAGE ALONG RIVER ABOVE MOUTH.
(1) INCLUDES 250 ACRES OF BROWN AND PURINGTON.
(2) FORMERLY LISTED AS 12".
(3) SEE SUTTER BUTTE CANAL COMPANY'S DIVERSION AT MILE 58.1 R.
(4) PLANT DIVERTS FEATHER RIVER WATER BACKED INTO HONCUT SLOUGH. SLOUGH IS TRIBUTARY TO FEATHER RIVER AT MILE 43.7 LEFT. MILEAGE OF PLANT ABOVE MOUTH OF HONCUT SLOUGH IS INDICATED.
(5) FORMERLY ANTONE HOLL.

TABLE 34 (CONTINUED)

FEATHER RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
A. P. BARBA (JOHN BETTENCOURT)	47.9 L	1-12"				206	215	149	136		706	110	
E. F. BIGGS	48.3 L	1-10"				92	50	170			312	310	
PAUL WAGNER (CLYNE RANCH)	51.0 R	1-6"				5	16	16			37	(1) 46	
C. E. PORTER (2)	51.1 L	1-7"				13	21	10	5		49	(3) 59	
EDWARD STEADMAN	51.4 R	1-10"					148	85	23		256	(4) 105	
CALIFORNIA LANDS, INCORPORATED	51.6 R	1-5"				20	16				36	25	
W. E. BLOWER	52.1 L	1-9"					24		12		36	50	
CALIFORNIA LANDS, INCORPORATED	52.5 L	1-6"			NO	DIVERS	ION						
F. L. MORRIS	52.7 L	1-8"				31	23	12	2		68	74	
FRANK DUTRA	52.9 R	1-6"					10	25	20		55	25	
G. H. BOGUE	53.1 R	1-6"			23	37	26	33	8	6	133	40	
BUDH SINGH	54.7 R	1-8"			68	63	71	41			243	(5) 31	
HEARST ESTATE (SUNICAL PACKING CO.)	55.1 L	1-14"				270	413	229	202		1114	287	
L. A. KISTER	55.5 L	1-8"			12	51	107	45	11	4	230	128	
RIO BONITA RANCH	56.6 R	1-14"			NO	DIVERS	ION						
J. H. ABBEY	56.8 R	1-8"			NO	DIVERS	ION						
ALVIN KISTER	57.0 L	1-8"				27	64	35	17		143	40	
J. E. CARRICO	57.0 R	1-8"					34	4	4		42	20	
HENRY HASELBUSCH	57.9 R	1-10"				20	41			28	89	38	
SUTTER BUTTE CANAL COMPANY	58.1R(6)	GRAVITY		1157	37459	59123	56197	51450	32094	14190	251670	15053	7790
RICHVALE IRRIGATION DISTRICT	58.1R(6)	GRAVITY		231	7492	11824	11239	10290	6419	2838	50333	983	6229
WESTERN CANAL COMPANY	59.7 R	GRAVITY			5706	13878	15719	15662	8862	90	(7) 59917	1374	6645
— U. S. G. S. OROVILLE GAGING STATION — MILE 65													
TOTALS			214	1538	51974	89713	92372	85835	51342	17885	390873	25162	20849

* MILEAGE ALONG RIVER ABOVE MOUTH.

(1) INCLUDES 15 ACRES ON ADJOINING STEADMAN PROPERTY, MILE 51.4 R.

(2) FORMERLY J. F. HARRIGER.

(3) INCLUDES 25 ACRES ON ADJOINING ROBINSON PROPERTY.

(4) AN ADDITIONAL 15 ACRES IRRIGATED FROM PLANT AT MILE 51.0 R.

(5) INCLUDES 6 ACRES ON ADJOINING EDSON PROPERTY.

(6) THIS IS A COMMON POINT OF DIVERSION FOR SUTTER BUTTE CANAL COMPANY AND RICHVALE IRRIGATION DISTRICT. OWNERSHIP IN THE WATER IS DIVIDED FIVE-SIXTHS TO SUTTER BUTTE CANAL COMPANY AND ONE-SIXTH TO RICHVALE IRRIGATION DISTRICT AND THE TOTAL MEASURED DIVERSION HAS BEEN ARBITRARILY DIVIDED IN THIS RATIO TO GIVE THE DIVERSION FOR EACH AS HERE GIVEN.

(7) IN ADDITION TO DIVERSIONS HERE LISTED THERE WERE DIVERSIONS BY WESTERN CANAL FOR FLOODING PONDS OF DUCK CLUBS IN BUTTE BASIN AS FOLLOWS: (ACRE-FEET) OCTOBER 6444; NOVEMBER 11702; DECEMBER 3239; TOTAL 21385.

TABLE 35

YUBA RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GEN-ERAL	RICE
— SEVENTH STREET BRIDGE — MILE 0.9													
CALIFORNIA LANDS, INCORPORATED (MORATA)	0.9 L	1-5"				8		8			16	5	
DAVIS BROTHERS	1.6 L	1-12"				59	89	159	80		387	115	
E. O. RUBKE	4.1 L	1-8"		8	72	116	133	99	44		472	111	
S. J. MONACO (1)	4.3 R	1-4"				24	13	16			53	7	
WM. M. DINSMORE	4.7 L(2)				PLANT DISMANTLED								
EARL FRUIT COMPANY AND DINSMORE	4.75L(2)	1-10"(3)				27	19	19			65	86	
WM. M. DISNMORE (VISTICA)	4.9 L(2)	1-5"					12	13			(4) 25	15	
DANTONI ORCHARDS (EARL FRUIT CO.)	5.3 L(2)	1-8"		5	29	59	40				(5)133	50	
MARYSVILLE RIVER FARMS COMPANY (L. A. PLANTZ)	5.9 L(2)	1-10"			NO	DIVERS	ION						
MARYSVILLE RIVER FARMS COMPANY (J. V. PEARSON AND J. NAGLER)	6.35L(2)	1-10"				87	263	143			(6)493	(6)125	
HALLWOOD IRRIGATION COMPANY AND CORDUA IRRIGATION DISTRICT (7)	11.0 R	GRAVITY		238	8650	10354	10461	9273	6276		45252 (7)	5941 (7)	1552 (7)
W. P. HAMMON	14.5 L	GRAVITY		274	283	274	283	283	274	283	(8)1954	80	
TOTALS			0	525	9034	11008	11313	10013	6674	283	48850	6535	1552

* APPROXIMATE MILEAGE ALONG RIVER ABOVE HIGHWAY CROSSING AT MARYSVILLE.
(1) REPORTED TO HAVE BEEN INSTALLED IN 1931 BUT NOT PREVIOUSLY LISTED.
(2) MILEAGE CORRECTION.
(3) REPLACES 8" UNIT.
(4) ADDITIONAL WATER ESTIMATED AT 4 ACRE-FEET OBTAINED FROM PLANT AT MILE 5.3 L.
(5) INCLUDES 4 ACRE-FEET SUPPLIED TO PROPERTY UNDER DIVERSION AT MILE 4.9 L.
(6) AN UNDETERMINED ADDITIONAL AMOUNT OF WATER OBTAINED FROM WELL PUMP.
(7) HALLWOOD IRRIGATION COMPANY AND CORDUA IRRIGATION DISTRICT HAVE A COMMON POINT OF DIVERSION AND COMMON CANAL FOR ABOUT ONE-HALF MILE; DIVERSION AND ACREAGE FIGURES ARE FOR COMBINED PROJECTS. IRRIGATED ACREAGE IS SEGREGATED AS FOLLOWS: HALLWOOD, RICE 600; GENERAL 5400; CORDUA, RICE 952 (INCLUDES 235 OUTSIDE DISTRICT), GENERAL 541.
(8) CONTINUOUS GRAVITY DIVERSION. WATER IS USED ON ORANGE GROVE AND SURPLUS RETURNS TO RIVER VIA DREDGER PONDS AND ROCK PILES.

TABLE 36

AMERICAN RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** TOTAL ACREAGE
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
— GARDEN HIGHWAY BRIDGE — MILE 0.2												
— AUBURN BOULEVARD BRIDGE — MILE 1.9												
— SACRAMENTO NORTHERN RAILROAD BRIDGE — MILE 2.0												
— WESTERN PACIFIC RAILROAD BRIDGE — MILE 2.1												
NORTH SACRAMENTO LAND COMPANY	2.4 R	1-6"						2	1		3	(1) 12
NORTH SACRAMENTO LAND COMPANY	(2) 2.45 R				PLANT	REMOVED						
NORTH SACRAMENTO LAND COMPANY (MOURA)	2.55 R (3)	1-3"						3			3	(4)
NORTH SACRAMENTO LAND COMPANY	(5) 2.8 R	1-5"			NO	DIVERSION						
G. A. MEISTER (AZEVEDA) (7)	(6) 3.1 L	1-10"				8	8	7	7		30	30
— SOUTHERN PACIFIC RAILROAD BRIDGE — MILE 3.5												
G. A. MEISTER (AZEVEDA)	(8) 3.7 L	1-4" 1-6"					31		2		33	16
G. A. MEISTER (AZEVEDA)	(9) 4.1 L	1-10"				18	17	15	13		63	70
— GAGING STATION — AMERICAN RIVER AT SACRAMENTO — MILE 6.1												
R. AND E. G. CUTTER (STEFFANI AND SCOTTI)	6.7 L	1-7"				3	7	6	7	5	28	20
C. M. CUTTER	6.8 L	1-5"					13				13	27
S. H. COWELL	7.1 L	1-7"				15	14				29	20
E. CLEMENS HORST	7.5 R	1-8"					134				134	100
HAGGIN BOTTOM LAND COMPANY (10)	7.7 R	1-4"			NO	DIVERSION						
HAGGIN BOTTOM LAND COMPANY (10)	7.8 R	1-4"			NO	DIVERSION						
A. A. MERKLEY AND J. H. KERBY	9.0 L	1-6"				25	23				48	40
SIERRA OAKS DAIRY	9.2 R	(11) 1-10"				41					41	40
M. OJI	9.2 L	1-8"					15	12			27	60

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 2.7 R.
(2) MILEAGE CORRECTED FROM 2.8 R.
(3) MILEAGE CORRECTED FROM 3.0 R.
(4) SEE ACREAGE NOTE FOR PLANT AT MILE 2.4 R.
(5) MILEAGE CORRECTED FROM 3.3 R.
(6) MILEAGE CORRECTED FROM 3.2 L.
(7) PLANT REINSTALLED AT AN OLD POINT OF DIVERSION.
(8) MILEAGE CORRECTED FROM 3.6 L.
(9) MILEAGE CORRECTED FROM 3.8 L.
(10) FORMERLY FRED KING.
(11) REPLACES 8" UNIT.

TABLE 36 (CONTINUED)

AMERICAN RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** TOTAL ACREAGE
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
C. E. WELLS	(1)9.35L	(2)1-8"					21				21	(3) 40
C. E. WELLS	9.5 L	(4)1-5"					11				11	(5)
C. E. WELLS	9.55L	1-5"			NO	DIVERSION						
HENRY COWELL	(1)9.6 L	1-6"			NO	DIVERSION						
HAGGIN BOTTOM LAND CO. (6)	10.2 R	(7)1-8"				18	52	23	16	15	124	(8) 75
GUY H. RODDAN	10.3 L	1-10"				17	20	15	5		57	31
GOLD NUGGET ORCHARD — E. A. BOYLE	10.4 R	1-5"				12		5	9		26	17
HAGGIN BOTTOM LAND COMPANY	10.5 R	1-6"		3	15	18	15	16	9		76	40
MUCKE SAND AND GRAVEL COMPANY (9)	11.2 L	1-6"			NO	DIVERSION						
J. T. GORE ESTATE	11.5 L	1-6"			NO	DIVERSION						
WM. A. MEYER	11.7 L	1-4"				17	22	11		8	58	30
HARRY NAKATOMI	11.7 L	1-5"					16	10			26	40
H. T. DANIELSON	13.1 R	1-5"		10	10	10	6	4			40	10
P. OSTERLI	13.2 R	1-6"			8	50	54	38			150	55
MARY DETERDING	13.9 R	1-6"				24	40	20			84	70
MARY DETERDING	14.7 R	1-4"					4	5			9	20
MARY DETERDING	15.1 R	1-6"				14	28	14			56	35
CARMICHAEL IRRIGATION DISTRICT	16.0 R	1-12" 1-8" 1-6"	5	325	630	600	735	606	527	172	3600	1900
WILLIAM H. DEVLIN	17.1 R	(10)1-6"				3	3	12	7		25	10
— GAGING STATION — AMERICAN RIVER AT FAIROAKS — MILE 19.2												
TOTALS			5	338	663	893	1289	824	603	200	4815	2808

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) CORRECTED MILEAGE.
(2) FORMERLY LISTED AS 5" UNIT.
(3) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 9.5 L.
(4) FORMERLY LISTED AS 8" UNIT.
(5) SEE ACREAGE NOTE FOR PLANT AT MILE 9.35 L.
(6) FORMERLY GOLD NUGGET ORCHARD COMPANY (ALLEN).
(7) NEW UNIT, REPLACES 5" UNIT.
(8) INCLUDES 35 ACRES ON ADJOINING CALIFORNIA NATIONAL BANK PROPERTY. (ALLEN ORCHARD).
(9) FORMERLY ANNIE HOEY.
(10) SMALL UNIT HAS BEEN REMOVED.

TABLE 37

DELTA UPLANDS DIVERSIONS FROM CACHE SLOUGH

WATER USER	LOCATION	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	* ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
RECLAMATION DISTRICT No. 2068	SW¼ NE¼ SEC. 34 T6N., R1E.	1-36" 1-30"	0	0	0	1629	2713	2400	1729	500	8971	2400

* ALL GENERAL CROPS. NO RICE.

TABLE 38

DELTA UPLANDS DIVERSIONS FROM OLD SAN JOAQUIN RIVER

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
EAST CONTRA COSTA IRRIGATION DISTRICT	36.5L (1)	2-30" 1-24" 1-18"		14	5123	6760	6168	4830	3303	781	26979	12775
BYRON-BETHANY IRRIGATION DISTRICT	40.9L (2)	1-30" 1-26"			2161	2785	2160	1845	1486	398	10835	4595
JOE SANTOS	(3) 44.6L	1-7"				10	13	13	10		46	10
E. H. STEVENSON	45.3L	1-12"			NO	DIVERSION						
H. LINDEMAN	47.2L	1-12"					25	4	13		42	70
A. F. NOONIS	47.2L	1-10"			NO	DIVERSION						
WEST SIDE IRRIGATION DISTRICT	(4) 47.65L	7-15"			2702	2628	3203	2216	1141	515	12405	8125
LANGEMAN AND FROESE	48.7L	1-8"			14	30	21	38	20		123	75
NAGLEE BURKE IRRIGATION DISTRICT	50.4L	1-16" 1-18"		5	779	845	945	880	720	319	4493	2000
FREEMONT IRRIGATION ASSOCIATION	50.9L	1-14"			183	352	349	261	186	34	1365	500
JOE FREITAS	51.0L	1-8"						9	5		14	32
ATTILIO CASSERINI	51.2L	1-8"					5				5	5
EXCELSIOR RANCH — TOM PAINE SLOUGH — MILE 54.3	52.4L	1-10"	10	11	65	63	84	75	49	35	392	(5) 120
TOTALS			10	30	11027	13473	12973	10171	6933	2082	56699	28307

* DISTANCE ALONG RIVER FROM ITS MOUTH FOUR AND ONE-HALF MILES BELOW ANTIOCH. MILEAGE AS ESTABLISHED BY WAR DEPARTMENT SURVEY OF 1913-15.

** ALL GENERAL CROPS. NO RICE.

(1) TO JUNCTION OF OLD RIVER AND INDIAN SLOUGH. PUMPING PLANT IS LOCATED TWO AND ONE-HALF MILES WEST ALONG INDIAN SLOUGH.

(2) TO JUNCTION OF OLD RIVER AND ITALIAN SLOUGH. PUMPING PLANT IS LOCATED TWO AND THREE-FOURTHS MILES SOUTHWEST ALONG ITALIAN SLOUGH AND EXTENSION CUT.

(3) PLANT IS ON CUT WHICH JOINS RIVER AT MILE 44.6 LEFT.

(4) TO JUNCTION OF OLD RIVER WITH INTAKE CUT. PUMPING PLANT IS LOCATED ONE MILE SOUTH ALONG INTAKE CUT.

(5) INCLUDES 50 ACRES ON STINSON ESTATE (SEE TOM PAINE SLOUGH MILE 0.7 S).

TABLE 39

DELTA UPLANDS DIVERSIONS FROM TOM PAINE SLOUGH

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
STINSON ESTATE COMPANY	0.7 S	2-18"			170	258	250	236	142	111	1167	(1) 907
STINSON ESTATE COMPANY	1.2 S	1-18"			83	25	49	50	20		227	(2)
HOLLY WESTERN SUGAR COMPANY	(3) 2.1 S	1-12"					26	159	154	159	(4) 498	INDUSTRIAL
TRACY CLOVER IRRIGATION DISTRICT	(3) 2.1 S	1-16"			142	207	207	264	200		1020	535
FARMERS DEVELOPED LANDS COMPANY												
PLANT NUMBER 1	2.9 S	1-12"			86	137	55	122	16	31	447	(5) 1784
PLANT NUMBER 3	6.3 S	1-24"			953	974	970	779	529	195	4400	(6)
PLANT NUMBER 5	8.3 S	1-12"			69	187	96	116	115	15	598	(6)
PLANT NUMBER 5A	9.0 S	1-12"			90	129	144	100	65	45	573	(6)
TOTAL			0	0	1593	1917	1797	1826	1241	556	8930	3226

* DISTANCE ALONG TOM PAINE SLOUGH FROM ITS MOUTH WHICH IS AT MILE 54.3 ON OLD SAN JOAQUIN RIVER (WAR DEPARTMENT SURVEY OF 1913-15.)

** ALL GENERAL CROPS. NO RICE.

(1) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 1.2 S. FIGURE INCLUDES 407 ACRES ON ADJOINING LANDS. AN ADDITIONAL 50 ACRES SERVED FROM EXCELSIOR RANCH (OLD SAN JOAQUIN RIVER, MILE 52.4 L).

(2) SEE ACREAGE NOTE FOR PLANT AT MILE 0.7 S.

(3) TO JUNCTION OF TOM PAINE SLOUGH AND DREDGER CUT. PUMPING PLANT IS LOCATED 1½ MILES SOUTH ALONG DREDGER CUT.

(4) THIS DIVERSION USED IN SUGAR FACTORY FOR WASHING AND COOLING PURPOSES AND IS THEN RETURNED TO TOM PAINE SLOUGH.

(5) THIS IS THE TOTAL UPLANDS AREA (SOUTH OF TOM PAINE SLOUGH) IRRIGATED FROM ALL FARMERS DEVELOPED LANDS COMPANY PLANTS ON TOM PAINE SLOUGH.

(6) SEE PLANT AT MILE 2.9 S.

TABLE 40

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
— GARWOOD BRIDGE — MILE 45.3												
PAUL WESTON	46.3 R	1-12"				9	75	136	4		224	222
AUGUST EISELE	47.2 R	1-5"					3	2			5	5
WOLFINGER BROTHERS	47.3 R	1-10"					9	9	5		23	15
JOHN HAACK	47.7 R				PLANT		REMOVED					
JOHN HAACK	48.0 R	1-12"			15	68	39	57	40	9	228	68
H. G. LEARNED	48.3 R	1-4"			7	7	12	9	11	3	49	16
H. G. LEARNED (YOSHIDA)	48.5 R	1-3½"			5	6	3	4	9	5	32	17
JOE CALCAGNO	48.5 R	1-6"		1	30	23	70	55	32	15	226	(1) 65
F. PICCARDO, J. VIGLIANI AND A. CALCAGNO	48.6 R	1-6"		2	13	27	15	28	20	2	107	(2) 75
G. B. FIGARI (J. CALCAGNO)	48.7 R	1-5"			5	16	9	19	3		52	50
M. O. COUPER	49.0 R				PLANT		REMOVED					
METTLER, CROSS AND DRURY (S. B. CHAPMAN)	49.5 R	1-14"			36	27	41	31	19	30	184	50
A. A. RODGERS	50.1 R	1-10"					48	15	31		94	35
— BRANDT BRIDGE — MILE 50.2												
BRANDT BROTHERS	50.4 R	1-6"	1	5	7	1	4	8	3	2	31	(3) 110
FRANK REICHMUTH	50.4 R	1-8"			14	68	49	54	38		223	95
BRANDT BROTHERS	50.8 R	1-6" 1-7" 1-10"	4	13	26	21	21	33	19	7	144	(4)
CALIFORNIA LANDS INCORPORATED	53.2 R	1-12"				24	30	23	24	24	125	20
F. DE LIMA	53.4 R	1-8"			6	12	15	17	14	1	65	32
M. DOS REIS	53.7 R	1-12"			127	218	173	188	102	18	826	(5) 270
— JUNCTION WITH MIDDLE RIVER — MILE 56.2												
OAKWOOD STOCK FARM	57.0 R	1-14"			150	230	191	172	75		818	(6) 263

* DISTANCE ALONG SAN JOAQUIN RIVER FROM ITS MOUTH FOUR AND ONE-HALF MILES BELOW ANTIOCH. (MILEAGE AS ESTABLISHED BY WAR DEPARTMENT SURVEY OF 1913-15).

** ALL GENERAL CROPS. NO RICE.

(1) INCLUDES 20 ACRES ON ADJOINING SCHMELLING PROPERTY.

(2) PICCARDO 25; VIGLIANI 30; AND CALCAGNO 20.

(3) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 50.8 R.

(4) SEE ACREAGE NOTE FOR BRANDT BROTHERS PLANT AT MILE 50.4 R.

(5) INCLUDES 70 ACRES ON ADJOINING R. BEKINS PROPERTY.

(6) OLIVERIA 200; SILVEIRIA 63.

TABLE 40 (CONTINUED)

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
JAMES TOBIN	57.15R	1-7"			NO	DIVERSION						
T. J. DUTNALL	57.3 R	1-3"				1	1	1			3	5
A. J. THOMSEN	57.3 R	1-5"			NO	DIVERSION						
P. CALORI	57.4 R				PLANT	REMOVED						
G. GARDELLA COMPANY	57.5 R	1-4"		2	7	9	12	4	3	1	38	12
V. SANGUENETTI	58.4 R	1-2½"			NO	DIVERSION						
G. B. FIGARI (G. ALFIERI)	58.6 R	1-3"			1	2	1	1			5	1
R. MAURO	58.7 R	1-4"				1		1			2	4
— MOSSDALE BRIDGE — MILE 58.9 —	RECORDING GAGE											
C. C. ABERSOLD	59.25R	1-6"		8	27	25	21	19	14	13	127	40
H. A. NIESTRATH (JOSEPH EGGER)	59.3 R	1-14"			86	119	106	99	72	25	507	80
H. A. NIESTRATH	(1) 60.1 R	1-6"			9	16	21	24	11		81	40
— JUNCTION WITH PARADISE CUT — PARADISE DAM — MILE 62.2												
BANTA CARBONA IRRIGATION DISTRICT	67.5 L	1-36"										
		3-24"		1518	5607	7706	8985	5933	2794	1515	34058	12803
		2-20"									(2)	(3)
MC MULLIN RECLAMATION DISTRICT 2075	71.0 R	1-16"	7	142	460	161	394	707	149	43	2063	1915
MORTENSEN-ANDERSON AND WHITMAN	73.2 R	1-12"			152	153		130	140		575	(4)245
J. LAWRENCE	75.0 R	1-4"			NO	DIVERSION						
J. W. CANNON	75.2 R	1-4"			NO	DIVERSION						
A. A. H. BECK	75.25R	1-5"							1		1	6
R. R. SWANK	75.35R	1-4"			NO	DIVERSION						
R. N. JANSEN	75.45R	1-6"								1	1	2
RALPH MARTIN (SIMPSON)	75.7 R	1-7"			NO	DIVERSION						
RALPH MARTIN (LOE WAN)	76.2 R	1-6"					5	6	4		15	10
— U. S. G. S. GAGING STATION — "SAN JOAQUIN RIVER NEAR VERNALIS" MILE 76.7												
TOTALS			12	1691	6790	8950	10353	7785	3637	1714	40932	16571

* DISTANCE ALONG SAN JOAQUIN RIVER FROM ITS MOUTH FOUR AND ONE-HALF MILES BELOW ANTIOCH. (MILEAGE AS ESTABLISHED BY WAR DEPARTMENT SURVEY OF 1913-15.)

** ALL GNERAL CROPS. NO RICE.

(1) UP WALTHALL SLOUGH .2 MILE AND OPPOSITE THIS MILEAGE ON RIVER.

(2) ADDITIONAL DIVERSIONS: ACRE-FEET, NOVEMBER 183; DECEMBER 715.

(3) INSIDE DISTRICT 11,503 ACRES, OUTSIDE DISTRICT, APPROXIMATELY 1300 ACRES.

(4) MORTENSEN 155; ANDERSON 40; WHITMAN 50.

TABLE 41

SAN JOAQUIN RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
— U.S.G.S. GAGING STATION "SAN JOAQUIN RIVER NEAR VERNALIS" — MILE 0.0													
RIVER JUNCTION FARMS COMPANY No. 2	2.4 R	1-14"			NO	DIVERSION							
— STANISLAUS RIVER — MILE 3.0													
W. C. BLEWETT	5.25L	3-12"		101	225	275	304	273	126	71	1375	1800	
EL SOLYO RANCH	5.35L	3-18"											
		1-12"	104	446	1806	1808	2424	2741	1879	1315	12523	2655	
— TUOLUMNE RIVER — MILE 14.3													
WEST STANISLAUS IRRIGATION DISTRICT	15.1 L	3-26"	474	617	5093	7776	12800	10967	4166	2765	(1)44658	15705	
WHITE LAKE RANCH No. 1	(2)15.1 L	1-6"			NO	DIVERSION							
WHITE LAKE RANCH No. 2	(2)15.1 L	1-8"			NO	DIVERSION							
WHITE LAKE RANCH No. 3	(2)15.1 L	1-8"			NO	DIVERSION							
— LAIRD SLOUGH BRIDGE — GAGING STATION "SAN JOAQUIN RIVER NEAR GRAYSON" — MILE 19.35													
RANCHO EL PESCADERO (C. L. JONES)	22.2 L	1-16"				147	223	151	132	48	701	350	
PATTERSON WATER COMPANY	27.7 L	4-26"											
		1-18"			6092	7369	6541	6852	5905	618	33377	14250	
		1-14"											
WISNOM AND ROSS (C. C. JONES)	27.8 R	1-16"				34	24	17			75	80	
MORTGAGE GUARANTEE COMPANY	29.8 R	1-10"				5	17				22	210	
PATTERSON RANCH COMPANY	33.1 L	2-16"											
		1-8"	17	52	562	672	855	1066	756	380	4360	1565	155
E. USTICK	35.85R	1-12"			238	210	224	224	196		1092	300	
— CROWS LANDING BRIDGE — MILE 36.7													
JAMES J. JOHNSON	36.8 R	1-10"			NO	DIVERSION							
A. J. SILVIERA	37.15R	1-6"		6		13	12	19	4	3	(3)(4)57	(3)(4)30	
A. J. SILVIERA	37.65R	1-7"											
KING RANCH	38.25R	1-10"			NO	DIVERSION							
L. B. AND E. M. CROW (M.S.CATRINA)	39.35L	(5) 1-12"		6	140	126	140	148	53	11	624	290	
OSCAR HOGAN	39.75R	1-12"				67	83	83	67		300	85	
— U.S.G.S. GAGING STATION "SAN JOAQUIN RIVER NEAR NEWMAN" — MILE 47.0													
— MERCED RIVER — MILE 47.05													
J. J. STEVINSON CORPORATION	52.7 R	1-10"			NO	DIVERSION							
— FREMONT BRIDGE — MILE 52.8													
— DELTA BRIDGE — GAGING STATION — MILE 82.0													
TOTALS			595	1228	14156	18502	23647	22541	13284	5211	99164	37320	155

* MILEAGE ALONG RIVER ABOVE DURHAM FERRY BRIDGE (U.S.G.S. GAGING STATION "SAN JOAQUIN RIVER NEAR VERNALIS").

(1) THERE WERE ADDITIONAL DIVERSIONS AS FOLLOWS (ACRE-FEET) NOVEMBER 215 AND DECEMBER 216.

(2) PUMP ON CUT LEADING TO WEST STANISLAUS IRRIGATION DISTRICT PLANT.

(3) THIS IS THE COMBINED DIVERSION AND ACREAGE FIGURES FOR THIS PLANT AND THE ONE AT MILE 37.65 R.

(4) SEE DIVERSION AND ACREAGE NOTES FOR PLANT AT MILE 37.15 R.

(5) FORMERLY LISTED AS 6" UNIT.

TABLE 42

MERCED RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
— GAGING STATION — "MERCED RIVER NEAR MOUTH" — MILE 1.1												
STEVINSON WATER DISTRICT	3.8 R	1-15"				225	289	217	212	90	1033	495
FLOYD STEVINSON	4.0 L	1-8"			NO	DIVERSION						
H. DE ANGELES	5.8 L	1-10"		2	34	74	67	51	42	16	286	85
J. F. PECK	6.1 L	1-18"				90	110	90			290	70
STEVINSON WATER DISTRICT	6.25 L	1-6"			NO	DIVERSION						
STEVINSON WATER DISTRICT	6.55 L	1-15"			NO	DIVERSION						
FRANCIS HARTMAN	8.5 L	1-12"		1	60	64	28	28			181	100
MARY COLLIER	8.85 L	1-15"			20	15		17	22	13	87	75
GRACE MCCULLAGH	9.4 L	1-10"		63	185	288	273	214	163	52	1238	190
R. W. ADAMS AND J. B. SILVA	10.35 L	1-10"			419	492	379	275	230	96	1891	400
		1-8"										
W. D. ADAMS	10.85 L	1-12"			236	370	334	287	290	156	1673	403
C. G. MC LAUGHLIN	11.4 L	1-8"			NO	DIVERSION						
C. G. MC LAUGHLIN(1)	11.55 L	1-4"					3	2			5	6
H. F. MILLIKEN ESTATE	11.6 L	1-10"				19	31	21	8		79	50
J. REGELLO	11.6 L	1-12"			67	113	102	100	76	34	492	90
— NEW MILLIKEN BRIDGE — MILE 11.65												
BETTENCOURT, NEVES AND AZEVEDO	12.85 L	1-10"			100	221	255	249	205	64	1094	(2) 255
CALIFORNIA LANDS, INCORPORATED	16.5 L	1-12"			88	81	71	59	19		318	75
MERCED RIVER FARM COMPANY	17.05 L	1-6"		4	4	4	4	4	4	1	25	18
— U.S.G.S GAGING STATION "MERCED RIVER NEAR LIVINGSTON" — MILE 17.1												
R. G. AND G. L. WOODWARD	17.3 L	1-6"			NO	DIVERSION						
R. G. AND G. L. WOODWARD	17.65 L	1-3"						1			1	3
FRED GRIFFITH	17.7 L	1-5"							4	4	8	4
C. P. HOCKETT AND F. SIMPKINS	18.7 L	1-6"					7	20	17	8	52	(3) 28
J. A. MC DONOUGH	19.3 L	1-6"					4	2	4		10	10
JOHN REININGHAUS	20.4 L	1-6"			21	24	26	22	9		102	50
—SOUTHERN PACIFIC RAILROAD (MAIN LINE) — MILE 21.05												
SUNBEAM FARM COMPANY (4)	21.1 R	1-6"			7	17	7	12	34	13	90	18

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) NEW INSTALLATION 1935.
(2) BETTENCOURT 155; NEVES AND AZEVEDO 100.
(3) SIMPKINS AND SHIELDS 24; HOCKETT 4.
(4) FORMERLY WILLIAM COLLIER (CABRALL AND COMPANY).

TABLE 42 (CONTINUED)

MERCED RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
WILLIAM COLLIER (O. W. HARRISON)	22.2 R	(1) 1-6" 1-12"			131	168	197	144	54	15	709	188
WILLIAM COLLIER	23.3 R	1-6"			58	82	82	86	58		366	42
M. MC CONNELL	23.4 L	1-5"			NO	DIVERSION						
C. J. MC CONNELL (VEIERA AND SANTOS)	24.2 L	1-5"				2	3	2	3	3	13	10
CALIFORNIA LANDS INCORPORATED (GONDALVOS)	24.3 R	1-4"			5						5	30
C. J. MCCONNELL (VEIERA AND SANTOS)	24.5 L	1-6"				3		3	3	3	12	9
CALIFORNIA LANDS INCORPORATED (GONDALVOS)	24.6 R	1-6"			13						13	35
RIVER FARMS ASSOCIATION	26.3 R	1-8"			13	82	95	53	19	27	289	71
C. A. LAUGHLIN	26.55 R	1-4"			NO	DIVERSION						
— SANTA FE RAILROAD CROSSING — MILE 27.05 —												
W. C. MAGNESON (MAGZELI)	27.6 R	1-10"			27	26		7	8	6	74	5
CALIFORNIA LANDS, INCORPORATED (NISHIHARA)	27.8 R	1-4"			2		6		11	1	20	25
Y. TANABE (KUBE)	28.1 R	1-6"					20	34	8	9	71	20
G. H. LOVELY (KUBE)	28.4 R	1-4"					4	11	6	6	27	20
J. CAMPADONGIA	28.6 R	1-6"			NO	DIVERSION						
R. K. KYNASTON	28.6 R	1-8"			14	26	30	39	29	10	148	85
C. L. MEHRTON	29.1 R	1-7"			7	19	20	14	5		65	50
TONY DEMCHILLI (BETTENCOURT)	29.75 R	1-6"				21	15	20	17		73	40
AMERICAN NATIONAL TRUST CO. (BONDAD)	29.9 R	1-6"			NO	DIVERSION						
CALIFORNIA LANDS, INC. (MAITOZA)	30.2 L	1-6"			1	4	18	16			39	20
AMERICAN NATIONAL TRUST COMPANY	30.95 R	(2) 1-12"			NO	DIVERSION						
CALIFORNIA LANDS, INC. (MAITOZA)	31.1 L	1-8"			NO	DIVERSION						
— SOUTHERN PACIFIC RAILROAD — OAKDALE BRANCH — MILE 32.52												
L. RUSCONI (3)	32.9 R	1-6"						19	6		25	45
L. RUSCONI	33.55 R	1-7"			73	70	198	237	2	1	581	125
C. P. STOUT (W. WESTFALL)	39.2 L	1-24"			27	84	86	116	39	4	356	60
— GAGING STATION — "MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING" — MILE 42.1 —												
TOTALS			0	70	1612	2684	2764	2472	1607	632	11841	3305

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) UNIT ADDED IN 1935.
(2) 5" UNIT DISMANTLED.
(3) NEW INSTALLATION 1935.

TABLE 43

TUOLUMNE RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
JOHN CALDWELL	1.8 R	1-10"			NO	DI	VERSION					
J. M. DE SOUZA	2.2 R	1-6"	7		5		10	13	21	14	70	50
E. B. HENRY	3.1 R	1-12"					47	47	27		121	20
— GAGING STATION - "TUOLUMNE RIVER AT TUOLUMNE CITY" - MILE 3.35												
BANCROFT FRUIT FARM	4.1 R	1-10"		26	90	70	49	40	39	44	358	110
BANCROFT FRUIT FARM	5.0 R	1-10"		21	67	87	82	84	51	44	436	150
RANDOLPH MARKETING COMPANY	7.1 R	1-10"			73	104	73	53	33		336	200
R. S. BROWN	7.8 L	1-10"			NO	DI	VERSION					
W. F. DUFFY (1)	7.9 R	1-8" 1-4"			5	10	9	7	1		32	25
W. F. DUFFY	8.4 R	1-10"			60	94	95	72	52	17	390	100
A. HOLMES (KISSAMOS & PAVLAKIAS) (2)	10.2 R	1-11"			18	40	53	41	22		174	50
— SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 15.8												
— SANTA FE RAILROAD — MILE 21.6												
— SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) — MILE 31.5												
— GAGING STATION "TUOLUMNE RIVER AT HICKMAN BRIDGE" — MILE 31.7												
GEORGE H. SAWYER	39.8 L	1-6"			8	17	20	18	11	1	75	65
— GAGING STATION "TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE" — MILE 39.9												
TOTALS			7	47	326	422	438	375	257	120	1992	770

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) NEW INSTALLATION 1935.
(2) FORMERLY LISTED AS A. HOLM.

TABLE 44

STANISLAUS RIVER DIVERSIONS

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
FRANK COKER	1.1 R	1-6"						4	3		7	8
H. SALYER	1.6 R	1-7"							2		2	7
A. B. KENNEDY	2.9 R	1-8"			NO	DIVERSION						
HATMARK RANCH	5.25 L	2-14"		37	66	62	118	131	76	30	520	50
— GAGING STATION "STANISLAUS RIVER AT HATMARK RANCH" — MILE 5.3												
BRET HARTE WATER USERS ASSOCIATION	5.9 R	1-20"		74	608	535	586	583	328	152	2866	900
MC MULLIN RECLAMATION DISTRICT 2075	5.9 R	2-16"			356	796	848	714	09		2803	597
HENRY PELUCCA	6.7 L	1-15"			28	35	26	39	7	7	142	48
J. W. UPDIKE	7.4 L	1-8"						15			15	40
S. M. UPDIKE	8.2 L	1-12"				26	32	19	26		103	40
D. F. KOETITZ	10.1 L	(1) 1-10"		139	59	125	108	124	132	85	772	225
D. F. KOETITZ	10.4 L	1-18"			NO	DIVERSION						
— SOUTHERN PACIFIC RAILROAD (MAIN LINE) — MILE 15.9												
AMERICAN TRUST COMPANY	18.5 R	1-12"			60	60	60	60	60	20	320	60
G. R. STODDARD	19.9 L	1-7"							5	4	9	10
PALO ALTO COMPANY	20.75 R	1-14"			NO	DIVERSION						
HEATH RANCH	20.9 L	1-4"				14	26	31	23	6	100	16
EARL FRUIT COMPANY	21.75 R	1-8"				49	51	25	8		133	75
— MODESTO-ESCALON BRIDGE — MILE 28.15												
— SANTA FE RAILROAD — MILE 31.05												
— SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) — MILE 39.0												
— GAGING STATION "STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE" — MILE 44.7												
TOTALS			0	250	1177	1702	1855	1745	759	304	7792	2076

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) ONE 10" UNIT HAS BEEN REMOVED.

CHAPTER IV

MEASUREMENTS OF RETURN WATER

Sacramento Return Waters

In the Sacramento Valley the flow of all well defined channels carrying irrigation waters returned to the Sacramento River is measured and recorded. Table 46 lists these channels in downstream order and gives the total flow as computed from the measurements.

Between Colusa and Red Bluff there are no large well defined return channels. Records or estimates of all natural inflow from streams in this stretch of the river were, however, obtained. Above Red Bluff, from a point below Cottonwood to Redding, there is a return from the irrigation of the Anderson-Cottonwood Irrigation District.

Return Flow from other than Sacramento River Sources

In the water returned to the Sacramento River as included in Table 46, it should be noted that practically all of that entering the river through Butte Slough is derived from Feather River diversions through the Western and Sutter Butte canals. Of the discharge entering through Sacramento Slough, that portion flowing down the East Borrow Pit of Sutter By-Pass, is, also, practically all of Feather River origin.

Relation of Sacramento Return Water to Irrigation Draft

Tables 47 and 48, inclusive, record the Sacramento River return water, July to September, inclusive, 1935, and indicate the relation between the return and the diversions from which it was derived. Since, in Tables 47 and 48, it is the purpose to show the return water from Sacramento River diversions only, the inflow from Butte Slough, East Borrow Pit of Sutter By-Pass,

Back Borrow Pit of Reclamation District 1000 and from the Feather and American Rivers has been excluded. In Table 47 is shown the relation to the diversions of that return water only which was measured at the well defined channels. With the records available for the discharge of the Sacramento River at Red Bluff, Butte City, Colusa, Wilkins Slough, Knights Landing, and Verona and all diversions between these points recorded, as well as the Feather River and other well defined inflows, it is possible to compute what should represent the total water returned to the river between each of these points, including not only the flow in the definite channels which were measured, but all seepage, groundwater return, etc., which could not be directly measured. The figures for the return water computed in this manner and the relation of this return to the draft is shown in Table 48. It should be noted, however, that the return shown for the Verona-Sacramento section is only that contributed by the measured drains since, as explained in Chapter II, the total return in this section including all accretions is not susceptible of computation in the manner outlined because of the fact that no record of flow actually measured at Sacramento is available.

The data in Tables 47 and 48 show that seepage, groundwater return, etc., (for the period July-September, Inclusive) which could not be directly measured, amounted to 32 per cent of the irrigation draft, the direct return in definite channels, 30 per cent, and the total return 62 per cent.

A comparison of the accumulated return water and the accumulated irrigation draft, in downstream order, Red Bluff to Sacramento, for the period July to September, inclusive, 1935, is shown on Plate 1. This shows also for the same period, the average discharge, inflow and draft at all points in this stretch of the river. The return water line is plotted from the data of Table 48.

Draft-Return Water Relation for Particular Sacramento Valley Areas

In the Sacramento Valley there are certain units or districts which are set apart physically by levees or otherwise, so that the direct return water in each district may be readily segregated when the records of all diversions to and discharges from the unit are available. Included in such units are, the area above the Colusa-Williams Highway Crossing of Colusa Trough, Reclamation District 108, and Reclamation District 1500. The relation between draft and return water for the Colusa Trough area is shown in Table 49 and for Reclamation Districts 108 and 1500, in Tables 50 and 51.

Tables 54 to 68, inclusive, present in detail the discharge records for the Sacramento Valley return water channels.

San Joaquin Return Waters

In the 1935 San Joaquin Valley return water measurements, the gaging stations were located at the same points as in previous years beginning with 1928, and the same methods were followed. A continuous record of the discharge during the season was obtained at an upper and lower station on each stream: San Joaquin, Stanislaus, Tuolumne and Merced Rivers. On the Tuolumne and San Joaquin Rivers, continuous records of discharge were also obtained at intermediate stations; one on the Tuolumne River at Hickman Bridge and two on the San Joaquin River, one near Grayson (Laird Slough) and the other just below the junction with Merced River. The latter is the station maintained by the U. S. Geological Survey and referred to as "San Joaquin River near Newman." (See Table 16). Maintenance of these stations is usually started in April or early May. However, in June of 1935 high water from natural flow had the effect of vitiating return water determinations from the measurements for that month so that the 1935 figures are only given beginning with July. Measurements and

records of all pumping diversions between stations on each stream were obtained, thereby completing the necessary data for the computations of the return water. The records for the gaging stations are given in Chapter II, Tables 14 to 26, inclusive, and the diversion records for the San Joaquin streams above Durham Ferry Bridge, are given in Chapter III, Tables 41 to 44, inclusive.

Table 52 gives the results of the San Joaquin return water measurements and Table 53 shows a comparison of the return water with the irrigation draft in the San Joaquin Valley. Plate 2 depicts the accumulated return water on the San Joaquin River in downstream order, Delta Bridge to Vernalis gaging station, for the period August to October, inclusive, 1935, and shows also for this period, the average discharge, inflow and draft at all points in this stretch of the river.

Comparative Sacramento and San Joaquin Return Water, 1924 to 1935

Comparative figures, 1924 to 1935, for the Sacramento and San Joaquin seasonal return water in per cent of the irrigation draft are shown in Table 45. Figures for the seasonal stream flow in per cent of the 40-year mean 1889-1929, of the Sacramento River at Red Bluff and the San Joaquin River and its three main tributaries above the Vernalis gaging station are given also in order to show what relation, if any, there may have been between the variation from year to year in the run-off and the variation in the return water percentages. With respect to the Sacramento River data, there appears to be a fairly close relationship between the seasonal run-off at Red Bluff and the return flow percentages. The higher return flow percentages occurred in the years of good run-off and the decrease in percentage in the years when the run-off was greatly below normal is quite marked. This is undoubtedly a reflection of the conservation and waste prevention measures effected in the

seasons of low water supply. In these seasons, the spill from the rice fields and all controllable wastes were practically eliminated in order that the river diversions might be reduced accordingly. The latter, then, approached more nearly the actual consumptive requirements of the crops so that the return flow percentage was considerably smaller. In the seasons of less critical water supply and correspondingly less urgent demand for conservation, the greater facility in irrigation operations obtained by larger diversions and correspondingly greater wastes and spill, may offer an explanation of the larger return water percentages in these seasons. In the years of more normal stream flow there probably occurs also, a greater accretion from groundwater storage, etc., and in this event the additional return from this source should not, strictly speaking, be included in the percentage figures since this would not be a return derived from the irrigation draft.

In the case of the San Joaquin return water data there appears to be no such definite relation between the seasonal flow of the San Joaquin River and its tributaries in per cent of normal and the return water percentages. This may be due to the regulation which occurs in Lake McClure on the Merced River, Don Pedro Reservoir on the Tuolumne River and Melones Reservoir on the Stanislaus River. It is to be noted that in some years the period used in the comparison of return flow and diversions makes considerable difference in the percentage figures, and further, that for the period August-September only, the percentage is nearly always greater than when the July-September period is used. Under the suspicion that there may be a considerable lag between the diversions and corresponding return flow, the figures in the last column of Table 45 were compiled to show the August-September return flow in per cent of the July-August diversions. These percentages still seem to bear no definite relation to the seasonal run-off percentages but their

variation from year to year is somewhat reduced and a more or less constant percentage of return flow is indicated.

The average percentage of diversions occurring as return water in the San Joaquin River is shown to be considerably smaller than that for the Sacramento River. This difference may probably be attributed to the fact that, whereas, due to basin topography, practically all drainage from Sacramento River diversions is quickly returned to the river, in the San Joaquin Valley, much of the drainage from the major foothill diversions may pass to the underground water and from there, in the lower areas of many of the irrigation districts, be recovered by drainage pumps for re-use in the irrigation canals. Considerable of the San Joaquin return, therefore, may never reach the river to be accounted for in the return water measurements.

TABLE 45

SACRAMENTO AND SAN JOAQUIN RETURN WATER PERCENTAGES, 1924-1935

Year	Sacramento: Seasonal Run-off at Red Bluff in per cent of Normal *	Sacramento: Return Water in per cent of Diversions: Jun.-Sep. Inc.	Sacramento: Return Water in per cent of Diversions: Jul.-Sep. Inc.	San Joaquin River: Seasonal Run-off in per cent of Normal S.J.River & Tribs. **	San Joaquin River: Return Water in per cent of Diversions: Jun. Sep. Inc.	San Joaquin River: Return Water in per cent of Diversions: Jul. Sep. Inc.	San Joaquin River: Return Water in per cent of Diversions: Aug. Sep. Inc.	San Joaquin River: Return Water in per cent of Diversions: Jul. Oct. Inc.	San Joaquin River: Return Water in per cent of Diversions: Aug. Oct. Inc.	San Joaquin River: Aug.-Sep Return in per cent of Jul.-Aug Diversions
1924	36	33	33	24		35	41			29
1925	86		(1)55	86			38			23
1926	61	49	45	55		28	32			22
1927	117	66	59	100			32			23
1928	82	49	46	67		28	28			23
1929	47	42	39	44		19	21			16
1930	65	55	47	50	20	21	22			17
1931	36	(2)33	32	26	(3)23	27	40			18
1932	54	56	47	101			26		29	21
1933	49	56	48	52		22	20	25	25	17
1934	48	45	41	35	(4)20	21	28	(5) 25	33	16
1935	80		62	98		30	24	34	31	19

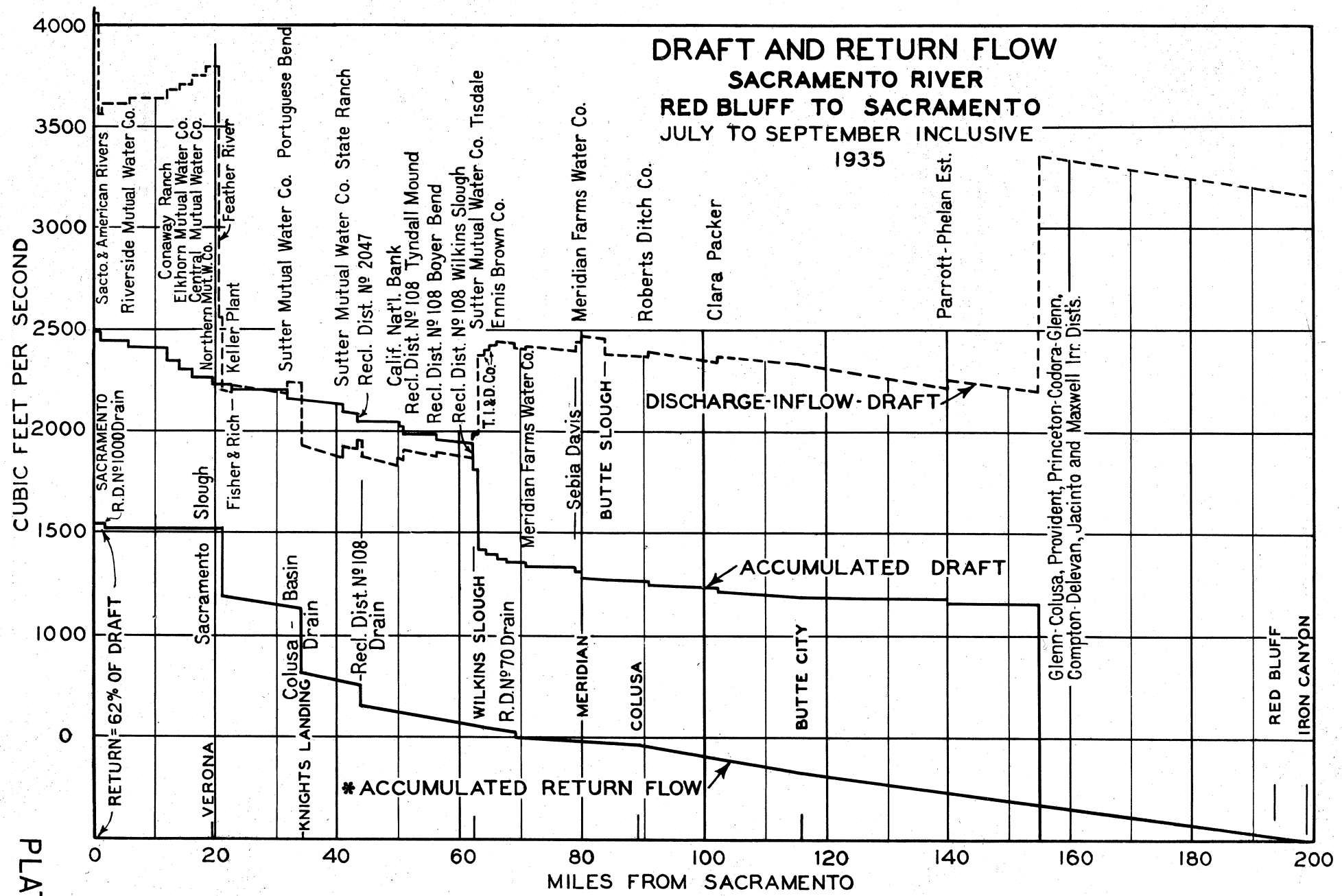
* 40-year mean (1889-1929) of natural run-off.
** 40-year mean (1889-1929) of natural run-off at foothill stations of San Joaquin, Merced, Tuolumne and Stanislaus Rivers.
(1) July-October, inclusive, 59.
(2) May-September, inclusive, 34.
(3) May-September, inclusive, 19.
(4) May-September, inclusive, 20.
(5) June-October, inclusive, 23; May-October, inclusive, 21.

TABLE 46

WATER DISCHARGED TO SACRAMENTO RIVER ABOVE SACRAMENTO AS MEASURED AT DEFINITE RETURN CHANNELS

RETURN	Table Number	July		August		September		October		July - Oct. Incl.	
		Acre-feet	cfs.	Acre-feet	cfs.	Acre-feet	cfs.	Acre-feet	cfs.	Acre-feet	cfs.
Butte Slough (1)	55	4980	81	2760	45	7480	126	14200	231	29420	121
Reclamation District 70 Drain	56	779	13	1110	18	1740	29	294	5	3920	16
Reclamation District 108 Drain	57	4310	70	4050	66	7730	130	1390	23	17480	72
Colusa Basin Drainage (2)	59	15100	246	19200	312	20800	350	7020	114	62120	254
Sacramento Slough (3)	60	21600	351	22300	363	22900	384	11200	183	78000	320
Reclamation District 1000 Drain	67	0		0		2010	34	1010	16	3020	12
Back Borrow Pit Reclamation District 1000	68	0		0		0		0		0	
Totals		46770	761	49420	804	62660	1050	35110	571	193960	795

(1) This flow is practically all from lands irrigated by Feather River diversions.
(2) A portion of the water which would ordinarily be returned to the Sacramento River at this point is diverted to the Knights Landing Ridge Cut. See Table 65.
(3) This is the combined daily flow as given in Tables 61 and 64 and includes some return water from Feather River diversions. See Table 62.



* In order to show return water from Sacramento River Irrigation only, the discharge to the Sacramento River of the Feather and American Rivers has been excluded as well as that from Butte Slough, the Feather River portion of Sacramento Slough and the inflow of Mill, Antelope, Deer and other creeks between Red Bluff and Butte City.

PLATE I

TABLE 47

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JULY TO SEPTEMBER
(USING ONLY RETURN WATER WHICH ENTERED THROUGH DEFINITE RETURN CHANNELS*)

	July		August		September		July to September Inclusive	
	Acre-feet	Aver. c.f.s	Acre-feet	Aver. c.f.s	Acre-feet	Aver. c.f.s	Acre-feet	Aver. c.f.s
RETURN								
Reclamation District 70 Drain	799	13	1110	18	1740	29	3650	20
Reclamation District 108 Drain	4310	70	4050	66	7730	130	16090	88
Colusa Basin Drainage at Knights Landing**	16420	267	19200	312	20800	350	56420	309
Sacramento Slough (less flow from East Borrow Pit Sutter By-Pass)	19500	317	20390	332	20170	338	60060	329
Reclamation District 1000 Drain (2nd Bannon Slough)	0	0	0	0	2010	34	2010	11
Total Return	41030	667	44750	728	52450	881	138230	757
Total Diversions-Red Bluff to Sacramento	185396	3015	176240	2866	94334	1585	455970	2498
Return in per cent of Diversions	22		25		55		30	

NOTE: In order to show return water from Sacramento River irrigation only, the discharge to the river of Butte Slough is excluded, as is also a portion of the return through Sacramento Slough derived from Feather River diversions and the return through the Back Borrow Pit of Reclamation District 1000.

* As distinguished from use of all accretions as indicated in Table 48.

** Includes flow diverted to Knights Landing Ridge Cut.

TABLE 48

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JULY TO SEPTEMBER
(INCLUDING ALL ACCRETIONS*)

River Section	July		August		September		Total Return Jul.-Sep. Inc.		Red Bluff to Lower end of Section: Return		Draft		Return in per cent of Draft
	Acre-feet	Aver. cfs.	Acre-feet	Aver. cfs.	Acre-feet	Aver. cfs.	Acre-feet	Aver. cfs.	Acre-feet	Aver. cfs.	Acre-feet	Aver. cfs.	
Red Bluff-Butte City	27900	454	20400	332	12700	213	61000	334	61000	334	218307	1196	28
Butte City-Colusa	14100	229	7380	120	1620	27	23100	127	84100	461	230638	1264	36
Colusa-Wilkins Slough	6570	107	3670	60	4210	71	14450	79	98550	540	355721	1949	28
Wilkins Slough-Knights Landing	32000	520	35800	582	40200	675	108000	592	206550	1132	394760	2163	52
Knights Landing-Verona	27300	444	21600	351	23900	402	72800	399	279350	1531	408220	2237	68
Verona to Sacramento**	0	0	0	0	2010	34	2010	11	281360	1542	455970	2499	62
Total Return	107870	1754	88850	1445	84640	1422	281360	1542					
Total Draft (Red Bluff to Sacramento	185396	3015	176240	2866	94334	1585	455970	2499					
Return in Per Cent of Draft	58		50		90		62						

* As the return water in this table between any two stations is computed as the difference in discharge between the upper and lower station, making due allowance for the intervening diversions, the results include both those accretions entering from definite return channels which have been measured and accretions due to seepage, groundwater return, etc., which cannot be directly measured.

** See discussion in text of Chapters II and IV.

NOTE: In the return water here shown, the discharge to the Sacramento River of the Feather and American rivers is excluded as is also the discharge of following return water channels, Butte Slough and that portion of the discharge of Sacramento Slough derived from Feather River waters. Also inflow from Mill, Antelope, and Deer and other creeks between Red Bluff and Butte City has been excluded.

TABLE 49

RELATION BETWEEN THE RETURN WATER IN COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY AND THE DIVERSIONS FROM WHICH THE RETURN WATER WAS DERIVED

	Mile and Bank	Jul.	Aug.	Sep.	July to Sept.		Acreage Irrigated	
		Acre-feet			Ac.Ft.	c.f.s.	General	Rice
DIVERSIONS								
- Sacramento River -								
Glenn-Colusa Irrigation District	154.8 R	57278	57924	31924	147126	806	16982	17356
Jacinto Irrigation District	154.8 R	3023	2761	1474	7258	40	5018	
Compton-Delevan Irrigation District	154.8 R	1188	1176	536	2900	16	50	500
Provident Irrigation District	154.8 R	9160	8196	4402	21758	119	300	4901
Princeton-Codora-Glenn Irrigation District	154.8 R	10025	10112	5943	26080	143	2512	1880
Maxwell Irrigation District	154.8 R	2152	2112	1930	6194	34		1100
California Lands, Inc.	154.8 R	221	20	0	241	1	322	
American Company	103.7 R	366	194	37	597	3	450	
Clara C. Packer	102.8 R	1138	1288	437	2863	16		380
R. C. Wohlfrom	101.1 R	183	0	0	183	1	133	
Cheney Slough Irrigation Company	99.0 R	51	109	0	160	1	364	
- Colusa Trough -	*							
Stevens Brothers	22.0 R	519	697	469	1685	9		320
A. D. J. Land Company	3.0 L	200	200	180	580	3		125
Total Diversions (Acre-feet		85504	84789	47332	217625		26131	26562
(c. f. s.		1391	1379	795		1192		
RETURN								
Colusa Trough at Colusa-Williams Highway		17500	20400	22400	60300	331		
Trough Diversions		719	897	649	2265	12		
Total Return (Acre-feet		18219	21297	23049	62565			
(c. f. s.		296	346	387		343		
Return in per cent of Diversions		21	25	49	29			

* Mileage above Colusa-Williams Highway.

TABLE 50

RELATION BETWEEN RETURN WATER AND DIVERSIONS
RECLAMATION DISTRICT 108

	Jul.	Aug.	Sep.	Jul. to Sep. Inclusive		Acreage Irrigated	
	Acre-feet			Acre-feet	Aver. c.f.s.	Gen'l	Rice
Diversions (1)	16756	17056	5363	39175	215	2994	8769
Return Water (2)	4310	4050	7730	16090	88		
Return in per cent of Diversions	26	24	144	41			

(1) The diversions comprise those from the Sacramento River, right bank, from Mile 43.1 to Mile 63.2.
(2) The return water is the discharge to the Sacramento River of Reclamation District 108 drain at Rough and Ready Bend (Table 57).

TABLE 51

RELATION BETWEEN RETURN WATER AND DIVERSIONS
RECLAMATION DISTRICT 1500

	Jul.	Aug.	Sep.	Jul. to Sep. Inclusive		Acreage Irrigated	
	Acre-feet			Acre-feet	Aver. c.f.s.	Gen'l	Rice
Diversions (1)	39861	36084	20068	96013	526	17496	8589
Return Water (2)	16300	16900	15600	48800	267		
Return in per cent of Diversions	41	47	78	51			

(1) The diversions comprise those from the Sacramento River, left bank, from Mile 29.9 to Mile 63.75. The principal ones are the Sutter Mutual Water Company's plants at Tisdale, State Ranch Bend, and Portuguese Bend.
(2) The return water is the discharge through the drainage plant of Reclamation District 1500 on the West Borrow Pit of the Sutter By-Pass. This water reaches the Sacramento River via Sacramento Slough. See Table 61.

TABLE 52

RETURN FLOW IN SAN JOAQUIN VALLEY STREAMS
(ACRE-FEET EXCEPT AS NOTED)

		AUG.	SEP.	OCT.	AUG-OCT INCL.
SAN JOAQUIN RIVER					
DISCHARGE AT DELTA BRIDGE		0	0	0	0
DISCHARGE NEAR NEWMAN	TABLE 16	22770	20510	31470	74750
INFLOW OF MERCED RIVER	TABLE 20	14500	14100	18100	46700
NET ACCRETION-DELTA BRIDGE TO NEWMAN		8270	6410	13370	28050
DIVERSIONS-DELTA BRIDGE TO NEWMAN	TABLE 41	0	0	0	0
NET RETURN FLOW-DELTA BRIDGE TO NEWMAN		8270	6410	13370	28050
NET RETURN FLOW-C.F.S.-DELTA BRIDGE TO NEWMAN		134	108	217	154
DISCHARGE AT GRAYSON (LAIRD SLOUGH)	TABLE 17	33800	27800	49300	110900
ACCRETION-NEWMAN TO GRAYSON		11030	7290	17830	36150
DIVERSIONS-NEWMAN TO GRAYSON	TABLE 41	8560	7113	1060	16733
RETURN FLOW-NEWMAN TO GRAYSON		19590	14400	18890	52880
RETURN FLOW-C.F.S.-NEWMAN TO GRAYSON		319	242	307	290
DISCHARGE NEAR VERNALIS	TABLE 18	61150	80330	125000	266480
INFLOW OF TUOLUMNE AND STANISLAUS RIVERS	TBLS. 24 & 26	39500	55700	71900	167100
NET ACCRETION-GRAYSON TO VERNALIS		-12150	-3170	+3800	-11520
DIVERSIONS-GRAYSON TO VERNALIS	TABLE 41	13981	6171	4151	24303
NET RETURN FLOW-GRAYSON TO VERNALIS		1830	3000	7950	12780
NET RETURN FLOW-C.F.S.-GRAYSON TO VERNALIS		30	50	129	70
NET RETURN FLOW-DELTA BRIDGE TO VERNALIS		29690	23810	40210	93710
NET RETURN FLOW-C.F.S.-DELTA BRIDGE TO VERNALIS		482	400	654	514
STANISLAUS RIVER					
DISCHARGE AT ORANGE BLOSSOM BRIDGE	TABLE 25	1720	1670	2630	6020
DISCHARGE AT HATMARK RANCH	TABLE 26	15800	14900	22200	52900
ACCRETION-ORANGE BLOSSOM TO HATMARK		14080	13230	19570	46880
DIVERSIONS-ORANGE BLOSSOM TO HATMARK	TABLE 44	1610	678	274	2562
RETURN FLOW-ORANGE BLOSSOM TO HATMARK		15690	13910	19840	49440
RETURN FLOW-C.F.S.-ORANGE BLOSSOM TO HATMARK		255	234	323	271
TUOLUMNE RIVER					
DISCHARGE AT ROBERTS FERRY BRIDGE	TABLE 22	2220	21500	36400	60120
DISCHARGE AT HICKMAN BRIDGE	TABLE 23	6710	26500	42600	75810
ACCRETION-ROBERTS FERRY TO HICKMAN		4490	5000	6200	15690
DIVERSIONS-ROBERTS FERRY TO HICKMAN	TABLE 43	18	11	1	30
RETURN FLOW-ROBERTS FERRY TO HICKMAN		4510	5010	6200	15720
RETURN FLOW-C.F.S.-ROBERTS FERRY TO HICKMAN		73	84	101	86
DISCHARGE AT TUOLUMNE CITY BRIDGE	TABLE 24	23500	40300	49300	113100
INFLOW OF DRY CREEK	TABLE 21	3600	4140	4520	12260
NET ACCRETION-HICKMAN TO TUOLUMNE CITY		13190	9660	2180	25030
DIVERSIONS-HICKMAN TO TUOLUMNE CITY	TABLE 43	297	198	105	600
NET RETURN FLOW-HICKMAN TO TUOLUMNE CITY		13490	9860	2280	25630
NET RETURN FLOW-C.F.S.-HICKMAN TO TUOLUMNE CITY		219	166	37	140
NET RETURN FLOW-ROBERTS FERRY TO TUOLUMNE CITY		18000	14870	8480	41350
NET RETURN FLOW-C.F.S.-ROBERTS FERRY TO TUOLUMNE CITY		293	250	138	227
MERCED RIVER					
DISCHARGE AT YOSEMITE VALLEY RR. CROSSING	TABLE 19	3810	3180	2180	9170
DISCHARGE NEAR MOUTH	TABLE 20	14500	14100	18100	46700
ACCRETION-YOSEMITE VALLEY RR. CROSSING TO MOUTH		10690	10920	15920	37530
DIVERSIONS-YOSEMITE VALLEY RR. CROSSING TO MOUTH	TBL. 42	2472	1607	632	4711
RETURN FLOW-YOSEMITE VALLEY RR. CROSSING TO MOUTH		13160	12530	16550	42240
RETURN FLOW-C.F.S.-YOSEMITE VALLEY RR. CROSSING TO MOUTH		214	211	269	231

TABLE 53

COMPARISON OF DIVERSIONS AND RETURN WATER - SAN JOAQUIN VALLEY
(Quantities in Acre-feet except as noted)

	Jul.	Aug.	Sep.	Oct.	Jul. to Oct. Inc.
- DIVERSIONS -					
San Joaquin River near Friant (1) (2) (Miller and Lux Canals, etc.)	158600	99190	75030	68970	401790
Merced River at Exchequer (1) (2) (Merced Irrigation District Canal, etc.)	100800	85070	63000	24290	273160
Turlock Irrigation District Canal (1)	74790	76050	63230	8180	222250
Modesto Irrigation District Canal (1)	39750	47250	30130	25290	142420
South San Joaquin and Oakdale Irrigation District Canals (1)	47560	47860	35670	8240	139330
Oakdale Irrigation District Canal (1)	19720	18450	15000	8000	61170
Pumping Diversions - San Joaquin, Merced, Tuolumne and Stanislaus Rivers (3)	28700	27130	15910	6270	78010
Total Diversions	469920	401000	297970	149240	1318130
Total Diversions (Average Second-feet)	7640	6520	5010	2430	5400
- RETURN -					
San Joaquin River near Vernalis (1)	165900	61150	80330	125000	432380
Pumping diversions - San Joaquin, Merced, Tuolumne, and Stanislaus Rivers (3)	28700	27130	15910	6270	78010
Total Return	194600	88280	96240	131270	510390
Undiverted power releases and spill (Tuolumne and Stanislaus Rivers)	13220	0	19840	32820	65880
Net Return	181380	88280	76400	98450	444510
Net Return (Average Second-feet)	2950	1440	1280	1600	1820
Return in per cent of Diversions	39	22	25	66	34

NOTE: Prior to July, return water measurements were vitiated by high river stages.
(1) U. S. G. S. Station.
(2) This flow all diverted below gaging stations after July 1st.
(3) See Tables 41, 42, 43, and 44.

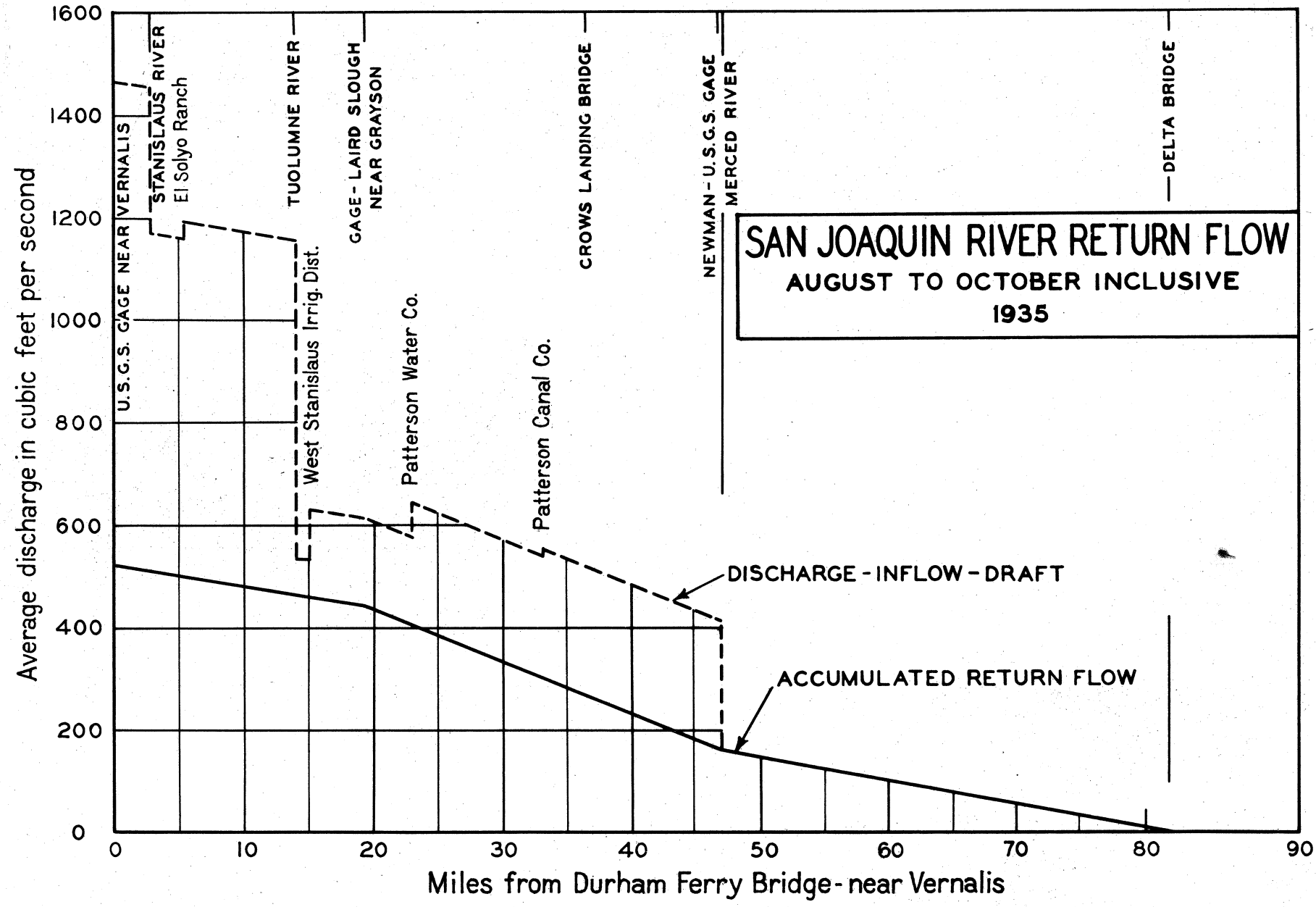

SAN JOAQUIN RIVER RETURN FLOW
AUGUST TO OCTOBER INCLUSIVE
1935
U.S.G.S. GAGE NEAR VERNALIS
STANISLAUS RIVER
El Solyo Ranch
TUOLUMNE RIVER
West Stanislaus Irrig. Dist.
GAGE - LAIRD SLOUGH NEAR GRAYSON
Patterson Water Co.
CROWS LANDING BRIDGE
Patterson Canal Co.
NEWMAN - U.S.G.S. GAGE
MERCED RIVER
DELTA BRIDGE
DISCHARGE - INFLOW - DRAFT
ACCUMULATED RETURN FLOW
Average discharge in cubic feet per second
0
200
400
600
800
1000
1200
1400
1600
0
10
20
30
40
50
60
70
80
90
Miles from Durham Ferry Bridge - near Vernalis

PLATE 2

TABLE 55

DISCHARGE OF BUTTE SLOUGH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*105	43	47	330
2			105	37	41	330
3			105	31	39	330
4			109	35	39	310
5			109	36	29	285
6			105	45	25	285
7			93	45	65	265
8			53	46	65	265
9			81	45	65	245
10			77	47	73	245
11			85	49	65	230
12			85	47	57	230
13			81	43	61	210
14			81	43	65	210
15			77	59	61	210
16			81	57	65	195
17			81	61	65	195
18			77	53	73	195
19			73	49	69	100
20			69	41	73	185
21			69	37	73	205
22			61	31	69	218
23			57	33	53	197
24			57	41	500	174
25			57	49	330	209
26			53	49	350	209
27			49	49	245	218
28			47	49	350	218
29			45	47	330	218
30			45	49	330	218
31			41	47		220
Mean			81.1	44.9	126	231
Ac.Ft. for Month			4980	2760	7480	14200

NOTE: This is the discharge to Sacramento River at Mile 84 left as measured at and below the dam of Butte Slough Irrigation Company one-fourth mile above the mouth of Butte Slough. This flow and Butte Slough and Butte Creek diversions (See Table 32) are made up almost entirely of return water from lands irrigated by Feather River diversions.

* Beginning of record for season.

TABLE 54

DISCHARGE OF COLUSA TROUGH AT COLUSA WILLIAMS HIGHWAY

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*280	294	353	185
2			275	285	357	151
3			270	301	368	137
4			268	302	369	119
5			264	304	379	120
6			272	319	382	105
7			279	314	382	98
8			294	303	393	91
9			299	313	406	81
10			297	320	404	81
11			297	316	396	81
12			288	313	396	81
13			285	319	411	82
14			277	329	408	55
15			283	346	410	67
16			290	341	423	79
17			283	338	429	71
18			289	343	449	70
19			284	346	459	74
20			271	352	434	71
21			274	349	421	66
22			286	352	404	62
23			291	353	389	58
24			300	356	378	51
25			296	356	351	31
26			291	354	344	25
27			286	356	299	19
28			283	354	264	23
29			285	352	243	19
30			288	349	216	17
31			295	352		14
Mean			284	332	377	73.7
Ac.Ft. for Month			17500	20400	22400	4530

NOTE: This is return water flowing in the main drain of Reclamation District 2047; it is drainage chiefly from lands irrigated by Glenn-Colusa, Provident, Princeton-Codora-Glenn, Compton-Delevan, and Maxwell Irrigation Districts.

* Beginning of record for season.

TABLE 56

DISCHARGE OF RECLAMATION DISTRICT 70 DRAIN

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*0	20	34	18
2			0	15	34	16
3			0	16	47	14
4			0	17	42	12
5			0	20	36	10
6			0	21	28	9
7			0	21	30	8
8			0	21	30	7
9			0	22	32	7
10			0	22	32	7
11			0	23	32	7
12			23	0	31	7
13			20	0	33	7
14			20	0	33	7
15			21	0	28	6
16			20	20	27	5
17			19	21	27	0
18			18	17	25	0
19			18	19	25	0
20			18	21	24	0
21			18	24	26	0
22			19	23	26	0
23			19	22	26	0
24			20	22	26	0
25			20	22	24	0
26			21	21	26	0
27			21	21	26	0
28			22	22	24	0
29			22	22	22	0
30			22	22	20	0
31			22	23		0
Mean			13.0	18.1	29.2	4.7
Ac.Ft. for Month			799	1110	1740	294

NOTE: This is the drainage from Reclamation District 70 returned to Sacramento River at Mile 68.8 Left. For this period of record it was all controlled gravity flow.

* Beginning of record for season.

TABLE 57

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN
AT ROUGH AND READY BEND

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*90	25	87	67
2			95	25	93	61
3			90	25	95	55
4			100	25	113	49
5			95	25	128	43
6			95	28	145	37
7			98	35	150	31
8			98	38	165	31
9			110	47	178	31
10			103	50	190	31
11			102	53	180	31
12			98	55	180	31
13			93	75	170	31
14			90	78	160	0
15			87	93	160	0
16			83	97	150	0
17			80	90	150	0
18			80	93	144	0
19			73	87	138	0
20			73	87	132	0
21			70	102	126	0
22			50	87	120	18
23			47	80	114	18
24			47	75	108	18
25			32	72	102	10
26			37	72	96	18
27			37	82	90	18
28			25	95	84	18
29			25	78	78	18
30			25	80	72	18
31			25	90		18
Mean			70.1	65.9	130	22.6
Ac.Ft. for Month			4310	4050	7730	1390

NOTE: This is the drainage from Reclamation District 108 returned to the Sacramento River at Mile 44.0 Right. All gravity flow. Additional drainage from Reclamation District 108 was discharged to Back Borrow Pit at Mile 20.2 left. See Table 58.

* Beginning of record for season.

TABLE 58

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN
ON BACK BORROW PIT

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Mean						
Ac.Ft. for Month						

NOTE: During the period of observation, July to October, inclusive, 1935, the discharge at this point was a negligible amount, due perhaps to re-use of water within district. Some observations of discharge were made as follows:

Date		C.F.S.
July	16	3.1
August	16	3.8
August	20	3.0
October	8	0

TABLE 59

DISCHARGE OF COLUSA BASIN DRAINAGE AT KNIGHTS LANDING

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*210	240	495	239
2			212	227	452	233
3			218	224	344	227
4			221	227	386	221
5			207	227	372	215
6			216	264	395	211
7			234	281	427	197
8			246	255	343	157
9			277	255	465	148
10			299	255	477	121
11			288	255	500	96
12			273	255	504	100
13			249	271	347	100
14			249	294	341	103
15			249	293	335	113
16			266	314	329	121
17			284	324	323	117
18			266	333	317	103
19			263	344	311	95
20			249	355	305	90
21			230	358	299	95
22			244	360	293	76
23			240	360	287	53
24			256	360	281	45
25			263	360	275	46
26			249	360	269	46
27			240	360	263	42
28			237	360	257	32
29			227	360	251	33
30			230	360	245	33
31			234	582		30
Mean			246	312	350	114
Ac.Ft. for Month			15100	19200	20800	7020

NOTE: This is the drainage from Colusa Basin passing down the Back Borrow Pit of Reclamation Districts 108 and 787 and entering the Sacramento River at Mile 34.15 Right, just above the Knights Landing gaging station. It includes the drainage from Reclamation District 787 entering the Back Borrow Pit via Sycamore Slough outlet. Irregularities in the flow are due to checking operations at the Knights Landing outfall gates whereby a portion of the flow of the Back Borrow Pit is diverted to the Knights Landing Ridge Cut. This diversion is shown in Table 65.

*Beginning of record for season.

TABLE 60

DISCHARGE OF SACRAMENTO SLOUGH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*393	358	408	332
2			393	355	413	415
3			393	355	413	262
4			392	294	480	179
5			391	292	569	187
6			390	294	459	186
7			389	296	427	163
8			388	352	247	381
9			388	292	261	315
10			387	329	721	254
11			386	324	488	169
12			382	345	443	160
13			375	359	474	158
14			374	375	479	158
15			370	405	410	142
16			372	416	494	155
17			374	404	354	155
18			369	390	396	148
19			367	380	366	148
20			362	363	362	148
21			357	373	346	148
22			309	373	228	148
23			261	373	376	141
24			242	373	315	141
25			252	371	313	140
26			235	447	298	142
27			305	386	274	116
28			315	389	223	108
29			325	392	211	108
30			324	397	280	108
31			310	403		150
Mean			351	363	384	183
Ac.Ft. for Month			21600	22300	22900	11200

NOTE: This is return water discharged to Sacramento River via Sacramento Slough at Mile 21.2 Left. This is the sum of the flow measured at two points: (1) Outlet of Reclamation District 1500 Drain (Table 61) and West Borrow Pit of Sutter By-Pass 1.4 miles above Reclamation District 1500 Drain (Table 64). The flow in Table 64 includes the flow of Table 62.

* Beginning of record for season.

TABLE 61

DISCHARGE OF RECLAMATION DISTRICT 1500 DRAIN

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*293	298	293	106
2			293	295	293	101
3			293	295	293	92
4			292	234	361	82
5			292	232	453	92
6			292	234	346	92
7			292	236	317	69
8			292	292	137	67
9			292	232	151	60
10			292	269	561	54
11			292	250	288	54
12			289	257	308	48
13			283	257	354	48
14			283	258	360	48
15			280	270	292	34
16			283	281	378	47
17			286	281	240	47
18			283	280	284	40
19			283	280	256	40
20			280	273	250	40
21			277	283	232	40
22			231	283	112	40
23			185	283	258	33
24			168	283	194	33
25			180	281	188	32
26			165	357	172	34
27			237	293	150	8
28			249	293	101	0
29			261	293	92	0
30			262	293	165	0
31			250	293		42
Mean			265	275	263	49.1
Ac.Ft. for Month			16300	16900	15600	3020

NOTE: This is the drainage from Reclamation District 1500 discharged to West Borrow Pit of Sutter By-Pass and thence via Sacramento Slough (in the By-Pass) to Sacramento River. This is one of the sources measured to obtain the total flow in Sacramento Slough. See Table 60.

* Beginning of record for season.

TABLE 62

DISCHARGE OF SUTTER BY-PASS - EAST BORROW PIT
(WILLOW SLOUGH AT CHANDLER)

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			25	9	53	157
2			34	9	53	245
3		* 0	34	9	45	100
4		0	34	9	40	27
5		0	27	9	40	27
6		0	23	9	40	27
7		0	23	9	43	27
8		0	23	9	47	245
9		0	25	29	126	200
10		0	28	52	183	100
11		0	36	60	133	50
12		0	47	60	50	51
13		0	56	60	31	52
14		0	70	60	20	53
15		0	56	60	15	55
16		0	47	32	15	57
17		5	47	16	15	59
18		15	47	16	23	61
19		15	46	16	34	63
20		15	46	22	34	65
21		15	45	28	34	67
22		15	35	28	34	68
23		15	28	28	34	69
24		16	28	28	34	70
25		16	28	28	33	71
26		16	28	28	33	73
27		16	28	33	33	74
28		16	28	48	33	75
29		16	20	53	33	76
30		16	9	53	33	77
31			9	53		77
Mean		**7.4	34.2	31.1	45.8	81.2
Ac.Ft. for Month		**411	2100	1910	2730	4990

NOTE: This is return water originating from Feather River and Butte Slough Diversions. It is discharged to Willow Slough through a controlled culvert at Chandler, thence across Sutter By-Pass to the West Borrow Pit and thence via the latter and Sacramento Slough (in the By-Pass) to Sacramento River. This is one of the sources measured to obtain the total flow in Sacramento Slough. See Table 60.

*Beginning of record for season.
**28 days.

TABLE 63

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT
OPPOSITE GELSHAUSER SLOUGH

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*46	40	46	53
2			46	39	46	53
3			46	38	46	53
4			46	38	46	53
5			46	36	46	51
6			46	35	46	50
7			46	34	46	49
8			46	35	45	48
9			46	36	44	46
10			46	38	43	45
11			46	39	43	44
12			46	41	43	43
13			46	43	43	42
14			46	45	46	41
15			47	47	49	39
16			48	48	51	37
17			48	48	53	35
18			48	48	56	34
19			48	48	59	32
20			48	48	61	31
21			48	48	64	29
22			48	48	66	27
23			47	48	68	25
24			46	48	70	24
25			46	48	69	22
26			45	48	68	20
27			44	47	66	18
28			43	47	64	16
29			42	46	61	15
30			41	46	57	14
31			40	46		13
Mean			45.8	43.4	53.7	35.6
Ac.Ft. for Month			2820	2670	3200	2190

NOTE: This is return water originating from Butte Slough diversions and from irrigation of Reclamation District 1660 and Sutter By-Pass lands. It is discharged via the West Borrow Pit and Sacramento Slough to Sacramento River. The point of measurement is 15.7 miles north of Reclamation District 1500 Drainage Plant.

* Beginning of record for season.

TABLE 64

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT
1.4 MILES ABOVE R. D. 1500 DRAINAGE PLANT

Day	Daily Discharge in Second-feet				
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*100	60	115	226
2			100	60	120	314
3			100	60	120	170
4			100	60	119	97
5			99	60	116	95
6			98	60	113	94
7			97	60	110	94
8			96	60	110	314
9			96	60	110	255
10			95	60	160	200
11			94	74	200	115
12			93	88	135	112
13			92	102	120	110
14			91	117	119	110
15			90	135	118	108
16			89	135	116	108
17			88	123	114	108
18			86	110	112	108
19			84	100	110	108
20			82	90	112	108
21			80	90	114	108
22			78	90	116	108
23			76	90	118	108
24			74	90	121	108
25			72	90	125	108
26			70	90	126	108
27			68	93	124	108
28			66	96	122	108
29			64	99	119	108
30			62	104	115	108
31			60	110		108
Mean			85.2	87.6	122	134
Ac.Ft. for Month			5240	5390	7240	8220

NOTE: This is the flow in the West Borrow Pit below the confluence of East Borrow Pit flow entering via Willow Slough. This point of measurement was newly established June 1, 1934. 1.4 miles downstream this flow is joined by the discharge through R.D. 1500 Drainage Plant and the combined flow is thence discharged via Sacramento Slough (in the By-Pass) to Sacramento River. This is one of the sources measured to obtain the total flow in Sacramento Slough. See Table 60.

* Beginning of record for season.

TABLE 65

DISCHARGE OF KNIGHTS LANDING RIDGE CUT AT WEST LINE OF YOLO BY-PASS

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			27			
2			27			
3			27			
4			28			
5			27			
6			27			
7			30			
8			33			
9			37			
10			43			
11			40			
12			37			
13			33	NO FLOW	NO FLOW	NO FLOW
14			33			
15			33			
16			37			
17			38			
18			37			
19			37			
20			33 (1)			
21			0			
22			0			
23			0			
24			0			
25			0			
26		*0	0			
27		0	0			
28		0	0			
29		0	0			
30		5	0			
31			0			
Mean		**5	33.2***	0	0	0
Ac.Ft. for Month		**9.9	1320***	0	0	0

NOTE: This is Colusa Basin drainage diverted to Knights Landing Ridge Cut by checking at the Knights Landing outfall gates on the Back Borrow Pit of Reclamation District 787.

*Beginning of record for season.
**One day.
***20 days.
(1) Flow dammed off.

TABLE 66

DISCHARGE OF YOLO BY-PASS-EAST BORROW PIT (TULE CANAL)

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			20	14	2	2
2			21	14	2	2
3			22	15	2	2
4			23	15	2	2
5			24	16	2	2
6			25	16	2	2
7			26	17	2	24
8			27	17	2	20
9			28	16	2	15
10			28	15	2	10
11			28	14	2	5
12			28	13	2	3
13			28	12	2	3
14			28	10	2	3
15			28	10	2	3
16			28	9	2	3
17			28	9	2	3
18			28	9	2	3
19			28	9	2	3
20			28	10	2	3
21			14	10	2	3
22			0	10	2	3
23			0	9	2	3
24			0	8	2	3
25			0	7	2	3
26		*15	6	6	2	3
27		16	12	5	2	3
28		17	12	4	2	3
29		18	12	2	2	3
30		19	13	2	2	3
31			13	2		3
Mean		**17.0	19.5	10.5	2.0	4.7
Ac.Ft. for Month		**169	1200	644	119	290

NOTE: This station is located on the East Borrow Pit of Yolo By-Pass three miles south of the Woodland-Elkhorn Highway and just below the south levee of Reclamation District 827. It records any undiverted drainage from Reclamation District 1600 and the return or waste from Colusa Basin Drainage diverted to Yolo By-Pass via Knights Landing Ridge Cut.

* Beginning of record for season.

** 5 days.

TABLE 67

DISCHARGE OF RECLAMATION DISTRICT 1000 DRAIN
(2nd BANNON SLOUGH)

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*141		75	64				43
2			12					
3	298		51					61
4								
5	112		32					69
6	112							
7	172	354	51					78
8	216	650						43
9		412						
10	358	258	26					52
11		199						
12	134	177	38	48				
13		88						
14	142	206	38	64			95	
15		199						61
16		251					146	
17	179	177	64	72			88	
18		184	38				66	
19				64			66	52
20	142	213					58	
21		88					66	
22	97	96	64				36	
23		59					65	
24	121	118					44	
25		81	70				58	
26		26					52	52
27		82					61	
28	132		145	36			52	
29		89						
30		70	80	36			60	
31								
Mean	76.0	136	25.3	12.8	0	0	33.8	16.5
Ac.Ft. for Month	4670	8090	1560	762	0	0	2010	1010

PUMPING — NO PUMPING

NOTE: This is drainage from Reclamation District 1000 returned to the Sacramento River by pumping at Mile 2.1 Left.

* Beginning of record for season.

TABLE 68

DISCHARGE OF BACK BORROW PIT RECLAMATION DISTRICT 1000

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			*			
2						
3						
4						
5						
6						
7						
8						
9			I	I	I	I
10			I	I	I	I
11			W	W	W	W
12			O	O	O	O
13			L	L	L	L
14			F	F	F	F
15						
16			O	O	O	O
17			N	N	N	N
18						
19			I	I	I	I
20			I	I	I	I
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
Mean	0	0	0	0	0	0
Ac.Ft. for Month	0	0	0	0	0	0

NOTE: This is a record of flow down the borrow pit outside the east levee of Reclamation District 1000 and entering the Sacramento River at Mile 1.3 Left. It is recorded at the old Garden Highway crossing (Natomas Trestle). This drainage is probably not derived from Sacramento River sources.

* Beginning of record for season.

CHAPTER V

USE OF WATER IN THE SACRAMENTO-SAN JOAQUIN DELTA

As outlined in preceding reports, this investigation having as its objective, a complete annual determination of the consumptive use of water in the entire Sacramento-San Joaquin Delta, has comprised the experimental work to determine the unit consumptive use of water by the various irrigated crops and vegetation in the Delta and the general field work to obtain annually a complete census of the irrigated crops and water consuming areas. With the unit consumptive use of water determined by the experimental work and the complete census available, the former is applied to the data of the latter to derive the consumptive use of water in the Delta as a whole or on individual tracts or islands.

Due to financial limitations the census of the irrigated crops and water consuming areas in the Delta has not been made since 1932. There is, therefore, no record of the Delta consumptive use of water since that time.

Table 69 summarizes the crop and water consuming areas and figures for the consumptive use of water as previously reported for the years 1924 to 1932 inclusive. It will be noted that in the nine year period shown, there has been no very great change in the irrigated crop area and that for the years 1930, 1931 and 1932 the crop areas and total water consuming areas, and consequently the estimates for the total consumptive use of water, are practically constant. From this consideration it appears reasonable to assume that there probably occurred little departure from these figures during 1935 and that probably the use of water in this year may be closely approximated by the consumptive use shown for the years 1930, 1931 and 1932.

TABLE 69

CONSUMPTIVE USE OF WATER IN THE SACRAMENTO-SAN JOAQUIN DELTA 1924-1932

Year	Water Consuming Area in Acres		Seasonal (2) Use of Water in Acre-feet		Seasonal Unit Consumption in Ac.-Feet per Ac.		Annual (3) Use of Water in Acre-feet		Annual Unit Consumption in Acre-feet per Ac.	
	Total (1)	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops	Total	Irr. Crops
1924		319800		674840		2.11				
1925		315600		660900		2.10				
1926		316200		649560		2.06				
1927		315600		649090		2.06				
1928		321500		674920		2.10				
1929	420900	321800	1100140	689550	2.62	2.14	1250180	839590	2.97	2.61
1930	446800	338000	1161000	744000	2.60	2.20	1322000	895000	2.96	2.65
1931	446310	339300	1167390	756010	2.61	2.23	1319250	907870	2.96	2.68
1932	447430	336440	1181030	746800	2.64	2.22	1334060	899830	2.98	2.67

(1) Total includes interior and exterior water surface, bare and weed lands which consume seepage water, willow and tule areas, etc.

(2) Includes water used by crops and vegetation during the composite growing season and by evaporation for the entire year.

(3) Includes in addition to seasonal use, the use of water on the cropped area during the non-growing or dormant season.

NOTE: Prior to 1929 the annual census was not complete with respect to water consuming areas other than irrigated crop lands.

CHAPTER VI

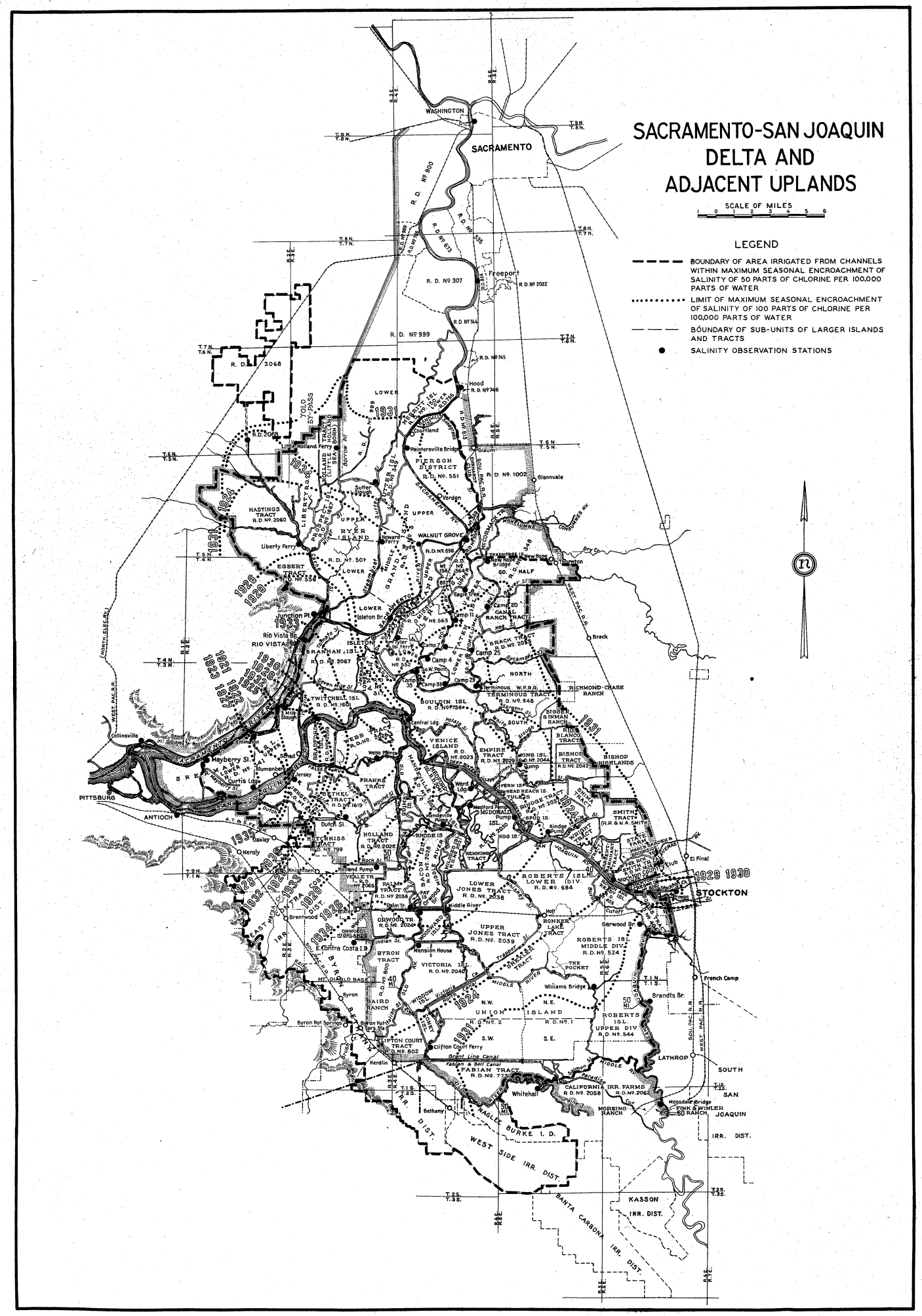
SALINITY INVESTIGATION

Purpose

The purpose of the salinity investigation, as outlined in previous reports, has been to record the occurrence and extent of the encroachment into upper Bay and Delta channels of salinity from San Francisco Bay, and to establish the relation between movement of salinity, stream flow to the Delta, and tidal action. As reported in Bulletin 27 of the Division of Water Resources, this relation was established for the conditions which obtained during the period of the special investigation for that Bulletin and upon the basis of all data available to that time. Subsequent investigations, therefore, have been directed to the maintenance of an unbroken record of the salinity, tidal and stream flow variations, essential not only in corroboration of the relation as at present established but as the basis for a check of possible modifications in the relation due to changes in channel and tidal conditions which may have taken place or will occur in the future. Also, during periods of low stream flow, the continuation of salinity sampling has been essential in keeping Delta irrigators advised of conditions so that damage from the use of water of too high salt content might be averted.

Scope

The scope of this investigation each season has been such as to insure that samples of water to be tested for salinity would be taken at regular intervals at a sufficient number of stations throughout the Delta and upper Bay region that the advance and retreat of the salinity from early Summer to late Fall would be completely recorded. Plate 3 shows the limit



MAXIMUM SEASONAL SALINITY ENCROACHMENT OF 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER, SACRAMENTO-SAN JOAQUIN DELTA, 1920-1935

of encroachment into the Delta of 100 part salinity in the years 1920 to 1935, inclusive. Eighteen Bay and Delta sampling stations are maintained permanently throughout the year, and five additional stations in 1935 were established and maintained for the duration of the season in order to completely record the encroachment and recession of salinity.

Station Maintenance and Records

As in the past, the salinity sampling at all stations was done by local observers. Each observer was provided with a schedule showing the exact time for taking the samples so that, throughout the Delta at four-day intervals, all samples would be taken at approximately one and one-half hours after the same high tide. The observers were furnished with stamped containers for the sample bottles so that the latter could be mailed as filled to the laboratory at Sacramento. All testing was done at the chemical laboratory of the Division of Highways. The records of the tests of all samples taken in 1935 are given in Table 72 and Table 71 gives the location and description of each station.

The maximum salinity as recorded at the stations operated in 1935 is shown in Table 70. For comparative purposes, this table shows also the maximum salinity recorded at these stations in previous years beginning with 1924. A comparison of the Summer stream flow to the Delta in 1935 and the corresponding salinity at certain of the lower Delta stations is shown on Plate 4.

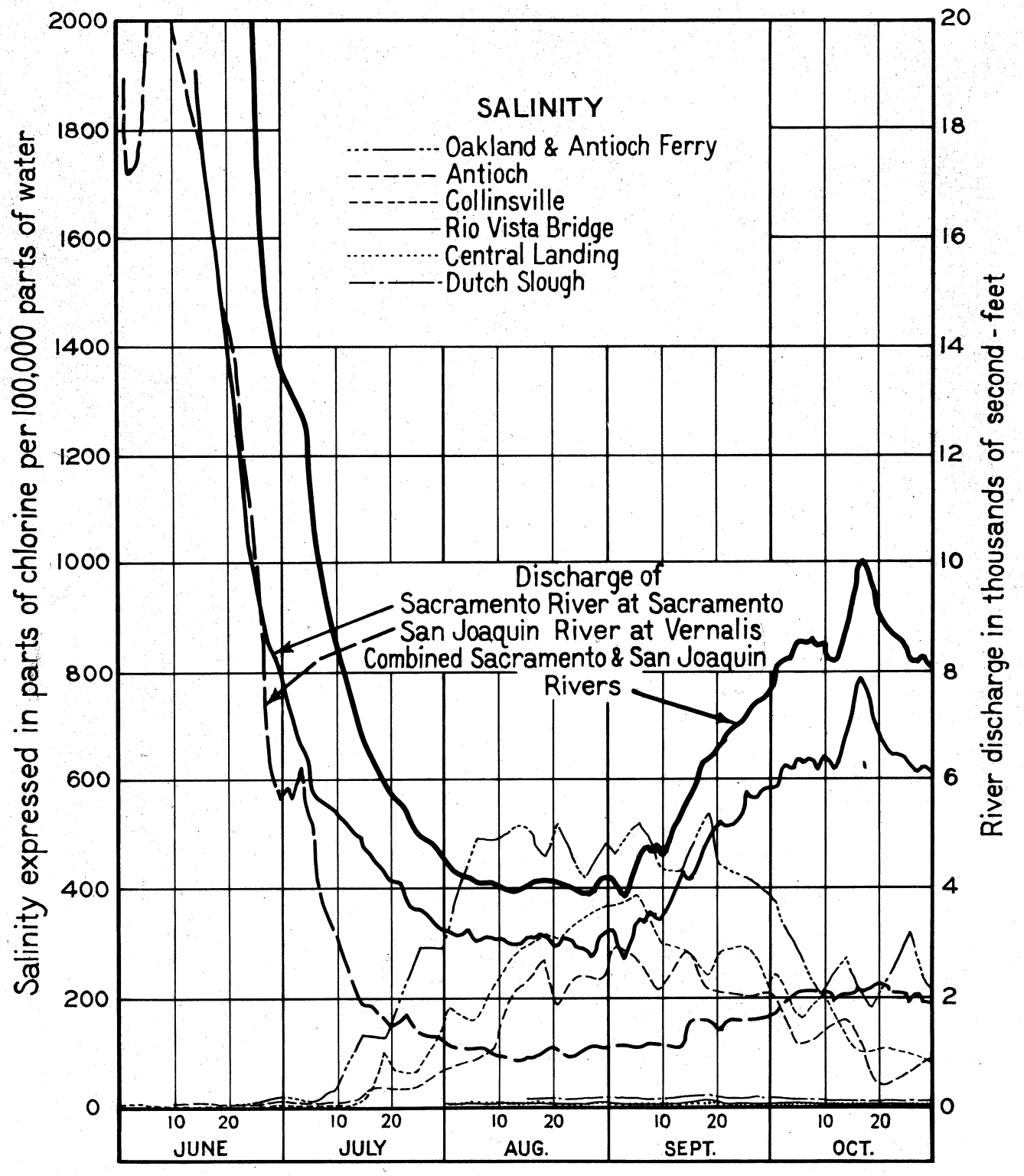
Salinity Bulletins

In preceding years during periods of low river flow and consequent rapid encroachment of salinity, water users throughout the Delta were anxious to obtain the results of the tests in order that their irrigation operations

might be governed to prevent the use of water of injurious salt content. Therefore bulletins were mailed at weekly or ten-day intervals to the water users throughout the Delta, reporting the salinity at the various stations. During 1935 however, the encroachment of salinity as shown on Plate 3 was not of sufficient magnitude to justify the issuing of these bulletins.

Tide Gages

In the analysis of the relation between salinity, stream flow and tidal action as presented in Bulletin 27, the comprehensive information covering the tidal variations throughout the Delta as obtained from the records of the tide gages was indispensable. Of the stations which supplied data used in the investigation for Bulletin 27, four were maintained by the U. S. Army Engineers, one each by U. S. Coast and Geodetic Survey, U. S. Navy; East Contra Costa Irrigation District and Staten Island Land Company. The remaining stations, eight in number, are being maintained by the Division of Water Resources and are located at Sacramento, Walnut Grove, San Joaquin end of Georgiana Slough, Sacramento and San Joaquin ends of Three Mile Slough, Antioch, Collinsville, and Mossdale Bridge (San Joaquin River).



COMPARISON OF
RIVER DISCHARGE AND SALINITY
AT BAY AND DELTA STATIONS
1935

PLATE 4

TABLE 70

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1924 TO 1935, INCLUSIVE

YEAR	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
SACRAMENTO-SAN JOAQUIN RUN-OFF IN PER CENT OF NORMAL*	28	83	57	114	80	42	63	29	78	46	40	86
STATION (1)	MAXIMUM RECORDED SALINITY IN PARTS OF CHLORINE PER 100,000											
	SAN FRANCISCO, SAN PABLO AND SUISUN BAYS											
POINT ORIENT			2020	1880	1870	1830	1780	1870	1720	1800	1840	1720
POINT DAVIS			1850	1510	1610	1660	1620	1810	1520	1680	1800	1500
BULLS HEAD POINT			1690	1330	1410	1370	1380	1690	1320	1380	1640	1260
BAY POINT			1400	950	1170	1050	1060	1540	1010	1160	1460	720
O AND A FERRY	1345	762	1100	510	750	830	800	1390	620	900	1200	540
INNISFAIL FERRY						870	810	1400	680	900	1260	720
	NORTH SAN PABLO BAY											
SONOMA CREEK BRIDGE						1600	1670	1660	1420	1620		
GRANDVIEW							1610	1870	1460	1660		
VALLEJO							1340	1700	1300	1420		
CUTTINGS WHARF							1320	1800	1200	1320		
	SACRAMENTO RIVER DELTA											
COLLINSVILLE	1150	448	1020	370	590	680	570	1260	500	620	1080	390
EMMATON	802	136	540	65	156	310	250	1000	166	380	760	88
THREE MILE SLOUGH BRIDGE	692	81	430	25	109	205	150	860	90	320	660	77
RIO VISTA BRIDGE	608	21	256	12	44	67	52	740	28	130	520	12
JUNCTION POINT						17	26	620	(2) 7	74	410	
LIBERTY FERRY	192	11	32		7	14	6	560			230	
GRAND ISLAND (STEAMBOAT SL.)						5					350	
ISLETON BRIDGE	310	12	68		13	6	10	635	(2) 6	46	310	
HOWARD FERRY	157		27			7		500			232	
SUTTER SLOUGH	46					11		320			50	
LITTLE HOLLAND FERRY	48					11		300			14	
RYDE						9		280			11	
RECLAMATION DISTRICT 2068								280			176	
WALNUT GROVE	42		15			8		220			10	
PAINTERSVILLE BRIDGE	47		17			9		144			8	
SACRAMENTO						8	5	10	6	7	7	4

* NORMAL TAKEN AS 40-YEAR MEAN (1889-1929) OF NATURAL RUN-OFF AT FOOTHILL STATIONS OF MAJOR TRIBUTARIES.
(1) FOR LOCATION AND DESCRIPTION SEE TABLE 71.
(2) MAXIMUM SALINITY OBTAINED FROM FIRST SAMPLE TAKEN IN SEASON.

TABLE 70 (CONTINUED)

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1924 TO 1935, INCLUSIVE

YEAR	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
SACRAMENTO-SAN JOAQUIN RUN-OFF IN PER CENT OF NORMAL*	28	83	57	114	80	42	63	29	78	46	40	86
STATION (1)	MAXIMUM RECORDED SALINITY IN PARTS OF CHLORINE PER 100,000											
MOKELUMNE RIVER DELTA												
SOUTHWEST POINT			65		23	9	9	390		17	107	
CAMP 33, STATEN ISLAND	113		32		25	8	7	245		13		
TYLER ISLAND FERRY	44		19			9	9	200			10	
CAMP 11, STATEN ISLAND	96		23			7		134		5	25	
CAMP 29, STATEN ISLAND			25		16	11		182			52	
CAMP 25, STATEN ISLAND	110		24			7		164		7		
CAMP 20, STATEN ISLAND			22			8		124			18	
SAN JOAQUIN RIVER DELTA												
ANTIOCH	1080	356	920	179	450	600	470	1240	400	580	960	290
CURTIS LANDING						450		1060	280	470	810	180
JERSEY	708	81	470	53	192	365	220	910	150	280	(2) 620	86
WEBB PUMP	414	24	147	16	46	80	61	680	35	122	(3) 340	16
CENTRAL LANDING	288	10	98		19	20	15	425	8	25	(4) 90	8
DUTCH SLOUGH								510	37	80	280	21
ROCK SLOUGH WEST OF DAM												8
WARD LANDING						23	16	350			190	
HOLLAND PUMP	308	18	148		34	42	23	325	11			
BACON PUMP										25	160	11
MANDEVILLE PUMP			84		25	25	17	350	18	29	166	
KING ISLAND PUMP	164		48		19	16		261			104	
ROCK SLOUGH EAST OF DAM												8
RINDGE PUMP	126	35	50		28	28	16	198	16	22	94	18
ORWOOD BRIDGE			86		21	18	12	277			107	
EAST CONTRA COSTA IRR. DIST.						16	17	200			73	
MIDDLE RIVER	186	13	69		21	17	13	270	12	18	108	11
MANSION HOUSE	148	11	69		16	16	11	240			90	
STOCKTON COUNTRY CLUB	108		48			36	18	122			44	
CLIFTON COURT FERRY	80		24			23		130			40	
STOCKTON						200	120	132	72	66	76	
GARWOOD BRIDGE								92			38	
BRANDTS BRIDGE								43			21	
WILLIAMS BRIDGE	42		18			12		118			43	
WHITEHALL						15		31			12	
MOSSDALE BRIDGE	14					16	10	12	14	13	25	12

* NORMAL TAKEN AS 40-YEAR MEAN (1889-1929) OF NATURAL RUN-OFF AT FOOTHILL STATIONS OF MAJOR TRIBUTARIES.
(1) FOR LOCATION AND DESCRIPTION SEE TABLE 71.
(2) ESTIMATED MAXIMUM OF 670 IN PERIOD NOT COVERED BY SAMPLING.
(3) ESTIMATED MAXIMUM OF 350 IN PERIOD NOT COVERED BY SAMPLING.
(4) ESTIMATED MAXIMUM OF 125 IN PERIOD NOT COVERED BY SAMPLING.

TABLE 71

SALINITY STATIONS AT WHICH OBSERVATIONS WERE TAKEN

STATION	MILES FROM GOLDEN GATE	TIME INTERVAL BETWEEN HIGH TIDE AT GOLDEN GATE AND TIME FOR TAKING SAMPLES AT STATION		LOCATION
		HOURS	MINS.	
				SAN FRANCISCO, SAN PABLO AND SUISUN BAYS
POINT ORIENT*	12.3	2	20	NORTH END SAN FRANCISCO BAY, EAST SHORE, ONE-HALF MILE SOUTH OF PT. SAN PABLO. WHARF OF STANDARD OIL COMPANY.
POINT DAVIS*	25.2	3	15	EAST END SAN PABLO BAY, SOUTH SHORE. OLEUM WHARF OF UNION OIL COMPANY.
BULLS HEAD POINT*	34.0	3	50	WEST END SUISUN BAY, SOUTH SHORE. WHARF OF MOUNTAIN COPPER COMPANY.
BAY POINT*	39.9	4	15	SUISUN BAY, SOUTH SHORE. BAY POINT WHARF OF COOS BAY LUMBER COMPANY.
O AND A FERRY*	46.5	4	40	UPPER END SUISUN BAY BETWEEN MALLARD STATION AND CHIPPS ISLAND AT SACRAMENTO NORTHERN RAILROAD FERRY CROSSING.
INNISFAIL FERRY*	47.3	4	50	MONTEZUMA SLOUGH, ABOUT 1 MILE EAST OF JUNCTION WITH CUTOFF SLOUGH, NEAR NORTH END OF GRIZZLY ISLAND.
				NORTH SAN PABLO BAY
SONOMA CREEK BRIDGE	26.4	3	10	SONOMA CREEK ENTRANCE AT DRAWBRIDGE.
GRAND VIEW	27.0	3	10	PETALUMA CREEK, STATE HIGHWAY DRAWBRIDGE NEAR TOWN OF GRAND VIEW.
VALLEJO	29.1	3	35	NAPA RIVER AT SEARS POINT TOLL ROAD BRIDGE, ABOUT ONE MILE FROM MARE ISLAND NAVY YARD CAUSEWAY.
CUTTINGS WHARF	36.7	4	00	NAPA RIVER, RIGHT BANK, OPPOSITE NORTH END OF BULL ISLAND, NEAR CARNEROS STATION ON SOUTHERN PACIFIC RAILROAD.
				SACRAMENTO RIVER DELTA
COLLINSVILLE*	50.8	5	25	SACRAMENTO RIVER, NORTH BANK, AT JUNCTION WITH SAN JOAQUIN RIVER.
EMMATON*	57.7	5	45	SACRAMENTO RIVER, SOUTH BANK, LOWER END OF HORSESHOE BEND.
THREE MILE SLOUGH BR.	60.0	5	55	AT JUNCTION OF SLOUGH AND SACRAMENTO RIVER.
RIO VISTA BRIDGE	63.5	6	05	AT HIGHWAY BRIDGE NEAR NORTHERLY LIMITS OF RIO VISTA.
JUNCTION POINT	65.2	6	10	SACRAMENTO RIVER, RIGHT BANK, JUST BELOW THE JUNCTION WITH STEAMBOAT SLOUGH.
LIBERTY FERRY	67.6	6	25	CACHE SLOUGH AT JUNCTION WITH PROSPECT SLOUGH.
GRAND ISLAND (STEAMBOAT SLOUGH)	68.2	6	30	STEAMBOAT SLOUGH AT GRAND ISLAND DRAINAGE PUMPING PLANT, THREE MILES FROM JUNCTION POINT.
ISLETON BRIDGE	68.7	6	30	SACRAMENTO RIVER, ONE MILE UPSTREAM FROM ISLETON.
HOWARD FERRY	71.4	6	55	STEAMBOAT SLOUGH, 1½ MILES BELOW JUNCTION WITH SUTTER SLOUGH.
SUTTER SLOUGH	72.8	7	00	AT JUNCTION WITH MINER SLOUGH.
LITTLE HOLLAND FERRY	73.2	7	05	BACK BORROW PIT OF RECLAMATION DISTRICT 999, TWO MILES ABOVE JUNCTION WITH MINER SL.
RYDE	74.4	7	15	SACRAMENTO RIVER, RIGHT BANK, AT TOWN OF RYDE.
RECLAMATION DIST. 2068	74.6	7	15	HAAS SLOUGH, AT RECLAMATION DISTRICT 2068 PUMPING PLANT.
WALNUT GROVE	77.4	7	25	SACRAMENTO RIVER, HIGHWAY BRIDGE, AT WALNUT GROVE.
PAINTERSVILLE BRIDGE	77.6	7	25	SACRAMENTO RIVER ONE MILE BELOW COURTLAND.
SACRAMENTO*	103.5	9	30	SACRAMENTO RIVER AT SOUTHERN PACIFIC RAILROAD BRIDGE.

* PERMANENT STATION MAINTAINED THROUGHOUT THE YEAR.

TABLE 71 (CONTINUED)

SALINITY STATIONS AT WHICH OBSERVATIONS WERE TAKEN

STATION	MILES FROM GOLDEN GATE	TIME INTERVAL BETWEEN HIGH TIDE AT GOLDEN GATE AND TIME FOR TAKING SAMPLES AT STATION		LOCATION
		HOURS	MINS.	
				MOKELUMNE RIVER DELTA
SOUTHWEST POINT	78.8	7	25	STATEN ISLAND, NORTH FORK MOKELUMNE RIVER, SOUTH BANK, JUST ABOVE JUNCTION WITH SOUTH FORK.
CAMP 33, STATEN ISLAND	80.2	7	30	SOUTH FORK, MOKELUMNE RIVER, NORTH BANK, TWO MILES ABOVE NORTH FORK JUNCTION.
TYLER ISLAND FERRY	81.9	7	40	ON GEORGIANA SLOUGH, ABOUT DUE EAST OF ISLETON.
CAMP 11, STATEN ISLAND	83.1	7	45	NORTH FORK, MOKELUMNE RIVER, EAST BANK, FOUR MILES ABOVE SOUTH FORK JUNCTION.
CAMP 29, STATEN ISLAND	83.4	7	50	SOUTH FORK, MOKELUMNE RIVER, NORTH BANK, OPPOSITE TERMINOUS.
CAMP 25, STATEN ISLAND	86.4	8	05	SOUTH FORK, MOKELUMNE RIVER, WEST BANK, ONE MILE ABOVE SYCAMORE SLOUGH JUNCTION.
CAMP 20, STATEN ISLAND	88.9	8	30	SOUTH FORK, MOKELUMNE RIVER, WEST BANK, ONE-HALF MILE BELOW BEAVER SLOUGH JUNCTION.
				SAN JOAQUIN RIVER DELTA
ANTIOCH*	54.9	5	55	SAN JOAQUIN RIVER, AT CITY WATER WORKS PUMPING PLANT.
CURTIS LANDING	58.9	6	10	SAN JOAQUIN RIVER, RIGHT BANK, ABOUT THREE-FOURTHS MILE ABOVE ANTIOCH TOLL BRIDGE.
JERSEY*	61.4	6	20	SAN JOAQUIN RIVER, LEFT BANK, ONE MILE BELOW MOUTH OF FALSE RIVER.
WEBB PUMP	72.0	7	00	FALSE RIVER, TWO MILES BELOW OLD RIVER JUNCTION.
CENTRAL LANDING*	72.0	7	00	MOKELUMNE RIVER AT CENTRAL LANDING, BOULDIN ISLAND.
DUTCH SLOUGH*	73.0	7	05	AT BETHEL ISLAND BRIDGE.
ROCK SLOUGH WEST OF DAM*	77.0	7	20	IN ROCK SLOUGH, WEST OF DAM AT JUNCTION OF SAND MOUND SLOUGH AND ROCK SLOUGH.
WARD LANDING	79.6	7	35	SAN JOAQUIN RIVER NEAR JUNCTION WITH LITTLE CONNECTION SLOUGH ON THE SOUTHWEST SIDE OF EMPIRE TRACT.
HOLLAND PUMP	80.6	7	40	ROCK SLOUGH, NORTH BANK, 1½ MILES WEST OF OLD RIVER JUNCTION.
BACON PUMP	82.9	7	50	OLD RIVER AT BACON ISLAND DRAINAGE PUMPING PLANT, NEAR JUNCTION WITH ROCK SLOUGH.
MANDEVILLE PUMP	83.0	7	50	CONNECTION SLOUGH, NORTH BANK, ONE MILE WEST OF MIDDLE RIVER, ON SOUTH END OF MANDEVILLE ISLAND.
KING ISLAND PUMP	84.2	8	00	HONKER CUT AT EMPIRE TRACT - KING ISLAND FERRY.
ROCK SLOUGH EAST OF DAM*	85.4	8	05	IN ROCK SLOUGH, THREE-FOURTHS OF A MILE EAST OF JUNCTION WITH SAND MOUND SLOUGH.
RINDGE PUMP*	86.1	8	10	SAN JOAQUIN RIVER, NORTH BANK, ONE MILE BELOW FOURTEEN MILE SLOUGH JUNCTION.
ORWOOD BRIDGE	86.3	8	10	OLD RIVER, AT SANTA FE RAILROAD CROSSING, ORWOOD.
EAST CONTRA COSTA I.D.	86.7	8	20	INDIAN SLOUGH, AT EAST CONTRA COSTA IRRIGATION DISTRICT PUMPING PLANT.
MIDDLE RIVER P.O.*	87.7	8	20	MIDDLE RIVER, EAST BANK, AT SANTA FE RAILROAD CROSSING.
MANSION HOUSE	88.4	8	30	VICTORIA ISLAND, OLD RIVER, EAST BANK, AT JUNCTION WITH NORTH VICTORIA CANAL.
STOCKTON COUNTRY CLUB	90.8	8	45	ON LINDLEY CUTOFF (SAN JOAQUIN RIVER), NORTH BANK, ABOUT THREE-FOURTHS OF A MILE ABOVE BURNS CUTOFF JUNCTION.
CLIFTON COURT FERRY	94.2	9	10	OLD RIVER JUST BELOW JUNCTION WITH GRANT LINE CANAL.
STOCKTON	94.8	9	15	NEAR HEAD OF STOCKTON CHANNEL AT WHARF OF CALIFORNIA TRANSPORTATION COMPANY.
GARWOOD BRIDGE	95.3	9	15	SAN JOAQUIN RIVER. AT DRAWBRIDGE ONE MILE ABOVE SANTA FE RAILROAD CROSSING.
BRANDT BRIDGE	100.6	9	50	SAN JOAQUIN RIVER. AT DRAWBRIDGE SIX MILES ABOVE SANTA FE RAILROAD CROSSING.
WILLIAMS BRIDGE	101.6	9	55	MIDDLE RIVER, ABOUT FOUR MILES BELOW SALMON SLOUGH JUNCTION.
WHITEHALL	104.8	10	20	OLD RIVER, WEST OF JUNCTION OF SALMON SLOUGH AND PARADISE CUT. DUE NORTH OF TRACY.
MOSSDALE BRIDGE*	108.5	10	50	SAN JOAQUIN RIVER AT LINCOLN HIGHWAY CROSSING, ABOUT THREE MILES SOUTHWEST OF LATHROP.

* PERMANENT STATION MAINTAINED THROUGHOUT THE YEAR.

TABLE 72

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	JANUARY							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1440	1460	1320	960	1040	1020	1000	1240
Point Davis				410	340	410	670	880
Bulls Head Point		720	180:ab	26:ab	14	71	240:ab	380
Bay Point			30	36:b	6	7	63	
O and A Ferry		20	6	2	5	3	5	30
Innisfail Ferry		228	166	70	80:a	170	126	76
	Sacramento River Delta							
Collinsville	40	4	2	1	1	2:a	1	3
Emmaton			3:cd	2	3		3	2
Sacramento	:a	1:ad	1	1:ab	1:a	1	1	2
	San Joaquin River Delta							
Antioch	:b 17	18	9	8	8	7	5	4
Jersey			9	8				
Central Landing			4	:ab	2:a	2		
Dutch Slough			15	15	14	12	8	10
Rindge Pump	7:d	9	4	3	4:a	1	6	6
Middle River P.O.			9	8	7	4	5	5
Mossdale Bridge			1	1	1:a	3	3	2

Station	FEBRUARY						
	2	6	10	14	18	22	26
	San Francisco, San Pablo and Suisun Bays						
Point Orient	1340	1400	1220	1220	1180	960	920
Point Davis	:ab 880	840	580	580	620	600	480
Bulls Head Point	490	440:a	140:ab	120	200	200:a	450
O and A Ferry	9	5	2	2	4:a	4:d	4
Innisfail Ferry	58	74	68	84	90:a	96	48
	Sacramento River Delta						
Collinsville	3	2	2	1	2	3	3
Emmaton		3	1	3	3	1:ad	4
Sacramento	:ab 1	1	1:ab	1	1	1:d	1
	San Joaquin River Delta						
Antioch	6:a	7	4	3	4	4	5
Jersey		5	5		4	5	4
Central Landing	2		3				1
Dutch Slough	8:a	9	9	7	7	7	7
Rindge Pump	6	6	4	6:a	6	6	9
Middle River P.O.	:ab 6	6	7	5:a	6	6	5
Mossdale Bridge	2	3:ab	4	2:a	2	1	3

a, b, c, d, e, f, See footnotes last page of this table.

TABLE 72 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	MARCH							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1260	1200	880	1000	1060	1140	1000	1160
Point Davis	680	560	260	360	510	360	360	700
Bulls Head Point		44:a	10	68	202	100	70:ab	262
O and A Ferry	6:a	2	3:ab	5	4	3	4:ab	5
Innisfail Ferry	42		86	76	64:ad	60	50	40
	Sacramento River Delta							
Collinsville	3	1:a	1	2	2		2	6
Emmaton	2	1	2	3:ab	2:a	1	2	1
Sacramento	:ab 1	1	1	:ab	1	3	1	3
	San Joaquin River Delta							
Antioch	3	4	5	3	4	4	3	4
Jersey	5		5	4:a	4	5	2	
Central Landing	2							
Dutch Slough	7	6	7	7:a	7	8	7	8
Rindge Pump	4	9	3	8	6	6	4	7
Middle River P.O.	5	7	5	7	4	6	3	
Mossdale Bridge	3	5	2	2	2	2:ab	3	4

Station	APRIL							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient		1080	740	720:b	380	760	860	840
Bulls Head Point		150	5:b	83:b	3:a	1:a	94:a	5
O and A Ferry	:a 3	1:a	4:b	1:b	1:a	1:a	2:b	1
Innisfail Ferry	:a 50:a	66	51:a	19:a	18:a	14	20:a	16
	Sacramento River Delta							
Collinsville	:a 1	3	2	:ab	1:a	2	2:a	1
Emmaton	:a 3:a	1	2:a	1:a	2:df	1	1:a	1
Sacramento	:b 1	1	1:b	1:b	1	1	1:a	1
	San Joaquin River Delta							
Antioch	:a 4	2	4:a	3:a	20	3	5:a	1
Jersey	:b 3							
Dutch Slough	:b 7:a	6	7:a	2:a	2	2	2:a	2
Rindge Pump	:b 11	6	2:a	1	2	1	2:a	3
Middle River P.O.	:e 8	6	3:b	3:b	2	1	1:a	2
Mossdale Bridge	:b 4:ab	1	1:a	2		1	2:a	1

a, b, c, d, e, f, See footnotes last page of this table.

TABLE 72 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	MAY							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	b 560	900	560	880 b	960	920	1080	
Bulls Head Point	b 2	32 a	12 b	40			220	140
O and A Ferry	b 2 a	3	1 b	4 b	3	2 a	1 b	1
Innisfail Ferry	a 17	16 a	18 a	12 a	14 a	16 a	18	
Sacramento River Delta								
Collinsville	a 2	1 a	2 a	1 b	1	2 a	1 a	1
Emmaton	a 1	1 a	1 a	2 a	1	a	1	
Sacramento	b 1	1 a	1 a	1 b	1	1 a	1 b	1
San Joaquin River Delta								
Antioch	a 4	2 a	3 a	5 a	1	1 a	2 a	1
Dutch Slough	b 1 a	2		b	1	4	a	2
Rindge Pump		4 a	2 a	2 b	4	2 a	2 a	1
Middle River P.O.	b 1	3 a	2 a	1 b	4 ab	2 a	2 c	1
Mossdale Bridge	ad 2	2 a	1 a	1 b	1	1 a	2 a	1

Station	JUNE							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	b 1020	940		1180 b	960	1220	1320	
Bulls Head Point	b 19	60 a	18 b	194 b	360	310 a	150 a	290
O and A Ferry	b 2 a	2 a	1 b	1 a	1	3 b	3	
Innisfail Ferry	a 18	17 a	14 a	17 a	11	a	13 a	17
Sacramento River Delta								
Collinsville	a 1	2 a	1 a	2 a	3 a	1 a	7 ab	1
Emmaton	1	1 a	1 a	6 a	1 a	1 a	1 a	1
Sacramento	b 1	1 a	1 b	1 b	1 a	1 a	2 a	2
San Joaquin River Delta								
Antioch	a 1	2 a	3 a	2 a	3 a	1 a	5 a	3
Dutch Slough	b 1	2 a	9 a	1 a	2 a	6 a	2 a	3
Rindge Pump	3	2 a	1 a	4 b	3 a	20 a	4 a	5
Middle River P.O.	b 2	4 a	2 b	1 b	3 a	2 a	2	
Mossdale Bridge	b 1	1 a	1	2 b	1 a	2 a	3 a	3

a, b, c, d, e, f, See footnotes last page of this table.

TABLE 72 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	JULY 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	b 1420	1200a	1080	1480	1560	1500	1540b	1580
Point Davis			1020b	1120	1020	1180ad	1200	1300
Bulls Head Point	b 510	420a	620b	800	900	800	b	1060
Bay Point							a	450
O and A Ferry	ab 18	11	30b	136a	134	180ab	290ab	290
Innisfail Ferry	a 18	19	20a	35	172	a	188b	310
	Sacramento River Delta							
Collinsville	5a	4a	4a	20	100	62ab	70a	148
Emmaton	b 4a	4a	1a	3	5	2a	5a	7
Sacramento	b 1a	2a	2b	2	2a	1b	4b	2
	San Joaquin River Delta							
Antioch	a 3	3a	3a	10a	36a	32a	40a	64
Curtis Landing							a	40
Jersey	a	2b	7b	3a	5a	3		
Dutch Slough	b 2	2a	4		5	5a	5a	7
Rindge Pump	b 5a	6a	7b	9	8a	11a	12b	11
Middle River P.O.	b 2b	4a	3b	4	a	4a	5b	8
Mossdale Bridge	b 4a	4a	7a	2ab	10a	10a	6a	9

Station	AUGUST 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1480	1580	1600b	1700	1700	1700b	1580	1660
Point Davis	1180a	1260	1300		1420	b	1380a	1400
Bulls Head Point	860	1020a	940ab	1060	1140	1200b	1180	1000
Bay Point	a 460a	520						
O and A Ferry	a 350	480b	490b	520	460	520a	420ab	480
Innisfail Ferry		390a	320		550a	560a	540a	560
	Sacramento River Delta							
Collinsville	184a	156a	228a	282a	320a	310	ab	370
Emmaton	13a	13a	15a	40	77a	56a	50	88
Three Mile Slough Bridge	8	16b	18a	26a	28	50b	60	54
Rio Vista Bridge	3	3b	3b	5	3b	5b	6	7
Sacramento	3a	3a	3b	2a	3a	2b	2ab	3
	San Joaquin River Delta							
Antioch	a 118	82a	118a	220	270a	190a	240	230
Curtis Landing	a 64a	38a	44a	102	88a	124		130
Jersey	33a	10a	19a	46	86			
Webb Pump			b	8	11b	11b	11ab	13
Central Landing	b 7	a	8a	5	4			4
Dutch Slough	5	7d	10b	13a	12a	15a	16	18
Bacon Pump			b	6	7b	6a	8	8
Rindge Pump	12	16a	13bd	14a	13a	14b	15ab	14
Middle River P.O.	a 6ab	8a	7b	7a	9a	8	ab	8
Mossdale Bridge	12a	9a	12a	10	8a	11a	10	10

a, b, c, d, e, f, See footnotes last page of this table.

TABLE 72 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	SEPTEMBER 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1720	1690	1660	1680	1600	1660	1700	1660
Point Davis	1400	1420		1380	1460	1500	1320	
Bulls Head Point	1000	1200:b	1220	1260	1180:a	900	1060	1000
O and A Ferry	460	520:a	440:a	440	540:b	440	420	480
Innisfail Ferry	560	560:a	580	640:a	600		600	720
	Sacramento River Delta							
Collinsville	a 340	390:a	300	280:a	240:a	280	290:a	220
Emmaton	a 82:a	68						
Three Mile Slough Bridge	40	77:a	45:a	47	54:a	39	21:a	15
Rio Vista Bridge	6	5:b	4	3	12	3	3	3
Sacramento	a 3:a	2:b	3:a	3:a	2:b	1:ab	1:a	1
	San Joaquin River Delta							
Antioch	290	270:a	220	280:a	220:a	230	200	210
Curtis Landing	180							
Jersey	a 36:a	38		82				
Webb Pump	a 13	11:b	12	16	13:b	13	15	12
Central Landing	a 4	:a	5				6:a	5
Dutch Slough	a 16	:b	14	20	17:a	17	21	20
Bacon Pump	8:b	10:b	11					
Rindge Pump	:a	17:a	18:a	15:a	16:a	15	16	
Middle River P.O.	a 10:a	11:a	12:a	9:a	10	:ab	11:a	11
Mossdale Bridge	a 12:b	10:a	9:a	9:a	6:a	5	6:a	5

Station	OCTOBER 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1600	1640	1660	1680	1580	1450	1660	1640
Point Davis	1320		1360	1340		1120	1320	1340
Bulls Head Point	1060	980	980	1140	930		980	880
Bay Point							480	720
O and A Ferry	370	260:ab	220	265:a	180	220	320	
Innisfail Ferry	620:a	580	500	460	440	420		460
	Sacramento River Delta							
Collinsville	240:a	170	210:a	130:a	100	107	100:a	88
Emmaton							5	6
Three Mile Slough Bridge	17	12	9	8	5	4		
Rio Vista Bridge	3		3	2	2	2	4	3
Sacramento	a 1:a	1:ab	1:a	1:a	1:ab	1:ab	1:a	1
	San Joaquin River Delta							
Antioch	180:a	120	140	160	57	43	64	85
Curtis Landing							25	
Jersey						13	18:a	10
Webb Pump	12:b	10	9	10	8:cd	7	10	8
Central Landing			4					
Dutch Slough	18:a	14	13	13	11		12	
Bacon Pump								7
Rindge Pump	a 11	11	11:a	10:a	10	9	8:a	12
Middle River P.O.				:a	9:a	7		
Mossdale Bridge	b 7:a	4	5	5	5	4	7:a	6

a, b, c, d, e, f, See footnotes last page of this table.

TABLE 72 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS
Samples taken by local observers approximately one and one-half hours after high high tide
Salinity expressed in parts of chlorine per 100,000 parts of water

Station	NOVEMBER 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1600	1600		1520	1540	1420		1540
Point Davis		1240	ab1200	1160	1220	1200	1220	1120
Bulls Head Point		880	1060	880	820	ab 800 a	880	960
Bay Point	640 ab	640				700		530
O and A Ferry	220	290 ab	180	320 a	216	220	200	230
Innisfail Ferry		360	390		380	360	380	
	Sacramento River Delta							
Collinsville	a 90	83 ab	84 a	88	65	85 a	66 a	114
Emmaton	5	4	6		4	2	3 a	3
Rio Vista Bridge	1	3	1	1	1	3		
Sacramento	a 1	1 ab	1 a	1	1 ab	1 a	1 a	1
	San Joaquin River Delta							
Antioch	62	40	77	68	38	60	83	58
Jersey					12	12		
Webb Pump	7	8	6	5	5	7	7	6
Dutch Slough					7		8	7
Rock Slough West of Dam	a 8	5	6	7	6	7	7 a	6
Bacon Pump	7	6	6	5	7	8	6	6
Rock Slough East of Dam		6	6	8	7	7	6 a	8
Rindge Pump	a 10	9	10 a	11	13	12	a	7
Middle River P.O.		9 ab	6 a	4	7	7 a	7	
Mossdale Bridge	b 6	6 ab	6 a	8		5 a	4	2

Station	DECEMBER 2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1560	1620	1680	1520	1520	1540	1600	1480
Point Davis		1280		1120	1160	1180	1260	1120
Bulls Head Point	940	1060	1180	660 a	700	a	800	820
Bay Point			660					
O and A Ferry	260	290	320	290	140	230 a	120 a	160
Innisfail Ferry	390	410	410	420	380	360	360	340
	Sacramento River Delta							
Collinsville	106	113	160 a	56	57		74	56
Emmaton	3	1	6 a	3	3	2	3 a	1
Sacramento	1 ab	1 a	1 a	1	1 ab	1 a	1	1
	San Joaquin River Delta							
Antioch	58		96	22	33	61	61	37
Jersey	6	16		7			6	5
Dutch Slough	6	6	8			10	6	6
Rock Slough West of Dam	7	a	7	7	5	5	5	5
Bacon Pump	ab 7	6	6	9	11	6		
Rock Slough East of Dam	6	7 a	6	6	6	6	5	4
Rindge Pump	7	8 a	9 a	10	10	7 a	6	8
Middle River P.O.	6	12 a	7		7	6 a	5	
Mossdale Bridge	bd 5	3	4 a	4	5	5	2	3

a Low high tide. b Taken on following day. c Taken two days later.
d Over 1 hour off scheduled time. e Taken on preceding day. f Taken 2 days earlier.