WATER PROJECT AUTHORITY

WATER PROJECT AUTHORITY

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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

SACRAMENTO-SAN JOAQUIN
WATER SUPERVISOR'S
REPORT

FOR YEARS

1933 and 1934

JUNE, 1935

22345

CALIFORNIA STATE PRINTING OFFICE

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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

S A C R A M E N T O - S A N J O A Q U I N

W A T E R S U P E R V I S O R ' S

R E P O R T

FOR YEARS

1 9 3 3 AND 1 9 3 4

JUNE, 1935

Page

ACKNOWLEDGMENT viii

ORGANIZATION ix

ADVISORY COMMITTEE x

CHAPTER I

INTRODUCTION 1
Origin and History of Work 1
Objectives and Scope 1
Investigational Work 3
State and Water Users' Cooperative Financing 4
Conservation Features and the 1934 Water Shortage 6

CHAPTER II

MEASUREMENTS OF STREAM FLOW 10

CHAPTER III

MEASUREMENTS OF DIVERSIONS 58

CHAPTER IV

MEASUREMENTS OF RETURN WATER 123
Sacramento Return Waters 123
Return Flow from other than Sacramento River Sources 123
Relation of Sacramento Return Water to Irrigation Draft . . . 123
Draft-Return Water Relation for Particular Sacramento Valley Areas 125
San Joaquin Return Waters 125
Comparative Sacramento and San Joaquin Return Water, 1924 to 1934 127

CHAPTER V

USE OF WATER IN THE SACRAMENTO-SAN JOAQUIN DELTA 177
Cooperative Irrigation Investigations in the Sacramento-San Joaquin Delta in 1933 - By O. V. P. Stout 180

CHAPTER VI

SALINITY INVESTIGATION 195
Purpose 195
Scope 195
Station Maintenance and Records 196
Salinity Bulletins 199
Tide Gages 199

LIST OF TABLES

Table		Page
1.	Comparative Sacramento-San Joaquin Water Supply, 1924 to 1934	6
2.	Discharge of Sacramento River at Kennett-1933	12
3.	Discharge of Sacramento River at Kennett-1934	13
4.	Discharge of Sacramento River near Red Bluff-1933	14
5.	Discharge of Sacramento River near Red Bluff-1934	15
6.	Discharge of Sacramento River at Butte City-1933	16
7.	Discharge of Sacramento River at Butte City-1934	17
8.	Discharge of Sacramento River at Colusa-1933	18
9.	Discharge of Sacramento River at Colusa-1934	19
10.	Discharge of Sacramento River below Wilkins Slough-1933	20
11.	Discharge of Sacramento River below Wilkins Slough-1934	21
12.	Discharge of Sacramento River at Knights Landing-1933	22
13.	Discharge of Sacramento River at Knights Landing-1934	23
14.	Discharge of Sacramento River at Verona-1933	24
15.	Discharge of Sacramento River at Verona-1934	25
16.	Discharge of Sacramento River at Sacramento-1933	26
17.	Discharge of Sacramento River at Sacramento-1934	27
18.	Discharge of Feather River at Nicolaus-1933	28
19.	Discharge of Feather River at Nicolaus-1934	29
20.	Discharge of American River at Sacramento-1933	30
21.	Discharge of American River at Sacramento-1934	31
22.	Discharge of Mokelumne River at Woodbridge-1933	32
23.	Discharge of Mokelumne River at Woodbridge-1934	33
24.	Discharge of San Joaquin River at Delta Bridge-1933	34
25.	Discharge of San Joaquin River at Fremont Bridge-1934	35
26.	Discharge of San Joaquin River near Newman-1933	36
27.	Discharge of San Joaquin River near Newman-1934	37
28.	Discharge of San Joaquin River near Grayson-1933	38
29.	Discharge of San Joaquin River near Grayson-1934	39
30.	Discharge of San Joaquin River near Vernalis-1933	40
31.	Discharge of San Joaquin River near Vernalis-1934	41
32.	Discharge of Merced River at Yosemite Valley Railroad Crossing-1933	42
33.	Discharge of Merced River at Yosemite Valley Railroad Crossing-1934	43
34.	Discharge of Merced River near Mouth-1933	44
35.	Discharge of Merced River near Mouth-1934	45
36.	Discharge of Dry Creek near Modesto-1933	46
37.	Discharge of Dry Creek near Modesto-1934	47
38.	Discharge of Tuolumne River at Roberts Ferry Bridge-1933	48
39.	Discharge of Tuolumne River at Roberts Ferry Bridge-1934	49
40.	Discharge of Tuolumne River at Hickman Bridge-1933	50
41.	Discharge of Tuolumne River at Hickman Bridge-1934	51
42.	Discharge of Tuolumne River at Tuolumne City-1933	52
43.	Discharge of Tuolumne River at Tuolumne City-1934	53
44.	Discharge of Stanislaus River at Orange Blossom Bridge-1933	54
45.	Discharge of Stanislaus River at Orange Blossom Bridge-1934	55
46.	Discharge of Stanislaus River at Hatmark Ranch-1933	56
47.	Discharge of Stanislaus River at Hatmark Ranch-1934	57
48.	Diversions, Acreage Irrigated and Gross Seasonal Duty of Water in the Sacramento-San Joaquin Area, 1933	60

LIST OF TABLES

Table		Page
49.	Diversions, Acreage Irrigated and Gross Seasonal Duty of Water in the Sacramento-San Joaquin Area-1934	61
50.	Summary of Sacramento River Diversions-1933	62
51.	Summary of Sacramento River Diversions-1934	62
52.	Sacramento River Diversions-1933	63
53.	Sacramento River Diversions-1934	73
54.	Colusa Trough Diversions-1933	83
55.	Colusa Trough Diversions-1934	84
56.	Back Borrow Pit Diversions-1933	85
57.	Back Borrow Pit Diversions-1934	86
58.	Lower Butte Creek and Butte Slough Diversions-1933	87
59.	Lower Butte Creek and Butte Slough Diversions-1934	89
60.	By-Pass and Drainage Channel Diversions-1933	91
61.	By-Pass and Drainage Channel Diversions-1934	93
62.	Feather River Diversions-1933	96
63.	Feather River Diversions-1934	98
64.	Yuba River Diversions-1933	100
65.	Yuba River Diversions-1934	101
66.	American River Diversions-1933	102
67.	American River Diversions-1934	103
68.	Delta Uplands Diversions from Cache Slough-1933	104
69.	Delta Uplands Diversions from Cache Slough-1934	104
70.	Delta Uplands Diversions from Old San Joaquin River-1933	105
71.	Delta Uplands Diversions from Old San Joaquin River-1934	106
72.	Delta Uplands Diversions from Tom Paine Slough-1933	107
73.	Delta Uplands Diversions from Tom Paine Slough-1934	108
74.	Delta Uplands Diversions from San Joaquin River-1933	109
75.	Delta Uplands Diversions from San Joaquin River-1934	111
76.	San Joaquin River Diversions-1933	113
77.	San Joaquin River Diversions-1934	114
78.	Merced River Diversions-1933	115
79.	Merced River Diversions-1934	117
80.	Tuolumne River Diversions-1933	119
81.	Tuolumne River Diversions-1934	120
82.	Stanislaus River Diversions-1933	121
83.	Stanislaus River Diversions-1934	122
84.	Sacramento and San Joaquin Return Water Percentages, 1924-1934.	130
85.	Water Discharged to the Sacramento River above Sacramento as Measured at Definite Return Channels-1933	133
86.	Water Discharged to the Sacramento River above Sacramento as Measured at Definite Return Channels-1934	133
87.	Relation between Return Water and Draft, Sacramento River, Red Bluff to Sacramento, June to September, 1933 (Using only Return Water which Entered through Definite Return Channels).	134
88.	Relation between Return Water and Draft, Sacramento River, Red Bluff to Sacramento, June to September, 1933 (Including all Accretions)	135
88-A.	Relation between Return Water and Draft, Sacramento River, Red Bluff to Sacramento, July to September, 1933 (Including all Accretions)	136

LIST OF TABLES

Table		Page
89.	Relation between Return Water and Draft, Sacramento River, Red Bluff to Sacramento, June to September, 1934 (Using only Return Water which enters through Definite Return Channels).	137
90.	Relation between Return Water and Draft, Sacramento River, Red Bluff to Sacramento, June to September, 1934 (Including all Accretions)	138
91.	Relation between Return Water in Colusa Trough at Colusa-Williams Highway and the Diversions from which the Return Water was Derived - 1933	139
92.	Relation between the Return Water in Colusa Trough at Colusa-Williams Highway and the Diversions from which the Return Water was Derived-1934	140
93.	Relation between Return Water and Diversions-Reclamation District 108 - 1933 and 1934	141
94.	Relation between Return Water and Diversions-Reclamation District 1500 - 1933 and 1934	141
95.	Return Flow in San Joaquin Valley Streams-1933	142
96.	Return Flow in San Joaquin Valley Streams-1934	145
97.	Comparison of Diversions and Return Water, San Joaquin Valley-1933	146
98.	Comparison of Diversions and Return Water, San Joaquin Valley-1934	147
99.	Discharge of Colusa Trough at Colusa-Williams Highway-1933	148
100.	Discharge of Colusa Trough at Colusa-Williams Highway-1934	149
101.	Discharge of Butte Slough-1933	150
102.	Discharge of Butte Slough-1934	151
103.	Discharge of Reclamation District 70 Drain-1933	152
104.	Discharge of Reclamation District 70 Drain-1934	153
105.	Discharge of Reclamation District 108 Drain at Rough and Ready Bend-1933	154
106.	Discharge of Reclamation District 108 Drain at Rough and Ready Bend-1934	155
107.	Discharge of Reclamation District 108 Drain on Back Borrow Pit-1933	156
108.	Discharge of Reclamation District 108 Drain on Back Borrow Pit-1934	157
109.	Discharge of Colusa Basin Drainage at Knights Landing-1933	158
110.	Discharge of Colusa Basin Drainage at Knights Landing-1934	159
111.	Discharge of Sacramento Slough-1933	160
112.	Discharge of Sacramento Slough-1934	161
113.	Discharge of Reclamation District 1500 Drain-1933	162
114.	Discharge of Reclamation District 1500 Drain-1934	163
115.	Discharge of Sutter By-Pass - East Borrow Pit (Willow Slough at Chandler)-1933	164
116.	Discharge of Sutter By-Pass - East Borrow Pit (Willow Slough at Chandler)-1934	165
117.	Discharge of Sutter By-Pass - West Borrow Pit Opposite Gelshauser Slough-1933	166
118.	Discharge of Sutter By-Pass - West Borrow Pit Opposite Gelshauser Slough-1934	167

LIST OF TABLES

Table		Page
119.	Discharge of Sutter By-Pass - West Borrow Pit 1.4 Miles above R. D. 1500 Drainage Plant-1934	168
120.	Discharge of Knights Landing Ridge Cut at West Line of Yolo By-Pass-1933	169
121.	Discharge of Knights Landing Ridge Cut at West Line of Yolo By-Pass-1934	170
122.	Discharge of Yolo By-Pass - East Borrow Pit (Tule Canal)-1933.	171
123.	Discharge of Yolo By-Pass - East Borrow Pit (Tule Canal)-1934.	172
124.	Discharge of Reclamation District 1000 Drain (2nd Bannon Slough)-1933	173
125.	Discharge of Reclamation District 1000 Drain (2nd Bannon Slough)-1934	174
126.	Discharge of Back Borrow Pit Reclamation District 1000-1933	175
127.	Discharge of Back Borrow Pit Reclamation District 1000-1934	176
128.	Consumptive Use of Water in the Sacramento-San Joaquin Delta 1924-1932	178
129.	Use of Water by Cattails and Tules grown in Tanks at Camp 3, King Island, 1933	183
130.	Use of Water by and Yields of Dock Grown in Tanks at King Island, 1933	186
131.	Use of Water by and Yields of Western Goldenrod (Solidago Occidentalis)Grown in Tanks at King Island, 1933	186
132.	Use of Water by and Yields of Barley and Mustard Grown in Tanks at King Island, 1933	188
133.	Use of Water by and Yields of Kelp Grown in Tanks at King Island, 1932-33	188
134.	Use of Water by and Yields of Lambs' Quarters (Chenopodium Album) Grown in Tanks at King Island, 1933	189
135.	Use of Water by and Yields of Nut-Grass (Cyperus Esculentus) Grown in Tanks at King Island, 1933	189
136.	Use of Water by Volunteer Weeds Grown in Tanks at King Island, 1933	191
137.	Use of Water by and Yields of Nettles (Urtica Gracilis Var.) Grown in Tanks at King Island, 1933	191
138.	Use of Water, Weight of Tops and Yield of Spears, Asparagus Tanks, Richmond-Chase Tract, Near Terminous, 1933	192
139.	Average use of Water by and Average Yields of Asparagus Grown in Tanks, Richmond-Chase Tract, 1927 to 1933, Inclusive	193
140.	Rainfall at Delta Stations in 1933	194
141.	Maximum Recorded Salinity at Bay and Delta Stations 1924 to 1934, Inclusive	203
142.	Salinity Stations at which Observations were taken during 1933 and 1934	205
143.	Salinity Observations, Sacramento-San Joaquin Delta and Upper Bays, 1933	207
144.	Salinity Observations, Sacramento-San Joaquin Delta and Upper Bays, 1934	218

LIST OF PLATES

Plate		Page
1.	Draft and Return Flow, Sacramento River, Red Bluff, to Sacramento, June to September, Inclusive, 1934	131
2.	San Joaquin River Return Flow, June to October, Inclusive, 1934.	143
3.	Maximum Seasonal Salinity Encroachment of 100 parts of chlorine per 100,000 parts of water, Sacramento-San Joaquin Delta, 1920-1934	197
4.	Comparison of River Discharge and Salinity at Bay and Delta Stations	201

ACKNOWLEDGMENT

In the conduct of the investigations of the Sacramento-San Joaquin Water Supervisor, much valuable assistance has been rendered by many individuals and public and private agencies.

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 extended by Federal agencies has included that of the Water Resources Branch of the Geological Survey, U. S. Department of Interior; the Division of Irrigation of the Bureau of Agricultural Engineering, U. S. Department of Agriculture; and the Sacramento District Engineer Office, South Pacific Division, Corps of Army Engineers, U. S. War Department.

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

ORGANIZATION

Earl Lee Kelly - - - - - - - - - - - - Director of Public Works
Edward Hyatt - - - - - - - - - - - - - - - - - - State Engineer

- - O - -

Harold Conkling - - - - - - Deputy in charge of Water Rights

Harlowe M. Stafford
Sacramento-San Joaquin Water Supervisor

Principal Assistant

Martin H. Blote - - - - - - - - Associate Hydraulic Engineer

Field and Office Assistant

Arthur M. Baker - - - - - - Junior Clerk and Engineering Aid

Assistance on Compilation of Report by

Harrison Smitherum - - - - - - - - Senior Hydraulic Engineer

and

State Emergency Relief Administration Workers
(Project No. 35-F2-80)

- - O - -

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 Supervisor Work.

Herbert E. White, Chairman, Sacramento

E. L. Adams, Chico
A. E. Anderson, San Francisco
Alden Anderson, Sacramento
G. A. Atherton, Stockton
P. M. Downing, San Francisco
William Durbrow, Grass Valley
Manly S. Harris, San Francisco
W. I. Hechtman, Sherman Island
Warren H. McBryde, San Francisco
R. V. Meikle, Turlock
Jesse Poundstone, Grimes
F. T. Robson, Vina

CHAPTER I

INTRODUCTION

The purpose of this report is to make of record the measurements made and data collected through the office of the Sacramento-San Joaquin Water Supervisor during the years 1933 and 1934.

Origin and History of Work

This 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 Bienniel 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. Tne latter Bulletin brings together all data and measurements obtained by the Water Supervisor in the five year period, 1924 to 1928, inclusive. The reports for subsequent years are mimeographed as the present report.

Objectives and Scope

The work of this office is a measure of relief in the difficulties attendant upon water supply conditions and tne use of water throughout the Sacramento-San Joaquin territory, particularly on tne Sacramento River and in tne Delta Region. The situation involves the major problem of satisfying the water requirements for irrigation in both tne 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 eleven years, each one of these

requirements has exceeded the available Summer flow in the rivers. Pending ultimate relief through the development of reservoir storage this situation has been met through a provisional administration of stream flow and diversions, by the Sacramento-San Joaquin Water Supervisor. 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 Water Supervisor is, concurrently with the provisional stream administration, conducting 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 Water Supervisor working in cooperation with the Permanent Committee of the Sacramento-San Joaquin River Problems Conference, has been able to effect conservation measures and regulation which have been highly successful in tiding over the critical situations of these seasons. Up-River areas are patrolled and waste eliminated, close check is kept of river flow, diversions and the advance of salinity into the Delta, and when salinity of dangerous degree threatens, bulletins giving the results of all tests throughout the Delta are 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 inter-

the Bureau of Agricultural Engineering; U. S. Department of Agriculture; 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. In the last two seasons it has been necessary to omit the census of irrigated crops and water consuming areas in the Delta, as conducted in previous years.

State and Water Users' Cooperative Financing

When the Water Supervisor 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 Water Supervisor 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

ests 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 Water Supervisor 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 and the Water Supervisor 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 biennium 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; some further studies (closed at the end of the 1933 season) of the consumptive use of water in the Sacramento-San Joaquin Delta in cooperation with the Division of Irrigation of

there were provided therefore, sufficient funds to complete the 1934 field work and the compilation and publication of the 1933 and 1934 reports.

Conservation Features and the 1934 Water Shortage

A comparison of the run-off and water supply conditions of the 1933 and 1934 seasons with those of previous seasons in which the work of the Water Supervisor has been conducted, is indicated in Table 1.

TABLE 1

COMPARATIVE SACRAMENTO-SAN JOAQUIN WATER SUPPLY, 1924 TO 1934

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

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

** Based on measured run-off - Natural flow was not compiled.

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 Water Supervisor 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

the Water Supervisor work, the water users had been informed of the pending water shortage and warned of the necessity of taking this into account in planning for the season. Later, letters were addressed to all water users advising of the control measures to be taken and urging the utmost conservation. A letter was also sent to the water users by the District Engineer for the U. S. War Department, advising that only through complete cooperation upon the part of the water users with the measures adopted by the Permanent Committee and the Division of Water Resources through the Water Supervisor, the reduction of diversions to the minimum actually necessary and the elimination of all wastage, would the War Department be constrained to forego drastic measures to reduce irrigation diversions in order to protect the interests of navigation. On all of the larger projects, Conservation Officers were appointed to cooperate with the Water Supervisor in the detection and prevention of waste and the rule was established to cut diversions by the amount of waste.

Throughout the critical period of July and August, detailed inspections of the use of water were made by the Water Supervisor's office in cooperation with the Conservation Officers and full cooperation was given by the water users to cut down waste and spill in order that the river diversions might be correspondingly reduced. By the latter part of July more than fifty stations had been established throughout the Delta to carry on regular sampling of the water for salinity testing and in the period from July to October, weekly bulletins giving the results of the tests were sent out to a list of more than two hundred Delta water users in order that they might be advised as to the encroachment of salinity dangerous to irrigation.

While the situation in the Sacramento-San Joaquin territory in the 1934 season was not as critical as that of 1931 when the lowest stream flow of record occurred, the requirement for a great deal of activity on the part of the Water Supervisor in the way of conservation and administration of the stream flow, was urgent. The previous season most similar to 1934 with respect to water supply conditions was 1924 and although the seasonal run-off in per cent of normal as shown in Table 1 was only 28 per cent in that year as compared to 40 per cent in 1934, it is to be noted that in the latter year the Sacramento River at Red Bluff reached the lowest flow of record, even lower than in 1931. Also the rice acreage served from the Sacramento River and its tributaries in 1934 exceeded that of 1924. Since rice is such a large consumer of water, the extent of the rice acreage is a considerable factor in the water supply situation. This is indicated in Table 1, where the variation of minimum river flow with seasonal run-off in per cent of normal clearly requires the additional explanation offered by the rice acreage figures. The minimum river flow at Red Bluff appears to reflect the cumulative effect of many dry seasons and with the succession of subnormal years since 1927, its steady and material decline is very marked.

By April 1934, it was clearly evident that a drastic program of conservation and river administration would be necessary, and at two meetings of the Permanent Committee of the Sacramento-San Joaquin River Problems Conference and representatives of the Division of Water Resources and the U. S. War Department, held in the latter part of April, plans were made to carry out such a program. In connection with previous letters sent out by the Permanent Committee soliciting subscriptions to carry on

CHAPTER II

MEASUREMENTS OF STREAM FLOW

During the irrigation seasons of 1933 and 1934, 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 H Street Bridge, Sacramento; on the Mokelumne River at Woodbridge, and on the San Joaquin River near Newman and Vernalis.

Supplementing the above cooperative stations, the Water Supervisor maintained stations on Lower Butte Creek and Slough, and in connection with the San Joaquin return water measurements (See Chapter IV), 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, 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

With the close of the season the records showed an encroachment of salinity into the Delta corresponding very closely to but not quite as far reaching as that of 1924, and the minimum combined flow to the Delta of the Sacramento and San Joaquin rivers exceeded that of 1924 by 300 second-feet. Faced with these facts and a probable crop loss due to salinity in the Delta, nearly as great as that of 1924, it may seem that little was accomplished by the strenuous efforts put forth. When viewed, however, from the standpoint of what the situation might have been without these efforts, with no recognition by the water users of the need for conservation and no concerted action for waste prevention, the results are more encouraging. In the evidence by the water users of their desire to cooperate and to put forth every possible effort to conserve water the War Department was constrained to waive severe action in the protection of navigation with which it is charged and was supported in assuming a course which took cognizance of the needs of irrigation. Likewise in the getting together of the water users on this cooperative endeavor, there was the very material benefit in the deterrent to and prevention of expensive and widespread litigation.

TABLE 2

DISCHARGE OF SACRAMENTO RIVER AT KENNETT-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	5360	12000	7420	6840	3420	2760	2560	2560
2	10700	11500	7420	6460	3300	2710	2560	2520
3	15900	11700	6840	6080	3300	2710	2520	2520
4	10100	12500	6460	5720	3190	2660	2560	2560
5	8220	11200	6460	5540	3190	2660	2560	2610
6	7220	10300	6080	5540	3190	2660	2610	2610
7	7220	9900	7030	5540	3190	2710	2660	2610
8	8020	9050	6840	5540	3190	2710	2610	2560
9	8630	8220	6650	5540	3190	2710	2610	2610
10	7820	7620	6650	5360	3190	2710	2610	2610
11	7820	7220	6840	5180	3080	2710	2610	2660
12	15900	7030	7030	5180	3080	2660	2560	2660
13	16500	7030	6650	5000	3080	2660	2560	2660
14	13500	7030	6460	4670	3080	2660	2610	2610
15	13000	7420	6270	4670	2970	2660	2610	2560
16	28700	7820	7030	4510	2970	2660	2660	2560
17	21300	7030	7420	4360	2970	2660	2660	2610
18	15100	6650	7420	4210	2970	2660	2610	2660
19	12200	6270	7220	3930	2920	2660	2560	2660
20	11700	6270	7220	3800	2860	2660	2610	2660
21	11000	6270	6650	3800	2860	2660	2610	2660
22	10100	6460	6650	3670	2860	2660	2610	2610
23	9470	6650	6650	3540	2860	2660	2610	2610
24	8630	7220	6460	3670	2860	2560	2660	2610
25	8420	7420	6650	3540	2810	2560	2860	2610
26	9050	7030	7030	3540	2810	2560	2860	2660
27	19100	7030	7030	3420	2760	2610	2860	2660
28	35500	7420	7030	3420	2760	2610	2760	2610
29	20100	7820	7220	3420	2760	2610	2660	3190
30	14800	7030	7420	3420	2760	2610	2610	4830
31	12700		7220		2760	2560		4670
Mean	13000	8140	6880	4640	3010	2660	2630	2770
Ac.Ft. for Month	799000	484000	423000	276000	185000	164000	156000	170000

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.

at a station below the City of Sacramento Intake. Because of tidal action, a gaging station at this point is not feasible. 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 (Tables 88 and 90) 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 12

DISCHARGE OF SACRAMENTO RIVER AT KNIGHTS LANDING-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	7390	7750	2380	1020	1370	3110
2	8020	7840	2330	980	1420	2990
3	7660	7750	2280	1000	1500	2930
4	8290	7300	2230	960	1500	2930
5	8110	6760	2130	960	1500	2870
6	7300	6240	2080	980	1460	2750
7	6940	5840	1980	1000	1550	2750
8	6580	5840	1930	1020	1730	2750
9	6940	5680	1930	1020	1880	2700
10	7300	5600	1880	980	1830	2700
11	7300	5760	1830	960	1880	2700
12	7210	5520	1780	960	1980	2700
13	7390	5280	1680	960	2030	2700
14	7570	5280	1640	1000	2080	2700
15	7210	5120	1550	1020	2080	2700
16	6760	4830	1550	980	2080	2640
17	6670	4550	1500	960	2230	2640
18	6760	4340	1460	940	2330	2530
19	7120	4200	1370	920	2330	2530
20	7750	3990	1320	940	2330	2580
21	7840	3650	1280	980	2380	2580
22	7480	3470	1190	980	2480	2580
23	7120	3290	1190	980	2530	2580
24	7030	3110	1190	1000	2640	2580
25	6850	2990	1100	1020	2750	2640
26	6490	2870	1080	1040	2810	2640
27	6490	2700	1080	1040	2870	2640
28	6850	2640	1080	1060	2990	2580
29	7030	2530	1040	1100	3110	2640
30	7030	2380	1040	1190	3230	2750
31	7480		1040	1280		3110
Mean	7220	4840	1590	1010	2160	2720
Ac.Ft. for Month	444000	288000	97800	62100	129000	167000

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.

TABLE 11

DISCHARGE OF SACRAMENTO RIVER BELOW WILKINS SLOUGH-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	4600	3060	1250	710	920	2500
2	4550	3120	1250	728	920	2500
3	5600	3230	1250	710	955	2500
4	5860	3010	1160	728	920	2500
5	5320	2800	1100	745	920	2450
6	4900	2600	1060	745	955	2400
7	4620	2350	1060	728	990	2300
8	4500	2500	1060	728	1100	2350
9	4180	2750	1060	675	1160	2500
10	4180	2600	1020	675	1130	2550
11	4060	2450	1060	675	1160	2600
12	3820	2350	1060	692	1320	2550
13	3400	2350	1020	692	1520	2500
14	3180	2210	1020	640	1640	2500
15	3060	2120	990	640	1720	2500
16	2800	2080	955	658	1760	2500
17	2700	1980	885	658	1760	2500
18	2600	1900	902	658	1800	2550
19	2500	1720	868	675	1900	2650
20	2750	1650	850	658	1980	2750
21	2600	1600	832	640	2030	2800
22	2450	1500	868	675	2120	2800
23	2400	1400	868	675	2160	2850
24	2350	1350	798	675	2260	3280
25	2300	1300	780	675	2300	3400
26	2210	1250	780	710	2400	3280
27	2210	1200	762	728	2450	3180
28	2300	1150	762	798	2450	3120
29	2400	1150	798	850	2500	3010
30	2500	1200	798	850	2500	3010
31	2550		710	868		3010
Mean	3400	2060	956	708	1660	2710
Ac.Ft. for Month	209000	123000	58800	43500	98800	167000

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.

TABLE 10

DISCHARGE OF SACRAMENTO RIVER BELOW WILKINS SLOUGH-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	7800	6940	2200	805	960	2870
2	8100	7030	2160	805	940	2770
3	7800	7030	2110	788	980	2770
4	8700	6670	2030	805	980	2770
5	7900	6400	1950	805	980	2720
6	7120	5820	1870	822	1000	2670
7	7030	5340	1830	840	1080	2620
8	6850	5040	1790	788	1120	2670
9	7500	5040	1710	752	1240	2670
10	7900	4970	1630	752	1360	2670
11	7500	4970	1590	752	1440	2670
12	7300	4970	1550	735	1520	2670
13	7210	4830	1440	752	1600	2670
14	7030	4620	1400	752	1640	2720
15	7030	4410	1340	735	1640	2770
16	6760	4270	1300	700	1780	2770
17	6580	4020	1300	700	1870	2720
18	6760	3900	1230	700	1920	2670
19	7120	3840	1200	718	1970	2670
20	7700	3600	1160	718	1970	2720
21	7400	3310	1090	718	2120	2770
22	7210	3110	1060	735	2220	2770
23	6850	2910	1060	718	2320	2770
24	6670	2760	985	700	2420	2770
25	6490	2610	955	735	2520	2770
26	6220	2560	985	718	2620	2720
27	6220	2470	955	718	2670	2670
28	6490	2380	920	770	2870	2670
29	6670	2290	900	805	2920	2720
30	6490	2200	900	900	2920	2820
31	6580		880	960		3020
Mean	7130	4340	1400	765	1790	2730
Ac.Ft. for Month	438000	258000	86100	47000	107000	168000

NOTE: This station is maintained seasonally under Federal-State cooperation by the Water Resources Branch of 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.

TABLE 9

DISCHARGE OF SACRAMENTO RIVER AT COLUSA-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	5230	3700	2040	1420	1450	2420
2	5830	3790	1970	1420	1450	2420
3	6930	3700	1900	1420	1420	2340
4	6430	3430	1900	1420	1420	2340
5	5930	3340	1900	1420	1400	2340
6	5630	3250	1830	1420	1420	2260
7	5330	3250	1830	1420	1510	2260
8	5140	3430	1800	1400	1540	2420
9	4960	3520	1800	1370	1510	2580
10	4960	3340	1760	1370	1510	2580
11	4780	3160	1760	1370	1580	2580
12	4600	3070	1730	1370	1760	2580
13	4330	2980	1700	1340	1800	2580
14	4150	2810	1670	1340	1870	2580
15	4060	2730	1640	1340	1870	2500
16	3880	2650	1570	1340	1870	2580
17	3700	2650	1570	1340	1940	2580
18	3520	2570	1570	1340	2020	2660
19	3610	2490	1570	1340	2020	2820
20	3700	2410	1540	1340	2100	2900
21	3520	2340	1540	1340	2100	2820
22	3430	2260	1540	1320	2100	2820
23	3340	2180	1510	1320	2180	3140
24	3250	2180	1510	1320	2180	3540
25	3250	2110	1510	1320	2260	3300
26	3250	2110	1510	1320	2340	3220
27	3250	2110	1480	1370	2340	3140
28	3340	2110	1480	1400	2420	3060
29	3520	2110	1510	1400	2420	3060
30	3520	2110	1480	1400	2420	2980
31	3520		1450	1420		3060
Mean	4320	2800	1660	1370	1870	2720
Ac.Ft. for Month	266000	167000	102000	84200	111000	167000

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.

TABLE 8

DISCHARGE OF SACRAMENTO RIVER AT COLUSA-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	8420	7870	2970	1530	1500	2680
2	8090	7760	2890	1500	1500	2590
3	8750	7340	2810	1500	1500	2590
4	8640	6940	2810	1530	1460	2590
5	7760	6440	2730	1500	1460	2510
6	7340	6140	2650	1500	1530	2510
7	7140	5840	2570	1500	1530	2510
8	7240	5840	2490	1460	1530	2510
9	7980	5840	2410	1420	1570	2590
10	7760	5740	2410	1460	1640	2590
11	7540	5740	2330	1420	1720	2590
12	7440	5640	2330	1420	1800	2590
13	7340	5540	2250	1420	1870	2590
14	7300	5340	2170	1420	1840	2590
15	7200	5140	2100	1350	1880	2590
16	7100	4940	2060	1380	1950	2590
17	7100	4670	1980	1380	2030	2510
18	7400	4490	1940	1380	2070	2510
19	7980	4310	1910	1350	2150	2590
20	8090	4130	1870	1350	2190	2590
21	7650	3860	1830	1350	2270	2590
22	7440	3690	1760	1350	2270	2590
23	7140	3530	1720	1350	2350	2680
24	6940	3370	1720	1380	2430	2680
25	6840	3290	1720	1350	2510	2590
26	6840	3290	1720	1350	2510	2590
27	7040	3210	1680	1380	2770	2590
28	7240	3130	1610	1420	2860	2590
29	7440	3050	1610	1460	2860	2680
30	7540	2970	1610	1500	2770	2770
31	7870		1570	1500		3510
Mean	7540	4970	2140	1420	2010	2620
Ac.Ft. for Month	464000	296000	132000	87300	120000	161000

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.

TABLE 7

DISCHARGE OF SACRAMENTO RIVER AT BUTTE CITY-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	5040	3600	1880	1370	1420	2430
2	6580	3680	1820	1350	1400	2430
3	6800	3440	1820	1360	1380	2430
4	6360	3280	1760	1360	1360	2430
5	5740	3120	1760	1370	1380	2290
6	5440	3040	1760	1380	1460	2290
7	5140	3200	1700	1370	1530	2290
8	5040	3360	1700	1340	1480	2500
9	4850	3360	1700	1350	1420	2580
10	4850	3120	1640	1350	1460	2660
11	4580	2960	1640	1340	1610	2660
12	4310	2880	1620	1330	1700	2580
13	4040	2800	1600	1310	1820	2580
14	3950	2660	1530	1320	1820	2580
15	3770	2660	1510	1320	1820	2580
16	3600	2580	1440	1320	1820	2580
17	3440	2430	1480	1310	1940	2660
18	3360	2360	1430	1320	1940	2800
19	3440	2290	1430	1320	2010	2960
20	3440	2220	1430	1330	2080	2960
21	3200	2150	1460	1350	2080	2880
22	3200	2150	1480	1340	2080	2960
23	3120	2080	1440	1310	2150	3680
24	3040	2010	1440	1290	2150	3680
25	2960	1940	1440	1290	2290	3440
26	2960	1940	1420	1320	2360	3280
27	3120	1940	1430	1350	2430	3200
28	3360	2010	1420	1380	2430	3120
29	3440	2010	1420	1380	2430	3120
30	3360	1940	1370	1380	2430	3040
31	3520		1380	1420		3200
Mean	4160	2640	1560	1340	1860	2800
Ac.Ft. for Month	256000	157000	95900	82400	111000	172000

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.

TABLE 6

DISCHARGE OF SACRAMENTO RIVER AT BUTTE CITY-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	8440	8200	2880	1520	1520	2580
2	8200	7720	2800	1500	1520	2580
3	9460	7240	2730	1500	1510	2580
4	8200	6800	2660	1520	1500	2500
5	7720	6580	2580	1510	1510	2500
6	7480	6140	2500	1510	1530	2500
7	7240	5940	2430	1460	1520	2500
8	7960	5940	2360	1430	1550	2500
9	8200	5940	2290	1430	1580	2500
10	7960	5940	2290	1420	1640	2500
11	7720	5740	2220	1420	1760	2500
12	7720	5740	2150	1420	1820	2580
13	7720	5640	2080	1410	1820	2580
14	7480	5440	2010	1390	1820	2660
15	7240	5240	2010	1360	1880	2660
16	7240	4940	1940	1380	2010	2500
17	7480	4760	1880	1390	2080	2500
18	7720	4580	1820	1370	2080	2500
19	8680	4310	1820	1350	2220	2580
20	8200	4130	1760	1360	2220	2660
21	7960	3860	1700	1360	2220	2660
22	7720	3600	1700	1360	2290	2660
23	7240	3440	1640	1400	2360	2660
24	7240	3360	1640	1410	2500	2660
25	7020	3280	1640	1400	2500	2660
26	7020	3200	1640	1400	2580	2660
27	7240	3120	1620	1410	2800	2660
28	7480	3040	1610	1480	2880	2660
29	7720	2960	1580	1510	2800	2730
30	7960	2960	1560	1530	2730	2960
31	8200		1570	1530		4850
Mean	7770	4990	2040	1430	2020	2670
Ac.Ft. for Month	478000	297000	125000	87900	120000	164000

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.

TABLE 5

DISCHARGE OF SACRAMENTO RIVER NEAR RED BLUFF-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	18600	11500	8050	4460	3020	2620	2550	2620
2	15200	10300	7780	4160	3020	2620	2480	2620
3	13500	9430	6980	4070	3020	2620	2550	2550
4	12500	8590	6470	3880	3020	2620	2550	2550
5	11500	8050	6100	3790	2940	2620	2620	2480
6	10900	7780	5860	3980	2940	2620	2620	2550
7	10300	7240	5640	4260	2860	2620	2550	2780
8	9430	7240	5520	4160	2860	2620	2480	2860
9	9150	6980	5520	3880	2860	2620	2480	2860
10	8590	6720	5300	3700	2860	2550	2400	2860
11	8320	6470	5080	3610	2860	2550	2480	2780
12	8050	6220	4870	3610	2860	2550	2550	2780
13	7780	5980	4760	3520	2860	2550	2480	2700
14	7510	5980	4560	3520	2860	2550	2480	2700
15	7510	5860	4360	3520	2780	2550	2480	2700
16	7510	5860	4260	3440	2780	2550	2480	2780
17	7240	5750	4160	3350	2780	2550	2480	2940
18	6980	5640	4460	3260	2780	2550	2550	3100
19	6980	5410	4160	3260	2780	2550	2550	2940
20	6720	5300	4070	3180	2700	2550	2550	2860
21	6470	5080	4070	3180	2700	2550	2480	3100
22	6470	5080	3980	3180	2700	2550	2480	4070
23	6470	6720	3880	3100	2700	2550	2550	3610
24	6220	10300	3790	3100	2700	2480	2700	3350
25	6220	9720	3880	3100	2700	2550	2700	3260
26	6470	7780	3980	3020	2700	2550	2700	3180
27	6340	6720	4260	3180	2700	2550	2700	3100
28	11500	6220	4160	3180	2700	2550	2620	3100
29	23600	5640	4160	3100	2620	2620	2620	3100
30	17000	5640	4260	3020	2620	2620	2620	3100
31	13500		4360		2620	2620		5150
Mean	9820	7040	4930	3530	2800	2570	2550	3004
Ac.Ft. for Month	604000	419000	303000	210000	172000	158000	152000	184700

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 NEAR RED BLUFF-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	6340	16600	8340	8340	3880	2780	2620	2780
2	8920	15400	10500	8060	3700	2860	2620	2780
3	23000	15000	8920	7510	3700	2780	2620	2700
4	15800	15800	8060	6980	3610	2780	2700	2700
5	11400	15400	7780	6720	3520	2780	2700	2700
6	9830	13900	7510	6340	3440	2700	2700	2700
7	8920	13200	8340	6340	3440	2700	2700	2700
8	9520	12100	8920	6340	3440	2780	2700	2700
9	10500	10800	8340	6220	3440	2780	2700	2780
10	10100	9830	8060	6100	3440	2780	2700	2780
11	9520	9220	8060	5860	3350	2780	2700	2780
12	12800	8630	8060	5750	3260	2780	2700	2780
13	25300	8630	8060	5520	3260	2700	2700	2860
14	19500	8340	7510	5750	3180	2700	2700	2860
15	17000	8340	7510	5640	3180	2700	2700	2780
16	30000	8920	7780	5410	3100	2700	2700	2700
17	39800	8920	8340	5300	3100	2700	2700	2700
18	24800	8060	9520	4980	3100	2700	2780	2780
19	18300	7780	8920	4760	3020	2700	2700	2860
20	16200	7510	8340	4560	3020	2620	2700	2780
21	15000	7240	8340	4360	3020	2620	2700	2860
22	13900	7240	7780	4260	3020	2620	2780	2860
23	12500	7510	7780	4160	2940	2620	2780	2860
24	11400	8060	7510	4160	2940	2620	2780	2780
25	10500	8630	7510	4070	2940	2620	2940	2780
26	13200	8630	7780	4070	2860	2620	3100	2780
27	13200	8060	8060	3980	2860	2620	3100	2860
28	44800	8340	8060	3880	2860	2700	3020	2860
29	35600	8920	8340	3880	2860	2700	2940	2940
30	23500	9220	8340	3880	2780	2700	2860	5680
31	18700		8630		2780	2700		6870
Mean	17400	10100	8230	5440	3190	2710	2760	3010
Ac.Ft. for Month	1070000	601000	506000	324000	196000	167000	164000	185000

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 3

DISCHARGE OF SACRAMENTO RIVER AT KENNETT-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	12000	8220	6840	3540	2810	2500	2500	2520
2	10100	7420	5900	3540	2860	2500	2500	2470
3	9470	6840	5360	3300	2810	2500	2500	2380
4	8840	6460	5000	3300	2810	2500	2550	2340
5	8630	6270	4830	3300	2810	2500	2500	2380
6	8220	5900	4670	3420	2760	2520	2500	2520
7	7620	5900	4510	3420	2660	2520	2420	2660
8	7030	5720	4510	3420	2660	2520	2420	2660
9	6840	5540	4360	3300	2710	2470	2380	2560
10	6650	5540	4210	3300	2710	2470	2380	2560
11	6270	5360	4210	3190	2710	2420	2470	2560
12	6080	5180	4070	3190	2710	2420	2470	2560
13	6080	5000	3930	3190	2660	2470	2470	2560
14	5900	5000	3800	3080	2610	2420	2420	2520
15	5900	4830	3800	3080	2660	2420	2420	2520
16	5900	4830	3670	3080	2610	2470	2470	2520
17	5720	4830	3670	2970	2660	2470	2470	2760
18	5540	4670	3670	2970	2660	2520	2520	2610
19	5540	4510	3670	2970	2660	2470	2520	2520
20	5360	4360	3670	2920	2610	2470	2470	2520
21	5360	4210	3540	2970	2560	2470	2470	2920
22	5360	4360	3540	2920	2600	2420	2420	3300
23	5180	5540	3420	2920	2550	2420	2520	2860
24	5000	7030	3420	2920	2550	2500	2560	2710
25	5360	5900	3420	2810	2600	2500	2560	2660
26	5180	5180	3420	2970	2600	2450	2560	2660
27	5900	4830	3540	2970	2500	2450	2520	2610
28	13200	4510	3540	2970	2500	2450	2520	2610
29	14500	4210	3540	2860	2500	2500	2520	2610
30	10800	5000	3670	2860	2500	2500	2520	2660
31	9260		3540		2500	2500		3420
Mean	7380	5440	4090	3120	2650	2470	2480	2636
Ac. Ft. for Month	454000	324000	251000	186000	163000	152000	148000	162100

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 13

DISCHARGE OF SACRAMENTO RIVER AT KNIGHTS LANDING-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	5000	3400	1240	805	1100	2600
2	4900	3470	1290	780	1100	2540
3	6000	3470	1290	755	1100	2480
4	6250	3470	1180	730	1100	2540
5	5970	3340	1180	755	1070	2540
6	5620	3210	1100	805	1070	2480
7	5270	3020	1020	805	1100	2360
8	4920	2960	1040	780	1240	2360
9	4580	3080	988	780	1400	2480
10	4440	3210	988	755	1400	2600
11	4380	3080	988	780	1370	2660
12	4250	2780	960	805	1560	2600
13	4060	2600	1020	855	1950	2600
14	3660	2480	1020	855	2060	2660
15	3470	2300	960	805	2120	2600
16	3340	2120	960	805	2300	2600
17	3140	2060	932	855	2240	2600
18	3020	2060	855	805	2240	2540
19	2900	1950	830	730	2240	2660
20	2960	1840	805	780	2300	2840
21	2960	1730	830	730	2480	2900
22	2840	1510	880	805	2420	2900
23	2840	1430	855	805	2480	2900
24	2720	1320	855	830	2600	3210
25	2720	1260	880	855	2600	3540
26	2720	1150	932	880	2600	3540
27	2840	1120	880	905	2600	3280
28	2900	1070	855	1040	2600	3210
29	3140	1120	855	1100	2600	3080
30	3280	1150	880	1120	2600	3020
31	3280		855	1100		3020
Mean	3880	2290	974	839	1920	2770
Ac.Ft. for Month	239000	136000	59900	51600	114000	170000

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.

TABLE 14

DISCHARGE OF SACRAMENTO RIVER AT VERONA-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	9720	33700	15300	21800	3660	1530	1910	4930
2	9920	32800	14800	21000	3540	1480	2020	4650
3	10400	31600	14300	19300	3420	1480	2200	4650
4	11900	30100	14300	16800	3420	1440	2200	4510
5	16800	28900	13700	14800	3300	1440	2080	4510
6	18600	27800	12800	13200	3070	1440	1960	4370
7	17000	26800	12300	13400	2960	1480	2080	4230
8	15300	25300	12300	14100	2850	1530	2200	4230
9	14600	23600	12800	13900	2850	1530	2510	4090
10	14600	21600	13000	13900	2850	1480	2440	4090
11	14800	19600	13000	14300	2740	1440	2510	4090
12	15100	17800	12600	13400	2630	1480	2640	4090
13	16300	16600	12800	12800	2630	1480	2700	4090
14	20000	15800	13200	12800	2460	1580	2770	4090
15	23600	15300	13200	12300	2410	1620	2770	4090
16	24600	15100	13000	11000	2360	1580	2770	3950
17	26600	15300	12800	9720	2260	1530	3030	3810
18	29200	15300	13000	8720	2210	1480	3160	3810
19	31000	14300	13900	7740	2110	1440	3160	3810
20	31000	13000	14300	6840	2060	1480	3160	3810
21	29500	12100	14100	6160	1910	1530	3290	3950
22	27600	11200	13900	5680	1760	1520	3420	3810
23	25300	11000	13900	5520	1760	1580	3550	3810
24	22800	11700	13000	5040	1760	1520	3810	3810
25	20300	12300	13000	4760	1710	1580	4090	3950
26	18600	13200	14100	4620	1660	1580	4230	3950
27	18000	13400	15300	4340	1620	1520	4230	3950
28	18000	13000	16800	4200	1620	1580	4510	3950
29	22800	13700	18000	4060	1580	1640	4790	4090
30	31000	15100	20800	3780	1530	1690	4930	4230
31	34000		21600		1530	1740		5380
Mean	20600	18900	14200	10700	2390	1530	3040	4150
Ac.Ft. for Month	1270000	1120000	877000	635000	147000	94100	181000	255000

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 15

DISCHARGE OF SACRAMENTO RIVER AT VERONA-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	35600	30600	7520	4240	2000	1240	1760	3960
2	34900	28700	8820	4380	1920	1270	2050	3960
3	33800	26000	10000	4380	1920	1270	1920	3830
4	32200	23000	10600	4380	1840	1270	1760	3960
5	30300	20100	10000	4240	1760	1340	1640	3830
6	28500	18300	9200	4100	1640	1440	1640	3830
7	26700	17200	8440	3960	1600	1340	1760	3700
8	24600	16500	7700	4100	1560	1300	1800	3700
9	22300	15700	7520	4380	1640	1340	2340	3700
10	20500	15000	7000	4520	1560	1270	2100	3700
11	19600	14400	6830	4240	1520	1270	1880	3830
12	18500	13700	6500	3830	1480	1270	1960	3830
13	17900	13100	6180	3570	1520	1340	2600	3830
14	17400	12700	5860	3440	1520	1300	2870	3830
15	17000	12100	5400	3200	1520	1270	3200	3830
16	16500	11600	5100	2980	1440	1300	3570	3700
17	16300	11400	4800	2980	1380	1380	3320	3700
18	15900	10800	4520	2870	1380	1300	3320	3960
19	15400	10400	4240	2760	1340	1300	3440	4100
20	15400	9800	4100	2600	1300	1340	3700	3960
21	15200	9010	4100	2540	1270	1300	3960	3960
22	15000	8440	3830	2440	1340	1380	3960	4100
23	15000	8060	3700	2240	1410	1410	4240	4240
24	14800	8250	3700	2190	1410	1410	4100	4660
25	14600	9200	3700	2140	1410	1410	3960	4800
26	14200	11200	3700	2050	1380	1480	3960	4800
27	14200	12300	3960	1960	1380	1440	3960	4660
28	14400	10800	4240	1920	1340	1520	3960	4520
29	16200	9200	4380	2000	1380	1680	3960	4520
30	25200	8060	4380	1920	1340	1760	4100	4380
31	30100		4380		1270	1720		4380
Mean	20900	14200	5950	3220	1510	1380	2960	4057
Ac.Ft. for Month	1290000	845000	366000	192000	92800	84800	176000	249000

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 16

DISCHARGE OF SACRAMENTO RIVER AT SACRAMENTO-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	10900	36800	19200	32500	4830	1500	1920	5190
2	11100	36400	18700	30100	4610	1500	2040	4820
3	11600	35800	17800	26900	4400	1590	2200	4810
4	13400	34800	17500	23300	4350	1480	2220	4690
5	18300	33700	17200	20300	4150	1400	1990	4690
6	19700	32500	16600	19900	3790	1380	1840	4560
7	18500	31300	15800	21700	3630	1390	1940	4410
8	17000	29300	16000	21900	3490	1430	2060	4530
9	16300	26800	16300	21900	3470	1450	2470	4260
10	16300	24300	16500	21900	3430	1410	2450	4260
11	16600	22000	16300	21900	3270	1440	2460	4260
12	17100	20400	15900	20800	3100	1460	2670	4260
13	19700	19500	16200	20600	3060	1420	2670	4290
14	22800	19100	17000	20200	2870	1540	2630	4270
15	25800	19300	17600	19200	2790	1630	2760	4350
16	27100	19600	17800	17300	2720	1550	2680	4160
17	31500	19100	17800	15000	2570	1450	3020	4010
18	32700	18300	17800	12200	2550	1390	3090	4030
19	33800	17000	18500	11000	2480	1340	3080	3970
20	33400	15300	19100	10000	2340	1420	3160	4010
21	32100	14600	19800	8960	2070	1470	3390	4100
22	30100	14500	19600	8470	1890	1420	3520	4020
23	27500	15000	18500	8000	1900	1490	3560	3980
24	24700	16800	18100	7310	1860	1440	3900	3970
25	22000	17500	19700	6840	1820	1540	4130	4130
26	20600	17500	22400	6450	1730	1590	4290	4120
27	20000	17500	23800	6180	1690	1550	4310	4120
28	20900	18800	26600	5960	1700	1640	4680	4120
29	27900	20100	29000	5760	1600	1690	4930	4310
30	34500	20100	32800	5140	1520	1710	5040	4450
31	37000		33400		1500	1740		9260
Mean	22900	22800	19700	15900	2810	1500	3040	4460
Ac.Ft. for Month	1410000	1360000	1210000	947000	173000	92100	181000	275000

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 17

DISCHARGE OF SACRAMENTO RIVER AT SACRAMENTO-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	39800	35100	9310	4740	1940	1120	1630	4090
2	38600	32800	10900	4810	1790	1160	1970	4070
3	37400	29500	12100	4810	1750	1160	1820	3940
4	36100	26100	13000	4750	1680	1170	1600	4080
5	34000	23000	12200	4560	1580	1290	1540	3970
6	32300	21200	11300	4430	1430	1370	1530	3950
7	30200	20300	10500	4610	1400	1260	1640	3810
8	28000	19800	9650	5180	1360	1220	1690	3850
9	25400	18900	9490	5400	1420	1240	2280	3820
10	23700	18100	8650	5380	1350	1180	2130	3830
11	23000	17400	8410	4970	1300	1180	1790	3960
12	21700	16800	8060	4400	1250	1170	2010	3980
13	21400	16300	7650	4030	1330	1240	2570	3970
14	20900	15700	7220	3830	1300	1190	2970	3990
15	20600	15200	6740	3580	1340	1130	3200	4010
16	20200	14800	6350	3410	1230	1210	3650	3800
17	19900	14300	5940	3360	1150	1290	3390	3880
18	19500	13500	5510	3170	1140	1210	3370	4310
19	18900	12900	5120	3010	1120	1180	3440	4270
20	19100	12200	4880	2800	1090	1220	3770	4130
21	18800	11500	4700	2700	1050	1170	4010	4230
22	18300	11100	4410	2540	1100	1250	4060	4210
23	18300	10700	4370	2320	1170	1270	4460	4450
24	18500	11800	4310	2240	1170	1290	4140	4920
25	18600	12200	4260	2110	1270	1300	4040	5060
26	18200	13800	4260	2000	1280	1520	4210	5110
27	17800	14600	4570	1930	1270	1440	4190	4880
28	18500	12800	4920	1890	1190	1480	4180	4760
29	27800	11100	4920	1990	1310	1580	4130	4740
30	34100	9870	4940	1880	1250	1590	4320	4560
31	35700		4980		1170	1590		4670
Mean	25000	17100	7210	3560	1330	1280	2990	4240
Ac.Ft. for Month	1540000	1020000	444000	212000	81700	78700	178000	260000

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 18

DISCHARGE OF FEATHER RIVER AT NICOLAUS-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	7900	13600	1140	317	232	1140
2	6620	12200	1100	337	232	1180
3	6620	10300	940	317	232	1100
4	5570	8890	898	317	236	1180
5	5120	7580	814	305	218	1270
6	5420	7100	758	309	215	1270
7	5270	8060	706	313	209	1220
8	6020	8220	688	309	200	1180
9	5870	8060	706	301	206	1100
10	5570	8220	700	297	243	1020
11	5270	8060	658	297	268	1060
12	4970	7260	628	301	274	1100
13	4830	7260	700	309	260	1100
14	5270	7260	598	353	285	1060
15	5570	6620	562	341	285	1060
16	5720	5720	510	321	297	1020
17	6020	4970	470	313	317	948
18	6320	4270	436	289	305	964
19	6470	3450	401	289	313	1020
20	6320	2620	373	309	357	1060
21	6170	2320	345	305	465	1020
22	6320	2320	345	293	485	1060
23	6320	2200	389	305	530	1060
24	5570	2040	385	297	628	1000
25	6170	1870	357	297	694	1100
26	7580	1610	369	282	694	1100
27	8890	1360	353	268	730	1140
28	9570	1410	325	250	972	1180
29	11000	1220	313	232	1100	
30	12800	1140	317	232	1140	
31	13800		317	236		
Mean	6800	5570	568	298	421	*1100
Ac.Ft. for Month	418000	331000	34900	18300	25100	*61100
Diversions Below Nicolaus Acre-feet	4309	3875	3538	5222	1834	22
Discharge to Sacto. River Acre-feet	414000	327000	31400	13100	23300	*61100

* 28 days.

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.

TABLE 19

DISCHARGE OF FEATHER RIVER AT NICOLAUS-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	2600	776	520	290	365	1010
2	4520	803	466	320	397	1040
3	4390	792	421	320	409	1040
4	3870	754	393	340	329	1040
5	3480	710	361	350	284	1010
6	3160	726	349	370	294	1040
7	2680	855	349	350	337	1010
8	2500	1010	377	313	377	978
9	2560	1080	365	305	357	915
10	2380	1010	365	313	238	945
11	2100	831	353	321	208	978
12	1940	754	357	333	284	978
13	1790	690	349	333	497	978
14	1640	645	337	310	615	945
15	1500	620	357	270	732	978
16	1380	600	317	280	670	915
17	1260	630	329	350	726	978
18	1180	605	325	300	715	1220
19	1150	580	291	310	786	1340
20	1080	555	294	320	885	1120
21	978	580	317	317	861	1120
22	873	590	345	313	978	1180
23	814	565	361	317	1040	1420
24	855	535	365	321	1010	1380
25	885	580	357	291	945	1300
26	915	545	357	313	1040	1260
27	1010	484	365	284	1150	1220
28	1080	492	325	291	1080	1180
29	978	506	313	345	1080	1220
30	885	502	310	361	1080	1180
31	792		280	345		1220
Mean	1850	680	354	319	659	1100
Ac.Ft. for Month	114000	40500	21800	19600	39200	67600
Diversions Below Nicolaus Acre-feet	1255	2070	651	1261	1171	13
Discharge to Sacto. River Acre-feet	113000	38400	21100	18300	38000	67600

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.

TABLE 20

DISCHARGE OF AMERICAN RIVER AT SACRAMENTO-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	3950	10800	1370	200	190	260
2	4040	9250	1260	255	200	240
3	3600	7800	1190	344	180	225
4	3300	6700	1120	270	120	225
5	3700	5700	1060	200	90	230
6	3950	6920	954	180	60	235
7	3620	8500	909	165	50	235
8	3860	8020	*880	162	55	230
9	3620	8260	850	170	53	220
10	3620	8260	820	190	60	210
11	3460	7800	780	255	75	215
12	3460	7580	720	230	150	220
13	3500	8020	680	180	86	240
14	3860	7580	655	210	30	220
15	4490	7140	620	245	115	210
16	4940	6500	580	200	90	245
17	5120	5500	530	150	70	240
18	4940	3640	560	148	50	256
19	4760	3510	590	146	65	200
20	4940	3420	500	180	85	*230
21	5700	3020	380	191	130	180
22	5900	3020	350	150	140	180
23	4760	2720	345	155	100	199
24	5300	2500	340	162	110	199
25	6920	2310	335	180	125	218
26	8500	2060	325	195	150	199
27	8750	2040	310	210	170	199
28	10000	1970	315	245	200	199
29	11200	1900	250	230	230	199
30	12200	1560	210	200	200	242
31	12000		190	175		3900
Mean	5547	5467	644	199	114	339
Ac.Ft. for Month	341000	325000	39600	12200	6800	20800
Diversions Below Gaging Station Acre-feet	32	31	39	31	2	5
Discharge to Sacramento River Acre-feet	341000	325000	39600	12200	6800	20800

* In the period from July 8th to October 20th the continuous water stage record was lost due to temporary discontinuance of Water Supervisor work. The discharge in this period has been estimated by comparison with the flow at Fairoaks, and from weekly gage readings and bi-weekly measurements.

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 H Street Bridge, Sacramento, 6.0 miles above the mouth of the river.

TABLE 21

DISCHARGE OF AMERICAN RIVER AT SACRAMENTO-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	2020	792	260	220	113	174
2	2340	718	220	206	97	170
3	2400	702	193	206	88	162
4	2680	644	172	206	82	170
5	2470	560	177	216	75	191
6	2340	595	156	229	82	166
7	2270	938	152	220	138	162
8	2200	1370	145	229	152	204
9	2200	1320	152	211	177	178
10	1900	1140	160	224	97	178
11	1840	1020	148	216	107	178
12	1840	855	145	193	152	191
13	1740	748	160	211	156	183
14	1650	672	120	198	189	204
15	1600	688	130	168	185	221
16	1490	732	134	206	100	140
17	1360	672	116	216	82	212
18	1230	581	113	220	98	385
19	1120	546	110	193	95	212
20	1010	499	116	202	84	208
21	863	460	123	198	140	183
22	847	417	113	206	183	136
23	920	404	113	189	195	234
24	839	335	120	202	98	281
25	792	302	198	206	125	281
26	815	272	220	202	244	267
27	879	290	229	234	276	244
28	946	320	181	172	271	262
29	823	320	243	127	221	239
30	831	270	248	113	212	195
31	871		198	120		305
Mean	1520	639	163	199	144	210
Ac.Ft. For Month	93500	38000	10000	12200	8570	12900
Diversions Below Gaging Station Acre-feet	29	36	42	25	23	0
Discharge to Sacto. River Acre-feet	93500	38000	10000	12200	8550	12900

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 H St. Bridge, Sacramento, 6.0 miles above the mouth of the river.

TABLE 22

DISCHARGE OF MOKELUMNE RIVER AT WOODBRIDGE-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	520	394	191	122	195	207	268	344
2	524	461	326	259	336	227	304	250
3	526	280	252	252	341	246	329	348
4	518	391	352	244	248	254	204	354
5	510	390	359	103	111	252	156	391
6	497	414	333	274	223	255	408	373
7	467	425	389	258	349	134	366	388
8	539	422	179	219	320	254	436	369
9	520	398	359	217	252	259	425	241
10	314	312	392	224	133	272	343	360
11	412	380	399	228	191	284	208	349
12	373	362	405	108	233	266	326	372
13	250	362	407	187	233	289	324	376
14	418	356	375	214	232	235	367	381
15	461	355	236	182	232	282	429	386
16	582	310	330	170	240	265	372	257
17	528	62	214	138	141	273	357	354
18	487	136	210	166	215	240	184	382
19	453	273	234	82	299	302	314	388
20	380	354	203	118	305	312	381	375
21	441	322	235	170	296	152	377	379
22	453	256	124	165	304	266	398	352
23	459	275	257	163	281	289	445	286
24	481	32	236	162	131	318	398	346
25	467	190	207	176	208	341	286	378
26	491	232	206	81	196	362	389	422
27	435	185	226	124	179	329	352	447
28	435	285	152	162	194	172	369	394
29	455	170	160	168	192	249	365	388
30	451	223	304	168	203	168	367	427
31	427		158		162	212		597
Mean	460	300	271	177	231	257	342	369
Ac. Ft. for Month	28300	17900	16700	10,500	14200	15800	20400	22700

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 23

DISCHARGE OF MOKELUMNE RIVER AT WOODBRIDGE-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	671	303	252	37	6.5	95	161	337
2	667	67	247	25	26	75	169	274
3	661	79	234	14	150	61	141	260
4	614	59	270	14	127	100	181	254
5	405	42	211	14	85	151	218	259
6	544	44	173	18	58	93	215	271
7	365	130	41	21	88	58	195	270
8	336	117	152	20	153	78	237	263
9	318	30	168	17	113	84	270	269
10	302	43	223	14	139	149	223	268
11	296	306	328	14	112	141	258	274
12	302	281	316	14	57	166	222	272
13	300	238	318	14	44	122	257	294
14	304	243	149	14	79	125	272	298
15	509	231	316	12	91	119	273	289
16	580	45	268	7.5	63	115	272	286
17	621	128	100	8	94	130	273	296
18	606	260	27	8.5	108	125	252	300
19	373	273	68	9	105	144	265	300
20	320	288	40	8.5	99	136	267	300
21	298	298	22	8.5	101	120	263	305
22	233	304	143	7	130	128	256	303
23	181	74	240	6.5	135	113	332	299
24	226	199	172	7	95	125	309	291
25	468	279	161	10	80	152	311	291
26	195	305	183	11	114	153	376	300
27	321	318	193	10	90	154	326	302
28	495	311	47	9	160	156	291	297
29	413	293	116	7	141	156	320	331
30	362	71	164	6	119	176	366	341
31	332		137		77	165		333
Mean	407	189	177	12.8	98.0	125	259	291
Ac.Ft. for Month	25000	11200	10900	762	6030	7690	15400	17900

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 24

DISCHARGE OF SAN JOAQUIN RIVER AT DELTA BRIDGE-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		37	176	4			
2		39	230	3			
3		41	247	2			
4		48	264	1			
5		56	280	0			
6		37	250	0			
7		28	220	0			
8		19	127	0			
9		14	35	0	"	"	"
10		8	37	0	"	"	"
11		3	39	0			
12		2	41	0	W	W	W
13		1	72	0	O	O	O
14		0	103	0	L	L	L
15		0	137	0	F	F	F
16		0	171	0			
17		0	275	0			
18		0	307	0	O	O	O
19		0	338	0	N	N	N
20		0	251	0			
21		0	164	0	"	"	"
22		0	78	0	"	"	"
23		0	57	0			
24		0	36	0			
25		0	30	0			
26		0	25	0			
27		0	19	0			
28		0	13	0			
29	*35	0	8	0			
30	35	70	6	0			
31		122		0			
Mean	**35	17	135	0.3	0	0	0
Ac. Ft. for Month	**139	1040	8010	20	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.

In 1934 there was no flow at this station in the period from the first observation on May 25th to October 31st.

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

TABLE 25

DISCHARGE OF SAN JOAQUIN RIVER AT FREMONT BRIDGE-1934

No continuous record of discharge

Miscellaneous Measurements as follows:

Date	Gage Height Feet	Discharge Second-feet
8/31/34	58.27	6.4
9/26/34	58.21	5.6
10/31/34	58.27	5.2

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 26

DISCHARGE OF SAN JOAQUIN RIVER NEAR NEWMAN-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	1060	500	417	555	611	247	236	213
2	1010	440	440	1100	574	228	243	232
3	968	451	462	1470	538	219	268	236
4	900	465	482	1740	486	230	290	243
5	878	482	482	1920	486	221	272	230
6	695	437	482	1980	454	226	268	221
7	595	417	518	2100	438	240	249	219
8	555	448	635	2040	438	217	234	213
9	518	454	655	1740	438	209	238	211
10	482	444	695	1370	413	199	254	195
11	482	414	675	1100	377	191	265	195
12	462	401	615	1080	354	189	245	193
13	465	392	575	1150	334	195	228	191
14	482	388	518	1370	318	201	230	203
15	518	363	482	1570	308	193	245	223
16	575	354	444	1740	305	203	238	223
17	595	372	398	1920	313	191	240	199
18	715	354	366	2240	298	193	258	183
19	655	360	369	2450	295	203	247	177
20	655	379	354	2590	277	199	234	173
21	655	379	348	2660	260	207	221	171
22	655	369	369	2520	247	187	226	170
23	615	369	372	2040	256	187	223	168
24	615	408	372	1520	254	197	223	168
25	595	434	333	1240	258	193	247	168
26	575	420	312	1140	247	205	256	168
27	555	372	348	1020	277	211	240	170
28	535	388	333	880	290	221	228	171
29	555	398	324	782	247	226	226	170
30	518	404	284	687	238	230	213	173
31	500		321		243	230		177
Mean	633	409	445	1590	351	209	243	195
Ac.Ft. for Month	38900	24300	27400	94600	21600	12900	14500	12000

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 27

DISCHARGE OF SAN JOAQUIN RIVER NEAR NEWMAN-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	1720	362	195	188	148	94	62	104
2	1570	385	198	188	144	102	70	92
3	1420	369	213	188	137	120	76	84
4	1190	375	226	180	135	107	70	90
5	980	347	203	190	144	118	80	96
6	860	326	198	211	124	118	64	92
7	763	320	208	221	126	104	70	100
8	687	302	198	229	144	100	76	124
9	649	288	219	219	148	104	86	126
10	649	296	229	189	131	98	109	113
11	592	290	216	182	115	92	118	104
12	574	276	198	184	111	96	109	113
13	538	282	203	187	107	104	100	126
14	520	296	203	178	120	88	92	124
15	503	296	178	182	135	82	90	122
16	486	268	166	187	157	70	90	131
17	486	237	166	180	151	86	85	135
18	520	229	164	189	137	82	90	137
19	503	219	159	*192	133	88	90	129
20	469	208	166	196	118	90	95	133
21	486	203	180	178	98	88	88	135
22	520	221	173	159	131	84	90	135
23	486	221	166	164	137	88	100	131
24	503	206	178	168	148	70	120	131
25	469	195	178	187	142	72	133	133
26	436	193	203	189	137	90	129	118
27	420	188	213	162	153	107	109	109
28	417	183	221	153	133	88	100	109
29	420	188	206	148	131	76	107	124
30	398	193	237	146	131	68	118	120
31	372		211		113	70		135
Mean	665	265	196	184	133	91.7	93.9	118
Ac.Ft. for Month	40900	15800	12100	10900	8180	5640	5590	7250

*Estimated.

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 28

DISCHARGE OF SAN JOAQUIN RIVER NEAR GRAYSON-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*785	574	475	921	297	310	291
2	765	598	738	863	289	315	312
3	729	644	1170	910	286	320	320
4	697	644	1550	913	289	345	350
5	633	666	1880	910	323	372	386
6	618	680	1990	834	342	342	378
7	595	705	2030	742	326	348	383
8	615	823	2120	716	315	345	392
9	613	910	2130	658	294	353	403
10	656	951	1940	640	302	358	397
11	669	970	1700	633	276	342	392
12	595	989	1540	567	273	353	381
13	543	1020	1430	509	281	348	403
14	519	1020	1460	453	268	329	434
15	504	993	1590	427	268	312	463
16	540	906	2000	411	248	307	513
17	582	790	2360	407	263	297	469
18	570	723	2320	396	268	364	375
19	516	662	2340	372	281	358	315
20	528	618	2320	350	273	356	299
21	564	588	2330	302	304	329	294
22	580	668	2260	294	310	315	289
23	592	698	2200	320	297	329	284
24	627	611	1980	350	299	310	284
25	643	595	1650	348	278	315	284
26	602	546	1370	315	260	337	281
27	560	534	1340	297	276	337	271
28	503	552	1210	312	297	315	268
29	523	617	1070	329	307	302	278
30	557	555	974	297	310	286	284
31		472		310	310		286
Mean	600	720	1720	520	290	332	347
Ac.Ft. for Month	35700	44300	102000	31900	17900	19700	21300

NOTE: This is a recording gage station at Laird Slough Bridge Mile 19.35 above Durham Ferry Bridge.

* Beginning of record for season.

TABLE 29

DISCHARGE OF SAN JOAQUIN RIVER NEAR GRAYSON-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*245	265	160	146	132	160
2	242	230	163	144	132	165
3	240	223	151	141	132	189
4	248	232	146	144	132	211
5	255	218	148	139	132	211
6	232	242	146	144	134	220
7	242	265	141	132	134	218
8	248	299	136	130	136	220
9	232	302	134	125	141	230
10	240	304	134	119	136	230
11	268	299	130	119	134	223
12	271	281	127	119	134	216
13	263	284	121	121	134	220
14	276	248	119	121	134	228
15	276	245	119	123	134	232
16	235	225	125	125	132	240
17	223	220	132	127	134	245
18	211	230	136	134	136	252
19	204	225	141	132	134	260
20	199	225	141	127	132	265
21	206	213	148	127	134	255
22	218	208	146	127	134	263
23	216	187	163	125	134	273
24	199	168	168	123	151	289
25	204	194	160	125	158	284
26	213	211	158	127	160	289
27	223	196	153	127	148	291
28	232	180	153	130	146	273
29	337	170	151	130	146	255
30	252	170	151	132	148	252
31	258		148	132		252
Mean	239	232	144	130	138	239
Ac.Ft. for Month	14700	13800	8820	7970	8210	14700

NOTE: This is a recording gage station at Laird Slough Bridge Mile 19.35 above Durham Ferry Bridge.

* Beginning of record for season.

TABLE 30

DISCHARGE OF SAN JOAQUIN RIVER NEAR VERNALIS-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	2560	1360	1120	3940	2370	641	760	1370
2	2560	1360	1150	4420	2160	632	735	1370
3	2560	1330	1180	5040	2030	646	760	1400
4	2440	1270	1180	5580	1850	675	812	1400
5	2300	1210	1210	5760	1760	675	840	1400
6	2240	1120	1270	5100	1610	725	840	1440
7	2050	1120	1420	4440	1490	725	922	1400
8	1870	1120	1690	5200	1430	700	1070	1440
9	1870	1150	1660	5900	1370	675	1160	1500
10	1750	1120	1630	6000	1340	646	1220	1500
11	1660	1150	1570	5900	1280	632	1280	1890
12	1570	1150	1540	5800	1160	623	1250	1700
13	1570	1070	1510	5500	1050	614	1280	1760
14	1540	1040	1510	5600	970	623	1250	1960
15	1420	1040	1480	5900	915	600	1220	2020
16	1390	1070	1450	7700	915	578	980	1760
17	1600	1120	1360	8240	888	569	1100	1700
18	1660	1180	1270	7300	860	569	1280	1600
19	1690	1150	1210	7500	805	614	1370	1470
20	1750	1120	1180	7200	778	725	1340	1470
21	1630	1100	1180	6300	725	650	1310	1440
22	1480	1100	1300	5300	750	675	1280	1400
23	1450	1100	1330	5200	725	700	1250	1400
24	1450	1180	1270	5000	725	700	1250	1440
25	1390	1180	1210	4620	725	720	1250	1440
26	1360	1210	1180	3580	700	685	1310	1400
27	1390	1150	1150	3000	675	675	1340	1400
28	1390	1040	1120	2930	641	730	1370	1440
29	1420	1040	1210	2720	610	730	1340	1470
30	1450	1070	1300	2580	596	735	1340	1560
31	1390		3050		618	760		1600
Mean	1740	1150	1380	5310	1110	666	1150	1530
Ac.Ft. for Month	107000	68400	84800	316000	68200	41000	68400	94100

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.

TABLE 31

DISCHARGE OF SAN JOAQUIN RIVER NEAR VERNALIS-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	2740	1160	522	*685	462	349	437	545
2	2540	1100	558	*640	473	349	476	581
3	2410	1100	586	*620	422	346	487	594
4	2340	1040	604	627	426	370	487	612
5	2150	950	635	646	433	380	480	626
6	1960	950	645	684	440	373	444	622
7	1820	895	675	703	448	373	444	645
8	1700	840	710	722	440	373	458	655
9	1630	785	665	722	430	373	466	710
10	1530	760	655	722	394	356	484	670
11	1530	710	685	722	370	346	505	630
12	1500	690	705	684	342	346	512	608
13	1530	670	665	684	336	353	516	608
14	1560	612	695	665	339	366	509	604
15	1530	617	690	646	349	356	494	608
16	1470	640	*620	627	359	339	516	617
17	1400	626	*600	627	376	315	527	812
18	1370	576	*600	627	387	339	523	980
19	1370	576	*560	627	387	349	516	1040
20	1500	568	*560	608	380	366	491	1040
21	1760	522	*600	608	380	349	469	1070
22	1700	536	*640	608	370	349	466	1100
23	1760	599	*600	559	383	366	480	1100
24	1700	563	*560	520	412	404	505	1130
25	1560	540	*600	538	415	422	545	1160
26	1560	514	*620	563	412	469	559	1130
27	1500	480	*665	570	408	487	563	1160
28	1530	468	*685	548	383	516	559	1160
29	1400	472	*805	509	380	487	559	1160
30	1280	500	*710	498	356	473	538	1160
31	1220		*685		363	448		1190
Mean	1700	702	639	627	395	383	500	849
Ac.Ft. for Month	105000	41800	39300	37300	24300	23600	29800	52220

*Estimated.

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.

TABLE 32

DISCHARGE OF MERCED RIVER AT YOSEMITE VALLEY
RAILROAD CROSSING-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		22	22	28	34	28	16
2		42	19	28	34	28	19
3		42	16	22	31	22	16
4		34	16	22	31	22	9.0
5		34	16	22	34	22	7.0
6		34	16	22	28	22	5.5
7		34	16	22	34	22	4.0
8		49	16	22	25	22	4.0
9		34	16	22	28	16	4.0
10		34	16	22	e27	16	4.0
11		28	25	22	e27	16	4.0
12		28	28	22	e26	16	4.0
13		28	e28	22	e26	16	2.7
14		28	e27	22	e25	28	2.7
15		25	e27	22	e25	16	2.7
16		22	e26	22	e24	16	1.4
17		16	e26	28	e24	14	1.4
18		19	e25	e28	e23	14	1.4
19		16	e25	e28	e22	16	1.4
20		19	e24	e29	22	14	1.4
21	*14	19	e24	e29	19	11	1.4
22	14	22	e23	e29	16	11	1.4
23	14	22	e23	e30	16	14	1.4
24	11	16	e22	e30	22	14	1.4
25	11	25	22	e30	25	11	1.4
26	11	22	25	e31	22	7.0	1.4
27	11	19	25	31	22	7.0	1.4
28	22	22	28	56	22	11	1.4
29	22	22	28	42	22	11	1.4
30	25	16	25	38	22	14	1.4
31		22		34	28		1.4
Mean	**16	26	22	28	25	17	4.1
Ac.Ft. for Month	**307	1620	1340	1700	1560	986	252

NOTE: This is a staff gage station. Daily readings.
* Beginning of record for season.
** 10 days.
e Estimated - Gage not read.

TABLE 33

DISCHARGE OF MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		20	28	23	16	1.0
2		20	27	18	13	0.9
3		22	27	16	13	0.8
4		22	28	16	13	0.8
5		23	28	18	13	0.8
6		20	30	24	13	0.8
7		26	30	28	10	0.8
8		23	28	24	10	0.8
9	*17	24	28	20	9.2	0.8
10	17	23	26	20	10	0.8
11	18	26	23	20	12	0.8
12	17	27	24	18	10	0.8
13	16	30	22	18	8.0	0.8
14	15	31	20	16	7.0	0.8
15	17	20	23	13	10	0.8
16	18	23	23	12	10	0.8
17	20	20	23	13	10	0.8
18	21	26	20	14	9.2	0.8
19	20	26	23	13	6.0	0.8
20	20	e27	e23	12	4.0	0.8
21	20	e28	e24	16	4.0	0.8
22	20	e29	e24	13	3.0	0.8
23	20	e30	e25	12	3.0	0.8
24	20	e31	e25	10	3.0	0.8
25	18	e32	e26	8.0	2.0	0.8
26	18	e34	e26	10	2.0	0.8
27	20	e36	e27	9.2	1.5	0.8
28	21	e38	28	9.2	1.5	0.8
29	20	40	28	9.2	1.0	0.8
30	20	28	34	10	1.0	0.8
31	20		35	20		0.8
Mean	**19	27	26	16	7.6	0.8
Ac.Ft. for Month	**859	1600	1600	957	453	50

NOTE: This is a staff gage station. Daily readings.
* Beginning of record for season.
** 23 days.
e Estimated - Gage not read.

TABLE 34

DISCHARGE OF MERCED RIVER NEAR MOUTH-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		206	182	182	177	182	167
2		226	**163	187	172	192	187
3		226	168	177	157	216	187
4		236	178	172	177	226	197
5		226	191	182	167	206	177
6		187	184	157	172	197	177
7		226	174	157	172	187	177
8		275	162	167	147	177	167
9		275	155	157	147	177	167
10		265	164	167	147	197	157
11		265	168	167	137	197	157
12		251	162	147	147	187	167
13		236	172	157	147	167	157
14		216	181	147	137	177	167
15		216	176	142	127	177	187
16		197	170	147	147	177	177
17		197	178	157	137	182	167
18		197	186	147	137	197	167
19		197	191	147	147	197	147
20	*195	197	180	137	157	182	127
21	177	187	175	137	177	167	127
22	177	206	171	137	147	172	127
23	187	197	180	157	147	162	127
24	197	197	196	157	157	167	127
25	216	182	**196	147	147	197	127
26	187	182	197	137	157	167	132
27	167	197	187	197	167	167	134
28	172	201	187	187	177	167	127
29	187	201	172	157	182	157	127
30	206	167	167	157	177	167	137
31		177		162	177		137
Mean	***188	213	177	159	157	183	155
Ac.Ft. for Month	***4100	13100	10500	9780	9650	10900	9540

NOTE: This is a staff gage station at bridge 1.1 miles above the mouth. Daily readings.

* Beginning of record for season.

** From June 2d to 25th the stage was affected by higher water levels in the San Joaquin River. For this period the discharge was estimated by comparison with the flow at the Merced River at the U.S.G.S. station near Livingston.

*** 11 days.

TABLE 35

DISCHARGE OF MERCED RIVER NEAR MOUTH-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		156	96	66	58	86
2		141	126	81	81	77
3		141	111	111	74	72
4		141	134	96	81	86
5		148	96	96	74	86
6		171	81	96	66	77
7	*126	178	96	96	66	96
8	156	186	126	81	74	106
9	156	178	141	96	96	116
10	141	141	111	81	100	96
11	126	148	96	88	100	86
12	141	148	81	111	96	96
13	141	156	81	96	98	116
14	156	126	111	66	96	116
15	126	148	141	66	96	116
16	111	163	171	36	96	126
17	111	178	141	66	96	126
18	96	201	126	74	81	116
19	96	194	96	74	81	96
20	126	178	81	81	96	116
21	141	156	66	74	88	126
22	141	141	141	74	81	126
23	126	148	119	74	81	121
24	141	156	126	66	81	126
25	148	194	111	66	88	136
26	201	171	126	88	96	116
27	208	126	141	88	96	116
28	208	141	111	66	96	106
29	201	141	126	66	106	131
30	231	126	141	66	96	126
31	171		96	81		146
Mean	**145	157	114	80	87	109
Ac.Ft. for Month	**7190	9360	7040	4890	5190	6710

NOTE: This is a staff gage station at bridge 1.1 miles above the mouth. Daily readings.

* Beginning of record for season.

** 25 days.

TABLE 36

DISCHARGE OF DRY CREEK NEAR MODESTO-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		49	48	80	44	56	63
2		49	43	80	42	54	60
3		49	43	78	48	58	60
4		42	40	60	49	60	60
5		42	40	54	46	60	61
6		43	44	48	46	60	63
7		68	49	43	46	64	64
8		76	46	43	44	64	64
9		58	43	44	43	66	68
10		54	42	44	42	70	78
11		54	42	42	42	70	80
12		49	41	41	41	70	82
13		49	40	40	43	72	82
14		49	40	40	44	74	83
15		120	43	40	44	75	83
16		64	42	41	44	72	88
17		52	42	40	47	80	88
18		52	57	40	48	81	88
19		52	57	42	48	83	92
20	*66	52	59	42	47	77	76
21	52	49	59	42	49	70	76
22	64	49	50	40	50	60	76
23	65	48	49	40	49	65	86
24	62	46	49	42	48	71	84
25	54	46	49	42	49	71	84
26	52	46	49	42	50	68	82
27	52	46	46	45	50	65	92
28	52	46	62	46	49	65	92
29	52	44	79	46	49	64	80
30	49	44	72	46	56	63	74
31		40		44	56		84
Mean	**56	52	49	47	47	68	77
Ac.Ft. for Month	**1230	3230	2910	2890	2880	4030	4740
M.I.D. Spill Below Station-Ac.Ft.		150	400	530	140	160	320
***Discharge to Tuolumne R. Acre-feet		3380	3310	3420	3020	4190	5060
***Discharge to Tuolumne R. Mean c.f.s.		55	56	56	49	70	82

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

* Beginning of record for season.

** 11 days.

*** Neglecting seepage return below station.

TABLE 37

DISCHARGE OF DRY CREEK NEAR MODESTO-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		50	42	44	45	38
2		50	42	43	44	38
3		47	46	44	44	38
4		46	44	43	45	37
5		47	43	43	41	37
6		49	41	41	43	37
7		46	41	43	41	37
8		43	41	42	40	36
9		42	41	44	41	37
10		42	40	44	40	36
11		41	40	43	39	37
12		41	42	43	39	37
13		41	42	44	39	37
14		41	40	44	40	38
15		41	42	44	40	38
16		40	46	45	39	39
17		45	46	44	39	39
18		44	48	44	39	39
19		44	42	44	39	39
20		42	44	43	39	39
21		42	44	43	39	40
22		42	46	42	39	40
23		40	47	45	39	42
24	*42	38	47	46	38	45
25	41	39	48	46	38	39
26	42	39	43	45	38	42
27	46	40	44	44	37	46
28	50	40	41	44	37	46
29	50	40	41	45	38	47
30	50	42	41	46	37	47
31	52		41	46		41
Mean	**47	43	43	44	40	40
Ac.Ft. for Month	**740	2550	2650	2700	2370	2440
M.I.D. Spill below Station-Ac.Ft.		40	61	35	0	0
***Discharge to Tuolumne R. Acre-feet		2590	2710	2740	2370	2440
***Discharge to Tuolumne R. Mean c.f.s.		44	44	44	40	40

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

* Beginning of record for season.

** 8 days.

*** Neglecting seepage return below station.

TABLE 38

DISCHARGE OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		44	36	575	39	40	606
2		44	38	120	40	40	606
3		43	39	65	42	40	600
4		43	39	57	42	39	600
5		43	41	55	41	72	600
6		43	112	52	41	453	600
7		49	240	50	38	480	606
8		44	470	50	38	480	620
9		42	531	46	38	480	836
10		41	548	44	38	480	1280
11		41	548	43	38	486	744
12		40	553	43	38	474	1040
13		44	569	43	38	488	1220
14		44	900	43	37	326	1240
15	*46	43	4340	43	36	112	678
16	46	42	5360	42	37	467	678
17	46	41	3860	41	36	490	678
18	46	41	3420	40	37	490	665
19	46	41	2770	38	37	490	691
20	46	41	2320	38	37	490	665
21	46	40	1950	39	37	490	626
22	46	40	2260	40	37	476	620
23	46	40	2270	40	36	478	620
24	45	40	2080	39	36	487	639
25	44	39	604	38	38	490	613
26	44	39	634	39	38	606	613
27	44	39	628	38	38	613	620
28	43	40	575	38	38	600	691
29	43	38	569	39	39	606	710
30	44	37	553	39	40	613	751
31		37		39	40		665
Mean	**45	41	1300	63	38	413	723
Ac.Ft. for Month	**1430	2540	77100	3880	2350	24500	44500

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

TABLE 39

DISCHARGE OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*44	40	37	35	28	34
2	43	41	37	35	29	34
3	43	41	36	36	28	34
4	42	41	36	38	27	35
5	43	43	36	37	27	36
6	43	43	36	35	27	36
7	41	43	37	35	28	35
8	41	43	38	35	29	35
9	41	43	37	33	28	35
10	41	41	36	34	26	54
11	41	40	36	35	27	67
12	39	39	37	34	28	52
13	41	39	37	34	29	45
14	40	39	37	33	29	43
15	40	38	37	31	29	400
16	39	40	36	31	29	485
17	40	39	36	30	29	569
18	40	38	36	31	30	562
19	39	38	37	32	30	562
20	38	38	37	32	29	569
21	38	38	39	33	31	582
22	38	38	38	32	31	582
23	38	39	37	32	32	582
24	38	38	38	32	31	582
25	39	38	35	31	31	575
26	41	38	34	31	32	575
27	41	37	36	30	32	575
28	39	37	36	30	35	575
29	40	37	36	30	36	575
30	40	38	35	27	35	575
31	40		34	27		582
Mean	40	40	36	33	30	325
Ac.Ft. for Month	2480	2350	2240	2010	1770	20000

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

TABLE 40

DISCHARGE OF TUOLUMNE RIVER AT HICKMAN BRIDGE-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		110	107	500	104	107	662
2		110	110	206	104	115	662
3		113	110	141	104	115	662
4		110	113	135	107	115	662
5		113	113	**134	107	118	662
6		113	173	129	107	447	662
7		138	229	129	104	519	677
8		135	428	129	101	528	670
9		118	464	132	104	523	747
10		118	472	127	101	527	1220
11		118	462	124	101	522	662
12		113	462	124	101	518	1170
13		110	455	121	101	522	1340
14		110	770	121	101	457	1480
15		110	4650	113	101	177	769
16		110	**	110	104	523	746
17		110		110	104	536	753
18	*118	110		110	104	524	738
19	118	110		110	107	524	753
20	115	110		104	107	515	723
21	113	110	RECORD	104	110	522	662
22	113	110		104	107	546	677
23	113	110		107	107	542	677
24	110	110		107	104	550	715
25	110	110		107	104	514	677
26	107	110		107	107	624	677
27	107	110		107	104	643	685
28	107	110	NO	107	107	643	776
29	110	110		104	104	649	815
30	110	107		104	104	662	892
31		107		104	104		738
Mean	***112	113	**	131	104	461	787
Ac.Ft. for Month	***2880	6930	**	8070	6420	27400	48400

NOTE: This is a recording gage station.
* Beginning of record for season.
** High water washed out gage well on June 16th and gage record from June 16th to July 5th was lost. Discharge July 1st to 5th estimated.
*** 13 days.

TABLE 41

DISCHARGE OF TUOLUMNE RIVER AT HICKMAN BRIDGE-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*110	101	93	93	101	104
2	110	101	93	93	107	104
3	110	101	93	96	107	107
4	110	101	93	99	101	107
5	110	104	93	101	101	107
6	107	104	96	101	101	107
7	107	104	93	101	101	107
8	107	104	96	101	101	107
9	107	107	96	101	101	107
10	107	104	96	101	101	110
11	104	101	93	101	99	138
12	104	99	93	99	101	127
13	104	99	96	101	101	118
14	104	99	96	101	99	118
15	101	96	99	101	99	436
16	101	99	99	101	99	604
17	101	96	99	101	99	588
18	104	93	96	101	99	582
19	101	96	96	101	99	593
20	104	93	99	101	96	598
21	104	96	96	101	96	604
22	101	96	96	101	99	582
23	99	96	96	101	101	593
24	101	93	96	104	101	588
25	101	93	96	104	101	593
26	101	96	99	104	104	593
27	101	93	99	104	104	611
28	101	93	96	104	104	604
29	101	96	96	104	104	604
30	101	93	96	101	104	593
31	101		93	101		624
Mean	104	98	96	101	101	373
Ac.Ft. for Month	6400	5850	5880	6200	6010	22900

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

TABLE 42

DISCHARGE OF TUOLUMNE RIVER AT TUOLUMNE CITY-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		321	282	862	308	329	878
2		329	297	882	313	310	878
3		321	292	668	321	315	882
4		315	292	507	323	323	874
5		313	292	479	323	326	874
6		313	302	461	326	350	858
7		337	340	427	321	584	870
8		394	392	400	318	679	890
9		386	545	400	313	e718	902
10		345	626	392	315	e718	1100
11		345	650	383	315	e730	1470
12		350	661	364	321	e730	1140
13		323	661	356	329	e726	1360
14		315	675	356	318	e730	1520
15		310	1380	350	308	e692	1370
16		353	4510	350	308	e493	1030
17		323	5270	348	310	696	995
18		313	4280	348	310	750	986
19	*340	308	3680	334	305	762	960
20	334	302	3100	337	e308	750	964
21	332	310	2620	364	e310	766	937
22	329	313	2360	383	e318	758	932
23	334	313	2530	364	e318	758	928
24	340	308	2510	337	e318	762	923
25	337	300	1990	329	e318	774	928
26	326	297	1090	329	329	778	919
27	326	292	995	332	334	830	937
28	323	292	950	323	334	870	955
29	329	287	910	282	332	870	1000
30	315	284	919	280	329	874	1030
31		280		308	329		1050
Mean	**330	319	1510	408	319	658	1010
Ac.Ft. for Month	**7860	19600	90100	25100	19600	39200	62200
Diversions Below Station-Ac.Ft.		53	73	60	76	39	62
M.I.D.Spill below Station-Ac.Ft.		220	820	650	150	350	400
⁄ Discharge to San Joaquin River Acre-feet		19800	90800	25700	19700	39500	62500

NOTE: This is a recording gage station 3.35 miles above the mouth.
* Beginning of record for season.
** 12 days.
e Partially estimated.
⁄ Neglecting seepage return below station.

TABLE 43

DISCHARGE OF TUOLUMNE RIVER AT TUOLUMNE CITY-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*316	302	270	277	297	289
2	318	308	277	280	296	283
3	324	311	270	282	295	284
4	316	312	282	297	291	291
5	324	314	280	302	288	293
6	324	321	282	287	287	297
7	326	321	294	280	291	293
8	324	314	284	282	295	314
9	316	314	284	282	297	329
10	310	315	284	290	291	288
11	305	305	287	287	290	287
12	305	313	282	290	286	296
13	303	316	280	297	293	301
14	297	304	284	294	289	297
15	295	296	290	290	288	291
16	292	297	290	292	285	420
17	313	305	292	290	289	661
18	310	303	294	292	285	778
19	300	301	292	297	282	812
20	303	304	290	297	281	813
21	308	302	292	300	274	810
22	290	288	290	297	276	816
23	282	278	290	297	293	809
24	292	281	287	297	296	811
25	292	276	290	302	301	812
26	295	282	292	307	296	834
27	300	290	287	305	296	823
28	300	282	282	300	287	801
29	301	282	287	297	281	790
30	301	270	287	294	282	784
31	302		284	294		777
Mean	306	300	286	293	289	541
Ac.Ft. for Month	18800	17900	17600	18000	17200	33300
Diversions Below Station-Ac.Ft.	50	37	38	66	51	27
M.I.D. Spill Below Station-Ac.Ft.	204	47	103	37	0	0
**Discharge to San Joaquin River Acre-feet	19000	17900	17700	18000	17100	33300

NOTE: This is a recording gage station 3.35 miles above the mouth.

* Beginning of record for season.

** Neglecting seepage return below station.

TABLE 44

DISCHARGE OF STANISLAUS RIVER AT
ORANGE BLOSSOM BRIDGE-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1				40	35	30	20
2				40	36	35	20
3				40	38	37	20
4			3530	40	40	37	20
5				40	28	40	20
6				40	21	35	20
7		177		40	23	32	20
8		166		40	23	32	20
9		66		40	23	31	20
10		54		40	25	30	20
11		54		40	25	29	20
12		73		40	26	28	20
13		73		35	27	25	21
14		63	3810	30	28	20	21
15		66	3730	30	29	20	22
16		132	3670	30	30	19	22
17		115	3690	30	31	19	23
18		69	3700	30	32	19	24
19	*37		3700	37	33	19	25
20	37		3710	37	34	19	25
21	37	236	3650	38	35	19	25
22	248	128		38	36	19	25
23	107	73		39	37	19	25
24	80	76	690	39	38	19	25
25	87	69		40	39	19	25
26		69		40	40	19	25
27		69		28	57	19	25
28		84		28	35	19	25
29				30	30	19	56
30			*	32	28	20	87
31				34	26		119
Mean	*	*	*	36	32	25	29
Ac.Ft. for Month	*	*	*	2230	1960	1480	1760

NOTE: This station is located 5.7 miles above Oakdale. The record is partially from recording gage and partially from intermittent staff gage readings.

* In the period from April 19th to June 30th the recorder was not operating properly and except for the partial discharge shown the record was lost.

TABLE 45

DISCHARGE OF STANISLAUS RIVER AT
ORANGE BLOSSOM BRIDGE-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*80	28	28	28	28	20
2	80	28	28	20	20	20
3	80	28	28	28	20	20
4	76	28	28	28	20	20
5	87	28	28	28	20	20
6	87	28	28	28	20	20
7	76	28	28	28	20	20
8	76	28	28	28	20	20
9	69	28	28	28	20	20
10	69	28	28	28	20	20
11	69	28	28	28	20	28
12	69	28	28	28	20	28
13	69	28	28	28	20	28
14	69	28	28	28	20	28
15	69	28	28	28	20	28
16	69	28	28	28	20	28
17	69	28	28	28	20	28
18	69	28	28	28	20	28
19	69	28	28	28	20	28
20	54	28	28	28	20	28
21	54	28	28	28	20	40
22	54	28	28	28	20	40
23	54	28	28	28	20	54
24	54	28	28	28	20	54
25	54	28	28	28	20	54
26	54	28	28	28	20	69
27	54	28	28	28	20	87
28	54	28	28	28	20	87
29	28	28	28	28	20	87
30	28	28	28	28	20	107
31	28		28	28		107
Mean	64	28	28	28	20	41
Ac.Ft. for Month	3910	1670	1720	1720	1210	2510

NOTE: This station is located 5.7 miles above Oakdale. The record is from daily staff gage readings.

* Beginning of record for season.

TABLE 46

DISCHARGE OF STANISLAUS RIVER AT HATMARK RANCH-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		287	4360	700	221	209	229
2		292	4770	590	223	194	238
3		293	5080	578	236	218	259
4		292	5160	560	249	221	234
5		309	4740	497	249	236	205
6		330	3660	443	257	245	202
7		419	3010	422	247	218	214
8		534	4030	425	244	196	209
9		459	4460	388	221	205	230
10		405	4540	391	185	220	234
11		353	4640	371	194	253	240
12		302	4560	352	220	249	220
13		269	4460	319	225	240	211
14		285	4740	310	230	230	221
15		285	4840	292	220	207	223
16		265	4700	288	220	191	221
17		258	2360	294	220	249	218
18		265	1800	278	221	251	227
19		282	2620	257	234	257	203
20	*303	282	2500	244	220	234	221
21	271	283	1580	244	221	244	203
22	241	320	1170	238	236	234	225
23	250	313	1060	229	249	232	249
24	231	292	1000	198	257	240	253
25	281	269	1120	218	244	249	257
26	298	270	939	218	247	257	249
27	269	265	780	230	229	238	247
28	258	258	861	212	207	229	268
29	271	256	816	220	234	220	264
30	285	735	768	236	218	247	288
31		3520		218	211		304
Mean	**269	428	3040	338	228	230	234
Ac.Ft. for Month	**5870	26300	181000	20700	14100	13700	14400

NOTE: This is a recording gage station 5.2 miles above the mouth of the river.

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

TABLE 47

DISCHARGE OF STANISLAUS RIVER AT HATMARK RANCH-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		154	177	140	154	136
2		148	175	137	173	144
3		152	167	135	172	146
4		167	167	161	158	142
5		173	152	171	146	142
6		196	152	188	136	132
7		180	171	178	126	137
8		182	186	173	132	144
9		163	167	161	140	130
10		144	133	138	138	138
11		177	129	133	147	137
12		182	125	104	142	136
13		190	135	133	148	126
14		182	140	138	148	142
15		171	158	144	149	131
16		173	156	152	150	136
17		163	142	138	155	147
18		161	144	144	150	150
19		159	138	142	154	144
20		163	138	144	138	154
21		161	133	142	134	151
22		161	135	140	134	150
23		154	135	140	139	151
24		144	161	144	146	150
25	*204	154	173	167	155	152
26	190	154	169	202	160	148
27	184	186	161	144	148	144
28	178	171	154	140	143	152
29	172	169	171	122	152	152
30	166	167	154	116	154	168
31	160		154	118		171
Mean	**179	167	153	146	147	144
Ac.Ft. for Month	**2490	9920	9430	8980	8770	8890
Diversions Below Station-Ac.Ft.		96	97	129	52	80
***Discharge to San Joaquin R.-Ac.Ft.		9820	9330	8850	8720	8810

NOTE: This is a recording gage station 5.3 miles above the mouth of the river. It was moved upstream 300 feet in May 1934.

* Beginning of record for season.

** 7 days.

*** Neglecting seepage return below station.

CHAPTER III

MEASUREMENTS OF DIVERSIONS

Measurements and records of diversions in 1933 and 1934 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 Rivers as obtained in connection with the return water measurements (See Chapter IV). For 1934 this report records a total of 461 diversions, segregated to the various sources as follows: Sacramento River 204, Colusa Trough 2, Back Borrow Pit (carrying drainage water from Colusa Basin along the back levees of Reclamation Districts 108 and 787) 8, Lower Butte Creek and Butte Slough 15, By-pass and Drainage Channels 22, Feather River 37, Yuba River 10, American River 24, diversions to Delta Uplands from Cache Slough 1, from Old San Joaquin River 12, from Tom Paine Slough 8, and from San Joaquin River (below Vernalis gaging station) 34, San Joaquin River (above Vernalis Gage) 15, Stanislaus River 14, Tuolumne River 10, and Merced River 45.

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 possible 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 Water Supervisor. 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 in the last two seasons, only the larger plants have kept the daily operation records and the power consumption data have been secured from the power distributing agency 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. 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, for 1933 and 1934, except for the larger diversions, the monthly records only are available.

Summaries of the 1933 and 1934 diversions throughout the Sacramento-San Joaquin territory are shown in Tables 48 and 49. A segregation is made to show the relative diversions from the various river sources. For each segreation the tables show also the acreage irrigated and the computed seasonal gross duty of water.

TABLE 48

DIVERSIONS, ACREAGE IRRIGATED AND GROSS SEASONAL DUTY OF WATER IN THE SACRAMENTO-SAN JOAQUIN AREA, 1933

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	1041700	101134	52994	154128	6.8
Feather River below Oroville	478300	21897	26541	48438	9.9
Yuba River on Valley Floor	64100	5935	2645	8580	7.5
American River below Fairoaks	4600	2848		2848	1.6
By-Pass and Drainage Channels (Including Lower Butte Creek and Slough)	76400	11441	5250	16691	4.6
Total above Sacramento	1665100	143255	87430	230685	7.2
Delta Uplands from Cache Slough, Old River, Tom Paine Slough and San Joaquin River	129100	52566		52566	2.5
San Joaquin River from Fremont Bridge to Durham Ferry Bridge	95600	35036		35036	2.7
Merced River below Snelling	12000	3229		3229	3.7
Tuolumne River below Roberts Ferry Bridge	2200	855		855	2.6
Stanislaus River below Orange Blossom Bridge	7200	2021		2021	3.6
Total Delta Uplands and Pumping Diversions of San Joaquin River and Tributaries *	246100	93707		93707	2.6
Sacramento-San Joaquin Delta **					

* 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 1933. 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 49

DIVERSIONS, ACREAGE IRRIGATED AND GROSS SEASONAL DUTY OF WATER IN THE SACRAMENTO-SAN JOAQUIN AREA-1934

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	1057000	93783	56516	150299	7.0
Feather River below Oroville	428000	23984	24918	48902	8.8
Yuba River on Valley Floor	51900	6305	1667	7972	6.5
American River below Fairoaks	5500	2770		2770	2.0
By-Pass and Drainage Channels (Including Lower Butte Creek and Slough)	116300	9971	8715	18686	6.2
Total above Sacramento	1658700	136813	91816	228629	7.2
Delta Uplands from Cache Slough, Old River, Tom Paine Slough and San Joaquin River	145600	56213		56213	2.6
San Joaquin River from Fremont Bridge to Durham Ferry Bridge	120700	41696	290	41986	2.9
Merced River below Snelling	17600	5091		5091	3.5
Tuolumne River below Roberts Ferry Bridge	2200	845		845	2.6
Stanislaus River below Orange Blossom Bridge	9400	2122		2122	4.4
Total Delta Uplands and Pumping Diversions of San Joaquin River and Tributaries *	295500	105967	290	106257	2.8
Sacramento-San Joaquin Delta **					

* 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 1934. 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 50

SUMMARY OF SACRAMENTO RIVER DIVERSIONS-1933
(Acre-feet)

River Section	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Totals
Redding to Red Bluff	0	11302	20328	20127	21470	21097	20259	20740	135323
Red Bluff to Butte City	1650	54781	86866	83226	90876	89015	47276	20682	474372
Butte City to Colusa	182	3564	6400	6850	6439	5577	3075	1194	33281
Colusa to Wilkins Slough	808	31050	49195	50803	48757	43543	20115	5878	250149
Wilkins Slough to Knights Landing	235	7902	11504	12465	12111	9642	4493	1029	59381
Knights Landing to Verona	0	2916	3131	3769	3888	2891	1002	240	17837
Verona to Sacramento	1577	7162	10580	12612	13911	14180	8851	2504	71377
Totals	4452	118677	188004	189852	197452	185945	105071	52267	1041720

- - 0 - -

TABLE 51

SUMMARY OF SACRAMENTO RIVER DIVERSIONS-1934
(Acre-feet)

River Section	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Totals
Redding to Red Bluff	0	9241	21178	21023	21908	21532	20692	18051	133625
Red Bluff to Butte City	34	43922	86813	78102	88325	88467	46601	16542	448806
Butte City to Colusa	178	1156	5745	5188	5280	3018	1570	1396	23531
Colusa to Wilkins Slough	43	31898	53939	48090	44159	40551	20775	4008	243463
Wilkins Slough to Knights Landing	615	11236	16813	18741	18297	15030	8383	1711	90826
Knights Landing to Verona	0	2876	4321	4658	3812	4125	946	139	20877
Verona to Sacramento	1729	9309	15901	17667	21062	18765	8918	2484	95835
Totals	2599	109638	204710	193469	202843	191488	107885	44331	1056963

TABLE 52

SACRAMENTO RIVER DIVERSIONS–1933

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET									
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	O		
CITY OF SACRAMENTO	0.8 L	3–20" 1–18"	1390	1790	1980	2510	2910	2800	2150	1930	17460	MUNICIPAL
— AMERICAN RIVER — MILE 1.1 LEFT												
JOE CORRY	(1) 1.2 L	1–8"				6	6	6			18	86
— BACK BORROW PIT RECL. DIST. 1000 — MILE 1.3 LEFT												
E. FOURNESS	1.45 R	1–8"			81	118	71	12		6	288	135
SUBURBAN HOLDINGS COMPANY (2)	2.05 L	1–8"	5	35	64	48	49	44	18	12	275	130
— RECLAMATION DISTRICT 1000 DRAIN — MILE 2.1 LEFT												
FRANK CHRISTOPHEL	2.4 L	1–5"	3	5	17	19	20	12	19		95	44
H. M. SWALLEY	2.45 L	1–5"		13	12	7	14	10	13	1	70	38
ALBERT ELKUS	2.9 L	1–5"			5	9	9	9	6		38	23
EARL FRUIT COMPANY (3)	3.55 R	1–16"	170	383	15	338	55	202			1163	160
W. E. M. BEARDSLEE	3.75 R	1–5"			28	40	25				93	51
W. I. ELLIOTT	4.0 R	1–10"			14	107	111	36	22		290	76
REESE AND GREER	4.65 R	1–7"		14	99	98	43				254	100
HARBINSON BROTHERS	5.05 R	1–14"					109	3	72	33	217	80
R. S. SEYDEL	5.25 R	1–8"			78	149	66	20			313	(4) 159
C. H. MERKELEY ESTATE	5.3 R	1–8"				41	15				56	55
A. CASSELMAN	5.5 R	1–6"				15	7				22	22
A. A. CASSELMAN	5.55 R	1–6"				9	9				18	30
K. L. LOVDAL	5.7 R	1–10"			N O	D I V E R S I O N						
J. E. BANDY	6.0 R	1–6"	7	15	20	38	51	51	36	19	237	80
RIVERSIDE MUTUAL WATER COMPANY	6.10 L	2–18"		574	1190	1550	1770	1500	900		7484	1436 61
O. A. AND F. L. WHITE	6.4 R	1–6"			14	16	9	4	3		46	70
E. S. FISK (5)	7.0 R	1–4"					22	10			32	19
CALIFORNIA BANK AND TRUST CO.	7.5 L	1–8"			6	15	42	43	24		130	90
F. L. MARTIN AND A. B. CARTER (F. J. STAHL)	7.8 L	1–10"				9	43	79	77	30	238	86
A. MARTY	7.9 R	1–8"		11	9	12	16	54	68	36	206	(6)
M. E. AND R. F. BENNETT	7.9 L	1–10"			74	71	97		33		275	(7) 101
M. MARTY (8)	8.3 R	2–10"		49	43	51	55	160	97	87	542	(9) 203
JULIUS BLAUTH	8.5 R	1–6"			33	111	55				199	85
H. WALDECK	8.7 R	1–6"		23	19	20	21	25	22	13	143	43
HAZEL GOETHE (10)	8.95 R	1–18"			130	540					670	735
A. A. SOUSA	9.35 R	1–14"			232	117	228	510	475	136	1698	530
R. G. PEARSON AND P. S. DRIVER	9.8 L	1–14"		85	102	80	192	78	42		579	(11) 151

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) PLANT MOVED TO THIS LOCATION FROM MILE 0.05 R ON AMERICAN RIVER.
(2) FORMERLY C. W. JONES
(3) FORMERLY HAYWARD REED.
(4) INCLUDES 60 ACRES ON ADJOINING SCHMIDT PROPERTY.
(5) FORMERLY A. MARTY.
(6) SEE PLANT AT MILE 8.3 R.
(7) INCLUDES 46 ACRES ON ADJOINING LANDS IRRIGATED FOR E. D. WILLEY.
(8) LISTED IN 1932 AS TWO PLANTS AT MILE 8.3 R., M. MARTIN AND MARTIN MARTY.
(9) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 7.9 R.
(10) FORMERLY T. T. C. GREGORY.
(11) PEARSON 96 ACRES; DRIVER 55 ACRES.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1933

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
CARL CASSELMAN	9.9 R	1-12"			72	82	78	34	19	19	304	146	
E.C.BOOM, TRUSTEE FOR F.W.KIESEL	10.25 L	1-14"		12	104	141	224	199	100		780	290	
REESE ESTATE	10.75 R	1-12"				103	94	100	65		362	80	
R.F.FIDDYMENT AND E.J.CAHILL	10.75 L	1-12"			3	62	66	63	17		211	(1)71	
A. L. WHITE	11.6 L	1-10"				9	54		46		109	65	
CONAWAY RANCH	12.0 R	4-36"			No	DIVERSION							
THOMAS O'CONNOR	12.5 R	1-12"			81	83	23	44			231	60	
GERTRUDE BROWN	12.7 R	1-6"	2	15	18	26	30	26	19	12	148	28	
JULIUS HAUSER	13.1 R	1-12"			No	DIVERSION							
HENRY SCHAEFER (2)	13.25 R	1-10"		6	23	49	93	78	25	7	281	48	
ELKHORN MUTUAL WATER COMPANY	14.1 L	1-24"		133	2107	2289	2922	2783	2151	105	12490	2366	
		1-20"											
CALIFORNIA LANDS, INC.	15.15 R	1-10"			72	97	68	166	116	52	571	185	
HARRY HALL	15.7 L	1-6"			No	DIVERSION							
CENTRAL MUTUAL WATER COMPANY	16.0 L	2-38"		3578	2787	2596	3238	4211	2200		(3)18610	1240	1956
FRANK FISHER AND HENRY RICH (HERSHEY PLANT)	16.27 R	1-20"		417	426	341	340	692			(4) 2216	(5) 143	
H. T. SILVIUS	16.4 R	1-6"			No	DIVERSION						(6)	
W. B. BEACH (7)	16.62 R	1-6"		4			40	20			64	35	
THOMAS J. COX ESTATE	16.7 R	1-16"			No	DIVERSION						(8)	
CALIFORNIA WESTERN STATES LIFE INSURANCE COMPANY (9)	17.75 R	1-20"			612	553	483	71			1719	442	
												(10)	
MORRIS AND JOHN SCHEIBER	18.45 L	1-12"			No	DIVERSION							
G. H. LYALL (F. S. MACHADO)	18.7 L	1-8"			10	37	38	25	16	6	132	40	
CALIFORNIA TRUST & SAVINGS BANK(11)	18.95 R	1-18"			No	DIVERSION							
NORTHERN MUTUAL WATER COMPANY	19.6 L	1-36"			No	DIVERSION							
— 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							

Verona

[redacted]

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) ALL CAHILL ACREAGE.

(2) FORMERLY J. KEFFER.

(3) 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.

(4) PART OF THIS DIVERSION WAS USED TO SUPPLEMENT IRRIGATION OF ACREAGE SHOWN FOR PLANT AT MILE 22.5 R. SURPLUS WATER WAS SPILLED TO EAST BORROW PIT OF YOLO BY-PASS TO BE REDIVERTED BY FISHER AND RICH PLANT AT MILE 10.1 R ON THE LATTER.

(5) INCLUDES ACREAGE ON ADJOINING PROPERTY: ROSE 15 ACRES; H. T. SILVIUS (MILE 16.4 R) 63 ACRES.

(6) SEE NOTE FOR FISHER AND RICH PLANT, MILE 16.27 R.

(7) PLANT REINSTALLED 1933.

(8) SEE NOTE FOR FISHER AND RICH PLANT, MILE 22.5 R.

(9) FORMERLY FISHER AND RICH MULL PLANT.

(10) INCLUDES 172 ACRES ON ADJOINING FISHER AND RICH LANDS.

(11) FORMERLY HOOVER RANCH.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1933

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
FRANK FISHER AND HENRY RICH (KELLER PLANT)	22.5 R	1-22"		74	159	594	451	259			1537	652	270
HERSHEY ESTATE	26.95 R	1-18"			NO	DIVERSION					(1)	(2)	
E. J. BRAUN (4)	OPP. 26.95 R	1-10"			NO	DIVERSION					(3)	(3)	
MORSE INGLIN	28.2 R	1-6"			17	21	17	11	7	4	77	30	
RUSSELL BROTHERS	29.2 R	1-12"		44	53	33	49	43	38		260	111	
KENDALL ESTATE	29.7 R	1-8"			61	72	73	7			213	40	
P. L. TRAGANZA AND K. RUSSELL	29.75 R	1-8"			1	2	3	2	3	3	14	8	
LAURA FREITAS	29.9 L	1-12"			59	134	134	1		1	329	104	
LEO GIOVANETTI	30.2 L	1-3"			11	11	4	1	1		28	(5) 21	
RECLAMATION DISTRICT 1500	30.45 L	1-2"			2	4	1				7	6	
KENDALL ESTATE	30.6 R	1-12"			61	88	65				214	42	
FLOYD ANDERSON	30.7 R	1-6"		2	10	12	13	13	13	7	70	(6) 30	
RECLAMATION DISTRICT 1500 (7)	30.75 L	1-6"			3	5	2				10	8	
J. G. BOULART	30.9 L	1-8"			NO	DIVERSION							
A. C. HUSTON (J. A. SIMMONS)	31.5 R	1-12"		3	43	80	69	11	6		212	89	
M. ALONSO	31.8 L	1-6"			1	5	3	3			12	30	
M. R. RICHARDSON (8)	32.0 R	1-10" (9)			225	269	144	22	3		663	300	
SUTTER MUTUAL WATER COMPANY (PORTUGUESE BEND)	32.0 L	2-24"		2688	2259	2254	2728	2497	900	149	13475	(10)	(10)
COLLIER BROTHERS	32.5 R	1-10"			48	59	45	19	31		202	89	
R. B. COULTER (11)	33.2 L	1-20"			NO	DIVERSION							
SNOWBALL ESTATE	33.5 R	1-12"		105						76	181	125	
J. C. KNOX AND FRED LEISER	33.75 L	1-12"			118	126	87	2			333	(12) 162	
— KNIGHTS LANDING GAGING STATION — MILE 34.0													
— COLUSA BASIN DRAINAGE — MILE 34.15 R													
MEEK ESTATE	34.2 R	1-10" 2-16"			413	623	33	29	288		1386	605 (13)	
RIVER FARMS COMPANY (TOWNSITE PLANT)	34.25 R	1-24" 1-26" 1-20"	120	2740	3320	2322	2327	1485	370	405	13089	1990 (14)	626

*MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) ADDITIONAL WATER FOR THE ACREAGE UNDER THIS DIVERSION WAS OBTAINED FROM FISHER AND RICH HERSHEY PLANT, MILE 16.27 R.

(2) INCLUDES 280 ACRES ON THOS. J. COX ESTATE, MILE 16.7 R.

(3) NO DIRECT DIVERSION FROM RIVER. 308 ACRES WERE IRRIGATED FROM SEEPAGE WATER IN GRAYS BEND (OLD CHANNEL NOW CUT OFF) DIVERTED BY MEANS OF A BOOSTER PLANT, AS FOLLOWS: ACRE-FEET, MAY 186, JUNE 252, JULY 122, TOTAL 560.

(4) ON GRAY'S BEND (OLD CHANNEL NOW CUT OFF).

(5) INCLUDES 9 ACRES ON ADJOINING ASHLEY PROPERTY.

(6) INCLUDES 14 ACRES ON ADJOINING GRANT PROPERTY.

(7) TEMPORARY INSTALLATION AT AN OLD POINT OF DIVERSION.

(8) FORMERLY KENDALL ESTATE.

(9) 18 INCH UNIT REMOVED.

(10) SEE PLANT AT MILE 63.75 L.

(11) PREVIOUSLY LISTED AS GEORGE STAM.

(12) KNOX 75 ACRES, LEISER 87 ACRES.

(13) INCLUDES ADJOINING LANDS AS FOLLOWS: RIVER FARMS COMPANY 120 ACRES, BETCHARD 20 ACRES, DIXON 5 ACRES AND ROBINSON 5 ACRES.

(14) INCLUDES 239 ACRES SERVED BY BOOSTER PLANT ON DRAIN AT EASTHAM SUPPLIED BY SPILL AND DRAINAGE FROM BOTH TOWNSITE AND R.D. 2047 PLANT (MILE 43.1 R).

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1933

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
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	34.85 L	1-12"			51	103	84				238	109	
FRED VAN LEW	35.2 L	1-12"			NO	DIVERSION							
J. H. SCOTT	35.6 L	1-7"		5	50	16	12	12			95	29	
A. COSTA (A. MORCONI)	35.8 L	1-10"		3	36	15	6	6	5	3	74	85	
AMEDEO MORONI	36.7 L	1-5"			NO	DIVERSION							
RIVER FARMS COMPANY (GARDEN PUMP)	36.95 R				PLANT	DISMANTLED							
W. W. BOTTIMORE	37.2 L	1-14"			NO	DIVERSION							
L. W. BUNDOCK	37.75 L	1-8"			21	23	25	34			103	100	
ADDIE REEL	38.4 L	1-10"			21	66	3				90	85	
CALIFORNIA LANDS INCORPORATED (H. A. KRAMER)	38.8 L	1-10"						15	61		76	100	
F. O. EASTMAN (1)	39.4 L	1-12"			68		36				104	76	
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	39.8 L	1-10"			33	89	67				189	85	
WM. DUFFY, JR.	39.9 L	1-6"			22	27	17				66	25	
SUTTER MUTUAL WATER COMPANY (STATE RANCH BEND)	40.6 L	1-24"		1567	2718	2322	2204	2186	1355	459	12811	(2)	(2)
BUELL RANCH (M. K. DEAN)	42.2 L				PLANT	DISMANTLED							
SUTTER BASIN CORPORATION (E. BOZZI)	42.3 L	1-8"					36	24	14	2	76	50	
A. KRAMER	43.1 L	1-12"			90	45	42	43	5	12	237	81	
EL DORADO RANCH	43.1 R	1-18"	115	320	183	213	174	64	30	148	1247	457	
RIVER FARMS COMPANY (RECLAMATION DIST. 2047 PLANT)	43.1 R	2-50"		1663	2052	3078	3686	3040	1560		15079 (3)		1200 (3)
RECLAMATION DISTRICT 108 DRAIN — MILE 44.0 R													
JOHN CLAUSS (G. GUISTI)	47.3 L	1-14"											
		1-24"			46	185	107		60		398	150	
P. J. HIATT	48.7 L	1-20"		665	569	550	623	1130			3537	600	
P. J. HIATT	49.7 L	1-14"		18							18	50	
RECLAMATION DISTRICT 108 (TYNDALL MOUND PLANT)	51.1 R	2-24"			NO	DIVERSION							
		1-36"											
CALIFORNIA NATIONAL BANK (P. J. HIATT) (4)	51.2 L	2-16" (5)		855	1074	1390	1724	1189	600		6832	500	300
J. F. WHITE	51.5 L	1-8"					2	15	10		27	20	
T. J. CUMMINS RANCH COMPANY	52.0 L	1-16"			163	166	114		21		464	161	
G. W. STRETTER	55.1 L	1-20"			NO	DIVERSION							
RECLAMATION DISTRICT 108 (BOYER BEND PLANT)	56.4 R	1-18"											
		1-30"			NO	DIVERSION							
J. M. MILLER	56.65 R	1-12"					78	24	18		120	52	
G. W. STRETTER	56.95 L	1-20"			NO	DIVERSION							
J. M. KIRKUP	57.5 L	1-16"			7	120	4	67	31		229	85	
H. S. FASIG	58.2 L	1-15"			171	423	254	74	35		957	(6) 273	
J. R. YOUNG	58.9 L	1-16"			NO	DIVERSION							

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) FORMERLY SUTTER BASIN CORPORATION (F. O. EASTMAN).

(2) SEE PLANT AT MILE 63.75 L.

(3) DRAINAGE AND SPILL FROM THIS DIVERSION SUPPLIED AN ADDITIONAL ACREAGE THROUGH BOOSTER PLANT AT EASTHAM. SEE NOTE FOR TOWNSITE PLANT, MILE 34.25 R.

(4) FORMERLY G. J. STAM.

(5) OLD 24" UNIT REPLACED BY 2-16" PUMPS IN 1933.

(6) INCLUDES 123 ACRES ON ADJOINING SAYLOR LANDS.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1933

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
LAMB BROTHERS	59.8 L	1-14"		56	35	101	13	80			285	(1) 175	
RECLAMATION DISTRICT 108 (STEINER BEND PLANT)	59.85 R	1-16"			NO	DIVERSION							
F. L. BURRELL (J. L. SILLS) (2)	60.4 L	1-10"			123	191	128	28	7		477	115	
BLANCHE COULTER BROWN	60.5 L	1-12"			53	120	89				262	(3) 122	
SUTTER BASIN CORPORATION (COLES LANDING)	61.3 L	1-12"			NO	DIVERSION							
JOHN KOLPIEN	61.3 R	1-12"							18		18	(4) 20	
HINES RANCH	62.3 R	1-10"			5	15	15	9	5		44	17	
J. B. SMITH (2)	62.3 L	1-10"				80	64	78			(5) 227	(5) 105	
WILLIAM BAKER	62.6 R	1-8"			3		28				31	26	
R. L. YOUNG (2)	62.8 L	1-8"		10	177	162	116	10			(6) 495	120	
—WILKINS SLOUGH GAGING STATION —	MILE 62.9												
RECLAMATION DISTRICT 108 (WILKINS SLOUGH PLANT)	63.2 R	5-42"	453	7553	7718	8812	8990	11410	1423		46359	173	5960
SUTTER MUTUAL WATER COMPANY (TISDALE) AND IMPROVEMENT MUTUAL WATER COMPANY	63.75 L	6-42"		18882	27017	28203	27491	23038	14632	4674	143937 (7)	20037 (8)	9074 (8)
LA ROCA MONTE RANCHO COMPANY	64.3 R	1-12"			44	38	30			8	120	35	
TISDALE IRRIGATION AND DRAINAGE CO.	64.4 L	1-12"	32	272	839	777	637	686	295	85	3623	(9) 1114	(9) 343
COLUSA DEVELOPMENT COMPANY (SPRECKLES SUGAR COMPANY)	64.9 R	1-24"			335	154	86			133	708	370	
M. BETTENCOURT	65.1 R	1-10"			5	36	30	23	17		111	25	
D. L. W. HOFFMAN	65.7 L	1-12"			21	27	6	33	29		116	60	
J. L. BROWNING	66.4 R	1-18"		100	730	642	520	180			2172	(10) 1582	
TISDALE IRRIGATION AND DRAINAGE CO. (WINSHIP PLANT)	67.1 L	1-20"		408	1495	1560	1560	1295	610		6928	(11)	(11)
DESMOND A. WINSHIP, ET AL	67.2 L	1-10"				15					(12) 15	(13)	
MERIDIAN FARMS WATER CO. #6	67.4 L	1-12"			102	91	116	73	33		415	128	
SCOTT F. ENNIS AND E. S. BROWN (14)	67.5 L	2-24"			1218	1034	1530	1486			5268	(15) 2942	
— RECLAMATION DISTRICT 70 DRAIN —	MILE 68.8 L												
MERIDIAN FARMS WATER CO. #5	68.81 L	1-12"			342	309	258	221	125		1255	267	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) INCLUDES 60 ACRES ON ADJOINING MCCUNE PROPERTY.

(2) NEW INSTALLATION 1933.

(3) 40 ACRES ADDITIONAL SERVED THROUGH SUTTER MUTUAL WATER COMPANY SYSTEM. SEE MILE 63.75 L.

(4) ALL ON ADJOINING BETTENCOURT LAND.

(5) INCLUDES 10 ACRES ON ADJOINING LANDS OF L. L. BABER. ADDITIONAL WATER FOR THIS ACREAGE RECEIVED FROM R. L. YOUNG PLANT AT MILE 62.8 L.

(6) A PORTION OF THIS DIVERSION USED FOR THE ACREAGES REPORTED UNDER THE PLANT AT MILE 62.3 L.

(7) INCLUDES WATER DELIVERED TO IMPROVEMENT MUTUAL WATER COMPANY AS FOLLOWS: (ACRE-FEET) MAY 1160, JUNE 480, JULY 2067, AUGUST 1385, SEPTEMBER 789, OCTOBER 740. TOTAL 6621.

(8) THESE FIGURES GIVE THE TOTAL ACREAGE IRRIGATED FROM THE PORTUGUESE BEND, STATE RANCH BEND AND TISDALE PLANTS AT MILES 32.0 L, 40.6 L, & 63.75 L, RESPECTIVELY. THEY INCLUDE 2243 ACRES OF GENERAL CROPS IRRIGATED BY IMPROVEMENT MUTUAL WATER CO. (IN R.D.1600) ENTIRELY FROM THE TISDALE PLANT AND ALSO 40 ACRES OF GENERAL CROPS OF BLANCHE COULTER BROWN AT MILE 60.5 L.

(9) THIS IS THE TOTAL ACREAGE IRRIGATED BY THIS PLANT AND THAT AT MILE 67.1 L. THE GENERAL CROP FIGURE INCLUDES 118 ACRES OF D. A. WINSHIP MILE 67.2 L, SERVED FROM PLANT AT MILE 67.1 L.

(10) SERVED JOINTLY BY THIS PLANT AND THAT AT MILE 69.0 R.

(11) SEE PLANT AT MILE 64.4 L.

(12) ADDITIONAL WATER RECEIVED FROM PLANT AT MILE 67.1 L.

(13) SEE ACREAGE NOTE FOR PLANT AT MILE 64.4 L.

(14) FORMERLY LISTED AS ENNIS-BROWN COMPANY.

(15) INCLUDES ADJOINING ACREAGES AS FOLLOWS: SPRINGER ESTATE 160 ACRES; MERIDIAN FARMS COMPANY 269 ACRES.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS-1933

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	69.0 R	1-24"		300	984	1042	846	555	86	4	3817	(1)	
FAXON RANCH	69.2 R	1-18"		31	331	241	296	231	54		1184	264	
— EDDYS FERRY (GRIMES) — MILE 69.45													
WILBUR JENSEN AND MARY CECIL, ET AL.	70.35 R	1-24"			NO	DIVERSION							
HOUCHINS, HOFFMAN, BECKLEY, AND RITCHIE (J. M. RITCHIE)	70.4 R	1-20"			NO	DIVERSION							
MERIDIAN FARMS WATER COMPANY #4 (GRIMES)	71.1 L	1-24"		262	2027	1390	1387	1051	608	36	6761	1492	
J. W. BROWNING	71.9 R	1-12"			NO	DIVERSION							
ANTONE STEIDELMEYER	71.9 R	1-12"		149	94		51				294	130	
E. E. VANN (LOVELACE BROWN)	73.6 R	1-12"			10	185	5	55			255	77	
MERIDIAN FARMS WATER COMPANY #3 (HEADQUARTERS)	74.8 L	1-18"		575	1212	1140	988	794	337	37	5083	771	121
L. B. WESTFALL	75.3 R	1-10"	27	5	88	92	32	33	15	60	352	66	
J. H. YATES	76.1 L	1-12"		11	49	61	42	21	7	2	193	60	
E. V. JACOBS	77.9 L	1-12"			284	88					372	190	
SEBIA DAVIS ESTATE	78.8 R	1-36"			NO	DIVERSION							
C. E. REISCHE	79.0 L	1-10"		54	66	108	59	45	15		347	(2) 131	
E. V. JACOBS	79.5 L	1-8"		23							23	35	
G. W. WOOD	79.7 L	1-10"		26	18	53	32	30	9	2	170	(3) 113	
— MERIDIAN BRIDGE — MILE 79.85													
MERIDIAN FARMS WATER COMPANY #1 AND #2 (MERIDIAN)	80.0 L	1-24"		955	2687	2700	1920	1441	1581	650	11934	2300	80
		1-18"			47						47	40	
GEO. P. AHLF	80.3 R	1-8"			PLANT	REMOVED							
M. S. DAVIS	80.9 L												
WONDERLY AND LILIANTHAL	81.5 L	1-16"	5	17	5	28	37	30	15		137	30	
STEIDELMEYER BROTHERS	81.9 R	1-16"	241	288	410	736	401	353	88	3	2520	(4) 480	
F. T. REISCHE AND L. J. WOOD	82.5 L	1-12"			24	21	35	21	23	3	127	(5) 65	
GEORGE W. KIRKPATRICK	83.3 L	1-14"			NO	DIVERSION							
P. E. GARMIRE	83.6 L	1-10"			NO	DIVERSION							
— BUTTE SLOUGH — MILE 84.0 L													
OAKLAND PRUNE COMPANY	86.1 R	1-12"		39	72	77	51	51		1	291	105	
J. F. PECK	86.6 L	1-18"			168	56	230				454	(6) 160	
LLOYD SCOGGINS	86.8 L	1-8"		61		50	54	35			200	45	
W. P. DWYER (LOWER)	86.9 R	1-16"		97	65	108	83	49		4	406	(7) 220	
W. P. DWYER (UPPER)	87.4 R	1-15"		160	71	71	75				377	(8)	
JACOBSEN AND O'ROURKE	87.6 L	1-10"			NO	DIVERSION							
SWINFORD TRACT IRRIGATION COMPANY	87.7 R	1-12"	50	131	67	160	70	8		75	561	132	
EDWARD K. LANGE	88.0 R	1-6"		2	7	9	9				27	26	

*MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) SEE PLANT AT MILE 66.4 R.
(2) INCLUDES NEIGHBORING ACREAGE. SEGREGATION AS FOLLOWS: REISCHE 60 ACRES, STAAS 25 ACRES, ROCKHOLT 18 ACRES, KILGORE 28 ACRES.
(3) INCLUDES 62 ACRES ON ADJOINING BURTIS LANDS.
(4) INCLUDES 30 ACRES ON ADJOINING TUBBS PROPERTY.
(5) REISCHE 40 ACRES AND WOOD 25 ACRES.
(6) INCLUDES 30 ACRES ON ADJOINING REICHEL PROPERTY.
(7) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THAT AT MILE 87.4 R.
(8) SEE PLANT AT MILE 86.9 R.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS–1933

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
W. D. DEJARNETT (NAGLE & LOCOVITCH)	88.2	L	1–10"		23	75	56	137	47		17	355	(1) 90	
W. D. DEJARNETT	88.7	L	1–14"		143	52	31	74				300	110	
COLUSA IRRIGATION COMPANY	89.2	R	1–20"		301	265	347	400	248	113	84	1759	875	
PHIL B. ARNOLD	89.25	L	1–8"		53	39	63	68				223	100	
P. V. BERKEY ESTATE	89.3	L	1–12"		126	111	132	121				553	85	
— COLUSA GAGING STATION — MILE 89.4														
T. H. BOGGS AND SISTERS	89.7	L	1–6"		3	3	4	4	4		1	19	35	
T. H. BOGGS AND SISTERS	89.8	L	1–12"			NO	DIVERSION							
ROBERTS DITCH COMPANY	90.7	R	2–20"	37	315	452	549	611	535	292	89	2880	860	
GEO. P. AHLF	92.5	L	1–8"(2)		14	123	104	51	24		11	327	(3) 120	
U. W. BROWN	93.0	R	1–12"			90	65	85	23			263	(4) 97	
GEO. P. AHLF	93.0	L	1–6"		3	19						22	50	
I. G. ZUMWALT	93.2	R	1–36"			NO	DIVERSION							
			1–18"											
TUTTLE LAND COMPANY	94.3	R	1–15"											
			1–20"	9	328	195	498	291	369	68	75	1833	(5) 286	
W. E. PINNEY	94.8	R	1–12"		33	133	18	123				307	(6) 95	
J. W. BROWNING	95.2	L	1–14"			NO	DIVERSION							
			1–20"											
M. E. HICOK	95.5	L	1–5"			5						5	5	
A. N. LEWIS	95.6	L	1–20"		297	166	30	512				1005	(7) 235	
			1–16"											
I. G. ZUMWALT	95.7	R	1–12"		244	16	288	343	69		265	1225	256	
BRIDGET GRAHAM ESTATE	95.8	L	1–16"			NO	DIVERSION						(8)	
			1–20"											
H. HEITMAN	97.7	R	1–12"	6	28	12	30	55	19	20		170	90	
FRANK BECKLEY	98.0	L	1–8"(9)		16	28		31	16			91	71	
J. L. ERISEY	98.3	R	1–10"		24	57	74	32	32		1	220	96	
R. A. SPERRY (JOE BOGGS) AND COLUSA DEVELOPMENT COMPANY	98.6	L	1–15"			NO	DIVERSION							
WM. AND D. BOGGS	98.8	L	1–18"	13	20	105	106	151	96	37		528	(10) 179	
CHENEY SLOUGH IRRIGATION COMPANY	99.0	R	1–36"										214	
			2–26"		282	463	449	38	24	318	276	1850	(11)	
TERRILL AND SARTAIN	99.2	L	1–20"		100	1415	1296	1105	1170	513	11	5610	130	(12) 640
DAVE GEORGE	99.8	L	1–16"		91	69	112	115	135			522	150	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) DE JARNETT 50 ACRES, NAGLE 20 ACRES, LOCOVITCH 20 ACRES.
(2) OLD PLANT DISMANTLED – NEW INSTALLATION AT SAME POINT IN 1933.
(3) INCLUDES ACREAGES ON ADJOINING LANDS AS FOLLOWS: COLUSA DEVELOPMENT COMPANY 45, A. G. LAUX 35.
(4) INCLUDES 40 ACRES ON ADJOINING ELLA ARNOLD PROPERTY. 3 ACRES ADDITIONAL SERVED THROUGH TUTTLE PLANT, MILE 94.3 R.
(5) INCLUDES 28 ACRES ON ADJOINING MEIGS PROPERTY AND 3 ACRES SERVED FOR U. W. BROWN, SEE MILE 93.0 R.
(6) INCLUDES 45 ACRES ON ADJOINING PROPERTY OF K. M. MARSH.
(7) BRIDGET GRAHAM ESTATE 130 ACRES (MILE 95.8 L), COLUSA DEVELOPMENT COMPANY 75 ACRES, KATE GRIFFIN 30 ACRES.
(8) SEE PLANT AT MILE 95.6 L.
(9) REPLACES 6" UNIT.
(10) INCLUDES 105 ACRES ON ADJOINING PROPERTY OF J. BOGGS.
(11) SEAVER 134 ACRES AND MITCHELL 80 ACRES.
(12) INCLUDES ADJOINING ACREAGES, J. W. BROWNING 80, CALIFORNIA LANDS INC. 40.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS-1933

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. W. BROWNING	100.8 L	1-20"			NO	DIVERSION							
R. C. WOHLFROM (1)	101.1 R	1-20"		125	103	193	94			270	785	173	
CLARA C. PACKER (2)	102.8 R	2-30" 2-18" 1-36"		943	1332	1416	1369	2119	1338		8517	100 (3)	650
NATIONAL PACIFIC LAND COMPANY	103.7 R	1-16"	49	65	286	213	385	245	148	50	1441	(4)405	
COMPTON-DELEVAN IRRGATION DISTRICT	103.8 R	2-24" 1-36			NO	DIVERSION (5)						(5)	(5)
E. M. GORDON	103.9 R	1-16" 1-20"		211	933	557	524	547	227		2999	65	350
B. F. GOULD	104.8 L	1-26"		351	50	585	410	129	114	62	1701	(6)273	
THOUSAND ACRE RANCH (H.W.KELLER)	106.0 R	1-14"	68	26	101	82	71				348	143	
CALIFORNIA LANDS INCORPORATED	110.0 R	1-12"		23	138	93	14			80	348	171	
CALIFORNIA LANDS INCORPORATED — PRINCETON FERRY — MILE 112	111.2 R	1-6"			13	13		13		3	42	27	
RECLAMATION DISTRICT 1004	112.1 L	(7)1-30" 1-50"			NO	DIVERSION							
PRINCETON-CODORA-GLENN IRR.DIST.	112.4 R	3-24"			NO	DIVERSION (5)						(5)	(5)
A. J. STONE	112.6 L	1-10"			67	33					100	70	
BUTTE CITY RANCH	114.7 R	1-6"			NO	DIVERSION							
EDWARD L. STEELE (G. D.HANSEN)	115.5 L	1-12"		27	26	42	25	8			123	40	
— BUTTE CITY GAGING STATION — MILE 115.8													
— BUTTE CITY BRIDGE — MILE 115.9													
BUTTE CITY RANCH	115.95R	1-12"			NO	DIVERSION							
ANTHONY RADEMACHER	116.1 L		PLANT TEMPORARILY REMOVED							24	312	140	
CALIFORNIA LANDS INCORPORATED	117.8 R	1-10"		16	67	81	49	75					
TOM BALCH (8)	117.9 R												
E. E. DOTY (8)	117.9 R												
J. F. HARBOUR AND E. H. WILEY	118.4 R	1-4"			NO	DIVERSION							
TOM CROUCH	119.0 L	1-10"			NO	DIVERSION							
C. T. WHITE (9)	123.7 R	1-6"			1	32					33	10	
S. TAYLOR	123.8 R	1-3"		1	3	4	2	1			11	3	
PRINCETON-CODORA-GLENN IRR. DIST.	123.9 R	3-24"			NO	DIVERSION (5)						(5)	(5)
PROVIDENT IRRIGATION DISTRICT	124.2 R	4-42" 1-36"			NO	DIVERSION (6)						(5)	(5)
CALIFORNIA LANDS INCORPORATED	124.4 R	1-16"			53	61	51	45	32		242	106	
C. L. LEONARD	126.3 R		PLANT DISMANTLED (10)									(10)	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) FORMERLY A. F. AND R. C. WOHLFROM.

(2) PREVIOUSLY LISTED AS MAXWELL IRRIGATION DISTRICT.

(3) INCLUDES 400 ACRES ON ADJOINING BANK OF AMERICA PROPERTY (FORMERLY MALLON AND BLEVINS) IN MAXWELL IRRIGATION DISTRICT.

(4) ACREAGE DIVIDED AS FOLLOWS: BENNTENCOURT 175, PROFFE 70, CABRALL 80, MARKS 80.

(5) SEE PLANT AT MILE 154.8 R.

(6) B. F. GOULD 55 ACRES, DUNHAM AND GOULD 35 ACRES, J. GOULD 18 ACRES, AND ADJOINING LANDS AS FOLLOWS: COLUSA DEVELOPMENT COMPANY 120 ACRES, D. P. O'SULLIVAN 45 ACRES.

(7) 24" UNIT MOVED TO BUTTE CREEK PLANT OF R. D. 1004 MILE 3.9 L.

(8) THE LISTING OF THIS PLANT WILL BE DISCONTINUED AS IT IS ON BEEHIVE BEND WHICH IS CUT OFF FROM THE MAIN RIVER CHANNEL DURING LOW WATER OR THE PERIOD OF THE IRRIGATION SEASON.

(9) FORMERLY LOVELACE BROWN.

(10) SERVED THROUGH GLENN-COLUSA IRRIGATION DISTRICT SYSTEM. SEE PLANT AT MILE 154.8 R.

TABLE 52 (CONTINUED)
SACRAMENTO RIVER DIVERSIONS—1933

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. E. CRAMER	129.0 L	1-5"			NO	DIVERSION							
— ORD FERRY — MILE 130.8													
PARROT-PHELAN ESTATE	141.5 L	5-24"					1532	1990	1020	545	(1)5087		(2)1030
— OLD CHICO LANDING RAILROAD BRIDGE SITE — MILE 142.1													
CHICO HOP COMPANY (3)	146.9 L	1-5"			NO	DIVERSION							
M. F. ROSE	148.7 R	1-6"				7	8	7	8	7	37	12	
M. F. ROSE	148.9 R	1-6"				8	7	8	7	8	38	13	
— GIANELLA BRIDGE — MILE 149.5													
HENRY GIANELLA	150.0 L	1-10"			NO	DIVERSION							
JOSEPH GIANELLA	(4)150.0 L	1-10"			NO	DIVERSION							
SACRAMENTO RIVER FARMS, LTD.	151.0 R	(5)1-12" 1-16"		179	552	514	929	849	450	279	3752	1000	
A. HOLECEK	152.2 R	1-6"			11	12	13	5	5	2	48	40	
MAAS BROTHERS	154.6 R	1-5"				3	3	3			9	8	
GLENN-COLUSA IRRIGATION DISTRICT	154.8 R (6)	1-100" 4-72" 2-50" 1-42" 2-30"	1650	41229	61565	58309	62381	63508	34071	13362	336075 (7)	20019 (8)	22141
JACINTO IRRIGATION DISTRICT	154.8 R	(9)		1219	1794	2376	2993	2801	1755	1287	14225	(10)4070	
COMPTON-DELEVAN IRRIGATION DIST.	154.8 R	(9)		1799	5720	5355	5533	3525	917	228	23077	(11)905	2863
PROVIDENT IRRIGATION DISTRICT	154.8 R	(9)		2462	6561	6251	6350	6078	2679	442	30823	(12)	(13)3659
PRINCETON-CODORA-GLENN IRR. DIST.	154.8 R	(9)		7446	9879	9477	10201	9304	5674	3522	55503	2953	(14)1460
MAXWELL IRRIGATION DISTRICT	154.8 R	(9)		405	614	595	613	614	609	933	4383	(15)900	510
— CORNING VINA BRIDGE — MILE 166.5													
A. F. LANDIS	166.7 R	1-3"				3	5	3	3	1	15	5	
H. F. JACOBS	166.8 R	1-2"			NO	DIVERSION							
R. A. FOSTER	169.1 R	1-8"					28	106			134	80	
E. B. NOBLE (16)	171.2 R	1-8"			NO	DIVERSION							
— TEHAMA BRIDGE — MILE 177.5													

2957

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.
(1) THIS DIVERSION WAS SUPPLEMENTAL TO GRAVITY DIVERSION FROM BUTTE CREEK FOR THE SAME ACREAGE.
(2) ALL ON PARROTT RANCH.
(3) FORMERLY P. M. ROONEY.
(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) TWO NEW UNITS INSTALLED IN 1933 REPLACING OLD 12" AND 18" PUMPS.
(6) THIS IS A COMMON POINT OF DIVERSION FOR THE GLENN-COLUSA, JACINTO, COMPTON-DELEVAN, PROVIDENT, PRINCETON-CODORA-GLENN AND MAXWELL IRRIGATION DISTRICTS.
(7) INCLUDES GRAVITY DIVERSION: (ACRE-FEET) MARCH 1650, APRIL 1700. DIVERSION IN NOVEMBER WAS 9350 ACRE-FEET. ADDITIONAL WATER WAS OBTAINED BY GRAVITY FROM STONEY CREEK AS FOLLOWS: (ACRE-FEET) MARCH 400, APRIL 240. THE DIVERSION SHOWN INCLUDES WATER FOR C. L. LEONARD (OUTSIDE DISTRICT) AS FOLLOWS: (ACRE-FEET) MAY 110, JUNE 140, JULY 86, AUGUST 14, SEPTEMBER 27, OCTOBER 35, TOTAL 412.
(8) INCLUDES 157 ACRES OF C. L. LEONARD (OUTSIDE DISTRICT) AND 724 ACRES DUCK PONDS.
(9) SAME PLANT AS THAT OF GLENN-COLUSA IRRIGATION DISTRICT.
(10) INCLUDES 83 ACRES SERVED FOR PROVIDENT IRRIGATION DISTRICT.
(11) INCLUDES 825 ACRES DUCK PONDS.
(12) SEE ACREAGE NOTE FOR JACINTO IRRIGATION DISTRICT, MILE 154.8 R.
(13) INCLUDES 811 ACRES SERVED FOR PRINCETON-CODORA-GLENN IRRIGATION DISTRICT AND 354 ACRES IRRIGATED FROM HUNTER CREEK (INTERIOR DRAIN) PUMP.
(14) 811 ACRES ADDITIONAL, INCLUDING 229 ACRES ON HENRY JAMESON PROPERTY (COLUSA TROUGH DIVERSIONS, MILE 22.0 R) WERE IRRIGATED FOR PRINCETON CODORA-GLENN IRRIGATION DISTRICT THROUGH PROVIDENT IRRIGATION DISTRICT SYSTEM.
(15) ALL DUCK CLUBS.
(16) FORMERLY HAMMON STOCK RANCHES.

TABLE 52 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1933

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
TEHAMA RANCH	178.3 R	1-6"			NO	DIVERSION							
E. B. NOBLE	184.5 R	1-14"		13	22	88	81	75	27	35	341	105	
— RED BLUFF BRIDGE — MILE 193.45													
S. E. AYER	194.1 R	1-6"			NO	DIVERSION							
G. E. SUTTON	196.2 R	1-6"		2	1	4	4	2	1		14	15	
J. A. EDWARDS	196.2 L	1-6"					20				20	30	
A. W. GIBSON (T. A. CROOK)	196.4 L	1-8"					10				10	4	
BANK OF AMERICA (1)	196.5 L	1-4"			NO	DIVERSION							
J. ERICKSON	196.6 L	1-5"		8	21	30	42	14	18	7	140	28	
C. DROZ (2)	197.0 L	1-8"			NO	DIVERSION							
FREEMEYER BROTHERS	197.65 L	1-3"				13	18				31	25	
J. PINE	197.73 L	1-2" (3) 1-6"			2	3	3	2			12	8	
— RED BLUFF GAGING STATION (IRON CANYON) — MILE 198.6													
— BEND FERRY BRIDGE — MILE 207													
T. L. BONNETT	209.0 L	1-2½"					10	9	5	1	25	8	
J. F. NUNES	215.5 R	1-7"			NO	DIVERSION							
— JELLEY'S FERRY — MILE 215.6													
J. F. NUNES	216.0 R	1-3"			NO	DIVERSION							
W. A. HUNAEUS	216.4 L	1-3"				2	2	5	2	1	12	10	
T. A. HAAKONSON (4)	217.5 L	1-5"					11	27	27	27	92	(5) 80	
J. L. HASKINS (6)	218.0 L	1-5"			6	24	21	10		5	66	55	
RIO ALTO RANCHO (7)	221.0 R	1-10"				52	64	60	34		210	230	
— 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"							3		3	8	
WM. MENZEL MEAT COMPANY	240.2 L	1-12"			68	94	207	128	108		605	(8) ~~120~~ 40	
FITZPATRICK-DEMPSTER & J.L.HENDERSON	240.5 L			PLANT		DISMANTLED							
GRAF AND GRAF	241.5 L	1-8"			20	26	35	33	24	17	155	35	
ADAMS BROTHERS	242.0 R	1-6"			5	56	56	55	21		193	74	
— REDDING-ALTURAS BRIDGE — MILE 242.0													
ANDERSON-COTTONWOOD IRRIGATION DIST.	246.0 R	GRAVITY		11265	20206	19797	20984	20690	19980	20650	(9) 133572	(10) 2159	
JOHN DIESTELHORST	246.3 R	1-10"		37	23	76	80	80	55	39	(11) 390	30	
TOTALS			4452	11867	18800	18985	19745	18594	10507	5226	104172	10113	4 5294

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) FORMERLY R. RISLEY.
(2) FORMERLY H. P. STICE.
(3) 6" UNIT REINSTALLED IN 1933.
(4) NEW INSTALLATION 1933.
(5) INCLUDES ADJOINING ACREAGE AS FOLLOWS: LUNDBLAD 10, McDEVITT 12.
(6) FORMERLY HASKINS BROTHERS.
(7) FORMERLY H. W. JOHNSON, JR.
(8) INCLUDES 20 ACRES ON ADJOINING HENDERSON PROPERTY.
(9) 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.
(10) DISTRICT SUPERINTENDENT ESTIMATED 1933 ACREAGE TO BE SAME AS IN 1932. AS NOTED IN 1932 THIS FIGURE WAS DERIVED FROM A DETAILED SURVEY AND INCLUDES 11859 ACRES ACTUALLY CROPPED AND SURFACE IRRIGATED AND 300 ACRES WHICH RECEIVED BENEFIT THROUGH SUB-IRRIGATION.
(11) IT IS ESTIMATED THAT AT LEAST ONE-HALF OF THIS DIVERSION IS RETURNED DIRECTLY TO THE RIVER.

TABLE 53

SACRAMENTO RIVER DIVERSIONS—1934

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"	1620	2110	2490	2640	2920	2840	2420	1930	18970	MUNICIPAL	
— AMERICAN RIVER — MILE 1.1 LEFT													
JOE CORRY	1.2 L	1-8"			NO	DIVERSION							
— BACK BORROW PIT RECL. DISTRICT 1000 — MILE 1.3 LEFT													
E. FOURNESS	1.45 R	1-8"		59	76	87	19	7	21		269	145	
SUBURBAN HOLDINGS COMPANY	2.05 L	1-8"	5	34	36	30	52	34	19	13	223	125	
— RECLAMATION DISTRICT 1000 DRAIN — MILE 2.1 L													
FRANK CHRISTOPHEL	2.4 L	1-5"		9	21	18	21	9	11		89	44	
H. M. SWALLEY	2.45 L	1-5"		9	20	16	21	20			86	38	
ALBERT ELKUS	2.9 L	1-5"		13	12	13	13	19			70	23	
EARL FRUIT COMPANY	3.55 R	1-16"			380	167	236				783	160	
W. E. M. BEARDSLEE	3.75 R	1-5"		10	32	42	14				98	55	
W. I. ELLIOTT	4.0 R	1-10"			86	118	70	15			289	76	
REESE AND GREER	4.65 R	1-7"		61	90	62	12				225	280	
HARBINSON BROTHERS	5.05 R	1-14"			76	50	116	12	55	8	317	61	
[redacted]EL	5.25 R	1-8"			17	109	61	66	33		286	(1) 155	
[redacted]LEY ESTATE	5.3 R	1-8"				31	25				56	55	
[redacted]	5.5 R	1-6"				9	10				19	22	
[redacted]LMAN	5.55 R	1-6"				14	13				27	30	
[redacted]	5.7 R	1-10"			NO	DIVERSION							
[redacted]	6.0 R	1-6"	8	25	38	39	47	54	33	19	263	83	
[redacted]UTUAL WATER COMPANY	6.10 L	2-18"		40	2913	2193	2238	2367	1146		10897	1634	177
[redacted]. L. WHITE	6.4 R	1-6"						2	11	8	21	12	
E. S. FISK	7.0 R	1-4"			NO	DIVERSION							
CALIFORNIA BANK AND TRUST COMPANY	7.5 L	1-8"			56	54	18	12	7		147	100	
F. L. MARTIN AND A. B. CARTER (F. J. STAHL)	7.8 L	1-10"		34	44	27	40	141	74		360	93	
A. MARTY	7.9 R	1-8"	21	48	46	36	49	71	60	34	365	(2)	
M. E. AND R. F. BENNETT	7.9 L	1-10"			53	69	21	42	51		236	90	
M. MARTY	8.3 R	2-10"	17	79	50	103	234	229	116	104	932	(3) 330	
JULIUS BLAUTH	8.5 R	1-6"				58	69				127	85	
H. WALDECK	8.7 R	1-6"	18	25	28	30	23	15	4		143	43	
HAZEL GOETHE	8.95 R	(4) 1-6"	25	34	46	39	56	77	63	20	360	37	
CALIFORNIA LANDS, INC. (5)	9.35 R	1-14"		66	272	49	142	20	207	160	916	520	
R. G. PEARSON AND P. S. DRIVER	9.8 L	1-14"		50	14	179	140	108	34		525	(6) 167	
CARL CASSELMAN	9.9 R	1-12"		35	58	76	57	38	29	2	295	100	
E. C. BOOM — TRUSTEE FOR F.W.KIESEL	10.25 L	1-14"		91	118	188	156	208	191	73	1025	263	
REESE ESTATE	10.75 R	1-12"		61	167	134	10				372	150	
R. F. FIDDYMENT AND E. J. CAHILL	10.75 L	1-12"	10	20	39	106	38	6			219	(7) 106	
A. L. WHITE	11.6 L	1-10"			44	30	56	10	50		190	65	

*MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) INCLUDES 60 ACRES ON ADJOINING SCHMIDT PROPERTY.

(2) SEE PLANT AT MILE 8.3 R.

(3) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE ONE AT MILE 7.9 R.

(4) 18" UNIT REMOVED AND 6" UNIT INSTALLED IN FALL OF 1933.

(5) FORMERLY A. A. SOUSA.

(6) PEARSON 115 ACRES; DRIVER 52 ACRES.

(7) FIDDYMENT 50 ACRES; CAHILL 56 ACRES.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1934

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
CONAWAY RANCH	12.0 R	4-36"		2816	2424	2665	3446	3087	541		14979	390	2000
THOMAS O'CONNOR	12.5 R	1-12"		17	78	54	11	52			212	76	
GERTRUDE BROWN	12.7 R	1-6"	5	15	15	20	27	23	16	7	128	55	
JULIUS HAUSER	13.1 R	1-12"			NO	DIVERSION							
HENRY SCHAEFER	13.25 R	1-10"		6	47	50	70	55	32		260	60	
ELKHORN MUTUAL WATER COMPANY	14.1 L	1-24" 1-20"		296	2192	2468	2453	2340	1347		11096	2205	
JOSEPH VERESS (1)	14.25 R	1-8"			NO	DIVERSION							
CALIFORNIA LANDS, INC.	15.15 R	1-10"		100	110	109		130	130	27	606	220	
HARRY HALL	15.7 L	1-6"			NO	DIVERSION							
CENTRAL MUTUAL WATER COMPANY	16.0 L	2-38"		2084	1737	2145	3856	3786	1542		(2)15150	960	1673
FRANK FISHER AND HENRY RICH (HERSHEY PLANT)	16.27 R	1-20"			322	162	516	79			1079	588 (3)	
H. T. SILVIUS	16.4 R	1-6"			NO	DIVERSION						(4)	
W. B. BEACH	16.62 R	1-6"			15	18					33	(5)47	
THOMAS J. COX ESTATE	16.7 R	(6)1-16"				96	192	43	50		381	(7)290	
CALIFORNIA WESTERN STATES LIFE INSURANCE COMPANY	17.75 R	1-20"			NO	DIVERSION						(8)	
[redacted] JOHN SCHIEBER	18.45 L	1-12"				106	119	80	15	75	395	60	
[redacted] (F. S. MACHADO)	18.7 L	1-8"		13	19	14	19	27	11	4	107	40	
[redacted] RUST AND SAVINGS BANK	18.95 R	1-18"			NO	DIVERSION							
[redacted] ANY - RECLAMATION [redacted] 01 (9)	19.6 L (9)	2-20" (9)		189	1287	1740	2050	1566	499		7331	140	1235
[redacted] UAL WATER COMPANY (9)	19.6L (9)	(9)1-24"		860	333	1204	1306	1075	100		4878	6	449
[redacted] SING STATION — MILE 19.6 [redacted] 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"		629	706	1250	1794	1421			5800	565 (10)	420
HERSHEY ESTATE	26.95 R	1-18"			NO	DIVERSION							
E. J. BRAUN	OPP. 26.95R (11)				PLAN	DISMANTLED							

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) NEW INSTALLATION 1934.

(2) 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.

(3) INCLUDES 68 ACRES ON ADJOINING H. T. SILVIUS PROPERTY (MILE 16.4 R).

(4) SEE NOTE FOR FISHER AND RICH PLANT, MILE 16.27 R.

(5) ON ADJOINING PROPERTIES: ROSE, 27 ACRES; T. J. COX ESTATE (MILE 16.7 R) 20 ACRES.

(6) OLD 16" UNIT REPLACED IN 1934.

(7) 20 ACRES ADDITIONAL SERVED FROM PLANT AT MILE 16.62 R.

(8) SEE NOTE FOR FISHER AND RICH PLANT, MILE 22.5 R.

(9) CROSS CANAL, THE MAIN DRAIN BETWEEN R. D. 1000 AND 1001 JOINS SACRAMENTO RIVER AT MILE 19.6 L. IN 1934 THE FORMER DAM AND BOOSTER PLANT AT THE MOUTH OF CROSS CANAL WERE REMOVED, RIVER WATER REACHING CROSS CANAL PUMPING PLANTS BY GRAVITY. A NEW PUMPING INSTALLATION FOR IRRIGATION OF R.D. 1001 LANDS WAS MADE AT R.D. 1001 DRAINAGE PLANT AT MILE 0.75 CROSS CANAL (NORTH BANK) AND THE FORMER PUMPING PLANT OF NORTHERN MUTUAL WATER CO. AT MILE 4.0 CROSS CANAL (SOUTH BANK) WAS REPLACED BY A NEW INSTALLATION AT MILE 1.0 CROSS CANAL (SOUTH BANK).

(10) INCLUDES 50 ACRES OF CALIFORNIA WESTERN STATES LIFE INSURANCE COMPANY, MILE 17.75 R.

(11) ON GRAY'S BEND (OLD CHANNEL NOW CUT OFF).

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS–1934

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
MORSE INGLIN	28.2 R	1–6"		24	1	11	23	15	14		88	30	
RUSSELL BROTHERS	29.2 R	1–12"				46	10	45	44	18	163	100	
KENDALL ESTATE	29.7 R	1–8"		16	58	109	9				192	(1)222	
P. L. TRAGANZA AND K. RUSSELL	29.75 R	1–8"		4	1	8	5				18	(2) 8	
LAURA FREITAS	29.9 L	1–12"				27	28	6	8		69	30	
LEO GIOVANETTI	30.2 L	1–3"			7	3	8	2	1		21	(3)21	
RECLAMATION DISTRICT 1500	30.45 L	1–2"			NO	DIVERSION							
KENDALL ESTATE	30.6 R	1–12"		60	78	20	70	32			260	(4)	
FLOYD ANDERSON	30.7 R	1–6"			2	8	6	7	7		30	18	
[redacted] 1500	30.75 L				PLANT	REMOVED							
	30.9 L	1–8"			NO	DIVERSION							
[redacted] MMONS)	31.5 R	1–12"		2	35	30	25	6	8		106	62	
	31.8 L	1–6"				4	2	3		7	16	25	
	32.0 R	1–10"		45	262	175	21	2			507	258	
[redacted] OMPANY	32.0 L	2–24"		1684	1544	1482	808	1499	328	109	7454	(5)	(5)
COLLIER BROTHERS	32.5 R	1–10"		14	72	43	27	24	12	5	197	120	
R. B. COULTER	33.2 L	1–20"		396	1553	1440	973	1060	523		5945		472
SNOWBALL ESTATE	33.5 R	1–12"			NO	DIVERSION							
J. G. KNOX AND FRED LEISER	33.75 L	1–12"			NO	DIVERSION							
SNOWBALL ESTATE (6)	33.8 R	1–3"		2	2	2	3		1		11	2	
— KNIGHTS LANDING GAGING STATION — MILE 34.0													
— COLUSA BASIN DRAINAGE — MILE 34.15 R													
MEEK ESTATE	34.2 R	2–16"											
		1–10"		224	715	468	65	16	311	18	1819	(7) 447	
RIVER FARMS COMPANY (TOWNSITE PLANT)	34.25 R	1–24"											
		1–26"	35	2156	2632	2487	2688	1110	11	11	11130	1613	1677
		1–20"										(8)	(8)
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	34.85 L	1–12"			NO	DIVERSION							
FRED VAN LEW	35.2 L	1–12"			NO	DIVERSION							
J. H. SCOTT	35.6 L	1–7"				22	9	2			58	35	
J. H. DONNELLY (9)	35.8 L	1–10"			9	10	4		6	1	35	(10)18	
AMEDEO MORONI	36.7 L	1–5"			NO	DIVERSION							
W. W. BOTTIMORE	37.2 L	1–14"			NO	DIVERSION							
L. W. BUNDOCK	37.75 L	1–8"			13	28	41	42			124	102	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THAT AT MILE 30.6 R. IT INCLUDES 26 ACRES ON THE ADJOINING PROPERTY OF K. RUSSELL.

(2) 26 ACRES ADDITIONAL IRRIGATED FROM PLANT AT MILE 29.7 R.

(3) INCLUDES 11 ACRES ON ADJOINING ASHLEY PROPERTY.

(4) SEE PLANT AT MILE 29.7 R.

(5) SEE PLANT AT MILE 63.75 L.

(6) PLANT INSTALLED 1934.

(7) INCLUDES ADJOINING LANDS AS FOLLOWS: RIVER FARMS COMPANY 150 ACRES AND BETCHARD 25 ACRES.

(8) INCLUDES 549 RICE AND 159 GENERAL CROPS SERVED BY BOOSTER PLANT ON DRAIN AT EASTHAM SUPPLIED BY SPILL AND DRAINAGE FROM BOTH TOWNSITE AND R. D. 2047 PLANT (FROM ONE-THIRD TO ONE-HALF FROM R. D. 2047 PLANT, MILE 43.1 R). THE 549 ACRES RICE INCLUDES ADJOINING OWNERSHIPS, SANDERCOCK 75 AND BAKER 10.

(9) FORMERLY A. COSTA (A. MORCONI).

(10) ALL ON ADJOINING GOFFITZ PROPERTY.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1934

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
ADDIE REEL	38.4 L	1-10"			NO	DIVERSION							
CALIFORNIA LANDS INCORPORATED (H. A. KRAMER)	38.8 L	1-10"				3	80	41			124	70	
F. O. EASTMAN	39.4 L	1-12"				111	44	44			199	83	
COMMERCIAL INVESTMENT COMPANY (R. B. BAILEY)	39.8 L	1-10"		54		94	50	35	14		247	85	
WILLIAM DUFFEY, JR.	39.9 L	1-6"					45	1	5		51	25	
SUTTER MUTUAL WATER COMPANY (STATE RANCH BEND)	40.6 L	1-24"	580	1510	2270	2060	1860	2420	940	81	11721	(1)	(1)
SUTTER BASIN CORPORATION (E. BOZZI)	42.3 L	1-8"					155	27			182	50	
A. KRAMER	43.1 L	1-12"			22	3	161	24	37	5	252	105	
EL DORADO RANCH	43.1 L	1-18"		300	459	365	~~267~~	~~90~~	179	170	1830	656	
RIVER FARMS COMPANY (RECLAMATION DISTRICT 2047 PLANT)	43.1 R	2-50"		5404	4278	5198	~~5911~~	5105	758		26654 (2)		1648 (2)
— RECLAMATION DISTRICT 108 DRAIN —	MILE 44.0 R												
JOHN CLAUSS (G. GUISTI)	47.3 L	1-14"		54		96	71		37		258	75	
		1-24"											
P. J. HIATT	48.7 L	1-20"		262	543	291	10	19	463	105	1693	790	
P. J. HIATT	49.7 L	1-14"			79	56					135	122	
RECLAMATION DISTRICT #108 (TYNDALL MOUND PLANT)	51.1 R	2-24"			NO	DIVERSION							
		1-36"											
CALIFORNIA NATIONAL BANK (P. J. HIATT)	51.2 L	1-16"		892	1274	1249	1045	1008	929		6397	550	210
		1-16"											
J. F. WHITE	51.5 L	1-8"				8	29	2	13		52	20	
T. J. CUMMINS RANCH COMPANY	52.0 L	1-16"			309	216	141	12	30	27	735	262	
[redacted]	52.9 L	1-10"			46	194	116	79			435	151	
	53.9 L	1-12"			102	352	296	158	73	86	1067	280	
	55.1 L	1-20"			646	1228	1210	1240	1220	6	(4) 5550		200
#108	56.4 R	1-18"											
		1-30"		34	672	542	~~314~~			25	1587	653	
	56.65 R	1-12"			132	72	——	48			252	60	
	56.95 L	1-20"			610	1605	2113	2338	2416	1137	(4) 10219		
		(5) 1-24"											
J. M. KIRKUP	57.5 L	1-16"			7	80	7	17			111	65	
H. S. FASIG	58.2 L	1-15"			NO	DIVERSION						(6)	
J. R. YOUNG	58.9 L	1-16"		87	380	438	476	119	223	39	1762	(7) 195	
LAMB BROTHERS	59.8 L	1-14"											
		(8) 1-8"		212	695	702	597	635	384		3225		

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) SEE PLANT AT MILE 63.75 L.

(2) RIVER FARMS COMPANY 144 ACRES; RECLAMATION DISTRICT 108, 1504 ACRES, DRAINAGE AND SPILL FROM THIS DIVERSION SUPPLIED AN ADDITIONAL ACREAGE THROUGH BOOSTER PLANT AT EASTHAM. SEE NOTE FOR TOWNSITE PLANT, MILE 34.25 R.

(3) NEW INSTALLATION 1934.

(4) EXCESSIVE LOSSES WERE NOTED.

(5) 24" UNIT INSTALLED 1934.

(6) SEE ACREAGE NOTE FOR J. R. YOUNG PLANT AT MILE 58.9 L.

(7) INCLUDES 75 ACRES SERVED FOR H. S. FASIG, MILE 58.2 L.

(8) 8" UNIT ADDED IN 1934.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1934

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 (STEINER BEND PLANT)	59.85 R	1-16"			345	147					492	200	
F. L. BURRELL (J. L. SILLS)	60.4 L	1-10"			118	158	71				347	100	
BLANCHE COULTER BROWN	60.5 L	1-12"		29	101	77	38				245	122	
SUTTER BASIN CORPORATION (COLES LANDING)	61.3 L	1-12"			NO	DIVERSION							
FIRST SAVINGS BANK OF COLUSA (1)	61.3 R	1-12"			NO	DIVERSION							
HINES RANCH	62.3 R	1-10"			4			19	16		39		
J. B. SMITH	62.3 L	1-10"											
		(2) 1-5"			328	360	370	347	248		(4)		
WILLIAM BAKER	62.6 R	1-8"		18	24	21	13		16				
R. L. YOUNG	62.8 L	1-8"							54		(4)		
— WILKINS SLOUGH GAGING STATION —	MILE 62.9												
RECLAMATION DISTRICT 108 (WILKINS SLOUGH PLANT)	63.2 R	5-42"		7762	10462	9058	9426	8677	1682				
SUTTER MUTUAL WATER COMPANY (TISDALE) AND IMPROVEMENT MUTUAL WATER COMPANY	63.75 L	6-42"		19770	31073	25360	24107	22977	13440	2092	138819 (5)	15855 (6)	9155 (6)
LA ROCA MONTE RANCHO COMPANY	64.3 R	1-12"			20	9	19	8	13		69	30	
TISDALE IRRIGATION & DRAINAGE CO.	64.4 L	1-12"		94	225	593	274	519	654	24	2383	(7)1500	
COLUSA DEVELOPMENT COMPANY	64.9 R	1-24"			NO	DIVERSION							
M. BETTENCOURT	65.1 R	1-10"				7	8	9	8		32	8	
CALIFORNIA LANDS, INC. (8)	65.7 L	1-12"					125	39	12		176	60	
J. L. BROWNING	66.4 R	1-18"		30	181	255	165	181	45		857	500	
TISDALE IRRIGATION AND DRAINAGE COMPANY (WINSHIP PLANT)	67.1 L	1-20"		22	500	1130	672	920	802	10	4056	(10)	
		(9) 1-12"										(10)	
DESMOND A. WINSHIP, ET AL.	67.2 L	1-10"			NO	DIVERSION							
MERIDIAN FARMS WATER COMPANY #6	67.4 L	1-12"		16	97	62	67	59	73	20	394	(11)138	
SCOTT F. ENNIS AND E. S. BROWN	67.5 L	2-24"			1157	1236	1419	1365	349		5526	(12)1765	
— RECLAMATION DISTRICT 70 DRAIN —	MILE 68.8 L												
MERIDIAN FARMS WATER COMPANY #5	68.81 L	1-12"		267	210	318	185	279	169		1428	269	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) FORMERLY JOHN KOLPIEN.

(2) 5" UNIT ADDED IN 1934.

(3) ADDITIONAL WATER FOR RICE RECEIVED FROM R. L. YOUNG PLANT AT MILE 62.8 L.

(4) THIS DIVERSION USED FOR ACREAGE REPORTED UNDER THE PLANT AT MILE 62.3 L.

(5) INCLUDES WATER DELIVERED TO IMPROVEMENT MUTUAL WATER COMPANY AS FOLLOWS: (ACRE-FEET). APRIL 86, MAY 1376, JUNE 1048, JULY 899, AUGUST 1284, SEPTEMBER 649. TOTAL 5342.

(6) 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. THEY INCLUDE 2001 ACRES OF GENERAL CROPS IRRIGATED BY THE IMPROVEMENT MUTUAL WATER COMPANY (IN R. D. 1600) ENTIRELY FROM THE TISDALE PLANT.

(7) THIS IS THE TOTAL ACREAGE IRRIGATED BY THIS PLANT AND THAT AT MILE 67.1 L AND INCLUDES 157 ACRES OF D. A. WINSHIP (MILE 67.2 L) SERVED FROM PLANT AT MILE 67.1 L.

(8) FORMERLY D. L. W. HOFFMAN.

(9) 12" UNIT ADDED IN 1934.

(10) SEE ACREAGE NOTE FOR PLANT AT MILE 64.4 L.

(11) INCLUDES 8 ACRES OF SPRINGER ESTATE.

(12) INCLUDES ADJOINING ACREAGES AS FOLLOWS: SPRINGER ESTATE 8 ACRES; MERIDIAN FARMS COMPANY 9 ACRES IN RECLAMATION DISTRICT 1660 AND 82 ACRES IN RECLAMATION DISTRICT 70.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS—1934

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	69.0 R	1-24"		211	643	532	~~123~~	45	23		1577	500	
FAXON RANCH	69.2 R	1-18"		179	418	233	~~151~~			140	1121	422	
— 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)1-6"		12	585	593	~~102~~	2	12		1306	(2) 575	
MERIDIAN FARMS WATER COMPANY #4 (GRIMES)	71.1 L	1-24"		502	1513	1448	953	934	461	99	5910	1214	318
J. W. BROWNING	71.9 R	1-12"			NO	DIVERSION							
ANTONE STEIDELMEYER	71.9 R	1-12"					~~188~~	30			218	130	
E. E. VANN (R. E. OTTENWALTER)	73.6 R	1-12"			NO	DIVERSION						(3)	
MERIDIAN FARMS WATER COMPANY #3 (HEADQUARTERS)	74.8 L	1-18"		87	366	667	460	206	567	141	2494	554	
L. B. WESTFALL	75.3 R	1-10"			194	102	~~76~~	45	71	25	513	(4) 96	
J. H. YATES	76.1 L	1-12"		9	60	54	17	6		41	187	60	
ELLA BLACKMER (5)	76.2 L	1-8"					48	5			53	16	
E. V. JACOBS	77.9 L	1-12"		119	234	80			38	120	591	190	
SEBIA DAVIS ESTATE	78.8 R	1-36"		1182	1903	1682	~~1609~~	1515	200		8091		1111
C. E. REISCHE	79.0 L	1-10"		39	112	110	52	53	3		369	(6) 141	
E. V. JACOBS	79.5 L	1-8"		10	81					26	117	35	
G. W. WOOD	79.7 L	1-10"			19	31	39	25	13	5	132	(7) 100	
— MERIDIAN BRIDGE — MILE 79.85													
MERIDIAN FARMS WATER COMPANY #1 AND #2 (MERIDIAN)	80.0 L	1-24" 1-18"		850	1960	2550	2450	2110	1640	972	12532	2251 (8)	75
GEORGE P. AHLF	80.3 R	1-8"		65	90		~~60~~				215	40	
WONDERLY AND LILIANTHAL	81.5 L	1-16"			30	12	113	68	29		252	(9) 73	
STEIDELMEYER BROTHERS	81.9 R	1-16"			510	583	~~220~~	269	157	66			
F. T. REISCHE AND L. J. WOOD	82.5 L	1-12"		8	14	25	16	16	17				
GEORGE W. KIRKPATRICK	83.3 L	1-14"			NO	DIVERSION							
P. E. GARMIRE	83.6 L				PLANT	REMOVED							
— BUTTE SLOUGH — MILE 84.0 L													
OAKLAND PRUNE COMPANY	86.1 R	1-12"			99	5	~~68~~	4		48			
J. F. PECK	86.6 L	1-18"		293	48	87	154						
LLOYD SCOGGINS	86.8 L	1-8"			45		39				84		
W. P. DWYER (LOWER)	86.9 R	1-16"	43		118	138	~~48~~		70	40	457		

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) 6" UNIT ADDED IN 1934.

(2) DIVIDED AS FOLLOWS: (ACRES) HOUCHINS 20, HOFFMAN 340, BECKLEY 180, RITCHIE 35.

(3) SEE ACREAGE NOTE FOR PLANT AT MILE 75.3 R.

(4) INCLUDES 30 ACRES FOR E. E. VANN, MILE 73.6 R.

(5) NEW INSTALLATION 1934.

(6) INCLUDES NEIGHBORING ACREAGE. SEGREGATION AS FOLLOWS: REISCHE 60 ACRES, KILGORE 28 ACRES, ROCKHOLT 18 ACRES, STAAS 15 ACRES, LEMOS 20 ACRES.

(7) INCLUDES 50 ACRES ON ADJOINING BURTIS LANDS.

(8) AN ADDITIONAL GENERAL CROP ACREAGE OF 666 ACRES WAS IRRIGATED FROM PLANT #7 PUMPING FROM AN INTERIOR LAKE SUPPLIED BY DRAINAGE AND SURPLUS WATER FROM PLANTS 1, 2, 3, AND 4.

(9) WONDERLY 30 ACRES, LILIANTHAL 25 ACRES, AND 18 ACRES ON ADJOINING BURKHART PROPERTY.

(10) INCLUDES 30 ACRES ON ADJOINING TUBBS PROPERTY.

(11) REISCHE 40 ACRES, WOOD 20 ACRES, AND 11 ACRES ON ADJOINING STAAS PROPERTY.

(12) INCLUDES 30 ACRES ON ADJOINING REICHEL PROPERTY.

(13) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THAT AT MILE 87.4 R.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS–1934

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSIONS MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED	
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		GENERAL	RICE
W. P. DWYER (UPPER)	87.4 R	1–15"			103	75	~~67~~			72	317	(1)	
JACOBSEN AND O'ROURKE	87.6 L	1–10"			46	29	11				86	30	
SWINFORD TRACT IRRIGATION COMPANY	87.7 R	1–12"		133	103	149	~~69~~		98	12	564	132	
EDWARD K. LANGE	88.0 R	1–6"			7		6			6	19	26	
W. D. DE JARNETT (NAGLE & LOCOVITCH)	88.2 L	1–10"			48	62	54		21		185	(2)80	
W. D. DE JARNETT	88.7 L	1–14"			17	170	29		17		233	110	
COLUSA IRRIGATION COMPANY	89.2 R	1–20"		185	289	404	~~342~~	185	91	49	1545	603	
PHIL B. ARNOLD	89.25 L	1–8"		52	75	75	83				285	75	
P. V. BERKEY ESTATE	89.3 L	1–12"		1	284	166	45				496	85	
— COLUSA GAGING STATION — MILE 89.4													
T. H. BOGGS AND SISTERS	89.7 L	1–6"		4	4	4	4	4	4	4	28	22	
T. H. BOGGS AND SISTERS	89.8 L	1–12"			NO	DIVERSION							
ROBERTS DITCH COMPANY	90.7 R	2–20"		64	551	560	~~601~~	334	435	75	2620	845	
GEORGE P. AHLF	92.5 L	(3)1–8"		41	116	82	93		74	35	441	(4) 120	
U. W. BROWN	93.0 R	1–12"			124	119	~~33~~			75	351	(5) 100	
GEORGE P. AHLF	93.0 L	1–6"			20	5			18	19	62	50	
I. G. ZUMWALT	93.2 R	1–36"											
		1–18"			NO	DIVERSION							
TUTTLE LAND COMPANY	94.3 R	1–15"											
		1–20"		78	352	441	~~332~~	95	132	62	1492	(6) 290	
W. E. PINNEY	94.8 R	1–12"		52	119	116	~~82~~			79	448	(7) 100	
J. W. BROWNING	95.2 L	1–14"											
		1–20"			NO	DIVERSION							
M. E. HICOK	95.5 L	1–5"			NO	DIVERSION							
A. N. LEWIS	95.6 L	1–20"											
		1–16"			162	42	665			36	905	(8)245	
I. G. ZUMWALT	95.7 R	1–12"			235	66	~~325~~	51	17	232	926	216	
BRIDGET GRAHAM ESTATE	95.8 L	1–16"											
		1–20"			NO	DIVERSION						(9)	
H. HEITMAN	97.7 R	1–12"			37	39	~~30~~		25		131	40	
FRANK BECKLEY	98.0 L	(10)1–10"			39	65	43	5	2	32	186	73	
J. L. ERISEY	98.3 R	1–10"				73	~~16~~	31		22	142	61	
R. A. SPERRY (JOE BOGGS) AND COLUSA DEVELOPMENT COMPANY	98.6 L	1–15"			NO	DIVERSION						(11)	
WILLIAM AND D. BOGGS	98.8 L	1–18"	20		32	38	49	26			165	(12)75	

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) SEE PLANT AT MILE 86.9 R.
(2) DE JARNETT 30 ACRES, NAGLE 30 ACRES, LOCOVITCH 20 ACRES.
(3) NEW UNIT, SAME SIZE AS IN 1933.
(4) INCLUDES ACREAGE ON ADJOINING LANDS AS FOLLOWS: COLUSA DEVELOPMENT COMPANY 45, A. G. LAUX 35.
(5) INCLUDES 40 ACRES ON ADJOINING ELLA ARNOLD PROPERTY. 8 ACRES ADDITIONAL SERVED THROUGH TUTTLE PLANT, MILE 94.3 R.
(6) INCLUDES 25 ACRES ON ADJOINING MEIGS PROPERTY, AND 8 ACRES SERVED FOR U. W. BROWN, SEE MILE 93.0 R.
(7) INCLUDES ACREAGES ON ADJOINING LANDS AS FOLLOWS: MARSH 45, DICKSON 5.
(8) BRIDGET GRAHAM ESTATE 170 ACRES (MILE 95.8 L); COLUSA DEVELOPMENT COMPANY 75 ACRES.
(9) SEE PLANT AT MILE 95.6 L.
(10) NEW INSTALLATION 1934. REPLACES GASOLINE OPERATED PLANT.
(11) SEE PLANT AT MILE 98.8 L.
(12) WILLIAM AND D. BOGGS 30 ACRES, ADJOINING LANDS OF J. BOGGS 30 ACRES, AND J. BOGGS ON SPERRY LAND (MILE 98.6 L) 15 ACRES.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS-1934

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
CHENEY SLOUGH IRRIGATION COMPANY	99.0 R	1-36" 2-26"			546	408	~~114~~	254	38		1360	(1) 364	
TERRILL AND SARTAIN	99.2 L	1-20"		8	19	52	78	11	53		221	155	
DAVE GEORGE	99.8 L	1-16"		46	79	118	181	83	87	30	624	165	
J. W. BROWNING	100.8 L	1-20"			N O	D I V E R S I O N							
R. C. WOHLFROM	101.1 R	1-20"			159	129	~~20~~		43	120	471	133	
CLARA C. PACKER	102.8 R	2-30" 2-18" 1-36"		410	1547	1429	~~1392~~	1373	441	8	6600	110	375
GLENN-COLUSA CORPORATION (CAUZZA) (2)	103.3 L	1-14"			N O	D I V E R S I O N							
AMERICAN COMPANY (3)	103.7 R	1-16"		134	162	305	~~319~~	186	153	38	1297	(4) 405	
COMPTON-DELEVAN IRRIGATION DISTRICT	103.8 R	2-24" 1-36"			N O	D I V E R S I O N		(5)				(5)	(5)
E. M. GORDON	103.9 R	1-16" 1-20"			560	342	~~365~~	388	21		1676		212
B. F. GOULD	104.8 L	1-26"	153	103	335	289	267	137		302	1586	(6) 283	
THOUSAND ACRE RANCH (H. W. KELLER)	106.0 R	1-14"	5	104	49	82	~~78~~	40		64	422	143	
CALIFORNIA LANDS, INCORPORATED	110.0 R	1-12"		67	91	39	~~91~~			91	379	144	
CALIFORNIA LANDS, INCORPORATED — PRINCETON FERRY — MILE 112	111.2 R	1-6"			10	10	~~9~~			10	39	27	
RECLAMATION DISTRICT 1004	112.1 L	1-30" 1-50"			N O	D I V E R S I O N							
PRINCETON-CODORA-GLENN IRR. DIST.	112.4 R	3-24"			N O	D I V E R S I O N			(5)			(5)	(5)
A. J. STONE	112.6 L	1-10"			80		80			62	222	100	
BUTTE CITY RANCH	114.7 R				P L A N		D I S M A N T L E D						
EDWARD L. STEELE (G. D. HANSEN)	115.5 L	1-12"		45	317	335	13		27		737	325	
— BUTTE CITY GAGING STATION — MILE 115.8													
— BUTTE CITY BRIDGE — MILE 115.9													
BUTTE CITY RANCH	115.95R				P L A N		D I S M A N T L E D						
CALIFORNIA LANDS, INCORPORATED	117.8 R	1-10"		42	122	25	~~115~~			98	402	145	
J. F. HARBOUR AND E. H. WILEY	118.4 R	1-4"			N O	D I V E R S I O N							
TOM CROUCH	119.0 L	1-10"			N O	D I V E R S I O N							
C. T. WHITE	123.7 R	1-6"			N O	D I V E R S I O N							
S. TAYLOR	123.8 R	1-3"	1			4	~~3~~	5	1		14	2	
PRINCETON-CODORA-GLENN IRR. DIST.	123.9 R	3-24"			N O	D I V E R S I O N		(5)				(5)	(5)
PROVIDENT IRRIGATION DISTRICT	124.2 R	4-42" 1-36"			N O	D I V E R S I O N		(5)				(5)	(5)
CALIFORNIA LANDS, INCORPORATED	124.4 R	1-16"	21			86	~~131~~	89			209	80	
E. E. CRAMER	129.0 L	1-5"			N O	D I V E R S I O N							
F. S. REAGER (7) — ORD FERRY — MILE 130.8	130.75R	1-6"				4	~~4~~	4	4		16	8	
PARROTT-PHELAN ESTATE	141.5 L	3-24"	11	85		708	3350	4180	1557		(8) 9891	(9) 1610	(10) 1468

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) SEAVER 259 ACRES, MITCHELL 80 ACRES, AND MIDDLECAMP 25 ACRES.

(2) NEW INSTALLATION OCTOBER 1934.

(3) FORMERLY NATIONAL PACIFIC LAND COMPANY.

(4) ACREAGE DIVIDED AS FOLLOWS: BETTENCOURT 175, PROFFE 70, CABRALL 80, MARKS 80.

(5) SEE PLANT AT MILE 154.8 R.

(6) B. F. GOULD 40 ACRES, GOULD AND DUNHAM 60 ACRES, J. GOULD 18 ACRES AND ADJOINING LANDS OF COLUSA DEVELOPMENT COMPANY 165 ACRES.

(7) NEW INSTALLATION 1934.

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

(9) PARROTT 1355, PHELAN 255.

(10) PARROTT 925, PHELAN 543.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS–1934

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
— 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"				8	7	8	7	8	38	12	
M. F. ROSE	148.9 R	1–6"				7	8	7	8	7	37	13	
— GIANELLA BRIDGE — MILE 149.5													
CALIFORNIA LANDS, INC. (1)	150.0 L	1–10"			NO	DIVERSION							
JOSEPH GIANELLA	(2)150.0 L	1–10"			NO	DIVERSION							
SACRAMENTO RIVER FARMS LTD.	151.0 R	1–12"											
		1–16"	45	653		645	854	758	597	153	3705	1050	
A. HOLECEK	152.2 R	1–6"			18	4	26	11	9	6	74	38	
MAAS BROTHERS	154.6 R	1–5"					7	7	7		21	16	
GLENN-COLUSA IRRIGATION DISTRICT	154.8 R	1–100"											
	(3)	4–72"											
		(4)2–66"	29999	56321		51173	57789	60492	32394	13417	301585	16831	17971
		2–50"									(5)	(6)	(7)
		1–42"											
		2–30"											
JACINTO IRRIGATION DISTRICT	154.8 R	(8)	139	2260		2345	2966	2640	2175	611	13136	(9)4049	
COMPTON-DELEVAN IRRIGATION DISTRICT	154.8 R	(8)	1839	2823		2447	2612	2264	593		12578	60	1457
PROVIDENT IRRIGATION DISTRICT	154.8 R	(8)	5561	13343		10858	10243	9069	3410		(10)52484	(11)(12)6005	
PRINCETON-CODORA-GLENN IRR. DIST.	154.8 R	(8)	5436	10066		8981	9363	8074	5698	1252	48870	3053	(13)1617
MAXWELL IRRIGATION DISTRICT	154.8 R	(8)	774	1131		662	678	728	74	969	5016	(14)500	635
— CORNING-VINA BRIDGE — MILE 166.5													
A. F. LANDIS	166.7 R	1–3"			2	3	4	5	3		17	5	
LAURA B. CARO (15)	166.8 R	1–2"							1		1	2	
R. A. FOSTER	169.1 R	1–8"			NO	DIVERSION							
E. B. NOBLE	171.2 R	1–8"			NO	DIVERSION							
TEHAMA BRIDGE — MILE 177.5													

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) FORMERLY HENRY GIANELLA.

(2) 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.

(3) THIS IS A COMMON POINT OF DIVERSION FOR THE GLENN-COLUSA, JACINTO, COMPTON-DELEVAN, PROVIDENT, PRINCETON-CODORA-GLENN, AND MAXWELL IRRIGATION DISTRICTS.

(4) 2–66" VERTICAL UNITS NEWLY INSTALLED 1934.

(5) THERE WAS NO GRAVITY DIVERSION FROM THE RIVER IN 1934; 2911 ACRE-FEET ADDITIONAL WAS OBTAINED BY GRAVITY FROM STONEY CREEK IN APRIL; NOVEMBER DIVERSION FROM RIVER AMOUNTED TO 764 ACRE-FEET. THE DIVERSION SHOWN INCLUDES WATER FOR C. L. LEONARD AND I. G. ZUMWALT (OUTSIDE DISTRICT) AS FOLLOWS: (ACRE-FEET) LEONARD – APRIL 16, MAY 156, JUNE 71, JULY 59, SEPTEMBER 45, OCTOBER 61, TOTAL 408; ZUMWALT – APRIL 828, MAY 2271, JUNE 1378, JULY 1547, AUGUST 1429, SEPTEMBER 881, TOTAL 8334.

(6) INCLUDES 35 ACRES OF PROVIDENT IRRIGATION DISTRICT AND 78 ACRES OF C. L. LEONARD (OUTSIDE DISTRICT): INCLUDES ALSO 1054 ACRES DUCK PONDS.

(7) INCLUDES 388 ACRES OF PROVIDENT IRRIGATION DISTRICT AND 1358 ACRES OF I. G. ZUMWALT (OUTSIDE DISTRICT).

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

(9) INCLUDES 45 ACRES SERVED FOR PROVIDENT IRRIGATION DISTRICT.

(10) ADDITIONAL WATER OBTAINED FROM WILLOW CREEK (DRAIN) PUMP.

(11) 45 ACRES SERVED BY JACINTO IRRIGATION DISTRICT AND 35 ACRES BY GLENN-COLUSA IRRIGATION DISTRICT.

(12) INCLUDES 580 ACRES SERVED FOR PRINCETON-CODORA-GLENN IRRIGATION DISTRICT AND 423 ACRES IRRIGATED FROM HUNTER CREEK (INTERIOR DRAIN) PUMP. 388 ACRES ADDITIONAL WERE SERVED BY GLENN-COLUSA IRRIGATION DISTRICT.

(13) 580 ACRES ADDITIONAL WERE IRRIGATED FOR PRINCETON-CODORA-GLENN IRRIGATION DISTRICT THROUGH PROVIDENT IRRIGATION DISTRICT SYSTEM.

(14) ALL DUCK CLUBS.

(15) FORMERLY H. F. JACOBS.

TABLE 53 (CONTINUED)

SACRAMENTO RIVER DIVERSIONS–1934

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
TEHAMA RANCH	178.3 R	1–6"			NO	DIVERSION							
E. B. NOBLE	184.5 R	1–14"			40	62	66	70	23	18	279	50	
CONELAND WATER COMPANY (1)	187.6 L	1–12"					187	36	30	3	256	260	
— RED BLUFF BRIDGE — MILE 193.45													
S. E. AYER	194.1 R	1–6"			NO	DIVERSION							
G. E. SUTTON	196.2 R	1–6"	1	2	5	9	4	2			23	10	
J. A. EDWARDS	196.2 L	1–6"				17	17				34	5	
A. W. GIBSON (T. A. CROOK)	196.4 L	1–8"			NO	DIVERSION							
BANK OF AMERICA	196.5 L	1–4"			NO	DIVERSION							
J. ERICKSON	196.6 L	1–5"			29	36	4	18	10		97	29	
C. DROZ	197.0 L	1–8"			NO	DIVERSION							
W. H. FREEMYERS (2)	197.65L	1–3"				10	5				15	27	
C. DROZ (3)	197.73L	1–2"				8					8	3	
		1–6"											
— RED BLUFF GAGING STATION (IRON CANYON) — MILE 198.6													
C. W. GRIFFIN (1)	206.75L	1–10"							14		(4) 14	30	
— BEND FERRY BRIDGE — MILE 207													
W. E. BONNETT (5)	209.0 L	1–2½"					4	4	1		9	6	
J. F. NUNES	215.5 R	1–7"			NO	DIVERSION							
— JELLEYS FERRY — MILE 215.6													
J. F. NUNES	216.0 R	1–3"			NO	DIVERSION							
W. A. HUNAEUS	216.4 L	1–3"					3	3		3	9	5	
T. A. HAAKONSON	217.5 L	1–5"				6	31	11			48	70	
J. L. HASKINS	218.0 L	1–5"			3	16	26	4	2		51	55	
RIO ALTO RANCHO	221.0 R	1–10"			23	58	63	55	59	10	268	200	
— BALLS FERRY BRIDGE — MILE 224.5													
— ANDERSON BRIDGE — MILE 232.9													
L. C. SMITH AND G. W. GEORGE	233.0 L	1–6"			NO	DIVERSION							
		1–4"											
WM. MENZEL MEAT COMPANY	240.2 L	1–12"			88	121	268	165	138		780	(6) 155	
GRAF AND GRAF	241.5 L	1–8"				31	94	59	51	6	241	45	
ADAMS BROTHERS	242.0 R	1–6"				3	8	18			29	25	
— REDDING–ALTURAS BRIDGE — MILE 242.0													
ANDERSON COTTONWOOD IRRIGATION DISTRICT	246.0 R	GRAVITY		9100	20994	20722	21330	21158	20402	18032	131836 (7)	13000 (8)	
JOHN DIESTELHORST	246.3 R	1–10"		43	70	66	81	55	25		(9) 340	29	
TOTALS			2599	109638	204710	193469	202843	191488	107885	44331	1056963	93703	56516

* MILEAGE ALONG RIVER ABOVE SACRAMENTO.

(1) NEW INSTALLATION 1934.

(2) FORMERLY FREEMYERS BROTHERS.

(3) FORMERLY J. PINE.

(4) USED ONLY TO SUPPLEMENT GRAVITY DIVERSION FROM PAYNES CREEK.

(5) FORMERLY T. L. BONNETT.

(6) INCLUDES 15 ACRES ON ADJOINING HENDERSON PROPERTY.

(7) 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.

(8) ESTIMATED BY DISTRICT SUPERINTENDENT AS APPROXIMATELY 800 ACRES MORE THAN IN 1933. THIS INCLUDES 300 ACRES INDIRECTLY IRRIGATED THROUGH "SUB-ING".

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

TABLE 54

*COLUSA TROUGH DIVERSIONS--1933

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
HATTIE O'HAIR	(1) 1.1 L	1-32" BOX			NO DIVERSION								
I. G. ZUMWALT	2.2 R	1-14" 1-36"			NO DIVERSION								
SACRAMENTO SHOOTING CLUB	3.0 R				PLANT DISMANTLED								
A. D. J. LAND COMPANY	3.0 L	1-28" BOX			NO DIVERSION								
SACRAMENTO SHOOTING CLUB	(2) 3.1 R				PLANT DISMANTLED								
MAXWELL IRRIGATION DISTRICT PLANT #6	3.1 R (2)	1-20"			NO DIVERSION							(3)	(3)
LOUIS BYINGTON	4.3 L	1-8"			NO DIVERSION								
MAXWELL IRRIGATION DISTRICT PLANT #2A	7.0 R	1-15" 1-26" 1-36"			NO DIVERSION							(3)	(3)
BEARRUP AND FESSIGM AND MARY E. ROUKE	11.5 L	1-32" BOX (4)		27	138						165	250	
GUN CLUBS AT COMPTON WEIR	11.8 R	GRAVITY			NO DIVERSION								
E. M. GORDON	12.1 R				PLANT DISMANTLED								
— LATERAL HIGHWAY — BUTTE CITY TO WEST SIDE — MILE 20.5													
RAZOR RANCH (GEORGE ANTHONY)	20.7 R	1-6"			NO DIVERSION								
RAZOR RANCH (GEORGE ANTHONY)	21.1 R	1-15"			NO DIVERSION								
HENRY JAMESON	22.0 R	1-16"			NO DIVERSION								(5)
TOTALS			0	27	138	0	0	0	0	0	165	250	0

* MAIN DRAIN OF RECLAMATION DISTRICT 2047.
** MILEAGE ALONG TROUGH ABOVE COLUSA WILLIAMS HIGHWAY.
(1) BELOW COLUSA-WILLIAMS HIGHWAY.
(2) PLANT DIVERTS WATER FROM A DRAIN CANAL CALLED LATERAL F. DRAIN ENTERS TROUGH AT MILE 3.1 RIGHT.
(3) SEE SACRAMENTO RIVER DIVERSION OF MAXWELL IRRIGATION DISTRICT AT MILE 154.8 R.
(4) ONE 32" UNIT HAS BEEN REMOVED.
(5) 229 ACRES SERVED THROUGH PRINCETON-CODORA-GLENN IRRIGATION DISTRICT. SEE MILE 154.8 R, SACRAMENTO RIVER DIVERSIONS.

TABLE 55

*COLUSA TROUGH DIVERSIONS-1934

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
HATTIE O'HAIR	(1)1.1 L	1-32" BOX			NO DIVERSION								
I. G. ZUMWALT	2.2 R	1-14" 1-36"		884	2011	1687	1356	1010	170		7118		(2)787
A. D. J. LAND COMPANY	3.0 L	1-28" BOX			NO DIVERSION								
MAXWELL IRRIGATION DISTRICT PLANT #6 (4)	(3)3.1 R	1-20"			PLANT DISMANTLED (4)								
LOUIS BYINGTON	4.3 L	1-8"			NO DIVERSION								
MAXWELL IRRIGATION DISTRICT PLANT #2A	7.0 R	1-15" 1-26" 1-36"			NO DIVERSION								
MAXWELL IRRIGATION DISTRICT PLANT #3A (5)	7.0 R (6)	1-20" (7)			NO DIVERSION								
BEARRUP, FESSIGM AND MARY E. ROUKE	11.5 L	1-32" BOX			PLANT DISMANTLED								
GUN CLUBS AT COMPTON WEIR	11.8 R	GRAVITY			NO DIVERSION								
— LATERAL HIGHWAY — BUTTE CITY TO WEST SIDE — MILE 20.5													
RAZOR RANCH (GEORGE ANTHONY)	20.7 R	1-6"			NO DIVERSION								
RAZOR RANCH (GEORGE ANTHONY)	21.1 R	1-15"			NO DIVERSION								
STEVENS BROTHERS (8)	22.0 R	1-18" BOX (9)		87	322	229	387	463	156		1644		200
TOTALS			0	971	2333	1916	1743	1473	326	0	8762	0	987

* MAIN DRAIN OF RECLAMATION DISTRICT 2047.
** MILEAGE ALONG TROUGH ABOVE COLUSA WILLIAMS HIGHWAY.
(1) BELOW COLUSA-WILLIAMS HIGHWAY.
(2) ADDITIONAL RICE ACREAGE SERVED THROUGH GLENN-COLUSA IRRIGATION DISTRICT — SEE SACRAMENTO RIVER DIVERSIONS, MILE 154.8 R.
(3) PLANT DIVERTS WATER FROM A DRAIN CANAL CALLED LATERAL F. DRAIN ENTERS TROUGH AT MILE 3.1 RIGHT.
(4) PLANT MOVED TO LATERAL E. (STONE CORRAL CREEK) AND IS NOW INSTALLED THREE-FOURTHS OF A MILE WEST OF PLANT 2A (MILE 7.0 R).
(5) NEW INSTALLATION 1934.
(6) PLANT IS ON LATERAL E, THREE-FOURTHS OF A MILE WEST OF PLANT 2A WHICH IS AT THIS MILEAGE ON COLUSA TROUGH.
(7) UNIT MOVED FROM DISMANTLED MAXWELL IRRIGATION DISTRICT PLANT #6 AT MILE 3.1 R.
(8) FORMERLY HENRY JAMESON.
(9) REPLACES FORMER 16" UNIT.

TABLE 56

*BACK BORROW PIT DIVERSIONS--1933

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													
RIVER FARMS COMPANY	1.45 R	1-20"			NO	DIVERSION							
W. P. DWYER	4.35 R	1-20"			NO	DIVERSION							
RECLAMATION DISTRICT 108 (G. E. YOUNGMARK)	8.8 R	1-14"		474	1075	1010	995	1075			4630		400
HERSHEY ESTATE (E. L. AND W. S. WALLACE)	11.15 R	1-14" (1)		316	784	768	793	720	30		3411		1000 (2)
HERSHEY ESTATE	13.25 L	1-14"			NO	DIVERSION							
HERSHEY ESTATE (E. L. AND W. S. WALLACE)	13.75 R	1-16" (3)		565	759	719	827	451			3321		(4)
B. F. MUMMA	14.75 R	1-10"				5	6	3	3	1	18	10	
— COUNTY LINE BRIDGE — MILE 15.25													
M. T. EMMERT	15.75 R	1-15"		193	508	532	424	443	88		2188		275
KATHERINE WEST	18.1 R	2-15"			NO	DIVERSION							
C. R. SUGGET AND GREGORY ESTATE	20.0 R	2-15"		365	1722	1324	726	602	230		4969		700
BEAN AND BRINDENBURG (KALFSBEEK (5))	22.15 R	1-16" 1-12"		363	798	850	884	824	107		3826		320
J. W. BROWNING	22.5 L	2-12"			NO	DIVERSION							
— HANNUM BRIDGE — MILE 22.8													
TOTALS			0	2276	5647	5208	4655	4118	458	1	22363	10	2695

*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) 16" UNIT REMOVED.

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

(3) REPLACES 6" UNIT. 16" PUMP MOVED FROM PLANT AT MILE 11.15 R.

(4) SEE PLANT AT MILE 11.15 R.

(5) FORMERLY GREGORY, BROWNING, KINDERY AND BRINDENBURG.

TABLE 57

*BACK BORROW PIT DIVERSIONS-1934

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
— KNIGHTS LANDING RIDGE CUT JUNCTION — MILE 0.4 R													
FAIRCHILD RANCH (1)	1.3 R	1-12"				261	375	403	211	30	1280	15	135
RIVER FARMS COMPANY (FUSCHLIN)	1.45 R	1-20"		1620	1270	792	865	824	256		5627		464
W. P. DWYER	4.35 R	1-20"			NO DIVERSION								
RECLAMATION DISTRICT 108 (G. E. YOUNGMARK)	8.8 R	1-14"		600	1004	841	1269	595		(2) 35	4344		320 (3)
HERSHEY ESTATE (PETERSON AND JOHNSON)	11.15 R	1-14" (4) 1-12"		876	937	950	1237	705	90		4795		740 (5)
HERSHEY ESTATE	13.25 L	1-14"			PLANT DISMANTLED								
HERSHEY ESTATE	13.75 R	1-16"			NO DIVERSION								
B. F. MUMMA	14.75 R	1-10"		177	104	97	130	97			605		93
— COUNTY LINE BRIDGE — MILE 15.25													
M. T. EMMERT	15.75 R	1-15"			NO DIVERSION								
KATHERINE WEST (V. MC CULLOGH AND T. H. MUMMA)	18.1 R	2-15"		1040	1150	1163	1340	856	136		5685		706
C. R. SUGGET AND GREGORY ESTATE	20.0 R	(6) 1-15"			446	442	460	463	237		2048		320
BEAN AND BRINDENBURG	22.15 R	1-16" 1-12"			NO DIVERSION								
J. W. BROWNING	22.5 L				PLANT DISMANTLED								
J. W. BROWNING (1)	22.65 L	1-24"			1260	1059	1458	1220	414		5411		600
— HANNUM BRIDGE — MILE 22.8													
TOTALS			0	4313	6171	5605	7134	5163	1344	65	29795	15	3378

* 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) NEW INSTALLATION 1934.

(2) DIVERSION IN OCTOBER FOR STOCK WATER.

(3) ON ADJOINING ACREAGE AS FOLLOWS: YOUNGMARK 90, BROWNING 90, DWYER 140.

(4) 12" UNIT ADDED IN 1934.

(5) PETERSON 400 ACRES, JOHNSON 340 ACRES, INCLUDING 80 ACRES ON ADJOINING LANDS OF RECLAMATION DISTRICT 108.

(6) ONE 15" (VERTICAL) UNIT REMOVED.

TABLE 58

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS—1933

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	(1) GUN CLUB
LOWER BUTTE CREEK														
RECLAMATION DISTRICT 1004	1.9 R				P L A N T	D I S M A N T L E D								
RECLAMATION DISTRICT 833 (R.C. INGRAM)	2.9 L	36" BOX			35	260	440	550			1285	675		
RECLAMATION DISTRICT 1004 (MOULTON IRRIGATED LANDS CO.) (2)	3.9 R	(3) 1–15" 1–24"			2040	2170	2640	2920	1385	20	11175 (4)	649 (5)	1185 (5)	
BUTTE LODGE GUN CLUB	4.0 R	1–22"							223	744	967			700
SOUTH BUTTE GUN CLUB	5.5 L				P L A N T	D I S M A N T L E D								
WINCHESTER GUN CLUB	5.5 L				P L A N T	D I S M A N T L E D								
RECLAMATION DISTRICT 1004	9.3 R	GRAVITY			620				300	744	(6) 1664			7) 1125
BUTTE BASIN GUN CLUBS (8)	10	GRAVITY												5000
— BIGGS-AFTON ROAD — MILE 19.4														
GLENN RICE FARMS	(9) 19.8 R	1–12"					620	488	223	25	1356		200	
JOHN HANNAH	20.2 R	1–20"			N O	D I V E R S I O N								
JOHN HANNAH	21.2 R	1–36"			N O	D I V E R S I O N								

* 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) FORMERLY COLUSA DELTA FARMS COMPANY.

(3) 12" UNIT HAS BEEN REMOVED AND 20" UNIT REPLACED BY 24" UNIT FROM SACRAMENTO RIVER PLANT OF RECLAMATION DISTRICT 1004 (MILE 112.1 L).

(4) ADDITIONAL WATER RECEIVED BY GRAVITY DIVERSION AT MILE 9.3 R.

(5) ACREAGE DIVIDED BETWEEN CALIFORNIA LANDS, INC. (IN R.D. 1004) 1185 RICE AND 315 GENERAL, AND MOULTON IRRIGATED LANDS CO. 334 GENERAL.

(6) THE DIVERSION IN MAY WAS USED TO SUPPLEMENT THE DIVERSION BY THE PLANT AT MILE 3.9 R AND WAS USED ON THE ACREAGE REPORTED UNDER THAT PLANT.

(7) DIVIDED AS FOLLOWS: (ACRES) WILD FOWL CLUB 250, CALIFORNIA DUCK CLUB 500, FINNIE ROD AND GUN CLUB 350, PUTNAM CLUB 25.

(8) 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 R.D. 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.

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

TABLE 58 (CONTINUED)

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS–1933

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	(1) GUN CLUB
BUTTE SLOUGH														
BUTTE SLOUGH IRRIGATION COMPANY, LTD. (DIVERSION TO SUTTER BY-PASS) (2)	0.3 WEST	GRAVITY		1328	3648	3294	4132	4468	1428		18298	(3)		
M. MARTY	0.3 WEST	1–12"				89	34	20			143	57		
G. S. AND D. C. SMITH	1.4 EAST	1–8"			26	150	167	155			498	240		
I. E. NALL	3.5 WEST	1–10"		26	29	62	58	32			207	114		
W. H. ROSS (W. MILLER)	3.7 WEST	1–10"				39	52	42			133	48		
P. A. REISCHE	4.1 WEST	1–12"		4	102	101	103	122	32	3	467	(4)217		
E. V. JACOBS (G. M. GOMES)	4.8 WEST	1–10"			61	167	70	136	28		462	110		
A. ARMSTRONG AND COLUSA COUNTY BANK	5.1 WEST	1–10"			15	15	73	47	12	3	165	(5)110		
T. J. HAGEMAN	6.8 WEST	3–8"				20		14			34	160		
TOTALS (LOWER BUTTE CREEK AND BUTTE SLOUGH			0	1358	6576	6367	8389	8994	3631	1539	36854	2380 (6)	1385	6825 (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 MILE 28.4 RIGHT AND 28.6 RIGHT. (SEE SUTTER BY-PASS DIVERSIONS, TABLE 60.)

(3) SEE ACREAGES UNDER REDIVERSIONS AT MILE 28.4 R AND 28.6 R, WEST BORROW PIT SUTTER BY-PASS. A CONSIDERABLE ADDITIONAL BUT INDEFINITE ACREAGE WAS SERVED BY SUB-IRRIGATION AND DIRECT DIVERSION 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 60, AND FOOTNOTE, TABLE 115.

(4) INCLUDES MESSICK 14, WOODS 15, BANK OF AMERICA 20, C. P. REISCHE 80, S. E. REISCHE 55, FEITH AND GRANNERMAN 6.

(5) ARMSTRONG 54, COLUSA COUNTY BANK 16, AND ADJOINING HANSEN LAND 40.

(6) DOES NOT INCLUDE ACREAGE UNDER DIVERSION 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.

TABLE 59

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS—1934

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			36	227	551	385			1199	529	
WEST BUTTE COUNTRY CLUB (2)	3.85L	1-6"					90	30			120	(3) 500	(3)
RECLAMATION DISTRICT 1004 (MOULTON IRRIGATED LANDS COMPANY)	3.9 R	1-15" 1-24"			188	36	75	306			605	300	
BUTTE LODGE GUN CLUB	4.0 R	1-22"							408	905	1313	(4)	700
RECLAMATION DISTRICT 1004	9.3 R	GRAVITY		40	168	520	620	448		1356	(5) 3152	(6) 1425	(5)
BUTTE BASIN GUN CLUBS (7) — BIGGS-AFTON ROAD — MILE 19.4	10	GRAVITY											5000
GLENN RICE FARMS	(8) 19.8 R	1-12"			NO	DI	VERSION:						
JOHN HANNAH	20.2 R	1-20"			NO	DI	VERSION:						
JOHN HANNAH	21.2 R	1-36"			NO	DI	VERSION:						

* 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) NEW INSTALLATION 1934.

(3) BEANS AND CORN ON GUN CLUB ACREAGE.

(4) SEE ACREAGE NOTES RECLAMATION DISTRICT 1004 MILE 9.3 R.

(5) DIVERSION UP TO SEPTEMBER FOR SUDAN GRASS ON GUN CLUB ACREAGES. OCTOBER DIVERSION FOR DUCK PONDS.

(6) DIVIDED AS FOLLOWS: (ACRES) CALIFORNIA DUCK CLUB 550, WILD FOWL CLUB 325, FINNIE ROD AND GUN CLUB 300, AND BUTTE LODGE GUN CLUB 250.

(7) 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 R.D. 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.

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

TABLE 59 (CONTINUED)

LOWER BUTTE CREEK AND BUTTE SLOUGH DIVERSIONS–1934

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		2520	5128	4048	5156	5264	4000		26116	(3)	
M. MARTY	0.3 WEST	1–12"		30	56		83	26	13	1	209	(4) 90	
G. S. AND D. C. SMITH	1.4 EAST	1–8"					197	200	30		427	240	
I. E. NALL	3.5 WEST	1–10"				37	53	89	31		210	120	
W. H. ROSS (W. MILLER)	3.7 WEST	1–10"				26	13	13			52	9	
P. A. REISCHE	4.1 WEST	1–12"		18	37	117	82	128	41	5	428	(5) 208	
E. V. JACOBS (G. M. GOMES)	4.8 WEST	1–10"			83	86	129	107	54		459	85	
A. ARMSTRONG AND COLUSA COUNTY BANK	5.1 WEST	1–10"			18	17	86	55	15	4	195	(6) 110	
W. NALL (7)	6.3 WEST	1–7"					14				14	10	
T. J. HAGEMAN	6.8 WEST	3–8"			2	2		2			6	18	
TOTALS (LOWER BUTTE CREEK AND BUTTE SLOUGH			0	2608	5716	5116	7149	7053	4592	2271	34505	3644 (8)	5700 (9)

* 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 61.)

(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 61, AND FOOTNOTE TABLE 116.

(4) INCLUDES 30 ACRES ON ADJOINING GRAY PROPERTY.

(5) INCLUDES MESSICK 13, BANK OF AMERICA 20, C. P. REISCHE 80, S. E. REISCHE 60, FEITH AND GRANNERMAN 8.

(6) ARMSTRONG 54, COLUSA COUNTY BANK 16 AND ADJOINING HANSEN LAND 40.

(7) NEW INSTALLATION 1934.

(8) DOES NOT INCLUDE ACREAGE UNDER DIVERSION TO SUTTER BY-PASS – SEE FOOTNOTES (2) AND (3).

(9) NOTE THAT THIS INCLUDES AN ESTIMATE OF 5000 ACRES FOR WHICH THE DIVERSIONS ARE NOT REPORTED.

TABLE 60

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS—1933

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
WEST BORROW PIT OF SUTTER BY-PASS													
— SOUTHERN PACIFIC RAILROAD CROSSING — MILE 2.5 (1)													
— KNIGHTS LANDING – MARYSVILLE CAUSEWAY — MILE 12.7													
— WEST BORROW PIT GAGING STATION – MILE 15.7													
MIDDLETON AND DESSEZ	17.0 R				PLANT DISMANTLED								
— 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. MCKEEHAN	27.1 R	1-16"			NO DIVERSION								
BUTTE SLOUGH IRRIGATION CO., LTD. (2)	28.4 R	GRAVITY		1020	1366	1151	1405	1703	525		7170	4444	
S. F. ROBERTSON (2) (3)	28.6 R	(4) 1-10"			66	65	58	3			192	162	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 29.15													
EAST BORROW PIT OF SUTTER BY-PASS													
C. F. HOLMES AND R. E. HUGHES (BAIRD AND TAYLOR) (6)	0.4 S* (5)	1-14"		25	496	574	558	580	193		2426		258
C. F. HOLMES AND R. E. HUGHES (7)	0.1 S*	1-10"			NO DIVERSION								
C. F. HOLMES AND R. E. HUGHES (BAIRD AND TAYLOR) (6)	0.5 N*	1-14" 1-12"			396	315	284	332	168		1495		219
E. H. CHRISTENSEN	1.4 N (8)				PLANT DISMANTLED (9)								
E. H. CHRISTENSEN	1.4 N (8)				PLANT DISMANTLED (10)								
C. F. HOLMES AND R. E. HUGHES	1.5 N*	(11) 1-14"			545	435	392	457	232		2061		302
E. H. CHRISTENSEN AND SON (12)	2.2 N	1-16"		190	206	503	538	503			1940		400
C. F. HOLMES AND R. E. HUGHES	3.1 N*				PLANT DISMANTLED								
E. H. CHRISTENSEN AND SON	4.3 N	1-15"			NO DIVERSION								
— KNIGHTS LANDING–MARYSVILLE CAUSEWAY — MILE 4.4 N													
C. F. HOLMES AND R. E. HUGHES (A. R. WAYBUR) (6)	4.5 N*	1-14" (13) 1-8"			339	620	628	625	284		2496		210
ARNOLD E. CHRISTENSEN	5.8 N				PLANT DISMANTLED								
— EAST LEVEE OF WADSWORTH CANAL — MILE 16.0 N													
R. L. MOREHEAD	18.75 N	1-10"			NO DIVERSION								
F. W. DE WITT AND GEORGE SMITH	18.8 N*	1-4"			42	60		28			130	(14) 280	
MEYER-PLATTER-MOREHEAD-DE WITT BROS.-EPERSON AND MIDDLETON	19.1 N	1-14"		66	430	167	357	430	218		1668	616 (15)	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 20.0 N													

(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 AND 28.6 R WERE 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 58).
(3) FORMERLY BURMOOD, TARKE, MC GRATH AND MESSICK.
(4) ONE 10" UNIT REMOVED.
(5) 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.
(6) NEW INSTALLATION 1933.
(7) FORMERLY LISTED AS RAY HUGHES.
(8) PLANT WAS ON DRAIN CANAL WHICH ENTERS BY-PASS AT THIS POINT.
(9) PLANT MOVED TO MILE 6.95 N* IN 1934.
(10) PLANT MOVED TO MILE 6.6 N* IN 1934.
(11) REPLACES FORMER 15" UNIT.
(12) FORMERLY SUTTER BASIN COMPANY.
(13) 8" UNIT TEMPORARY.
(14) DE WITT 180 ACRES, SMITH 100 ACRES.
(15) DE WITT AND MEYER 145, MEYER 84, MOREHEAD 100, EPPERSON 170, MIDDLETON 117.

TABLE 60 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS-1933

WATER USER	MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED GENERAL	RICE
SACRAMENTO SLOUGH													
C. F. HOLMES AND R. E. HUGHES (H. C. HINCKLEY)	(1) 1.4 R	1-24"				111	350	438			899	368	
KNIGHTS LANDING RIDGE CUT (2)													
RUSSELL BROTHERS	(3) 2.3 L	1-12"			NO	DIVERSION							
— RECLAMATION DISTRICT 730 DRAINAGE PLANT #2 — MILE 3.8													
HERSHEY ESTATE (A. J. DARNEILLE)	4.7 L	1-15"			83	150	100				333	240	
SIEBER BROTHERS (4)	4.7 R	1-6"			12	20	15				47	16	
FRANK FISHER AND HENRY RICH (5)	6.3 (6)	GRAVITY			698	1000	1000	500	266		(7)3464	(8) 700	
— WEST LEVEE YOLO BY-PASS — MILE 6.3													
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)													
CONAWAY RANCH	(9) 4.2 R	1-12"			NO	DIVERSION							
— SACRAMENTO-WOODLAND RAILROAD CROSSING — MILE 6.2													
— RECLAMATION DISTRICT 1600 DRAINAGE PLANT — MILE 10.0													
FRANK FISHER AND HENRY RICH	10.1 R	1-30" 1-6" (10)									(10)	(10)	
— FREMONT WEIR (EAST END) — MILE 12.3													
BACK BORROW PIT RECLAMATION DISTRICT 1000													
W. F. SANDERCOCK	(11) 0.6 R	1-10"			26	26					(12) 52	150	
— GAGING STATION — MILE 2.1													
TOTALS - BY-PASS AND DRAINAGE CHANNEL DIVERSIONS													
WEST BORROW PIT OF SUTTER BY-PASS			0	1020	1432	1216	1463	1706	525	0	(13) 7362	4606	0
EAST BORROW PIT OF SUTTER BY-PASS			0	281	2454	2674	2757	2955	1095	0	12216	896	1170
SACRAMENTO SLOUGH			0	0	0	111	350	438	0	0	899	368	0
KNIGHTS LANDING RIDGE CUT			0	0	793	1170	1115	500	266	0	3844	956	0
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)			0	0	0	0	0	0	0	0	0	0	0
BACK BORROW PIT RECLAMATION DISTRICT 1000			0	0	26	26	0	0	0	0	52	150	0
TOTALS			0	1301	4705	5197	5685	5599	1886	0	(13)24373	6976	1170

(1) MILEAGE IS GIVEN EASTERLY FROM DRAINAGE PLANT OF RECLAMATION DISTRICT 1500 WHICH IS AT HEAD OF SLOUGH.
(2) 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 120.
(3) MILEAGE IS GIVEN SOUTHERLY FROM HEAD IN BACK BORROW PIT NEAR KNIGHTS LANDING.
(4) NEW INSTALLATION 1933.
(5) DIVERSION FROM THIS SOURCE PREVIOUSLY REPORTED UNDER YOLO BY-PASS DIVERSIONS - SEE MILE 10.1 R., FOOTNOTE 7, PAGE 53, 1932 REPORT.
(6) FLOW DIVERTED TO IRRIGATION CANAL AT END OF KNIGHTS LANDING RIDGE CUT AT WEST LEVEE OF YOLO BY-PASS.
(7) JUNE, JULY AND AUGUST DIVERSIONS ARE ESTIMATED. SOME ADDITIONAL WATER FOR THIS ACREAGE WAS DERIVED FROM SEEPAGE AND SPILL FROM R.D.1600 (SEE SACRAMENTO RIVER DIVERSIONS MILE 16.27 R AND YOLO BY-PASS DIVERSIONS, MILE 10.1 R).
(8) IN YOLO BY-PASS.
(9) MILEAGE IS GIVEN NORTHERLY FROM NORTH LEVEE OF SACRAMENTO BY-PASS.
(10) 30" UNIT WAS NOT OPERATED AND A 6" PUMP WAS TEMPORARILY INSTALLED TO ASSIST IN THE DIVERSION OF SEEPAGE AND SPILL FROM R.D. 1600 (SEE SACRAMENTO RIVER DIVERSIONS MILE 16.27 R) TO SUPPLEMENT WATER FOR THE 700 ACRES LISTED UNDER KNIGHTS LANDING RIDGE CUT DIVERSIONS AT MILE 6.3. NO OPERATION RECORD FOR 6" PUMP.
(11) MILEAGE IS GIVEN EASTERLY FROM SACRAMENTO RIVER.
(12) DIVERSIONS AFTER JULY 1ST FROM WELLS.
(13) INCLUDES 7362 ACRE-FEET INCLUDED ALSO IN DIVERSIONS LISTED UNDER BUTTE SLOUGH. SEE FOOTNOTE (2) WEST BORROW PIT SUTTER BY-PASS DIVERSIONS, THIS TABLE, AND FOOTNOTE (2) BUTTE SLOUGH DIVERSIONS, TABLE 58.

TABLE 61

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS-1934

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 (2)													
— 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 (CHRISTENSEN) (3)	16.1 L	1-16"					625	650			1275 (4)		(4)
— 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. MCKEEHAN	27.1 R	1-16"			NO	DIVERSION							
BUTTE SLOUGH IRRIGATION CO. LTD.(5)	28.4 R	GRAVITY		863	1796	1507	1764	1632	1073		8635	(6)3969	
S. F. ROBERTSON (5)	28.6 R	1-10"			18	40	40				98	165	
FRYE BROTHERS (3) (5)	29.0 R	1-7"				8	27				35	26	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 29.15													
EAST BORROW PIT OF SUTTER BY-PASS													
	(7)												
C. F. HOLMES AND R. E. HUGHES (BAIRD AND CRAWFORD)	0.4 S*	1-14"			402	453	461	532	386		2234		224 (8)
C. F. HOLMES AND R. E. HUGHES	0.1 S*	(9)1-16"			250						250		(10)
C. F. HOLMES AND R. E. HUGHES (BAIRD AND CRAWFORD)	0.5 N*	1-14" 1-12"			633	503	454	530	268		2388		350

(1) MILEAGE IS GIVEN NORTHERLY FROM DRAINAGE PLANT OF RECLAMATION DISTRICT 1500. MILE 9.15 WEST BORROW PIT IS OPPOSITE CHANDLER.
(2) NEWLY ESTABLISHED 1934 - SEE TABLE 119.
(3) NEW INSTALLATION 1934.
(4) THE DIVERSION BY THIS PLANT COMBINED WITH THAT FROM THE PLANTS ON THE EAST BORROW PIT OF THE SUTTER BY-PASS AT MILES 5.8 N, 6.6 N, AND 6.95 N TO SERVE THE ACREAGE REPORTED UNDER THE PLANT AT MILE 5.8 N.
(5) DIVERSIONS AT MILE 28.4 R, 28.6 R, AND 29.0 R WERE 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 59).
(6) INCLUDES ACREAGE ON ADJOINING LANDS AS FOLLOWS: HEIKEN 85, HYATT AND ZANDER 155, STONE AND YOUNGBERG 181.
(7) 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.
(8) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THAT AT MILE 0.1 S*.
(9) REPLACES FORMER 10" UNIT.
(10) SEE PLANT AT MILE 0.4 S*.

TABLE 61 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS—1934

WATER USER	MILE AND BANK (1)	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	TOTAL DIVERSION MARCH TO OCTOBER ACRE-FEET	ACREAGE IRRIGATED GENERAL	RICE
EAST BORROW PIT OF SUTTER BY-PASS (CONTINUED)													
A. W. KIMERER (2)	(3) 1.4 N	1-14"				200	612	530	235		1577		250
C. F. HOLMES AND R. E. HUGHES	1.5 N*	(4) 1-8" 1-4"			130	130					260	265	
E. H. CHRISTENSEN AND SON	2.2 N	1-16"			NO	DIVERSION							
C. F. HOLMES AND R. E. HUGHES (5)	3.1 N*	(5) 1-14" 1-12"			633	474	552	593	199		2451		315
E. H. CHRISTENSEN AND SON	4.3 N	1-15"			NO	DIVERSION							
— KNIGHTS LANDING-MARYSVILLE CAUSEWAY — MILE 4.4 N													
C. F. HOLMES AND R. E. HUGHES (A. R. WAYBUR)	4.5 N*	1-14"			628	626	479	491	295		2519		230
STATE RECLAMATION BOARD (E. H. CHRISTENSEN AND SON) (2)	5.8 N*	1-16"			375	833	764	750	252		2974		(6) 750
STATE RECLAMATION BOARD (E. H. CHRISTENSEN AND SON) (7)	6.6 N*	1-12"			363	459	480	233	164		1699		(8)
STATE RECLAMATION BOARD (E. H. CHRISTENSEN AND SON) (2)	6.95N*	1-12"			473	359	578	566	149		2125		(8)
— EAST LEVEE OF WADSWORTH CANAL — MILE 16.0 N													
R. L. MOREHEAD	18.75 N	1-10"			NO	DIVERSION							
F. W. DE WITT AND GEORGE SMITH	18.8 N*	1-4"				36	71	21			128	(9) 280	
MEYER-PLATTER-MOREHEAD-DE WITT BROS.-EPERSON AND MIDDLETON	19.1 N	1-14"			458	50	611	474	102		1695	410 (10)	
— NORTHERN ELECTRIC RAILROAD CROSSING — MILE 20.0 N													
SACRAMENTO SLOUGH													
C. F. HOLMES AND R. E. HUGHES (RAYMOND AND CRAWFORD)	(11) 1.4 R	1-24"			968	1291	1587	1534	891	575	6846		381 (12)

(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) NEW INSTALLATION 1934.
(3) PLANT IS ON DRAIN CANAL WHICH ENTERS BY-PASS AT THIS POINT.
(4) REPLACING FORMER 14" UNIT.
(5) NEW INSTALLATION 1934 AT A PREVIOUS POINT OF DIVERSION.
(6) THIS IS THE TOTAL ACREAGE SERVED BY THIS PLANT AND THE OTHERS AT MILES 6.6 N*, 6.95 N* — EAST BORROW PIT AND 16.1 L WEST BORROW PIT.
(7) NEW INSTALLATION 1934. UNIT MOVED FROM MILE 1.4 N.
(8) SEE PLANT AT MILE 5.8 N*.
(9) DE WITT 180 ACRES, SMITH 100 ACRES.
(10) MEYER 90, MOREHEAD 80, DE WITT BROS. 240.
(11) MILEAGE IS GIVEN EASTERLY FROM DRAINAGE PLANT OF RECLAMATION DISTRICT 1500 WHICH IS AT HEAD OF SLOUGH.
(12) INCLUDES 82 ACRES ON ADJOINING LANDS OF BANK OF YOLO.

TABLE 61 (CONTINUED)

BY-PASS AND DRAINAGE CHANNEL DIVERSIONS—1934

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 (1)													
RUSSELL BROTHERS	(2) 2.3 L	1-12"			NO	DIVERSION							
— RECLAMATION DISTRICT 730 DRAINAGE PLANT #2 — MILE 3.8													
CALIFORNIA NATIONAL BANK (LINNELL)(3)	4.55L	1-12"			116	62	96	10			284	110	
HERSHEY ESTATE (A. J. DARNEILLE)	4.7 L	1-15"			155	174	123				452	250	
SIEBER BROTHERS	4.7 R	1-6"			12	20	15				47	17	
FRANK FISHER AND HENRY RICH	(4) 6.3	GRAVITY			3100	1400	2540	2430	565		10035	(5) 120	(5) 1250
E. L. WALLACE (6)	(4) 6.3	GRAVITY			1200	593	1000	950	220		3963		(5) 600
— WEST LEVEE YOLO BY-PASS — MILE 6.3													
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)													
CONOWAY RANCH	(7) 4.2 R				PLANT	DISMANTLED							
— SACRAMENTO-WOODLAND RAILROAD CROSSING — MILE 6.2													
— RECLAMATION DISTRICT 1600 DRAINAGE PLANT — MILE 10.0													
FRANK FISHER AND HENRY RICH (8)	10.1 R												
— FREMONT WEIR (EAST END) — MILE 12.3													
BACK BORROW PIT RECLAMATION DISTRICT 1000													
W. F. SANDERCOCK	(9) 0.6 R				PLANT	DISMANTLED							
— GAGING STATION — MILE 2.1													
TOTALS — BY-PASS AND DRAINAGE CHANNEL DIVERSIONS													
WEST BORROW PIT OF SUTTER BY-PASS			0	863	1814	1555	2456	2282	1073	0	(10) 10043	4160	0
EAST BORROW PIT OF SUTTER BY-PASS			0	0	4345	4087	5027	4770	2071	0	20300	955	2119
SACRAMENTO SLOUGH			0	0	968	1291	1587	1534	891	575	6846	0	381
KNIGHTS LANDING RIDGE CUT			0	0	4583	2249	3774	3390	785	0	14781	497	1850
YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL)			0	0	0	0	0	0	0	0	0	0	0
BACK BORROW PIT RECLAMATION DISTRICT 1000			0	0	0	0	0	0	0	0	0	0	0
TOTALS			0	863	11710	9182	12844	11976	4820	575	(10) 51970	5612	4350

(1) 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 121.
(2) MILEAGE IS GIVEN SOUTHERLY FROM HEAD IN BACK BORROW PIT NEAR KNIGHTS LANDING.
(3) NEW INSTALLATION 1934.
(4) FLOW DIVERTED TO FISHER AND RICH AND WALLACE IRRIGATION CANALS AT END OF KNIGHTS LANDING RIDGE CUT AT WEST LEVEE OF YOLO BY-PASS.
(5) IN YOLO BY-PASS.
(6) NEW DIVERSION 1934.
(7) MILEAGE IS GIVEN NORTHERLY FROM NORTH LEVEE OF SACRAMENTO BY-PASS.
(8) AREA FORMERLY SERVED BY THIS DIVERSION NOW IRRIGATED BY GRAVITY DIVERSION FROM KNIGHTS LANDING RIDGE CUT — SEE KNIGHTS LANDING RIDGE CUT DIVERSIONS, MILE 6.3.
(9) MILEAGE IS GIVEN EASTERLY FROM SACRAMENTO RIVER.
(10) INCLUDES 8768 ACRE-FEET INCLUDED ALSO IN DIVERSIONS LISTED UNDER BUTTE SLOUGH. SEE FOOTNOTE (5) WEST BORROW PIT OF SUTTER BY-PASS DIVERSIONS, THIS TABLE, AND FOOTNOTE (2) BUTTE SLOUGH DIVERSIONS, TABLE 59.

TABLE 62

FEATHER RIVER DIVERSIONS–1933

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"			179	283	577	132	110		(1)1281		479
PUNTER AND RUTZ	1.55 L	1–6"			NO	DIVERSION							
SUTTER BASIN COMPANY	2.60 R	1–20" 1–26"		357	4059	3476	2810	4945	1659		(2)17306	381	1534
S. A. MCKEEHAN	5.44 L				PLANT	DISMANTLED							
J. M. INMAN (STARK BROTHERS)	6.44 L	1–8"		41	39	16	60	32	16		204	72	
M. SCHEIBER	7.7 L	1–8"			32	100	91	113	49	22	407	100	
— NICOLAUS GAGING STATION — MILE 9.3													
— NICOLAUS BRIDGE — MILE 9.4													
GEORGE POLLOCK COMPANY	9.75 R	1–20"		39	153	281	295	606	313	13	1700	(3) 432	
GARDEN HIGHWAY MUTUAL WATER CO.	13.1 R	1–20" 1–24"		504	667	936	1270	746	233		4356	1038 (4)	
FEATHER RIVER WATER COMPANY	16.35 R	1–14"	88	321	144	214	398	46	118		1329	253	
PLUMAS MUTUAL WATER COMPANY	17.5 L	1–22"	321	482	1350	1180	1792	1792	1743	436	9096	1600	
G. C. SHANNON	18.75 R	1–6"			53	15	32	27	39	7	173	67	
W. D. BUTLER	(5)21.4 R				PLANT	DISMANTLED							
OSWALD WATER DISTRICT	(5)21.4 R	1–16"	275	330	753	936	960	705	260	350	4569	449	
ALICIA MUTUAL WATER COMPANY	24.0 L	1–16" 1–20" 1–26" (6) 1–30"		807	2009	2800	1983	2325	862	319	11105 (6)	960	700
CUNNINGHAM BROTHERS (7)	(5)25.2 R	1–12"		91	14	193	47				345	130	
— MOUTH OF YUBA RIVER — MILE 27.3													
— YUBA CITY – MARYSVILLE BRIDGE — MILE 28.0													
J. L. SULLIVAN	33.9 R	1–10"	192	147	22	115	158	22	17		673	150	
SUTTER BUTTE CANAL COMPANY (SUNSET PLANT) (8)	38.1 R	2–42" 1–26"			NO	DIVERSION							
PACIFIC HIGHWAY ORCHARDS TRACT (CHARLES COTTRELL)	43.7L(9) H.SL.0.4L	1–8"			NO	DIVERSION							
ANTONE HOLL (10)	43.7L(9) H.SL.0.7L	1–4"			11	12	20	20			63	22	
MOZNETT–WETMORE SUBDIVISION #1 (CHARLES ST. CLAIR)	43.7L(9) H.SL.1.2L	1–10"		42	57	99	101	83	45	13	440	160	

* MILEAGE ALONG RIVER ABOVE MOUTH.

(1) 2180 ACRE-FEET ADDITIONAL RECEIVED FROM PLANT AT MILE 2.6 R.

(2) INCLUDES 2180 ACRE-FEET DELIVERED TO RICE UNDER PLANT AT MILE 0.6 R.

(3) INCLUDES ACREAGE ON ADJOINING LAND AS FOLLOWS: ANDERSON 30, ALBRIGHT 32.

(4) INCLUDES 192 ACRES OF BROWN AND PURINGTON.

(5) MILEAGE CORRECTED.

(6) INCLUDES DIVERSION OF 202 ACRE-FEET, APRIL 6TH TO 9TH, BY 30" PUMP ON OLD OVERFLOW CHANNEL.

(7) FORMERLY JACKSON DIGGS.

(8) SEE SUTTER BUTTE CANAL COMPANY DIVERSION AT MILE 58.1 R.

(9) 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.

(10) NEW INSTALLATION 1933.

TABLE 62 (CONTINUED)

FEATHER RIVER DIVERSIONS-1933

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
MANUEL A. BARBA	43.7 L(1) H.SL.1.25L	1-8"			7	12	16	12	14	13	74	50	
A. P. BARBA (JOHN BETTENCOURT)	47.9 L	1-12"		175	121	108	51	40	55		(2) 550	87	
E. F. BIGGS	48.3 L	1-10"			51	67	79	95			292	230	
CALIFORNIA LANDS, INC. (CLYNE RANCH) (3)	51.0 R	1-6"			23	14	14	11		10	72	31	
J. F. HARRIGER	51.1 L	1-7"				5	12	13	5		(4) 35	26	
EDWARD STEADMAN	51.4 R	1-10"				144	208	175			527	(5) 130	
CALIFORNIA LANDS, INC. (6)	51.6 R	1-5"			15	12	15			16	58	25	
W. E. BLOWER (7)	52.1 L	1-9"					34	6			40	55	
CALIFORNIA LANDS, INC. (8)	52.5 L	1-6"				24	24	24	26	10	108	32	
F. L. MORRIS	52.7 L	1-8"		19	16	25	31	5	3	11	110	87	
FRANK DUTRA	52.9 R	1-6"				20	10	19	10		59	20	
G. H. BOGUE	53.1 R	1-6"			10	27	19	11			67	40	
BUDH SINGH	54.7 R	1-8"				19	76	16			111	30	
HEARST ESTATE (SUNICAL PACKING CO.)	55.1 L	1-14"		60	31	206	235	286	67	65	950	323	
L. A. KISTER	55.5 L	1-8"			30	110	111	10	4		265	103	
RIO BONITA RANCH	56.6 R	1-14"			NO	DIVERSION							
J. H. ABBEY	56.8 R	1-8"				28	16				44	35	
ALVIN KISTER	57.0 L	1-8"			4	63	47	49		2	165	49	
J. E. CARRICO	57.0 R	1-8"				35	15	7			57	(9) 26	
HENRY HASELBUSCH	57.9 R	1-10"			19	25	24	17	20		105	48	
SUTTER BUTTE CANAL COMPANY	(10)58.1 R	GRAVITY	3760	22142	58557	55874	55076	47413	32238	18461	(11) 293521	13823	7059
RICHVALE IRRIGATION DISTRICT	(10)58.1 R	GRAVITY	752	4428	11711	11175	11015	9483	6448	3692	(12) 58704	126	8134
WESTERN CANAL COMPANY	59.7 R	GRAVITY		1234	11392	12986	16509	16605	10161	478	(13) 69365	707	8635
TOTALS			5388	31219	91529	91635	94231	85891	54515	23918	478326	21897	26541

* MILEAGE ALONG RIVER ABOVE MOUTH.

(1) 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.

(2) SOME ADDITIONAL RECEIVED FROM A WELL.

(3) THIS PLANT REPORTED TO HAVE BEEN INSTALLED AND OPERATED IN 1932.

(4) ADDITIONAL WATER RECEIVED FROM A WELL ON ADJOINING ROBINSON PROPERTY.

(5) INCLUDES 10 ACRES ON ADJOINING INGRAM PROPERTY.

(6) FORMERLY SILVA-BERGTHOLDT.

(7) FORMERLY BLOWER BROTHERS.

(8) FORMERLY C. O. KISTER.

(9) INCLUDES 6 ACRES ON ADJOINING SMITH PROPERTY.

(10) 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.

(11) ADDITIONAL NOVEMBER DIVERSION, 9422 ACRE-FEET.

(12) ADDITIONAL NOVEMBER DIVERSION, 1884 ACRE-FEET.

(13) IN ADDITION TO THE DIVERSION HERE LISTED THERE WERE DIVERSIONS BY WESTERN CANAL FOR FLOODING PONDS OF DUCK CLUBS IN BUTTE BASIN AS FOLLOWS: (ACRE-FEET) OCTOBER 7525, NOVEMBER 10,290, DECEMBER 6167, TOTAL 23,982.

TABLE 63

FEATHER RIVER DIVERSIONS–1934

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	1–6"			NO DIVERSION								
SUTTER BASIN COMPANY	2.60 R	1–20"			1150	1955	535	1155	1041		5836	1639	
		1–26"											
CALIFORNIA LANDS, INC. (1)	6.44 L	1–8"		32	23	22	42	11	76		206	40	
M. SCHEIBER	7.7 L	1–8"		46	82	93	74	95	54	13	457	120	
— NICOLAUS GAGING STATION — MILE 9.3													
— NICOLAUS BRIDGE — MILE 9.4													
GEORGE POLLOCK COMPANY	9.75 R	1–20"					268	246	285	37	836	(2)252	
GARDEN HIGHWAY MUTUAL WATER COMPANY	13.1 R	1–20"											
		1–24"		563	817	797	725	558	415		3875	(3)937	
FEATHER RIVER WATER COMPANY	16.35 R	1–14"		196	257	210	228	128	219		1238	243	
PLUMAS MUTUAL WATER COMPANY	17.5 L	1–22"		433	1615	2125	2073	2083	1920	266	10515	1215	270
G. C. SHANNON (4)	18.25 R	1–6"			10	29	16	31			86	30	
G. C. SHANNON	18.75 R	1–6"			72	44	32	38	11	12	209	67	
OSWALD WATER DISTRICT	21.4 R	1–16"		498	403	900	746	463	367		3377	480	
ALICIA MUTUAL WATER COMPANY	24.0 L	1–16"											
		1–20"											
		1–26"		405	1543	2000	1550	1240	1069	257	8064	726	
		1–30"											
CUNNINGHAM BROTHERS	25.2 R	1–12"		30	13	60	157				260	153	
— MOUTH OF YUBA RIVER — MILE 27.3													
— YUBA CITY – MARYSVILLE BRIDGE — MILE 28.0													
J. L. SULLIVAN	33.9 R	1–10"	163	41	141	83	81				509	150	
SUTTER BUTTE CANAL COMPANY (5)	38.1 R	2–42"			NO DIVERSION								
(SUNSET PLANT)		1–26"											
PACIFIC HIGHWAY ORCHARDS TRACT	43.7L (6)	1–8"			NO DIVERSION								
(CHARLES COTTRELL)	H.SL.0.4L												
ANTONE HOLL	43.7L (6)	1–4"		6	4	8	3	4	2		27	21	
	H.SL.0.7L												
MOZNETT–WETMORE SUBDIVISION #1	43.7L (6)	1–10"		30	104	120	117	43	34	21	469	160	
(CHARLES ST. CLAIR)	H.SL.1.2L												

* MILEAGE ALONG RIVER ABOVE MOUTH.

(1) FORMERLY J. M. INMAN.

(2) INCLUDES ACREAGES ON ADJOINING LANDS AS FOLLOWS: ANDERSON 30 AND ALBRIGHT 32.

(3) INCLUDES 138 ACRES OF BROWN AND PURINGTON.

(4) NEW INSTALLATION 1934.

(5) SEE SUTTER BUTTE CANAL COMPANY DIVERSION AT MILE 58.1 R.

(6) 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.

TABLE 63 (CONTINUED)

FEATHER RIVER DIVERSIONS-1934

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
MANUEL A. BARBA	43.7L (1) H.SL.1.25L	1-8"		16		34	26	38	39	13	166	50	
A. P. BARBA (JOHN BETTENCOURT)	47.9 L	1-12"			68	86	101	145	59		459	122	
E. F. BIGGS	48.3 L	1-10"				68	71	193	42		374	270	
PAUL WAGNER (2)	51.0 R	1-6"				33	13	7			53	(3)46	
J. F. HARRIGER	51.1 L	1-7"			4	34	13	19	14		84	(4)44	
EDWARD STEADMAN	51.4 R	1-10"			56	200	184	7	66	15	528	(5)105	
CALIFORNIA LANDS, INC.	51.6 R	1-5"			26	6	9				41	25	
W. E. BLOWER	52.1 L	1-9"				9	29	28			66	55	
CALIFORNIA LANDS, INC.	52.5 L	1-6"(6)			22	38	32				92	30	
F. L. MORRIS	52.7 L	1-8"			31	34	9	1	17		92	87	
FRANK DUTRA	52.9 R	1-6"				11	15	25			51	25	
G. H. BOGUE	53.1 R	1-6"				15	26	33	6		80	40	
BUDH SINGH	54.7 R	1-8"				122	86	19	10	9	246	(7)40	
HEARST ESTATE (SUNICAL PACKING CO.)	55.1 L	1-14"		18	188	318	277	98	156	14	1069	287	
L. A. KISTER	55.5 L	1-8"			90	55	131	38			314	128	
RIO BONITA RANCH	56.6 R	1-14"			NO	DIVERSION							
J. H. ABBEY	56.8 R	1-8"				11					11	35	
ALVIN KISTER	57.0 L	1-8"			12	72	62	12	38		196	43	
J. E. CARRICO	57.0 R	1-8"					60	20	10		90	29	
HENRY HASELBUSCH	57.9 R	1-10"			26	34	32	23	27		142	65	
SUTTER BUTTE CANAL COMPANY	58.1 R(8)	GRAVITY	1735	24620	53483	46750	46533	40333	25998	15127	254579	14397	7336
RICHVALE IRRIGATION DISTRICT	58.1 R(8)	GRAVITY	347	4924	10697	9350	9307	8067	5200	3025	50917	642	7433
WESTERN CANAL COMPANY	59.7 R	GRAVITY		2359	21288	16653	17804	17133	6946	211	(9)82394	1186	9879
TOTALS			2245	34217	92225	82379	81467	72334	44121	19020	428008	23984	24918

* MILEAGE ALONG RIVER ABOVE MOUTH.

(1) 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.

(2) FORMERLY CALIFORNIA LANDS, INC.

(3) INCLUDES 15 ACRES ON ADJOINING STEADMAN PROPERTY.

(4) INCLUDES 10 ACRES ON ADJOINING ROBINSON PROPERTY.

(5) AN ADDITIONAL 15 ACRES SERVED THROUGH PLANT AT MILE 51.0 R.

(6) REPLACES FORMER 8" UNIT.

(7) INCLUDES 15 ACRES ON ADJOINING HASTINGS PROPERTY.

(8) 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.

(9) 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 9820, NOVEMBER 6080, DECEMBER 1920, TOTAL 17,820.

TABLE 64

YUBA RIVER DIVERSIONS–1933

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
CALIFORNIA LANDS INC. (MORATA) (1)	0.9 L	1–5"						1	1		2	4	
DAVIS BROTHERS	(2)1.6 L	(3)1–12"			54	21	37	116	11		(4) 239	(4)98	
MARYSVILLE RIVER FARMS COMPANY	2.8 L				PLANT	DISMANTLED							
E. O. RUBKE	(2)4.1 L	1–8"				72	40				112	80	
WM. M. DINSMORE (PERKINS) (5)	(6)5.15L	1–8"											
		1–6"				13	46	86	72	12	229	(7)75	
DANTONI ORCHARDS (EARL FRUIT COMPANY)	(2)5.7 L	1–8"		87	163	134	54	13			451	48	
MARYSVILLE RIVER FARMS COMPANY (L. A. PLANTZ) (8)	(9)6.7 L	1–10"			32	17	47	52	55	13	216	75	
MARYSVILLE RIVER FARMS COMPANY (BISCEGLIA BROTHERS)	7.05L (10)	1–12"		70	166	79	158	119			592	120	
HALLWOOD IRRIGATION COMPANY AND CORDUA IRRIGATION DISTRICT	11.0 R	GRAVITY		7230	10400	9950	10300	10300	7360	4370	59910 (11)	5355 (11)	2645 (11)
W. P. HAMMON	(2)14.5 L	GRAVITY		435	449	435	358	233	225	232	(12)2367	80	
TOTALS			0	7822	11264	10721	11040	10920	7724	4627	64118	5935	2645

* APPROXIMATE MILEAGE ALONG RIVER ABOVE HIGHWAY CROSSING AT MARYSVILLE.

(1) REPORTED TO HAVE OPERATED IN 1932. NOT PREVIOUSLY LISTED.

(2) MILEAGE CORRECTION.

(3) REPLACES FORMER 8" UNIT.

(4) SOME ADDITIONAL WATER FOR THIS ACREAGE OBTAINED FROM WELLS.

(5) NEW INSTALLATION 1933 AT FORMER POINT OF DIVERSION.

(6) MILEAGE CORRECTION. PREVIOUSLY LISTED AS 4.5 L.

(7) INCLUDES 20 ACRES ON ADJOINING EARL FRUIT COMPANY ORCHARD (DANTONI ORCHARDS).

(8) LISTED ERRONEOUSLY IN 1932 AS L. A. PLANTZ AT MILE 6.8 L. PUMP WAS NOT MOVED IN NOVEMBER 1931 AS REPORTED.

(9) MILEAGE CORRECTION. PREVIOUSLY LISTED AS 6.2 L.

(10) MILEAGE CORRECTION. PREVIOUSLY LISTED AS 6.6 L.

(11) 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 900, GENERAL 5000; CORDUA, RICE 1745, GENERAL 355.

(12) CONTINUOUS GRAVITY DIVERSION. WATER IS USED ON ORANGE GROVE AND SURPLUS RETURNS TO RIVER VIA DREDGER PONDS AND ROCK PILES. GREATER DIVERSION APRIL TO JULY WAS IN CONNECTION WITH CONSTRUCTION OF NEW DREDGE AT HAMMONTON.

TABLE 65

YUBA RIVER DIVERSIONS–1934

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
CALIFORNIA LANDS, INC. (MORATA)	0.9 L	1–5"				1	1	1	1		4	5	
DAVIS BROTHERS	1.6 L	1–12"				54	61	113	95		323	100	
E. O. RUBKE	4.1 L	1–8"			48	42	31	35	25		181	(1) 25	
WM. M. DINSMORE	5.15L	(2) 1–6"				10	5				(3) 15	(3)	
EARL FRUIT COMPANY AND DINSMORE (4)	5.2 L	1–8"			60	115	101	92	48		(5) 416	(6) 120	
WM. M. DINSMORE (RENISON) (4)	5.3 L	1–5"			10			10			20	15	
DANTONI ORCHARDS (EARL FRUIT COMPANY)	5.7 L	1–8"		114	178	104	45	80			521	50	
MARYSVILLE RIVER FARMS COMPANY (L. A. PLANTZ)	6.7 L	1–10"			NO	DIVERSION							
MARYSVILLE RIVER FARMS COMPANY (BISCEGLIA BROTHERS)	7.05L				PLANT	DISMANTLED							
MARYSVILLE RIVER FARMS COMPANY (BISCEGLIA BROTHERS) (4)	7.15L	1–10"			30	73	81	30			214	60	
HALLWOOD IRRIGATION COMPANY AND CORDUA IRRIGATION DISTRICT	11.0 R	GRAVITY		6563	10362	10151	10552	7860	3102		48590 (7)	5750 (7)	1667 (7)
W. P. HAMMON	14.5 L	GRAVITY		230	233	230	235	233	225	232	(8) 1618	80	
TOTALS			0	6907	10921	10780	11112	8454	3496	232	51902	6305	1667

* APPROXIMATE MILEAGE ALONG RIVER ABOVE HIGHWAY CROSSING AT MARYSVILLE.
(1) INCLUDES 25 ACRES ON ADJOINING MARYSVILLE RIVER FARMS COMPANY LANDS.
(2) 8" UNIT REMOVED.
(3) THIS DIVERSION USED TO SUPPLEMENT THAT AT MILE 5.2 L FOR DINSMORE ACREAGE.
(4) NEW INSTALLATION 1934.
(5) ADDITIONAL WATER FOR DINSMORE ACREAGE RECEIVED THROUGH PLANT AT MILE 5.15 L.
(6) DINSMORE 60, EARL FRUIT COMPANY (DANTONI ORCHARDS) 60.
(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 450, GENERAL 5450; CORDUA, RICE 1217, GENERAL 300.
(8) CONTINUOUS GRAVITY DIVERSION. WATER IS USED ON ORANGE GROVE AND SURPLUS RETURNS TO RIVER VIA DREDGER PONDS AND ROCK PILES.

TABLE 66
AMERICAN RIVER DIVERSIONS–1933

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.		
JOE CORRY (1)	0.05 R	1–8"										
G. A. MEISTER	3.2 L	1–10"			NO	DIVERSION						
G. A. MEISTER	3.6 L	1–4"										
		1–6"			1	3	6	9	2	5	26	18
G. A. MEISTER	3.8 L	(2) 1–10"		20	30	28	33	22	1		134	68
— GAGING STATION – AMERICAN RIVER AT SACRAMENTO —			MILE 6.0									
R. AND E. G. CUTTER (3)	6.7 L	1–7"			38	34	45	29	21	18	185	44
C. M. CUTTER	6.8 L	1–15"			3	11	18		25		57	27
S. H. COWELL	7.1 L	1–7"				8	24	34	19	6	91	24
E. CLEMENS HORST	7.5 R	1–8"				55	122				177	(4) 100
FRED KING	7.7 R	1–4"			20	64	74				158	(5) 27
FRED KING (3)	7.8 R	1–4"				18	28	11			57	(6)
H. MORITA	7.9 R				PLANT		REMOVED					
A. A. MERKELEY (7)	9.0 L	1–6"			8	44	50	14			116	40
SIERRA OAKS DAIRY	9.2 R	1–8"			26	4					30	15
M. OJI (8)	9.2 L	1–8"		24	48	61	58	55	24	11	281	90
C. E. WELLS	9.45 L	1–5"			2	15	11	8			36	(9) 45
C. E. WELLS	9.5 L	1–8"			6	36	25	20			87	(10)
C. E. WELLS	9.55 L	1–5"			NO	DIVERSION						
HENRY COWELL	9.9 L	1–5"			NO	DIVERSION						
GIBBENS AND RICHARDSON	10.2 R	1–8"			NO	DIVERSION						
GUY H. RODDAN	10.3 L	1–10"			NO	DIVERSION						
GOLDEN NUGGET ORCHARD–E. V. BOYLE (11)	10.4 R	1–5"		3	37	5	9				54	(12) 53
HAGGIN BOTTOM LAND COMPANY (13)	10.5 R	1–8"				8	15	8	10	3	44	35
ANNIE HOEY	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"		5	3	9	15	12		5	49	29
HARRY NAKATOMI	11.7 L	1–5"			NO	DIVERSION						
H. T. DANIELSON	13.1 R	1–5"		4	19	11	18	15	8	1	76	17
P. OSTERLE	13.2 R	1–6"		24		42	59	31	11		167	50
MARY DETERDING	13.9 R	1–6"		8	6	42	34	39	16		145	35
MARY DETERDING	15.1 R	1–6"				27	29	13	8		77	35
CARMICHAEL IRRIGATION DISTRICT	16.0 R	1–12"										
		1–8"		18	224	542	642	603	279	253	2561 (14)	2085
		1–6"										
WILLIAM H. DEVLIN	17.1 R	1–6"										
		1–1¼"				3	2	1		1	7	11
— FAIROAKS GAGING STATION —	MILE 19.2											
TOTALS			0	106	471	1070	1317	924	424	303	4615	2848

* MILEAGE ALONG RIVER ABOVE MOUTH. ** ALL GENERAL CROPS. NO RICE.

(1) PLANT MOVED TO MILE 1.2 L ON SACRAMENTO RIVER.
(2) REPLACES FORMER 6" UNIT.
(3) NEW INSTALLATION 1933.
(4) ADDITIONAL WATER FOR THIS ACREAGE OBTAINED FROM WELLS.
(5) SERVED JOINTLY BY THIS PLANT AND THAT AT MILE 7.8 R.
(6) SEE PLANT AT MILE 7.7 R.
(7) FORMERLY M. T. HARDING.
(8) FORMERLY ROY K. MIURA.
(9) SERVED JOINTLY BY THIS PLANT AND THAT AT MILE 9.5 L.
(10) SEE PLANT AT MILE 9.45 L.
(11) LISTED AS C. E. ALLEN IN 1932.
(12) INCLUDES 48 ACRES IN C. E. ALLEN TRACT OF GOLD NUGGET ORCHARD.
(13) PREVIOUSLY LISTED AS DEL PASO HOP COMPANY
(14) A TOTAL OF 70 ACRE-FEET ADDITIONAL WAS RECEIVED FROM FAIROAKS IRRIGATION DISTRICT DURING SEPTEMBER AND OCTOBER.

TABLE 67
AMERICAN RIVER DIVERSIONS–1934

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.		
NORTH SACRAMENTO LAND CO. (1)	2.8 R	1–3"			NO	DIVERSION						
NORTH SACRAMENTO LAND CO. (MOURA)(1)	3.0 R	1–5"					3	3	2		8	20
G. A. MEISTER	3.2 L				PLANT		REMOVED					
NORTH SACRAMENTO LAND CO. (1)	3.3 R	1–6"			7						7	12
G. A. MEISTER	3.6 L	1–4"										
		1–6"			NO	DIVERSION						
G. A. MEISTER	3.8 L	1–10"		19	22	36	39	22	21		159	86
— GAGING STATION — AMERICAN RIVER AT SACRAMENTO — MILE 6.0												
R. AND E. G. CUTTER	6.7 L	1–7"	3	8	18	19	20	20	10	5	103	20
C. M. CUTTER	6.8 L	1–5"				14	18		25		57	27
S. H. COWELL	7.1 L	1–7"			NO	DIVERSION						
E. CLEMENS HORST	7.5 R	1–8"				85	115				200	(2) 100
FRED KING	7.7 R	1–4"			NO	DIVERSION						
FRED KING	7.8 R	1–4"			4	16	20	15			55	30
A. A. MERKELEY AND J. H. KERBY	9.0 L	1–6"		11	27	22	37	4	1		102	40
SIERRA OAKS DAIRY	9.2 R	1–8"			NO	DIVERSION						
M. OJI	9.2 L	1–8"		18	14	38	30	28	24	1	153	80
C. E. WELLS	9.45L	1–5"				7	19				26	(3) 40
C. E. WELLS	9.5 L	1–8"					56				56	(4)
C. E. WELLS	9.55L	1–5"			NO	DIVERSION						
HENRY COWELL	9.9 L	(5) 1–6"			NO	DIVERSION						
GIBBENS AND RICHARDSON	10.2 R				PLANT		REMOVED					
GOLD NUGGET ORCHARD–C.E.ALLEN (6)	10.2 R	1–5"		7	29	28	7				71	(7) 65
GUY H. RODDAN	10.3 L	1–10"			25	7	12	17	5	1	67	25
GOLD NUGGET ORCHARD–E.W.BOYLE	10.4 R	1–5"			18	19	9	5	3	13	67	(8)
HAGGIN BOTTOM LAND COMPANY	10.5 R	(9) 1–6"					21	20	8	4	53	35
ANNIE HOEY	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"	1	18	16	24	12		12	3	86	29
HARRY NAKATOMI	11.7 L	1–5"			4	10	7	9			30	10
H. T. DANIELSON	13.1 R	1–5"		10	10	16	15	13	4		68	17
P. OSTERLE	13.2 R	1–6"	54	4	46	94	52	35			285	55
MARY DETERDING	13.9 R	1–6"		5	19	40	33	14	10	14	135	70
MARY DETERDING (10)	14.7 R	1–4"			2	2	13	8	14	6	45	20
MARY DETERDING	15.1 R	1–6"			12	21	18	8			59	35
CARMICHAEL IRRIGATION DISTRICT	16.0 R	1–12"										
		1–8"	5	329	620	578	720	585	484	279	3600	1935
		1–6"										
WILLIAM H. DEVLIN	17.1 R	1–6"										
		1–1¼"		2	3	2	5		1		13	11
— FAIROAKS GAGING STATION — MILE 19.2												
TOTALS			63	431	896	1078	1281	806	624	326	5505	2770

* MILEAGE ALONG RIVER ABOVE MOUTH. ** ALL GENERAL CROPS. NO RICE.

(1) OLD INSTALLATION BUT NOT PREVIOUSLY LISTED.
(2) ADDITIONAL WATER FOR THIS ACREAGE OBTAINED FROM WELLS.
(3) SERVED JOINTLY BY THIS PLANT AND THAT AT MILE 9.5 L.
(4) SEE PLANT AT MILE 9.45 L.
(5) REPLACES FORMER 5" UNIT.
(6) NEW INSTALLATION 1934.
(7) TOTAL ACREAGE IRRIGATED BY THIS PLANT AND THAT AT MILE 10.4 R. C. E.ALLEN, 48 ACRES; E. W. BOYLE, 17 ACRES.
(8) SEE PLANT AT MILE 10.2 R.
(9) REPLACES 8" UNIT.
(10) NEW INSTALLATION IN 1934 AT OLD PUMP SITE.

TABLE 68

DELTA UPLANDS DIVERSIONS FROM CACHE SLOUGH-1933

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	330	1750	2055	1955	2085	1530	910	10615	2240

-- 0 --

TABLE 69

DELTA UPLANDS DIVERSIONS FROM CACHE SLOUGH-1934

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	1260	2120	2320	2350	2360	500	0	10910	2500

* ALL GENERAL CROPS. NO RICE.

TABLE 70

DELTA UPLANDS DIVERSIONS FROM OLD SAN JOAQUIN RIVER-1933

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	36.5 L (1)	2-30" 1-24" 1-18"	465	3809	4115	4389	4521	4349	2444	1716	25808	11896
BYRON-BETHANY IRRIGATION DISTRICT	40.9 L (2)	1-30" 1-26"		2135	2400	2035	1798	2200	1375	748	12691	4800
JOE SANTOS	(3) 44.6 L	1-7"			23	8					31	5
E. H. STEVENSON	45.3 L	1-12"	14	46							60	100
H. LINDEMAN	47.2 L	1-12"		229	68	141	91	94	49	34	706	(4) 320
A. F. NOONIS	47.2 L	1-10"			NO DIVERSION							
WEST SIDE IRRIGATION DISTRICT	(5) 47.65 L	7-15"		2826	2438	2109	3112	2174	1040	570	14269	7796
LANGEMAN AND FROESE (6)	48.7 L	1-8"	9	6	33	29	28	28	8		141	75
NAGLEE BURKE IRRIGATION DISTRICT	50.4 L	1-16" 1-18"		833	906	1025	933	1128	900	279	6004	2000
FREEMONT IRRIGATION ASSOCIATION	50.9 L	1-14"		224	315	296	400	421	248	116	2020	649
ATTILIO CASSERINI	51.2 L	1-8"			10	8	8	8			34	35
EXCELSIOR RANCH (7) — TOM PAINE SLOUGH — MILE 54.3	52.4 L	1-10"		6	43	52	47	12	18		178	(8) 175
TOTALS			488	10114	10351	10092	10938	10414	6082	3463	61942	27851

* DISTANCE ALONG THE 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) INCLUDES 70 ACRES FOR KIRKMAN NURSERY.

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

(6) FORMERLY N. E. AND JOHN WELTY.

(7) FORMERLY LISTED AS LABRUCHERIE AND CORBARI.

(8) INCLUDES 56 ACRES ON STINSON ESTATE (SEE TOM PAINE SLOUGH, MILE 0.7 SOUTH).

TABLE 71

DELTA UPLANDS DIVERSIONS FROM OLD SAN JOAQUIN RIVER–1934

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	36.5 L (1)	2–30" 1–24" 1–18"	896	6163	5595	3946	5700	4273	2141	742	29456	13760
BYRON-BETHANY IRRIGATION DISTRICT	40.9 L (2)	1–30" 1–26"	820	2743	1791	1502	2205	1883	1165	571	12680	4780
JOE SANTOS	(3) 44.6 L	1–7"		50	45	72	11	10	15		203	50
E. H. STEVENSON	45.3 L	1–12"		74			2				76	100
H. LINDEMAN	47.2 L	1–12"	77	48	22	22	12	23	12		216	(4) 285
A. F. NOONIS	47.2 L	1–10"			NO	DIVERSION						
WEST SIDE IRRIGATION DISTRICT	(5) 47.65 L	7–15"	1301	4021	2020	1673	3383	2330	1272	1526	17526	8074
LANGEMAN AND FROESE	48.7 L	1–8"			13	13	20	25	20		91	75
NAGLEE-BURKE IRRIGATION DISTRICT	50.4 L	1–16" 1–18"	110	1300	565	1060	1060	1000	895	176	6166	2000
FREEMONT IRRIGATION ASSOCIATION	50.9 L	1–14"		253	224	319	340	304	271		1711	455
JOE FREITAS (6)	51.0 L	1–8"				2	7		2		11	10
ATTILIO CASSERINI	51.2 L	1–8"			8	11	10	6	2		37	25
EXCELSIOR RANCH — TOM PAINE SLOUGH — MILE 54.3	52.4 L	1–10"		35	38	88	77	92	22	4	356	(7) 178
TOTALS			3204	14687	10321	8708	12827	9946	5817	3019	68529	29792

* DISTANCE ALONG THE 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) INCLUDES 70 ACRES FOR KIRKMAN NURSERY.

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

(6) NEW INSTALLATION 1934.

(7) INCLUDES 56 ACRES ON STINSON ESTATE (SEE TOM PAINE SLOUGH MILE 0.7 S).

TABLE 72

DELTA UPLANDS DIVERSIONS FROM TOM PAINE SLOUGH-1933

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"		222	245	191	358	186	237	21	1460	(1)2132
STINSON ESTATE COMPANY	1.2 S	1-18"								48	48	(2)
HOLLY WESTERN SUGAR COMPANY	(3)2.1 S	1-12"					36	159	154	159	(4) 508	INDUSTRIAL
TRACY CLOVER IRRIGATION DISTRICT	(3)2.1 S	1-16"		183	192	416	200	382	99	118	1590	534
FARMERS DEVELOPED LANDS COMPANY (5)												
PLANT NUMBER 1	2.9 S	1-12"		59	62	99	113	104	76	49	562	(6)1784
PLANT NUMBER 3	6.3 S	1-24"		655	927	861	767	850	864	793	5717	(7)
PLANT NUMBER 5	8.3 S	1-12"		118	119	127	127	125	80	76	772	(7)
PLANT NUMBER 5A	9.0 S	1-12"		69	63	81	114	92	33	87	539	(7)
TOTALS			0	1306	1608	1775	1715	1898	1543	1351	11196	4450

* 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 IRRIGATED FROM THIS PLANT AND THAT AT MILE 1.2 S AND INCLUDES 875 ACRES IRRIGATED ALSO BY WASTE WATER FROM HOLLY-WESTERN SUGAR COMPANY, MILE 2.1 S. 56 ACRES ADDITIONAL SERVED FROM EXCELSIOR RANCH (OLD SAN JOAQUIN RIVER MILE 52.4 L).
(2) SEE 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 WATER WAS REUSED BY STINSON ESTATE TO IRRIGATE 875 ACRES SERVED ALSO FROM STINSON PLANTS. SEE MILE 0.7 S.
(5) FORMERLY CALIFORNIA IRRIGATED FARMS COMPANY.
(6) THIS IS THE TOTAL UPLANDS AREA (SOUTH OF TOM PAINE SLOUGH) IRRIGATED FROM ALL FARMERS DEVELOPED LANDS COMPANY PLANTS ON TOM PAINE SLOUGH.
(7) SEE PLANT AT MILE 2.9 S.

TABLE 73

DELTA UPLANDS DIVERSIONS FROM TOM PAINE SLOUGH-1934

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"		231	189	242	139	204	227	160	1392	(1)2231
STINSON ESTATE COMPANY	1.2 S	1-18"		72		16		8		65	161	(2)
HOLLY WESTERN SUGAR COMPANY	(3)2.1 S	1-12"					108	159	154	159	(4) 580	INDUSTRIAL
TRACY CLOVER IRRIGATION DISTRICT	(3)2.1 S	1-16"	16		329	232	94	160	189		1020	534
FARMERS DEVELOPED LANDS COMPANY												
PLANT NUMBER 1	2.9 S	1-12"	16	172	85	82	98	67	71	12	603	(5)1784
PLANT NUMBER 3	6.3 S	1-24"	27	1208	507	686	1131	724	690	553	5526	(6)
PLANT NUMBER 5	8.3 S	1-12"	11	268	68	125	228	172	153	16	1041	(6)
PLANT NUMBER 5A	9.0 S	1-12"		118	94	50	138	122	94	7	623	(6)
TOTALS			70	2069	1272	1433	1936	1616	1578	972	10946	4549

* 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 IRRIGATED FROM THIS PLANT AND THAT AT MILE 1.2 S AND INCLUDES 1440 ACRES IRRIGATED ALSO BY WASTE WATER FROM HOLLY-WESTERN SUGAR COMPANY, MILE 2.1 S. 56 ACRES ADDITIONAL SERVED FROM EXCELSIOR RANCH (OLD SAN JOAQUIN RIVER, MILE 52.4 L).

(2) SEE 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 WATER WAS REUSED BY STINSON ESTATE TO IRRIGATE 1440 ACRES SERVED ALSO FROM STINSON PLANTS. SEE MILE 0.7 S.

(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 74

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER—1933

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"		39	79	44	78	22	11		273	215
AUGUST EISELE	47.2 R	1-5"				1	1	1			3	1
WOLFINGER BROTHERS	47.3 R	1-10"			3	3	3	3			12	9
JOHN HAACK	47.7 R	1-4"				3					3	(1)
JOHN HAACK	48.0 R	1-12"			10	101	37	363	35	29	575	(2)305
H. G. LEARNED	48.3 R	1-4"	1	5	4	4	8	9	6	5	42	12
H. G. LEARNED (YOSHIDA) (3)	48.5 R	1-3½"		2	3	5	3	3	10	5	31	15
JOE CALCAGNO (4)	48.5 R	1-6"			21	12	16	13	30	17	109	40
F. PICCARDO, J. VIGLIANI AND A. CALCAGNO (5)	48.6 R	1-6"		13	12	13	13	16	11	13	91	(6) 70
G. B. FIGARI (7)	48.7 R	1-5"		3	3	6	16	3	6		37	20
M. O. COUPER	49.0 R	1-5"			NO	DIVERSION						
METTLER, CROSS AND DRURY (S. B. CHAPMAN)	49.5 R	1-14"			16	56	36	13	43	29	193	60
A. A. RODGERS	50.1 R	1-10"			NO	DIVERSION						
— BRANDT BRIDGE — MILE 50.2												
BRANDT BROTHERS (8)	50.4 R	1-6"						23	6	5	34	(9)160
FRANK REICHMUTH	50.4 R	1-8"		24	28	27	67	50	40	3	239	65
JOHN BRANDT	50.5 R				PLANT REMOVED							
BRANDT BROTHERS (10)	50.8 R	1-6"										
		(11)1-7"	4	11	10	140	20	24	18	14	241	(12)
		1-10"										
CALIFORNIA LANDS, INC.	53.2 R	1-12"		20	51	41	53	47	34		246	100

* 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) SEE MILE 48.0 R.

(2) THIS IS THE COMBINED ACREAGE SERVED BY THIS PLANT AND THAT AT MILE 47.7 R.

(3) PREVIOUSLY LISTED AS I. YOSHIDA.

(4) LISTED ERRONEOUSLY IN 1932 AS WALDO ROHNERT.

(5) PREVIOUSLY LISTED AS FRANK PICCARDO.

(6) PICCARDO, 25 ACRES, VIGLIANI 25 ACRES, CALCAGNO 20 ACRES.

(7) FORMERLY G. ACCINELLI.

(8) NEW INSTALLATION 1933.

(9) THIS IS THE TOTAL ACREAGE SERVED BY BRANDT BROTHERS PUMPS AT MILES 50.4 R AND 50.8 R.

(10) PREVIOUSLY LISTED AS JOHN BRANDT.

(11) 7" AND 10" PUMPS ARE GAS INSTALLATIONS, NOT LISTED SINCE 1931.

(12) SEE BRANDT BROTHERS MILE 50.4 R.

TABLE 74 (CONTINUED)

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER–1933

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.		
F. DE LIMA	53.4 R	1–8"		9	4	16	27	12	6		74	40
M. DOS REIS	53.7 R	1–12"		203	87	131	196	154	103	25	899	(1) 269
W. C. FRANK	54.9 R			PLANT DISMANTLED								
— JUNCTION WITH MIDDLE RIVER — MILE 56.2												
OAKWOOD STOCK FARM	57.0 R	1–14"		105	237	220	240	167	167	32	1168	290
JAMES TOBIN (2)	57.15R	1–7"					2	1			3	2
S. MAURO	57.2 R				PLANT		REMOVED					
T. J. DUTNALL	57.3 R	1–3"		2	1	1	1	1			6	2
A. J. THOMPSON	57.3 R	1–5"		1	5	4	8	3	1	3	25	8
G. GARDELLA COMPANY	57.5 R	1–4"	6	6	4	8	9	7	5		45	30
V. SANGUENETTI	58.4 R	1–2½"	3	3	2	4	6	5	3		26	15
G. B. FIGARI (G. ALFIERI)	58.6 R	1–3"		2	1	2	2	1	1		9	5
R. MAURO	58.7 R	1–4"		1	1	1	2	2	1		8	7
— MOSSDALE BRIDGE — MILE 58.9 RECORDING GAGE												
C. C. ABERSOLD	(3)59.25 R	1–6"			NO	DIVERSION						
H. A. NIESTRATH (JOSEPH EGGER)	59.3 R	1–14"	27	116	117	105	153	114	93	36	761	80
H. A. NIESTRATH (4)	(5)60.1 R	1–6"	5	7	12	13	13	14	11		75	20
— JUNCTION WITH PARADISE CUT — PARADISE DAM – MILE 62.2												
BANTA CARBONA IRRIGATION DISTRICT	67.5 L	1–36"										
		3–24"	721	8310	4564	3787	8889	5960	2363	1699	36293 (6)	14200 (7)
		2–20"										
MC MULLIN RECLAMATION DISTRICT 2075(8)	71.0 R	1–16"		141	677	837	596	409	52	21	2733	1500
MORTENSEN–ANDERSON AND WHITMAN	73.2 R	1–12"		151	137	214	208	141	109	163	1123	(9) 485
— U. S. G. S. GAGING STATION — "SAN JOAQUIN RIVER NEAR VERNALIS" – MILE 76.7												
TOTALS			767	9174	6089	5799	10703	7581	3165	2099	45377	18025

* 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 79 ACRES ON ADJOINING R. BEKINS PROPERTY.

(2) REPORTED TO HAVE BEEN INSTALLED SEVERAL YEARS – NOT PREVIOUSLY LISTED.

(3) MILEAGE CORRECTION.

(4) REPORTED TO HAVE BEEN INSTALLED IN 1932 AND 1932 ACREAGE GIVEN FOR PLANT AT MILE 59.3 R INCLUDED 20 ACRES SERVED BY THIS PLANT.

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

(6) 418 ACRE-FEET ADDITIONAL DIVERTED IN NOVEMBER.

(7) INCLUDES 1495 ACRES OUTSIDE OF DISTRICT BOUNDARIES.

(8) FORMERLY LISTED AS MC MULLIN ESTATE.

(9) MORTENSEN 300, ANDERSON 125, WHITMAN 60.

TABLE 75

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER–1934

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"		131	74	116	189	112	14		636	225
AUGUST EISELE	47.2 R	1–5"				1	1	1			3	1
WOLFINGER BROTHERS	47.3 R	1–10"			143		50	50	9		252	55
JOHN HAACK	47.7 R	1–4"			NO	DIVERSION						
JOHN HAACK	48.0 R	1–12"	4	34	28	92	351	254	4		767	360
H. G. LEARNED	48.3 R	1–4"		9		6	5	10	5	1	36	30
H. G. LEARNED (YOSHIDA)	48.5 R	1–3½"		8		4		9	6	5	32	(1) 5
JOE CALCAGNO	48.5 R	1–6"	1	30	9	22	42	42	35	20	201	(2) 70
F. PICCARDO, J. VIGLIANI AND A. CALCAGNO	48.6 R	1–6"		24	21	20	21	22	11	7	126	(3) 79
G. B. FIGARI	48.7 R	1–5"			NO	DIVERSION						
M. O. COUPER	49.0 R	1–5"			NO	DIVERSION						
METTLER, CROSS AND DRURY (S. B. CHAPMAN)	49.5 R	1–14"			40	41	44	45	19		189	60
A. A. RODGERS	50.1 R	1–10"				119		41	28		188	80
— BRANDT BRIDGE — MILE 50.2												
BRANDT BROTHERS	50.4 R	1–6"	3	14	4	3	8	6	5	3	46	(4) 267
FRANK REICHMUTH	50.4 R	1–8"		21	21	60	78	46	42	4	272	(5) 75
BRANDT BROTHERS	50.8 R	1–6" 1–7" 1–10"	9	20	98	93	108	101	25	13	467	(6)
CALIFORNIA LANDS, INC.	53.2 R	1–12"		38	49	66	54	63	25		295	100
F. DE LIMA	53.4 R	1–8"		11	9	14	15	13	6	1	69	32
M. DOS REIS	53.7 R	1–12"	6	153	150	146	186	180	138	61	1020	(7) 279
— JUNCTION WITH MIDDLE RIVER — MILE 56.2												
OAKWOOD STOCK FARM	57.0 R	1–14"		204	161	217	215	192	98	24	1111	284

* 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) 4 ACRES ADDITIONAL SERVED FROM PICCARDO PLANT AT MILE 48.6.

(2) INCLUDES 20 ACRES ON ADJOINING SCHMELLING PROPERTY.

(3) PICCARDO 25 ACRES, VIGLIANI 30 ACRES, CALCAGNO 20 ACRES, AND 4 ACRES FOR LEARNED, (SEE MILE 48.5 R).

(4) THIS IS THE TOTAL ACREAGE SERVED BY BRANDT BROTHERS PUMPS AT MILES 50.4 R, AND 50.8 R.

(5) INCLUDES 20 ACRES ON ADJOINING LAGLER PROPERTY.

(6) SEE BRANDT BROTHERS MILE 50.4 R.

(7) INCLUDES 79 ACRES ON ADJOINING R. BEKINS PROPERTY.

TABLE 75 (CONTINUED)

DELTA UPLANDS DIVERSIONS FROM SAN JOAQUIN RIVER–1934

WATER USER	*MILE AND BANK	NUMBER AND SIZE OF PUMP	MONTHLY DIVERSIONS IN ACRE-FEET								TOTAL DIVERSION: MARCH TO OCTOBER ACR-EFEET	** ACREAGE IRRIGATED
			MAR.	APR.	MAY	JUN.	JUL.	AUG.	SEP.	OCT.		
JAMES TOBIN	57.15 R	1–7"				10	10	10			30	20
T. J. DUTNALL	57.3 R	1–3"	1	1	1	1	1	1			6	2
A. J. THOMPSON	57.3 R	1–5"	3	11	4	6	5	2			31	7
P. CALORI (1)	57.4 R	1–4"				4	5	4			13	10
G. GARDELLA COMPANY	57.5 R	1–4"	5	12	8	11	11	7	2	2	58	30
V. SANGUENETTI	58.4 R	1–2½"	2	4	2	4	6	3			21	15
G. B.FIGARI (G. ALFIERI)	58.6 R	1–3"	2	1	1	2	1	1			8	4
R. MAURO	58.7 R	1–4"		2	1	1	1	1			6	6
— MOSSDALE BRIDGE — MILE 58.9	RECORDING GAGE											
C. C. ABERSOLD	59.25 R	1–6"			NO	DIVERSION						
H. A. NIESTRATH (JOSEPH EGGER)	59.3 R	1–14"		85	87	146	105	114	102	53	692	80
H. A. NIESTRATH	(2) 60.1 R	1–6"		12	12	14	12	14	5		69	20
— JUNCTION WITH PARADISE CUT — PARADISE DAM MILE 62.2												
BANTA CARBONA IRRIGATION DISTRICT	67.5 L	1–36" 3–24" 2–20"	3602	9378	6022	3352	10682	6585	3209	1722	44552 (3)	14733 (4)
MC MULLIN RECLAMATION DISTRICT 2075	71.0 R	1–16"	32	181	714	661	420	522	168	20	2718	1915
MORTENSEN–ANDERSON AND WHITMAN	73.2 R	1–12"	59	222	170	154	157	195	98	24	1079	(5) 485
J. LAWRENCE (6)	75.0 R	1–4"			NO	DIVERSION						
J. W. CANNON (6)	75.2 R	1–4"				1					1	1
A. A. H. BECK (6)	75.25 R	1–5"				6	3	5	2		16	12
R. R. SWANK (6)	75.35 R	1–4"			NO	DIVERSION						
R. N. JANSEN (6)	75.45 R	1–6"			1	3	4	4	2		14	3
RALPH MARTIN (6)	75.7 R	1–7"		12	16			12			40	7
RALPH MARTIN (MARKS) (6)	76.2 R	1–6"	15	15	15	15	15	15	10	5	105	20
— U. S. G. S. GAGING STATION — "SAN JOAQUIN RIVER NEAR VERNALIS" MILE 76.7												
TOTALS			3744	10633	7861	5411	12805	8682	4068	1965	55169	19372

* 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) NEW INSTALLATION 1934.

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

(3) 616 ACRE–FEET ADDITIONAL DIVERTED IN NOVEMBER.

(4) INCLUDES 1800 ACRES OUTSIDE OF DISTRICT BOUNDARIES.

(5) MORTENSEN 300, ANDERSON 125, WHITMAN 60.

(6) PLANT REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1934. NOT PREVIOUSLY LISTED.

TABLE 76

SAN JOAQUIN RIVER DIVERSIONS—1933

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.		
— 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 (1)	5.25 L	3-12"	51	297	271	194	205	182	164	220	1584	720
EL SOLYO RANCH	5.35 L	3-18" 1-12"	654	1104	1480	898	2662	2119	1420	1080	11417	3509
— TUOLUMNE RIVER — MILE 14.3												
WEST STANISLAUS IRRIGATION DISTRICT	15.1 L	3-26"	1282	7449	4806	3075	8826	8692	3580	1584	(2)39294	14802
WHITE LAKE RANCH No. 1	(3)15.1 L	1-6"			NO	DIVERSION						
WHITE LAKE RANCH No. 2	(3)15.1 L	1-8"			NO	DIVERSION						
WHITE LAKE RANCH No. 3	(3)15.1 L	1-8"				102	187	22			311	100
— LAIRD SLOUGH BRIDGE — GAGING STATION "SAN JOAQUIN RIVER NEAR GRAYSON" MILE 19.35												
RANCHO EL PESCADERO (4)	22.2 L	1-16"				127	42	111	84		364	210
PATTERSON WATER COMPANY	27.7 L	4-26" 1-18" 1-14"	3049	4813	4210	6612	6065	6461	5558	543	37311	13500
WISNOM AND ROSS (C.C. JONES)	27.8 R	1-10"	23	98							1121	180
MORTGAGE GUARANTEE COMPANY	29.8 R	1-10"			24	22	14	18			78	180
PATTERSON RANCH COMPANY	33.1 L	2-16"	297	519	268	550	766	540	485	286	3711	1370
E. USTICK	35.85 R	1-12"			NO	DIVERSION						
— CROWS LANDING BRIDGE — MILE 36.7												
JAMES J. JOHNSON	36.8 R	1-10"			NO	DIVERSION						
A. J. SILVIERA	37.15 R	1-6"									(5)	(5)
A. J. SILVIERA	37.65 R	1-7"	19	12	17	22	29	23	20	10	(6) 152	(6) 35
KING RANCH (7)	38.25 R	1-10"		10	1	5		10		10	36	40
L. B. AND E. M. CROW (M. S. CATRINA)	39.35 L	1-6"	33	19	53	63	105	103	86	42	504	190
OSCAR HOGAN	39.75 R	1-12"	88	110	114	92	142	92	40	20	698	200
— U. S. G. S. GAGING STATION "SAN JOAQUIN RIVER NEAR NEWMAN" MILE 47.0												
— MERCED RIVER — MILE 47.05												
— FREMONT BRIDGE — MILE 52.8												
— DELTA BRIDGE (8) GAGING STATION — MILE 82.0												
TOTALS			5496	14431	11244	11762	19043	18373	11437	3795	95581	35036

* MILEAGE ALONG RIVER ABOVE DURHAM FERRY BRIDGE (U.S.G.S. GAGING STATION "SAN JOAQUIN RIVER NEAR VERNALIS").
** ALL GENERAL CROPS. NO RICE.
(1) FORMERLY VERNALIS INVESTMENT COMPANY.
(2) ADDITIONAL WATER DIVERTED AS FOLLOWS (ACRE-FEET): FEBRUARY 297, NOVEMBER 265, DECEMBER 44.
(3) PUMP ON CUT LEADING TO WEST STANISLAUS IRRIGATION DISTRICT PLANT.
(4) PREVIOUSLY LISTED AS CHARLES MOREING.
(5) SEE PLANT AT MILE 37.65 R.
(6) COMBINED DIVERSION AND ACREAGE FIGURES FOR PLANTS AT MILES 37.15 R AND 37.65 R.
(7) FORMERLY NELSON BROTHERS.
(8) PREVIOUSLY LISTED AS TURNER RANCH BRIDGE.

TABLE 77

SAN JOAQUIN RIVER DIVERSIONS—1934

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	5.25 L	3-12"	126	429	530	268	306	328	266	280	2533	1820	
EL SOLYO RANCH	5.35 L	3-18" 1-12"	640	2216	2052	1630	2704	2247	1691	103	13283	3655	
— TUOLUMNE RIVER — MILE 14.3													
WEST STANISLAUS IRRIGATION DISTRICT	15.1 L	3-26"	2892	9918	6308	3198	12624	11768	4574	2229	(1) 53511	19143	
WHITE LAKE RANCH No. 1	(2)15.1 L	1-6"			NO	DIVERS	ION						
WHITE LAKE RANCH No. 2	(2)15.1 L	1-8"			NO	DIVERS	ION						
WHITE LAKE RANCH No. 3	(2)15.1 L	1-8"			NO	DIVERS	ION						
— LAIRD SLOUGH BRIDGE — GAGING STATION "SAN JOAQUIN RIVER NEAR GRAYSON" MILE 19.35													
RANCHO EL PESCADERO	22.2 L	1-16"		179	75	176	132	110			672	240	
PATTERSON WATER COMPANY	27.7 L	4-26" 1-18" 1-14"	1503	7290	6485	5746	7107	6006	5230	212	39579	14625	
WISNOM AND ROSS (C. C. JONES)	27.8 R	1-10"	127	63							190	175	
MORTGAGE GUARANTEE COMPANY	29.8 R	1-10"	10	11							21	200	
PATTERSON RANCH COMPANY	33.1 L	2-16" (3) 1-8"	411	1366	1469	1338	1579	1512	750	225	8650	1105	240
E. USTICK	35.85 R	1-12"		72	10	50	64	56	53		305	190	
— CROWS LANDING BRIDGE — MILE 36.7													
JAMES J. JOHNSON	36.8 R	1-10"				12	16	13			41	20	
A. J. SILVIERA	37.15 R	1-6"									(4)	(4)	
A. J. SILVIERA	37.65 R	1-7"	14	31	15	28	23	29	11	8	(5) 159	(5) 30	
KING RANCH	38.25 R	1-10"			NO	DIVERS	ION						
L. B. AND E. M. CROW (M. S. CATRINA)	39.35 L	1-6"	87	87	71	71	102	111	63	11	603	290	
OSCAR HOGAN	39.75 R	1-12"	125	147	137	98	130	76	70	55	838	203	
— U. S. G. S. GAGING STATION — "SAN JOAQUIN RIVER NEAR NEWMAN" MILE 47.0													
— MERCED RIVER — MILE 47.05													
J. J. STEVINSON CORPORATION (6)	52.7 R	1-10"						136	172		308		50
— FREMONT BRIDGE — MILE 52.8													
— DELTA BRIDGE — GAGING STATION MILE 82.0													
TOTALS			5935	21809	17152	12615	24787	22392	12880	3123	120693	41696	290

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

(1) ADDITIONAL WATER DIVERTED AS FOLLOWS: (ACRE-FEET) FEBRUARY 160, NOVEMBER 824, DECEMBER 4.

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

(3) 8 INCH UNIT ADDED IN 1934.

(4) SEE PLANT AT MILE 37.65 R.

(5) COMBINED DIVERSION AND ACREAGE FIGURES FOR PLANTS AT MILE 37.15 R AND 37.65 R.

(6) NOT PREVIOUSLY LISTED.

TABLE 78

MERCED RIVER DIVERSIONS-1933

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 CORPORATION	2.2 R	1-15"			NO	DIVERSION						
STEVINSON WATER DISTRICT	3.8 R	1-15"		143	196	198	200	123	114	116	1090	560
FLOYD STEVINSON	4.0 L	1-8"			NO	DIVERSION						
J. F. PECK	6.1 L	1-18"			NO	DIVERSION						
STEVINSON WATER DISTRICT	6.25 L	1-6"			NO	DIVERSION						
STEVINSON WATER DISTRICT	6.55 L	1-15"				114	115				229	90
FRANCIS HARTMAN	8.5 L	1-12"		26	26	62	96	63	59	33	365	85
MARY COLLIER	8.85 L	1-15"			21	47	67	51	34		220	54
GRACE MCCULLAGH	9.4 L	1-10"	65	168	189	205	218	218	184	13	1260	185
J. R. ADAMS AND J. B. SILVA	10.35 L	1-10"	60	183	226	228	245	247	197	102	1488	400
W. D. ADAMS	10.85 L	1-12"	112	238	271	303	323	320	288	199	2054	403
C. G. MCLAUGHLIN	11.4 L	(1) 1-8"			NO	DIVERSION						
H. F. MILLIKEN	11.6 L	1-10"					13	14			27	80
J. REGELLO	11.6 L	1-12"	32	68	77	86	108	116	96	40	623	95
— NEW MILLIKEN BRIDGE — MILE 11.65												
BETTENCOURT, NEVES AND AZEVEDO	12.85 L	1-10"		127	237	246	254	241	182	68	1355	270
CALIFORNIA LANDS, INCORPORATED	16.5 L	1-12"	15	47	70	84	88	75	58	26	463	95
MERCED RIVER FARM COMPANY	17.05 L	1-6"		1	3	3	3	3	1	1	15	15
— U. S. G. S. GAGING STATION — "MERCED RIVER NEAR LIVINGSTON" MILE 17.1												
R. G. WOODWARD	17.3 L	1-6"			1					1	2	5
FRED GRIFFITH	17.7 L	1-5"		2	3	3	5	2	5		20	10
J. A. SHIELDS	18.2 L	1-6"			4	5	10	2	2		23	25
J. A. MC DONOUGH	(2) 19.3 L	1-6"		3	3	5	6	3	2		22	8
JOHN REININGHAUS	20.4 L	1-6"	13	18	20	55	63	52	32		253	75
— SOUTHERN PACIFIC RAILROAD (MAIN LINE) — MILE 21.05												
WILLIAM COLLIER (CABRALL AND COMPANY)	(2) 21.1 R	1-6"				21					21	30

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) REPLACES FORMER 6" UNIT.
(2) MILEAGE CORRECTION.

TABLE 78 (CONTINUED)

MERCED RIVER DIVERSIONS–1933

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 (CABRALL AND COMPANY)	22.2 R	1–12"			146	80	94	62	32	8	422	170
M. MC CONNELL	(1) 23.4 L	1–5"			NO DIVERSION							
C. J. MC CONNELL (VEIERA AND SANTOS) (2) (1)	24.2 L	1–5"		2	8	5	7	8			30	10
C. J. MC CONNELL (VEIERA AND SANTOS) (2) (1)	24.5 L	1–6"			8	5	7	11	6		37	14
LINEHERS COMPANY	(1) 25.6 R				PLANT DISMANTLED							
RIVER FARMS ASSOCIATION	26.3 R	1–8"		116	77	60	97	54	46		450	90
C. A. LAUGHLIN	26.55 R	1–6"				1	3	3	1		8	5
— SANTA FE RAILROAD — MILE 27.05												
W. C. MAGNESON (3)	(3) 27.6 R	1–10"			NO DIVERSION							
Y. TANABE	(1) 28.1 R	1–6"				5	17	19	14	6	61	(4) 35
G. H. LOVELY	28.4 R	1–4"			NO DIVERSION							(5)
J. CAMPADONCIA	28.6 R	1–6"		2	4			12	13		31	10
R. K. KYNASTON	(1) 28.6 R	1–8"		32	43	26	48	37	33	18	237	85
C. L. MEHRTON	29.1 R	1–7"	5	7	6		5	4	2		29	20
TONY DEMCHILLI	29.75 R	1–6"	15	18	27	28	39	21	8	8	164	40
AMERICAN NATIONAL TRUST CO. (G. BONDAD)	29.9 R	1–6"	3	9	8	5	13	17	12	5	72	35
AMERICAN NATIONAL TRUST COMPANY	30.95 R	1–12"			NO DIVERSION							
AMERICAN NATIONAL TRUST COMPANY	31.7 R				PLANT DISMANTLED							
— SOUTHERN PACIFIC RAILROAD — OAKDALE BRANCH	MILE 32.52											
L. RUSCONI	33.55 R	1–7"		128	41	36	176	75	139	1	596	170
C. P. STOUT	39.2 L	1–24"		68	42	74	59	48	32		323	60
— GAGING STATION — "MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING" MILE 42.1												
TOTALS			320	1406	1757	1990	2372	1900	1600	645	11990	3229

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) MILEAGE CORRECTION.
(2) FORMERLY LISTED AS M. MC CONNELL.
(3) LISTED IN 1932 AS W. MAGUNSON, MILE 27.6 L.
(4) INCLUDES 15 ACRES FOR G. H. LOVELY, MILE 28.4 R.
(5) SEE ACREAGE NOTE MILE 28.1 R.

TABLE 79

MERCED RIVER DIVERSIONS—1934

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 CORPORATION	2.2 R				PLANT DISMANTLED							
STEVINSON WATER DISTRICT	3.8 R	1—15"		175	240	243	247	151	140	141	1337	465
FLOYD STEVINSON	4.0 L	1—8"			NO DIVERSION							
H. DE ANGELES (1)	5.8 L	1—10"		35	63	72	61	60	37	13	341	85
J. F. PECK	6.1 L	1—18"			140	140	140				420	145
STEVINSON WATER DISTRICT	6.25 L	1—6"			NO DIVERSION							
STEVINSON WATER DISTRICT	6.55 L	1—15"	220	440	452	519	644	647	572	238	3732	1470
FRANCIS HARTMAN	8.5 L	1—12"		40	125	53	79	69	57	71	494	85
MARY COLLIER	8.85 L	1—15"		61	75	66	54	74	107		437	(2) 114
GRACE MC CULLAGH	9.4 L	1—10"	81	214	235	215	218	194	135		1292	190
R. W. ADAMS (3) AND J. B. SILVA	10.35 L	1—10"										
		(4) 1—8"		279	262	306	344	286	185	84	1746	400
W. D. ADAMS	10.85 L	1—12"	90	227	162	132	182	177	148	145	1263	403
C. G. MC LAUGHLIN	11.4 L	1—8"	10	10	10	10		10			50	22
H. F. MILLIKEN ESTATE	11.6 L	1—10"		50	63	36	79	28			256	100
J. REGELLO	11.6 L	1—12"	38	104	95	101	108	99	70	19	634	90
— NEW MILLIKEN BRIDGE — MILE 11.65												
BETTENCOURT, NEVES AND AZEVEDO	12.85 L	1—10"		194	229	188	245	234	155	63	1308	270
CALIFORNIA LANDS, INCORPORATED	16.5 L	1—12"	25	54	90	57	100	97	48	9	480	75
MERCED RIVER FARM COMPANY	17.05 L	1—6"		5	10	10	10	9	2	1	47	20
— U. S. G. S. GAGING STATION "MERCED RIVER NEAR LIVINGSTON"	MILE 17.1											
R. G. AND G. L. WOODWARD	17.3 L	1—6"					2	2	2		6	(5) 16
R. G. AND G. L. WOODWARD (6)	17.65 L	1—3"					1	1			2	(7)
FRED GRIFFITH	17.7 L	1—5"				1	6	6	3		16	10
J. A. SHIELDS	18.2 L				PLANT REMOVED							(8)
C. P. HOCKETT AND F. SIMPKINS (9)	18.7 L	1—6"				15	12	17	12	4	60	(10) 14
J. A. MC DONOUGH	19.3 L	1—6"			3	6	2				11	8
JOHN REININGHAUS	20.4 L	1—6"	19	38				4	14	14	89	58
— SOUTHERN PACIFIC RAILROAD (MAIN LINE) —	MILE 21.05											
WILLIAM COLLIER (CABRALL AND COMPANY)	21.1 R	1—6"	3	9							12	15

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1934. NOT PREVIOUSLY LISTED.
(2) INCLUDES 40 ACRES ON ADJOINING FAWCETT PROPERTY.
(3) FORMERLY J. R. ADAMS.
(4) 8" UNIT ADDED IN 1934.
(5) G. L. WOODWARD 6, R. G. WOODWARD 10. THIS IS THE TOTAL FOR THIS PLANT AND THAT AT MILE 17.65 L.
(6) REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1934. NOT PREVIOUSLY LISTED.
(7) SEE PLANT AT MILE 17.3 L.
(8) NOW RECEIVES WATER FROM PLANT AT MILE 18.7 L. (F. SIMPKINS).
(9) NEW INSTALLATION 1934.
(10) HOCKETT 4, SIMPKINS 10.

TABLE 79 (CONTINUED)

MERCED RIVER DIVERSIONS—1934

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 (CABRALL AND COMPANY)	22.2 R	1-12"	56	139	129	71	83	55	28	7	568	150
WILLIAM COLLIER (CABRALL & CO.) (1)	23.3 R	1-6"			3	11	17	11			42	45
M. MC CONNELL	23.4 L	1-5"			13		3				16	12
C. J. MC CONNELL (VEIERA AND SANTOS)	24.2 L	1-5"			5	4	4	2	6	2	23	(2) 25
CALIFORNIA LANDS, INC. (GONDALVOS)(1)	24.3 R	1-4"						2	1		3	(3) 43
C. J. MCCONNELL (VEIERA AND SANTOS)	24.5 L	1-6"		5	10	10	10	11	11	4	61	(4)
CALIFORNIA LANDS, INC. (GONDALVOS)(5)	24.6 R	1-6"					4	4	2		10	(6)
RIVER FARMS ASSOCIATION	26.3 R	1-8"		116	77	60	97	54	46		450	90
C. A. LAUGHLIN	26.55 R	(7) 1-4"				1	5	5	1		12	8
— SANTA FE RAILROAD — MILE 27.05												
W. C. MAGNESON	27.6 R	1-10"			33	15	40	37	28		153	50
CALIFORNIA LANDS, INC. (1)	27.8 R	1-4"	17	17	20	7	6	7	6		80	30
Y. TANABE	28.1 R	1-6"		18	22						40	20
G. H. LOVELY	28.4 R	1-4"				18	10	11			39	30
J. CAMPADONCIA	28.6 R	1-6"					7	13	10		30	18
R. K. KYNASTON	28.6 R	1-8"		11	26	21	27	35	32	10	162	75
C. L. MEHRTON	29.1 R	1-7"			10	13	23	24	14		84	40
TONY DEMCHILLI	29.75 R	1-6"		12	23	14	20	20	13		102	35
AMERICAN NATIONAL TRUST COMPANY (G. BONDAD)	29.9 R	1-6"	4	18	17	2					41	(8) 80
CALIFORNIA LANDS, INC. (5)	30.2 L	1-6"	12	27	19		4	25	31		118	20
AMERICAN NATIONAL TRUST COMPANY	30.95 R	1-12"		30	51	12	7	8	9		117	(10)
		(9) 1-5"										
CALIFORNIA LANDS, INC. (A.S. MAITOZA)(5)	31.1 L	1-8"		23	41	13	20	14	21		132	20
— SOUTHERN PACIFIC RAILROAD — OAKDALE BRANCH		MILE 32.52										
L. RUSCONI	33.55 R	1-7"	23	210	144	90	161	100	52	1	781	170
C. P. STOUT	39.2 L	1-24"	29	66	92	105	120	70	20		502	75
— GAGING STATION — "MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING"					MILE 42.1							
TOTALS			627	2627	2989	2637	3202	2673	2018	826	17599	5091

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) NEW INSTALLATION 1934.
(2) TOTAL FOR THIS PLANT AND THAT AT 24.5 L.
(3) TOTAL FOR THIS PLANT AND THAT AT 24.6 R.
(4) SEE PLANT AT MILE 24.2 L.
(5) REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1934. NOT PREVIOUSLY LISTED.
(6) SEE PLANT AT MILE 24.3 R.
(7) REPLACES FORMER 6" UNIT.
(8) THIS IS THE TOTAL FOR THIS PLANT AND THAT AT MILE 30.95 R.
(9) 5 INCH UNIT INSTALLED IN 1934.
(10) SEE PLANT AT MILE 29.9 R.

TABLE 80

TUOLUMNE RIVER DIVERSIONS—1933

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"		42	19	42	21	39	21	11	195	40
J. M. DE SOUZA	2.2 R	1-6"	8	10	11	13	20	18	13	21	114	30
E. B. HENRY	3.1 R	1-8"		25	23	18	19	19	5	30	139	25
— GAGING STATION — "TUOLUMNE RIVER AT TUOLUMNE CITY" MILE 3.35												
BANCROFT FRUIT FARM	4.1 R	1-10"		1		15	49	54	14	15	148	105
BANCROFT FRUIT FARM	5.0 R	1-10"		40	33	81	100	92	53	71	470	180
RANDOLPH MARKETING COMPANY	7.1 R	1-10"	34	71	41	82	77	93	64	12	474	200
W. F. DUFFY	8.4 R	1-10"	30	33	48	73	89	49	56	44	422	110
A. HOLM (KISSAMOS AND PAVLAKIAS) (1)	10.2 R	1-11"			15	46	53	41	16	1	172	100
JAMES BERRYHILL	13.0 L				PLANT	DISMANTLED						
JAMES BERRYHILL	13.6 L				PLANT	DISMANTLED						
— 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 HECKMAN BRIDGE" MILE 31.7												
GEORGE H. SAWYER	39.8 L	1-6"			23	10	23	6	24		86	65
A. J. JAMIESON					PLANT	REMOVED						
— GAGING STATION — "TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE" MILE 39.9												
TOTALS			72	222	213	380	451	411	266	205	2220	855

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1933. NOT PREVIOUSLY LISTED.

TABLE 81

TUOLUMNE RIVER DIVERSIONS—1934

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"	60	53							113	40
J. M. DE SOUZA	2.2 R	1-6"	11	26	30	37	38	45	30	27	244	60
E. B. HENRY	3.1 R	(1) 1-12"		24	20			21	21		86	25
— GAGING STATION — "TUOLUMNE RIVER AT TUOLUMNE CITY" MILE 3.35												
BANCROFT FRUIT FARM	4.1 R	1-10"		3	60	51	54	59	15	16	258	115
BANCROFT FRUIT FARM	5.0 R	1-10"	37	87	98	104	80	74	43	57	580	145
RANDOLPH MARKETING COMPANY	7.1 R	1-10"		64	86	51	40	18		14	273	200
R. S. BROWN (2)	7.8 L	1-10"			1	4					5	5
W. F. DUFFY	8.4 R	1-10"		57	66	57	68	87	75	36	446	90
A. HOLM (KISSAMOS AND PAVLAKIAS)	10.2 R	1-11"		20	13	52	23	36	14		158	100
— 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"			22	12	22	9	21		86	65
— GAGING STATION — "TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE" MILE 39.9												
TOTALS			108	334	396	368	325	349	219	150	2249	845

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) REPLACED 8" UNIT AUGUST 1934.
(2) NEW INSTALLATION 1934.

TABLE 82

STANISLAUS RIVER DIVERSIONS—1933

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 — "STANISLAUS RIVER AT HATMARK RANCH"	MILE 5.24											
HATMARK RANCH	5.25 L	2-14"		234	55	12	100	52	2	4	459	80
BRET HART WATER USERS ASSOCIATION	5.9 R	1-20"		618	426	839	759	678	424	231	3975	900
MC MULLIN RECLAMATION DISTRICT 2075	(1) 5.9 R	2-16"		83	456	348	229	188	126	15	1445	410
HENRY PELUCCA	6.7 L	1-15"		32	24	11	24	17	20	12	140	50
J. W. UPDIKE (2)	7.4 L	(3) 1-8"				10	8	9			27	40
S. M. UPDIKE	8.2 L	1-12"			85	10	21	65	16	30	227	75
D. F. KOETITZ	10.1 L	2-10"	70	43	64	50	74	43	22		366	250
D. F. KOETITZ	10.4 L	1-18"			NO	DIVERSION						
— SOUTHERN PACIFIC RAILROAD (MAIN LINE) —	MILE 15.9											
AMERICAN TRUST COMPANY (4)	18.5 R	1-12"			20	30	30	30	30	20	160	80
G. R. STODDARD	19.9 L	1-7"				10	53	52	26		141	40
PALO ALTO COMPANY	20.75 R	1-14"						10			10	5
HEATH RANCH	(1) 20.9 L	1-4"		8	13	16	22	22	18	4	103	16
EARL FRUIT COMPANY	21.75 R	1-8"	33	28	15	19	30	10			135	75
T. K. BAIRD ESTATE	27.0 L				PUMP		REMOVED					
— MODESTO-ESCALON BRIDGE —	MILE 28.15											
— SANTA FE RAILROAD —	MILE 31.85											
— SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) —	MILE 39.0											
— GAGING STATION — "STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE"	MILE 44.7											
TOTALS			103	1046	1158	1355	1350	1176	684	316	7188	2021

* MILEAGE ALONG RIVER ABOVE MOUTH.
** GENERAL CROPS. NO RICE.
(1) MILEAGE CORRECTION.
(2) FORMERLY S. M. UPDIKE.
(3) PREVIOUSLY LISTED AS 10".
(4) FORMERLY BUCKS RANCH.

TABLE 83

STANISLAUS RIVER DIVERSIONS-1934

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)	1.1 R	1-6"				5	5	2	4		16	14
H. SALYER (1)	1.6 R	1-7"				8	10	1	11		30	30
A. B. KENNEDY (1)	2.9 R	1-8"			NO	DIVERSION						
HATMARK RANCH	5.25 L	2-14"		98	69	83	82	126	37	80	575	80
— GAGING STATION — "STANISLAUS RIVER AT HATMARK RANCH" MILE 5.3 (2)												
BRET HARTE WATER USERS ASSOCIATION	5.9 R	1-20"	103	637	534	629	753	698	468	180	4002	900
MC MULLIN RECLAMATION DISTRICT 2075	5.9 R	2-16"	46	706	265	514	447	571	108	9	2666	547
HENRY PELUCCA	6.7 L	1-15"		29	16	31	27	20	11	13	147	48
J. W. UPDIKE	7.4 L	1-8"			2	19		15	7	10	53	45
S. M. UPDIKE	8.2 L	1-12"		7	25	49	12	54	13	24	184	30
D. F. KOETITZ	10.1 L	2-10"	23	99	99	71	95	85	68	63	603	105
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"		20	30	30	30	30	30	20	190	40
G. R. STODDARD	19.9 L	1-7"			29	24	64	39	9		165	40
PALO ALTO COMPANY	20.75 R	1-14"			163	169	112	20			464	150
HEATH RANCH	20.9 L	1-4"			17	27	24	22	14	3	107	18
EARL FRUIT COMPANY	21.75 R	1-8"	68	24	25	28	36				181	75
— MODESTO-ESCALON BRIDGE — MILE 28.15												
— SANTA FE RAILROAD — MILE 31.85												
— SOUTHERN PACIFIC RAILROAD — (OAKDALE BRANCH) MILE 39.0												
— GAGING STATION — "STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE" MILE 44.7												
TOTALS			240	1620	1274	1687	1697	1683	780	402	9383	2122

* MILEAGE ALONG RIVER ABOVE MOUTH.
** ALL GENERAL CROPS. NO RICE.
(1) REPORTED TO HAVE BEEN INSTALLED PRIOR TO 1934. NOT PREVIOUSLY LISTED.
(2) GAGE MOVED UPSTREAM IN MAY, 1934.

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. Tables 85 and 86 list these channels in downstream order and give 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 Tables 85 and 86 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 87 to 90, inclusive, record the Sacramento River return water, June to September, inclusive, 1933 and 1934, and indicate the relation between the return and the diversions from which it was derived. The high figure of 76 per cent for the June 1933 return flow (Table 88) indicates that probably in that month there was still considerable drain-

age and seepage from natural local sources, not return from diversions. For this reason, Table 88-A giving only the figures for July to September, inclusive, may indicate more correctly the draft-return water relation in the 1933 season. Since, in Tables 87 to 90, 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 Tables 87 and 89 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 are shown in Tables 88, 88-A and 90. 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.

A comparison of the data of these tables for the periods July to September, 1933 and June to September, 1934, shows that seepage, ground-

water return, etc., which could not be directly measured, amounted to 21 per cent of the irrigation draft in 1933 and 19 per cent in 1934. The direct return measured in definite channels amounted to 27 per cent of the draft in 1933 and 26 per cent in 1934. The total return in the respective periods amounted to 48 per cent of the draft in 1933 and 45 per cent in 1934.

A comparison of the accumulated return water and the accumulated irrigation draft, in downstream order, Red Bluff to Sacramento, for tne period June to September, inclusive, 1934, 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 90.

Draft-Return Water Relation for Particular Sacramento Valley Areas

In the Sacramento Valley there are certain units or districts that are set apart physically by levees or otherwise, so that the return water in each district may be readily segregated when tne records of all diversions to and discharges from tne unit are available. Included in such units are, tne 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 Tables 91 and 92 and for Reclamation Districts 108 and 1500, in Tables 93 and 94, respectively.

Tables 99 to 127, inclusive, present in detail the discharge records for tne Sacramento Valley return water channels.

San Joaquin Return Waters

In tne 1933 and 1934 San Joaquin Valley return water measure-

ments, 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 Tables 26 and 27). Maintenance of these stations was started in April or early May. However, in June of 1933 high water from natural flow had the effect of vitiating return water determinations from the measurements for that month so that the 1933 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 24 to 47, inclusive, and the diversion records for the San Joaquin streams are given in Chaper III, Tables 76 to 83, inclusive.

Tables 95 and 96 give the results of the San Joaquin return water measurements and Tables 97 and 98 show 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 June to October, inclusive, 1934 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 1934

Comparative figures, 1924 to 1934, for the Sacramento and San Joaquin seasonal return water in per cent of the irrigation draft are shown in Table 84. 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 per-

centage 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 84 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 84

SACRAMENTO AND SAN JOAQUIN RETURN WATER PERCENTAGES, 1924-1934

Year	Sacramento River			San Joaquin River						Aug.-Sep. Return in per cent of Jul.-Aug Diversions
	Seasonal Run-off at Red Bluff in per cent of Normal *	Return Water in per cent of Diversions		Seasonal Run-off in per cent of Normal S.J.River & Tribs. **	Return Water in per cent of Diversions					
		Jun.-Sep. Inc.	Jul.-Sep. Inc.		Jun. Sep. Inc.	Jul. Sep. Inc.	Aug. Sep. Inc.	Jul. Oct. Inc.	Aug. Oct. Inc.	
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	(6) 47	45	41	(6) 37	(4) 20	21	28	(5) 25	33	16

* 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.

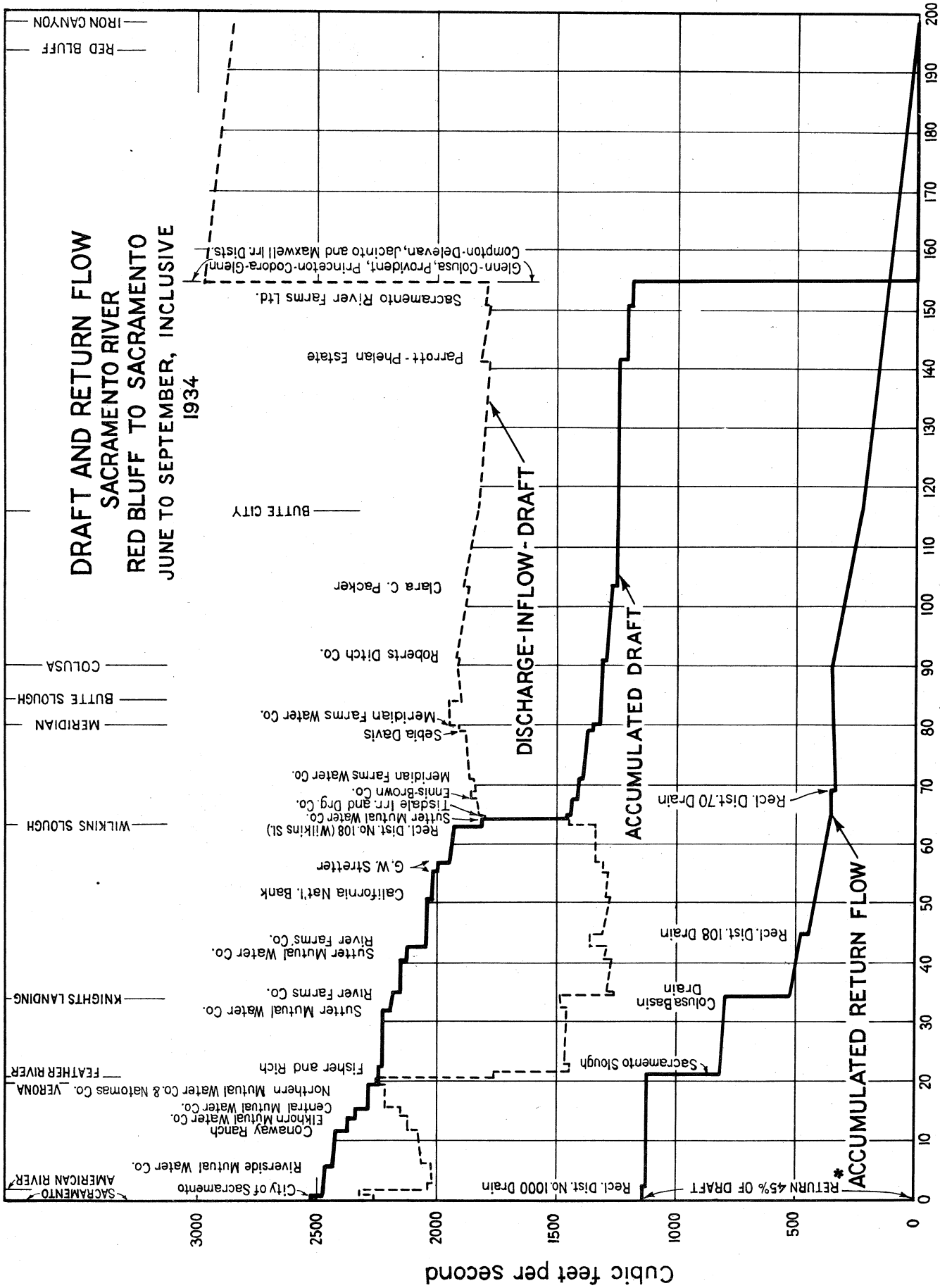
(2) May-September, inclusive, 34.

(3) May-September, inclusive, 19.

(4) May-September, inclusive, 20.

(5) June-October, inclusive, 23; May-October, inclusive, 21.

(6) Measured run-off - Natural flow not compiled.



* In order to show return water from Sacramento River irrigation only, the discharge to the Sacramento River of the Feather and American Rivers is excluded as is also return through Butte Slough, a portion of the return through Sacramento Slough derived from Feather River diversions and the return through the Back Borrow Pit of Recl. Dist. No. 1000

PLATE 1

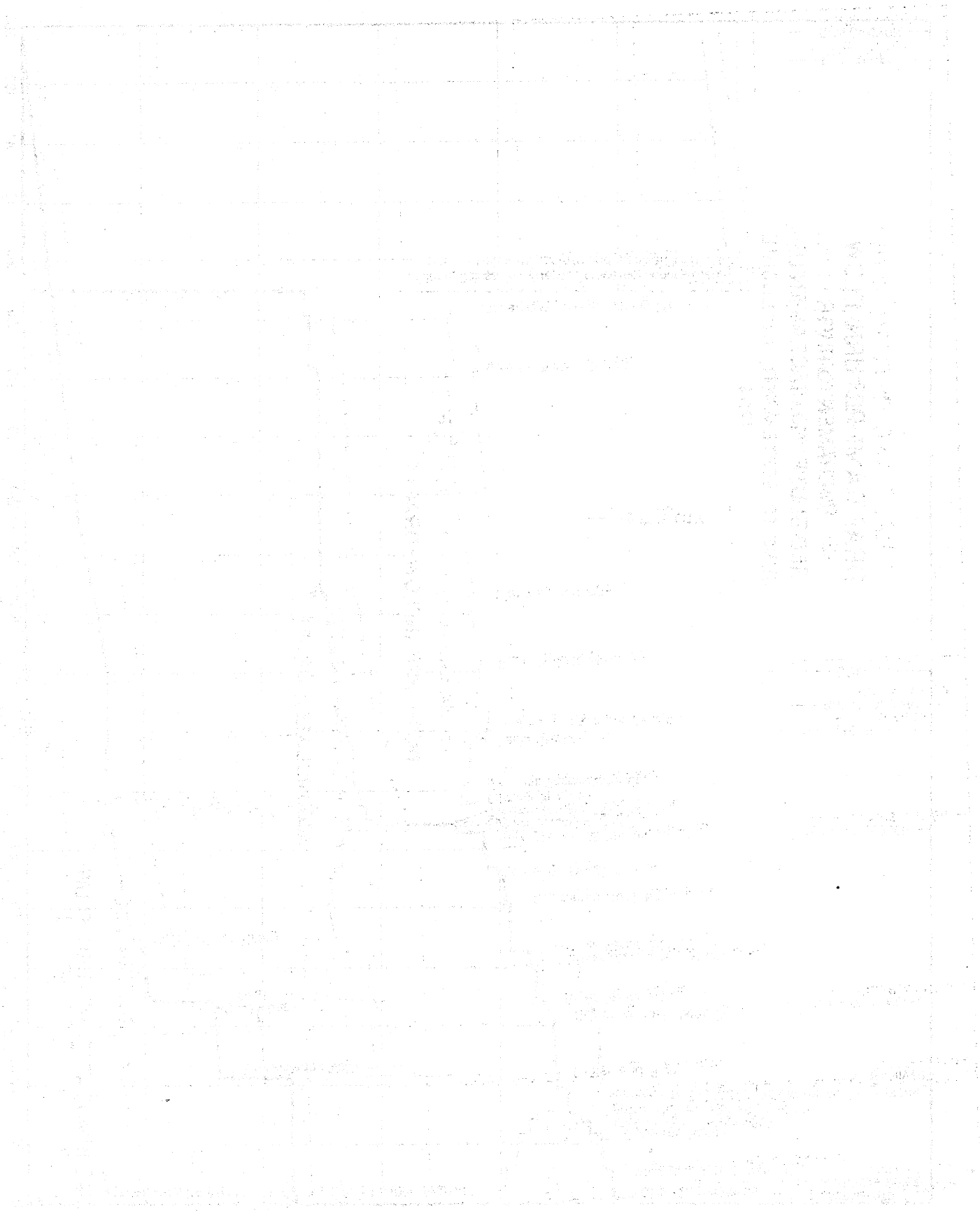


TABLE 85

WATER DISCHARGED TO THE SACRAMENTO RIVER ABOVE SACRAMENTO AS MEASURED AT DEFINITE RETURN CHANNELS-1933

*From records for Butte Slough, District 70 Drain, District 108 Drain, Colusa Basin Drainage at Knights Landing, Sacramento Slough, District 1000 Drain (2d Bannon Slough) and Back Borrow Pit of District 1000.

Month	Acre-feet	Average Second-feet
June	42700	718
July	33300	542
August	38500	626
September	57700	970
October	21500	350
June-October, Incl.	193700	638

* See Tables 101, 103, 105, 109, 111, 124 and 126.

- - 0 - -

TABLE 86

WATER DISCHARGED TO THE SACRAMENTO RIVER ABOVE SACRAMENTO AS MEASURED AT DEFINITE RETURN CHANNELS-1934

**From records for Butte Slough, District 70 Drain, District 108 Drain, Colusa Basin Drainage at Knights Landing, Sacramento Slough, District 1000 Drain (2d Bannon Slough) and Back Borrow Pit of District 1000.

Month	Acre-feet	Average Second-feet
June	45800	770
July	32500	528
August	38600	628
September	52200	878
October	27800	452
June-October, Incl.	196900	649

**See Tables 102, 104, 106, 110, 112, 125 and 127.

TABLE 87

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JUNE TO SEPTEMBER, 1933
(USING ONLY RETURN WATER WHICH ENTERED THROUGH DEFINITE RETURN CHANNELS*)

	June		July		August		September		June to September Inclusive	
	Ac.Ft.	c.f.s	Ac.Ft.	c.f.s	Ac.Ft.	c.f.s	Ac.Ft.	c.f.s	Ac.Ft.	c.f.s
RETURN										
Reclamation District 70 Drain	1480	25	1310	21	940	15	1530	26	5260	22
Reclamation District 108 Drain	3340	56	2090	34	2390	39	5710	96	13530	56
Colusa Basin Drainage at Knights Ldg.**	13000	219	9000	146	14000	228	18500	312	54500	225
Sacramento Slough (Less flow from East Borrow Pit Sutter By-Pass)	20500	345	20000	325	20100	327	19200	323	79800	330
Reclamation District 1000 Drain (2nd Bannon Slough)	100	2	0	0	0	0	1970	33	2070	9
Total Return	38420	647	32400	526	37430	609	46910	790	155160	642
Total Diversions-Red Bluff to Sacramento	169725	2850	175982	2860	164848	2680	84812	1430	595367	2460
Return in Per Cent of Diversions	23		18		23		55		26	

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 88.

** Includes flow diverted to Knights Landing Ridge Cut. See Tables 109 and 120. Figures for June, July and August partially estimated.

TABLE 88

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JUNE TO SEPTEMBER, 1933
(INCLUDING ALL ACCRETIONS*)

River Section	June (1)		July		August		September		Total Return Jun-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.	Acre-feet	Aver: cfs.	
Red Bluff-Butte City	47600	800	19600	319	9920	161	3280	55	80400	332	80400	332	310393	1280	26
Butte City-Colusa	5850	98	13400	218	4980	81	3080	52	27310	113	107710	445	332334	1370	32
Colusa-Wilkins Slough	9130	153	2260	37	2040	33	1240	21	14670	60	122380	505	495552	2050	25
Wilkins Slough-Knights Ldg.	44500	748	25300	411	25700	413	26800	450	122300	506	244680	1011	534263	2200	46
Knights Landing-Verona	21200	356	19900	324	20800	338	24500	412	86400	357	331080	1368	545813	2260	61
Verona-Sacramento**	100	2	0	0	0	0	1970	33	2070	9	333150	1377	595367	2460	56
Total Return	128380	2157	80460	1309	63440	1031	60870	1023	333150	1377					
Total Draft - Red Bluff to Sacramento	169725	2850	175982	2860	164848	2680	84812	1430	595367	2460					
Return in per cent of Draft	76 (1)		46		38		72		56						

* 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 return through Butte Slough, 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. Also, inflow from Mill, Antelope, Deer and other creeks between Red Bluff and Butte City has been excluded.

(1) The high percentage for June indicates that probably in that month there was still considerable drainage and seepage from natural local sources, not return from diversions. (Compare with June return, Table 87). Table 88-A, following, made up for July to September, inclusive, probably indicates more correctly, therefore, the draft-return water relation in 1933.

*TABLE 88-A

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JULY TO SEPTEMBER, 1933
(INCLUDING ALL ACCRETIONS)

River Section	July		August		September		Total Return Jul.-Sep. Inclusive		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	19600	319	9920	161	3280	55	32800	180	32800	180	227167	1240	14
Butte City-Colusa	13400	218	4980	81	3080	52	21460	118	54260	298	242258	1330	22
Colusa-Wilkins Slough	2260	37	2040	33	1240	21	5540	30	59800	328	354673	1940	17
Wilkins Slough-Knights Landing	25300	411	25700	418	26800	450	77800	426	137600	754	380919	2090	36
Knights Landing-Verona	19900	324	20800	338	24500	412	65200	358	202800	1112	388700	2130	52
Verona-Sacramento	0	0	0	0	1970	33	1970	11	204770	1123	425642	2330	48
Total Return	80460	1309	63440	1031	60870	1023	204770	1123					
Total Draft- Red Bluff to Sacramento	175982	2860	164848	2680	84812	1430	425642	2330					
Return in per cent of Draft	46		38		72		48						

* Same as Table 88 except that June figures are eliminated. See note (1) Table 88.

TABLE 89

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JUNE TO SEPTEMBER, 1934
(USING ONLY RETURN WATER WHICH ENTERS THROUGH DEFINITE RETURN CHANNELS*)

	June		July		August		September		June 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.	Acre-feet	Aver. c.f.s.
RETURN										
Reclamation District 70 Drain	1700	29	1440	23	1110	18	1160	20	5410	22
Reclamation District 108 Drain	3630	61	1150	19	3990	65	3320	56	12090	50
Colusa Basin Drainage at Knights Ldg. **	16300	274	11800	192	15100	246	22600	380	65800	272
Sacramento Slough (less flow from East Borrow Pit Sutter By-Pass)	18700	314	20400	332	19700	320	14600	246	73400	303
Reclamation District 1000 Drain (2nd Bannon Slough)	0	0	0	0	650	11	2270	38	2920	12
Total Return	40330	678	34790	566	40550	660	43950	740	159620	659
Total Diversions-Red Bluff to Sacramento	172446	2900	180935	2940	169956	2760	87193	1470	610530	2520
Return in per cent of Diversions	23		19		24		50		26	

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 90.

** Includes flow diverted to Knights Landing Ridge Cut. See Tables 110 and 121.

TABLE 90

RELATION BETWEEN RETURN WATER AND DRAFT, SACRAMENTO RIVER, RED BLUFF TO SACRAMENTO, JUNE TO SEPTEMBER, 1934
(INCLUDING ALL ACCRETIONS*)

River Section	June		July		August		September		Total Return Jun-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.	Acre-feet	Aver. cfs.	
Red Bluff-Butte City	24200	407	12200	198	12800	208	5010	84	54210	224	54210	224	301495	1250	18
Butte City-Colusa	15200	256	11400	185	4820	78	1570	26	32990	136	87200	360	316551	1310	28
Colusa-Wilkins Slough	-2420	-41	320	5	-880	-14	1820	31	-1160	-5	86040	355	470126	1940	18
Wilkins Slough-Knights Ldg.	33700	566	22900	372	26500	431	24400	409	107500	444	193540	799	530577	2190	36
Knights Landing-Verona	21400	360	15000	244	18300	298	22600	380	77300	319	270840	1118	544118	2250	50
Verona-Sacramento**	0	0	0	0	650	11	2270	38	2920	12	273760	1130	610530	2520	45
Total Return	92080	1548	61820	1004	62190	1012	57670	968	273760	1130					
Total Draft- Red Bluff to Sacramento	172446	2900	180935	2940	169956	2760	87193	1470	610530	2520					
Return in per cent of Draft	53		34		37		66		45						

* 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 return through Butte Slough, 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. Also, inflow from Mill, Antelope, Deer and other creeks between Red Bluff and Butte City has been excluded.

TABLE 91

RELATION BETWEEN THE RETURN WATER IN COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY AND THE DIVERSIONS FROM WHICH THE RETURN WATER WAS DERIVED-1933

	Mile and Bank	Jun.	Jul.	Aug.	Sep.	June to Sept. Inclusive		Acreage Irrigated	
		Acre-feet				Ac.Ft.	c.f.s.	General	Rice
DIVERSIONS									
- Sacramento River -									
Glenn-Colusa Irrigation District	154.8 R	58309	62381	63508	34071	218269	903	20019	22141
Jacinto Irrigation District	154.8 R	2376	2993	2801	1755	9925	41	4070	
Compton-Delevan Irrigation District	154.8 R	5355	5533	3525	917	15330	63	905	8863
Provident Irrigation District	154.8 R	6251	6350	6078	2679	21358	88		3659
Princeton-Codora-Glenn Irrigation Dist.	154.8 R	9477	10201	9304	5674	34656	143	2953	1460
Maxwell Irrigation District	154.8 R	595	613	614	609	2431	10	900	510
California Lands, Inc.	124.4 R	61	51	45	32	189	1	106	
E. M. Gorden	103.9 R	557	524	547	227	1855	8	65	350
National Pacific Land Company	103.7 R	213	385	245	148	991	4	405	
Clara C. Packer	102.8 R	1416	1369	2119	1338	6242	26	100	650
R. C. Wohlfrom	101.1 R	193	94	0	0	287	1	173	
Cheney Slough Irrigation Company	99.0 R	449	38	24	318	829	3	214	
- Colusa Trough -					(NONE)				
Total Diversions (Acre-feet		85252	90532	88810	47768	312362		29910*	31633
(c. f. s.		1430	1470	1440	802		1291		
RETURN									
Colusa Trough at Colusa-Williams Hy. (Acre-feet		17500	15000	17500	22900	72900**			
(c. f. s.		294	244	284	385		301		
Return in per cent of Diversions		21	17	20	48	23			

* Includes 2449 acres duck ponds.
** Figures for June, July and August partially estimated.

TABLE 92

RELATION BETWEEN THE RETURN WATER IN COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY AND THE DIVERSIONS FROM WHICH THE RETURN WATER WAS DERIVED-1934

	Mile and Bank	Jun.	Jul.	Aug.	Sep.	June to Sept. Inclusive		Acreage Irrigated	
		Acre-feet				Ac.Ft.	c.f.s.	General	Rice
DIVERSIONS									
- Sacramento River -									
Glenn-Colusa Irrigation District	154.8 R	51173	57789	60492	32394	201848	833	16831	17971
Jacinto Irrigation District	154.8 R	2345	2966	2640	2175	10126	42	4049	
Compton-Delevan Irrigation District	154.8 R	2447	2612	2264	593	7916	33	60	1457
Provident Irrigation District	154.8 R	10858	10243	9069	3410	33580	139		6005
Princeton-Codora-Glenn Irrigation Dist.	154.8 R	8981	9363	8074	5698	32116	133	3053	1617
Maxwell Irrigation District	154.8 R	662	678	728	74	2142	9	500	635
California Lands, Inc.	124.4 R	86	13	89	0	188	1	80	
E. M. Gordon	103.9 R	342	365	388	21	1116	5		212
American Company	103.7 R	305	319	186	153	963	4	405	
Clara C. Packer	102.8 R	1429	1392	1373	441	4635	19	110	375
R. C. Wohlfrom	101.1 R	129	20	0	43	192	1	133	
Cheney Slough Irrigation Company	99.0 R	408	114	254	38	814	3	364	
- Colusa Trough -	*								
Stevens Brothers	22.0 R	229	387	463	156	1235	5		200
I. G. Zumwalt	2.2 R	1687	1356	1010	170	4223	17		787
Total Diversions (Acre-feet		81081	87617	87030	45366	301094		25585**	29259
(c. f. s.		1360	1420	1420	762		1244		
RETURN									
Colusa Trough at Colusa-Williams Highway		14700	14000	15000	18200	61900	256		
Trough Diversions		1916	1743	1473	326	5458	22		
Total Return (Acre-feet		16616	15743	16473	18526	67358			
(c. f. s.		280	256	268	312		278		
Return in per cent of Diversions		21	18	19	41	22			

* Mileage above Colusa-Williams Highway.

** Includes 1554 acres duck ponds.

TABLE 93

RELATION BETWEEN RETURN WATER AND DIVERSIONS -
RECLAMATION DISTRICT 108 - 1933 AND 1934

	Jun.	Jul.	Aug.	Sep.	Jun. to Sep: Inclusive: Acre-feet	Jun. to Sep: Inclusive: Aver. c.f.s.	Acreage Irrigated: Gen'l	Acreage Irrigated: Rice
	Acre-feet							
1933								
Diversions (1)	8827	9111	11443	1464	30845	128	288	5960
Return Water (2)	3816	2582	3132	6242	15772	65		
Return in per cent of Diversions	43	28	27	426	51			
1934								
Diversions (1)	14120	14623	12954	2339	44036	182	1113	6842
Return Water (2)	4690	2133	5090	4237	16150	67		
Return in per cent of Diversions	33	15	39	181	37			

(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 Sacramento River of R. D. 108 Drain at Rough and Ready Bend (Tables 105 and 106) and the discharge to Back Borrow Pit (Tables 107 and 108).

- - 0 - -

TABLE 94

RELATION BETWEEN RETURN WATER AND DIVERSIONS -
RECLAMATION DISTRICT 1500 - 1933 AND 1934

	Jun.	Jul.	Aug.	Sep.	Jun. to Sep: Inclusive: Acre-feet	Jun. to Sep: Inclusive: Aver. c.f.s.	Acreage Irrigated: Gen'l	Acreage Irrigated: Rice
	Acre-feet							
1933								
Diversions (1)	35476	34153	29148	16948	115725	477	21376	9374
Return Water (2)	17200	18700	18600	16500	71000	293		
Return in per cent of Diversions	48	55	64	97	61			
1934								
Diversions (1)	36709	34066	32903	20743	124421	514	17290	10799
Return Water (2)	16900	19600	18100	11700	66300	274		
Return in per cent of Diversions	46	58	55	56	53			

(1) The diversions comprise all 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 Sutter By-Pass. This water reaches the Sacramento River via Sacramento Slough. See Tables 113 and 114.

TABLE 95

RETURN FLOW IN SAN JOAQUIN VALLEY STREAMS—1933
(ACRE-FEET EXCEPT AS NOTED)

		JUL.	AUG.	SEP.	OCT.	JUL.-OCT INCL.
SAN JOAQUIN RIVER						
DISCHARGE AT DELTA BRIDGE (1)	TABLE 24	20	0	0	0	20
DISCHARGE NEAR NEWMAN	TABLE 26	21600	12900	14500	12000	61000
INFLOW OF MERCED RIVER	TABLE 34	9780	9650	10900	9540	39870
NET RETURN FLOW — DELTA BRIDGE TO NEWMAN		11800	3250	3600	2460	21110
NET RETURN FLOW — C.F.S. — DELTA BRIDGE TO NEWMAN		192	53	61	40	87
DISCHARGE AT GRAYSON (LAIRD SLOUGH)	TABLE 28	31900	17900	19700	21300	90800
ACCRETION — NEWMAN TO GRAYSON		10300	5000	5200	9300	29800
DIVERSIONS — NEWMAN TO GRAYSON	TABLE 76	7163	7358	6273	911	21705
RETURN FLOW — NEWMAN TO GRAYSON		17500	12300	11500	10200	51500
RETURN FLOW — C.F.S. — NEWMAN TO GRAYSON		285	200	193	166	211
DISCHARGE NEAR VERNALIS	TABLE 30	68200	41000	68400	94100	271700
INFLOW OF TUOLUMNE AND STANISLAUS RIVERS	TBLS. 42 &46	46400	33800	53200	76900	210300
NET ACCRETION — GRAYSON TO VERNALIS		-10100	-10700	-4500	-4100	-29400
DIVERSIONS — GRAYSON TO VERNALIS	TABLE 76	11880	11015	5164	2884	30943
NET RETURN FLOW — GRAYSON TO VERNALIS		1780	315	664	-1220	1540
NET RETURN FLOW — C.F.S. — GRAYSON TO VERNALIS		29	5	11	-20	6
NET RETURN FLOW — DELTA BRIDGE TO VERNALIS		31100	15900	15800	11400	74200
NET RETURN FLOW — C.F.S. — DELTA BRIDGE TO VERNALIS		506	258	265	186	304
STANISLAUS RIVER						
DISCHARGE AT ORANGE BLOSSOM BRIDGE	TABLE 44	2230	1960	1480	1760	7430
DISCHARGE AT HATMARK RANCH	TABLE 46	20700	14100	13700	14400	62900
ACCRETION — ORANGE BLOSSOM TO HATMARK		18470	12140	12220	12640	55470
DIVERSIONS — ORANGE BLOSSOM TO HATMARK	TABLE 82	1350	1176	684	316	3526
RETURN FLOW — ORANGE BLOSSOM TO HATMARK		19800	13300	12900	13000	59000
RETURN FLOW — C.F.S. — ORANGE BLOSSOM TO HATMARK		322	216	217	211	242
TUOLUMNE RIVER						
DISCHARGE AT ROBERTS FERRY BRIDGE	TABLE 38	3880	2350	24500	44500	75230
DISCHARGE AT HICKMAN BRIDGE	TABLE 40	8070	6420	27400	48400	90290
ACCRETION — ROBERTS FERRY TO HICKMAN		4190	4070	2900	3900	15060
DIVERSIONS — ROBERTS FERRY TO HICKMAN	TABLE 80	23	6	24	0	53
RETURN FLOW — ROBERTS FERRY TO HICKMAN		4210	4080	2920	3900	15110
RETURN FLOW — C.F.S. — ROBERTS FERRY TO HICKMAN		68	66	49	64	62
DISCHARGE AT TUOLUMNE CITY BRIDGE	TABLE 42	25100	19600	39200	62200	146100
INFLOW OF DRY CREEK	TABLE 36	3420	3020	4190	5060	15690
NET ACCRETION — HICKMAN TO TUOLUMNE CITY		13610	10160	7610	8740	40120
DIVERSIONS — HICKMAN TO TUOLUMNE CITY	TABLE 80	368	329	203	143	1043
NET RETURN FLOW — HICKMAN TO TUOLUMNE CITY		14000	10500	7810	8880	41190
NET RETURN FLOW — C.F.S. — HICKMAN TO TUOLUMNE CITY		228	171	131	144	169
NET RETURN FLOW — ROBERTS FERRY TO TUOLUMNE CITY		18200	14600	10700	12800	56300
NET RETURN FLOW — C.F.S. — ROBERTS FERRY TO TUOLUMNE CY.		296	237	180	208	231
MERCED RIVER						
DISCHARGE AT YOSEMITE VALLEY RR. CROSSING	TABLE 32	1700	1560	986	252	4498
DISCHARGE NEAR MOUTH	TABLE 34	9780	9650	10900	9540	39870
ACCRETION — YOSEMITE VALLEY RR. CROSSING TO MOUTH		8080	8090	9914	9288	35372
DIVERSIONS — YOSEMITE VALLEY RR. CR. TO MOUTH	TBL. 78	2372	1900	1600	645	6517
RETURN FLOW — YOSEMITE VALLEY RR. CROSSING TO MOUTH		10500	9990	11500	9930	41920
RETURN FLOW — C.F.S. — YOSEMITE VALLEY RR. CR. TO MOUTH		171	162	193	162	172

(1) PREVIOUSLY REFERRED TO AS TURNER RANCH BRIDGE OR SAN LUIS RANCH GAGING STATION.

SAN JOAQUIN RIVER RETURN FLOW
JUNE TO OCTOBER INCLUSIVE
1934
DELTA BRIDGE
DISCHARGE-INFLOW-DRAFT
U.S.G.S. GAGE NEAR NEWMAN
MERCED RIVER
CROWS LANDING BRIDGE
PATTERSON RANCH CO.
PATTERSON WATER CO.
GAGE AT GRAYSON (LAIRD SLOUGH)
WEST STANISLAUS IRR. DIST.
TUOLUMNE RIVER
EL SOLYO RANCH AND W.C.BLEWETT
STANISLAUS RIVER
DURHAM FERRY BDGE.
U.S.G.S. GAGE NEAR VERNALIS
ACCUMULATED RETURN FLOW
Distance in miles from Durham Ferry bridge
Average discharge in cubic feet per second
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
50
100
150
200
250
300
350
400
450
500
550
600

PLATE 2

TABLE 96

RETURN FLOW IN SAN JOAQUIN VALLEY STREAMS-1934
(ACRE-FEET EXCEPT AS NOTED)

		JUN.	JUL.	AUG.	SEP.	OCT.	JUN.- OCT. INCL.
SAN JOAQUIN RIVER							
DISCHARGE AT DELTA BRIDGE		0	0	0	0	0	0
DISCHARGE NEAR NEWMAN	TABLE 27	10900	8180	5640	5590	7250	37560
INFLOW OF MERCED RIVER	TABLE 35	9360	7040	4890	5190	6710	33190
NET ACCRETION - DELTA BRIDGE TO NEWMAN		1540	1140	750	400	540	4370
DIVERSIONS - DELTA BRIDGE TO NEWMAN	TABLE 77			136	172		308
NET RETURN FLOW - DELTA BRIDGET TO NEWMAN		1540	1140	890	570	540	4680
NET RETURN FLOW - C.F.S. - DELTA BR. TO NEWMAN		26	18	14	10	9	15
DISCHARGE AT GRAYSON (LAIRD SLOUGH)	TABLE 29	13800	8820	7970	8210	14700	53500
ACCRETION - NEWMAN TO GRAYSON		2900	640	2330	2620	7450	15940
DIVERSIONS - NEWMAN TO GRAYSON	TABLE 77	7519	9153	7913	6177	511	31273
RETURN FLOW - NEWMAN TO GRAYSON		10400	9790	10200	8800	7960	47150
RETURN FLOW - C.F.S. - NEWMAN TO GRAYSON		174	159	166	148	129	156
DISCHARGE NEAR VERNALIS	TABLE 31	37300	24300	23600	29800	52200	167200
INFLOW OF TUOLUMNE & STANISLAUS RIVERS	TABLES 43 AND 47	27700	27000	26800	25800	42100	149400
NET ACCRETION - GRAYSON TO VERNALIS		-4200	-11520	-11170	-4210	-4600	-35700
DIVERSIONS - GRAYSON TO VERNALIS	TABLE 77	5096	15634	14343	6531	2612	44216
NET RETURN FLOW - GRAYSON TO VERNALIS		900	4110	3170	2320	-1990	8510
NET RETURN FLOW - C.F.S. - GRAYSON TO VERNALIS		15	67	52	39	-32	28
NET RETURN FLOW - DELTA BRIDGE TO VERNALIS		12800	15000	14300	11700	6510	60310
NET RETURN FLOW - C.F.S. -DELTA BR. TO VERNALIS		215	244	232	197	106	199
STANISLAUS RIVER							
DISCHARGE AT ORANGE BLOSSOM BRIDGE	TABLE 45	1670	1720	1720	1210	2510	8830
DISCHARGE AT HATMARK RANCH	TABLE 47	9920	9430	8980	8770	8890	45990
ACCRETION - ORANGE BLOSSOM TO HATMARK		8250	7710	7260	7560	6380	37160
DIVERSIONS-ORANGE BLOSSOM TO HATMARK	TABLE 83	1591	1600	1554	728	322	5795
RETURN FLOW - ORANGE BLOSSOM TO HATMARK		9840	9310	8810	8290	6710	42960
RETURN FLOW -C.F.S.- ORANGE BLOSSOM TO HATMARK		165	151	143	139	109	142
TUOLUMNE RIVER							
DISCHARGE AT ROBERTS FERRY BRIDGE	TABLE 39	2350	2240	2010	1770	20000	28370
DISCHARGE AT HICKMAN BRIDGE	TABLE 41	5850	5880	6200	6010	22900	46840
ACCRETION - ROBERTS FERRY TO HICKMAN		3500	3640	4190	4240	2900	18470
DIVERSIONS - ROBERTS FERRY TO HICKMAN	TABLE 81	12	22	9	21		64
RETURN FLOW - ROBERTS FERRY TO HICKMAN		3510	3660	4200	4260	2900	18530
RETURN FLOW - C.F.S. - ROBERTS FERRY TO HICKMAN		59	60	68	71	47	61
DISCHARGE AT TUOLUMNE CITY BRIDGE	TABLE 43	17900	17600	18000	17200	33300	104000
INFLOW OF DRY CREEK	TABLE 37	2590	2710	2740	2370	2440	12850
NET ACCRETION - HICKMAN TO TUOLUMNE CITY		9460	9010	9060	8820	7960	44310
DIVERSIONS - HICKMAN TO TUOLUMNE CITY	TABLE 81	319	265	274	147	123	1128
NET RETURN FLOW - HICKMAN TO TUOLUMNE CITY		9780	9280	9330	8970	8080	45440
NET RETURN FLOW-C.F.S.-HICKMAN TO TUOLUMNE CITY		165	151	152	151	132	150
NET RETURN FLOW - ROBERTS FERRY TO TUOLUMNE CITY		13300	13000	13500	13200	11000	64000
NET RETURN FLOW-C.F.S.-ROBERTS FY. TO TUOLUMNE CY.		224	211	220	222	179	211
MERCED RIVER							
DISCHARGE AT YOSEMITE VALLEY RR. CROSSING	TABLE 33	1600	1600	957	453	50	4660
DISCHARGE NEAR MOUTH	TABLE 35	9360	7040	4890	5190	6710	33190
ACCRETION-YOSEMITE VALLEY RR. CROSSING TO MOUTH		7760	5440	3933	4737	6660	28530
DIVERSIONS-YOSEMITE VALLEY RR. CROSSING TO MOUTH	TABLE 79	2637	3202	2673	2018	826	11356
RETURN FLOW-YOSEMITE VALLEY RR. CR. TO MOUTH		10400	8640	6610	6760	7490	39900
RETURN FLOW-C.F.S.-YOSEMITE VALLEY RR. CROSSING TO MOUTH		175	140	107	114	122	131

TABLE 97

COMPARISON OF DIVERSIONS AND RETURN WATER, SAN JOAQUIN VALLEY – 1933

(QUANTITIES IN ACRE-FEET EXCEPT AS NOTED)

	JUL.	AUG.	SEP.	OCT.	JUL.-OCT. INCL.
– DIVERSIONS –					
SAN JOAQUIN RIVER NEAR FRIANT (1) (2) (MILLER AND LUX CANALS, ETC.)	97200	81200	67800	36000	282200
MERCED RIVER AT EXCHEQUER (1) (2) (MERCED IRRIGATION DISTRICT CANAL, ETC.)	96500	91600	53000	2730	243830
TURLOCK IRRIGATION DISTRICT CANAL (1)	69500	58500	52400	13800	194200
MODESTO IRRIGATION DISTRICT CANAL (1)	37300	46100	29400	26600	139400
SOUTH SAN JOAQUIN AND OAKDALE IRRIGATION DISTRICT CANAL (1)	42200	49300	17600	7010	116110
OAKDALE IRRIGATION DISTRICT CANAL (1)	15600	16000	12200	8000	51800
PUMPING DIVERSIONS – SAN JOAQUIN, MERCED, TUOLUMNE AND STANISLAUS RIVERS(3)	23200	21900	14000	5000	64100
TOTAL DIVERSIONS	381500	364600	246400	99140	1091640
TOTAL DIVERSIONS (AVERAGE SECOND-FEET)	6200	5930	4140	1610	4480
– RETURN –					
SAN JOAQUIN RIVER NEAR VERNALIS (1)	68200	41000	68400	94100	271700
PUMPING DIVERSIONS – SAN JOAQUIN, MERCED, TUOLUMNE AND STANISLAUS RIVERS(3)	23200	21900	14000	5000	64100
TOTAL RETURN	91400	62900	82400	99100	335800
UNDIVERTED POWER RELEASES AND SPILL (TUOLUMNE AND STANISLAUS RIVERS)	500	0	22100	42300	64900
*NET RETURN	90900	62900	60300	56800	270900
*NET RETURN (AVERAGE SECOND-FEET)	1480	1040	1010	923	1110
*RETURN IN PER CENT OF DIVERSIONS	24	17	24	57	25

NOTE: JUNE AND EARLIER RETURN WATER MEASUREMENTS WERE VITIATED BY NATURAL FLOW AND HIGH RIVER STAGES.

(1) U. S. G. S. STATION.

(2) THIS FLOW ALL DIVERTED BELOW GAGING STATION AFTER JULY 1ST.

(3) SEE TABLES 76, 78, 80, AND 82. THIS IS RETURN WATER DIVERTED BY PUMPING.

* UNDETERMINED RETURN WATER FROM SOUTH SAN JOAQUIN IRRIGATION DISTRICT ENTERING SAN JOAQUIN RIVER BELOW VERNALIS GAGING STATION IS NOT INCLUDED IN THESE FIGURES. ALSO, NO ACCOUNT IS TAKEN OF RETURN TO GROUNDWATER RE-DIVERTED TO IRRIGATION CANALS VIA DRAINAGE PUMPS IN THE VARIOUS IRRIGATION DISTRICTS.

TABLE 98

COMPARISON OF DIVERSIONS AND RETURN WATER – SAN JOAQUIN VALLEY – 1934

(QUANTITIES IN ACRE-FEET EXCEPT AS NOTED)

	MAY	JUN.	JUL.	AUG.	SEP.	OCT.	MAY–OCT. INCL.
– DIVERSIONS –							
SAN JOAQUIN RIVER NEAR FRIANT (1) (2) (MILLER AND LUX CANALS, ETC.)	105000	71400	64600	50400	24300	22800	338500
MERCED RIVER AT EXCHEQUER (1) (2) (MERCED IRRIGATION DISTRICT CANAL, ETC.)	73800	64900	79300	11900	7020	2150	239070
TURLOCK IRRIGATION DISTRICT CANAL (1)	56600	68400	74400	69500	42500	22100	333500
MODESTO IRRIGATION DISTRICT CANAL (1)	38300	36800	46200	38700	2060	90	162150
SOUTH SAN JOAQUIN AND OAKDALE IRRIGATION DISTRICT CANAL (1)	46200	32700	46100	30800	9100	6380	171280
OAKDALE IRRIGATION DISTRICT CANAL (1)	16400	13700	15900	14400	4000	4250	68650
PUMPING DIVERSIONS – SAN JOAQUIN, MERCED, TUOLUMNE AND STANISLAUS RIVERS (3)	21800	17300	30000	27100	15900	4500	116600
TOTAL DIVERSIONS	358100	305200	356500	242800	104880	62270	1429750
TOTAL DIVERSIONS (AVERAGE SECOND-FEET)	5820	5130	5800	3940	1760	1010	3920
– RETURN –							
SAN JOAQUIN RIVER NEAR VERNALIS (1)	39300	37300	24300	23600	29800	52200	206500
PUMPING DIVERSIONS – SAN JOAQUIN, MERCED, TUOLUMNE AND STANISLAUS RIVERS (3)	21800	17300	30000	27100	15900	4500	116600
TOTAL RETURN	61100	54600	54300	50700	45700	56700	323100
UNDIVERTED POWER RELEASES AND SPILL (TUOLUMNE AND STANISLAUS RIVERS)	0	0	0	0	0	18600	18600
*NET RETURN	61100	54600	54300	50700	45700	38100	304500
*NET RETURN (AVERAGE SECOND-FEET)	993	918	882	824	768	619	834
*RETURN IN PER CENT OF DIVERSIONS	17	18	15	21	44	61	21

(1) U. S. G. S. STATION.

(2) THIS FLOW ALL DIVERTED BELOW GAGING STATION AFTER MAY 1ST.

(3) SEE TABLES 77, 79, 81, AND 83. THIS IS RETURN WATER DIVERTED BY PUMPING.

* UNDETERMINED RETURN WATER FROM SOUTH SAN JOAQUIN IRRIGATION DISTRICT ENTERING SAN JOAQUIN RIVER BELOW VERNALIS GAGING STATION IS NOT INCLUDED IN THESE FIGURES. ALSO, NO ACCOUNT IS TAKEN OF RETURN TO GROUNDWATER RE-DIVERTED TO IRRIGATION CANALS VIA DRAINAGE PUMPS IN THE VARIOUS IRRIGATION DISTRICTS.

TABLE 99

DISCHARGE OF COLUSA TROUGH AT COLUSA WILLIAMS HIGHWAY-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		283				415	218
2		254				473	189
3		244				435	182
4		243				431	172
5		268				439	168
6		354				451	158
7	*115	392				421	149
8	103	395				423	142
9	106	368				415	138
10	129	378				403	129
11	126	363				407	119
12	129	357				427	115
13	129	352				409	115
14	124	348				401	111
15	120	382				401	97
16	137	471				401	84
17	124	421				401	71
18	129	401				401	71
19	111	405				401	73
20	133	417				401	83
21	164	437				393	81
22	168	445				405	81
23	172	431			(1)	393	83
24	176	(1)			382	361	81
25	180				401	327	83
26	183				427	295	81
27	201				429	281	81
28	210				417	266	83
29	196				431	254	83
30	187				437	218	100
31					427		108
Mean	**148	**366	(1)	(1)	**419	385	114
Ac.Ft. for Month	**7050	**16700			**6650	22900	7000

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.

** Partial month.

(1) Record from May 24th to August 23d lost due to temporary discontinuance of Water Supervisor work.

LE 100

COLUSA-WILLIAMS HIGHWAY-1934

			arge in Second-feet			
			ıl.	Aug.	Sep.	Oct.
			98	236	313	55
			96	236	334	67
			14	228	355	80
			14	234	376	56
			14	235	397	52
			16	236	418	55
			12	237	439	51
			18	238	461	47
			19	239	474	43
			27	241	487	39
			23	243	500	35
			32	254	514	31
			23	246	529	28
			14	227	517	28
			27	218	217	28
			34	221	231	27
			50	230	245	27
			46	232	256	27
			34	216	261	26
			23	213	253	26
			37	216	259	27
			39	226	269	28
23	663	209	241	230	274	29
24	700	205	237	224	210	31
25	737	202	232	245	172	30
26	780	199	230	256	136	29
27	695	196	241	272	104	29
28	612	193	250	291	78	29
29	529	190	237	316	55	29
30	446	187	239	315	58	29
31	363		239	313		29
Mean	**486	247	228	244	306	37
Ac.Ft. for Month	**23100	14700	14000	15000	18200	2280

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.

** 24 days.

TABLE 101

DISCHARGE OF BUTTE SLOUGH-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		106	200	10	10	65	89
2		156	200	10	10	68	105
3		132	190	10	10	67	105
4		155	175	10	10	72	103
5		53	160	10	10	68	82
6		61	145	10	10	68	62
7		46	130	10	10	72	56
8		46	115	10	10	85	48
9		240	100	10	10	283	45
10		100	85	10	11	104	38
11		81	70	10	7	138	27
12		74	55	10	8	126	23
13		105	40	10	21	118	21
14		80	25	10	30	113	17
15		138	10	10	36	117	18
16		84	10	10	25	143	16
17		128	10	2	2	147	14
18		95	10	10	15	147	9
19	*5	51	10	10	18	75	6
20	19	78	10	10	31	50	5
21	26	78	10	10	29	87	3
22	26	78	10	10	26	90	2
23	26	78	10	10	21	86	2
24	19	105	10	10	20	86	3
25	29	90	10	10	17	88	3
26	146	116	10	10	18	88	3
27	193	164	10	10	26	85	2
28	76	585	10	10	31	82	2
29	54	0	10	10	34	74	3
30	66	208	10	10	41	74	3
31		204		10	48		3
Mean	**57.1	120	61.7	9.7	19.5	98.9	29.6
Ac.Ft. for Month	**1360	7370	3670	599	1200	5880	1820

NOTE: This is the discharge to Sacramento River at Mile 84 Left as measured at and below the dam of Butte Slough Irrigation Company 1/4 mile above the mouth of Butte Slough. This flow and Butte Slough and Butte Creek diversions (See Table 58) are made up almost entirely of return water from lands irrigated by Feather River diversions.

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

TABLE 103

DISCHARGE OF RECLAMATION DISTRICT 70 DRAIN-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*		0	21	31	16	25	25
2			21	23	31	16	26	22
3			24	23	32	16	26	20
4			18	24	32	16	26	19
5			24	25	32	16	27	17
6			16	25	34	16	27	16
7			24	25	32	16	27	14
8			24	31	32	16	26	13
9			18	32	31	16	26	11
10			17	32	30	16	26	10
11			18	31	29	16	26	8
12			18	32	13	15	25	7
13			18	31	14	15	26	8
14			19	24	14	15	26	8
15			20	23	15	15	25	7
16			21	22	16	15	24	5
17			22	5	16	14	22	4
18			19	11	16	13	8	4
19			18	13	16	13	10	4
20			17	30	17	14	11	3
21			23	29	17	14	11	3
22			16	29	17	14	11	3
23			19	30	17	14	11	3
24			27	30	17	14	11	3
25			23	30	16	14	84	0
26			23	21	16	1	70	0
27			24	22	16	13	40	0
28			24	23	15	13	20	0
29			21	24	16	13	25	0
30			21	24	16	34	25	0
31			21		16	26		0
Mean	0	0	19.9	24.8	21.4	15.3	25.8	7.6
Ac.Ft. for Month	0	0	1230	1480	1310	942	1530	470

FLOW ON

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 102

DISCHARGE OF BUTTE SLOUGH-1934

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		65	260	16	4	97	119
2		56	246	12	4	75	117
3		56	243	13	4	83	107
4		56	237	12	4	75	105
5		57	241	11	4	69	100
6		49	126	11	4	61	82
7		44	64	10	4	66	82
8		46	116	10	5	66	100
9		68	110	10	5	69	129
10		48	181	11	5	64	141
11	*325	48	185	11	5	66	141
12	167	48	163	16	5	75	139
13	248	42	145	25	5	80	127
14	233	36	127	51	5	119	320
15	218	48	119	25	5	153	20
16	201	43	105	3	5	137	10
17	193	39	105	9	5	137	23
18	180	41	93	3	5	137	2
19	109	30	85	4	5	131	0
20	65	30	75	4	5	129	0
21	92	37	56	5	5	153	0
22	102	70	38	5	5	158	3
23	79	59	32	5	5	189	13
24	65	62	26	5	5	189	4
25	61	67	21	5	12	181	2
26	65	73	18	5	26	148	2
27	70	125	16	5	31	107	2
28	55	122	15	5	33	141	2
29	49	123	18	5	61	141	2
30	45	121	18	5	49	105	2
31		360		5	45		2
Mean	**131	70.0	109	10.4	11.9	113	61.2
Ac.Ft. for Month	**5200	4300	6510	639	734	6750	3760

NOTE: This is the discharge to Sacramento River at Mile 84 Left as measured at and below the dam of Butte Slough Irrigation Company 1/4 mile above the mouth of Butte Slough. This flow and Butte Slough and Butte Creek diversions (See Table 59) are made up almost entirely of return water from lands irrigated by Feather River diversions.

*Beginning of record for season.

**20 days.

TABLE 106

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN
AT ROUGH AND READY BEND-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*0	0	0	130	42	38	90	0
2	0	0	0	0	44	40	86	0
3	0	0	0	0	44	42	76	0
4	0	0	0	76	42	44	68	0
5	115	0	0	93	42	46	60	0
6	45	0	0	93	42	48	56	0
7	0	0	0	75	29	50	60	0
8	0	0	0	55	34	54	64	0
9	0	0	0	75	35	56	60	0
10	0	0	0	78	36	56	56	0
11	0	0	0	69	0	56	48	0
12	0	0	0	80	21	56	52	0
13	0	0	0	89	21	58	52	70
14	0	40	0	55	21	60	52	44
15	0	204	0	62	20	60	104	32
16	0	202	0	62	0	65	100	30
17	0	0	0	64	0	65	95	28
18	0	0	0	55	0	65	84	0
19	0	0	0	50	0	65	74	0
20	0	0	0	52	0	70	72	0
21	0	0	0	52	0	70	72	0
22	0	0	0	52	0	75	50	0
23	0	0	0	52	0	80	48	0
24	0	0	0	50	0	83	38	0
25	0	0	280	52	0	84	30	0
26	0	207	300	52	0	85	28	0
27	0	43	290	50	0	86	0	0
28	0	0	270	52	0	87	0	0
29	0	0	230	52	36	88	0	0
30	0	0	170	52	36	89	0	0
31	0		140		37	90		0
Mean	5.0	23.2	54.1	61.0	18.8	64.9	55.8	6.6
Ac.Ft. for Month	308	1380	3330	3630	1150	3990	3320	405

NOTE: This is the drainage from Reclamation District 108 returned to the Sacramento River at Mile 44.0 Right. The discharge prior to May 25th was by pumping and for the remainder of the season by controlled gravity outlet. Additional drainage from Reclamation District 108 was discharged to Back Borrow Pit at Mile 20.2 Left. See Table 108.

*Beginning of record for season.

TABLE 107

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN
ON BACK BORROW PIT-1933

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		8	8	8	16	
2		8	8	8	16	
3		8	8	8	16	
4		8	8	8	16	
5		8	8	8	16	
6		8	8	8	14	
7		8	8	8	12	
8		8	8	8	10	
9		8	8	8	8	-
10		8	8	8	8	-
11		8	8	8	8	
12	*8	8	8	8	8	
13	8	8	8	8	8	
14	8	8	8	8	8	
15	8	8	8	8	8	
16	8	8	8	8	8	
17	8	8	8	8	8	
18	8	8	8	8	8	
19	8	8	8	8	8	
20	8	8	8	8	8	
21	8	8	8	10	8	
22	8	8	8	12	8	-
23	8	8	8	14	8	-
24	8	8	8	16	8	
25	8	8	8	18	8	
26	8	8	8	24	8	
27	8	8	8	24	8	
28	8	8	8	24	0	
29	8	8	8	24	0	
30	8	8	8	24	0	
31	8		8	24		
Mean	**8.0	8.0	8.0	12.1	8.9	0
Ac.Ft. for Month	**317	476	492	742	532	0

FLOW - NO

NOTE: This is drainage from Reclamation District 108 discharged by gravity outlet to Back Borrow Pit at Mile 20.2 Left.

*Drainage outlet completed and operation started.
**20 days.

TABLE 108

DISCHARGE OF RECLAMATION DISTRICT 108 DRAIN ON BACK BORROW PIT-1934

Day	Daily Discharge in Second-feet				
	Jun.	Jul.	Aug.	Sep.	Oct.
1	*21	16	16	30	1
2	21	16	16	30	1
3	21	16	16	30	1
4	21	16	16	28	1
5	21	16	16	25	1
6	21	16	16	22	1
7	21	16	16	18	1
8	21	16	16	15	0
9	21	16	16	12	0
10	20	16	16	10	0
11	19	16	16	10	0
12	18	16	16	10	0
13	16	16	16	10	0
14	16	16	16	16	0
15	16	16	16	23	0
16	16	16	16	16	0
17	16	16	16	10	0
18	16	16	16	10	0
19	16	16	16	18	0
20	16	16	16	27	0
21	16	16	17	22	0
22	16	16	18	17	0
23	16	16	15	11	0
24	16	16	14	6	0
25	16	16	12	6	0
26	16	16	18	6	0
27	16	16	23	6	0
28	16	16	26	6	0
29	16	16	29	6	0
30	16	16	30	6	0
31		16	32		0
Mean	17.8	16.0	17.9	15.4	0.2
Ac.Ft. for Month	1060	983	1100	917	14

NOTE: This is drainage from Reclamation District 108 discharged by gravity outlet to Back Borrow Pit at Mile 20.2 Left.

* Beginning of record for season.

TABLE 109

DISCHARGE OF COLUSA BASIN DRAINAGE AT KNIGHTS LANDING-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		195	133			626	294
2		200	117			553	236
3		200	179			422	228
4		200	186			381	218
5		15	237			359	194
6		0	273			365	147
7		21	653			359	143
8		22	412			989	139
9		22	370			309	133
10		37	370			232	127
11		203	369			217	130
12		484	136			217	133
13		674	202			196	144
14		110	530			184	127
15		607	304			192	127
16		791	245			192	126
17		272	199			185	121
18		365	157			196	114
19		516	157			208	108
20		310	166			203	101
21		276	168			192	95
22		252	189			173	88
23		262	***			170	82
24		420				151	75
25	*130	416			***	151	81
26	140	105			314	152	81
27	150	94			304	135	74
28	160	88			324	133	65
29	170	113			336	825	64
30	180	212			343	494	46
31		245			808		121
Mean	**155	249	**262	***	**405	305	128
Ac.Ft. for Month	**1840	15300	**11400	***	**4820	18200	7860

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. Marked 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 120.

*Beginning of record for season.
**Partial month.
***Record from June 23d to August 25th lost due to temporary discontinuance of Water Supervisor work.

TABLE 110

DISCHARGE OF COLUSA BASIN DRAINAGE AT KNIGHTS LANDING-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		400	140	135	285	137
2		360	129	139	282	135
3		320	128	144	277	131
4		280	135	149	273	136
5		319	120	153	295	119
6	*132	318	118	151	289	101
7	107	315	124	151	279	87
8	97	270	130	159	242	90
9	109	246	124	164	409	80
10	117	236	131	162	371	84
11	209	323	135	166	415	80
12	209	277	138	171	322	80
13	124	205	142	212	430	112
14	134	199	140	215	305	106
15	142	202	135	214	214	83
16	150	222	138	215	870	87
17	158	231	151	192	696	100
18	167	212	151	192	701	92
19	179	248	153	192	667	93
20	294	252	139	192	575	86
21	294	263	142	192	477	80
22	294	248	133	193	406	73
23	267	227	140	193	352	68
24	208	245	133	171	331	63
25	304	113	134	173	299	58
26	336	123	130	187	237	53
27	410	129	130	204	194	72
28	437	136	132	216	169	77
29	483	150	127	320	171	58
30	469	161	129	301	160	58
31	419		133	296		55
Mean	**240	241	134	191	366	88
Ac. Ft. for Month	**12400	14300	8260	11700	21800	5420

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. Marked 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 121.

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

TABLE 111

DISCHARGE OF SACRAMENTO SLOUGH-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		420	331	355	327	503	357
2		402	345	303	325	502	326
3		354	388	350	335	522	290
4		378	380	365	333	482	177
5		297	453	389	323	395	178
6		330	368	372	328	387	119
7		295	347	372	329	405	175
8		301	380	393	326	375	129
9		297	332	400	338	361	134
10		300	389	382	335	350	137
11		309	337	362	324	340	126
12		333	422	358	337	337	124
13		369	394	356	344	337	123
14	*402	341	383	369	343	331	121
15	311	371	327	382	351	329	123
16	322	332	371	377	340	291	119
17	288	322	336	255	337	374	114
18	314	331	335	369	333	342	114
19	299	378	415	367	334	405	122
20	234	378	341	365	359	343	132
21	152	260	336	346	337	290	128
22	147	446	387	311	348	402	126
23	141	438	374	307	346	554	126
24	151	421	378	313	347	498	128
25	154	433	369	317	351	480	123
26	147	386	399	321	355	455	110
27	210	394	421	325	362	433	99
28	217	382	265	327	367	350	61
29	224	463	353	327	367	346	123
30	259	398	348	328	357	363	109
31		421		328	395		104
Mean	**234	364	367	348	343	396	144
Ac.Ft. for Month	**7880	22400	21800	21400	21100	23600	8880
***Estimated inflow below gaging stations-Ac.Ft.	**300	1000	1370	720	780	750	1070
Monthly Diversions below gaging stations	0	0	111	350	899	0	0
Disch. to Sacramento R. Acre-feet	**8180	23400	23100	21800	21000	24400	9950

NOTE: This is return water discharged to Sacramento River via Sacramento Slough at Mile 21.2 Left. It is the sum of the flow as measured at three points: Outlet of R.D. 1500 Drain (Table 113), East Borrow Pit Sutter By-Pass at Chandler (Table 115) and West Borrow Pit Sutter By-Pass opposite Gelshauser Slough (Table 117).

*Beginning of record for season.

**17 days.

***Drainage to West Borrow Pit of Sutter By-Pass from rice irrigation in the By-Pass. See Note, Table 115.

TABLE 112

DISCHARGE OF SACRAMENTO SLOUGH-1934

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*248	254	301	374	370	305	213
2	223	273	301	435	370	289	219
3	223	274	299	344	367	335	235
4	227	288	190	350	368	156	263
5	228	279	296	353	365	273	310
6	292	219	296	362	414	295	336
7	278	363	299	372	394	342	342
8	257	292	297	376	382	304	346
9	190	230	306	378	382	343	342
10	109	317	306	378	382	356	340
11	78	323	304	381	385	197	332
12	70	351	301	379	385	328	324
13	69	339	296	377	385	433	319
14	85	339	343	375	385	424	308
15	85	342	398	368	382	382	296
16	85	326	395	377	382	347	288
17	91	337	392	353	382	373	275
18	110	338	388	351	380	206	259
19	126	341	383	348	380	256	221
20	127	344	380	354	386	296	113
21	137	347	376	354	395	358	110
22	239	348	383	354	375	466	336
23	288	349	465	358	315	335	318
24	309	350	383	360	310	356	316
25	325	353	377	361	306	268	318
26	375	360	370	366	294	189	315
27	310	363	418	368	182	178	310
28	301	416	493	370	302	175	304
29	278	422	418	362	305	202	301
30	267	425	378	364	305	207	301
31		399		367	305		301
Mean	201	332	351	367	355	299	287
Acre-feet for Month	12000	20400	20900	22600	21900	17800	17700
** Estimated inflow below gaging stations-Ac.Ft.	400	1500	**	**	**	**	**
Monthly Diversions below gaging stations	0	968	1291	1587	1534	891	575
Disch. to Sacramento R. Acre-feet	12400	20900	19600	21000	20400	16900	17100

NOTE: This is return water discharged to Sacramento River via Sacramento Slough at Mile 21.2 Left. For the period prior to June 1st it is the sum of the flow as measured at three points: (1) Outlet of R.D. 1500 Drain (Table 114), (2) East Borrow Pit Sutter By-Pass at Chandler (Table 116), and (3) West Borrow Pit Sutter By-Pass opposite Gelshauser Slough (Table 118). Subsequent to June 1st it is the sum of the flow as measured at (1) and a new lower station on the West Borrow Pit below the junction of the flow passing (2) and (3). See Table 119.

*Beginning of record for season.

**Drainage to West Borrow Pit of Sutter By-Pass from rice irrigation in the By-Pass. See Note, Table 116. Beginning June 1st this drainage was measured in the flow passing the new lower station on the West Borrow Pit.

TABLE 113

DISCHARGE OF RECLAMATION DISTRICT 1500 DRAIN-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*0	14	392	184	326	300	318	147
2	0	14	368	196	273	298	319	114
3	0	14	320	222	320	307	320	114
4	19	14	344	240	334	303	333	112
5	16	28	264	333	357	288	330	112
6	15	35	299	266	337	293	315	53
7	20	58	266	266	334	298	327	109
8	0	36	271	313	323	295	306	62
9	0	0	266	266	319	306	300	67
10	0	24	266	313	322	303	297	71
11	0	90	268	256	318	287	294	62
12	0	96	271	342	314	293	291	62
13	36	99	296	318	312	300	291	62
14	24	106	259	318	312	302	285	62
15	20	32	287	271	309	317	282	67
16	18	70	266	315	309	309	244	67
17	14	62	268	278	195	306	327	62
18	14	109	273	276	309	302	294	62
19	12	111	316	354	308	303	357	62
20	11	114	313	278	308	326	295	68
21	11	117	193	276	291	303	238	67
22	15	118	339	330	271	312	283	67
23	12	117	266	319	276	308	278	62
24	18	116	273	320	283	306	234	62
25	22	116	318	314	288	302	232	62
26	36	123	266	322	293	302	228	62
27	45	186	264	322	298	302	230	61
28	25	193	254	205	300	302	147	24
29	46	200	306	322	300	302	143	86
30	28	234	217	323	300	303	157	72
31	23		246		300	308		67
Mean	16.1	88.2	284	289	305	303	276	73.8
Ac.Ft. for Month	992	5250	17500	17200	18700	18600	16500	4540

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 three sources measured to obtain the total flow in Sacramento Slough. See Table 111.

*Beginning of record for season.

TABLE 114

DISCHARGE OF RECLAMATION DISTRICT 1500 DRAIN-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*103	25	203	231	349	321	244	111
2	0	0	213	231	404	321	228	111
3	155	0	213	229	294	318	272	115
4	0	0	238	120	291	321	93	113
5	155	0	238	224	291	318	211	110
6	103	64	170	224	300	318	234	111
7	103	50	308	225	306	318	281	111
8	0	50	236	227	312	318	243	115
9	0	51	177	228	312	318	268	112
10	52	52	275	227	312	318	274	115
11	53	62	291	225	315	321	102	117
12	111	53	321	222	315	321	230	119
13	55	53	311	217	315	321	333	119
14	56	69	313	269	315	321	324	118
15	52	69	317	326	315	321	282	116
16	45	69	303	326	321	321	247	118
17	45	75	315	326	321	321	275	118
18	46	94	318	324	318	321	111	119
19	47	110	321	324	315	321	164	99
20	47	110	324	324	321	327	206	0
21	68	120	327	320	321	336	188	0
22	13	222	327	320	321	314	178	228
23	47	270	327	402	321	256	95	213
24	48	291	327	320	321	251	166	216
25	22	285	330	314	321	247	118	222
26	44	293	330	311	324	235	94	222
27	40	238	333	354	324	121	96	219
28	40	238	333	429	324	241	94	216
29	45	213	339	354	315	244	119	213
30	26	213	348	364	315	244	112	213
31	0		360		318	244		213
Mean	52	115	293	285	318	294	196	140
Ac.Ft. for Month	3220	6820	18000	16900	19600	18100	11700	8610

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 112.

*Beginning of record for season.

TABLE 115

DISCHARGE OF SUTTER BY-PASS - EAST BORROW PIT
(WILLOW SLOUGH AT CHANDLER)-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	245	8	8	17	9	147	155
2	246	9	18	17	9	140	155
3	247	9	43	17	9	154	116
4	247	9	40	17	10	95	5
5	249	9	32	17	15	5	6
6	249	9	32	17	14	6	6
7	251	9	28	17	9	6	6
8	247	9	15	46	9	6	7
9	244	9	16	53	10	7	7
10	240	10	27	34	10	7	8
11	239	16	33	20	15	8	8
12	228	33	33	21	22	8	8
13	219	40	29	22	22	8	9
14	209	45	18	33	19	8	9
15	200	44	9	47	12	9	9
16	183	24	9	41	9	9	9
17	167	9	9	32	9	9	9
18	155	9	9	32	9	10	9
19	146	9	10	32	9	10	17
20	86	10	10	32	10	10	21
21	7	10	10	32	10	13	21
22	7	48	10	18	10	79	21
23	8	110	11	9	10	234	29
24	19	83	16	9	12	219	33
25	22	50	16	9	19	200	29
26	8	55	41	9	22	179	18
27	8	65	70	9	27	155	9
28	8	63	37	9	32	155	9
29	8	62	14	9	32	155	9
30	9	61	14	10	21	155	9
31		25		10	54		9
Mean	147	31.0	22.2	22.5	15.8	73.5	25.0
Ac.Ft. for Month	8730	1910	1320	1380	970	4380	1540

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 three sources measured to obtain the total flow in Sacramento Slough. See Table 111. In 1933 diversions were made from the East Borrow Pit above Chandler for a considerable rice acreage in the By-Pass which drained to the West Borrow Pit below the gaging station on the latter. Estimate of this return is shown in Table 111.

TABLE 116

DISCHARGE OF SUTTER BY-PASS - EAST BORROW PIT
(WILLOW SLOUGH AT CHANDLER)-1934

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	204	34	9	9	9	29	43
2	205	42	9	9	9	13	51
3	206	42	10	9	9	9	51
4	210	30	10	9	9	9	51
5	212	20	10	9	9	9	51
6	214	27	10	9	9	9	100
7	216	32	10	9	9	9	149
8	196	32	10	9	9	9	143
9	129	27	10	9	9	9	136
10	47	17	10	9	9	9	128
11	7	9	10	9	9	10	121
12	8	9	31	9	10	16	113
13	8	9	60	10	10	34	105
14	8	9	44	10	10	34	97
15	8	9	26	10	10	39	89
16	8	9	22	10	10	43	89
17	8	9	20	10	10	43	73
18	8	9	9	10	10	43	38
19	8	9	9	10	10	70	38
20	9	9	9	10	10	134	38
21	9	9	9	10	10	200	38
22	9	10	9	10	10	146	38
23	9	10	10	10	10	47	38
24	9	10	10	10	10	35	38
25	30	10	10	10	10	31	38
26	71	16	10	10	10	27	38
27	60	16	10	10	10	28	38
28	50	68	10	10	10	28	38
29	50	67	10	10	17	29	38
30	38	59	10	10	47	29	38
31		22		10	39		38
Mean	75.1	22.2	14.5	9.6	12.0	39.3	68.5
Ac.Ft. for Month	4470	1370	865	591	738	2340	4210

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 112. In 1934 diversions were made from the East Borrow Pit above Chandler for a considerable rice acreage in the By-Pass which drained to the West Borrow Pit below the upper gaging station on the latter. Beginning June 1st this return was measured in the flow passing a new lower station on the West Borrow Pit below Willow Slough junction. Estimate of the April and May return below the upper station is shown in Table 113.

TABLE 117

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT
OPPOSITE GELSHAUSER SLOUGH-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		20	139	12	18	38	55
2		25	131	13	18	43	57
3		25	123	13	19	48	60
4		25	100	14	20	54	60
5		24	88	15	20	60	60
6		22	70	18	21	66	60
7		20	53	21	22	72	60
8		21	52	24	22	63	60
9		22	50	28	22	54	60
10		24	49	26	22	46	58
11		25	48	24	22	38	56
12		29	47	23	22	38	54
13		33	47	22	22	38	52
14	*87	37	47	24	22	38	50
15	79	40	47	26	22	38	47
16	69	42	47	27	22	38	43
17	59	45	49	28	22	38	43
18	50	49	50	28	22	38	43
19	42	53	51	27	22	38	43
20	34	55	53	25	23	38	43
21	28	57	50	23	24	39	40
22	22	59	47	22	26	40	38
23	16	62	44	22	28	42	35
24	16	65	42	21	29	45	33
25	16	65	39	20	30	48	32
26	16	65	36	19	31	48	30
27	16	65	29	18	33	48	29
28	16	65	23	18	33	48	28
29	16	95	17	18	33	48	28
30	16	120	11	18	33	51	28
31		150		18	33		28
Mean	**35.2	48.5	56.0	21.1	24.4	46.0	45.6
Ac.Ft. for Month	**1190	2980	3330	1300	1500	2740	2800

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. This is one of three sources measured to obtain the total flow in Sacramento Slough. See Table 111.

*Beginning of record for season. ** 17 Days.

TABLE 118

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT
OPPOSITE GELSHAUSER SLOUGH-1934

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*19	17	17	29	20	38	38
2	18	18	16	31	22	38	41
3	17	19	15	33	25	38	43
4	17	20	14	34	28	38	48
5	16	21	14	36	28	39	53
6	14	22	15	37	28	40	58
7	12	23	15	33	28	42	63
8	11	24	14	33	28	43	70
9	10	26	15	33	28	44	78
10	10	25	16	33	28	45	76
11	9	23	17	33	28	46	74
12	9	21	18	30	28	48	72
13	8	19	18	26	29	49	70
14	8	17	17	22	29	50	68
15	8	16	16	20	30	51	66
16	8	14	15	16	30	53	65
17	8	13	14	12	29	54	63
18	8	11	15	8	29	55	62
19	8	11	16	9	28	56	61
20	8	11	17	10	28	58	60
21	8	11	17	11	29	60	54
22	8	11	18	11	30	55	48
23	9	12	20	12	31	51	42
24	9	13	22	12	33	47	36
25	10	13	24	13	35	43	36
26	11	14	26	14	36	40	36
27	12	14	28	14	37	38	36
28	13	15	28	15	38	35	36
29	15	16	28	15	38	33	36
30	16	18	28	16	38	35	36
31		17		18	38		36
Mean	11.2	16.9	18.4	21.6	30.1	45.4	53.6
Ac.Ft. for Month	668	1040	1100	1330	1850	2700	3290

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. This is one of the sources measured to obtain the total flow in Sacramento Slough. See Table 112.

*Beginning of record for season.

TABLE 119

DISCHARGE OF SUTTER BY-PASS - WEST BORROW PIT
1.4 MILES ABOVE R. D. 1500 DRAINAGE PLANT -1934

Day	Daily Discharge in Second-feet				
	Jun.	Jul.	Aug.	Sep.	Oct.
1	70	25	49	61	102
2	70	31	49	61	108
3	70	50	49	63	120
4	70	59	47	63	150
5	72	62	47	62	200
6	72	62	96	61	225
7	74	66	76	61	231
8	70	64	64	61	231
9	78	66	64	75	230
10	79	66	64	82	225
11	79	66	64	95	215
12	79	64	64	98	205
13	79	62	64	100	200
14	74	60	64	100	190
15	72	53	61	100	180
16	69	56	61	100	170
17	66	32	61	98	157
18	64	33	59	95	140
19	59	33	59	92	122
20	56	33	59	90	113
21	56	33	59	170	110
22	63	33	61	288	108
23	63	37	59	240	105
24	63	39	59	190	100
25	63	40	59	150	96
26	59	42	59	95	93
27	64	44	61	82	91
28	64	46	61	81	88
29	64	47	61	83	88
30	14	49	61	95	88
31		49	61		88
Mean	66.5	48.5	60.7	103	147
Ac.Ft. for Month	3960	2980	3730	6130	9060

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 112.

TABLE 120

DISCHARGE OF KNIGHTS LANDING RIDGE CUT AT WEST LINE OF YOLO BY-PASS-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		0	38			54	
2		0	57			38	
3		0	78			16	
4		0	80			8	
5		0	95			6	
6		0	113			6	
7		0	136			6	
8		0	80			0	
9		0	50			0	-
10		11	***			0	-
11		80				0	
12		113				0	FLOW
13		95				0	
14		5				0	
15		0				0	
16		0				0	
17		0				0	
18		0				0	
19		11				0	NO
20		3				0	
21		0				0	-
22		0				0	-
23		0				0	
24		0				0	
25	*0	0			***	0	
26	0	0			72	0	
27	0	0			70	0	
28	0	0			76	0	
29	0	0			79	0	
30	0	11			82	0	
31		23			72		
Mean	**0	11.3	**80.8	***	**75.2	4.5	0
Ac.Ft. for Month	**0	698	**1440	***	**895	266	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. This diversion is for irrigation in Yolo By-Pass. See Table 60.

*Beginning of record for season.
**Partial month.
***Record from June 10th to August 25th lost due to temporary discontinuance of Water Supervisor work.

TABLE 121

DISCHARGE OF KNIGHTS LANDING RIDGE CUT AT WEST LINE OF YOLO BY-PASS -1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		65	53	40	52	
2		55	51	42	51	
3		49	49	44	49	
4		44	52	46	44	
5		44	53	47	48	
6	*101	44	52	49	50	
7	86	44	56	49	50	
8	81	40	60	50	34	
9	88	33	57	52	12	
10	93	33	62	53	2	
11	96	26	64	55	2	
12	96	19	65	58	2	
13	93	16	64	59	0	
14	98	15	61	60	0	
15	102	15	63	60	0	
16	71	18	63	60	0	
17	74	20	63	60	0	
18	78	21	64	60	0	
19	84	27	60	60	0	
20	90	28	56	60	0	
21	90	30	53	60	0	
22	90	27	57	60	0	
23	78	24	54	60	0	
24	56	27	54	51	0	
25	54	31	55	51	0	
26	64	36	55	58	0	
27	71	39	56	65	0	
28	78	42	56	70	0	
29	93	40	57	59	0	
30	89	53	59	53	0	
31	73		60	51		
Mean	**83.3	33.5	57.5	54.9	13.2	0
Ac.Ft. for Month	**4300	1993	3540	3380	785	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. This diversion is for irrigation in Yolo By-Pass. See Table 61.

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

TABLE 122

DISCHARGE OF YOLO BY-PASS-EAST BORROW PIT
(TULE CANAL)-1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1			0	5	5	14	
2			0	5	5	13	
3			0	5	5	12	
4			0	5	5	11	
5			0	5	5	10	
6			0	5	5	9	
7			0	5	5	8	
8			0	5	5	7	
9			0	5	5	6	
10			0	4	5	5	
11			0	4	5	4	
12		FLOW	0	4	5	3	FLOW
13			0	4	5	2	
14			0	4	5	1	
15			0	4	5	1	
16			5	4	5	1	
17			5	6	5	1	
18			5	6	5	1	
19		NO	5	6	5	0	NO
20			5	6	5	0	
21			5	6	5	0	
22			5	6	5	0	
23			5	6	5	0	
24			5	5	5	0	
25			5	5	19	0	
26			5	5	20	0	
27	*0		5	5	19	0	
28	0		5	5	18	0	
29	0		5	5	17	0	
30	0		5	5	16	0	
31				5	15		
Mean	**0	0	2.5	5.0	7.9	3.6	0
Ac.Ft. for Month	**0	0	149	308	484	216	0

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 for irrigation in the By-Pass.

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

TABLE 123

DISCHARGE OF YOLO BY-PASS-EAST BORROW PIT
(TULE CANAL)-1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*0	43	10	20	30	7
2	0	38	10	20	30	7
3	0	32	9	20	30	6
4	0	28	10	20	30	4
5	0	32	10	21	30	4
6	0	33	10	21	30	4
7	0	34	11	21	30	4
8	0	32	11	21	30	3
9	0	31	11	21	40	3
10	0	30	12	21	50	3
11	0	29	12	21	60	2
12	1	28	12	22	60	2
13	2	27	13	24	70	2
14	4	25	13	35	60	2
15	7	23	13	50	50	2
16	10	22	14	50	40	2
17	13	20	14	0	30	2
18	16	19	14	0	20	2
19	19	18	15	0	15	2
20	22	17	14	5	15	2
21	25	16	17	10	12	2
22	28	15	18	15	11	2
23	31	14	18	20	10	2
24	34	12	18	25	10	2
25	45	11	19	30	9	2
26	46	11	19	30	9	2
27	48	11	19	30	8	2
28	50	10	20	30	8	2
29	50	10	20	30	7	2
30	34	10	20	30	7	2
31	43		20	30		2
Mean	17.0	22.7	14.4	22.4	28.0	2.8
Ac.Ft. for Month	1050	1350	885	1380	1670	172

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 for irrigation in the By-Pass.

*Beginning of record for season.

TABLE 124

DISCHARGE OF RECLAMATION DISTRICT 1000 DRAIN
(2nd BANNON SLOUGH)-1933

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*							64
2		108						
3								
4			64				76	
5	104		16					
6								
7								
8								120
9							92	
10							142	
11							67	
12	97			50			67	
13							58	
14	56							
15							58	80
16								
17							84	
18							58	
19	72							
20							58	
21			166				58	
22							51	56
23								
24							67	
25								
26	104							
27								
28							59	
29								48
30								
31								
Mean	14.0	3.6	7.9	1.7	0	0	33.2	11.9
Ac.Ft. for Month	859	214	488	99	0	0	1970	730

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 125

DISCHARGE OF RECLAMATION DISTRICT 1000 DRAIN
(2nd BANNON SLOUGH)-1934

Day	Daily Discharge in Second-feet							
	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*116							
2							68	
3							61	
4	173							
5							61	
6							53	
7								
8								
9								
10							166	
11	173							
12							98	
13								
14							98	
15								
16							120	
17							90	
18	166						50	
19								
20							83	
21								111
22								
23							91	
24								
25								
26						133	53	66
27						67		
28						67		
29						59		
30							53	
31								
Mean	20.2	0	0	0	0	10.5	38.2	5.7
Ac.Ft. for Month	1250	0	0	0	0	647	2270	351

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 126

DISCHARGE OF BACK BORROW PIT RECLAMATION DISTRICT 1000 -1933

Day	Daily Discharge in Second-feet						
	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1		22					
2		20					
3		20					
4		20					
5		20					
6		20					
7		20					
8		22					
9		24	'	'	'	'	'
10		25	'	'	'	'	'
11		30					
12		28	FLOW	FLOW	FLOW	FLOW	FLOW
13		26					
14		24					
15		22					
16		20					
17		18					
18		16					
19		14	NO	NO	NO	NO	NO
20		12					
21		10	'	'	'	'	'
22		8	'	'	'	'	'
23		6					
24		4					
25		2					
26		0					
27	*13	0					
28	15	0					
29	17	0					
30	19	0					
31	21	0					
Mean	**17.0	14.6	0	0	0	0	0
Ac.Ft. for Month	**169	899	0	0	0	0	0

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

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

TABLE 127

DISCHARGE OF BACK BORROW PIT RECLAMATION DISTRICT 1000 -1934

Day	Daily Discharge in Second-feet					
	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	*8	0				0
2	8	0				0
3	8	0				0
4	8	0				0
5	8	0				0
6	8	0				0
7	8	1				0
8	7	2				0
9	6	3				0
10	5	4				0
11	4	4				0
12	3	4	FLOW	FLOW	FLOW	0
13	1	4				0
14	1	4				0
15	1	3				0
16	1	3				1
17	1	3				2
18	0	3				2
19	0	2	NO	NO	NO	3
20	0	2				4
21	0	2				4
22	0	1				5
23	0	1				6
24	0	0				7
25	0	0				8
26	0	0				8
27	0	0				8
28	0	0				9
29	0	0				9
30	0	0				10
31	0					10
Mean	2.8	1.5	0	0	0	3.1
Ac.Ft. for Month	171	91	0	0	0	190

NOTE: This is water flowing down the borrow pit outside the east levee of Reclamation District 1000 and entering the Sacramento River at Mile 1.3 Left. It is measured 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 could not be made in 1933 and 1934. There is, therefore, no record of the Delta consumptive use of water in these years, for this report.

Table 128 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 in the years 1933 and 1934 and that probably the use of water in the latter years may be closely approximated by the consump-

tive use shown for the years 1930, 1931 and 1932.

TABLE 128

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.

Cooperative Irrigation Investigations

Through the Federal-State cooperation for Irrigation Investigations the Delta experimental work has been conducted by the Division of Irrigation, Bureau of Agricultural Engineering, U. S. Department of Agriculture, and has included probably as its most successful feature and that furnishing most definite and conclusive results, the consumptive use of water determinations for various Delta crops and vegetation grown in tanks. With the close of the 1930 season, the major portion of this investigation was practically completed. That is, the tank work had covered the range of the principal

crops grown in the Delta as well as some experimentation with aquatic growths and weeds. At that time, therefore, an analysis and summary of the results were submitted by the Bureau of Agricultural Engineering and used as the basis for the computations of the consumptive use of water in the Sacramento-San Joaquin Delta as presented in Bulletin 27 of the Division of Water Resources.

However, the period of the investigation with respect to certain of the consumptive use determinations appeared to have been somewhat short as the basis for final conclusions and it was considered desirable to continue the experimental work on these. In 1931 and 1932 the items included in this continuation of the work comprised the maintenance of tule, cattail, and various weed tanks at King Island, tule tanks at Simmons Island, asparagus tanks on the Richmond-Chase tract, evaporation stations at Grand, King and Simmons Islands and Byron, and a general study of the character, occurrence, and extent of water consuming weed growths in the Delta. In the computations for the 1932 consumptive use of water in the Delta one modification of the unit consumption figures was made on the basis of the data derived by the continued experimental work. This was an increase in the figure for the use of water by weeds, under the classification "Idle Land with Weeds," to correspond to a total annual consumption of 2.15 acre-feet per acre. The experimental work continued in 1933 and brought to a close at the end of that season comprised tule, cattail and various weed tanks at King Island, the asparagus tanks on the Richmond-Chase tract, and evaporation stations on King and Grand islands and at Byron. The work done and the results for 1933 are presented in the following report by Dr. O. V. P. Stout who was in charge of the work for the Division of Irrigation, of the U. S. Bureau of Agricultural Engineering.

COOPERATIVE IRRIGATION INVESTIGATIONS IN THE SACRAMENTO-SAN JOAQUIN DELTA IN 1933

By

O. V. P. Stout,
Irrigation Engineer,
Division of Irrigation,
Bureau of Agricultural Engineering,
United States Department of Agriculture.

INTRODUCTION

Cooperative irrigation investigations directed primarily to the determination of the amount of water used consumptively in the Sacramento-San Joaquin Delta were begun in 1924. The results have been set forth annually in the mimeographed reports of the Sacramento-San Joaquin Water Supervisor. Bulletin No. 23 of the Division of Water Resources, Department of Public Works, State of California, contains a summary of the work for the five-year period 1924-1928. The information secured has been an important factor in the consideration of the Central Valley Project and in the preparation of Bulletins No's. 27 and 28 of the Division of Water Resources, entitled respectively "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay" and "Economic Aspects of a Salt Water Barrier Below Confluence of Sacramento and San Joaquin Rivers."

This report is a statement of the progress made with the undertaking in the year 1933. The work of that year was carried on in an atmosphere of uncertainty from time to time as to whether funds for its support in the period just ahead would be forthcoming, but the final outcome was the completion of the season's work on the reduced scale which has obtained since 1930, when it was decided that a serviceable knowledge of the water

required for the irrigation of Delta crops had been built up, and that there remained only the investigation of the demands of aquatic plants, weeds and other non-crop plants.

TANK EXPERIMENTS

Experiments on the consumptive use of water by plants growing in tanks were conducted along the same lines as in 1932. Weeds and aquatic plants were observed in double tanks of galvanized iron consisting of an inner cylinder about 2 feet in diameter, perforated at the bottom and containing the soil. This inner cylinder was set in an outer water-tight cylinder of diameter a few inches greater. Each tank presents 2.9 square feet of soil surface, so that 15,000 (closely approximate) of them would be required to provide soil surface amounting to one acre. The asparagus tanks were of the same material and same type, but of larger diameter, each tank presenting 9.28 square feet of soil surface, and requiring 4,694 of them to make an acre. All tanks were 5 feet deep, and set in the soil so that their tops were slightly higher than the surrounding ground surface. A device was used in transplanting weeds, by means of which their setting in the tank was the undisturbed top foot of soil in which they had sprouted.

Tules and Cattails on King Island - Two tanks of tules and two of cattails were set in a patch of these plants at Camp 3, King Island, in the summer of 1930. Plants grew in the succeeding years from the roots of the original transplanting. The results for 1933 are shown in Table 129.

All living plants in the tanks were frozen in December, 1932, and little new growth was noted until after the patch was burned over on March 10, 1933. The cattails grew very rapidly in the ten days fol-

lowing the burning, so that as observed on March 21st the stalks were from 2 to 6 feet high. The ruling heights of tule stems on the same date were 6 and 12 inches. On March 22d all dead (1932) stalks and stems were cut off at the ground surface, water was pumped out of the tanks and fresh water put in. The water pumped out had not become noticeably brackish.

The observer's field note-book, containing the record of observations from April 30th to June 11th, inclusive, was lost. The use of water was therefore estimated for that period, taking into account for each tank the daily rates of use just before April 30th and just after June 11th, and also the season's record of evaporation at the weed tank plot on King Island.

As in 1932, the cattails in Tank No. 2 and the tules in Tank No. 3 seemed normal as compared with plants in the patch. The cattails in Tank No. 1, likewise as in 1932, were of inferior growth. The fact that the soil of the tank did not take water readily leads to the presumption that there was an overcrowding of roots. The tules in Tank No. 4, for some unknown reason, also grew somewhat less vigorously than the surrounding plants in the patch. It may be remarked (Table 129) that the use of water corresponds in a general way with the growth and vigor of the plants in the respective tanks noted above.

Weeds on King Island - The battery of 20 tanks on King Island, (p. 138, Water Supervisor's Report for 1932) was increased in May, 1933 by the transfer of four tanks from Simmons Island. The surrounding field crop was barley, as it was in 1932. The barley constituted practically the only protection of the tank-grown weeds from undue exposure to sun and wind. The harvest of the barley in early summer left the experimental weeds without

TABLE 129

USE OF WATER BY CATTAILS AND TULES GROWN IN TANKS AT CAMP 3, KING ISLAND, 1933

(Acre-feet per Acre)

Period		CATTAILS				TULES			
		Tank No. 1		Tank No. 2		Tank No. 3		Tank No. 4	
From	To	Increment	Summation	Increment	Summation	Increment	Summation	Increment	Summation
Jan. 16	Mar. 31	0.34	0.34	0.60	0.60	0.64	0.64	0.49	0.49
Mar. 31	Apr. 29	0.69	1.03	0.76	1.36	1.29	1.93	0.95	1.44
Apr. 29	Jun. 12	1.37	2.40	2.34	3.70	2.20	4.13	1.66	3.10
Jun. 12	Jul. 23	2.14	4.54	3.85	7.55	2.95	7.08	2.36	5.46
Jul. 23	Sep. 2	0.55	5.09	3.31	10.86	2.25	9.33	1.26	6.72
Sep. 2	Oct. 13	0.52	5.61	2.23	13.09	1.56	10.89	0.96	7.68
Oct. 13	Nov. 17	0.23	5.84	--	--	0.66	11.55	0.20	7.88

material protection except for weeds growing in the fence around the tank plot.

The stubble field surrounding the weed tanks was irrigated by flooding late in August and water entered the tank plot and flowed over the tops of tanks No's. 2, 5, and 6, and 15 to 24 inclusive. There is consequently at least a small measure of uncertainty in the interpolated reckoning of the use of water in a period of a few days including the date of the flooding.

Tanks No's. 2 and 6 contained each one plant curly dock (Rumex crispus), and tank No. 15 two plants of the same, transplanted from the field on February 9th. Tank No. 20 contained three plants of green dock (Rumex conglomeratus) transplanted on March 2d. The green dock in Tank No. 20 was harvested completely on July 19th. The curly dock in Tank No. 15 was harvested completely on July 1st, and in the other tanks was not finally harvested until November 10th, but the seed stems and matured leaves and stalks of a first growth were cut on various dates in June and July. The results, Table 130, show that a crop stand of dock would produce a heavy yield and use enough water to serve two or three times as great an area of field crops. A full stand of the plant on an area is seldom or never encountered, however, as it grows in scattering fashion on neglected wet areas and pastures, and more compactly on ditch banks and slopes, including roadside ditches. It is strongly frost resistant and accomplishes more or less of growth in the winter season in California.

On May 27th western goldenrod (solidago occidentalis) from the north side of the county road on King Island was set in tanks No's. 10 and 18. The plants grew and proved to be heavy users of water. They were

harvested on November 10th. At the close of the season the plants in the two tanks presented different styles of growth. Twenty-two plants with from 1 to 5 stalks to the plant were counted in tank No. 10. Tank No. 18 contained two plants with a total of 17 stalks. At the time of harvest the blooms had ripened, but the plants were in full green leaf and using water. Some new shoots were noted starting upward from the roots. Plants were 4 feet or a little more in height. The numerical data of the experiment are set forth in Table 131.

On March 23d some barley with weeds was transplanted to the tanks from a field in the north half of King Island. The weeds consisted mostly of wild mustard and radish. It is estimated that birds got about two-thirds of the grain as it ripened. At the time of transplanting the ruling height of the barley was about 6 inches in Tanks No's. 3, 7, and 11, and about 7 inches in Tank No. 14. The mustard, radish, etc. were then quite close to the ground in all tanks. Aphis appeared near the end of May on the mustard in the tanks and they were sprayed, but not before the plants in tank No. 11 had suffered considerable damage. The grain and weeds in these tanks were harvested on June 25th and 26th. The quantitative data of the experiment appear in Table 132.

On November 16, 1932 the so-called kelp (Polygonum amphibium, var. Hartwrightii) was introduced into tanks No's. 4, 8, 12, 16, and 19, by taking roots from the field and burying them about 2 or 3 inches beneath the surface of the soil in the tanks. They did not get much of a start in growth during the winter, and use of water was correspondingly low. Up to May 19th the use in the five tanks, No's. 4, 8, 12, 16, and 19 was respectively 1.42, 0.82, 1.62, 0.83, and 1.04 acre-feet per acre.

TABLE 130

USE OF WATER BY AND YIELDS OF DOCK GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number 2	6	15	20
Record of use of water begun	Feb.13	Feb.13	Feb.13	Mar.11
Cumulative Use of Water in Ac.Ft./Ac. to -				
May 18	2.17	2.49	3.28	2.79
Jul. 1	--	--	5.25	--
Jul. 19	5.40	5.17	--	7.26
Aug. 30	6.84	6.59		
Oct. 15	8.00	7.70		
Nov. 10	8.35	7.92		
Dates of final harvest	Nov.10	Nov.10	Jul. 1	Jul.19
Total yield of air-dry matter in aerial portion of plant, Tons per acre	13.17	13.75	16.15	17.99
Nominal depth to water table in feet	1.50	2.00	1.25	1.00

Tanks 2-6-15 transplanted on February 9th.
Tank 20 transplanted on March 2d.
Tanks 2-6-15 are Rumex crispus, or curly dock.
Tank 20 is Rumex conglomeratus, or green dock.

-- 0 --

TABLE 131

USE OF WATER BY AND YIELDS OF WESTERN GOLDENROD (SOLIDAGO OCCIDENTALIS) GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number 10	18
Nominal depth to water table in feet	2.50	2.50
Record of use of water begun	May 31	May 31
Cumulative Use of Water in Ac.Ft./Ac. to August 13	4.38	3.24
Cumulative Use of Water in Ac.Ft./Ac. to November 10	8.04	5.75
Date of harvest	Nov.10	Nov.10
Yield of air-dry matter in aerial portion of plant, Tons per Acre	8.88	5.62

Transplanted May 27th from north side of county road, south side of check 1, camp 3, King Island.

Table 133 shows, along with the other quantitative data, that by the time of harvest of the kelp on November 10th the total use of water in 12 months had reached a considerable amount, averaging for the growing season nearly or quite twice the alfalfa requirement.

Seedling plants of lambs' quarters (Chenopodium album) were taken from the field on May 6th, 8th, and 9th and set in Tanks No's. 1, 5, 9, 13, and 17, from which nettles had been removed a few days previously, after having occupied the tanks for 13 months. The lambs' quarters plants were harvested on September 20th, at which time the use of water and the yield of the air-dry aerial portion of the plants were as indicated, along with other data, in Table 134. In the period from transplanting up to August 12th they had used about 80 per cent of the amount of water that they used up to harvest.

The tanks brought over from Simmons Island and set in the weed tank plot on King Island were designated as No's. 21, 22, 23, and 24. Nut-grass from the field was set in these tanks on May 26th and 27th, at which time the ordinary range of lengths of grass blades was from 4 to 14 inches, with prevailing length about 10 inches. The grass lived throughout the season, and grew some, but did not fruit. By the end of October the grass in all four tanks was apparently dead, and on November 8th it was harvested. The quantitative data of the experiment appear in Table 135.

Tanks No's. 3, 7, 11, 14, 15, and 20 were permitted to sprout volunteer crops of weeds after mustard and grain were removed from No's. 3, 7, 11, and 14 on June 25th and 26th, and dock from No. 15 on July 1st and from No. 20 on July 19th. This procedure gave a random density of

TABLE 132

USE OF WATER BY AND YIELDS OF BARLEY AND MUSTARD GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number			
	3	7	11	14
Nominal depth to water table in feet	2.00	2.50	2.00	2.50
Record of use of water begun	Mar.26	Mar.30	Mar.31	Mar.31
Cumulative use of water in Ac.Ft./Ac. to				
June 26:	2.97	3.04	2.11	2.33
Date of harvest June -	25-26:	25-26:	25-26:	25-26:
Yield of grain and straw, Tons per acre	3.31	3.06	2.95	3.57
Yield of air-dry weeds, Tons per acre	4.29	7.86	5.84	5.73
Total yield of air-dry matter in aerial portion of plants, Tons per acre	7.60	10.92	8.79	9.30

Transplanted from field on March 23d.
It is estimated that birds got about two-thirds of the grain.

-- 0 --

TABLE 133

USE OF WATER BY AND YIELDS OF KELP* GROWN IN TANKS AT KING ISLAND, 1932-33

Item	Tank Number				
	4	8	12	16	19
Nominal depth to water table in feet	1.70	3.00	1.35	2.60	1.80
Record of use of water begun - 1932	Nov.16	Nov.16	Nov.16	Nov.16	Nov.16
Cumulative Use of water in Ac.Ft./Ac. to-					
May 18, 1933	1.42	0.82	1.62	0.83	1.04
Nov.10, 1933	7.29	6.12	8.81	4.24	5.34
Date of harvest 1933	Nov.10	Nov.10	Nov.10	Nov.10	Nov.10
Yield of air-dry matter in aerial portion of plant, Tons per acre	4.04	4.35	5.18	3.14	3.23

*This is the local name for Polygonum amphibium var. Hartwrightii.

Roots from field set in tanks November 16, 1932.

TABLE 134

USE OF WATER BY AND YIELDS OF LAMBS' QUARTERS (CHENOPODIUM ALBUM) GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number				
	1	5	9	13	17
Nominal depth to water table in feet	2.50	2.50	2.50	2.50	2.50
Record of use of water begun	May 11	May 11	May 11	May 11	May 12
Cumulative use of water in Ac.Ft./Ac. to					
Aug. 12	3.80	3.33	3.11	3.38	3.70
Sep. 20	4.41	4.37	3.84	4.32	4.57
Date of harvest	Sep.20	Sep.20	Sep.20	Sep.20	Sep.20
Yield of air-dry matter in aerial portion of plant, Tons per acre	6.64	4.52	6.11	7.15	6.68

Transplanted from field as follows:
Tanks No. 1-5-9 on May 6th.
Tank No. 13 on May 8th.
Tank No. 17 on May 9th.

-- 0 --

TABLE 135

USE OF WATER BY AND YIELDS OF NUT-GRASS (CYPERUS ESCULENTUS) GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number			
	21	22	23	24
Nominal depth to water table in feet	1.50	2.00	1.50	2.00
Record of use of water begun	Jun. 2	Jun. 3	Jun. 3	Jun. 3
Cumulative use of water in Ac.Ft./Ac. to -				
Aug. 30	3.68	2.98	3.10	2.81
Nov. 8	4.10	3.63	4.16	3.40
Date of harvest	Nov. 8	Nov. 8	Nov. 8	Nov. 8
Yield of air-dry matter in aerial portion of plant, Tons per acre	2.29	3.37	5.19	3.60

Nut-grass transplanted from field to tanks on May 26-27.

stand of plants in the tanks, as distinguished from a selected and therefore probably overdense stand in the instances of transplanting. Table 136, which includes with other quantitative data, the use of water, shows that although this use considerably exceeds that of the general run of crop plants, the excess is of less magnitude than in a good many of the instances of transplanted weed growths.

The nettle (Urtica gracilis var.), so common along ditch banks in the Delta, come up in 1933 in Tanks No's. 1, 5, 9, 13, and 17, from roots which had supported plants in 1932. None of them thrived, and on May 4, 1933 all of them were harvested. The record of use of water and yield of plants is given in Table 137.

Asparagus on Richmond-Chase Ranch - The twelve asparagus tanks on Richmond-Chase ranch No. 7, three miles east of Terminous, were continued in service and under observation in 1933. This was the seventh season of record for this experiment, the nursery crowns having been set in the tanks in 1927. The amounts of water used and the yields of spears and tops or fern are given in Table 138.

Table 139 gives average water used and average yields of tops and spears for each of the seven years of the experiment.

METEOROLOGICAL RECORDS

Equipment for obtaining records of rainfall, evaporation, temperature, and humidity was in place in 1933 at King Island, Grand Island, and Byron. Of the records thus obtained only that of rainfall at King Island will be reported here, along with rainfall record furnished by Mr. H. F. Churchill, superintendent for the Richmond-Chase Company. These records are set forth in Table 140.

TABLE 136

USE OF WATER BY VOLUNTEER WEEDS GROWN IN TANKS AT KING ISLAND, 1933

Item	Tank Number					
	3	7	11	14	15	20
Nominal depth to water table, in feet	1.00	1.50	3.00	2.50	2.00	0.10* 2.67
Record of use of water begun	Jun. 29	Jun. 30	Jun. 30	Jun. 30	Jul. 5	Jul. 20
Cumulative use of water in Ac.Ft./Ac, to Aug. 11	0.69	0.98	---	---	---	---
Nov. 8	3.40	3.65	2.52	2.76	3.29	2.74
Date of harvest	Nov. 8	Nov. 8	Nov. 8	Nov. 8	Nov. 8	Nov. 8
Weeds noted in tanks **	c-bur w-grass radish barley smt-wd	c-bur lmb-qtr w-grass radish smt-wd	c-bur lmb-qtr w-grass radish smt-wd barley	c-bur lmb-qtr radish pig-wd	c-bur lmb-qtr nt-grs Jnsn-gr w-grs smt-wd	cat-tl. w-grass

Weeds sprouted after barley and weeds had been harvested from tanks 3-7-11-14 and dock from tanks 15-20.

*The only water added to tank 20 while this crop was growing was the accidental flooding on Aug. 30. On July 20 the water table stood at 0.28. Just before the flooding it stood at 1.70. The flooding raised it to 0.10, and by Nov. 8 it had fallen to 2.67.

**Abbreviations as follows: cocklebur, c-bur; cat-tail, cat-tl; water grass, w-grass; lambs' quarters, lmb-qtr; nut grass, nt-grs; pigweed, pig-wd; Johnson grass, Jnsn-gr; smartweed, smt-wd.

-- 0 --

TABLE 137

USE OF WATER BY AND YIELDS OF NETTLES (URTICA GRACILIS VAR.) GROWN IN TANKS AT KING ISLAND, 1933

Item		Tank Number				
		1	5	9	13	17
Record of use of water begun		Jan. 3	Jan. 2	Jan. 3	Jan. 9	Jan. 4
Date of harvest	1933	May 4	May 4	May 4	May 4	May 4
Nominal depth to water table, in feet		3.50	3.00	2.50	2.00	1.50
Cumulative use of water in Ac.Ft./Ac. to May 4, 1933		1.03	0.88	0.85	0.44	0.64
Yield of air-dry matter in aerial portion of plant, Tons per acre		2.32	1.52	1.30	0.52	1.48

Tank 1 contained a nettle growing from an old root, set in April, 1932. The plants in the other tanks came up from roots of seedlings transplanted from the field in April, 1932.

All were harvested and the roots dug out on May 4, 1933, as none was doing well and the growths were not representative of plants growing at large.

TABLE 138

USE OF WATER, WEIGHT OF TOPS (1) AND YIELD OF SPEARS, ASPARAGUS TANKS, RICHMOND-CHASE TRACT, NEAR TERMINOUS, 1933

Tank Number	Sex of Plant (2)	Depth to water table (3)	Water used in 1933	Weight of tops in 1933 (4)	Water used in 1932 (5)	Weight of Spears in 1933
		Feet	Acre-feet per Acre	Grams	Acre-feet per Acre	Grams
1	P	2	3.80	1,396	3.13	802
2	S	2	5.26	786	3.64	1,187
3	P	2	4.47	881	2.81	2,055
4	P	2	3.47	641	2.90	747
5	P	3	1.76	124	1.37	391
6	S	3	3.66	342	2.55	1,436
7	P	3	2.76	735	2.18	860
8	S	3	4.06	450	2.35	855
9	P	4	3.30	638	2.24	1,526
10	S	4	1.57	219	1.69	660
11	P	4	4.30	1,135	3.04	956
12	S	4	2.00	312	1.53	728

(1) Tops were weighed following a period of damp weather, so that these weights are probably somewhat in excess of the truth for dry weight. Duplicate weighings of dock in dry weather and in damp weather, respectively, showed the damp-weather weights to be 10 per cent greater than the dry-weather weights.

(2) P signifies pistillate, S staminate.

(3) Nominal approximate depths. Actual depths in general exceeded these somewhat, the excess occasionally amounting to as much as one foot in some tanks.

(4) Including berries. Separation of berries prevented by moulding.

(5) Given for consideration with weight of spears in 1933.

TABLE 139

AVERAGE USE OF WATER BY AND AVERAGE YIELDS OF ASPARAGUS GROWN IN TANKS, RICHMOND-CHASE TRACT, 1927 TO 1933, INCLUSIVE

Item	Year						
	1927	1928	1929	1930	1931	1932	1933
Average water used, Acre-feet per acre	1.67	3.32	2.26	2.37	3.81	2.45	3.77
Total yield of tops (Inc. berries), grams	2,131	4,923	4,848	--	--	--	7,659
Total yield of tops (Exc. berries), grams	1,116	3,540	4,559	3,126	5,487	4,307	--
Total yield of spears, grams	--	--	14,186	13,901	13,560	26,813	12,203
Average yield of tops (Exc. berries), Tons per acre	0.481	1.526	1.966	1.348	2.366	1.857	--
Average yield of spears, Tons per acre	--	--	6.117	5.994	5.847	11.561	5.262

TABLE 140

RAINFALL AT DELTA STATIONS IN 1933

King Island				Richmond-Chase Ranch			
Day	Daily Inches	Summation Inches	Summation Feet	Day	Daily Inches	Summation Inches	Summation Feet
Jan. 4	.05	.05	.004	Jan. 19	1.16	1.16	.097
18	.06	.11	.009	20	.14	1.30	.108
19	.93	1.04	.087	22	.29	1.59	.132
20	.16	1.20	.100	23	.70	2.29	.191
21	.20	1.40	.117	25	.85	3.14	.262
23	.59	1.99	.166	26	.07	3.21	.267
25	.87	2.86	.238	28	.52	3.73	.311
26	.12	2.98	.248	29	.23	3.96	.330
28	.48	3.46	.288				
29	.24	3.70	.308				
Feb. 12	.66	4.36	.363	Feb. 13	1.00	4.96	.413
13	.10	4.46	.372	16	.08	5.04	.420
16	.06	4.52	.377				
21	.12	4.64	.387				
Mar. 12	.51	5.15	.429	Mar. 13	1.05	6.09	.507
13	.49	5.64	.470	15	.02	6.11	.509
16	.44	6.08	.507	16	.62	6.73	.561
26	.15	6.23	.519	26	.14	6.87	.572
28	.39	6.62	.552	28	.98	7.85	.654
29	.02	6.64	.553				
Apr.	No rain			Apr.	No rain		
May 2	.06	6.70	.558	May 5	.35	8.20	.683
6	.10	6.80	.567	8	.54	8.74	.728
7	.50	7.30	.608	21	.22	8.96	.747
8	.05	7.35	.612				
21	.22	7.57	.631				
Jun. 28	.05	7.62	.635	Jun.	No rain		
				Jul.	No rain		
Later record not available when this table was prepared				Aug.	No rain		
				Sep.	No rain		
				Oct. 30	.20	9.16	.763
				31	.69	9.85	.821
				Nov.	No rain		
				Dec. 4	.65	10.50	.875
				12	1.20	11.70	.975
				13	.61	12.31	1.026
				14	.42	12.73	1.061
				15	.43	13.16	1.097
				30	1.00	14.16	1.180
				31	.45	14.61	1.218

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, in such seasons as that of 1934, 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

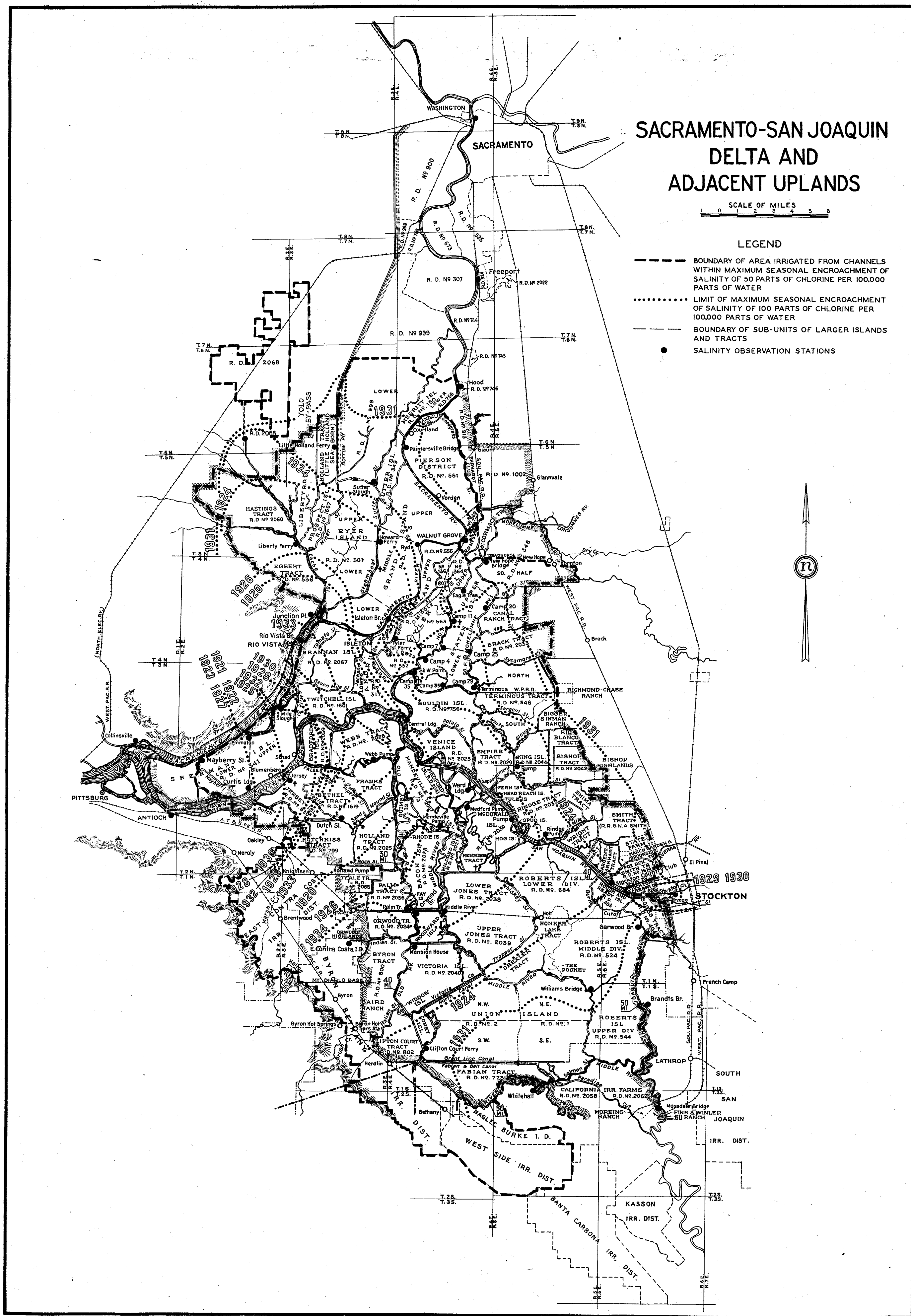
The scope of this investigation each season has been such as to insure that samples of water to be tested for salinity would be taken at regular intervals at a sufficient number of stations throughout the Delta and upper Bay region that the advance and retreat of the salinity from

early Summer to late Fall would be completely recorded. In 1933 and 1934 the Summer stream flow to the Delta dropped to minimums of 1900 and 1400 second-feet, respectively, and in each year the location of the line representing salinity encroachment of 100 parts of chlorine per 100,000 parts of water was, correspondingly, well up in the Delta. In 1934 particularly, the encroachment approached very closely that of 1924, in fact exceeding the latter in the Sacramento Delta but stopping somewhat short of it in the San Joaquin Delta. This is indicated on Plate 3 which shows the limit of encroachment into the Delta of 100 part salinity in the years 1920 to 1934, inclusive. Sixteen Bay and Delta sampling stations are maintained permanently throughout the year, and seventeen additional stations in 1933 and thirty-four additional in 1934 were established and maintained for the duration of the season in order to completely record the encroachment and recession.

Station Maintenance and Records

As in the past, the salinity sampling at all regular 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 1933 and 1934 are given in Tables 143 and 144, and Table 142 gives the location and description of each station.

The maximum salinity as recorded at the stations operated in



MAXIMUM SEASONAL SALINITY ENCROACHMENT OF 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER, SACRAMENTO-SAN JOAQUIN DELTA, 1920-1934

PLATE 3

1933 and 1934 is shown in Table 141. 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 1933 and 1934 and the corresponding salinity at certain of the lower Delta stations is shown on Plate 4.

Salinity Bulletins

With an exceptionally high encroachment of salinity in the 1934 season, 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. In the period from July to October, therefore, bulletins reporting the salinity at the various stations were mailed to a list of more than 200 water users, at weekly or ten-day intervals. In addition, many samples taken by various landowners at points other than the regular stations were tested and the results forwarded to the individuals particularly interested.

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. The record of these gages has therefore been continued as an essential requirement in connection with any further such analysis for subsequent salinity, stream flow and tidal conditions. Of the stations which supplied data used in the investigation for Bulletin 27, four are being 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, and the remaining stations, eight in number, are being maintained by the Water Supervisor. The latter 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).

TABLE 141

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1924 TO 1934, INCLUSIVE

YEAR	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
SACRAMENTO-SAN JOAQUIN RUN-OFF IN PER CENT OF NORMAL*	28	83	57	114	80	42	63	29	78	46	40**
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
POINT DAVIS			1850	1510	1610	1660	1620	1810	1520	1680	1800
BULLS HEAD POINT			1690	1330	1410	1370	1380	1690	1320	1380	1640
BAY POINT			1400	950	1170	1050	1060	1540	1010	1160	1460
O AND A FERRY	1345	762	1100	510	750	830	800	1390	620	900	1200
INNISFAIL FERRY						870	810	1400	680	900	1260
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
EMMATON	802	136	540	65	156	310	250	1000	166	380	760
THREE MILE SLOUGH BRIDGE	692	81	430	25	109	205	150	860	90	320	660
RIO VISTA BRIDGE	608	21	256	12	44	67	52	740	28	130	520
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

* NORMAL TAKEN AS 40-YEAR MEAN (1889-1929) OF NATURAL RUN-OFF AT FOOTHILL STATIONS OF MAJOR TRIBUTARIES.
** BASED ON MEASURED RUN-OFF. - NATURAL FLOW NOT COMPILED.
(1) FOR LOCATION AND DESCRIPTION SEE TABLE 142.
(2) MAXIMUM SALINITY OBTAINED FROM FIRST SAMPLE TAKEN IN SEASON.

TABLE 141 (CONTINUED)

MAXIMUM RECORDED SALINITY AT BAY AND DELTA STATIONS
1924 TO 1934, INCLUSIVE

YEAR	1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934
SACRAMENTO-SAN JOAQUIN RUN-OFF IN PER CENT OF NORMAL*	28	83	57	114	80	42	63	29	78	46	40**
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	113		32		25	8	7	245		13	
TYLER ISLAND FERRY	44		19			9	9	200			10
CAMP 11, STATEN	96		23			7		134		5	25
CAMP 29, STATEN			25		16	11		182			52
CAMP 25, STATEN	110		24			7		164		7	
CAMP 20, STATEN			22			8		124			18
					SAN JOAQUIN RIVER DELTA						
ANTIOCH	1080	356	920	179	450	600	470	1240	400	580	960
CURTIS LANDING						450		1060	280	470	810
JERSEY	708	81	470	53	192	365	220	910	150	280	(2)620
WEBB PUMP	414	24	147	16	46	80	61	680	35	122	(3)340
CENTRAL LANDING	288	10	98		19	20	15	425	8	25	(4) 90
DUTCH SLOUGH								510	37	80	280
WARD LANDING						23	16	350			190
HOLLAND PUMP	308	18	148		34	42	23	325	11		
BACON PUMP (5)										25	160
MANDEVILLE PUMP			84		25	25	17	350	18	29	166
KING ISLAND PUMP	164		48		19	16		261			104
RINDGE PUMP	126	35	50		28	28	16	198	16	22	94
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
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	(6) 25

*NORMAL TAKEN AS 40-YEAR MEAN (1889-1929) OF NATURAL RUN-OFF AT FOOTHILL STATIONS OF MAJOR TRIBUTARIES.
**BASED ON MEASURED RUN-OFF. - NATURAL FLOW NOT COMPILED.
(1) FOR LOCATION AND DESCRIPTION SEE TABLE 142.
(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.
(5) BACON PUMP SUBSTITUTED FOR HOLLAND PUMP ON ACCOUNT OF CONSTRUCTION OF A DAM IN ROCK SLOUGH BELOW HOLLAND PUMP.
(6) PROBABLY A LOCAL CONDITION AND NOT AN ENCROACHMENT FROM DOWNSTREAM. SEE RECORD SEPTEMBER 22 TO OCTOBER 6, TABLE 144.

TABLE 142

SALINITY STATIONS AT WHICH OBSERVATIONS WERE TAKEN DURING 1933 AND 1934

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 142 (CONTINUED)

SALINITY STATIONS AT WHICH OBSERVATIONS WERE TAKEN DURING 1933 AND 1934

STATION	MILES FROM GOLDEN GATE	TIME INTERVAL BETWEEN HIGH TIDE AT GOLDEN GATE AND TIME FOR TAKING SAMPLES AT STATION HOURS	MINS.	LOCATION
				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.
WARD LANDING	79.6	7	35	SAN JOAQUIN RIVER NEAR JUNCTION WITH LITTLE CONNECTION SLOUGH ON THE SOUTHWEST SIDE OF EMPIRE TRACT.
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.
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 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
				DRAINAGE WATER STATIONS
JERSEY DRAIN	61.4	—	—	JERSEY ISLAND DRAINAGE PUMP ON SAN JOAQUIN RIVER, ABOUT ONE MILE BELOW FALSE RIVER.
GRAND ISLAND DRAIN (STEAMBOAT SLOUGH)	68.2	—	—	GRAND ISLAND DRAINAGE PUMP ON STEAMBOAT SLOUGH, ABOUT THREE MILES FROM JUNCTION POINT.
CAMP 35 DRAIN, STATEN ISLAND	78.7	—	—	STATEN ISLAND, DRAINAGE PUMP ON SOUTH FORK MOKELUMNE RIVER, ONE MILE FROM JUNCTION WITH NORTH FORK MOKELUMNE RIVER.
BACON ISLAND DRAIN	82.9	—	—	BACON ISLAND DRAINAGE PUMP ON OLD RIVER NEAR JUNCTION WITH ROCK SLOUGH.
MANDEVILLE DRAIN	83.0	—	—	MANDEVILLE ISLAND DRAINAGE PUMP ON CONNECTION SLOUGH, ABOUT 1 MILE FROM MIDDLE RIVER.
CAMP 11 DRAIN, STATEN ISLAND	83.1	—	—	STATEN ISLAND DRAINAGE PUMP ON NORTH FORK MOKELUMNE RIVER, FOUR MILES ABOVE JUNCTION WITH SOUTH FORK MOKELUMNE RIVER.

* PERMANENT STATION MAINTAINED THROUGHOUT THE YEAR.

TABLE 143

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	1560	1440	1500	1460	1460	1520	1360	1320
Point Davis			1160	1200	1120	1160	1020	880
Bulls Head Point	880	880:a	480	820	840:a	480	540	460
Bay Point	540	540	600	580:a	380	580	480	240
O and A Ferry	138	230	230	260:a	130	310	130	12
Innisfail Ferry	420:a	500	380	380	340	340	340	320
North San Pablo Bay								
Sonoma Creek Bridge	1120		1040		1040		980	
Grandview	1260		1100		1100		1080	
Vallejo		:c	880:c	1100	1100	900:bd	820	
Cuttings Wharf	980		920		860		122	
Sacramento River Delta								
Collinsville	62	90	116	116	44	103	38	12
Emmaton	4	2	3		3	2	2	1
Sacramento	1	2	1	1	1	1:a	1	1
San Joaquin River Delta								
Antioch	42	34	49	32	53	72	32	12
Jersey			9	9	7	16:a	8	6
Central Landing		4	3	3	4	4	4	3
Rindge Pump	10	10	10	10:a	10	12	12	7
Middle River P. O.	:ab 8:a	9	8	7:a	9:a	9	9	11
Stockton	20:a	20	20:a	32				27
Mossdale Bridge	3	5	5:ab	4	7	6:a	9	4
Drainage Water Stations								
Jersey Drain			39	45	46	52	61	66
Grand Is. Dr.(Steamboat)	:c 6:c	4:c	6:c	7:c	6	10	7	
Camp 35 Dr. (Staten Is.)	21	24	27	27	6	33	28	30
Bacon Island Drain	12	12	11	11	11	15	16	16
Mandeville Drain		16	18	16	17	19	21	25
Camp 11 Dr. (Staten Is.)	25	34	33	33	17	44	30	36

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

TABLE 143 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	FEBRUARY						
	2	6	10	14	18	22	26
	San Francisco, San Pablo and Suisun Bays						
Point Orient	1160:	1300:	1300:	1320:	1300:	:	1140:
Point Davis	:	1020:	:	840:	940:	780:	720:
Bulls Head Point	500:a	280:ab	230:	420:	540:a	138:	500:
Bay Point	130:	270:	262:	:a	42:	260:	140:
O and A Ferry	31:	19:	25:	22:	17:	11:	23:
Innisfail Ferry	126:	146:	180:	184:a	246:	138:	152:
	North San Pablo Bay						
Sonoma Creek Bridge	620:	:	580:	:	600:	:	700:
Grandview	920:	:	760:	:	780:	:	880:
Vallejo	580:	:	660:	:	:b	520:b	590:
Cuttings Wharf	33:	:	420:	:	120:	:	410:
	Sacramento River Delta						
Collinsville	4:	3:	:	5:a	4:	10:	5:
Emmaton	4:	1:	2:	2:	2:	2;	:
Sacramento	:	1:	1:	1:	1:	1:	1:
	San Joaquin River Delta						
Antioch	5:	4:	6:	6:	8:	8:	8:
Jersey	8:	7:	7:	6:	8:	:	:
Central Landing	:ad	2:	4:	1:	4:	4:	:
Rindge Pump	7:	9:	7:	8:	6:	6:	7:
Middle River P.O.	16:	11:	9:a	10:	10:a	6:	7:
Stockton	42:	30:	30:	23:	25:	:	:
Mossdale Bridge	:a 3:	9:	4:	:	4:	4:ab	4:
	Drainage Water Stations						
Jersey Drain	68:	64:	61:	63:	24:	:	:
Grand Island Dr.(Steamboat)	e 8:	:	10:b	11:e	10:e	9:e	9:
Camp 35 Dr.(Staten Island)	30:	27:	25:	25:	28:	26:	25:
Bacon Island Drain	15:	13:	12:	13:	13:	13:	13:
Mandeville Drain	:	25:	24:	24:	24:	24:	23:
Camp 11 Dr.(Staten Island)	34:	28:	14:	12:	11:	7:	20:

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

TABLE 143 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	1400	1180		1400	1220	1180:b	1220	1320
Point Davis		900	900	920	600	560	:a	420
Bulls Head Point	730	620	680	560	240	250:a	260:a	130
Bay Point	:b 230	:a 34	:b 320	:a 68	120	50:a	30:a	12
O and A Ferry	:d 13	35	20	:a 10	4	2:a	2	
Innisfail Ferry	134	96		:a 120	108	:a 94:a	88	54
				North San Pablo Bay				
Sonoma Creek Bridge	680		700		780	:b	780	
Grandview	860	:a	740	1020	980	1020:b	900	800
Vallejo				:b	460	400		
Cuttings Wharf	228			300		94		15
				Sacramento River Delta				
Collinsville	11	7	6	5	3	3	2	1
Emmaton	1	2	1	1	1	1:a	1:a	1
Sacramento	1	1	1	1	1	1:b	1	1
				San Joaquin River Delta				
Antioch	7		6	6	5	3	3:a	2
Jersey	6	6	10			6:b	5	3
Central Landing	2	2	3	2		2:a	2	2
Rindge Pump	7	10	9	10	11	13	18	13
Middle River P.O.	8	5	8	7	11	:b	10	10
Stockton	:a 28	34						
Mossdale Bridge	:a 5	6	8	11		9:b	10	13
				Drainage Water Stations				
Jersey Drain	59	57	62			64:b	60	59
Grand Is. Dr.(Steamboat)	:e 9	:e 9	:e 8		:e 7	:e 8	:e 8	7
Camp 35 Dr. (Staten Is.)	27	27	34	37	22	24	35	23
Bacon Island Drain	13	12	24	15	13	14	11	12
Mandeville Drain	22	23	25					
Camp 11 Dr. (Staten Is.)	32	40	48	49	23	33	39	18

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	APRIL							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1020:	1240:b	1300:	1060:	1340:b	1260:b	1260:	
Point Davis	680:a	840:	:	:	:a	800:a	760:	700:
Bulls Head Point	210:a	380:a	170:	520:b	340:b	300:a	300:	270:
Bay Point	:d 6:	:a	17:a	43:a	71:a	90:a	88:	:
O and A Ferry	3:a	5:b	2:a	3:a	4:b	8:	:	:
Innisfail Ferry	42:a	95:a	88:a	60:a	40:a	62:	:	52:
	North San Pablo Bay							
Sonoma Creek Bridge	420:	:a	560:	:	720:	:a	640:	:
Grandview	:a 760:b	820:a	840:	:	880:	:a	900:	:
Vallejo	:	:abd	300:a	380:	:a	500:	:ad	300:
Cuttings Wharf	62:	:	:	170:	:b	160:	:	190:
	Sacramento River Delta							
Collinsville	1:a	2:a	1:	3:a	2:a	2:	4:	3:
Emmaton	2:a	1:a	1:	:a	1:a	1:	:	2:
Sacramento	:b	1:ab	1:	1:a	1:b	1:b	1:	2:
	San Joaquin River Delta							
Antioch	3:a	2:a	4:	2:a	3:a	3:a	7:	4:
Jersey	:a	4:bd	3:	:	:	:b	3:	:
Central Landing	2:a	1:a	1:	:a	1:	:	:	:
Rindge Pump	12:a	13:b	15:	15:a	16:b	16:b	17:	16:
Middle River P. O.	:a	11:b	15:	12:a	11:a	11:b	10:	:
Stockton	:	:	:	:	:	:	:	39:
Mossdale Bridge	:a 13:b	13:b	12:ab	12:a	11:b	10:b	8:	11:
	Drainage Water Stations							
Jersey Drain	:	16:	:	49:	:	:b	63:	:
Grand Is.Dr.(Steamboat)	6:	7:	6:	6:	7:	:	10:	8:
Camp 35 Dr. (Staten Is.)	26:	27:	24:	18:	37:	48:	28:	21:
Bacon Island Drain	12:	12:	10:	13:	11:	10:	11:	:
Mandeville Drain	24:	25:	26:	26:	25:	27:	26:	25:
Camp 11 Dr. (Staten Is.)	27:	27:	20:	42:	41:	100:	29:	16:

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

TABLE 143 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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		1380:b	1480:	1380:		:b	1300:	1320:
Point Davis	:a 620	:a 720	:a 900:			:a	660:	660:
Bulls Head Point	320:b	510:a	340:	530:	360:b	300:ab	320:	300:
Bay Point	28:a	75:a	86:			:a	24:	65:
C and A Ferry	:a 12:a	9:		1:ab	15:b	6:b	6:a	6:
Innisfail Ferry	51:a	72:a	64:	56:ab	59:a	57:a	59:	45:
North San Pablo Bay								
Sonoma Creek Bridge	660:	:b	940:	:a	720:	:a	740:	
Grandview	920:	:a	1040:		1020:	:a	1020:	
Vallejo	:b	660:b	520:		:a	420:		520:
Cuttings Wharf	170:			260:				450:
Sacramento River Delta								
Collinsville	1:	3:		3:a	1:a	2:	2:	1:
Emmaton	1:a	2:			:a	1:a	2:	1:
Sacramento	:b 1	:b	1:	1:b	1:b	1:b	1:	1:
San Joaquin River Delta								
Antioch	3:a	2:a	4:	5:a	4:a	2:a	3:	3:
Jersey				4:a	6:a	3:b	4:	4:
Central Landing	1:			:a	2:		4:	6:
Rindge Pump	18:a	22:b	19:	17:a	15:b	14:b	15:	14:
Middle River P.O.	11:a	11:b	11:	11:a	11:b	13:b	11:	12:
Stockton	:ab 39:a	32:a	32:ab	32:a	33:			
Mossdale Bridge	8:b	9:a	8:	8:a	8:	:bd	11:	10:
Drainage Water Stations								
Jersey Drain				42:	31:	29:b	39:	40:
Grand Is. Dr. (Steamboat)	:c 7:c	7:c	10:				8:	
Camp 35 Dr. (Staten Is.)		27:	13:	28:		10:	15:	18:
Bacon Island Drain	12:	12:	12:	13:	12:	11:	11:	11:
Mandeville Drain	26:	27:	28:	27:		27:	22:	19:
Camp 11 Dr. (Staten Is.)		32:	14:	20:		13:	17:	9:

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	JUNE							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1300:	1360:b	1340:	1260:	1260:b	1400:	1160:	1330:
Point Davis	:	:b	640:	640:	640:	:a	760:	:
Bulls Head Point	400:b	560:b	460:	264:b	480:b	500:	340:	520:
Bay Point	40:bd	53:a	28:ab	11:	6:a	56:a	100:	:
O and A Ferry	4:b	5:b	5:	6:b	3:b	9:	33:	:
Innisfail Ferry	53:a	55:a	51:	47:a	49:	:	:a	36:
North San Pablo Bay								
Sonoma Creek Bridge	960:	:a	940:	:	840:	:a	680:	:
Grandview	:a 980:	:a	960:	:	920:	:	920:	:
Vallejo	:ac 460:a	440:	:	:	:ae	400:a	440:d	700:
Cuttings Wharf	400:	:b	360:	:abd	440:	:	380:	:
Sacramento River Delta								
Collinsville	:a 2:a	2:a	1:a	1:a	2:a	2:	5:a	3:
Emmaton	:b 3:a	4:a	3:a	1:cd	2:a	1:a	2:a	2:
Sacramento	:a 1:b	1:b	1:a	1:b	1:b	1:	1:a	1:
San Joaquin River Delta								
Antioch	:a 3:a	4:a	3:a	5:a	5:a	4:a	6:a	5:
Jersey	:a	4:	:a	6:	:	:a	4:a	4:
Central Landing	:a	2:	:	:	:	2:	:	:
Rindge Pump	:a 12:b	5:	:a	2:a	3:b	2:	4:a	3:
Middle River P.O.	:a 11:b	11:b	6:	:b	2:b	3:	1:a	1:
Stockton	:	:b	43:b	40:b	40:	:	38:b	36:
Mossdale Bridge	:b 3:b	1:b	3:b	1:b	1:bd	1:ab	2:b	3:
Drainage Water Stations								
Jersey Drain	:b 6:	31:	:	29:	:	:	15:	13:
Grand Is. Dr. (Steamboat)	5:	6:	8:	7:	6:	5:	5:	7:
Camp 35 Dr. (Staten Is.)	25:	25:	21:	19:	39:	25:	7:	7:
Bacon Island Drain	11:	11:	11:	4:	4:	3:	2:	2:
Mandeville Drain	18:	:	:	12:	10:	10:	8:	5:
Camp 11 Dr. (Staten Is.)	26:	20:	41:	30:	43:	24:	13:	24:

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	1330:b	1560:	1480:	1490:	1540:b	1620:	1520:	1660:
Point Davis	980:	:	1080:a	1060:	1260:b	1300:	1180:	:
Bulls Head Point	780:	:	680:	:b	900:b	920:	860:	1180:
Bay Point	:a 230:	160:	460:	410:	;	:	700:a	620:
O and A Ferry	214:b	190:a	254:	340:b	480:b	450:a	400:	460:
Innisfail Ferry	36:a	91:a	118:a	146:a	180:	:a	290:d	350:
North San Pablo Bay								
Sonoma Creek Bridge	960:	:	:	:	960:	:	1100:	:
Grandview	980:	:a	1020:	:	1040:	:	1040:	:
Vallejo	:d 760:	:de	1000:	:acd	900:	:cd 980:	:	:
Cuttings Wharf	380:	:	520:	:b	610:	:	700:	:
Sacramento River Delta								
Collinsville	:a 6:a	59:	72:a	84:a	118:a	204:a	190:a	220:
Emmaton	:a 1:	:	5:a	3:a	9:a	14:	44:a	42:
Sacramento	:a 1:b	2:	1:a	2:b	3:b	3:	2:a	4:
San Joaquin River Delta								
Antioch	:a 5:a	20:	57:a	34:a	61:a	129:	178:a	160:
Jersey	:a 3:a	4:	9:	:	:a	19:	:a	28:
Central Landing	:a	1:a	3:b	6:b	3:b	6:	5:a	6:
Rindge Pump	::a 5:b	7:	7:a	7:a	6:b	8:	9:a	14:
Middle River P.O.	:a 2:b	2:	:a	4:a	3:b	4:	4:a	6:
Stockton	:b 38:	:	:b	39:b	40:b	49:	49:b	49:
Mossdale Bridge	:b 3:b	6:ab	8:a	8:a	8:b	8:	9:b	10:
Drainage Water Stations								
Jersey Drain	21:	16:	39:	:	:	21:	:	19:
Grand Is. Dr.(Steamboat)	7:	5:	5:	8:	7:	7:	9:	11:
Camp 35 Dr. (Staten Is.)	8:	6:	6:	6:	5:	7:	4:	4:
Bacon Island Drain	2:	3:	3:	8:	4:	4:	5:	4:
Mandeville Drain	6:	5:	5:	10:	4:	4:	5:	6:
Camp 11 Dr. (Staten Is.)	7:	6:	8:	7:	6:	12:	11:	8:

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	AUGUST							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1640:b	1660:	1720:	1680:	1720:b	1700:	1700:	1760:
Point Davis	:bd1420:b	1400:	1460:	1480:	:	:	1600:a	1420:
Bulls Head Point	1260:	:	1060:	1220:b	1200:a	1160:	1260:	1300:
Bay Point	:a 600:a	640:	820:	:abd900:a	860:a	980:	1160:	:
O and A Ferry	:b 580:b	600:a	620:	660:b	720:b	700:	760:	880:
Innisfail Ferry	:a 420:a	510:a	520:a	600:a	600:a	640:	720:a	860:
North San Pablo Bay								
Sonoma Creek Bridge	1200:	:	1300:	:a	1320:	:	1340:	:
Grandview	1120:	:	1200:	:a	1280:	:	1440:	:
Vallejo	:	:de	1220:	:	:bd	1300:d	1340:	:
Cuttings Wharf	940:	:	900:	:b	1060:	:	1120:	:
Sacramento River Delta								
Collinsville	:a 310:	410:a	420:a	420:a	460:a	560:	600:ab	570:
Emmaton	:a	128:	159:	:	:a	280:	380:b	250:
Three Mile Slough Bridge	:	:	:	152:b	200:a	210:	285:a	170:
Rio Vista Bridge	:	:	:b	22:b	58:b	60:	73:b	108:
Isleton Bridge	:	:	:	:	:	:	:b	33:
Sacramento	:b 4:b	6:a	6:a	4:b	7:a	5:a	6:b	6:
San Joaquin River Delta								
Antioch	:a 220:a	290:a	300:a	320:a	360:a	460:	580:a	480:
Curtis Landing	:	:	:a	226:a	280:	:a	290:a	320:
Jersey	:b	168:a	110:a	118:	:a	200:a	170:a	240:
Webb Pump	:	:	:	:b	58:b	68:	82:b	90:
Central Landing	:b	8:a	8:a	12:	:a	17:	:a	19:
Dutch Slough	:	:	:a	27:bd	31:a	40:	52:c	54:
Mandeville Pump	:	:	:	:	:	:	:a	17:
Rindge Pump	:a 10:b	14:a	14:a	17:b	15:b	18:a	17:a	22:
Middle River P.O.	:ad 5:bd	5:ad	7:a	7:a	7:b	8:	10:	:
Stockton	:b 49:	:ad	55:bd	48:	:	:	66:b	64:
Mossdale Bridge	:b	9:b	11:b	11:b	10:	10:abd	9:	:
Mokelumne River Delta								
Southwest Point	:	:	:a	8:a	10:b	17:a	8:a	15:
Camp 33 Staten Island	:	:	:a	5:a	9:b	8:a	9:a	9:
Camp 11 Staten Island	:	:	:a	3:a	4:b	5:a	3:a	5:
Camp 25 Staten Island	:	:	:a	7:a	4:b	7:a	6:a	7:
Drainage Water Stations								
Jersey	:	46:	:	53:	:	77:	79:	76:
Grand Is.Dr.(Steamboat)	8:	10:	8:	9:	9:	12:	13:	15:
Camp 35 Dr. (Staten Is.)	4:	7:	7:	9:	9:	9:	9:	11:
Bacon Island Drain	5:	6:	7:	8:	9:	10:	12:	15:
Mandeville Drain	:b 6:	8:	10:	11:	10:	13:	16:	20:
Camp 11 Dr. (Staten Is.)	11:	14:	12:	15:	9:	9:	11:	15:

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933

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	b	1740		1800		1760			b	1700		1800		1760	1780
Point Davis	b	1540				1680		1580	a	1620					
Bulls Head Point	b	1340		1340		1160		1300	b	1160		1380		1340	
Bay Point				1060		1140			a	1100			a	940	
O and A Ferry	b	840	a	880		900	b	820	b	820		800		820	b 680
Innisfail Ferry				820		840	a	840	a	860		900	ab	880	
North San Pablo Bay															
Sonoma Creek Bridge						1500			b	1540				1580	
Grandview	a	1400				1520			a	1540				1660	
Vallejo								1420							
Cuttings Wharf	b	1280				1220			bd	1260					
Sacramento River Delta															
Collinsville	a	580	a	540		620	a	580	a	540	a	560	a	540	a 500
Emmaton					a	290	a	310	a	280		330			
Three Mile Slough Br.	b	320	a	240	a	250	a	190	a	200		250	a	220	b 180
Rio Vista Bridge	b	130	a	116		102	b	98	b	93		83		78	a 51
Junction Point	a	74		56	a	45	a	36	a	43		37	a	14	a 11
Isleton Bridge	b	46		21		25	b	21	b	9		17		10	b 6
Sacramento	b	7	a	6			b	6	b	7	a	6	a	5	a 3
San Joaquin River Delta															
Antioch	a	540		540	a	480	a	460	a	460		540		520	a 440
Curtis Landing	a	430	a	440	a	470	a	400	a	380	a	320	a	300	
Jersey	a	150	a	260	a	210	a	280	b	230	a	250	a	220	
Webb Pump	bd	122	b	74		92	b	94	b	80		86		74	b 62
Central Landing	d	25		23			a	18	a	17	a	17			a 14
Dutch Slough	a	70	a	38	a	68			a	71		80		58	
Bacon Pump	a	16		20		23	b	24	a	23		25		24	a 21
Mandeville Pump.	a	20	a	22		26	b	27	a	26		27		29	b 24
Rindge Pump	b	18	a	20	a	21	a	20				22			a 17
Middle River P.O.	ed	11	a	13	a	11	a	12			a	15	a	18	a 15
Stockton	ab	66		52	b	54			b	42		40	b	42	b 37
Mossdale Bridge			a	9	a	6	a	7	a	7	a	9	a	8	
Mokelumne River Delta															
Southwest Point	a	17	a	16	a	9	a	9	a	12	a	14	a	10	a 9
Camp 33 Staten Island	a	11	a	9	a	8	a	7	a	10	a	13	a	7	a 6
Camp 11 Staten Island	a	5	a	3	a	2	a	3	a	3	a	5	a	4	a 2
Camp 25 Staten Island	a	4	a	7	a	6	a	1	a	3	a	7	a	5	a 4
Drainage Water Stations															
Jersey Drain	b	67		76		64		78	b	60		77		83	
Grand Is.Dr.(Steamboat)				17		15				14		15		15	16
Camp 35 Dr. (Staten Is.)		13		16		9		10		10		11		11	12
Bacon Island Drain		15		16		19		18		18		19		18	18
Mandeville Drain		22		24		27		31		32		31		33	31
Camp 11 Dr.(Staten Is.)		11		14		10		9		16		22		21	21

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

TABLE 143 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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	OCTOBER							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1760:	1780:	1760:	1620:	1680:	1760:	1760:	1760:
Bulls Head Point	ab1040:	1160:	1260:	510:	1070:	1240:	1120:ab	1220:
Bay Point	980:a	920:a	860:	:	:	:a	720:	:
O and A Ferry	680:	610:	600:b	590:	560:	720:	380:a	600:
Innisfail Ferry	:b 840:	820:	860:	810:	660:	660:a	720:	740:
North San Pablo Bay								
Sonoma Creek Bridge	1540:	:	1620:	:	1520:	:	1520:	:
Grandview	1600:	:	1650:	:	1640:	:	1640:	:
Vallejo	:	:	:	1280:	1340:	1300:	:	:
Cuttings Wharf	1200:	:	1320:	:	:	1280:	:	1320:
Sacramento River Delta								
Collinsville	520:	500:a	460:	360:	400:	460:a	380:	360:
Emmaton	220:	210:	210:	:	:	114:a	96:	162:
Three Mile Slough Bridge	120:	170:a	90:	67:ab	51:	73:	63:	101:
Rio Vista Bridge	25:	52:	13:	5:	4:	13:a	8:	7:
Junction Point	8:	20:a	7:	4:	4:	4:a	4:	:
Isleton Bridge	5:	7:	5:	3:	2:	3:	:	:
Sacramento	2:a	2:a	2:	2:ab	4:a	2:a	2:ab	2:
San Joaquin River Delta								
Antioch	420:	460:	280:	280:	340:	320:	350:	370:
Curtis Landing	320:e	330:a	260:	210:	238:	246:	:	:
Jersey	:a	170:a	130:	:	:	:	:	:
Webb Pump	:ab	42:	44:a	32:	30:	35:a	25:b	33:
Central Landing	13:	:	:	6:	:	:a	9:b	8:
Dutch Slough	:ab 67:	:	:	:	:	:	:	:
Bacon Pump	22:	23:	20:	15:	15:	17:b	16:	16:
Mandeville Pump	25:	25:	24:	21:	21:	18:b	18:	19:
Rindge Pump	17:a	18:	:	10:	14:a	12:a	16:a	15:
Middle River P.O.	:ab 13:	:a	12:	14:	11:a	11:a	11:	:
Stockton	:a 37:	37:b	43:	51:	49:	48:	:	:
Mossdale Bridge	:ab 7:	:a	7:	5:	5:	8:a	8:a	7:
Mokelumne River Delta								
Southwest Point	:ab 7:a	7:a	6:	5:	4:a	6:a	5:	4:
Camp 33 (Staten Island	:ab 3:a	5:a	4:	2:a	2:a	3:a	2:	4:
Drainage Water Stations								
Jersey	:	80:	71:	:	:	:	:	:
Grand Is.Dr. (Steamboat)	13:	12:	13:	11:	16:	19:	17:	13:
Camp 35 Dr. (Staten Is.)	16:	15:	16:	16:	17:	13:	18:	18:
Bacon Island Drain	:	17:	17:	15:	14:	19:b	14:	16:
Mandeville Drain	33:	31:	32:	33:	29:	31:	30:	28:
Camp 11 Dr. (Staten Is.)	20:	23:	11:	:	9:	8:	13:	18:

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

TABLE 143(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1933
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
San Francisco, San Pablo & Suisun Bays	
Point Orient	1660
Bulls Head Point	1060
Bay Point	720
North San Pablo Bay	
Grandview	1560
Cuttings Wharf	1260
Sacramento River Delta	
Emmaton	52
San Joaquin River Delta	
Antioch	270
Webb Pump	18
Central Landing	6
Bacon Pump	14
Mandeville Pump	19
Mossdale Bridge	7
Drainage Water Stations	
Camp 35 Dr. (Staten Island)	23
Bacon Island Drain	15
Mandeville Drain	27
Camp 11 Dr.(Staten Island)	17

* Due to temporary discontinuance of Water Supervisor work, salinity sampling was completely stopped on November 2, 1933 and only partially resumed from February 6, 1934 to May 10, 1934.

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

TABLE 144

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	FEBRUARY*							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Bulls Head Point			460	515	420:ab	360	250	
	Sacramento River Delta							
Collinsville		8		4	5	1	2	
	San Joaquin River Delta							
Antioch		5	6	6:a	5	3	4	

Station	MARCH							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Bulls Head Point	90	150	380	260	300	160	270:b	260
	Sacramento River Delta							
Collinsville	:a 3	7	3	3	4	2	3	
	San Joaquin River Delta							
Antioch	:a 4	4	3	3	4	4	:a	3

Station	APRIL							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Bulls Head Point	:a 50	170:b	320:b	510	420	420:b	600:b	800
	Sacramento River Delta							
Collinsville	2	2:a	3	3	5:a	3:a	6:a	6
	San Joaquin River Delta							
Antioch	4:e	3:a	4:a	4	:a	5:a	4:a	9

* Due to temporary discontinuance of Water Supervisor work, salinity sampling was completely stopped on November 2, 1933 and only partially resumed from February 6, 1934, to May 10, 1934.

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

TABLE 144 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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 1560			1440	1600 b	1680
Point Davis		b 1100	a 1080		1120	b	1320 b	1280
Bulls Head Point	620	540 b	660 b	820	800	860 a	760	1100
Bay Point						a	520 a	600
O and A Ferry		b	82 b	156 a	126	a	156 b	340
Innisfail Ferry		a	100 a	118	130 a	140 a	158 a	224
Sacramento River Delta								
Collinsville	a	21 a	10 a	35	53 a	42 a	72 a	110
Emmaton		d	1					
Sacramento			b	1	1 a	6 b	2 b	7
San Joaquin River Delta								
Antioch	a 12	a 12	a 11	a 21	32 a	24 a	37 a	75
Jersey			a	4	6 a	6	b	5
Central Landing		b	4 b	4	3 a	4 b	3 a	6
Rindge Pump			b	14	16 a	21	21 b	17
Middle River P.O.		b	9 b	9	12 a	11 b	12	10
Stockton		b	51	69	60 ab	49		
Mossdale Bridge			b	12	9 a	12 a	12 b	12

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

TABLE 144 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	JUNE							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1660:	1620:b	1060:b	1680:	1620:	1660:b	1740:	1720:
Point Davis	a 1180:a	1140:	1400:a	1240:	1280:	:	:	:
Bulls Head Point	880:	940:	:	1040:	1020:	1060:a	940:	1060:
Bay Point	680:a	540:a	760:a	740:	760:a	640:a	740:a	880:
O and A Ferry	:b	320:a	300:b	400:	:	540:b	580:a	480:
Innisfail Ferry	300:a	340:a	400:a	440:a	400:a	440:a	540:a	600:
	Sacramento River Delta							
Collinsville	a 130:a	116:a	222:a	190:a	240:a	260:a	380:a	380:
Emmaton	:	:	:	:a	27:a	23:a	61:	140:
Three Mile Slough Bridge	7:b	6:a	13:a	17:a	14:a	15:b	70:	88:
Rio Vista Bridge	5:b	6:b	4:b	4:	4:b	4:b	11:a	16:
Junction Point	:	:	:	:	:a	6:a	6:	5:
Sacramento	2:a	2:b	4:b	3:b	4:b	6:b	5:	5:
	San Joaquin River Delta							
Antioch	:a	62:a	114:a	130:a	154:a	118:a	200:a	300:
Curtis Landing	:	:	:b	96:a	60:a	114:a	138:	:
Jersey	16:a	13:	:	:a	29:a	19:a	31:a	64:
Webb Pump	:b	6:b	9:b	10:	12:b	16:b	22:	27:
Central Landing	a 5:a	6:a	8:b	7:	6:b	5:	8:	7:
Dutch Slough	:a	7:a	9:b	11:	11:b	10:b	35:	23:
Bacon Pump	:b	9:	:b	24:b	9:a	9:b	9:	10:
Mandeville Pump	:	:	:	:a	10:b	8:a	12:	7:
Rindge Pump	17:a	22:a	20:b	19:a	22:a	21:b	18:	15:
East Contra Costa I.D.	11:b	13:b	12:b	11:b	13:b	11:b	13:	10:
Middle River P.O.	10:a	12:	11:b	12:	:a	13:b	11:	9:
Mansion House	:	:	:	:	:a	9:a	13:	11:
Stockton	42:b	44:b	54:b	46:b	48:b	49:b	53:	55:
Mossdale Bridge	12:b	13:b	12:b	12:b	13:b	13:b	15:	12:
	Mokelumne River Delta							
Southwest Point	3:a	6:a	6:b	7:a	5:a	5:a	8:	6:

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

TABLE 144(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934

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	1620	1720	1800		1740	1740:b	1640	1720
Point Davis				1500		:b	1620	1640
Bulls Head Point	1080	1240		1360	1200	1420:b	1380	1340
Bay Point	:a 900	:a 900						
O and A Ferry	680:b	740:a	600	700:a	960	920:b	880:a	880
Innisfail Ferry	:a 580:b	640		:a	720:a	740:a	880	820
Sacramento River Delta								
Collinsville	:a 390:d	400:b	640	620:a	580:a	600:a	620	760
Emmaton	:a 132:a	146:b	280	:a	280:a	310:a	370	470
Three Mile Slough Bridge	104:b	146:a	140:b	230:a	190:a	250:a	320:a	330
Rio Vista Bridge	22:b	34:b	50	70	94:b	164:b	200	220
Junction Point	:a 7:a	8:a	10	33:a	32:a	47:a	70:a	114
Liberty Ferry	:a 4:a	3:a	5	7:ad	8:ad	21:b	31	35
Isleton Bridge	8:b	8:b	14	21	24:b	46:b	66	80
Howard Ferry	:b	8	14	15:b	32:a	22:a	34	
Sutter Slough				5	5:b	6:b	8:a	8
Little Holland Ferry				6:a	6:a	4:b	6:a	5
Ryde	:a 5:a	7:a	5	5:a	4:b	5	4	5
R. D. 2068				5	4:ad	3:b	4:a	5
Walnut Grove	:bd 6:b	5:b	3	5		:b	5	5
Paintersville Bridge				5	5:b	6:b	5	6
Sacramento	:a 4:b	4:b	5	5:a	5	:b	4:a	5
San Joaquin River Delta								
Antioch	:a 300:a	340:a	380	440	580:a	480:a	560	680
Curtis Landing	:a 240:a	220:a	290:a	360:a	320:a	390	:a	550
Jersey	:a	72:bd	238	:a	170	:a	240:a	350
Webb Pump	:e	39:f	47:f	78	104:b	150	200	
Central Landing	:a 15:b	13:b	17	25:a	23:b	44:b	52	46
Dutch Slough	:a	25:b	33		53:a	62:b	120	116
Ward Landing				17:a	19:a	23:b	37:a	43
Bacon Pump	:b 10:ad	11:bd	11	17:d	21:d	21:b	35	36
Mandeville Pump		:a	13	17:b	18	:b	34	45
King Island Pump				12		:b	15:a	20
Rindge Pump	:a 20:a	19:b	20	15:a	18:a	18	20:a	20
Orwood Bridge				11:b	17:b	16:b	22	23
East Contra Costa I.D.	:b 12:b	10:b	10	11:a	11:b	14:b	13	16
Middle River P.O.	:a 11:a	11:b	11	11:a	13:a	14:b	17:a	18
Mansion House	:ad	10:b	12	:a	13:a	14:b	19:a	18
Stockton Country Club	:a 26:a	26:b	25	23	:a	28:b	29:a	30
Clifton Court Ferry	:b 12:b	11:b	12	:b	11:b	12:b	17:b	14
Stockton	:b	52:b	68	:b	58:b	58:b	68	
Garwood Bridge	:a 23:b	26:b	28	28:a	29:a	31:b	32:a	30
Brandts Bridge				:a	11:b	21:b	14:a	11
Williams Bridge	:a 14:b	14:b	12	12:a	11:b	11:b	13:a	12
Whitehall	12	:b	12	:a	12:a	12:a	12	
Mossdale Bridge	:a 10:b	13:b	9	11:b	8:bd	9:b	8:b	7
Mokelumne River Delta								
Southwest Point	:a 6:a	5:a	6	15:a	13:a	9:b	34:a	24
Tyler Island Ferry	:b 5:b	6:b	5	7	6:b	6:b	10:a	5
Camp 11 Staten Island	:a 6:a	5:a	8	6:a	6:a	6:b	7:a	8
Camp 29 Staten Island	:a 6:a	5:a	5	7:a	8:a	10:b	11:a	13
Camp 20 Staten Island	:a 9:a	15:a	5	7:a	7:a	7:b	9:a	8

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

TABLE 144 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	AUGUST							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1740	1740 b	1720	1820	1740			1840
Point Davis	a 1640	b 1640	b 1660		1640		1670	1800
Bulls Head Point	1460	b 1480	b 1380	1580	1480		1480	1500
Bay Point		ad 1200			ad 1220			
O and A Ferry	960	b	1080	980	1060	b 1140	1160 a	1080
Innisfail Ferry	a 920	a 1000	980	1040	1080	b 1080 a	1220 a	1170
Sacramento River Delta								
Collinsville	a 700	a 760 a	860	920	800	a	980	1080
Emmaton	a 440	a 440 a	500	640			760	740
Three Mile Slough Bridge	a 330	b 400 b	480	540	440 a	560	640	660
Rio Vista Bridge	240	b 280 b	260	360	440	b 440	440	520
Junction Point	a 108	a 112 a	144 a	250 a	180 a	320	360 a	310
Liberty Ferry	a 38	a 51 b	90	124	142 a	160 a	210	220
Grand Is.Dr.(Steamboat)	110	b 96 b	170	220	250	b 270	270	
Isleton Bridge	112	b 116 b	154	200		b 310	220	270
Howard Ferry	b 60	a	60	118	232 a	120	195	
Sutter Slough	b 19	b 14 b	16	20	22	b 50	21	23
Little Holland Ferry	a 7	a 7 a	9 a	11		a 14	13 a	8
Ryde	a 5	b 8 b	7	8	9	b 11	a	7
R. D. 2068	b 5	a 6 b	7 a	10 a	14 a	33	58 a	86
Walnut Grove	b 6	b 6 b	6	7	b 7	b 6	10	10
Paintersville Bridge	b 6	b 7 b	7	6	b 6	b 6	7	
Sacramento	a 5		a	6 a	5			
San Joaquin River Delta								
Antioch	a 580	a 640 a	740	800	900 a	820	890	900
Curtis Landing	a 580	a 600 a	620 a	640 a	640 a	700 a	810 a	700
Jersey	a 300	a 390		520 a	420	b 600		
Webb Pump							a	280
Central Landing	b 61	b 84 b	78	a	84			88
Dutch Slough	a 132	d 126 b	170 a	240	250	b 255	250	
Ward Landing	a 45	a 57 a	32	90 a	90 a	118	129	140
Bacon Pump	b 50	b 54 b	68	76 b	94 b	110 f	111	122
Mandeville Pump	bd 50	b 56 b	78	b	90	bd 118		
King Island Pump	a	23 a	37 a	48 a	42 a	44	58	
Rindge Pump	a 24	a 28 b	34 a	33 a	42 a	46	56 a	66
Orwood Bridge	b 24	b 31 b	37	45 b	56 b	62	66	80
East Contra Costa I.D.	b 16	b 22 b	22	b	31 b	35	41 a	23
Middle River P.O.	b 22	b 32 b	40 a	47 a	48 b	62	76 a	66
Mansion House	a 21	b 27 b	33 a	38 a	38 b	52	59 a	62
Stockton Country Club		b	34 a	35 a	40	34	37	44
Clifton Court Ferry	ab 15	b 16 b	19	17 b	22 b	32	29 b	31
Stockton	b 62	b	69	76 b	76 b	74	74	
Garwood Bridge	a 32	b 38 b	38 a	34 a	28 a	34	37 a	23
Brandts Bridge	b	12 b	14 a	12 b	19 b	15	9	
Williams Bridge	b 13	b 13 b	15 b	17 a	20 b	29	a	28
Whitehall	b 11	b 11 b	12 a	10 a	11	a	9 a	12
Mossdale Bridge	b 9	b 8 b	12 b	8 a	15 b	10 a	7 a	17
Mokelumne River Delta								
Southwest Point	a 20	a 17 ab	70 a	68 a	38 a	104	107 a	72
Tyler Island Ferry	b 5	b 7 b	5	6 b	6 b	7	8	
Camp 11 Staten Island	a 7	a 8 b	13 a	14 a	10 a	21	25 a	14
Camp 29 Staten Island	a 14	a 15 b	20 a	22 a	24 a	34	50 a	52
Camp 20 Staten Island	a 9	a 9 b	11 a	11 a	10 a	18	16 a	12

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

TABLE 144(CONTINUED)
SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	:b 1800:	1760:	1840:	:	1780:e	1840:	1800:	
Point Davis	1700:	:	1660:	1720:	1700:	1780:	1740:	1700:
Bulls Head Point	1540:b	1600:	1640:	1480:	1520:ab	1540:a	1460:	:
Bay Point	:a 1300:	:	1460:	1420:ad	1360:ad	1280:a	1360:d	1260:
O and A Ferry	1200:b	1160:ab	1180:	1160:	1100:	1040:	1020:	1000:
Innisfail Ferry	:a 1200:a	1140:	1200:	1220:a	1200:	1240:	1240:a	1200:
	Sacramento River Delta							
Collinsville	:a 1080:a	1000:	1060:a	880:a	940:	920:	920:	760:
Emmaton	:a 560:	:	720:a	500:a	520:	560:	420:a	360:
Three Mile Slough Bridge	:a 520:a	500:	620:a	460:b	520:ab	520:	340:	370:
Rio Vista Bridge	:b 380:b	360:	490:	400:b	400:	320:	260:	420:
Junction Point	:a 260:a	228:	410:a	210:a	240:	260:a	200:a	180:
Liberty Ferry	:a 170:a	152:	:	230:a	180:	160:a	120:	204:
Grand Is. Dr.(Steamboat)	:b	240:	:	350:	180:	120:	190:a	200:
Isleton Bridge	: 230:b	230:	35:	290:b	200:	34:	170:	140:
Howard Ferry	:a 46:a	35:	62:	:	:	:	:	:
Sutter Slough	:a 7:b	12:	8:	11:b	7:	4:	:	:
Little Holland Ferry	:a 8:b	9:	7:a	7:a	7:	:	:	:
Ryde	:b	6:ab	7:a	7:a	6:	5:	:	:
R. D. 2068	:a 92:a	100:f	108:a	90:a	94:b	98:a	126:a	114:
Walnut Grove	: 7:	8:	8:	6:	:	:	:	:
Paintersville Bridge	:b 6:b	8:	7:	6:	5:	:	:	:
Sacramento	: :	:	:	:ad	3:ab	4:a	5:a	3:
	San Joaquin River Delta							
Antioch	:a 840:a	840:	960:	860:a	800:	800:	760:	700:
Curtis Landing	:a 740:a	720:a	700:	:	:	660:	660:a	580:
Jersey	: :	:	620:	620:	:	:	460:	:
Webb Pump	:b 340:b	340:	340:	:a	300:	:	:	280:
Central Landing	:a 90:a	72:bd	78:	:a	64:	62:	:	:
Dutch Slough	:a 250:a	260:a	280:a	260:a	270:	270:a	270:	260:
Ward Landing	:a 140:a	142:	190:a	144:a	156:	190:a	158:a	122:
Bacon Pump	:b 120:b	132:	:	146:bd	140:	:	160:	:
Mandeville Pump	:d	152:	:	:	:d	166:	:	:
King Island Pump	:a 86:a	76:	88:	104:	:	:	:	:
Rindge Pump	:a 58:ab	62:ab	72:a	72:a	84:ab	86:a	80:a	80:
Orwood Bridge	:b 76:b	84:	:	94:b	104:	107:b	104:b	104:
East Contra Costa I.D.	:b 50:b	54:	60:	68:b	66:	70:	72:b	72:
Middle River P.O.	:a 82:b	92:ab	100:a	98:a	94:ab	102:a	92:	:
Mansion House	:a 62:b	74:ab	80:a	74:a	88:	90:	90:	:
Stockton Country Club	:a 42:b	39:ab	40:	:	40:ab	38:	39:a	36:
Clifton Court Ferry	:b 31:b	39:	34:	28:b	35:	40:	34:a	25:
Stockton	: :b	64:	66:	:	:	:	:	62:
Garwood Bridge	:a 32:b	36:ab	30:a	21:a	27:ab	33:a	17:a	22:
Brandts Bridge	:e 9:b	9:	9:	9:a	9:	11:	:	:
Williams Bridge	:b 31:b	41:ab	29:b	43:b	24:	19:ad	16:	:
Whitehall	:a 9:a	11:ab	9:a	10:	:	:	:	:
Mossdale Bridge	:b 8:b	10:	8:ab	10:b	9:ab	21:b	23:b	21:
	Mokelumne River Delta							
Southwest Point	:a 60:a	48:ab	90:a	42:a	47:	38:a	19:a	12:
Tyler Island Ferry	:b 7:b	7:	7:	7:b	7:	:	7:	:
Camp 11 Staten Island	:a 12:a	15:ab	19:a	7:a	7:	9:	:	:
Camp 29 Staten Island	:a 51:a	44:ab	47:a	42:a	42:	36:a	34:a	30:
Camp 20 Staten Island	:a 12:a	13:ab	11:a	5:a	4:	5:	:	:

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

TABLE 144 (CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	OCTOBER							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1800	1800	1820	1720	1720	1800	1780	
Point Davis	1680	1640	1640	1610	1550	1680	—	
Bulls Head Point	a 1380	ab 1420	1460	1410	1360	1360	1380	
Bay Point		1220	1240	1170		1100	1100	bd 1020
O and A Ferry	a 920	880	890	a 800	ab 780	ab 660	820	640
Innisfail Ferry	a 1260	b 1160	1030	1060	1070	1060	980	880
Sacramento River Delta								
Collinsville	a 660	800	770	a 620	560	580	500	
Emmaton	a 510	470	290	a 380	a 220	ab 240	a 90	202
Three Mile Slough Bridge	a 470	400	a 280	de 385	240	290	a 154	216
Rio Vista Bridge	b 310	270	305	220	200	140	90	42
Junction Point	a 240	202	190	a 105	88	100	a 54	21
Liberty Ferry	a 140	114	106	77	58	50	30	a 24
Grand Is. Dr. (Steamboat)	a 35		131	65		56		40
Isleton Bridge	b 3	4	96	10	9	5		
Howard Ferry								1
R. D. 2068	a 96	ab 176	110	118	116	116	a 108	104
Sacramento	b 2	ab 1	a 1	a 1	ab 1	ab 1	a 1	1
San Joaquin River Delta								
Antioch	a 660	620	580	620	540	500	460	440
Curtis Landing	a 610	520	540	420	400	400	410	400
Jersey		a	340		340	a	260	220
Webb Pump	b 220				ab	148	140	112
Central Landing	ab	40	43		24	54	a 11	
Dutch Slough	a 250	240	250		200	194	a 178	
Ward Landing	a 124	128	100	a 120	106	98	102	82
Bacon Pump	b 148	142	135	141	130	120	112	80
Mandeville Pump	ade 152	d 156	d	140	148	ab 128		
King Island Pump	a 80	80	a 96	93	78	86	90	80
Rindge Pump	a 74	72	a 60	a 71	94	ab 52	44	30
Orwood Bridge	b 100	96	91	96	82	ab 62	64	42
East Contra Costa I.D.	b 68	70	73	62	60	54	a 48	39
Middle River P.O.	a 104	108	a 104	a 94		ab 86	a 64	72
Mansion House	a 74	78	ad 74	ad 73	64	58	a 34	22
Stockton Country Club	b 37	ab 31	d 32	a 30	25	ab 21	a 21	
Clifton Court Ferry	b 24	22	18	18	19	12		
Stockton	b 56		60	50	56			52
Garwood Bridge	a 22	23	a 16	a 18	16	ab 7		
Williams Bridge	b 9	10	a	12	a 11	7		
Whitehall	a 8	9	a 10	a 12				
Mossdale Bridge	b 21	25	b	7	21	ab 20		7
Mokelumne River Delta								
Southwest Point	a 22	a 5	a 5	a 18	17	ab 4	a 7	12
Camp 29 Staten Island	a 27	a 22	a 16	a 12	15	ab 10	a 12	8

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

TABLE 144(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	1760	1740	1740	1800	1740	1720	1540	1360
Bulls Head Point			1240		1300	1080	620	
Bay Point	900:b	1000	1060		980:d	540	220	
O and A Ferry	640:ab	480	520	440:ab	340:a	450:a	65:a	46
Innisfail Ferry	920	820		740	720	500	320	300
	Sacramento River Delta							
Collinsville	470	480	480	310	260	102	46	17
Emmaton	190	130	136	94	72	15:a	10	5
Three Mile Slough Bridge	170:ab	110	106	68:ab	22			
Rio Vista Bridge	72	39:b	12	7				
Junction Point	25	27:a	10	5		2:a	2	
Liberty Ferry	20	11		8	7	3		4
R. D. 2068	94:d	92		44		58:a	41	42
Sacramento	1:d	1:ab	1	1:ab	1:a	1:a	1	1
	San Joaquin River Delta							
Antioch	420	390	180	250	240	104	37	29
Curtis Landing							56	
Jersey	200		210	150	:a	44:a	38	
Webb Pump	110	92						
Dutch Slough	146:ab	122	120	:d	88:ae	76		
Ward Landing				60	52	42:a	42:a	34
Bacon Pump	74	74	72	46	50	42	27	22
Mandeville Pump	98		:d	72		:c	42	
King Island Pump	72	68	60	56	:a	40	37	
Rindge Pump	29	23:a	28	25	:a	20:a	20	13
Orwood Bridge	36	30						
East Contra Costa I. D.		31	26		20	19:a	15	15
Middle River P.O.	57:ab	39:a	38	34:ab	22:a	21:a	17	13
Mansion House	20	22	13	12	14	10:a	11	8
Stockton Country Club	25:bd	15:ab						
Stockton	34	36	34	32				
Mossdale Bridge	7:ab	6:a	6:ab	8:ab	8:a	7:a	7:a	4
	Mokelumne River Delta							
Southwest Point	3							
Camp 29 Staten Island	9							

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

TABLE 144(CONTINUED)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS, 1934
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	DECEMBER							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1520	1620	1620	1540	1380	1480	1500	1420
Bulls Head Point	ab 610	960			ab 540	a 500		
Bay Point	440 d	510 b	510 b	510				
O and A Ferry	248 a	172	162	162	90	98	90	78
Innisfail Ferry	370	240	350	380	300	250	290	270
Sacramento River Delta								
Collinsville	27	77	63	26	34	26 a	20	25
Emmaton	5 ab	5 a	19					
Liberty Ferry	2	1 a	2	3	2	1		
R. D. 2068		43 a	42					
Sacramento	ab 1	ab 1	a 1	1	2 ab	1	1	1
San Joaquin River Delta								
Antioch	24	35	50	46	32	27	24	19
Central Landing				4				
Dutch Slough		36						
Ward Landing	34							
Bacon Pump	21							
Mandeville Pump		a	26					
Rindge Pump	15 ab	17 a	17	14	14 a	14	12	
Middle River P.O.	12	15 a	12 d	13	13 a	8	11	9
Mossdale Bridge	5	5 a	6	7	5	4	4	3

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