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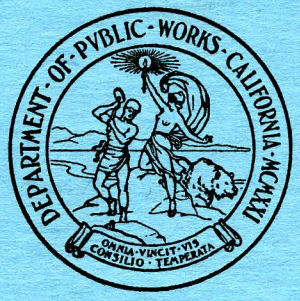
Bull. 23-47

REPORT OF

SACRAMENTO-SAN JOAQUIN
WATER SUPERVISION

FOR

1947



JUNE, 1948

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

EARL WARREN, Governor
C. H. PURCELL, Director of Public Works
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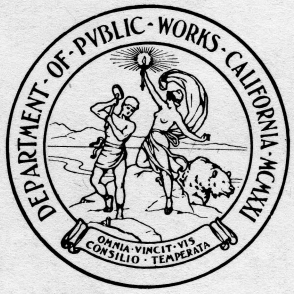

JUNE, 1948

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ACKNOWLEDGMENT

Valuable assistance has been rendered by many individuals and by many public and private agencies in the conduct of the field work and the preparation of data for this report of the Sacramento-San Joaquin Water Supervision activities.

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

The Pacific Gas and Electric Company and the Merced, Modesto, and Turlock irrigation districts have furnished a large number of electric power consumption records for use in the compilation of pumped diversions.

The United States Geological Survey, Department of Interior, has extended valuable cooperation in gathering and assembling stream flow data.

The City of San Francisco Public Utilities Commission, Hetch Hetchy Water Supply, in the San Joaquin Valley, and the United States Bureau of Reclamation, in both the Sacramento and San Joaquin Valleys, have made available a large amount of stream flow data.

The Modesto, Oakdale, and Turlock irrigation districts and the United States Bureau of Reclamation have assisted in observing and maintaining recording gages in the San Joaquin Valley area.

The United States Bureau of Reclamation provided the funds necessary to maintain the regular program of salinity observations in the Sacramento-San Joaquin Delta during 1947.

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 interes and cooperation and particular activity in the pro mulgation of effective conservation measures in th seasons of critical water supply have contributed in large measure to the successful prosecution of the Water Supervision work.

Herbert E. White, Chairman, Sacramento

E. L. Adams, Chico
William Durbrow, Grass Valley
Manley S. Harris, San Francisco
Wm. N. L. Hutchinson, Walnut Grove
Warren H. McBryde, San Francisco
R. V. Meikle, Turlock
F. T. Robson, Vina

ORGANIZATION

C. H. Purcell — Director of Public Works

Edward Hyatt — State Engineer

A. D. Edmonston — Assistant State Engineer

T. B. Waddell — Principal Hydraulic Engineer

The preparation of this report and the collection and compilation of the supporting data were under the direction of

Irvin M. Ingerson
Senior Hydraulic Engineer

Field and Office Personnel

Carl A. Werner — Associate Hydraulic Engineer
In charge of stream flow measurements and computations

Arthur M. Baker — Assistant Hydraulic Engineer
In charge of diversion measurements and computations

Field and Office Engineers

Earl D. Stafford	Associate Hydraulic Engineer
Don S. Hays	Assistant Hydraulic Engineer
C. H. Epperson	Sub-Foreman, F.C.C.& M.
Franz M. Kuchta	Junior Civil Engineer
Grant C. Ardell	Junior Engineering Aid
Thomas I. Rausch	Intermediate Clerk
Arthur L. Winslow, Jr.	Junior Engineering Aid

In addition to the foregoing Franklin C. Craig, Associate Engineer, U. S. Geological Survey worked directly with and was assisted by personnel of the Division of Water Resources on stream flow measurements and computations

Office Assistants

Marie Morris	Senior Clerk
Rosa M. Haldaman	Intermediate Typist Clerk

Harry Searancke
Acting Administrative Assistant

FOREWORD

The number of tables presented in this 1947 Water Supervision Report has been decreased as compared with previous reports. Repetitious data have been consolidated into fewer tables. A large amount of historical data has been deleted with appropriate reference to previous reports. Many tables containing only computative data have been deleted because the scope of this report can not embody all of the possible ways of interpreting the basic data, and attempt has been made, therefore, to minimize the analytical and computative data to such as are obviously of value as a ready reference in the current problems of stream flow, diversions, water utilization and water supervision.

All basic hydrographic data which have been presented in the reports of previous years are presented in this 1947 report.

Figures given in former reports to show average quantities based upon records since 1920, have been revised to show average quantities based upon more recent and more indicative years.

REPORT OF SACRAMENTO-SAN JOAQUIN WATER SUPERVISION FOR 1947

SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

Water supervision activities, resulting from the efforts of the first Sacramento-San Joaquin River Problems Conference and its Permanent Committee working with the former Division of Water Rights, were inaugurated in 1924. A complete description of the origin, history and conduct of the work is found in the 1924 and 1926 Biennial Reports of the former Division of Water Rights, in Bulletin Number 4 of that Division, and in Bulletin Number 23 of the succeeding Division of Water Resources. The latter bulletin brings together all data and measurements obtained in the first five-year period, 1924 to 1928, inclusive. Annual Water Supervision reports for subsequent years are in separately bound books similar to this report.

Objectives

At the outset, the objective of the work of Water Supervision in the valley floor areas along the Sacramento and San Joaquin river system was to afford relief to water users from the difficulties of obtaining irrigation supplies occasioned by uncoordinated diversions during years of substantially subnormal runoff. The situation called for a voluntary regulation of diversions in order to alleviate as far as possible the damage from the serious shortages in the water supplies needed for irrigation, municipal consumption, salinity control in the Sacramento-San Joaquin Delta, and navigation purposes. Equitable coordination of diversions was accomplished primarily through the Water Supervision program.

There is no agreement between the water users under which a watermaster might distribute the natural water supply equitably to those entitled to receive it, but it appears inevitable that such an agreement, embracing a definite schedule of relative water rights, will be developed. Its realization will require, however, reliable data, covering a long period of years, on the actual diversions and uses of water, stream flows, stream accretions and salinity encroachment into the Sacramento-San Joaquin Delta. Looking toward that end, it has been the objective of the Division of Water Resources through its Water Supervision work, to collect and record all of the basic hydrographic data necessary to formulate an intelligent and practicable agreement defining the respective water rights of the parties affected in the area covered.

Scope of Work

The area embraced by the Sacramento-San Joaquin Water Supervision work lies on the Sacramento and San Joaquin valley floors. It specifically covers all of the lands irrigated from the Sacramento River between Redding and Sacramento, including those irrigated from the Colusa Trough, Back Borrow Pit, Knights Landing Ridge Cut, and Yolo By-Pass above West Sacramento, from Lower Butte Creek and Butte Slough, from the Feather River below Oroville, from the Yuba River below Smartville, from the Sutter By-Pass and Sacramento Slough, from the American River below Fairoaks, from the San Joaquin River between Fremont Ford Bridge (Stevinson-Gustine Highway) and Mossdale Bridge, from the Merced River below Snelling, from the Tuolumne River below La Grange, and from the

Stanislaus River below Knights Ferry, and the irrigated areas lying on the "uplands" side of and receiving water from the San Joaquin River between Mossdale Bridge and Stockton, Old San Joaquin River and Tom Paine Slough. The cooperative activities of the U. S. Bureau of Reclamation during 1947 make it possible to increase the area covered by data in this report to include the lands along the San Joaquin River upstream from Fremont Ford Bridge to Friant. The area covered and its geographical relation to the Central Valley Drainage Basin are shown on Plate 1.

Water Supervision Activities

The work of the Sacramento-San Joaquin Water Supervision unit of the Division of Water Resources is divided into two portions, field work, mainly during the spring, summer and fall months, and office work during the winter and early spring months.

The field activities include:

(1) Measurement of stream flow passing the many recording stations along the river and drainage channels;

(2) Measurements of the amounts of water diverted and collection of records of use by each water user;

(3) Measurements of the amounts of water returned to natural channels, through drainage plants or gravity drains, for possible re-use;

(4) Obtaining an annual census of irrigated acreages and crops supplied by either a primary, or drainage water supply, or both;

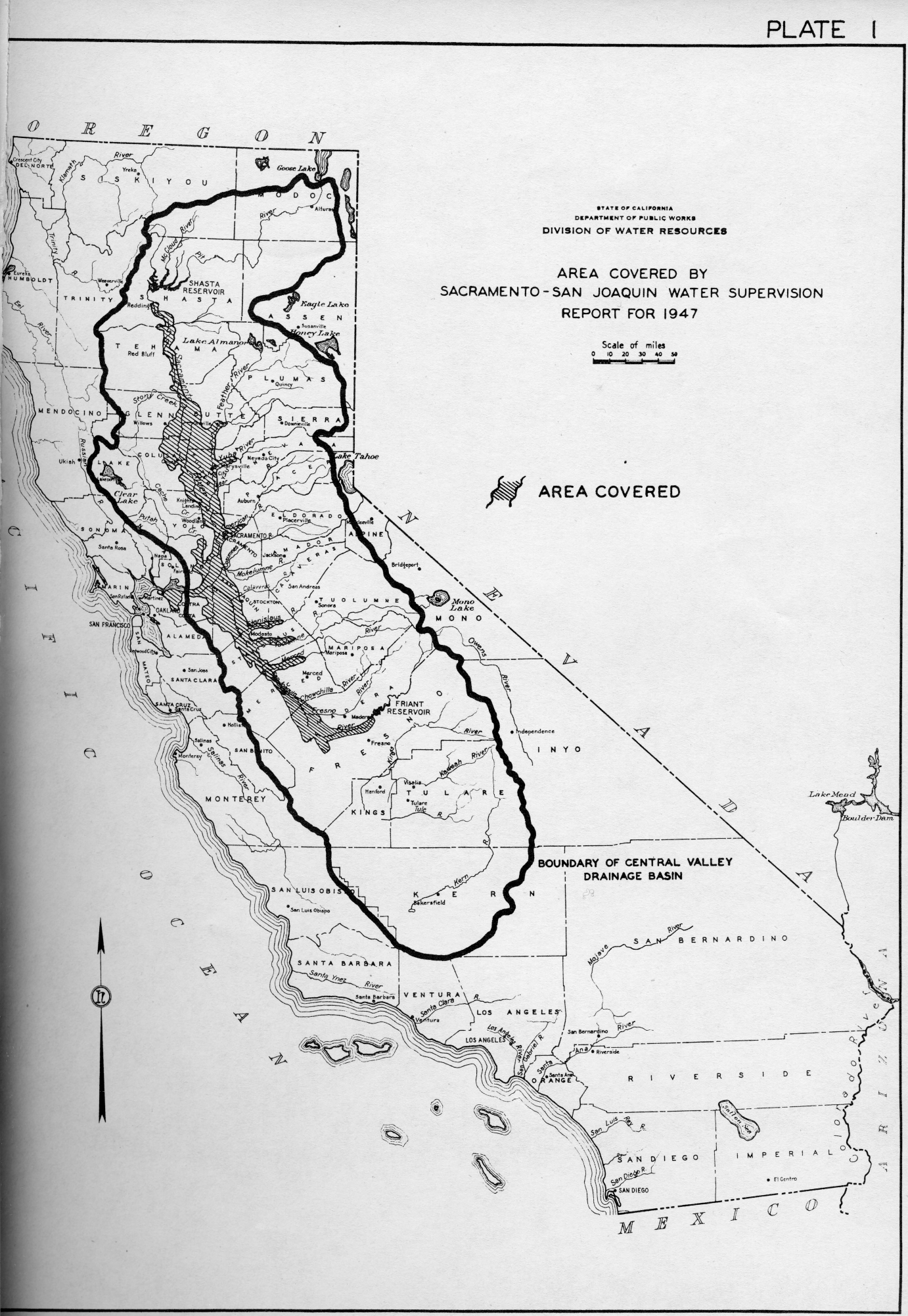
(5) Cooperation with and assistance to water users in connection with individual problems of diversion; and

(6) Assistance with hydrographic activities of cooperating public and private agencies.

The office work comprises mainly the assembly, computation and analysis of hydrographic and other data collected during the field season for presentation in the annual report of Water Supervision. This report contains the basic records of water supply available to, and the use of water by, each user of water from the streams covered in the area. The computation of stream flow, drainage and accretions involves the conversion of the recorded daily gage records to figures showing the daily flows in second feet and monthly runoffs in acre-feet. The computation of the amounts of water diverted by each water user involves the reduction of data showing the operation of his diversion plant, its electric power consumption, and its efficiency. The results of these computations are then compiled in the tabulations in this report for the purpose of giving basic records that are readily usable by all interested parties. The office work also includes the preparation of certain hydrographic data in form to be used as a guide in the ensuing season's field work.

Hydrographic Activities of Cooperating Agencies

The United States Geologic Survey, Water Resources Branch, through continued cooperative agreements with the Division of Water Resources, has maintained a series of stream gaging stations in the Sacramento and San Joaquin valleys. Some of the work of obtaining data from these stations is done by one of its engineers who works out of Sacramento, utilizing the office facilities of the Division of Water Resources. Certain of the stream flow rating measurements and the office work of compiling the records have been conducted cooperatively by the Federal engineer and the State Water Supervision engineers.


STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
AREA COVERED BY
SACRAMENTO - SAN JOAQUIN WATER SUPERVISION
REPORT FOR 1947
Scale of miles
0 10 20 30 40 50
AREA COVERED
BOUNDARY OF CENTRAL VALLEY
DRAINAGE BASIN
OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
Goose Lake
Eagle Lake
Honey Lake
Lake Almanor
Lake Tahoe
Mono Lake
Clear Lake
Lake Mead
Boulder Dam
SHASTA RESERVOIR
FRIANT RESERVOIR
Salton Sea
SISKIYOU
MODOC
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
COLUSA
YUBA
NEVADA
PLACER
LAKE
SONOMA
EL DORADO
ALPINE
AMADOR
CALAVERAS
TUOLUMNE
MARIN
SAN FRANCISCO
CONTRA COSTA
ALAMEDA
SAN JOAQUIN
STANISLAUS
MARIPOSA
MONO
SANTA CLARA
SANTA CRUZ
MERCED
FRESNO
INYO
MONTEREY
SAN BENITO
KINGS
TULARE
KERN
SAN LUIS OBISPO
SANTA BARBARA
VENTURA
LOS ANGELES
SAN BERNARDINO
RIVERSIDE
ORANGE
SAN DIEGO
IMPERIAL
Crescent City
DEL NORTE
HUMBOLDT
Eureka
Yreka
Alturas
Redding
Weaverville
Red Bluff
Quincy
Willows
Oroville
Downieville
Nevada City
Auburn
Placerville
Susanville
Ukiah
Santa Rosa
Napa
Vallejo
San Rafael
Martinez
Oakland
Stockton
Jackson
Sonora
Modesto
Mariposa
Merced
San Jose
Santa Cruz
Hollister
Salinas
Monterey
Fresno
Madera
Bridgeport
Independence
Hanford
Visalia
Tulare
Bakersfield
San Luis Obispo
Santa Barbara
Ventura
Los Angeles
San Bernardino
Riverside
Santa Ana
San Diego
El Centro
Pit River
McCloud River
Trinity River
Eel River
Klamath River
Feather River
Yuba River
American River
Cache Creek
Putah Creek
Sacramento River
Mokelumne River
Calaveras River
San Joaquin River
Stanislaus River
Tuolumne River
Merced River
Owens River
Kings River
Kaweah River
Tule River
Kern River
Santa Ynez River
Santa Clara River
Los Angeles River
San Gabriel R.
San Jacinto R.
Santa Ana River
Mojave River
San Luis Rey R.
San Diego R.

The Modesto Irrigation District, the Oakdale Irrigation District, the South San Joaquin Irrigation District, and the Turlock Irrigation District in the San Joaquin Valley have cooperated with the Water Supervision engineers by assisting in the installation of certain recorder equipped stream gaging stations and are continuing to cooperate by operating the recording instruments at those stations.

The City of San Francisco Public Utilities Commission, Hetch Hetchy Water Supply, has continued to cooperate with the Water Supervision engineers by maintaining, operating and compiling records from a series of stream gaging stations on the San Joaquin and Tuolumne rivers in the San Joaquin Valley.

The United States Bureau of Reclamation, through its offices at Sacramento, Colusa, Chico, Modesto and Merced, has cooperated by operating certain recorder equipped stream gaging stations, by furnishing records of flow at certain stations, by making stream flow rating measurements and by measuring the quantities of water diverted by many of the pumping plants along the main stream of the Sacramento and San Joaquin rivers. Since 1945, work of the State Water Supervision engineers has included furnishing to the Bureau current monthly preliminary estimates of flow and diversion quantities along the Sacramento River as affected by releases from Shasta Reservoir, and along the San Joaquin River as affected by releases from Friant Reservoir (Millerton Lake). This additional cooperation has necessitated monthly conferences at the Bureau's field offices between its engineers and State Water Supervision engineers in order to preliminarily compute the monthly diversions.

The final computations of the diversion quantities, as shown in this report, are the result of giving full consideration to all measurements and records of operation during the entire season for each individual diversion.

The specific degree of cooperation by these agencies with the Water Supervision engineers is detailed in footnotes on the many stream flow tabulations contained in this report.

SHASTA AND FRIANT RESERVOIR OPERATIONS

Shasta Reservoir on the Sacramento River above Redding was first used to store water for irrigation use during the winter of 1943-44 and releases for supplemental irrigation water along the Sacramento River commenced in the late spring of 1944. The release of water from the reservoir during 1944, 1945, 1946 and 1947 changed substantially the natural regimen of flow of the Sacramento River and in many respects greatly benefited conditions along that stream. However, it also has created added diversion problems.

Friant Reservoir on the San Joaquin River near Friant was first used to store water for irrigation use during the winter and spring of 1943-44 and the first releases for supplemental irrigation water occurred during 1944. Releases were made during 1947 for regulating and supplementing the irrigation supplies along the San Joaquin River.

The operations of the Shasta and Friant reservoirs are directed by the United States Bureau of Reclamation.

Reservoir Data

Shasta Reservoir is created by a gravity concrete dam, 500 feet high above low water level, located 13 miles upstream from Redding. The ultimate gross capacity of the

reservoir with spillway gates installed is 4,500,000 acre-feet, of which a space of 4,000,000 acre-feet will be available for the active storage of water and 500,000 acre-feet of space will be reserved for silt deposits and to create head for the generation of power. The spillway steel drum gates had not been installed in 1947 and the capacity of the reservoir to the fixed lip of the spillway was only 3,714,000 acre-feet. The ultimate storage capacity will be filled every year when the natural stream runoff from above the dam is equal to or exceeds the normal amount. Water from the reservoir is conveyed from the Sacramento Valley in the channel of the Sacramento River.

Friant Reservoir, on the San Joaquin River, is created by a gravity concrete dam 274 feet high above low water level, and is located at the base of the foothills about 20 miles northeast of Fresno. The ultimate gross capacity of the reservoir with spillway gates installed, is 520,000 acre-feet, of which a space of 404,000 acre-feet between the top of the spillway gates at elevation 578 and the bottom of the Friant-Kern Canal outlet at elevation 459.4 feet will be available for the storage of water for flood control and to supply irrigation demands in the San Joaquin Valley. It is planned to ultimately convey the major portion of the water from Friant Reservoir through the Madera and Friant-Kern canals to lands north and south of the San Joaquin River in Madera, Fresno, Kings, Tulare and Kern counties. During 1947, however, the spillway gates on Friant Dam had not been completely installed so the capacity of Friant Reservoir available for the storage of water for irrigation was the 350,000 acre-feet of space between the fixed crest of the spillway at elevation 560 feet and the bottom of the Madera Canal outlets at elevation 442.2 feet. The Friant-Kern Canal was in course of construction during 1947 and no water was diverted through it.

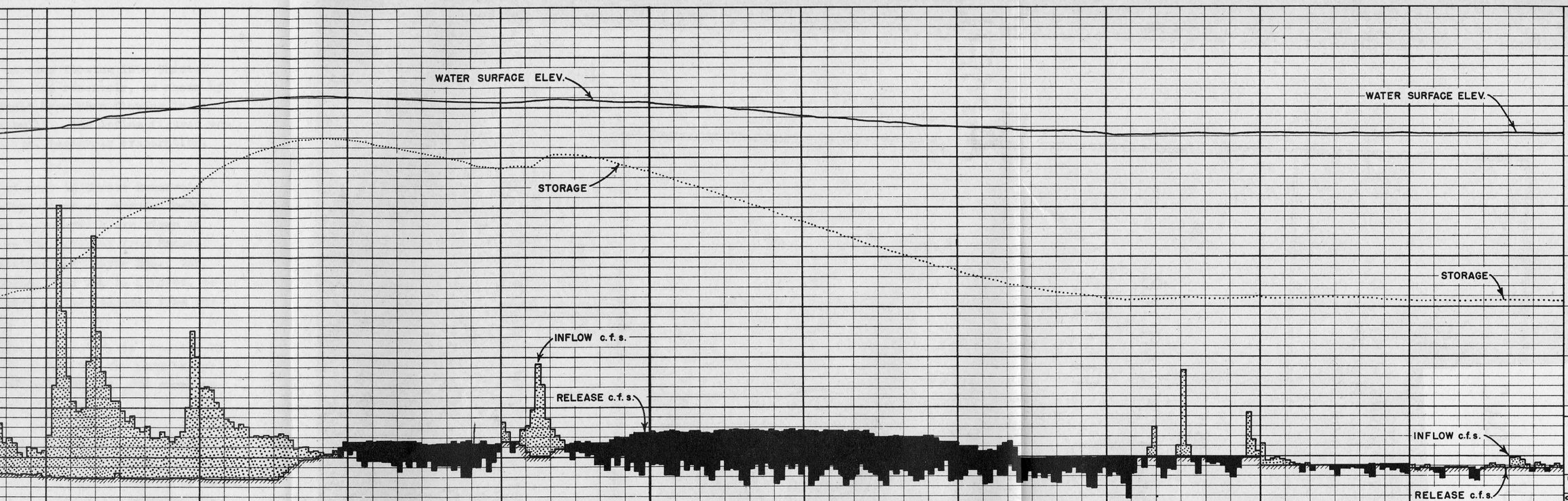
Shasta Reservoir Operation - 1947

The Shasta Reservoir has been constructed as a multi-purpose project. It is designed to furnish water for (1) irrigation in the Sacramento and San Joaquin valleys, including the Sacramento-San Joaquin Delta area; (2) salinity control in the Delta by maintaining a flow in the lower Sacramento River sufficient to repel the intrusion of salt water from Suisun Bay; (3) navigation on the Sacramento River above Sacramento to Chico Landing; and (4) the generation of hydro-electric power. The reservoir will also be used to control floods in the Sacramento River originating above Shasta Dam.

Although the storage of water in the reservoir commenced in the early part of the winter of 1943-1944, the ensuing season's subnormal runoff into it was not sufficient to completely fill the reservoir. However, the United States Bureau of Reclamation was able to release sufficient stored water throughout the irrigation season of 1944 to augment the natural stream flows and thereby facilitate diversions of those natural flows by the diverters along the Sacramento River.

Since 1944, including 1947, the quantity of water in storage in Shasta Reservoir was sufficient to afford releases (1) to facilitate irrigation diversions by maintaining higher river levels along the Sacramento River, (2) to sustain minimum flow for navigation of approximately 5000 second feet upstream from Knights Landing, (3) to supplement irrigation supplies in the Delta area below Sacramento, and (4) to control salinity. During 1947, a year of 54 percent of normal runoff to the Delta, releases from the reservoir were regulated to maintain a stream flow out of the Delta into Suisun Bay sufficient to hold back the line of excess saline concentration to an arc embracing only 32,400 acres of the lower Delta area.

PLATE 2

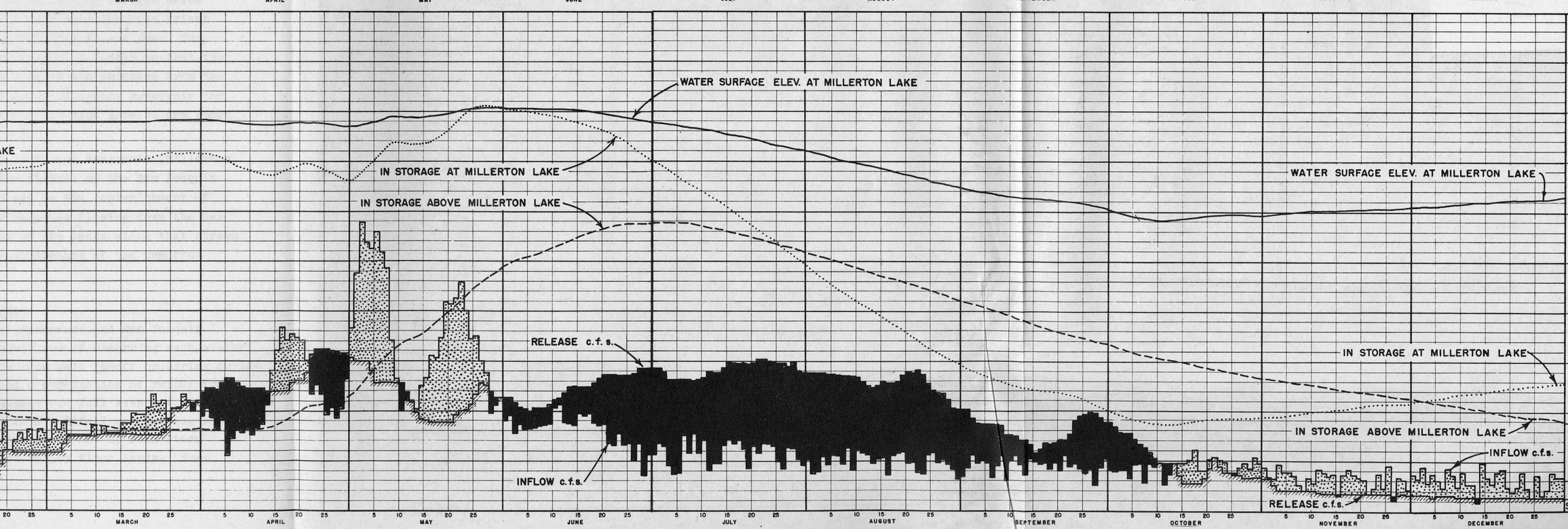


UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION REGION II
BRANCH OF OPERATION AND MAINTENANCE
DIVISION OF IRRIGATION OPERATIONS

SHASTA LAKE OPERATIONS
CENTRAL VALLEY PROJECT
1947

DRAWN ..... SUBMITTED .....
TRACED G.L.R. ..... RECOMMENDED .....
CHECKED ..... APPROVED .....

S-1914-A | SACRAMENTO, CALIF.



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION REGION II
BRANCH OF OPERATION AND MAINTENANCE
DIVISION OF IRRIGATION OPERATIONS

MILLERTON LAKE OPERATIONS
CENTRAL VALLEY PROJECT
1947

DRAWN ..... SUBMITTED .....
TRACED G.L.R. ..... RECOMMENDED .....
CHECKED ..... APPROVED .....

S-1915-A | SACRAMENTO, CALIF.

ACC. TOTAL AT DAM SITE (1,000 AC. FT.)	ELEVATION (FEET)	INFLOW & RELEASE (C.F.S.)	STORAGE (ACRE FEET)
9,000	1,050	45,000	3,500,000
8,000	1,000	40,000	3,250,000
7,000	950	35,000	3,000,000
6,000	900	30,000	2,750,000
5,000	850	25,000	2,500,000
4,000	800	20,000	2,250,000
3,000	750	15,000	2,000,000
2,000	700	10,000	1,750,000
1,000	650	5,000	1,500,000

DISCHARGE	T. W. S. ELEVATION
3,000 c.f.s.	578
12,000 "	585
50,000 "	603
250,000 "	632.5

ELEV. 1065 – CREST OF DRUM GATES (4,493,000 AC. FT.)
(NOT YET INSTALLED)

ELEV. 1037 – BOTTOM OF SPILLWAY. (3,714,000 AC.FT.)

WATER SURFACE ELEV.

⊗⊗⊗⊗⊗⊗ ELEV. 942 ℄ (1,749,000 AC.FT.) 6-102" OUTLETS

STORAGE

⊗⊗⊗⊗⊗⊗⊗⊗ ELEV. 842 ℄ (602,300 AC.FT.) 8-102" OUTLETS

○○⊗⊗⊗ ELEV. 815 ℄ (420,300 AC.FT.) POWER PENSTOCKS

STORAGE

INFLOW c.f.s.

RELEASE c.f.s.

○○○○ ELEV. 742 ℄ (125,900 AC.FT.) 4-102" OUTLETS

RELEASE c.f.s.

ELEV. 586 ℄ TURBINES

INFLOW c.f.s.

⊗ OUTLETS IN-OPERATIVE

5 10 15 20 25 JANUARY · FEBRUARY · MARCH · APRIL · MAY · JUNE · JULY · AUGUST · SEPTEMBER · OCTOBER

ELEVATION (FEET)	INFLOW & RELEASE (C.F.S.)	STORAGE (ACRE FEET)
600	9,000	450,000
550	8,000	400,000
500	7,000	350,000
450	6,000	300,000
400	5,000	250,000
350	4,000	200,000
300	3,000	150,000
250	2,000	100,000
200	1,000	50,000

ELEV. 578 - CREST OF DRUM GATES (520,600 AC. FT.)
(NOT YET INSTALLED)

ELEV. 560 - BOTTOM OF SPILLWAY (436,500 AC. FT.)

WATER SURFACE ELEV. AT MILLERTON LAKE

⊗⊗⊗⊗ ELEV. 464 - ℄ (125,500 AC.FT.) 4-110" FRIANT-KERN CANAL OUTLETS

IN STORAGE AT MILLERTON LAKE

○⊗ ELEV. 446 - ℄ (92,650 AC.FT.) 2-91" MADERA CANAL OUTLETS (TEMPORARILY 1-84" OUTLET)

IN STORAGE AT MILLERTON LAKE

IN STORAGE ABOVE MILLERTON LAKE

○○⊗⊗ ELEV. 380 - ℄ (20,460 AC.FT.) 4-110" RIVER OUTLETS (TEMPORARILY 2-84" OUTLETS)

IN STORAGE ABOVE MILLERTON LAKE

RELEASE c.f.s.

INFLOW c.f.s.

INFLOW c.f.s.

RELEASE c.f.s.

⊗ OUTLETS IN-OPERATIVE

5 10 15 20 25 JANUARY · FEBRUARY · MARCH · APRIL · MAY · JUNE · JULY · AUGUST · SEPTEMBER · OCTOBER

The daily total mean second feet flows of all streams flowing into Shasta Reservoir during 1947 are given in Table 6. This inflow to the reservoir, as shown by the daily figures, represents the amount of water that would have been flowing in the Sacramento River at the dam site if the dam had not been built. The inflow figures are computed by combining the effects of daily change in storage, reservoir evaporation, releases and spill.

A tabulation of the daily amounts of water in storage in Shasta Reservoir during 1947 is given in Table 7. The daily mean-second-foot-flows as measured below Shasta Dam at the United States Geological Survey station near Keswick are given in Table 8. The flows at the Keswick station are the same as the releases from Shasta Reservoir except for the amounts of inflow between the station and Shasta Dam. The amounts of this inflow are small during the irrigation season, and can be ignored, so that the flows at the gaging station can be assumed the same as the releases from the reservoir during that period.

A chart depicting the operation of Shasta Reservoir for 1947, as prepared by the U. S. Bureau of Reclamation, giving the inflows to the reservoir, the amounts released, the water surface elevations and the amounts of water in storage, is shown on Plate 2.

Friant Reservoir Operation - 1947

The Friant Reservoir will be used only for the storage of water for flood control and irrigation purposes. The daily total mean-second-foot-inflows to Friant Reservoir during 1947 are given in Table 62. A tabulation of the daily amounts of water in storage in the reservoir during 1947 is given in Table 63. The daily mean-second-foot-flows, as measured at the United States Geological Survey gaging station below Friant, are given in Table 64. These flows are the same as the releases from Friant Reservoir except for the amounts of inflow between the station and Friant Dam. The amounts of this intermediate inflow are small during the irrigation season so that the measured flows at the gaging station are practically the same as the releases from the reservoir during that period. A chart depicting the operation of Friant Reservoir for 1947, as prepared by the U. S. Bureau of Reclamation, giving the same data as are shown by the chart for Shasta Reservoir, is also shown on Plate 2.

During the 1947 irrigation season water stored in Friant Reservoir (Millerton Lake) was released both into the Madera Canal and into the channel of the San Joaquin River. Diversions by the Madera Canal served largely to aid in the replenishment of ground water supplies in the Madera area. The regulated releases flowing down the San Joaquin River served not only the irrigation requirements of the lands along that stream above the head of the Gravelly Ford Canal, but also the requirements of the numerous diversions below that point to Temple Slough.

RUNOFF AND WATER SUPPLY

The variable flows of the streams entering the Sacramento and San Joaquin valleys on the north and east sides result from the rainfall runoff occurring each winter and spring season principally from December to April, the snow melt runoff occurring during the spring and summer seasons from March through June, and a combination of runoff from perennial springs and released stored water during the summer and fall seasons. Flood flows in the valley floor channels are caused by runoffs from rainfall and melting snow in the mountain areas in excess of mountain reservoir capacities, and by rain storm runoff from the vast area of minor foothill watersheds and valley floor lands. Some

incidental flood control is accomplished by reservoirs in many of the tributary watersheds including those of the Sacramento, Feather, Yuba, Stanislaus, Tuolumne, Merced and San Joaquin rivers. The extent of the flood flows in 1947 is given by the accompanying tabulations of daily stream flows.

During the summer irrigation season, variations in flow of the streams on the valley floor are affected, (1) by the combination of diversions from the streams for irrigation and of accretions to the streams from both direct surface drainage and seepage from ground water, and (2) by releases of stored water for irrigation, navigation, salinity control and the generation of electric power.

1947 Inventory of Runoff

A comprehensive summary and inventory of the monthly stream flows, diversions and accretions, in acre-feet, is contained in Tables 2 and 3. This inventory is arranged to give these data for each reach of each stream covered by Water Supervision work in a summarized ready-reference form. The inventory is designed to give a picture of the complete disposition of the season's water supply.

1947 Runoff Comparisons

A comparison of the full natural runoffs in percent of a 50-year normal for the period 1920-1947, in the major streams tributary to the Sacramento and San Joaquin valleys is given in Table 1. As shown in that table, the 1947 natural runoff may be summarized as follows:

Stream and Station	Percentage of 50-year normal
Sacramento River at Red Bluff	58 percent
Sacramento River at Sacramento	54 percent
San Joaquin River at Friant	59 percent
San Joaquin River at Vernalis	55 percent
Sacramento and San Joaquin rivers flow to the Delta	54 percent

A comparison of the season's actual minimum flows is given in Table 131. The mimimum 10-day flows during 1947 are shown to have been:

Stream and Station	Average minimum 10-day flow
Sacramento River at Sacramento	4700 second feet
San Joaquin River at Vernalis	477 second feet
Combined Sacramento and San Joaquin rivers flow to the Delta	5270 second feet

It is apparent from these comparisons that the water supply available in the 1947 season was substantially subnormal. Observations of water utilization and the amounts of residual flows in the streams reaching the Delta in 1947 indicated that the demands for irrigation and salinity control exceeded the natural flow supplies, and the releases of stored water from Shasta Reservoir were of primary importance in maintaining satisfactory river flows and fresh water conditions in the Delta.

Primary Irrigation Supplies

The flows onto the valley floor during the summer season through the major streams are considered to be the primary water supplies for irrigation. This primary water is differentiated from the flows available for irrigation in the lower reaches of the streams resulting from large accretions including the return of a substantial amount, through drainage, of the flows diverted for irrigation upstream. The amounts of primary water available for irrigation in the Sacramento Valley are given in the flow tabulations for

those gaging stations located at the edge of the valley floor, to wit, tables numbered 8, 39, 44, 45, 52 and 56.

In the San Joaquin River service area, primary water supplies are almost entirely diverted from the upper reaches of the Stanislaus, Tuolumne and Merced rivers by the large irrigation districts, and from the San Joaquin River in the vicinity of Mendota by the large canal companies. These upper diversion points on the Stanislaus, Tuolumne and Merced rivers are above the upstream gaging stations considered in this report. However, the amounts of the diversions by the large irrigation districts along the east side of the valley are given in Tables 109, 110, and 111. Primary water supplies in the San Joaquin River for irrigation below Friant are measured by the San Joaquin River gaging station below Friant, Table 64.

Accretions to Stream Flow

As evidenced by the data for stream flow and diversions, summarized in Tables 2 and 3, there are large quantities of accretions to the flows of the streams and channels in their courses across the valley floors. These accretions are of major importance as available irrigation supplies. They are made up of measured flows from surface drains and of many other flows, not susceptible to direct measurement, from minor ephemeral streams, from scores of small surface drains, from seepage and return of percolated irrigation water and from escaping underground water normally present as the result of percolated rainfall on the valley floor.

During the summer season a large portion of the accrete water is derived from upstream irrigation returning to the streams either as surface drainage or waste into open drains or as deep percolation to the ground water from which it finds its way to nearby streams or drains.

Throughout the year, along certain reaches of the streams, the flows are augmented by outflows from seepage of the natural ground water. This portion of the ground water, which is independent of irrigation as a source, is replenished from two other sources, (1) rainfall on the valley floor, a portion of which percolates to the water table during periods of abundant precipitation, and (2) infiltration and escape from stream channels through the banks during high flood flow conditions, later to partially return to that stream when its water levels recede to low flow conditions of the summer and fall.

The figures shown in all previous reports, giving the relation of "return water in percent of diversion" as discussed under heading "Drainage and Return Water", may be misleading inasmuch as all accretions, heretofore referred to as "return water", actually may include substantial amounts of ground water seepage not derived from upstream irrigation and unmeasured contributions from small tributaries.

Sacramento Valley Accretions. In the Sacramento Valley all of the accretions to natural and regulated flows which are not diverted on lands north and west of the Sacramento Delta flow into the Delta and are available for use in that area. Practically all of the summer accrete flows in Colusa Trough, Back Borrow Pit, Knights Landing Ridge Cut, and Yolo By-Pass are mainly return waters derived from diversions from the Sacramento River. Since the Sacramento River is the main stream through the Sacramento Valley the accretions to that stream include substantial amounts of return water from irrigated areas served by water from other sources, particularly the Feather River. A large part of the summer return water flows reaching the Sacramento River through the Butte Slough

Outfall Gates (Mile 84.0L) and from Sutter By-Pass through Sacramento Slough (Mile 21.2L) are of Feather River origin. However, the measured flows in Sacramento Slough, Table 38, include not only return water from Feather River diversions but also return water from Sacramento River diversions into Reclamation District No. 1500, Table 37. In previous Water Supervision reports estimates are given showing that bank seepage into the West Borrow Pit of the Sutter By-Pass from R.D. 1500 amounts to 10 per cent of that district's diversions from the Sacramento River.

Along the Sacramento River between Colusa and Red Bluff there are no large well defined artificial drainage channels. Records or estimates of natural inflow to the Sacramento River from streams in this stretch were, however, obtained where available. Above Red Bluff to Redding there is considerable drainage water from the Anderson-Cottonwood Irrigation District, but is not recorded as such.

Along the Feather River, during years of subnormal water supply, practically all of the primary regulated water is diverted upstream from, or at, the Sutter-Butte diversion dam, yet accretions accumulate below that point in amounts sufficient to afford a limited supply for all diversions.

Table 2 is designed to give a summary not only of monthly flows measured on the Sacramento Valley floor but also the computed monthly amounts of accretions (or losses, as shown by a minus sign preceding the figure) occurring along each reach of each stream between gaging stations. At the end of each series of data for one stream, as shown in Table 2, there are summations of diversion and accretion quantities.

In order to compare 1947 season conditions along the Sacramento River with those of previous years, the following tabulation gives the seasonal accretions, July through September, in per cent of simultaneous diversions. This tabulation, in part, is excerpted from Table 147 in the 1946 Water Supervision Report. The figure for 1947 is derived from the summation data in Table 2, accompanying this report, but under the same provisions detailed in the "note" under the 1946 Table 147.

Comparative Seasonal Accretion Percentages - 1938-1947

Sacramento River - Red Bluff to Sacramento

Year	Seasonal Runoff at Red Bluff in per cent of 50-year Normal	Accretions in per cent of Diversions* July through September
1938	168	64
1939	50	36
1940	120	40
1941	164	56
1942	129	56
1943	97	53
1944	53	49
1945	76	43
1946	92	51
1947	58	52

*Excludes City of Sacramento municipal.

It is apparent from the above tabulation that there are variations in the accretion percentages with relation to the seasonal runoffs. However, a definite trend in this relation indicates that summer accretions to stream flow on the Sacramento Valley floor are influenced not only by return water from irrigation but also by natural ground water seepage.

San Joaquin Valley Accretions. The summer and fall season stream flows in the lower San Joaquin River and its tributaries on the valley floor consist mainly of accrete flows derived to a large extent, from irrigation water returning to the stream channels by way of percolation into the groundwater and the latter's seepage into the channels. The exceptions to this condition are on the Tuolumne and Stanislaus rivers when irregular releases for power generation below upstream diversion points further augment the flows.

The channels of the Stanislaus, Tuolumne and Merced rivers in their westward flow across the valley floor from the foothills are in deep degraded canyons between more or less sheer bluffs rising from 10 to 50 feet to the predominant level of the upper plains of the valley floor. The plains areas are intensively irrigated with regulated gravity water supplies derived from the upper reaches of the same streams. Thus, an abundant water supply in normal years, a deep and permeable soil and the deep river channels are all conducive to relatively steep slopes of the groundwater table toward the rivers and the consequent high rate per mile of accretions to the stream flow.

The magnitude and importance of these accrete waters in the San Joaquin Valley as a water supply is brought out in Table 3. There does not appear to be as definite a relation of accretions to diversions along these San Joaquin Valley streams as exists in the Sacramento Valley. This lack of a relation may be due, (1) to the considerable lag between the time diversions are made from the streams for storage in terminal reservoirs (Woodward, Dallas-Warner, and Owens) and the time a portion of those waters return to the stream channels after having been applied for irrigation, and (2) to the prevailing climatic effects upon rainfall, humidity, transpiration and evaporation.

The ratio of accretion (including return water from irrigation) to diversions along the lower San Joaquin River and its tributaries, Stanislaus, Tuolumne and Merced rivers, is considerably smaller than that for the Sacramento River. Analysis of pertinent data in Table 3 and comparison with the data contained in Table 147 of the 1946 Water Supervision Report indicate this San Joaquin Valley ratio to vary between 19 and 35 percent while the foregoing table on page 24 shows the Sacramento Valley ratio to vary between 36 and 64 percent. This difference may be attributed to the fact that, whereas, due to basin topography and geology, practically all drainage from the Sacramento River diversions is quickly returned to the river, considerable of the return water in the San Joaquin Valley may never reach the surface streams because of its percolation to ground water and its immediate recovery by drainage and deep well pumps in the areas of many of the irrigation districts for re-use through the irrigation canals.

Stream Flow Measurements

Many of the stream gaging stations, the records from which are reported herein, are maintained, operated and rated, and the flows at them are computed, by agencies cooperating with the work of the Sacramento-San Joaquin Water Supervision. The methods used by all cooperating parties are standardized and the results obtained are equally good. In order to obtain uniformity, however, the Water Supervision engineers cooperate with the other agencies in obtaining and correlating the records for each of the cooperative stations.

Approximately one-half of the gaging stations on streams and drainage channels for which records are reported herein are maintained, operated and rated, and the flows at them are computed, solely by the Division of Water Resources through the Water Supervision and Flood Control organizations.

An automatic water stage recorder is in operation at each of the gaging stations used in this work. The continuous records of water surface elevations at the stations serve two major purposes in the preparation of the data presented in this report. First, the actual water surface elevations at two adjacent stations on a stream afford the means of obtaining the water surface elevations at the pumping plants along the stream between those stations. These elevations give the pumping heads, which heads, in turn, become factors in determining the rates of diversion by the pumping plants. Second, the water surface elevation (gage height) is a factor in determining the flow of the stream, in second feet, passing the station.

A stream flow rating is made for each gaging station. This rating gives the flows in second feet for each gage height at the station. Normally this gage height-flow relation, or rating, is more or less permanent where there is a fixed channel and flow regimen at the station. The rating varies however where the bed of the channel is of loose shifting sand, or heavy weed growth accumulates as the season progresses, or where there may be backwater effects from downstream conditions. In this latter case more frequent measurements of flow are made to obtain accurate records of the flows passing the stations.

Water surface elevations at certain gaging stations at any time may be derived by the reader by using Table 5 coupled with the stream flow data in Tables 8 to 91, inclusive. From the stream flow table the flow on any desired day is interpolated into the specific station's rating table in Table 5 to give a gage height (or elevation) of the stream's water surface for that day.

Preliminary Data from Cooperating Agencies

Some of the stream flow records submitted by cooperating agencies and included in this report must be considered "Preliminary Data" since this report is published prior to final preparation of the data for publication by those agencies. This condition is particularly true with respect to some data furnished by the U. S. Geological Survey.

Stream Flow Bulletins

During 1947, stream flow bulletins were compiled from time to time and mailed to interested agencies and persons. The bulletins listed the results of stream flow current meter measurements made along the Sacramento and San Joaquin river system on the valley floor by Division of Water Resources (Sacramento-San Joaquin Water Supervision) and U. S. Geological Survey engineers.

Notes on Certain Gaging Stations

Records are obtained and published in this report for 86 gaging stations in the Sacramento and San Joaquin valleys. A brief description of each station is given at the bottom of the stream flow data table. The location of each station is shown on Plate 3 in the pocket on the back cover of this report. Additional notes on one of the stations are believed desirable, however, for a better understanding of the records. These notes are as follows:

Sacramento River at Sacramento. The method of computing daily mean flows at this station for 1947 has been radically changed. Heretofore, as shown in previous reports, the low flows which are affected by tidal action, were derived from (1) the records of flows at Verona on the Sacramento River and at H Street Bridge on the American River and (2) records of diversions from and drainage to the rivers between those two upper stations and the I Street Bridge at Sacramento. The method previously used did not

take into account unmeasured accretions or losses in the reach between Verona and I Street Bridge and in the American River below H Street.

The procedure employed in 1947 involves the computation of daily mean Sacramento River flows passing Sacramento by the usual and standard practice of rating the stream, at the I Street Bridge station by means of the slope-velocity method. This method requires a consideration of the gage heights recorded at the river gaging station at Snodgrass Slough (20 miles downstream from Sacramento) as well as the recorded gage heights at Sacramento. The adaptation of this method as a means of direct rating, was accepted after Water Supervision engineers had measured and studied the problem with this method in mind for the past three years.

The final relation for tidal influenced flow conditions at Sacramento involves the construction of a rating curve having as the ordinate the difference between the gage heights at Sacramento and at Snodgrass Slough and as the abscissa a function of velocity (fV) equalling the discharge (Q) divided by the gage height at Sacramento. Flows, in second feet, passing Sacramento are obtained from this relation by multiplying the scale value of fV for any differential gage height, by the corresponding gage height at the I Street recorder. This relation is used for gage heights at Sacramento below 10.5 feet (a flow of 33,000 second feet) below which tidal fluctuations are effective.

The flows for gage heights above 10.5 feet follow the simple exponential relation

$$Q = 435 \times (\text{I Street Recorder G.H.} + 7.40)^{3/2},$$

since tidal fluctuations cease, and a straight flow-stage relation exists.

Channel dredging activities by the U. S. Corps of Engineers in the vicinity of Sacramento during two years prior to 1947 caused a substantial shift in the flow-stage relationship in those years, but frequent flow measurements, including tidal cycle measurements, made during 1947 delimit the above relationships.

Automatic Radio Stream Gage Transmission

For purposes of receiving immediate and current information on flood flows in the winter and spring, and the variations of summer water supplies at critical stations, the Division of Water Resources has maintained for many years a system of automatic radio transmission of gage heights. The radio signals indicating the gage heights are received at Sacramento headquarters office of the Division through a permanent receiver, or at desired points in the valley through portable receivers. The stream gaging stations which are equipped with automatic radio gage height transmitters are, Sacramento River near Red Bluff, Sacramento River at Ord Ferry, Sacramento River at Colusa, Sacramento River at Fremont Weir, Feather River near Oroville, South Fork American River at Coloma, North Fork American River at Rattlesnake Bridge and San Joaquin River near Vernalis. The instantaneous stream flow information thus received is not only of value to the Water Supervision and Flood Control work of the Division but it is relayed immediately to interested agencies including the United States Bureau of Reclamation, United States Weather Bureau, and United States Corps of Engineers, and made public daily through the press.

Precipitation

In the Central Valley of California direct precipitation is a negligible source of water supply for growing crops during the late spring, summer and fall seasons. During the early irrigating season, however, the attendant cooler temperatures and higher humidities of rain storms substantially reduce the demand for irrigation diversions, and are

two of the main factors affecting the variations in demand in the same month from year to year.

The following tabulation gives the 1947 monthly total precipitation at representative valley floor rainfall stations and the monthly normals. Records are from U. S. Weather Bureau.

Station	Inches of Precipitation												
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Red Bluff - 1947	0.53	2.30	2.62	1.94	0.87	0.66	T	0.02	0.15	3.90	0.89	1.69	15.57
- normal	4.76	3.92	3.25	1.70	1.13	0.47	0.03	0.05	0.80	1.33	2.97	4.40	24.81
Colusa - 1947	0.05	2.78	2.00	0.38	0.88	0.60	0	0	0	2.20	0.99	1.25	11.13
- normal	3.24	2.96	2.14	1.08	0.53	0.27	0.01	0.01	0.30	0.66	1.65	3.25	16.10
Marysville - 1947	0.44	2.39	3.44	0.40	0.16	0.76	0	0	0	2.83	1.60	1.08	13.10
- normal	3.86	3.50	2.76	1.47	0.81	0.24	0	0.01	0.31	1.04	2.20	3.77	19.97
Sacramento - 1947	0.60	2.34	3.28	0.15	0.17	0.28	0	0	T	2.60	1.02	0.65	11.09
- normal	3.72	3.02	2.57	1.51	0.77	0.15	0	0	0.38	0.92	1.88	3.03	17.95
Modesto - 1947	0.34	0.54	0.80	0.16	0.22	0.23	0	0	0.03	1.67	1.45	0.99	6.43
- normal	2.18	1.80	1.74	0.91	0.46	0.12	0.01	0.01	0.16	0.52	1.19	1.97	11.07
Merced - 1947	0.40	0.76	1.00	0.51	0.11	0.12	0	0	0.01	1.21	0.91	0.47	5.50
- normal	2.30	1.91	1.87	1.01	0.48	0.11	0.01	0.02	0.18	0.49	1.17	1.80	11.35
Fresno - 1947	0.20	0.60	0.46	0.41	0.20	0.02	T	T	T	0.81	0.43	0.42	3.55
- normal	1.73	1.43	1.58	0.95	0.44	0.08	0.01	0.01	0.21	0.57	0.93	1.45	9.39

It can be seen from these data that Central Valley floor precipitation averaged 60 percent of normal for the 1947 season.

USE OF WATER FOR IRRIGATION

The prevailing warm temperatures and a prolonged frost-free period during the summer season in the Sacramento and San Joaquin valleys favors the profitable production of a wide variety of marketable crops in large quantities. The availability of irrigation water during the dry summer season affords continuous growing conditions necessary for the many crops.

The major irrigated crops in the Sacramento Valley include rice, alfalfa and clover, citrus and orchard fruits, nuts, grapes, hops, truck crops, and field crops; in the Delta area they include alfalfa, orchard fruits, corn and truck crops; and in the San Joaquin River and tributaries service area they include grapes, nuts, orchard fruits, cotton, alfalfa and clover, truck crops, corn, grain, flax and pasture.

Irrigation Diversions

Measurements and records of diversions in 1947 have included all of the points of diversion on the valley floor along the Sacramento River and its tributaries; along the upland banks of the delta channels of Old San Joaquin River, Tom Paine Slough and San Joaquin River; along the Stanislaus, Tuolumne and Merced rivers, below the major irrigation districts' upstream gravity diversions; and along the San Joaquin River between Friant Dam and Durham Ferry Bridge (Vernalis).

This report contains records of a total of 841 points of diversion segregated as to various sources as follows: Sacramento River 288, Colusa Trough (above Colusa-Williams Highway crossing) 24, Back Borrow pit (extension of Colusa Trough along back levees of Reclamation Districts 108 and 787) 22, Knights Landing Ridge Cut 11, Yolo By-Pass 11, Lower Butte Creek and Butte Slough 33, Sutter By-Pass and Sacramento Slough 39, Feather River 42, Yuba River 13, American River 32, Old San Joaquin River 17, Tom Paine Slough 9,

San Joaquin River (below Vernalis gaging station) 61, San Joaquin River (between Vernalis gaging station and Fremont Ford Bridge) 20, San Joaquin River (between Fremont Ford Bridge and Friant Dam)109; Fresno Slough and Fresno Slough By-Pass 9 , Merced River 59, Tuolumne River 19, and Stanislaus River 23. The location of these points of diversion are shown on Plate 3 in the pocket at the back of this report.

All of the diversions, except 30 by gravity, are accomplished by pumping. The records of diversion by gravity are obtained by means of canal ratings established by flow measurements. 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 a relation established between electric power consumption, static head and plant efficiency. This is made possible by the fact that nearly all of the pumping plants are electrically operated. The relation between water pumped and power input is determined from current meter measurements of the discharge and the measured kilowatt input. At the larger pumping plants several measurements are made during each season. At the smaller plants a number of measurements are made initially to determine the ratings and thereafter measurements are made at invervals to discover any changes which may occur in the ratings. Due to the intermittent operation of the smaller plants and the large area to be covered by the field engineers, it is not possible to make many discharge measurements at any one of them. However, it is believed that the rating, as initially determined, remains more or less constant and that over a period of time enough measurements are secured to determine any change in the rating. All rating measurements made by owners or cooperating agencies have been given full consideration in the final computations of the amounts of water diverted by each individual plant.

Prior to 1933 a daily diversion record for each plant was compiled. However, since that year, except for some of the larger plants, the monthly diversion records only are available. The diversions for 1947 have been computed on a monthly basis only, and the breakdown into daily records was not made. The monthly amounts of water diverted at the individual points of diversion along all of the streams covered by the Water Supervision work are given in Table 93 through 111.

The records of diversions from the upper San Joaquin River and from Fresno Slough and Fresno Slough By-Pass are continued in this report for 1947. Table 107 gives diversions along the main stem of the San Joaquin River between Fremont Ford and Friant and Table 108 gives the diversions from Fresno Slough and Fresno Slough By-Pass. Fresno Slough and Fresno Slough By-Pass normally convey excess Kings River water flood flows into the San Joaquin River at a point above Mendota Dam, but during the irrigation season San Joaquin River water is backed up through those channels by the Mendota Dam to afford irrigation supplies to the James and Tranquillity irrigation districts and to certain other diverters. The data in Tables 107 and 108 were furnished by the U. S. Bureau of Reclamation. The field activities of the Sacramento-San Joaquin Water Supervision work did not include upper San Joaquin River observations except to become acquainted with the general problems involved.

A seasonal summary of water utilization during the past seven years, 1939 through 1947, from the Sacramento River and its tributaries and the San Joaquin River and its tributaries is shown in Table 92. This table presents an overall picture of the water utilization in these areas.

Table 125 shows a comparison of the acreage of rice irrigated during the period 1924 through 1947 from the stream channels within the Sacramento and San Joaquin valleys which are covered by Water Supervision work, and the total acreage of rice in California irrigated from all sources as reported by the Federal-State Crop Reporting Service. In Table 112 there are shown the average monthly diversions in percent of the seasonal for the streams in the Sacramento and San Joaquin valleys. A summary of the monthly diversions from the Sacramento and San Joaquin valley streams for the seven-year period of record prior to 1947 is given in Tables 113 through 123. Table 124 shows, for the Sacramento River only, the seasonal diversions and acreages irrigated for the period 1939 through 1947, segregated to the different river sections.

On about July 1, 1947, the Banta-Carbona Irrigation District constructed a temporary dam of earth filled sacks across the San Joaquin River 50 feet below its intake canal. The prevailing low flow conditions of the river at that point allowed the tidal fluctuations full sway at the district's pumping plant causing serious loss of pumping capacity and damage to the plant. The dam held the river water upstream at the average high tide level thereby maintaining approximately a 2.5 feet higher water level at the plant. The prevailing low flows in the river were allowed to pass over the sack dam at specially prepared sections. Similar temporary dams have been placed at this site during other years of low flow since 1924.

Irrigated Acreage

Toward the end of the irrigating season in 1947, as was done in previous years, a complete canvass was made of acreages irrigated from each of the points of diversion covered by the Water Supervision work. The irrigated acreage for all of the points of diversion on the streams north of Durham Ferry Bridge (Vernalis) on the San Joaquin River, including the Sacramento Valley floor streams, was plotted on suitable maps and are retained on file in the office of the Division of Water Resources for record.

The area irrigated through each individual point of diversion along the streams covered in this work is given in Tables 93 to 111, inclusive. These tabulations and the associated summarizing tables do not include data on diversions and use of water in the Delta.

The following is a summary of the total acreage irrigated during 1947 in the area covered by the Water Supervision work. A comparison of annual total acreage irrigated, 1939 through 1947, is given in Table 4. Detailed acreage tabulations are found in Tables 92 through 111.

Area	1947 Irrigated Acreage	
Sacramento Valley Floor above Sacramento	382,600	
San Joaquin Valley Floor above Delta	496,400	
Total area served by measured diversions		879,000
Sacramento-San Joaquin Delta		
Cropped	336,000	
Water and native plants	113,000	
Total Delta		449,000
Grand Total		1,328,000

In view of the methods of farming, which usually employ rotation of crops with summer-fallow, it is probable that the acreage of land under irrigation facilities in the area covered by the Water Supervision activities approaches 1,400,000 acres.

Gross Duty of Water

The term "gross duty of water", as used in this report, is defined as being the total amount of water diverted to serve one acre of irrigated land. The gross duty for any particular period may be expressed as the amount of water diverted in acre-feet per acre irrigated, or, conversely stated, may be expressed as the number of acres irrigated per one second-foot average diversion rate. The gross duty of water does not include solely the net amount of water consumed by plants in their processes of transpiration and growth, but also includes all irrecoverable losses through evaporation and deep percolation, plus canal and conveyance losses, and those amounts of water which act as a necessary vehicle to carry irrigation heads across porous soils or to maintain fresh water ponds in the growing of rice and which return to some river or drainage channel, with little loss, to become available for re-use.

Gross duty of water figures for the individual stream channels covered by Water Supervision work are given for the Sacramento and San Joaquin valleys in Table 92.

Use of Water in Delta

Previous Water Supervision annual reports have included considerable analyses of the utilization of water in the Sacramento-San Joaquin Delta. The work of Water Supervision does not cover the delta area to the extent of measuring flows in the numerous interconnected channels or quantities of water diverted for irrigation, but, periodically, surveys have been made of crops and irrigated acreages. Special investigations of the Delta irrigation problems have been conducted and the results therefrom have been reported in previous reports.

In previous years, when the crop surveys were made, the total consumptive use of water has been segregated to show the use in each river delta. There was also shown a classification of the irrigated crops with respect to the peat and sedimentary soils on which they were produced.

SALINITY INVESTIGATIONS

The intrusion of salty water from San Francisco Bay into the channels of the Delta from which irrigation supplies are derived, is a matter of extreme importance and the Water Supervision work has included observations during 1947 of the saline content of the water at several stations throughout the Delta and upper San Francisco and Suisun Bay areas, with cooperation from the U. S. Bureau of Reclamation.

Purpose

The purpose of the salinity investigation, as outlined in previous reports, has been to record the occurrence and extent of salinity encroachment 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 at 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 the corroboration of the relation presently established, but as the basis for a check of possible modifications in the relation due to changes in channel and tidal conditions which may have taken place or will occur in the future. Also, during periods of low stream flow, the continuation of salinity sampling has been essential in keeping the Delta irrigators advised

of conditions through periodic bulletins so that damage from the use of water of too high salt content might be averted. (Saline concentrations exceeding 100 parts of chlorine per 100,000 parts of water are toxic to the average plant and are objectionable for human consumption.)

During 1947 the continuous observations of salinity served as an important factor in determining the amounts of release from Shasta Reservoir as controlled by the U. S. Bureau of Reclamation.

Scope

The general scope of this investigation each season has been such as to insure that samples of water to be tested for salinity could be taken at regular intervals at a sufficient number of stations throughout the Delta and upper Bay region so that the advance and retreat of the salinity from early summer to late fall would be completely recorded. Plate 4 shows the limit of encroachment into the Delta of water having 100 parts of chlorine per 100,000 parts of water for the years 1931, 1938, 1943, 1944, 1945, 1946 and 1947. These certain years are chosen, first, to represent a range of runoff conditions prior to the commencement of releases from Shasta Reservoir, to wit, 30 per cent of normal runoff during 1931, 170 per cent of normal runoff during 1938, 114 per cent of normal runoff during 1943, and second, to represent the consecutive years concurrent with those releases. The salinity encroachment lines for each of the years 1920 to 1944, inclusive, may be found on the Delta map in the 1944 annual Water Supervision Report.

Due to curtailment of appropriations to the Division of Water Resources by the Legislature in the 1941-1942 budget, sampling for salinity at all stations in the Bay and Delta areas was stopped by the Division of Water Resources on July 15, 1941. Through cooperation of the Fontana Farms Company, the City of Antioch Water Department, the U. S. Bureau of Reclamation, the Dow Chemical Company at Pittsburg and the City of San Francisco, miscellaneous samples were taken during the 1943 season and the results of the analyses are presented in the 1943 report of Water Supervision. In that same report there are tabulated a large number of complete analyses of water from the channels of the Sacramento and San Joaquin valleys and the Delta as prepared by the U. S. Bureau of Reclamation.

A regular program of salinity sampling and testing was re-established early in 1944 as part of the activities of the Sacramento-San Joaquin Water Supervision, with the necessary funds therefor being provided by the U. S. Bureau of Reclamation. This regular program was continued throughout 1947. The records of water samples taken during 1947 from 33 active sampling stations are given in Table 128.

Complete or Partial Analysis of Surface Flows

As a matter of record there is included in this report a tabulation of the results of complete or partial chemical analyses of samples of water taken at many points along the Sacramento and San Joaquin rivers and in the Delta during 1947. These results are contained in Table 132 and are furnished entirely by the U. S. Bureau of Reclamation. The methods of collecting the samples and of analysis are definitely different from the methods employed in determining the chlorine component as part of the regular salinity observation activities in the Sacramento-San Joaquin Delta. Although the records of the U. S. Bureau of Reclamation include results of complete or partial analysis at many points on streams in the Central Valley area this annual report gives results for only a limited series of river points which are indicative of the trend and the source of salt concentrations.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
SACRAMENTO–SAN JOAQUIN WATER SUPERVISION

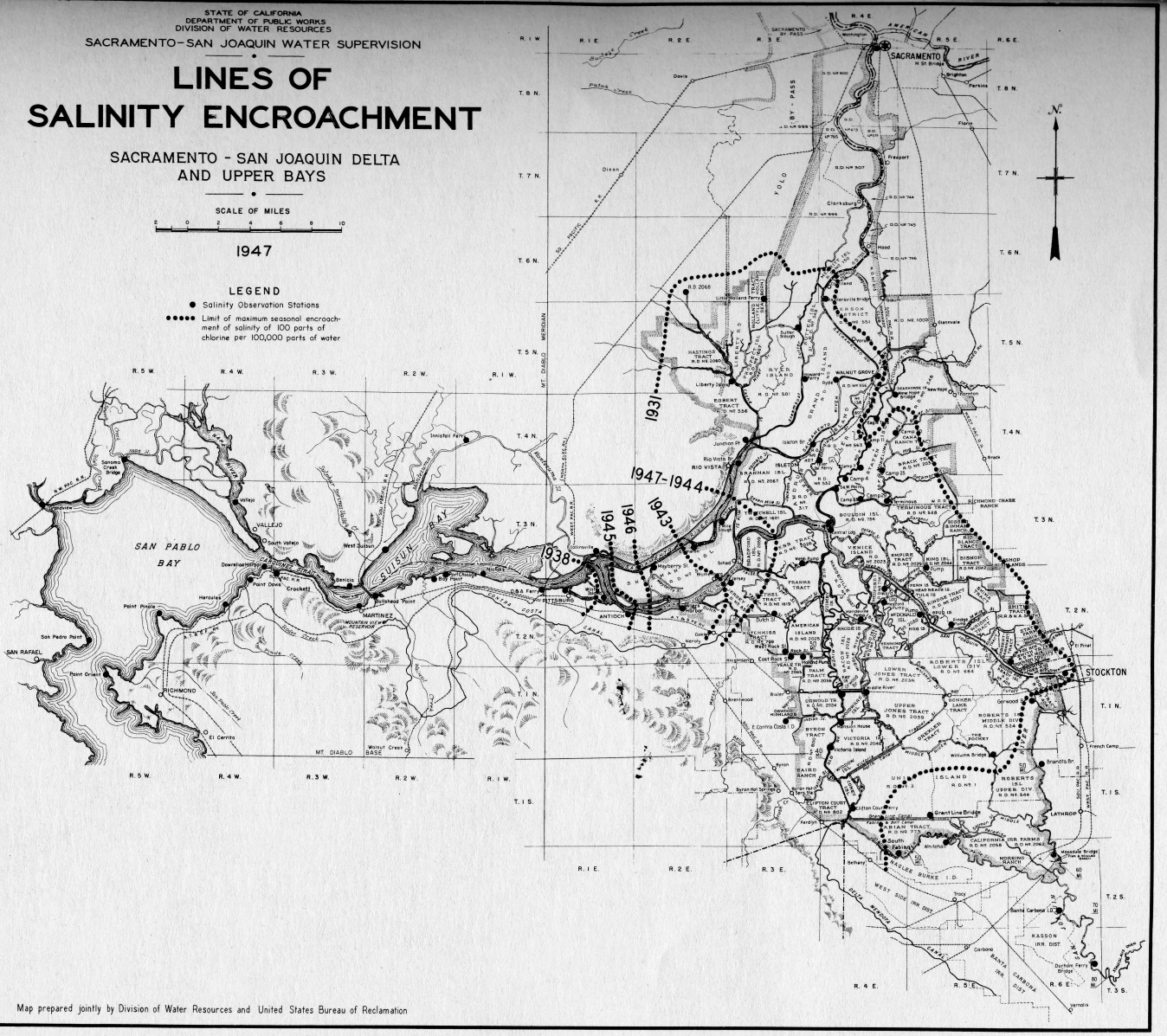
LINES OF SALINITY ENCROACHMENT

SACRAMENTO - SAN JOAQUIN DELTA AND UPPER BAYS

SCALE OF MILES
0 2 4 6 8 10

1947

LEGEND
- Salinity Observation Stations
- Limit of maximum seasonal encroachment of salinity of 100 parts of chlorine per 100,000 parts of water



Map prepared jointly by Division of Water Resources and United States Bureau of Reclamation

New Salinity Observation Stations

Construction work was started on the headworks of the Delta-Mendota Canal, a unit of the Central Valley Project, during 1947. Inflows to the Delta area from the San Joaquin River during 1947 decreased to less than 500 second feet in July. This low flow condition caused an accumulation of saline waters along the southwest edge of the Delta in Old River, and it became apparent that additional salinity observation stations surrounding the intake of the new canal were needed. Three new stations were established for this purpose: Clifton Court Ferry (re-established), South Fabian and Grant Line Canal Bridge.

Two other new stations were established, one immediately below the intake canal of Banta-Carbona Irrigation District and the other at the San Joaquin River Gaging Station near Vernalis (Durham Ferry Bridge). These new stations were established for the purpose of checking salinity in San Joaquin River water above the temporary diversion dam placed across that stream below the Banta-Carbona intake canal, in comparison to concentrations below the dam when tidal fluctuations were present.

A description of the location of each of these new stations is contained in Table 127, together with the descriptions of all other stations active during 1947.

Station Maintenance and Records

The salinity sampling at all stations is done by local observers. Each observer is provided with a schedule showing the exact time for taking the samples, so that, throughout the Delta and upper bays all samples are taken at approximately one and one-half hours after the same high tide at four-day intervals. Table 127 gives the location and description of each active station from which samples were received during 1947. Location description of inactive stations are deleted in this report but can be found in previous reports.

The observers are furnished with stamped containers for the sample bottles so that the latter can be mailed, as filled, to the laboratory at Sacramento. All analyses of the water were made at the Materials and Research Laboratory of the Division of Highways in Sacramento during the 1947 season.

The maximum salinity as recorded at the stations in 1947 is shown in Table 126. For comparative purposes, this table shows also the maximum salinity recorded at these stations in previous years beginning with 1937. Only presently indicative and active stations are included in this comparison.

Daily Salinity Observations

In compliance with the desire of the U. S. Bureau of Reclamation to obtain daily observations of salinity in the Suisun Bay area arrangements were made for daily observations with the U. S. Maritime Commission, Reserve Fleet Division, for the West Suisun station and with the U. S. Navy, Marine Barracks, for the Port Chicago station. Special schedules of daily times for taking salinity samples were prepared for each of the two stations and complete and satisfactory cooperation by the two agencies was experienced through the year. The special results of the daily observations were transmitted immediately to the U. S. Bureau of Reclamation as received from the State Testing Laboratory. The daily records at these two stations are given in Tables 129 and 130. However, the regular four-day interval results of observations for the two stations, West Suisun and Port Chicago, are included herein in Table 128 together with similar results for all other stations.

Salinity Bulletins

During 1947 a salinity bulletin was mailed each month to many interested agencies and individuals giving the results of samples taken and analyzed at four-day intervals at all of the stations. The figures given were the laboratory determination of the number of parts of chlorine per 100,000 parts of water.

Area of Salinity Encroachment

There is an apparent relation between the average stream flow to the Delta during the ten-day period of minimum flow and the area affected by salinity encroachment. Data amassed in this regard indicate that when the flow to the Delta drops below a certain amount the rate of advance of salinity encroachment greatly accelerates. A comparison of the average stream flows during the ten-day period of minimum flow and the affected acreage in the Delta is presented in Table 131.

TIDE GAGES

The 28 recording tide gages located on the Delta channels and on the upper bays were continued during 1947. Previous Water Supervision Reports contained detailed descriptions and locations of the gages. The Flood Control branch of the Division of Water Resources operates and maintains 18 of these tide gages. The remaining 10 are operated by Federal agencies.

TABLES

TABLE 1

ANNUAL RUNOFF IN PERCENT OF 50 YEAR NORMAL(1)
SACRAMENTO-SAN JOAQUIN RIVER SYSTEM

	Sacramento and San Joaquin Rivers to Delta	Sacramento River at Red Bluff	Sacramento River at Sacramento	Feather River near Oroville	Yuba River at Smartville	American River at Fairoaks	Mokelumne River at Mokelumne Hill	Stanislaus River below Melones	Tuolumne River near La Grange	Merced River at Exchequer	San Joaquin River below Friant	San Joaquin River near Vernalis
Mean Annual Runoff(1) Thous. Ac. Ft.	(2) 26977	8747	(2) 19342	4853	2490	2879	802	1273	1985	1069	1914	(2) 6241
1920	52	48	48	45	52	51	58	58	68	64	69	66
1921	118	131	126	124	127	111	109	99	102	95	84	95
1922	103	76	95	105	119	114	115	112	125	133	123	123
1923	76	61	70	63	83	96	88	89	90	88	87	88
1924	28	38	30	27	24	19	24	21	28	24	23	24
1925	86	92	84	65	85	94	104	96	97	85	75	88
1926	60	65	63	65	65	48	47	48	56	57	61	56
1927	121	125	127	121	142	127	112	107	103	101	105	104
1928	84	87	89	88	98	88	80	75	77	69	61	70
1929	44	50	44	38	41	40	43	41	49	46	46	46
1930	65	70	71	80	73	57	57	58	58	48	46	53
1931	30	38	32	30	26	25	26	25	30	25	25	27
1932	78	58	69	68	85	90	93	106	106	104	108	106
1933	48	52	46	39	43	44	53	48	56	48	58	54
1934	43	51	45	42	40	39	37	33	41	34	37	37
1935	91	86	87	88	90	90	88	95	106	110	101	103
1936	96	81	92	88	104	118	112	104	109	108	98	104
1937	80	68	70	65	75	81	87	87	101	114	115	105
1938	170	168	167	175	162	157	154	161	173	195	193	180
1939	43	50	43	39	36	36	43	41	46	45	49	46
1940	115	120	118	116	115	118	107	110	112	103	98	105
1941	137	164	143	133	129	109	105	105	126	136	137	127
1942	129	129	133	136	137	136	123	117	120	120	118	118
1943	114	97	111	115	126	135	125	123	120	121	108	117
1944	56	53	54	57	56	51	56	53	66	64	63	62
1945	86	76	79	77	88	88	97	100	106	103	112	106
1946	92	92	92	85	96	100	93	93	95	88	91	92
1947	54	58	54	52	55	49	49	50	55	53	59	55

(1) 50 year normal taken as 50 year (1889-1939) mean annual full natural runoff (Oct.-Sept. incl.).

(2) Summation of full natural runoff at foothill stations on major tributaries only, and does not include runoff from minor tributaries and from valley floor.

TABLE 2

INVENTORY OF MONTHLY STREAM FLOW - SACRAMENTO RIVER AND TRIBUTARIES - 1947

Item	Mileage	Record in Table No.	Quantities in Acre-Feet												Annual Total
			Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
SACRAMENTO RIVER															
INFLOW TO SHASTA RESERVOIR (Computed)		6	232100	436400	717500	445200	270800	378500	223100	200600	188200	289200	237800	237300	3856700
Change in Storage		7	-109000	+250000	+532000	+207000	-143000	-15000	-253000	-251000	-137000	-2200	-12400	+4200	+70600
Unmeasured Accretions			6700	6000	13000	-8700	-14700	-10500	-16200	-17700	-13500	2800	-3400	-1300	-57500
AT KESWICK	250.5	8	347800	192400	198500	229500	399100	383000	459900	433900	311700	294200	246800	231800	3728600
Diversions		93	190	133	149	8847	22411	20957	22021	21189	19743	6100	177	159	122076
Unmeasured Accretions			-115146	5508	63146	2768	493	5123	-458	10786	16100	13550	12739	9652	71061
AT REDDING	243.0	9	336064	197775	204697	223421	377182	367166	437421	423497	308057	301650	259362	241293	3677585
Diversions		93	0	0	14	806	2862	2363	2885	3403	2547	542	0	0	15422
Unmeasured Accretions			16483	78983	130390	70110	7960	19222	6813	-4452	-12825	14050	19102	21144	366980
AT BALL'S FERRY	224.5	10	3525147	276758	335073	292725	382280	384025	441349	415642	292685	315158	278464	262437	4029143
BATTLE Cr. Nr. COTTONWOOD	221.5L	21	13510	20950	23220	31890	16980	15470	10000	9230	9080	16140	16520	15910	198900
COTTONWOOD Cr. Nr. COTTONWOOD	222.2R	20	6820	57760	82610	24920	10310	12920	3010	2240	2600	7190	7190	6090	223660
Diversions		93	0	0	0	9	215	228	338	189	171	47	0	0	1197
Unmeasured Accretions			4623	9432	9097	20574	8045	19413	5679	8677	10506	10959	7826	-3837	110994
NEAR RED BLUFF	198.6	11	377500	364900	450000	370100	417400	431600	459700	435600	314700	349400	310000	280600	4561500
Diversions		93	0	0	4	9	28	16	162	25	17	2	0	0	263
Unmeasured Accretions			31002	114393	105245	75443	18681	8793	3907	13965	10790	25325	45701	29679	482924
AT VINA BRIDGE	166.5	12	408502	479293	555241	445534	436053	440377	463445	449540	325473	374723	355701	310279	5044161
Diversions		93	0	0	32	62169	121159	119011	128906	124192	75748	23740	0	0	654957
Unmeasured Accretions			9679	-11564	2829	13454	9567	4186	2914	-4001	-1430	-2006	6189	-159	29658
AT HAMILTON CITY BRIDGE	150.0	13	418181	467729	558038	396819	324461	325552	337453	321347	248295	348977	361890	310120	4418862
STONY Cr. Nr. HAMILTON CITY	136.3R	23	0	10120	19240	697	0	0	0	0	0	0	0	0	30057
Diversions		93	0	0	0	6615	15854	5040	9738	7703	4366	8	0	0	49324
Unmeasured Accretions			10019	50351	26622	44999	19793	20588	14985	13756	23271	12131	20810	16580	273905
AT BUTTE CITY	115.8	14	428200	528200	603900	435900	328400	341100	342700	327400	267200	361100	382700	326700	4673500
MOULTON WEIR	104.0L	22	0	0	0	0	0	0	0	0	0	0	0	0	0
COLUSA WEIR	92.4L	24	0	0	0	0	0	0	0	0	0	0	0	0	0
Diversions		93	0	0	2	9206	22863	19403	22029	20611	8374	988	0	0	103476
Unmeasured Accretions			6500	-3500	16302	15206	2863	-6797	5229	5611	3374	-2212	6300	8100	56976
AT COLUSA	89.4	15	434700	524700	620200	441900	308400	314900	325900	312400	262200	357900	389000	334800	4627000
BUTTE SLOUGH OUTFALL	84.0L	25	33000	45820	-38270	30680	25720	35320	13750	16760	29470	35900	33500	8070	346260
R. D. 70 DRAIN	68.8L	27	165	113	305	347	2154	1831	2041	2259	1676	236	258	30	11415
TISDALE WEIR	64.2L	26	0	0	0	0	0	0	0	0	0	0	0	0	0
Diversions		93	0	0	335	46057	89697	77169	84306	77508	29064	1693	0	0	405829
Unmeasured Accretions			-24565	-49433	-31140	-1570	-11277	7918	-2285	-2611	4918	-30443	-10158	-3600	-154246
AT WILKINS SLOUGH	62.9	16	443300	521200	627300	425300	235300	282800	255100	251300	269200	361900	412600	339300	4424600
R. D. 108 DRAIN	44.0R	28	1340	2670	2700	2630	18060	11580	16100	20790	17170	1820	1160	1060	100380
COLUSA BASIN DRAIN	34.15R	32	10480	10650	10220	5320	13140	26400	9490	23840	44650	23190	13760	8190	199330
SYCAMORE SLOUGH	34.15R	33	0	6	16	30	902	754	1130	1170	1160	282	34	0	5484
Diversions		93	0	0	0	16149	28854	28586	29972	28362	8674	139	0	0	140736
Unmeasured Accretions			12180	-15326	3964	17269	11552	5652	8752	7062	-1506	-10053	-6354	-3450	29742
AT KNIGHT'S LANDING	34.0	17	467300	519200	644200	434400	250100	301600	260900	275800	322000	377000	421200	345100	4618800
SACRAMENTO SLOUGH	21.2L	38	2700	48810	51000	44420	32200	44190	42200	47860	49840	16280	15840	9720	405060
FEATHER RIVER AT NICOLAUS	20.9L	43	146500	452800	776700	573300	124000	74330	16780	24640	40820	135600	157600	143400	6666170
FREMONT WEIR	23.0R	34	0	0	0	0	0	0	0	0	0	0	0	0	0
R. D. 1001 DRAIN	19.6L	48	63	208	288	119	684	270	0	0	0	0	0	0	1632
Diversions		93, 100	0	0	0	5205	12653	14162	14532	13282	5693	179	0	0	65706
Unmeasured Accretions			15337	19982	-3188	6966	10069	4572	-7248	-3918	733	199	-6040	-9920	27544
AT VERONA	19.6	18	631900	1041000	1469000	1054000	404400	410800	298100	331100	407700	528900	588600	488300	7653800
R. D. 1000 (#3) DRAIN	6.85L	50	1062	1423	1529	424	0	0	0	234	2656	992	688	211	9219
R. D. 1000 (2nd Bannon Sl.) DRAIN	2.1L	51	0	645	0	1340	3700	1010	0	333	7400	2870	0	623	17921
AMERICAN RIVER AT SACRAMENTO	1.1L	53	70410	180700	290600	287900	242300	85420	17180	10300	8490	49750	56670	45240	134960
SACRAMENTO WEIR	4.2R	49	0	0	0	0	0	0	0	0	0	0	0	0	0
Diversions		93, 102	2041	1864	2207	12242	30576	29501	32413	30942	16814	2928	2077	2118	165723
Unmeasured Accretions			81769	76896	96378	109978	43676	34471	25233	27575	4068	-9884	48119	19744	558023
AT SACRAMENTO	0.4	19	783100	1298800	1855300	1441400	663500	502200	308100	338600	413500	569700	692000	552000	9418200
SHASTA RESERVOIR TO SACRAMENTO															
Total Accretions			158181	281722	375845	366497	106722	112641	47321	54750	44499	24416	14083	82633	1796061
Total Diversions			2231	1997	2743	167314	347172	316436	347302	327406	171211	36366	2254	2277	1724709
FEATHER RIVER															
NEAR OROVILLE	71.0	39	83010	297900	439000	341900	177400	143600	135800	132300	100700	120900	113200	107600	2193310
Diversions		100	0	0	0	28024	141189	120877	125986	114712	71759	20363	0	0	622910
Unmeasured Accretions			4560	15500	39800	29724	3349	4947	946	-518	1399	-5147	4200	1000	99760
NEAR GRIDLEY	49.7	40	87570	313400	478800	343600	39560	27670	10760	17070	31340	95390	117400	108600	1670160
Diversions		100	0	0	90	619	5863	1790	3848	3602	1881	66	0	0	17759
Unmeasured Accretions			11420	5300	30290	41319	40023	20080	8968	10372	8921	6776	-3600	-6800	173069
AT YUBA CITY	28	41	98990	318700	509000	384300	73720	45960	15880	23840	37380	102100	113800	101800	1825470
YUBA R. AT MARYSVILLE	27.3L	46	50830	150900	266100	190600	77730	43640	11540	11020	9760	23080	23010	22430	880640
Diversions		100, 101	0	0	0	0	0	0	0	0	0	0	0	0	0
Unmeasured Accretions			-36420	-33700	-42400	-2000	-16150	-20600	-13320	-8160	-5040	4420	10490	170	-162710
BELOW SHANGHAI BEND	23.0	42	113400	435900	732700	572900	135300	69000	14100	26700	42100	129600	147300	124400	2543400
BEAR RIVER NEAR WHEATLAND	10.8L	47	4180	21480	64110	26660	4060	309	186	90	76	3540	4790	3880	133361
Diversions		100	0	0	0	1508	5480	5582	5880	5422	3354	376	0	0	27602
Unmeasured Accretions			28920	-4580	-20110	-24752	-9880	10603	8374	3272	1998	2836	5510	15120	17311
AT NICOLAUS	9.3	43	146500	452800	776700	573300	124000	74330	16780	24640	40820	135600	157600	143400	2666470
OROVILLE TO NICOLAUS															
Total Accretions			8480	-17480	7580	44291	173142	15030	4968	4966	7278	8885	16600	9490	127430
Total Diversions			0	0	90	30151	152532	128249	135714	123736	76994	20805	0	0	668271
AMERICAN RIVER															
AT FAIROAKS	19.2	52	64890	173800	294700	284400	242000	86370	16740	10990	8840	49580	52780	40900	1325990
Diversions		102	0	0	308	328	473	1103	1184	1079	1070	235	0	0	5780
Unmeasured Accretions			5520	6900	-3792	3828	773	153	1624	389	720	405	3890	4340	24750
AT SACRAMENTO	6.1	53	70410	180700	290600	287900	242300	85420	17180	10300	8490	49750	56670	45240	1344960
SUTTER BY-PASS															
BUTTE SLOUGH TO SUTTER BY-PASS	29.4	35	2040	34920	20740	13440	5260	4760	5180	4960	2590	3830	6000	5660	109380
WADSWORTH CANAL	25.7L	36	1765	3027	1920	1690	7130	9250	6960	8420	11170	6300	2360	1390	61382
TISDALE WEIR	18.9R	26	0	0	0	0	0	0	0	0	0	0	0	0	0
R. D. 1500 DRAIN	0.0R	37	2810	3500	4030	5680	25010	26200	27820	31460	26120	5290	2480	1480	161880
Diversions		99	0	0	301	3098	8437	9236	10433	9851	4506	0	0	0	45862
Unmeasured Accretions			-3915	7363	24611	26708	3237	13216	12673	12871	14466	860	5000	1190	118280
SACRAMENTO SLOUGH	-1.0	38	2700	48810	51000	44420	32200	44190	42200	47860	49840	16280	15840	9720	405060
BACK BORROW PIT															
COLUSA TROUGH AT HIGHWAY 20	37.0	29	7708	15059	9632	8327	29169	35334	27801	41072	49106	17800	9047	3896	253951
Diversions		95	0	0	0	2052	4797	6769	6278	5647	3216	1190	0	0	29901
Unmeasured Accretions			323	6071	2285	4271	1159	7436	4177	4160	6970	1712	660	549	39773
COLUSA TROUGH AT COLLEGE CITY	22.7	30	8031	21130	11917	10546	25579	36001	25700	39585	52860	18322	9707	4445	263823
KNIGHTS LDG. RIDGE CUT	0.4R	31	0	11860	6054	7002	2900	1976	3314	3911	1609	10	238	0	38874
Diversions		95, 96	0	0	0	4531	11772	13485	13294	12807	4035	166	0	0	60090
Unmeasured Accretions			2449	1380	4357	6307	2233	5860	398	973	-2566	5044	4291	3745	34471
COLUSA BASIN DRAIN	0.0	32	10480	10650	10220	5320	13140	26400	9490	23840	44650	23190	13760	8190	199330
HIGHWAY 20 TO OUTFALL GATES															
Total Accretions			2772	7451	6642	10578	3392	13296	4575	5133	4404	6756	4951	4294	74244
Total Diversions			0	0	0	6583	16521	20254	19572	18454	7251	1356	0	0	89991
YOLO BY-PASS															
FREMONT WEIR			0	0	0	0	0	0	0	0	0	0	0	0	0
KNIGHT'S LDG. RIDGE CUT	10.1R	31	0	11860	6054	7002	2900	1976	3314	3911	1609	10	238	0	38874
CACHE CREEK AT YOLO	7.0R	54	0	10280	17520	3580	0	0	0	0	0	0	0	0	31380
Diversions		97	0	0	0	120	1210	1506	1806	1839	599	0	0	0	7080
Unmeasured Accretions			728	-4090	-2294	-3452	1250	1070	1652	678	2610	857	225	626	-140
YOLO BY-PASS NEAR WOODLAND	0.0	55	728	18050	21280	7010	2940	1540	3160	2750	3620	867	463	626	63034
YUBA RIVER															
YUBA RIVER AT NARROWS DAM		44	44810	120000	230500	178600	94130	57720	28100	27190	23470	27780	22360	25940	880600
DEER CREEK NEAR SMARTSVILLE		45	2050	8750	15960	6640	979	1060	338	279	119	1780	2250	1710	41915
Diversions		101	0	0	0	3820	17316	16339	17364	19152	15577	10517	0	0	100085
Unmeasured Accretions			3970	22150	19640	9180	-63	1199	466	2703	1748	4037	-1600	-5220	58210
YUBA RIVER AT MARYSVILLE	0.9	46	50830	150900	266100	190600	77730	43640	11540	11020	9760	23080	23010	22430	880640

TABLE 3

INVENTORY OF MONTHLY STREAM FLOW - SAN JOAQUIN RIVER AND TRIBUTARIES - 1947

Item	Mileage	Record in Table No.	Quantities in Acre-Feet Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
DELTA TRIBUTARIES															
COSUMNES RIVER AT MICHIGAN BAR		56	8080	22790	43200	32170	10760	3330	386	70	12	2600	3650	3080	130128
COSUMNES RIVER AT McCONNELL		57	7780	26630	47180	33250	9130	1990	0	0	0	1380	3170	2600	133110
DRY CREEK NEAR GALT		58	520	3070	6550	2660	5	0	19	70	1	0	0	0	12895
MOKELUMNE RIVER AT WOODBRIDGE		59	32910	27240	6720	8880	1500	781	1320	3460	8220	7360	10480	16370	125241
CALAVERAS RIVER AT JENNY LIND		60	3440	9980	16040	5650	1310	614	0	0	0	0	1150	1370	39554
CALAVERAS RIVER AT STOCKTON		61	2120	9420	13490	3770	53	0	0	0	0	0	0	0	28853
SACRAMENTO RIVER AT SACRAMENTO		19	783100	1298800	1855300	1441100	663500	502200	308100	338600	413500	569700	692000	552000	9418200
YOLO BY-PASS NEAR WOODLAND		55	728	18050	21280	7010	2940	1540	3160	2750	3620	867	463	626	63034
SAN JOAQUIN RIVER NEAR VERNALIS		77	171100	133700	138900	88510	125800	56080	32380	35010	63900	81860	106800	105600	1139640
Total Measured Flow to Delta			998258	1516910	2089420	1585480	802928	562591	344979	379890	489241	661167	812913	677196	10920973
SAN JOAQUIN RIVER															
INFLOW TO FRIANT RESERVOIR		62	83400	81100	112200	135000	218000	96700	71600	61300	54600	54690	38340	37540	1044470
Change in Storage		63	+33400	+32100	+12200	-26700	+72600	-52200	-105800	-100400	-44600	-6100	+14600	+20000	-150900
COTTONWOOD CREEK Nr. FRIANT	269.63R	65	175	196	69	6	0	0	0	0	0	0	0	0	446
Diversions			0	0	0	49	27	54	46	0	0	35	49	15	275
Unmeasured Accretions			-1375	-1556	-7919	-14057	-15473	-13046	-18454	-15000	-2230	655	679	705	-87071
BELOW FRIANT	268.13	64	48800	47640	92150	147600	129900	135800	158900	146700	96970	61410	24370	18230	1108470
Diversions		107	551	222	994	7081	4331	1998	2198	1620	1111	838	707	485	22136
Unmeasured Accretions			2425	3331	-5450	-10721	-5807	-11481	-13079	-9887	-3707	4537	3876	2473	-43490
AT WHITEHOUSE	219.83	66	50674	50749	85706	129798	119762	122321	143623	135193	92152	65109	27539	20218	1028844
FRESNO SLOUGH BY-PASS	208.9L	67	5660	0	0	0	1410	0	0	0	0	0	0	0	7070
Diversions		107,108	4159	9513	52197	102439	94302	95366	116017	107986	73119	50726	18713	17169	741706
Unmeasured Accretions			255	-7556	-4889	-8609	-3850	-1895	-4066	-4607	-5123	-5873	-2596	-109	-48918
NEAR MENDOTA	206.2	68	52430	33680	28620	18750	23020	25060	23540	22600	13910	8510	6230	2940	259290
Diversions		107	0	329	9038	16321	17304	18046	22410	22466	14650	9257	6274	3763	139858
Unmeasured Accretions			2180	1029	3498	831	1524	126	-120	29	853	795	63	1161	11969
NEAR DOS PALOS	186.0	69	54610	34380	23080	3260	7240	7140	1010	163	113	48	19	338	131401
Diversions		107	0	0	0	0	0	0	0	0	0	0	0	0	0
Unmeasured Accretions			-22510	-13960	-8910	-1450	-430	0	260	-47	-47	34	-19	-275	-47354
NEAR EL NIDO	168.0	70	32100	20420	14170	1810	6810	7140	1270	116	66	82	0	63	84047
Diversions		107	0	0	192	352	152	124	240	129	66	0	4	0	1259
Unmeasured Accretions			-9160	-4440	-2408	42	-398	-256	40	23	510	-82	4	-63	-16188
AT DELTA BRIDGE	158.7	71	22940	15980	11570	1500	6260	6760	1070	10	510	0	0	0	66600
Diversions		107	0	0	0	0	0	0	0	12	10	35	12	8	77
Unmeasured Accretions			51240	31100	27410	14050	11980	8350	7790	6842	9810	5395	5002	5958	184927
AT FREMONT FORD	129.5	72	74180	47080	38980	15550	18240	15110	8860	6840	10310	5360	4990	5950	251450
MUD SLOUGH	125.0L	73	NO RECORD FOR 1947 - FLOW NEGLIGIBLE												
MERCED RIVER NEAR STEVINSON	123.75R	80	12490	10310	10410	9530	22370	13000	11380	10310	9590	7770	9420	9560	136140
Diversions		106,109	0	0	16	545	397	528	650	607	414	164	0	0	3321
Unmeasured Accretions			5300	3330	4606	1105	-293	1208	460	807	354	1124	310	580	18891
NEAR NEWMAN	123.7	74	91970	60720	53980	25640	39920	28790	20050	17350	19840	14090	14720	16090	403160
MERCED RIVER SLOUGH Nr. NEWMAN	122.2R	81	0	0	0	0	246	0	0	0	0	0	0	0	246
Diversions		106	0	0	3446	12939	10639	11280	13227	9294	7093	857	0	0	68775
Unmeasured Accretions			12559	9059	9030	14244	9458	13353	14023	14050	13514	8337	8179	6323	132129
NEAR GRAYSON	96.05	75	104529	69779	59564	26945	38985	30863	20846	22106	26261	21570	22899	22413	466760
TUOLUMNE RIVER AT TUOLUMNE CITY	91.0R	86	53524	48278	49031	20588	18069	16532	15193	17276	39759	48387	67636	53098	447371
Diversions		106, 110	0	0	6081	15070	13003	12818	16497	14710	8264	1666	0	0	88109
Unmeasured Accretions			3997	356	4078	4836	8005	5717	6551	2591	2829	3054	-1576	4859	45297
AT HETCH HETCHY CROSSING	82.65	76	162050	118413	106592	37299	52056	40294	26093	27263	60585	71345	88959	80370	871319
STANISLAUS RIVER Nr. MOUTH	79.7R	91	14350	12640	33340	50450	77180	17230	7640	6980	7290	9580	15920	24940	277540
Diversions		106, 111	0	0	2247	3888	4762	4032	4758	4341	2791	862	0	0	27681
Unmeasured Accretions			-5300	2647	1215	4649	1326	2588	3405	5108	-1184	1797	1921	290	18462
NEAR VERNALIS	76.7	77	171100	133700	138900	88510	125800	56080	32380	35010	63900	81860	106800	105600	1139640
FRIANT RESERVOIR TO VERNALIS															
Total Accretions			39611	23340	20261	4920	6042	4664	-3190	-91	15579	19773	15843	21902	168654
Total Diversions			4710	10084	74211	158684	144917	144246	176043	161165	107518	64440	25759	21440	1093197
MERCED RIVER															
AT YOSEMITE VAL. R.R. CROSSING	42.1	78	1580	1370	1510	940	17980	2560	2790	1370	573	286	488	486	31933
Diversions		109	0	0	5	152	913	748	981	906	439	54	0	0	4198
Unmeasured Accretions		110	5410	4320	4275	3842	3893	5208	4731	4846	4566	4178	5052	6164	56485
AT CRESSEY	27.6	79	6990	5690	5780	4630	20960	7020	6540	5310	4700	4410	5540	6650	84220
Diversions		109	0	0	207	2166	1818	2096	2711	2582	1665	311	0	0	13556
Unmeasured Accretions			5500	4620	4837	7066	3228	8076	7551	7582	6555	3671	3880	2910	65476
NEAR STEVINSON	4.6	80	12490	10310	10410	9530	22370	13000	11380	10310	9590	7770	9420	9560	136140
YOSEMITE VAL. R.R. CROSSING TO STEVINSON															
Total Accretions			10910	8940	9112	10908	7121	13284	12282	12428	11121	7849	8932	9074	121961
Total Diversions			0	0	212	2318	2731	2844	3692	3488	2104	365	0	0	17754
TUOLUMNE RIVER															
AT LA GRANGE	50.5	82	38760	33460	30770	1100	1140	385	375	403	26580	32360	51180	42400	258913
Diversions		110	0	0	0	0	0	0	0	0	0	0	0	0	0
Unmeasured Accretions			2470	3020	4180	3740	2020	1765	1455	1152	1210	180	-640	-240	20312
AT ROBERTS FERRY BRIDGE	39.9	83	41230	36480	34950	4840	3160	2150	1830	1555	27790	32540	50540	42160	279225
Diversions		110	0	0	0	29	69	66	104	50	36	10	0	0	364
Unmeasured Accretions			-1770	-520	860	4200	5330	5100	5240	6145	3200	4690	7290	1630	41395
AT HICKMAN BRIDGE	31.7	84	39460	35960	35810	9040	8490	7250	7070	7700	30990	37230	57830	43790	320620
DRY CREEK NEAR MODESTO	16.5R	87	1375	1680	1900	3755	2850	3330	2460	3005	2400	2000	1770	1410	27935
Diversions		110	0	0	0	50	127	70	122	111	56	2	0	0	538
Unmeasured Accretions			12265	7380	7680	7265	6117	4720	4282	4516	4476	9162	4710	6710	79283
AT MODESTO	15.92	85	53100	45020	45390	20010	17330	15230	13690	15110	37810	48390	64310	51910	427300
Diversions		110	0	0	167	573	632	631	653	486	351	105	0	0	3598
Unmeasured Accretions			424	3258	3808	1151	1371	1933	2156	2652	2300	102	3326	1188	23669
AT TUOLUMNE CITY	3.35	86	53524	48278	49031	20588	18069	16532	15193	17276	39759	48387	67636	53098	447371
LA GRANGE TO TUOLUMNE CITY															
Total Accretions			13389	13138	16528	16356	14838	13518	13133	14465	11186	14134	14686	9288	164659
Total Diversions			0	0	167	652	828	767	879	647	443	117	0	0	4500
STANISLAUS RIVER															
AT ORANGE BLOSSOM BRIDGE	44.7	88	2640	4050	34932	45390	83050	33641	1380	1904	1950	2500	7960	19590	208710
Diversions		111	0	0	0	206	337	348	379	275	152	28	0	0	1725
Unmeasured Accretions			4590	4320	-3602	736	-2433	4594	3809	3031	3552	4408	5850	5590	34445
AT RIVERBANK	32.0	89	7230	8370	31330	45920	80280	7610	4810	4660	5350	6880	13810	25180	241430
Diversions		111	0	0	47	594	521	458	628	568	221	93	0	0	3130
Unmeasured Accretions			4330	2780	6277	7274	2771	8198	5518	5278	4461	3953	2370	1090	54300
AT RIPON BRIDGE	16.0	90	11560	11150	37560	52600	82530	15350	9700	9370	9590	10740	16180	26270	292600
Diversions		111	0	0	1159	3509	4047	3778	4373	4197	3045	873	0	0	24981
Unmeasured Accretions			2790	1490	-3061	1359	-1303	5658	2313	1807	745	-287	-260	-1330	9921
NEAR MOUTH	4.3	91	14350	12640	33340	50450	77180	17230	7640	6980	7290	9580	15920	24940	277540
ORANGE BLOSSOM Br. TO MOUTH															
Total Accretions			11710	8590	-386	9369	-965	18450	11640	10116	8758	8074	7960	5350	98666
Total Diversions			0	0	1206	4309	4905	4584	5380	5040	3418	994	0	0	29836

TABLE 4
ANNUAL IRRIGATED ACREAGE 1939-1947

SACRAMENTO-SAN JOAQUIN RIVER SYSTEM SERVICE AREA
AS COVERED BY SACRAMENTO-SAN JOAQUIN WATER SUPERVISION

Stream	Year	1939		1940		1941		1942		1943		1944		1945		1946		1947	
	Crop	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice	General	Rice
Sacramento River Redding to Sacramento		158768	63833	119730	64391	118581	85196	111226	107663	126266	115599	111868	122242	106395	115015	117556	124135	121590	123981
Colusa Trough	(1)	35	1062	225	700	270	1280	270	1520	600	2766	1540	4487	200	3882	3030	3694	1735	6474
Buck Barrow Pit		1713	5772	3130	3259	3890	1969	2755	5647	2811	11684	965	9017	1585	5175	2062	7880	2295	9044
Knights Landing Ridge Cut.		551	0	452	0	317	803	430	875	400	1005	305	3230	230	3320	1170	2795	1975	1087
Yolo By-Pass above Highway 40		1986	2631	2049	0	1526	88	1300	0	1460	404	1235	1000	1594	500	620	200	1241	1895
Lower Butte Creek and Butte Slough	(1)	12263	607	9647	407	9621	0	8717	1045	8729	2024	7754	1760	7824	2110	8247	1846	4524	1115
Sutter By-Pass and Sacramento Slough	(1)	7657	1635	8091	647	7827	1600	5551	1792	5384	3037	5889	4303	4712	6996	9380	4925	8835	3210
Feather River Oroville to Mouth	(2)	29234	26303	30117	23526	27658	26640	38477	25177	24089	46566	25235	49843	25106	47865	27189	51052	28264	49749
Yuba River Smartville to Mouth		6642	1898	7220	1270	7472	1345	6661	1125	6280	2310	7009	2401	8815	1085	8872	1956	8282	3630
American River Fairoaks to Mouth	(2)	864	0	3061	0	3046	0	3132	0	3112	0	3205	0	2935	0	2893	0	3670	0
San Joaquin River Friant to Fremont Ford	(3)							NOT COVERED PRIOR TO 1946								305888	9727	336245	10563
San Joaquin River Fremont Ford to Vernalis		42379	420	39373	470	39866	484	41934	580	41143	342	42196	1464	41601	849	43094	1396	43076	1355
Fresno Slough and Fresno Slough By-Pass								NOT COVERED PRIOR TO 1946								19145	1868	17421	2698
Merced River Snelling to Mouth	(4)	3478	0	3123	0	3570	0	3302	0	3680	0	4509	0	4403	0	4484	0	5883	0
Tuolumne River La Grange to Mouth	(4)	864	0	1072	0	1295	0	1619	0	1826	0	3161	0	3259	0	3564	0	3761	0
Stanislaus River Melones to Mouth	(4)	6331	0	6902	0	6940	110	7095	130	7360	0	7915	0	6872	0	6343	0	6598	0
San Joaquin River - Delta Uplands Vernalis to Stockton		18672	0	18457	0	19298	0	17932	0	19685	0	20547	0	19935	0	24545	0	25122	0
Old San Joaquin River Delta Uplands		34956	0	29009	0	28842	0	28749	0	40607	0	32331	0	32139	0	34263	0	37859	0
Tom Paine Slough Delta Uplands		3911	0	4007	0	3963	0	4357	0	5058	150	14676	235	5165	221	5733	317	5278	546
Totals above Delta		219713	103741	183722	94200	180208	118921	178519	144844	179131	185395	165005	198283	159396	185948	181019	198483	182411	200185
Sacramento River System		53052	420	50472	470	51671	594	53950	710	54009	342	57781	1464	56135	849	382518	12991	412984	14616
San Joaquin River System		57539	0	51473	0	52103	0	51038	0	65350	150	67554	235	57239	221	64541	317	68259	546
Delta Uplands																			
Grand Total		330304	104161	285665	94670	283982	119515	283507	145554	298490	185887	290340	199982	272770	187018	628078	211791	663654	215347

(1) Figures for General Crops include acreage flooded for gun clubs.
(2) Figures for General Crops include 2200 acres in Carmichael Irrigation District classed as irrigated suburban areas.
(3) Figures exclude acreage in Madera Irrigation District.
(4) Figures exclude acreage in Merced, Turlock, Modesto, Waterford, Oakdale and South Joaquin Irrigation Districts.

TABLE 5

RELATION OF GAGE HEIGHT TO STREAM FLOW - 1947 SEASON

SACRAMENTO-SAN JOAQUIN VALLEY STREAM GAGING STATIONS

STATION	Gage height, U.S.E.D. elevation, for rated flows of:								
	2000 cfs	3000 cfs	4000 cfs	5000 cfs	6000 cfs	7000 cfs	8000 cfs	9000 cfs	10000 cfs
Sacramento River at Sacramento	Flows under 30000 cfs are affected by tidal action and are rated by slope-velocity methods not applicable to this table.								
at Verona		8.6	9.9	10.8	11.5	12.2	12.8	13.3	13.8
at Wilkins Slough		22.8	24.7	26.2	27.6	29.0	30.5	31.9	33.3
at Colusa			38.6	39.8	40.8	41.8	42.7	43.7	46.6
at Butte City			69.6	70.2	70.7	71.2	71.6	72.1	72.5
near Red Bluff(1)		253.5	254.1	254.6	255.0	255.4	255.8	256.1	256.5
	200 cfs	500 cfs	1000 cfs	2000 cfs	3000 cfs	4000 cfs	5000 cfs	6000 cfs	7000 cfs
Feather River near Oroville		185.5	187.1	189.3	191.1	192.8	194.5	195.9	197.3
at Nicolaus	20.3	20.8	21.6	22.7	23.6	24.5	25.2	25.9	26.6
American River at Fair Oaks(1)	65.2	66.0	66.6	67.5	68.3	68.5	69.1	70.2	70.6
San Joaquin River near Vernalis	12.3	13.6	14.6	16.1	17.4	18.5	19.4	20.2	21.1
at Hetch Hetchy Xing		17.9	19.1	21.2	22.6	23.5			
near Grayson	26.0	27.4	28.9	31.2	33.2				
near Newman	52.3	53.3	54.6	56.6	58.1	59.3	60.5		
at Fremont Ford	59.4	60.8	62.5	65.0	66.9				
Merced River at Cressey Bridge(2)	2.2	3.5	5.0	7.3	9.1	10.5			
Tuolumne River at Modesto(1)	36.4	37.7	39.4						
Stanislaus River near Mouth	21.0	22.4	24.2	26.9	30.9				

(1) - U.S.G.S. datum.
(2) - Assumed Datum.

TABLE 6

INFLOW TO SHASTA RESERVOIR - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3320	4340	7110	11990	5310	8520	4270	4220	2710	3310	6370	4060
2	4380	3340	12080	12010	5810	7550	4340	2180	3190	3500	4660	3590
3	3870	3380	30220	11890	4710	5520	4250	2690	3730	3140	4820	3930
4	3870	4510	19680	10540	4220	6670	3210	3150	3730	2380	4970	4110
5	3030	4380	13100	9980	4740	7910	3240	3730	3270	1850	4700	3680
6	3800	3940	10670	8950	4720	8210	3180	4230	2390	3350	4660	3420
7	3890	4380	9570	8590	4730	9810	4730	3730	2420	4920	4310	2760
8	3800	3860	9940	8000	4630	14400	3700	3200	3820	3840	4230	3960
9	3830	3850	14550	8440	4660	12370	4210	2110	3160	5820	3370	3800
10	3820	5900	27140	8060	4280	8960	3740	2710	3170	7910	4210	3800
11	3300	9850	17620	7060	3590	7910	4120	3210	4280	3940	3520	3810
12	2810	33650	13550	7200	4750	7230	3190	4260	3580	2790	4070	3770
13	3840	18960	12220	7170	4140	6760	2670	3720	2480	3760	4140	2740
14	3840	13960	10660	7250	4710	5600	3700	3430	1550	3710	4090	2520
15	3940	11880	10680	7120	4230	4810	4700	3200	4640	6010	3680	3770
16	3860	10420	9650	7200	4230	5710	3680	2660	2990	13640	3080	4010
17	3910	9900	8580	7450	4780	5560	3820	2160	3490	6080	3870	4250
18	3870	8430	9120	7230	3780	5250	3680	3690	2960	4380	3860	4020
19	2490	8400	7960	6800	4310	5300	2690	3230	3290	3280	3970	3910
20	3880	6420	7530	5930	4340	4320	2140	3720	2480	4740	3900	3780
21	3870	6940	8080	6090	4320	4330	3750	3590	2440	4420	3830	4870
22	3870	6350	6910	6100	3870	3790	4230	3030	3520	4260	3250	4920
23	3890	5320	6960	5660	4320	5020	3190	2560	3420	4360	2850	4680
24	3750	4940	7550	5230	3190	4250	4260	2680	3950	4070	4030	4100
25	3150	5910	7060	5540	3160	5250	3750	3610	3470	3490	3670	3470
26	3060	5880	6540	5250	4120	3740	2240	3220	3430	7840	3870	4270
27	4140	5380	7080	5230	4070	4520	2590	3900	1990	3840	3580	4100
28	4650	5550	7520	5710	5030	3660	4090	3590	1930	4900	3750	3330
29	4600		9910	5090	3610	3260	3710	4540	3450	9310	3340	3990
30	4590		17520	5700	4540	4630	4200	2560	3950	6540	3230	4230
31	4100		15010		5610		3190	2610		5440		3975
Mean	3775	7858	11670	7482	4405	6361	3628	3262	3163	4704	3996	3859
Runoff in Ac. Ft.	232100	436400	717500	445200	270800	378500	223100	200600	188200	289200	237800	237300

NOTE: This is the total mean second-feet flow inflowing to Shasta Reservoir as computed by the U. S. Bureau of Reclamation, taking into account change in storage, release, spill and evaporation; and represents the natural flow passing the dam site if the dam had not been constructed.

TABLE 7

DAILY CONTENT OF SHASTA RESERVOIR IN ACRE-FEET - 1947

Date	Figure given is amount in storage at end of day											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2206000	2104000	2360000	2902000	3088000	2952000	2926000	2673000	2422000	2289100	2294000	2278000
2	2203000	2104000	2378000	2920000	3086000	2954000	2919000	2662000	2416000	2286600	2294900	2277600
3	2199000	2104000	2432000	2938000	3082000	2952000	2912000	2652000	2411000	2283400	2296100	2277800
4	2195000	2106000	2465000	2953000	3077000	2952000	2903000	2643000	2406000	2278500	2297600	2278400
5	2190000	2108000	2485000	2967000	3073000	2955000	2894000	2635000	2401000	2272600	2298500	2278200
6	2186000	2109000	2500000	2979000	3069000	2960000	2885000	2628000	2394000	2269800	2299400	2277400
7	2182000	2111000	2513000	2990000	3065000	2969000	2879000	2620000	2387000	2270100	2299600	2275400
8	2178000	2112000	2527000	3000000	3061000	2987000	2871000	2611000	2383000	2268500	2299600	2275800
9	2174000	2113000	2550000	3011000	3057000	3001000	2864000	2600000	2377000	2270700	2297900	2275900
10	2170000	2118000	2598000	3021000	3052000	3008000	2856000	2590000	2370000	2277100	2297900	2275900
11	2165000	2131000	2627000	3029000	3046000	3012000	2849000	2581000	2365000	2275400	2296600	2275900
12	2159000	2191000	2648000	3037000	3042000	3014000	2840000	2574000	2360000	2271500	2296300	2275800
13	2155000	2222000	2666000	3045000	3037000	3015000	2830000	2566000	2355000	2269400	2296100	2273700
14	2151000	2243000	2681000	3053000	3033000	3013000	2822000	2558000	2348000	2267300	2295900	2271600
15	2147000	2260000	2695000	3061000	3028000	3009000	2816000	2550000	2347000	2269800	2294900	2271500
16	2143000	2274000	2708000	3069000	3023000	3007000	2808000	2541000	2343000	2287600	2292700	2271800
17	2139000	2287000	2719000	3077000	3019000	3005000	2800000	2531000	2340000	2290200	2292100	2272600
18	2135000	2297000	2731000	3084000	3013000	3002000	2792000	2524000	2336000	2289500	2291500	2272900
19	2129000	2307000	2741000	3089000	3008000	2999000	2782000	2516000	2333000	2286600	2291000	2272900
20	2125000	2313000	2750000	3092000	3003000	2994000	2771000	2509000	2328000	2286600	2290400	2272900
21	2121000	2320000	2760000	3094000	2998000	2989000	2763000	2502000	2323000	2285900	2289700	2275000
22	2117000	2326000	2768000	3096000	2992000	2983000	2756000	2494000	2320000	2284900	2287800	2277100
23	2113000	2330000	2776000	3097000	2987000	2979000	2747000	2485000	2317000	2284200	2285100	2278900
24	2110000	2333000	2785000	3097000	2980000	2973000	2740000	2476000	2315000	2282900	2284900	2279700
25	2107000	2338000	2793000	3097000	2973000	2969000	2732000	2469000	2312000	2280400	2283800	2279100
26	2104000	2343000	2800000	3096000	2968000	2962000	2721000	2461000	2309000	2276700	2283100	2280100
27	2103000	2347000	2808000	3095000	2963000	2956000	2711000	2455000	2303000	2275000	2281900	2280800
28	2103000	2352000	2817000	3095000	2960000	2948000	2704000	2449000	2297000	2275400	2281000	2279900
29	2103000		2831000	3093000	2954000	2939000	2696000	2445000	2294000	2284600	2279300	2280300
30	2103000		2860000	3091000	2950000	2933000	2689000	2437000	2292000	2288300	2277400	2281200
31	2102000		2884000		2948000		2680000	2429000		2289800		2281600
Monthly Change Ac. Ft.	-109000	+250000	+532000	+207000	-143000	-15000	-253000	-251000	-137000	-2200	-12400	+4200

NOTE: Reservoir water level recorder maintained by U. S. Bureau of Reclamation.

TABLE 8

FLOW OF SACRAMENTO RIVER AT KESWICK - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5940	3800	3080	3080	6490	6710	7460	7490	5950	4730	4410	3860
2	5940	3340	3340	3190	6480	6580	7420	7480	5880	4700	4220	3720
3	5970	3400	5210	3110	6480	6560	7460	7490	5930	4700	4210	3710
4	5980	3370	4050	3050	6480	6530	7470	7430	5930	4720	4190	3730
5	5660	3490	3330	3030	6490	6520	7470	7510	5650	4720	4170	3730
6	5960	3400	3190	2980	6490	5770	7470	7510	5570	4710	4160	3730
7	5980	3400	3140	2970	6490	5450	7470	7470	5590	4730	4160	3730
8	5980	3350	3070	2970	6490	5500	7490	7430	5620	4700	4130	3750
9	5980	3400	3540	2950	6490	5380	7490	7420	5860	4900	4120	3750
10	5980	3350	3910	2890	6480	5320	7490	7400	6400	5000	4110	3760
11	5970	3960	3350	2990	6490	5490	7490	7400	6420	4790	4120	3750
12	5970	5010	3160	2880	6510	5970	7480	7360	6060	4770	4110	3730
13	6010	3790	3080	2910	6510	5950	7470	7380	4700	4760	4110	3760
14	6000	3510	3080	2890	6510	6230	7480	7170	4670	4740	4120	3510
15	5980	3450	3170	2920	6490	6510	7480	6840	4720	4820	4120	3760
16	6010	3430	2790	2850	6440	6530	7490	6870	4710	5370	4120	3820
17	6010	3400	3310	3090	6440	6520	7490	6860	4730	4810	4120	3850
18	6010	3400	3050	3500	6450	6490	7510	6870	4810	4770	4110	3840
19	5640	3360	2960	4110	6450	6470	7480	6900	4810	4740	4130	3930
20	5970	3330	2870	4280	6470	6480	7470	6900	4790	4770	4130	3860
21	6030	3280	3070	4740	6480	6480	7490	6900	4820	4770	4110	3840
22	6040	3320	3000	4780	6510	6490	7510	6900	4820	4730	4120	3940
23	6040	3080	2800	4850	6480	6690	7480	6900	4830	4720	4130	3800
24	5520	3430	3000	4960	6490	7000	7470	6880	4840	4700	4140	3730
25	4690	3330	2930	5090	6490	7000	7490	6910	4850	4680	4130	3760
26	4650	3160	2950	5440	6450	7000	7490	6910	4830	4680	4150	3730
27	4690	3340	3070	5450	6440	7140	7480	6700	4850	4660	4140	3750
28	4720	3140	2850	5460	6480	7430	7490	6380	4810	4710	4150	3750
29	4690		3050	5810	6440	7440	7490	6390	4850	5230	4150	3780
30	4680		3480	6490	6560	7470	7480	6340	4860	4800	4150	3760
31	4670		3200		6780		7490	6380		4700		3740
Mean	175360	97020	100080	115710	201220	193100	231890	218770	157160	148330	124440	116860
Runoff in Ac. Ft.	347800	192400	198500	229500	399100	383000	459900	433900	311700	294200	246800	231800

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 250.5 above Sacramento. These flows include releases from Shasta Reservoir.

TABLE 9

FLOW OF SACRAMENTO RIVER AT REDDING* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	5670	3880	3080	3260	6070	6380	7070	7210	5890	4640	4660	4140
2	5670	3540	3360	3350	6070	6260	7070	7210	5780	4630	4420	3950
3	5670	3540	5380	3200	6100	6240	7070	7210	5780	4630	4360	3890
4	5670	3540	4190	3120	6070	6240	7090	7070	5780	4640	4360	3960
5	5390	3540	3410	3110	6100	6530	7090	7210	5610	4660	4360	3940
6	5650	3540	3240	3040	6100	5660	7090	7240	5540	4670	4360	3950
7	5690	3540	3210	3000	6120	5400	7090	7180	5560	4750	4360	3910
8	5690	3540	3130	3030	6140	5420	7090	7240	5560	4680	4360	3970
9	5710	3540	3570	3010	6170	5250	7090	7270	5740	4860	4300	3960
10	5690	3540	4330	2940	6140	5190	7090	7270	6290	5070	4320	3920
11	5690	4020	3450	3100	6170	5340	7090	7270	6290	4970	4320	3910
12	5710	5300	3260	2910	6190	5710	7090	7270	5960	4920	4340	3910
13	5740	3930	3190	2990	6170	5740	7090	7270	4780	4890	4340	3920
14	5760	3610	3150	2940	6140	5980	7090	7040	4710	4880	4340	3690
15	5740	3540	3180	2940	6140	6220	7070	6720	4730	4980	4340	3940
16	5740	3530	2980	2790	6120	6260	7090	6700	4710	5510	4340	3960
17	5740	3510	3370	2930	6140	6240	7090	6700	4690	4980	4360	4060
18	5740	3510	3160	3200	6140	6240	7120	6720	4710	4940	4360	4020
19	5440	3440	3030	3830	6140	6220	7090	6720	4720	4950	4360	4040
20	5670	3360	2970	3960	6140	6220	7070	6750	4720	5010	4320	4020
21	5740	3300	3170	4440	6120	6240	7090	6720	4720	5010	4320	4000
22	5780	3370	3090	4500	6120	6240	7120	6750	4820	4950	4320	4060
23	5780	3090	2900	4600	6050	6310	7150	6770	4790	4900	4320	3920
24	5380	3500	3100	4720	6120	6580	7120	6750	4780	4910	4320	3830
25	4720	3380	3050	4840	6140	6580	7180	6770	4780	4910	4340	3860
26	4670	3160	3050	5140	6070	6580	7150	6770	4790	4910	4360	3850
27	4680	3290	3190	5140	6050	6750	7150	6600	4790	4900	4360	3840
28	4720	3130	2940	5140	6100	7010	7180	6290	4760	4920	4360	3840
29	4720		3080	5460	6120	7010	7240	6290	4770	5460	4380	3850
30	5060		3730	6050	6240	7070	7210	6240	4760	5020	4400	3790
31	4710		3260		6460		7210	6290		4930		3750
Mean	5465	3561	3329	3755	6134	6170	7114	6887	5177	4906	4358	3924
Runoff in Ac. Ft.	336064	197775	204697	223421	377182	367166	437421	423497	308057	301650	259362	241293

NOTE: Prior to November 2, 1947, recorder was located at Highway 44, Mile 243.0; subsequent to November 2, recorder was located at Mile 240.7. Both locations are below the diversion dam and above the Churn Creek pumps of the Anderson-Cottonwood Irrigation District.

TABLE 10

FLOW OF SACRAMENTO RIVER AT BALLS FERRY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6070	4380	3520	5340	6340	7060	7110	7190	5810	4460	7420	4220
2	6040	3650	4520	10380	6280	6830	7080	7190	5600	4410	5900	4130
3	6040	3650	11870	9800	6280	6520	7080	7190	5600	4390	5000	4210
4	6040	3650	13300	5850	6250	6420	7110	7080	5600	4390	4900	4150
5	5800	3710	6710	5090	6280	7120	7110	7190	5440	4410	4870	4140
6	5910	3620	5110	4600	6250	7820	7110	7190	5260	4390	4730	4130
7	6040	3650	4590	4330	6280	6390	7140	7110	5340	4520	4660	4110
8	6040	3620	4350	4210	6280	7110	7140	7190	5310	4610	4590	4170
9	6040	3690	6900	4150	6280	6730	7140	7190	5390	4720	4520	4160
10	6040	4220	14250	3960	6250	5910	7190	7190	6020	5260	4520	4100
11	6040	4860	8050	3940	6250	5730	7220	7190	6070	5240	4520	4120
12	6020	22750	5890	3750	6250	6120	7220	7110	5890	4900	4500	4110
13	6070	11460	5040	3740	6250	6040	7190	7140	4660	4770	4480	4090
14	6070	6030	4580	3640	6230	6120	7220	7050	4410	4750	4480	3970
15	6040	4960	4290	3640	6200	6420	7250	6580	4440	4820	4550	4050
16	6020	5180	4430	3500	6170	6420	7250	6580	4440	7050	4520	4120
17	6040	4650	3970	3510	6150	6390	7250	6580	4370	6330	4480	4320
18	6040	4270	3960	3720	6120	6340	7250	6550	4440	5180	4460	4320
19	5840	4080	3850	4130	6150	6250	7250	6550	4410	4920	4480	4270
20	5840	3950	3720	4330	6150	6250	7220	6580	4440	4910	4460	4380
21	6040	3830	3760	4700	6120	6200	7190	6550	4460	5260	4480	4640
22	6070	3830	3680	4820	6150	6200	7190	6580	4440	5000	4440	5870
23	6070	3570	3650	4820	6120	6250	7190	6550	4440	4870	4410	4650
24	5700	3800	3710	4920	6120	6660	7140	6520	4460	4820	4440	4390
25	4820	3650	3650	4950	6120	6660	7160	6520	4460	4770	4440	4260
26	4770	3550	3560	5290	6150	6630	7160	6520	4440	4820	4410	4250
27	4780	3680	3670	5340	6150	6690	7220	6500	4480	4820	4440	4220
28	4900	3590	3580	5340	6200	7080	7220	6040	4460	4870	4440	4210
29	4840		3790	5450	6150	7140	7190	6020	4460	7480	4440	4200
30	4810		6200	6340	6230	7110	7160	6040	4520	7990	4410	4190
31	4860		6780		6530		7160	6090		5760		4160
Mean	5733	4983	5449	4919	6217	6454	7178	6760	4919	5125	4680	4268
Runoff in Ac. Ft.	352547	276758	335073	292725	382280	384025	441349	415642	292685	315158	278464	262437

NOTE: This station is maintained and operated and records compiled by U. S. Bureau of Reclamation. It is located at Mile 224.5 above Sacramento.

TABLE 11

FLOW OF SACRAMENTO RIVER NEAR RED BLUFF (IRON CANYON) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6500	5040	4080	6600	7110	7670	7540	7480	6300	4850	9930	4500
2	6470	3970	5280	12100	7060	7750	7460	7480	5910	4720	8200	4330
3	6470	3950	13900	16300	7060	7270	7480	7480	5890	4720	5930	4330
4	6440	3970	22100	8480	7060	7110	7480	7400	5890	4740	5540	4330
5	6370	4100	10200	6820	7030	7270	7460	7460	5860	4740	5500	4360
6	6220	4010	7290	6750	7010	9260	7460	7460	5660	4740	5280	4350
7	6470	4060	6220	5930	6980	7240	7460	7430	5680	4830	5170	4330
8	6470	3990	5820	5610	6980	8180	7480	7430	5680	5150	5040	4350
9	6470	4180	6750	5590	6980	8240	7510	7430	5700	5150	4950	4350
10	6500	5150	18700	5280	6930	7010	7510	7460	6240	5820	4890	4330
11	6500	6020	12700	5000	6880	6520	7510	7460	6400	6050	4870	4310
12	6520	31200	8930	4810	6880	6850	7480	7400	6400	5430	4850	4290
13	6520	22800	7350	4740	6880	6800	7480	7400	5280	5230	4830	4290
14	6520	9550	6520	4620	6800	6700	7480	7400	4810	5170	4850	4290
15	6470	7240	6120	4540	6720	7080	7480	6980	4810	5190	4890	4100
16	6440	6900	6370	4360	6640	7080	7480	6880	4810	7120	4870	4330
17	6440	6400	5300	4400	6620	7080	7480	6880	4810	8050	4870	4580
18	6420	5660	5430	4580	6620	7030	7480	6850	4790	5980	4830	4640
19	6340	5300	5280	4830	6620	6900	7480	6850	4790	5540	4790	4540
20	6150	5060	5080	5320	6570	6850	7460	6880	4810	5430	4760	4910
21	6400	4760	4870	5570	6570	6800	7460	6900	4740	5890	4760	5120
22	6400	4680	4760	5700	6570	6800	7460	6930	4760	5590	4740	6470
23	6370	4480	4890	5680	6540	6800	7460	6930	4790	5370	4740	5390
24	6120	4380	4660	5770	6540	7140	7430	6900	4830	5320	4740	4870
25	5190	4330	4600	5770	6540	7190	7460	6880	4830	5260	4760	4660
26	5120	4250	4460	6050	6620	7160	7460	6880	4830	5210	4760	4620
27	5120	4310	4460	6120	6600	7140	7480	6880	4830	5210	4740	4560
28	5300	4250	4520	6120	6700	7480	7480	6440	4830	5260	4740	4540
29	5210		4950	6150	6670	7590	7480	6420	4830	7430	4740	4480
30	5210		6270	6980	6670	7590	7460	6470	4870	10100	4720	4480
31	5190		9040		6980		7480	6470		6850		4460
Mean	6140	6571	7319	6219	6788	7253	7476	7084	5289	5682	5209	4564
Runoff in Ac. Ft.	377500	364900	450000	370100	417400	431600	459700	435600	314700	349400	310000	280600

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.

TABLE 12

FLOW OF SACRAMENTO RIVER AT VINA BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	6990	5820	4980	8460	7590	7770	7570	7640	6670	5030	11730	5140
2	6910	4870	5670	10400	7590	8080	7570	7720	6210	4900	14100	4870
3	6840	4540	12110	21840	7540	7690	7540	7690	6140	4830	7630	4780
4	6820	4500	28610	13250	7540	7440	7540	7670	6090	4810	6510	4790
5	6770	4530	15330	9080	7490	7390	7570	7620	6050	4810	6300	4790
6	6410	4530	9560	8670	7420	9260	7540	7640	5820	4810	6020	4780
7	6700	4520	7870	7840	7390	7890	7520	7620	5820	4920	5790	4760
8	6770	4510	7230	7130	7340	8280	7490	7590	5820	5290	5680	4760
9	6750	4620	7130	7140	7310	9050	7520	7620	5790	5380	5520	4840
10	6750	6100	17850	6740	7160	7870	7540	7620	6070	6000	5430	4810
11	6720	7070	18510	6230	7130	7030	7520	7670	6480	6460	5300	4760
12	6770	40000	12080	6000	7110	6960	7540	7620	6550	5910	5310	4760
13	6890	37900	9790	5740	7130	7080	7520	7620	6060	5540	5270	4750
14	6960	15550	8540	5670	7080	6870	7490	7620	5030	5430	5290	4730
15	6940	10720	8030	5540	7060	7060	7520	7360	4960	5430	5310	4530
16	6940	9070	7770	5610	6940	7160	7520	7110	4960	7120	5340	4730
17	6960	8770	7260	6070	6890	7160	7540	7130	4960	9770	5310	5010
18	6940	7520	7010	6070	6840	7130	7540	7110	4960	6910	5270	5180
19	6940	6840	6890	6070	6840	6990	7570	7110	4960	6090	5200	5030
20	6650	6360	6650	6070	6840	6890	7520	7080	4960	5820	5200	5280
21	6940	6010	6300	6070	6840	6770	7540	7110	4940	6300	5200	5700
22	6940	5740	6300	6300	6840	6770	7570	7160	4960	6210	5160	6760
23	6960	5540	6180	6300	6790	6750	7570	7130	4960	5840	5160	6210
24	6940	5240	6180	6300	6770	6960	7520	7130	4980	5700	5180	5490
25	6410	5310	6070	6390	6790	7130	7490	7110	4980	5610	5180	5230
26	5890	5230	5720	6530	6790	7110	7490	7110	4980	5560	5180	5140
27	5860	5080	5430	6700	6840	7080	7520	7110	4960	5610	5180	5030
28	6050	5150	5570	6720	6940	7310	7590	6870	4980	5630	5180	4990
29	5990		5870	6750	6940	7520	7570	6650	4980	6840	5160	4960
30	5800		6930	6940	6940	7570	7540	6700	5010	11730	5160	4950
31	5750		10510		7130		7570	6700		8630		4900
Mean	6644	8630	9030	7487	7092	7400	7537	7311	5470	6094	5978	5046
Runoff in Ac. Ft.	408502	479293	555241	445534	436053	440377	463445	449540	325473	374723	355701	310279

NOTE: This station is maintained and operated and records compiled by U. S. Bureau of Reclamation. It is located at Mile 166.5 above Sacramento.

TABLE 13

FLOW OF SACRAMENTO RIVER AT HAMILTON CITY (GIANELLA BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7170	5940	5200	8980	5830	6090	5490	5470	4750	4240	9360	5220
2	7150	5330	5460	9590	5830	6240	5470	5490	4410	4110	15430	4940
3	7100	4750	9300	19560	5810	6070	5370	5540	4200	4150	8290	4810
4	7070	4690	26860	15030	5780	5710	5470	5520	4150	4200	6880	4800
5	7050	4660	17200	10780	5690	5660	5490	5370	4150	4150	6480	4800
6	6800	4720	10490	8770	5590	6750	5520	5450	4090	4150	6240	4770
7	6970	4630	8500	8220	5610	6560	5490	5520	4020	4200	5970	4740
8	7050	4650	7670	7400	5700	6360	5400	5450	4090	4460	5830	4720
9	7050	4730	7430	7300	6240	7100	5490	5490	4200	4770	5660	4780
10	7050	5870	14610	6870	5470	6380	5490	5490	4330	5410	5570	4740
11	7070	6610	19860	6170	5490	5420	5490	5540	4870	6100	5520	4700
12	7050	28770	12910	6070	5400	5090	5570	5450	5010	6000	5450	4690
13	7050	36880	10090	5610	5420	5180	5540	5450	4830	5540	5420	4700
14	7070	17320	8880	5230	5280	4940	5540	5490	3950	5330	5420	4710
15	7050	11250	8290	4700	5160	5040	5490	5370	3880	5280	5420	4580
16	7000	9220	8030	4490	5010	5210	5470	5040	3950	5920	5450	4690
17	7000	8900	7640	4200	4920	5160	5490	5010	3910	9080	5420	4950
18	6970	7860	7470	4060	4970	5060	5520	4990	4040	6840	5400	5180
19	7000	7160	7220	4060	4920	4970	5520	5010	3950	5810	5350	5060
20	6750	6670	6870	4440	4800	4850	5470	5010	3970	5590	5330	5160
21	6920	6310	6530	4560	4890	4730	5540	5110	3920	5800	5330	5640
22	6970	6000	6480	4800	4890	4750	5520	5160	3920	6090	5280	6360
23	6970	5850	6310	4750	4820	4750	5400	5280	3870	5690	5280	6490
24	6970	5460	6310	4680	4820	4800	5470	5250	3990	5490	5230	5660
25	6600	5590	6050	4730	4800	5040	5470	5090	3950	5420	5230	5310
26	6000	5420	5760	4770	4870	5090	5490	4970	4110	5280	5230	5180
27	5930	5240	5590	5010	5060	5040	5470	4970	4150	5400	5230	5080
28	6030	5330	5860	5040	4990	5180	5490	4920	4150	5610	5250	5010
29	6070		5970	5010	5130	5420	5490	4630	4150	6170	5250	4980
30	5960		6760	5180	5110	5490	5470	4750	4220	10540	5250	4980
31	5940		9790		5280		5450	4730		9120		4920
Mean	6801	8422	9075	6669	5277	5471	5488	5226	4173	5675	6082	5044
Runoff in Ac. Ft.	418181	467729	558038	396819	324461	325552	337453	321347	248295	348977	361890	310120

NOTE: This station is maintained and operated and records compiled by U. S. Bureau of Reclamation. It is located at Mile 149.5 above Sacramento.

TABLE 14

FLOW OF SACRAMENTO RIVER AT BUTTE CITY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7390	6060	5760	10400	5690	5670	5630	5520	4950	4440	8360	5400
2	7300	5930	5670	9100	5800	6300	5650	5630	4890	4390	15700	5290
3	7230	5110	6950	15500	5780	6460	5520	5630	4560	4140	10900	5170
4	7180	4970	21200	19600	5780	6130	5550	5610	4490	4290	7930	5150
5	7180	4910	22600	12400	5780	5990	5650	5500	4470	4300	7060	5130
6	7130	4890	13700	10400	5670	6100	5690	5480	4490	4340	6810	5110
7	6970	4810	10500	10000	5610	7520	5590	5520	4360	4410	6460	5110
8	7160	4790	9100	8910	5590	6570	5460	5500	4390	4560	6240	5090
9	7180	4850	8550	8460	6170	7230	5500	5550	4510	4890	6020	5090
10	7160	5500	10600	8220	5480	7250	5550	5570	4600	5340	5910	5090
11	7180	6900	22000	7270	5460	6130	5570	5610	4970	5990	5780	5070
12	7180	17800	16600	6950	5380	5590	5550	5520	5230	6370	5710	5030
13	7160	47200	12800	6570	5420	5550	5550	5480	5250	5950	5710	4990
14	7180	28300	10800	6150	5290	5440	5630	5520	4640	5670	5690	4970
15	7180	15100	9800	5630	5170	5320	5630	5500	4250	5590	5690	4950
16	7160	11800	9150	5290	5070	5480	5550	5230	4270	5690	5690	4810
17	7160	10600	9100	5050	4970	5480	5570	5130	4250	8310	5690	5030
18	7130	9660	8140	4770	4890	5380	5550	5070	4300	8220	5610	5270
19	7130	8550	8100	4640	4990	5320	5550	5110	4250	6370	5550	5360
20	7090	7830	7740	4700	4950	5210	5550	5050	4210	6020	5550	5320
21	6950	7320	7390	4950	5050	5010	5550	5130	4200	5910	5520	5690
22	7130	6900	7110	5030	5050	4950	5550	5170	4200	6410	5500	5970
23	7160	6630	6880	4970	5010	5030	5590	5230	4160	6170	5480	6930
24	7160	6260	6970	4890	5030	4950	5670	5270	4200	5910	5480	6210
25	6950	6080	6630	4850	5050	5170	5570	5250	4300	5800	5500	5710
26	6320	5970	6350	4850	5070	5210	5550	5130	4360	5650	5500	5480
27	6130	5820	6130	4990	5150	5250	5570	5150	4470	5630	5500	5360
28	6170	5760	6170	5090	5150	5210	5590	5170	4510	5880	5480	5290
29	6240		6350	5090	5290	5480	5590	4950	4500	6150	5480	5250
30	6170		6840	5050	5320	5570	5570	4930	4490	8670	5460	5210
31	6080		8790		5440		5500	4970		10600		5190
Mean	6964	9511	9822	7326	5340	5732	5574	5325	4491	5873	6432	5314
Runoff in Ac. Ft.	428200	528200	603900	435900	328400	341100	342700	327400	267200	361100	382700	326700

NOTE: Station is maintained jointly by Division of Water Resources and the Water Resources Branch of the U.S. Geological Survey. Stream flow measurements are made also by the U. S. Bureau of Reclamation. Station is near Butte City Ferry and is at Mile 115.8 above Sacramento.

TABLE 15

FLOW OF SACRAMENTO RIVER AT COLUSA - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7430	6240	6130	10200	4870	5080	5310	5430	4780	4470	9320	5570
2	7400	6240	6020	9640	5260	5430	5400	5450	4780	4490	11300	5520
3	7370	5660	6460	11100	5340	5810	5300	5460	4510	4420	13900	5380
4	7320	5370	12800	19500	5370	5630	5220	5440	4340	4450	9470	5310
5	7290	5290	22900	16600	5410	5440	5380	5400	4270	4510	7650	5300
6	7280	5250	18700	12400	5350	5340	5420	5310	4270	4460	7040	5270
7	7140	5230	12900	11000	5280	6460	5440	5290	4180	4480	6650	5250
8	7180	5190	10100	9960	5240	6060	5360	5270	4150	4560	6380	5240
9	7230	5210	9050	8910	5550	6140	5290	5240	4270	4800	6210	5200
10	7230	5390	9000	8440	5440	6570	5320	5260	4440	5080	6020	5240
11	7230	6690	17000	7700	5180	5840	5310	5260	4620	5560	5900	5220
12	7230	9150	19300	7090	5110	5230	5270	5220	4980	6090	5820	5170
13	7220	27500	15300	6800	5060	5070	5320	5130	5110	5920	5730	5140
14	7210	30500	12300	6400	5040	5110	5270	5130	4890	5610	5690	5130
15	7210	21800	10700	5970	4920	5020	5260	5130	4260	5430	5690	5120
16	7190	15700	9780	5520	4900	5100	5190	4980	4120	5440	5670	4990
17	7180	12700	9470	5200	4790	5150	5170	4820	4150	6550	5670	5130
18	7170	11200	8800	4890	4750	5160	5170	4800	4210	8630	5640	5310
19	7170	9860	8510	4640	4810	5090	5170	4800	4280	7020	5610	5440
20	7180	8850	8210	4540	4760	5020	5200	4760	4230	6290	5540	5440
21	7010	8150	7890	4640	4800	4890	5160	4790	4240	6060	5520	5550
22	7090	7630	7520	4620	4820	4780	5180	4880	4200	6370	5520	5900
23	7180	7220	7360	4690	4770	4770	5200	4930	4180	6430	5480	6540
24	7180	6940	7280	4600	4720	4710	5260	5040	4180	6170	5480	6560
25	7180	6590	7090	4520	4790	4760	5270	5000	4310	6030	5490	5970
26	6890	6510	6850	4520	4750	4900	5320	4940	4330	5910	5520	5660
27	6470	6330	6580	4560	4790	4960	5370	4920	4450	5820	5540	5550
28	6340	6150	6500	4720	4840	4930	5420	4950	4510	5940	5550	5480
29	6370		6620	4730	4880	5070	5460	4920	4480	6150	5560	5440
30	6330		6790	4700	4950	5250	5480	4750	4490	7010	5560	5410
31	6250		8760		4920		5430	4820		10300		5370
Mean	7069	9448	10090	7427	5015	5292	5301	5081	4407	5821	6537	5445
Runoff in Ac. Ft.	434700	524700	620200	441900	308400	314900	325900	312400	262200	357900	389000	334800

NOTE: Station is maintained jointly by the Division of Water Resources and the Water Resources Branch of the U.S. Geological Survey. Stream flow measurements are made also by the U. S. Bureau of Reclamation. Station is at Colusa Bridge below Colusa Weir and is at Mile 89.4 above Sacramento.

TABLE 16

FLOW OF SACRAMENTO RIVER BELOW WILKINS SLOUGH - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	7670	6370	6650	9390	3430	4660	3950	4220	4090	4820	9680	5750
2	7650	6370	6590	10200	3820	4930	4020	4260	4170	4800	9480	5710
3	7580	6140	6650	10100	3980	5420	4000	4300	4090	4770	13100	5550
4	7510	5620	9060	14800	4020	5500	3880	4280	3830	4700	11100	5420
5	7500	5430	18200	16400	4020	5330	3980	4330	3770	4760	8860	5380
6	7500	5350	19300	13200	3980	5220	4120	4220	3820	4750	7860	5350
7	7390	5350	15400	11300	3940	5780	4180	4190	3870	4690	7420	5320
8	7360	5300	12200	10300	3870	6500	4140	4190	3830	4770	7060	5290
9	7390	5360	10500	9510	4010	6200	4070	4150	3890	4920	6860	5190
10	7390	5430	9720	9010	4770	6760	4060	4200	4130	5320	6640	5210
11	7370	6200	12900	8650	4290	6610	4110	4240	4420	5730	6470	5230
12	7380	7450	18600	8010	4130	5800	4150	4190	4830	6290	6370	5200
13	7360	17000	16900	7590	3850	5170	4270	4130	5170	6480	6260	5170
14	7350	22300	13800	7180	3760	4960	4330	4100	5300	6180	6180	5140
15	7360	21000	12000	6610	3720	4790	4320	4120	4850	5860	6140	5130
16	7340	18000	10700	5960	3570	4490	4220	4090	4450	5690	6130	5070
17	7290	15100	9960	5500	3520	4490	4150	3980	4480	5980	6080	5090
18	7270	13200	9480	5050	3480	4350	4140	3850	4560	8000	6070	5280
19	7280	11700	8930	4600	3490	4230	4130	3840	4750	7900	6020	5470
20	7280	10600	8640	4210	3500	4180	4240	3840	4750	6730	5970	5520
21	7150	9680	8300	4040	3530	4040	4180	3840	4760	6170	5950	5550
22	7130	8990	7930	3980	3490	3800	4170	3950	4770	6110	5920	5870
23	7220	8410	7630	3950	3510	3660	4120	4000	4770	6400	5870	6280
24	7250	7950	7420	3780	3450	3540	4100	4070	4720	6240	5820	6760
25	7240	7510	7340	3610	3570	3500	4150	4080	4820	6040	5800	6280
26	7050	7250	7080	3470	3680	3590	4170	4010	4880	5900	5780	5860
27	6610	6980	6800	3420	3750	3700	4200	3960	4960	5770	5800	5630
28	6420	6740	6580	3550	3880	3680	4200	3980	5030	5760	5800	5540
29	6400		6610	3560	4050	3760	4230	4070	5020	6020	5780	5540
30	6430		6850	3500	4710	3960	4290	3980	4960	6320	5770	5660
31	6390		7520		4380		4330	4020		8600		5610
Mean	7210	9385	10201	7148	3827	4753	4148	4086	4525	5886	6935	5518
Runoff in Ac. Ft.	443300	521200	627300	425300	235300	282800	255100	251300	269200	361900	412600	339300

NOTE: Station is maintained jointly by the Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. Stream flow measurements are made also by the U. S. Bureau of Reclamation, Station is located at Mile 62.9 above Sacramento. 0.3 of a mile below Wilkin's Slough pumping plant of Reclamation District 108, and 1.3 miles below Tisdale Weir.

TABLE 17

FLOW OF SACRAMENTO RIVER AT KNIGHTS LANDING - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8110	6690	6940	8460	3330	5530	3790	4440	4790	5390	9660	5940
2	8060	6820	6990	10500	3480	5810	3830	4410	4890	5280	9120	5930
3	7970	6640	6720	9920	3630	6080	3960	4490	4890	5300	11800	5780
4	7890	6050	7090	13100	3770	6280	3810	4460	4720	5240	11900	5620
5	7910	5760	15900	16600	3910	5940	3890	4420	4620	5270	9690	5580
6	7880	5690	20100	14200	4010	5720	4030	4470	4650	5310	8370	5510
7	7810	5700	16700	12500	3920	5900	4180	4440	4780	5300	7580	5470
8	7790	5640	13200	11300	3800	7030	4250	4430	4820	5250	7210	5510
9	7760	5830	11300	10400	3910	6790	4180	4400	4870	5390	7010	5350
10	7770	5770	9420	9640	4660	7230	4130	4480	5120	5710	6810	5340
11	7720	6320	9260	9260	4730	7410	4280	4470	5470	6180	6600	5330
12	7840	7720	16500	8590	4420	6550	4340	4540	5820	6640	6570	5310
13	7770	15200	17200	8090	4160	5860	4380	4440	6060	6910	6420	5260
14	7730	21000	14600	7550	4000	5400	4490	4440	6200	6620	6350	5230
15	7780	19300	12900	6960	4010	5240	4520	4470	5990	6230	6370	5270
16	7740	15900	11800	6320	3850	4870	4520	4500	5730	6020	6290	5260
17	7720	13900	10900	5780	3770	4700	4400	4560	5670	5760	6230	5110
18	7670	12800	10500	5240	3810	4620	4350	4290	5650	7080	6280	5270
19	7750	11700	9860	4610	3740	4400	4270	4290	5800	8170	6170	5460
20	7660	10800	9560	4400	3840	4290	4360	4340	5760	7160	6120	5540
21	7580	10100	9170	4040	3940	4210	4310	4360	5700	6410	6120	5470
22	7460	9470	8920	3860	3890	3860	4280	4390	5620	6200	6080	5800
23	7560	8910	8810	3810	3910	3650	4270	4470	5570	6410	6040	6060
24	7570	8380	8140	3670	3820	3540	4150	4540	5490	6450	6020	6640
25	7580	7870	8140	3440	3920	3420	4260	4670	5550	6270	6010	6410
26	7540	7530	8170	3310	3980	3310	4330	4610	5580	6100	5930	6020
27	7060	7280	7900	3320	4050	3490	4360	4500	5660	6060	5900	5850
28	6770	6980	7630	3380	4330	3590	4360	4630	5710	5960	5920	5640
29	6680		7020	3340	4910	3620	4400	4700	5610	6070	5930	5690
30	6700		6810	3410	5330	3740	4450	4670	5550	6280	5880	5730
31	6790		6620		5250		4420	4710		7630		5620
Mean	7601	9348	10480	7300	4067	5069	4244	4485	5411	6131	7079	5613
Runoff in Ac. Ft.	467300	519200	644200	434400	250100	301600	260900	275800	322000	377000	421200	345100

NOTE: Station is maintained jointly by the Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. Stream flow measurements are made also by the U. S. Bureau of Reclamation. It is located at the Knights Landing Railroad 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 18

FLOW OF SACRAMENTO RIVER AT VERONA - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	11200	9660	12100	28000	7400	7120	4320	5260	5870	7170	13500	7810
2	10900	9630	12200	28100	7270	7800	4300	5210	5750	7350	13200	7620
3	10700	9240	14400	26900	7880	8830	4430	5440	5710	7200	16000	7970
4	10700	8760	21200	28900	8810	8900	4410	5360	5640	6950	16200	7920
5	10700	8640	28300	31900	8950	8270	4350	5390	5500	6950	14100	7890
6	10500	8750	31600	30300	8680	7700	4600	5290	5600	6920	12600	8040
7	10400	8780	29100	27300	8470	7760	4660	5300	5780	6710	11500	7910
8	10400	8900	24600	25200	8300	9540	4740	5220	5780	6660	10700	7670
9	10400	8830	22000	23500	7750	11700	4770	5330	5920	7080	9980	7400
10	10400	8760	22800	22400	7720	12500	4630	5220	6020	7780	9310	7620
11	10400	9560	33900	21000	8070	11700	4830	5320	6400	8390	8980	7910
12	10500	12000	40600	19600	7080	10100	4770	5290	6860	9050	8970	7760
13	10500	30800	40900	18500	6200	8560	4950	5360	7270	9040	8710	7670
14	10400	43800	36400	17300	5600	7480	4900	5350	7720	8560	8930	7510
15	10300	46800	31600	16300	5600	7160	5090	5400	7760	8250	9140	7380
16	10300	45100	30400	15700	5440	6480	5000	5460	7680	7990	8930	7090
17	10300	38600	25200	15200	5260	5960	5050	5490	7750	9580	8580	7240
18	10200	32000	23500	14900	5320	5700	4900	5430	7780	12900	8370	7600
19	10200	27800	22500	13800	5250	5430	4980	5190	7730	11900	8590	8020
20	10200	24700	21900	12800	5290	5400	4980	5320	7720	10200	8610	8240
21	10100	21300	20900	11800	5460	5070	5190	5400	7560	8860	8560	8340
22	9980	18600	19700	11300	5470	4790	5000	5290	7350	8950	8470	8470
23	10100	16600	18900	10900	5490	4480	4880	5390	7170	9200	8290	8660
24	10200	15000	19600	10000	5370	4340	4830	5390	7140	9140	7990	9390
25	10100	14000	19100	9360	5300	4190	4940	5530	7380	8930	7880	9320
26	10100	13200	18200	8800	5440	4000	5140	5400	7540	8630	8200	8540
27	9910	12600	17300	8360	5470	4020	5080	5330	7410	8250	8290	7760
28	9490	12300	16500	7860	5720	4040	5190	5460	7400	7990	8250	7860
29	9580		18200	7620	6230	4010	5070	5560	7320	8490	7880	7760
30	9770		21300	7700	6700	4080	5140	5630	7040	9290	8020	7680
31	9660		25700		6900		5160	5930		12300		8120
Mean	10280	18740	23890	17710	6577	6904	4848	5385	6852	8602	9891	7941
Runoff in Ac. Ft.	631900	1041000	1469000	1054000	404400	410800	298100	331100	407700	528900	588600	488300

NOTE: Station is maintained jointly by the Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. Stream flow measurements are made also by the U. S. Bureau of Reclamation. 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.

TABLE 19

FLOW OF SACRAMENTO RIVER TO SACRAMENTO - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	14500	11900	16000	34300	12900	8700	5020	5460	5790	7330	16200	8790
2	14200	11600	16300	34400	14100	10700	4970	5460	6000	7260	16100	8260
3	13900	11200	20100	33900	16400	11400	4530	5320	5580	6980	19000	9210
4	13700	10800	27000	34500	17900	11000	4580	5130	5550	6790	19800	8850
5	13800	10500	32700	36300	17900	10000	4640	5220	5490	7170	17600	8820
6	13700	10900	35100	35600	17400	9000	4920	5260	5780	6980	15800	9180
7	13500	10700	34400	33100	16700	8800	4850	5160	5750	6650	14400	9080
8	13300	11000	30700	31500	15300	11800	4740	5170	5510	6460	13200	8750
9	13200	10900	27700	29700	13500	14400	4800	4870	5720	7110	12000	8420
10	13100	10800	30500	28700	12000	16500	4730	4750	5950	8270	11000	8390
11	13000	12500	43800	27300	12400	14800	4620	5150	6510	8110	10400	8870
12	13300	15700	47200	26000	11300	12700	4610	5280	7000	8720	10100	8950
13	13200	42900	47000	25100	9100	10300	4790	5830	7380	9570	10300	8770
14	13000	54100	43900	24400	7900	8500	5080	5870	7890	9190	10400	8790
15	12700	55700	37600	24200	8000	8200	5150	5870	8200	8770	10800	8410
16	12400	53700	34500	23900	8100	7900	5190	6120	8630	8840	10400	7880
17	12400	46700	31800	23700	8100	7000	5380	6110	8490	11000	9600	8140
18	12300	38600	30500	23500	8300	6900	5200	6070	8120	17200	9240	8330
19	12300	33700	29300	22000	8400	6800	5250	6210	7800	14500	9550	8830
20	12300	29900	28400	20800	8500	6200	5440	6020	7620	11700	9510	9620
21	12200	26800	27600	20100	8800	5500	5720	5770	7140	9520	9540	9650
22	12000	23800	26600	18900	8800	5700	5580	5230	7120	9490	9480	9360
23	12100	21500	25800	17300	8900	5600	5270	5170	7000	10000	9380	9700
24	12100	19500	26800	15700	8300	5400	4940	5130	7310	10000	8870	10300
25	12000	18400	25800	14900	7900	5500	4900	5580	7500	9670	8610	10900
26	11900	17700	24500	14200	8200	5400	4970	5360	7490	9380	9200	10100
27	11600	16900	23600	13900	7600	4900	4920	5490	7370	9000	9670	8920
28	11700	16400	22900	13400	7200	4500	4830	5660	7420	8650	9600	8980
29	11700		24700	12600	7700	4400	4950	5720	7540	9250	9370	8620
30	11900		29100	12800	8500	4700	5420	5600	7800	9780	9550	8460
31	11800		33500		8400		5330	5680		13900		8970
Mean	12740	23390	30170	24220	10790	8440	5010	5510	6950	9270	11630	8980
Runoff in Ac. Ft.	783100	1298800	1855300	1441400	663500	502200	308100	338600	413500	569700	692000	552000

NOTE: This represents the flow of the Sacramento River past Sacramento (below the City of Sacramento intake) to the Delta. Additional water flows to the Delta via East Borrow Pit of Yolo By-Pass. (See Tables 49 and 55.) Daily mean flows are computed from newly derived curves which take into account tidal fluctuations during low stages.

TABLE 20

FLOW OF COTTONWOOD CREEK NEAR COTTONWOOD - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	136	112	352	684	235	269	76	30	55	50	222	84
2	133	108	544	684	226	336	74	34	53	50	240	81
3	126	105	5910	788	226	264	68	38	53	46	218	81
4	119	108	5240	668	226	226	60	41	50	44	190	81
5	122.	116	1850	598	222	222	55	38	46	42	167	81
6	122	116	1250	577	214	357	55	34	43	40	152	81
7	122	116	977	535	211	357	50	32	41	42	141	81
8	116	119	848	515	214	541	50	34	41	60	131	79
9	116	136	1100	515	207	451	48	38	43	79	121	76
10	112	212	4450	476	195	374	48	41	48	108	118	75
11	112	325	2720	445	184	310	48	43	50	145	111	75
12	112	11900	1750	432	174	278	48	36	48	86	108	75
13	112	4790	1360	408	170	247	48	32	48	67	102	73
14	112	2070	1190	397	170	211	48	34	46	58	102	73
15	105	1320	1130	391	166	188	48	34	38	54	105	73
16	102	1080	1080	368	163	184	48	30	41	354	108	73
17	98	942	986	368	152	174	50	32	43	403	108	84
18	100	788	924	362	149	170	50	36	43	210	102	82
19	100	676	865	362	152	166	50	30	41	141	100	80
20	100	598	780	341	133	146	53	28	41	111	94	100
21	100	535	692	305	133	133	53	28	38	94	94	140
22	100	489	636	296	133	133	48	36	36	86	92	180
23	98	451	613	282	130	133	41	40	36	94	89	180
24	98	420	570	269	111	123	43	36	36	89	89	160
25	98	397	522	260	111	111	41	32	36	84	89	140
26	98	379	482	256	111	96	36	32	38	81	89	130
27	102	362	457	247	117	82	36	34	43	76	89	120
28	119	352	470	247	133	76	41	38	43	76	86	115
29	119		502	251	143	76	41	46	46	183	86	110
30	116		652	239	136	79	32	53	48	315	84	105
31	112		748		149		30	60		258		100
Mean	111	1040	1344	419	168	217	49	36	44	117	121	99
Runoff in Ac. Ft.	6820	57760	82610	24920	10310	12920	3010	2240	2600	7190	7190	6090

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey. Cottonwood Creek is a west-side tributary to Sacramento River at Mile 222.2R.

TABLE 21

FLOW OF BATTLE CREEK NEAR COTTONWOOD - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	254	227	251	800	305	292	177	153	149	157	1290	222
2	240	209	337	2170	318	305	175	151	149	164	572	219
3	222	222	523	1640	334	299	175	149	149	162	334	240
4	224	214	655	675	328	283	171	151	149	160	271	266
5	219	212	419	567	321	274	173	149	148	162	292	257
6	229	214	337	771	311	302	173	149	148	157	248	251
7	224	212	314	562	311	314	171	148	149	168	240	254
8	222	199	341	510	305	450	175	151	151	219	229	263
9	222	298	347	536	296	431	168	148	149	189	227	251
10	219	408	472	459	280	341	171	149	149	266	227	240
11	222	542	506	423	280	299	168	148	148	248	224	246
12	216	2080	408	415	274	263	164	149	148	204	227	246
13	222	834	375	396	274	260	164	149	149	199	224	240
14	216	506	354	415	266	251	162	149	148	202	224	246
15	212	423	344	408	257	248	162	148	148	202	227	251
16	209	423	334	411	254	235	160	149	149	561	235	248
17	212	358	344	415	248	246	160	149	153	384	229	280
18	212	321	337	400	254	246	160	149	151	292	222	271
19	209	302	334	385	251	229	155	149	162	246	219	260
20	219	289	324	378	251	222	155	148	155	254	219	318
21	214	274	318	378	263	219	155	155	151	400	216	314
22	209	274	318	361	263	214	153	155	153	299	209	337
23	212	257	389	344	257	206	155	151	157	266	214	283
24	209	257	361	324	251	204	155	151	160	248	216	268
25	212	254	324	337	248	202	155	148	155	240	219	257
26	214	251	318	321	246	194	155	149	162	235	216	257
27	227	248	314	314	257	194	155	149	160	235	212	248
28	224	254	361	328	268	194	155	153	160	243	219	246
29	219		396	318	263	192	155	151	157	474	214	260
30	222		489	318	251	189	155	155	162	556	216	243
31	224		463		277		153	149		344		240
Mean	220	377	378	536	276	260	163	150	153	262	278	259
Runoff in Ac. Ft.	13510	20950	23220	31890	16980	15470	10000	9230	9080	16140	16520	15910

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey. Battle Creek is an east-side tributary to Sacramento River opposite Mile 221.5L.

TABLE 22

FLOW OVER MOULTON WEIR FROM SACRAMENTO RIVER TO BUTTE BASIN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8	NO FLOW OVER WEIR DURING 1947											
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Elevation of crest is 76.75 U.S.E.D. datum; length of crest is 500 feet. Weir is on left bank at Mile 104.0.

TABLE 23

FLOW OF STONY CREEK NEAR HAMILTON CITY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	63	155								
2		0	74	141								
3		0	561	158								
4		0	1050	148								
5		0	524	134								
6		0	359	127								
7		0	280	118								
8		0	236	116								
9		0	208	108								
10		0	619	93								
11		0	1050	65								
12	N	1480	651	39	N	N	N	N	N	N	N	N
13	0	1060	485	0	0	0	0	0	0	0	0	0
14		528	408	0								
15		348	362	0								
16	F	266	326	0	F	F	F	F	F	F	F	F
17	L	230	294	0	L	L	L	L	L	L	L	L
18	O	190	269	0	O	O	O	O	O	O	O	O
19	W	160	249	0	W	W	W	W	W	W	W	W
20		138	227	0								
21		121	205	0								
22		108	187	0								
23		97	174	0								
24		87	165	0								
25		82	125	0								
26		76	101	0								
27		70	76	0								
28		63	74	0								
29			72	0								
30			80	0								
31			148									
Mean	0	182	313	47	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	10120	19240	2780	0	0	0	0	0	0	0	0

NOTE: U. S. Geological Survey station located on Stony Creek about 5 miles above mouth. Prior to February 1946 station was located 8 miles above mouth. Flow to the Sacramento River is cut off during the irrigation season by an earth fill installed by Glenn-Colusa Irrigation District to transport water from their main canal across Stony Creek. Stony Creek is a west-side tributary at Mile 136.3R. 2083 acre feet was diverted in April by G.C.I.D.

TABLE 24

FLOW OVER COLUSA WEIR FROM SACRAMENTO RIVER TO BUTTE BASIN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8	NO FLOW DURING 1947											
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Elevation of crest is 61.80 U.S.E.D. datum; length of crest is 1650 feet. Weir in left bank at Mile 92.4.

TABLE 25

FLOW OF BUTTE SLOUGH TO SACRAMENTO RIVER - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	679	483	931	630	56	830	120	240	380	432	224	399
2	889	504	945	700	42	700	141	285	413	427	0	354
3	777	532	819	672	167	758	127	254	409	461	224	455
4	574	588	644	0	79	775	136	245	385	408	700	399
5	553	525	0	0	91	833	183	272	357	352	752	420
6	525	462	0	714	56	874	156	284	390	306	350	336
7	525	483	0	735	143	1146	150	266	432	298	350	350
8	623	511	777	840	85	880	187	236	437	284	826	508
9	574	525	896	875	218	832	180	237	433	258	847	0
10	567	525	784	1008	210	1048	188	258	439	819	856	0
11	553	518	0	1064	214	1018	161	280	464	525	826	0
12	525	623	0	770	252	918	240	263	488	462	826	0
13	483	0	0	1064	186	987	320	236	546	420	791	0
14	483	0	721	1015	292	955	338	250	556	665	728	0
15	504	0	812	987	222	995	301	236	532	629	686	0
16	518	1085	952	808	179	624	266	267	497	976	679	0
17	546	1470	994	506	182	474	253	303	511	849	644	0
18	553	1519	896	327	210	362	230	285	496	655	616	0
19	469	1505	896	308	298	367	242	309	487	595	602	0
20	511	1610	931	281	434	387	287	309	518	698	280	0
21	339	1589	952	478	325	351	244	295	520	821	399	0
22	315	1540	924	368	434	280	262	343	541	982	616	0
23	504	1302	860	265	524	216	256	321	555	968	574	0
24	483	1099	0	325	639	180	220	342	578	1010	532	0
25	483	1085	675	241	714	196	242	263	588	1034	518	0
26	483	1071	645	192	859	213	256	248	589	1056	504	0
27	518	1008	565	150	902	208	260	216	587	1069	490	0
28	546	938	582	90	1081	122	253	200	587	136	483	0
29	553		572	35	1240	144	246	287	583	127	483	285
30	497		768	20	1234	134	252	305	561	188	483	360
31	483		754		1398		236	313		192		201
Mean	537	825	622	516	418	594	224	272	495	584	563	131
Runoff in Ac. Ft.	33000	45820	38270	30680	25720	35320	13750	16760	29470	35900	33500	8070

NOTE: This station is operated by Division of Water Resources with cooperation by U. S. Bureau of Reclamation. This is the discharge to the Sacramento River at Mile 84.0 Left and is measured at and regulated by the gravity culverts at the mouth of the slough. This flow, together with that shown in Tables 40 and 41 is, during the summer months, made up almost entirely of return water from lands irrigated by Feather River diversions. Discharge from the Sacramento River to Butte Basin over Moulton and Colusa weirs is shown in Tables 22 and 24.

TABLE 26

FLOW OVER TISDALE WEIR FROM SACRAMENTO RIVER TO SUTTER BY-PASS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	NO FLOW DURING 1947											
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Elevation of crest is 45.45 U.S.E.D. datum; length of crest is 1155 feet. Weir on left bank at Mile 64.2L.

TABLE 27

FLOW OF RECLAMATION DISTRICT 70 DRAIN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	10	0	34	37	33	34	41	14	0	6
2	12	0	5	0	33	38	28	34	39	6	7	6
3	8	0	2	0	32	35	29	35	35	0	6	3
4	12	0	0	0	34	36	34	34	37	4	5	0
5	0	0	0	12	34	36	34	35	38	8	6	0
6	6	0	0	0	33	39	41	34	40	9	0	0
7	9	0	11	7	35	32	35	35	40	9	0	0
8	0	0	0	0	30	33	35	35	38	9	4	0
9	0	0	0	0	30	32	31	34	36	9	6	0
10	0	0	15	10	28	32	36	35	36	4	6	0
11	0	0	17	0	32	38	37	35	39	0	6	0
12	0	0	10	5	33	26	34	35	35	0	5	0
13	0	0	0	0	32	28	34	37	33	0	5	0
14	10	0	9	0	34	33	34	37	29	6	5	0
15	0	0	9	0	34	32	34	37	27	7	4	0
16	0	0	0	0	34	35	26	38	34	3	5	0
17	0	0	0	0	33	35	29	39	32	0	4	0
18	0	8	9	0	35	33	30	38	28	0	6	0
19	5	15	0	0	39	32	34	39	30	0	7	0
20	0	3	0	0	35	31	34	37	29	4	5	0
21	6	0	0	0	34	32	34	38	28	6	0	0
22	0	11	0	0	37	27	32	37	27	0	0	0
23	9	0	3	5	37	27	32	38	21	0	3	0
24	0	0	6	20	37	29	34	37	18	3	5	0
25	6	0	4	20	39	0	32	38	15	6	5	0
26	0	6	7	14	39	24	32	38	15	5	5	0
27	0	7	8	14	41	24	32	39	12	5	5	0
28	0	7	8	20	40	26	34	38	0	2	5	0
29	0		8	23	41	28	35	37	0	0	5	0
30	0		7	25	39	33	35	41	13	0	5	0
31	0		6		38		35	41		0		0
Mean	3	2	5	6	35	31	33	37	28	4	5	0.5
Runoff in Ac. Ft.	165	113	305	347	2154	1831	2041	2259	1676	236	258	30

NOTE: This is the drainage from Reclamation District 70 returned to the Sacramento River at 68.8 Left. This is a combination irrigation and drainage plant and discharges both to the Sacramento River and to an irrigation canal. The above flow includes gravity as well as pumped drainage.

TABLE 28

FLOW OF RECLAMATION DISTRICT 108 DRAIN AT ROUGH AND READY BEND - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	73	0	0	0	102	480	238	279	441	48	45	58
2	0	165	222	0	27	301	273	281	356	44	32	0
3	0	0	99	67	45	316	230	366	385	32	17	40
4	0	0	0	0	172	302	233	323	388	0	0	0
5	121	0	103	0	228	304	234	273	385	52	0	0
6	0	0	0	91	216	306	234	321	389	0	0	33
7	0	0	89	0	217	304	285	302	418	63	0	0
8	0	0	0	0	255	393	228	312	388	0	0	43
9	0	148	130	0	343	334	234	305	389	60	0	0
10	0	0	0	0	361	334	307	388	385	48	0	0
11	0	0	0	0	633	332	283	278	350	40	0	47
12	157	74	113	0	306	310	256	278	411	49	0	0
13	0	154	0	134	301	276	267	311	390	36	0	26
14	0	124	0	0	301	263	266	315	365	49	40	0
15	0	110	0	0	299	244	315	313	335	0	135	0
16	0	163	160	83	307	240	232	316	371	60	47	36
17	0	50	0	0	321	222	265	437	380	40	59	0
18	0	0	0	0	441	221	278	293	375	0	31	0
19	159	95	112	0	278	221	281	391	343	0	0	58
20	0	0	0	203	186	210	283	383	282	73	0	0
21	0	0	0	109	282	144	279	362	191	0	32	0
22	0	165	0	104	287	0	273	363	159	45	41	53
23	0	98	133	74	288	191	268	354	78	0	0	0
24	0	0	0	0	290	201	283	371	111	43	60	43
25	0	0	0	0	387	77	281	354	138	0	0	0
26	166	0	75	0	274	65	279	371	123	0	0	0
27	0	0	0	116	335	168	279	296	116	58	0	53
28	0	0	0	64	379	178	277	345	79	0	47	0
29	0		0	157	383	242	273	397	70	50	0	46
30	0		126	123	533	172	277	398	67	0	0	0
31	0		0		330		277	415		25		0
Mean	22	48	44	44	294	245	267	338	289	30	20	17
Runoff in Ac. Ft.	1340	2670	2700	2630	18060	14580	16400	20790	17170	1820	1160	1060

NOTE: This is the drainage from Reclamation District 108 discharged to the Sacramento River at Mile 44.0 Right. Additional drainage from Reclamation District 108 is sometimes discharged to Back Borrow Pit at Mile 20.2 Left.

TABLE 29

FLOW OF COLUSA TROUGH AT COLUSA-WILLIAMS HIGHWAY* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	172	102	147	96	176	1077	383	539	835	434	207	85
2	165	102	162	94	172	1133	395	549	853	421	326	74
3	162	102	240	92	148	1050	370	541	834	431	415	71
4	156	102	331	88	112	913	391	556	788	374	341	68
5	150	102	433	86	114	860	406	568	811	351	286	71
6	143	102	285	84	105	864	383	554	885	359	226	61
7	142	102	212	82	132	950	388	587	902	336	191	56
8	141	102	200	82	125	1100	417	600	877	385	170	52
9	139	102	187	80	155	1088	456	541	932	427	163	49
10	138	102	173	80	469	1025	465	554	1012	551	159	46
11	136	110	163	86	615	935	421	562	929	609	155	48
12	133	607	156	181	279	737	470	577	915	456	129	46
13	131	1081	150	112	144	641	505	632	944	342	114	51
14	127	1008	144	88	159	533	509	655	967	254	105	57
15	120	633	139	71	273	474	473	656	968	210	112	51
16	120	395	133	110	389	385	473	651	969	201	119	38
17	119	376	122	174	457	349	473	659	936	186	114	33
18	119	332	119	188	596	349	473	651	927	191	105	32
19	119	299	117	224	680	373	473	682	925	157	100	49
20	116	277	115	207	634	331	444	718	859	213	98	88
21	113	243	113	252	598	259	444	721	774	193	98	78
22	106	218	110	279	590	180	444	778	731	178	103	81
23	103	198	108	206	579	188	444	788	798	189	100	83
24	102	180	103	195	579	239	473	816	787	159	93	71
25	102	167	100	172	645	227	473	769	715	150	93	74
26	102	158	96	131	717	269	473	769	689	140	90	73
27	102	148	98	131	876	277	473	769	660	138	90	73
28	102	142	100	139	1016	324	473	778	533	167	88	74
29	102		101	221	1085	332	488	826	499	252	86	79
30	102		101	167	1046	372	528	826	503	283	85	78
31	102		98		1041		535	835		237		74
Mean	125	271	157	140	474	594	452	668	825	289	152	63
Runoff in Ac. Ft.	7708	15059	9632	8327	29169	35334	27801	41072	49106	17800	9047	3896

* Also known as Colusa Trough at Highway 20 and Colusa Trough at Tahoe Ukiah Highway.

NOTE: This station is operated by State Division of Water Resources with cooperation by U. S. Bureau of Reclamation. 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, Maxwell and Jacinto Irrigation Districts. Flow reaches Sacramento River via Back Borrow Pit.

TABLE 30

FLOW OF COLUSA TROUGH (BACK BORROW PIT) NEAR COLLEGE CITY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	185	99	150	112	105	1167	270	515	845	457	251	93
2	178	98	161	132	134	1212	283	527	885	416	281	82
3	170	99	207	176	105	1191	296	515	912	461	399	82
4	159	103	334	259	58	1044	301	533	861	377	354	94
5	159	99	406	423	66	926	335	563	848	335	305	77
6	157	99	362	491	64	923	361	533	909	356	251	74
7	150	98	340	434	85	1001	348	572	960	346	225	63
8	148	99	366	216	82	1147	379	590	967	377	207	56
9	142	101	237	98	122	1198	402	554	999	440	189	55
10	138	138	196	107	330	1147	461	542	1093	536	176	48
11	138	157	183	152	500	1035	434	551	1116	644	178	48
12	132	387	192	258	296	828	440	551	1042	515	155	49
13	132	1090	220	241	105	641	482	603	1001	385	132	48
14	132	1309	260	132	83	606	473	619	1025	278	124	61
15	130	1276	273	60	161	452	536	628	1049	227	116	59
16	126	1014	286	46	246	406	506	616	1088	200	130	53
17	122	866	217	122	307	301	464	628	1018	192	122	36
18	120	774	170	157	410	286	437	652	980	192	116	32
19	118	659	130	148	542	296	455	675	997	161	107	37
20	116	434	122	170	557	288	419	699	940	166	103	59
21	114	288	120	178	512	253	422	674	851	229	101	119
22	112	248	114	202	515	163	431	705	776	198	107	96
23	112	222	114	177	500	140	399	753	824	194	107	101
24	111	207	111	146	500	157	440	712	824	194	98	90
25	109	189	109	148	542	219	449	773	790	157	94	80
26	107	176	107	101	628	216	452	759	736	130	94	87
27	103	167	109	71	790	193	425	749	732	122	94	87
28	105	157	107	79	1018	222	413	759	588	150	94	94
29	114		103	133	1188	234	438	793	494	210	94	98
30	107		101	148	1164	258	503	800	500	309	90	94
31	103		101		1181		503	814		283		89
Mean	131	380	194	177	416	605	418	644	888	298	163	72
Runoff in Ac. Ft.	8031	21130	11917	10546	25579	36001	25700	39585	52860	18322	9707	4445

NOTE: This station is maintained, operated and records computed by U. S. Bureau of Reclamation. Station is located at College City Bridge on Back Borrow Pit at Mile 22.7.

TABLE 31

FLOW OF KNIGHTS LANDING RIDGE CUT - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	70	32	71	16	62	51	1	0	0
2	0	0	0	128	29	68	19	63	55	1	0	0
3	0	0	0	200	26	53	26	65	59	1	34	0
4	0	0	0	297	20	46	32	67	53	1	73	0
5	0	0	52	484	13	44	40	70	45	1	13	0
6	0	0	143	633	7	51	48	70	46	0	0	0
7	0	0	294	510	0	56	54	70	50	0	0	0
8	0	0	327	239	0	58	58	74	54	0	0	0
9	0	0	123	111	0	60	60	77	52	0	0	0
10	0	0	73	71	1	48	66	75	58	0	0	0
11	0	0	110	47	22	46	71	74	56	0	0	0
12	0	0	163	22	56	32	67	68	42	0	0	0
13	0	61	232	12	54	25	70	62	35	0	0	0
14	0	732	283	21	42	40	72	61	32	0	0	0
15	0	1240	321	21	36	34	74	61	34	0	0	0
16	0	1110	330	17	42	30	74	62	19	0	0	0
17	0	933	207	19	58	27	62	64	10	0	0	0
18	0	839	122	28	86	20	56	67	8	0	0	0
19	0	651	80	33	74	19	54	68	8	0	0	0
20	0	265	63	41	62	31	51	66	7	0	0	0
21	0	94	44	48	58	30	45	58	6	0	0	0
22	0	41	26	61	55	21	46	56	5	0	0	0
23	0	11	13	68	56	14	47	60	4	0	0	0
24	0	0	8	71	58	11	58	64	5	0	0	0
25	0	0	6	67	56	10	65	68	4	0	0	0
26	0	0	0	57	63	9	65	68	4	0	0	0
27	0	0	0	45	84	9	56	62	3	0	0	0
28	0	0	0	38	119	10	53	46	3	0	0	0
29	0		0	34	111	11	50	46	2	0	0	0
30	0		1	37	77	12	56	48	1	0	0	0
31	0		31		65		60	50		0		0
Mean	0	213	98	118	47	33	54	64	27	0	4	0
Runoff in Ac. Ft.	0	11860	6054	7002	2900	1976	3314	3911	1609	10	238	0

NOTE: Knights Landing Ridge Cut diverts water from the Back Borrow Pit of Reclamation District 108 at a point above the Outfall Gates, into the Yolo By-Pass above Elkhorn. Winter flows are uncontrolled. Summer flows for irrigation are controlled at the Outfall Gates and at the junction with Yolo By-Pass by weir boards and gates. Daily mean flows for the period April to October are estimated based on current-meter measurements. Station has been operated cooperatively since 1941 by the Division of Water Resources and the U. S. Geological Survey.

TABLE 32

FLOW OF COLUSA BASIN DRAINAGE TO SACRAMENTO RIVER AT KNIGHTS LANDING - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	197	135	213	0	0	1070	2	247	305	586	242	179
2	199	135	191	0	0	1170	2	250	324	521	325	160
3	186	130	171	0	0	1120	2	259	356	501	0	132
4	184	140	0	0	0	929	10	269	414	511	650	135
5	182	135	0	0	0	740	33	286	420	466	515	148
6	197	140	0	0	0	767	72	282	425	498	368	140
7	182	135	0	0	0	808	95	286	460	508	305	137
8	185	135	0	403	0	907	120	305	491	465	300	132
9	182	142	504	530	0	1120	128	323	476	460	298	120
10	178	145	0	398	0	1110	174	309	521	530	254	121
11	175	175	205	452	0	1030	233	340	711	632	250	108
12	167	227	0	443	0	859	233	391	775	651	244	103
13	173	0	0	332	0	491	249	400	704	530	200	108
14	176	0	0	50	0	343	246	398	674	441	195	108
15	182	0	0	50	0	303	266	398	699	353	189	109
16	172	0	0	2	0	196	326	406	1100	285	200	115
17	166	0	361	2	0	105	320	413	1360	311	186	121
18	163	0	403	2	0	69	207	436	1210	222	195	112
19	161	230	469	2	69	50	117	440	1190	201	189	102
20	162	623	368	2	241	25	104	478	1150	253	168	100
21	168	603	364	2	283	25	78	468	1070	252	168	115
22	167	499	355	2	254	25	82	457	971	282	175	156
23	163	399	275	2	251	25	87	480	945	270	166	158
24	159	329	0	1	260	13	139	517	966	260	168	158
25	158	257	138	1	254	2	177	542	956	256	170	156
26	160	222	192	1	304	2	219	542	905	230	170	148
27	168	216	195	1	470	2	219	502	868	200	166	147
28	125	220	196	1	770	2	203	389	803	191	164	147
29	150		0	1	1176	2	190	389	666	210	160	160
30	135		551	1	1204	2	217	404	596	297	158	156
31	160		0		1090		234	414		321		140
Mean	170	192	166	89	214	444	154	388	750	377	231	133
Runoff in Ac. Ft.	10480	10650	10220	5320	13140	26400	9490	23840	44650	23190	13760	8190

NOTE: This station is operated by Division of Water Resources. 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 34.15R, just above the Knights Landing gaging station. It does not include any drainage from Reclamation District 787 entering the Back Borrow Pit via Sycamore Slough outlet (See Table 33 for Sycamore Slough contribution). 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 31. Total flow to Sacramento River is sum of Tables 32 and 33.

TABLE 33

FLOW OF SYCAMORE SLOUGH INTO COLUSA BASIN DRAIN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	1	0	5	32	25	15	25	17	0	0
2	0	0	1	0	5	32	25	15	23	17	0	0
3	0	0	1	0	5	32	25	15	21	15	0	0
4	0	0	1	0	5	30	25	15	20	15	0	0
5	0	0	1	0	5	28	25	15	19	12	2	0
6	0	0	0	0	4	25	25	16	19	10	2	0
7	0	0	0	0	4	25	25	16	19	7	3	0
8	0	0	0	0	4	23	22	16	19	5	5	0
9	0	0	0	0	3	23	20	16	19	3	5	0
10	0	0	0	0	3	20	20	17	19	3	0	0
11	0	0	0	0	3	20	20	17	19	3	0	0
12	0	0	0	0	2	18	18	17	19	3	0	0
13	0	0	0	0	2	18	18	17	19	3	0	0
14	0	0	0	0	2	16	16	17	19	3	0	0
15	0	0	0	0	2	10	16	17	19	3	0	0
16	0	0	0	0	2	1	16	19	19	3	0	0
17	0	0	0	0	2	1	16	19	19	2	0	0
18	0	0	0	0	2	1	16	19	19	2	0	0
19	0	0	0	0	2	2	15	19	19	2	0	0
20	0	0	0	0	2	2	15	19	19	2	0	0
21	0	0	0	0	45	2	15	21	19	2	0	0
22	0	0	0	0	40	2	15	21	19	2	0	0
23	0	0	0	0	36	2	15	21	19	2	0	0
24	0	0	0	0	36	2	15	21	19	2	0	0
25	0	0	0	0	36	2	15	23	19	2	0	0
26	0	1	0	0	34	2	15	23	19	2	0	0
27	0	1	1	3	34	2	15	23	19	0	0	0
28	0	1	1	3	33	2	15	25	19	0	0	0
29	0		1	4	33	2	15	25	19	0	0	0
30	0		0	5	32	3	15	25	19	0	0	0
31	0		0		32		15	25		0		0
Mean	0	0.1	0.3	0.5	14.7	12.7	18.3	19.0	19.4	4.6	0.6	0
Runoff in Ac. Ft.	0	5.9	16	30	902	754	1130	1170	1160	282	34	0

NOTE: Flow and leakage estimated from observations and measurements made during 1947. This water is discharged below Outfall Gates and is not included in the flow shown in Table 32.

TABLE 34

FLOW OVER FREMONT WEIR FROM SACRAMENTO RIVER TO YOLO BY-PASS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	THERE WAS NO FLOW OVER FREMONT WEIR DURING 1947											
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Station is located on Sacramento River at mile 23.0 R. Elevation of crest is 33.5 U.S.E.D. datum; length is 9120 feet.

TABLE 35

FLOW OF BUTTE SLOUGH TO SUTTER BY-PASS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	66	18	113	308	72	72	76	94	69	28	202	21
2	61	18	98	345	90	82	81	88	64	25	219	15
3	48	17	94	396	78	84	80	85	54	23	503	9
4	44	15	257	777	77	89	87	83	50	19	367	7
5	51	13	660	910	83	91	76	81	55	17	183	6
6	48	12	746	689	82	86	77	84	55	17	144	3
7	41	13	735	505	88	91	88	77	51	18	138	2
8	38	14	479	380	83	96	93	78	48	17	128	5
9	36	15	324	310	87	100	90	90	45	15	130	35
10	34	17	278	270	74	121	89	81	46	19	117	50
11	34	23	561	240	90	111	91	81	49	22	104	59
12	33	100	810	170	86	106	97	88	46	23	95	65
13	32	571	888	160	80	95	86	78	40	22	85	71
14	33	1570	771	110	87	72	80	78	36	20	67	67
15	32	3080	592	90	79	52	79	77	34	28	51	62
16	32	3250	476	68	81	66	78	84	37	37	45	64
17	30	2500	405	61	83	54	80	81	37	38	43	71
18	29	1740	335	58	81	71	81	86	37	94	41	101
19	29	1160	279	57	90	75	86	86	38	54	39	144
20	28	836	252	58	93	61	77	81	38	40	41	177
21	24	650	216	96	87	59	89	86	37	81	40	195
22	24	515	72	95	98	58	88	83	41	98	36	204
23	28	395	57	87	102	59	76	81	39	111	32	212
24	30	310	50	114	100	73	85	77	41	118	29	201
25	27	256	141	82	93	77	86	72	42	128	27	192
26	23	203	137	74	93	93	87	78	42	122	25	190
27	21	160	133	66	91	78	85	69	40	118	24	200
28	18	132	123	66	90	79	81	78	35	117	24	223
29	18		121	82	77	76	87	75	31	129	23	144
30	18		110	52	81	73	88	69	30	137	22	29
31	18		143		78		84	70		194		30
Mean	33	629	337	226	86	80	84	81	44	62	101	92
Runoff in Ac. Ft.	2040	34920	20740	13440	5260	4760	5180	4960	2590	3830	6000	5660

NOTE: This is discharge from Butte Slough to Sutter By-Pass. During low flow periods gates at head of Slough are regulated (Table 25) which forces water under Long Bridge as shown in this table. Normal summer flows are primarily from Feather River sources. During flood periods Sacramento River water enters Butte Basin above Butte City by bank spill and over Moulton and Colusa weirs. The purpose of the summer regulation is to make water available for use on Sutter By-Pass lands (below Long Bridge) and Butte Slough Irrigation Company in R.D. 70. This station is maintained and operated by the Division of Water Resources.

TABLE 36

FLOW OF WADSWORTH CANAL TO SUTTER BY-PASS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	39	22	38	10*	63	226	108	130	214	156	40	29
2	38	21	39	20	75	202	100	126	203	149	50	28
3	36	21	41	20	76	190	110	121	194	154	56	28
4	35	21	44	20	75	180	119	137	192	125	107	28
5	34	21	41	20	76	185	124	142	194	124	42	28
6	34	20	39	20	81	202	124	134	221	114	41	27
7	34	19	38	20	80	249	124	119	219	106	41	26
8	33	19	38	20	85	280	130	121	216	92	41	26
9	32	19	38	20	101	277	124	132	235	108	40	27
10	31	21	44	20	99	280	110	124	219	146	40	23
11	31	23	40	20	101	222	106	119	216	133	40	22
12	30	265	37	20	84	177	100	121	216	106	39	21
13	29	191	36	20	81	156	101	124	246	92	39	21
14	29	109	35	20	94	113	106	132	205	91	38	20
15	28	82	34	20	99	93	110	146	181	87	38	19
16	28	72	33	12	102	112	108	141	155	92	37	19
17	28	64	32	0	100	135	116	134	224	94	36	21
18	28	59	30	23	108	120	114	136	211	91	36	21
19	27	55	30	22	108	114	115	140	190	89	35	21
20	26	51	29	22	106	122	116	132	171	91	34	20
21	25	49	27	32	125	123	115	130	152	91	33	21
22	24	47	26	35	129	122	107	137	154	89	33	21
23	24	45	25	69	140	117	104	146	130	91	32	21
24	24	45	24	62	172	116	105	151	100	87	31	20
25	24	44	23	45	163	82	108	144	109	78	31	20
26	23	42	21	35	143	87	108	139	169	77	30	21
27	23	40	20	43	150	87	118	149	184	82	30	21
28	24	39	21	60	176	90	136	161	184	93	30	20
29	23		20	63	184	88	119	162	190	102	30	20
30	23		19	58	199	114	107	160	137	86	29	20
31	23		8		220		116	153		58		20
Mean	29	55	31	28	116	155	113	137	188	102	40	23
Runoff in Ac. Ft.	1765	3027	1920	1690	7130	9250	6960	8420	11170	6300	2360	1390

NOTE: This is the discharge (measured at Weir #4) to the East Borrow Pit of the Sutter By-Pass at Mile 16.0 (north from Chandler). This flow is made up entirely of Feather River drainage or return flows. This flow and flow from Butte Slough (Table 35) makes up the entire Feather River contribution to the Sutter By-Pass. See footnote Table 35.

TABLE 37

FLOW OF RECLAMATION DISTRICT 1500 DRAIN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	100	57	92	10	245	617	426	443	592	160	0	37
2	20	12	28	0	272	544	360	446	491	136	189	0
3	4	0	223	0	293	572	437	496	555	169	0	36
4	104	0	94	0	340	525	398	449	501	129	76	37
5	44	0	79	86	334	534	422	519	559	133	34	37
6	0	0	7	80	332	541	413	445	558	134	48	0
7	0	60	159	0	408	551	498	480	616	144	61	37
8	0	20	0	0	413	639	444	445	554	132	37	37
9	38	0	144	35	421	551	503	496	633	127	48	37
10	112	68	95	83	548	532	437	445	498	145	49	0
11	27	44	0	4	708	461	439	450	587	132	37	36
12	94	206	89	0	335	420	450	453	514	142	49	30
13	0	150	140	0	263	361	481	524	584	112	37	30
14	51	150	0	83	287	402	422	587	575	90	37	0
15	61	146	94	82	352	420	473	455	543	73	42	144
16	128	38	149	28	310	360	445	464	515	95	36	0
17	48	86	0	7	360	360	489	719	511	60	37	0
18	76	166	20	0	405	360	445	488	447	55	36	0
19	44	7	86	58	360	406	473	453	522	61	36	41
20	28	0	83	120	390	391	449	478	447	46	37	0
21	52	76	80	198	413	360	482	527	355	61	36	44
22	44	92	40	120	470	360	543	452	310	53	36	41
23	40	76	0	200	433	360	387	519	235	50	37	0
24	36	45	0	168	433	360	520	445	261	54	30	41
25	40	110	98	268	450	360	437	542	253	0	36	0
26	36	28	95	214	488	360	488	446	215	0	0	40
27	41	92	80	223	490	360	453	558	196	36	37	41
28	41	37	0	241	491	360	443	559	198	0	36	0
29	37		0	274	493	360	445	558	172	59	37	0
30	36		18	281	594	423	481	699	173	37	37	0
31	37		37		480		445	819		43		0
Mean	46	63	65	95	407	440	453	512	439	86	42	24
Runoff in Ac. Ft.	2810	3500	4030	5680	25010	26200	27820	31460	26120	5290	2480	1480

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. (Table 38.) A small amount of gravity drainage through the pumps during the summer months is included in the above flow.

TABLE 38

FLOW OF SACRAMENTO SLOUGH TO SACRAMENTO RIVER - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	109	0	660	762	213	925	639	704	959	539	0	0
2	26	0	0	1330	210	948	565	620	871	502	0	108
3	0	0	710	1400	224	870	604	762	837	505	0	163
4	26	0	1000	0	93	850	699	588	869	515	378	253
5	103	0	55	612	510	859	604	800	808	485	808	252
6	0	0	0	1920	495	861	666	700	874	465	724	338
7	0	0	2070	1880	493	839	639	806	931	468	656	293
8	0	0	1880	1750	528	1020	675	644	869	448	584	285
9	0	0	1520	1340	560	908	787	840	968	423	532	153
10	25	0	1250	1360	591	975	679	700	920	464	517	284
11	0	162	0	1350	952	1020	765	786	948	470	437	292
12	0	0	0	1110	617	950	686	687	957	340	338	288
13	0	0	0	920	311	882	785	834	944	548	327	158
14	0	0	2400	865	281	810	624	751	1007	527	287	58
15	0	0	3040	875	509	833	755	738	872	225	293	153
16	0	0	0	707	428	641	629	730	915	114	183	0
17	0	3480	1710	753	433	632	776	739	933	0	409	0
18	0	4930	1350	334	470	625	632	801	957	0	0	0
19	0	4500	1310	319	484	589	756	800	936	235	220	0
20	0	3370	1230	202	469	682	630	800	960	320	176	0
21	0	2270	1230	287	477	596	745	810	940	240	120	0
22	0	1300	1030	277	563	590	743	720	850	128	179	0
23	0	1110	420	182	579	659	673	834	768	0	69	0
24	0	908	0	99	657	613	781	746	675	0	255	0
25	181	835	880	0	656	567	650	853	654	69	66	131
26	647	702	540	90	731	473	778	741	620	0	121	403
27	0	731	400	314	816	495	568	850	572	63	121	206
28	0	311	0	440	856	511	752	873	583	114	68	334
29	0		40	486	780	496	628	874	583	0	116	289
30	244		970	431	613	560	774	886	549	0	0	248
31	0		0		638		591	1110		0		212
Mean	44	879	829	747	524	743	686	778	838	265	266	158
Runoff in Ac. Ft.	2700	48810	51000	44420	32200	44190	42200	47860	49840	16280	15840	9720

NOTE: This is the discharge to the Sacramento River at Mile 21.2L via Sacramento Slough. This is the entire outflow of the Sutter By-Pass area and R.D. 1500. During high water periods the slough is entirely submerged as it lies within the By-Pass area. Sharp rises in river elevation will cause zero or negative flow. See tables 26, 35, 36 and 37, which, when combined, will give the measured flow entering the By-Pass area. This station is operated by the Division of Water Resources.

TABLE 39

FLOW OF FEATHER RIVER NEAR OROVILLE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1420	1310	2860	9520	3810	2930	2250	2400	1860	1620	3330	1590
2	1480	1200	5040	8400	4330	2670	2180	2300	2050	1400	3490	1680
3	1520	1400	7180	9070	4370	2350	2170	2020	2030	1450	2620	1610
4	1340	1720	6740	7900	3920	2170	2170	2320	1880	1280	2600	1870
5	1230	1800	5680	6980	3710	2140	2160	2290	1900	984	2990	1870
6	1400	2030	4980	7160	3920	2400	2150	2260	1900	1270	2550	1800
7	1460	2080	4630	6740	3860	2800	2130	2250	1860	1500	2190	1400
8	1420	1670	5000	6450	3620	5020	2130	2270	1740	1820	1620	1630
9	1380	1780	5000	6620	3410	3700	2070	2240	1700	1780	1450	1970
10	1360	3280	15200	6150	2860	2890	2060	2000	1700	1980	1800	1960
11	1320	2640	13200	5990	2490	2280	2060	2170	1650	1780	1420	1930
12	1250	29200	9640	5870	2580	2280	2060	2240	1650	1180	1760	1800
13	1240	22700	8140	5510	2760	2290	2060	2230	1960	1370	2000	1830
14	1320	13900	7350	5530	2680	2060	2060	2280	2060	1490	1930	1360
15	1320	9940	6780	5890	2600	2080	2080	2340	1860	1310	1720	1490
16	1330	7540	6460	5960	2650	2120	2100	2340	1920	7520	1280	1910
17	1240	6040	6480	6100	2450	2200	2280	2230	1640	3810	1780	2040
18	1220	5230	6780	5610	2400	2250	2330	2280	1450	1710	1760	2060
19	1210	4580	6920	5190	2480	2180	2170	2290	1480	1160	1880	1980
20	1120	4380	6380	4860	2520	2120	2090	2280	1290	1650	1880	1920
21	1340	3860	6080	4700	2480	2070	2280	2040	1240	1960	1830	1630
22	1260	3370	5870	4680	2410	2040	2390	2040	1520	1780	1600	2220
23	1270	3080	7140	4380	2380	2080	2480	1880	1700	1780	1370	2160
24	1190	3130	6100	4260	2400	2150	2360	1870	1720	1650	1610	1870
25	1250	2930	5850	4030	2370	2280	2360	2020	1480	1360	1820	993
26	1160	3030	5540	3870	2340	2270	2320	2100	1460	1080	1700	1430
27	1370	3240	5230	3610	2350	2250	2060	1980	1520	1480	1180	1510
28	1620	3130	6390	3700	2370	2140	2350	1980	1200	1750	1520	1310
29	1650		8100	3840	2320	2090	2340	2000	1570	3290	1320	1340
30	1610		13100	3790	2250	2120	2340	1920	1790	4300	1090	2000
31	1550		11500		2360		2420	1860		2470		1890
Mean	1350	5364	7140	5745	2885	2414	2208	2152	1693	1967	1903	1750
Runoff in Ac. Ft.	83010	297900	439000	341900	177400	143600	135800	132300	100700	120900	113200	107600

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 highway crossing about 4.5 miles above Oroville on right bank.

TABLE 40

FLOW OF FEATHER RIVER NEAR GRIDLEY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1650	1440	2930	11300	1800	694	70	415	122	1130	2500	1360
2	1500	1360	4320	9790	2060	708	64	347	150	903	3950	1730
3	1550	1360	6960	10400	2150	611	105	318	281	841	2700	1620
4	1540	1750	8230	9420	1820	303	116	95	245	825	2480	1890
5	1370	1820	6540	8090	1340	236	120	257	166	687	2930	1970
6	1380	1980	5430	8010	1460	328	105	275	224	472	2660	1900
7	1570	2070	4760	7580	1410	757	98	262	272	895	2340	1670
8	1550	1840	5120	7180	1310	2570	103	253	205	1250	1980	1530
9	1450	1750	4640	7480	1090	2100	95	257	187	1360	1630	1930
10	1440	2690	13900	6940	841	1400	78	236	158	1500	1640	1880
11	1400	2580	16600	6560	520	817	73	86	286	1670	1710	1830
12	1400	19200	12000	6460	383	539	67	197	310	950	1610	1750
13	1340	28200	9830	5840	328	495	67	332	460	982	2020	1760
14	1370	17600	8580	5740	352	399	66	362	818	1030	2050	1500
15	1410	12900	7840	6300	276	142	64	464	788	990	1900	1320
16	1370	9520	7290	6120	236	128	63	464	795	3890	1610	1770
17	1330	7380	7080	6120	257	128	62	426	751	4830	1540	1940
18	1340	6080	7540	5800	152	174	190	404	521	1890	1860	2120
19	1260	5040	7640	5050	140	194	352	489	421	1110	1980	2040
20	1090	4720	7200	4380	142	176	95	453	484	1050	1960	2040
21	1330	4080	6680	4050	135	168	67	404	411	1650	1920	1880
22	1330	3650	6480	3880	147	154	257	308	449	1640	1780	1950
23	1370	3270	7490	3430	132	132	453	201	715	1480	1560	2200
24	1270	3150	6580	3170	130	112	420	106	1000	1450	1470	2030
25	1300	3070	6460	2920	135	102	337	77	911	1220	1870	1480
26	1260	3020	5880	2690	152	86	337	181	751	934	1790	1260
27	1280	3270	5460	2260	164	89	323	245	803	942	1660	1600
28	1650	3210	6010	2080	216	81	105	179	810	1340	1260	1540
29	1760		8710	2260	271	67	285	165	580	2280	1450	1350
30	1600		13600	1950	216	61	347	216	1220	4320	1390	1960
31	1690		13600		179		442	133		2580		1940
Mean	1420	5640	7790	5780	643	465	175	278	510	1550	1970	1770
Runoff in Ac. Ft.	87570	313400	478800	343600	39510	27670	10760	17070	30340	95390	117400	108600

NOTE: Station is maintained and operated by the Division of Water Resources. It is located at Gridley Bridge, Mile 49.7 above mouth.

TABLE 41

FLOW OF FEATHER RIVER AT YUBA CITY (5TH ST. BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1930	1730	3410	12600	2520	531	195	454	241	1370	2420	1070
2	1780	1480	3860	11200	2570	1480	202	458	230	1210	3380	1530
3	1820	1410	6790	11100	2980	1140	200	428	241	1010	2950	1580
4	1830	1630	10700	11100	3020	850	216	394	313	1010	2630	1640
5	1660	1910	8260	9410	2730	600	225	300	313	955	2660	1810
6	1600	1920	6460	8430	2490	494	220	385	280	760	2670	1800
7	1740	2090	5480	8240	2500	904	225	428	310	817	2420	1650
8	1740	2050	5370	7720	2310	2070	218	409	335	1170	2220	1350
9	1690	1830	5260	7720	1980	3230	211	396	291	1470	1740	1660
10	1660	2110	12500	7330	1710	2530	212	408	288	1570	1520	1910
11	1650	2830	18100	6840	1390	1840	202	396	322	1800	1800	1800
12	1620	6140	14800	6630	1080	1260	199	270	420	1440	1490	1750
13	1510	26900	11600	6270	880	959	191	372	453	973	1770	1650
14	1510	23000	9710	6170	807	807	189	428	795	1220	1960	1540
15	1570	15100	8650	6360	745	646	182	458	926	1170	1910	1200
16	1560	11500	7930	6500	672	440	180	515	955	1360	1650	1400
17	1570	8670	7550	6570	620	349	187	515	995	5670	1290	1730
18	1500	6960	7640	6460	613	253	190	458	871	2890	1760	1990
19	1460	5840	7700	5910	550	274	263	490	748	1760	1770	2000
20	1390	5240	7500	5190	487	262	325	534	719	1260	1850	2030
21	1390	4730	6920	4910	440	260	235	515	700	1670	1830	2020
22	1520	4240	6760	4600	410	255	202	437	679	1880	1800	1770
23	1470	3830	7050	4210	416	246	296	396	800	1730	1520	2140
24	1440	3570	7720	3840	360	230	420	310	989	1720	1290	2040
25	1420	3560	6820	3610	355	220	419	256	1080	1590	1680	1800
26	1450	3400	6280	3370	338	216	410	210	940	1310	1740	1090
27	1370	3480	5780	3050	344	209	410	279	906	1060	1720	1380
28	1620	3540	5960	2860	371	210	370	299	930	1350	1170	1420
29	1810		8540	2830	440	208	270	269	780	1660	1490	1230
30	1800		11700	2720	537	199	360	272	996	3450	1290	1530
31	1830		13800		500		380	280		3160		1830
Mean	1610	5740	8280	6460	1200	772	258	388	628	1660	1910	1660
Runoff in Ac. Ft.	98990	318700	509000	384300	73720	45960	15880	23840	37380	102100	113800	101800

NOTE: This station is maintained and operated by the Division of Water Resources. It is located at Yuba City-Marysville (5th Street) Bridge, Mile 28.0 above mouth. Backwater from the Yuba River at times affects the stage-discharge relationship of this station.

TABLE 42

FLOW OF FEATHER RIVER BELOW SHANGHAI BEND - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2270	1950	4490	18800	4210	829	262	409	276	1460	3450	1700
2	2090	1710	5110	15700	4120	1170	248	479	258	1570	3370	1630
3	2080	1550	9240	15700	4200	1490	242	494	224	1450	3800	1720
4	2090	1750	14900	16000	4690	1410	239	472	229	1330	3600	1790
5	1930	2020	11500	13900	4390	1160	242	430	282	1280	3370	1870
6	1840	2090	9100	12300	3960	952	242	396	307	1070	3350	1960
7	1920	2250	7820	12000	3840	994	235	437	307	986	3240	1980
8	1970	2280	7550	11800	3670	1480	233	458	313	1430	3060	1920
9	1930	2010	7550	11600	3330	2710	229	451	301	1860	2780	1840
10	1860	2210	16900	11400	2990	3300	225	416	282	1960	2480	1940
11	1860	3300	29700	10900	2660	3010	222	402	295	2140	2310	2070
12	1860	6720	24100	10300	2330	2390	209	357	351	2020	2220	2110
13	1790	38500	17000	9010	2100	1890	199	326	431	1630	2120	2100
14	1760	36900	13600	8800	1920	1580	178	389	530	1590	2210	2040
15	1800	24000	11900	9010	1800	1370	162	451	900	1520	2280	1920
16	1810	15500	11100	9300	1670	1170	151	516	1040	1570	2260	1820
17	1820	9410	10600	9260	1560	1010	143	560	1130	4100	2110	1870
18	1730	9590	10600	9460	1450	899	128	552	1170	4740	1990	2000
19	1710	8060	10600	8980	1390	802	122	516	1050	3450	2060	2180
20	1640	7280	10400	7670	1300	731	140	567	934	2600	2130	2300
21	1610	6550	9720	7320	1240	650	145	604	900	2240	2190	2400
22	1810	5900	9310	7080	1130	598	132	619	842	2360	2220	2450
23	1700	5250	9880	6720	1080	552	125	560	833	2430	2140	2460
24	1690	4740	11000	6430	1030	502	147	479	1010	2350	2000	2490
25	1600	4690	9740	5780	986	451	324	402	1260	2300	1900	2480
26	1630	4460	9020	5070	922	397	396	326	1290	2160	1990	2270
27	1580	4470	8380	4850	869	369	416	282	1200	1900	2020	1990
28	1780	4630	8490	4690	842	333	402	282	1150	1800	1980	1900
29	1970		11800	4540	842	301	328	282	1120	1950	1840	1830
30	2020		16900	4470	836	281	295	282	1020	2520	1790	1780
31	2010		21400		857		328	276		3580		1890
Mean	1840	7850	11920	9630	2200	1160	229	435	708	2110	2480	2020
Runoff in Ac. Ft.	113400	435900	732700	572900	135300	69000	14100	26700	42100	129600	147300	124400

NOTE: This station is maintained by the Division of Water Resources. It is located on the right bank at Mile 23.0 above mouth. Station is rated above 20,000 c.f.s. by means of simultaneous measurements of Yuba River and Feather River at Marysville with appropriate time lag between Marysville and Shanghai Bend.

TABLE 43

FLOW OF FEATHER RIVER AT NICOLAUS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2910	2670	4960	17500	3690	936	260	387	304	1400	3400	1780
2	2720	2450	5400	15600	3610	1440	270	447	260	1460	3890	1830
3	2660	2170	8880	15600	4030	1680	282	459	245	1320	4550	2250
4	2600	2300	15700	15800	4690	1500	276	435	314	1190	3550	2220
5	2550	2660	14000	14100	4520	1200	336	381	375	1160	3270	2500
6	2410	2800	11300	13100	3980	1040	314	364	342	1070	3640	2590
7	2390	2990	9610	12500	3760	1120	287	417	326	866	3350	2360
8	2500	3040	8710	12200	3620	1900	314	441	331	1160	3040	2080
9	2490	2860	8950	12000	3390	4490	304	417	326	1530	2610	2100
10	2410	2840	14300	11700	2810	4030	292	411	309	1700	2250	2590
11	2410	3900	25900	11200	2310	3050	292	405	353	1860	2280	2660
12	2390	6420	24900	10300	1850	2180	250	331	417	1980	2280	2460
13	2340	26300	19600	8980	1620	1670	230	304	501	1440	2220	2360
14	2390	33100	15700	8900	1490	1430	188	423	561	1360	2590	2180
15	2320	25000	13500	8980	1430	1250	170	447	859	1470	2680	1880
16	2310	17500	12200	9140	1310	1010	174	501	950	1510	2420	1820
17	2310	13600	11600	9400	1210	873	188	519	1030	4840	2050	2250
18	2250	11400	11300	9640	1180	752	197	501	1080	4700	2170	2600
19	2240	9610	11300	8980	1120	686	230	417	936	3100	2440	2770
20	2160	8420	11200	8100	1070	693	292	519	838	2500	2540	2840
21	2010	7700	10700	7480	1020	654	250	537	866	2400	2580	2920
22	2190	6900	10300	7120	950	628	158	543	790	2700	2560	2750
23	2210	6070	10800	6790	922	585	158	435	752	2700	2280	2810
24	2190	5500	11800	6000	894	519	287	393	971	2600	2000	2920
25	2110	5310	11000	5590	852	435	405	298	1200	2500	2060	2680
26	2170	4940	10300	5150	831	393	381	230	1220	2300	2430	2030
27	2120	4830	9800	4690	810	364	399	225	1080	2000	2400	1760
28	2240	5030	9800	4280	824	353	381	326	1060	2200	2110	2000
29	2570		12700	4160	880	320	287	292	1070	2700	1870	1930
30	2680		16100	4070	908	292	260	309	915	3800	1930	1920
31	2620		19300		943		348	309		4850		2480
Mean	2383	8154	12630	9635	2017	1249	273	401	686	2205	2648	2333
Runoff in Ac. Ft.	146500	452800	776700	573300	124000	74330	16780	24640	40820	135600	157600	143400

NOTE: Station maintained jointly by Division of Water Resources and Water Resources Branch of the U. S. Geological Survey. It is located on left bank at Mile 9.3L above mouth.

TABLE 44

FLOW OF YUBA RIVER AT NARROWS DAM - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	875	705	1230	5040	2040	1050	580	500	360	420	225	425
2	783	545	2280	4500	2240	1320	520	485	460	310	220	430
3	739	710	3860	4880	3150	1210	540	485	460	285	420	425
4	730	710	3710	4260	2920	1060	545	565	460	280	420	440
5	730	710	2860	3720	2690	965	450	510	465	275	420	465
6	730	710	2370	3620	2670	1000	450	465	350	275	440	220
7	730	710	2120	3460	2460	1230	545	480	350	430	450	220
8	730	710	2200	3280	2120	2300	545	470	440	335	470	450
9	730	710	2400	3300	1800	2340	535	355	430	315	445	570
10	730	710	10900	3040	1610	1850	505	355	430	210	440	625
11	730	710	8630	2910	1490	1410	480	475	430	210	440	450
12	730	7480	5540	2830	1450	1260	350	470	445	210	430	420
13	730	13600	4220	2830	1380	1090	345	465	330	210	435	220
14	730	5520	3640	2930	1320	980	450	465	330	210	460	220
15	730	3850	3380	3040	1270	920	460	480	425	370	230	440
16	730	3000	3240	3060	1250	864	460	350	425	565	230	420
17	730	2640	3240	3140	1230	783	480	350	420	665	425	430
18	730	2260	3180	2980	1210	741	475	520	425	665	425	475
19	730	1990	3110	2800	1180	685	330	465	425	665	425	555
20	700	1800	2920	2800	1160	645	310	470	275	660	450	720
21	700	1620	2740	2750	1130	650	455	465	270	660	447	720
22	700	1600	2640	2480	1110	655	450	465	380	660	220	630
23	705	1370	3800	2240	1090	650	455	350	390	640	220	435
24	720	1300	3430	2130	1020	535	455	350	405	665	454	445
25	720	1250	2900	2070	965	490	460	445	410	670	455	225
26	720	1210	2640	2020	935	505	340	443	340	670	455	225
27	715	1230	2450	2020	935	500	350	405	280	670	225	225
28	710	1260	3180	1980	955	445	465	450	280	570	450	225
29	710		4400	1960	895	445	460	435	475	420	225	440
30	710		6840	1960	910	520	455	360	470	425	220	450
31	705		6160		872		465	360		390		440
Mean	729	2165	3749	3001	1531	970	457	442	394	452	376	422
Runoff in Ac. Ft.	44810	120200	230500	178600	94130	57720	28100	27190	23470	27780	22360	25940

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. For total flow of Yuba River near Smartville combine with flows in Table 45.

TABLE 45

FLOW OF DEER CREEK NEAR SMARTVILLE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	87	38	48	212	30	36	8.7	4.4	3.0	1.8	171	18
2	84	32	182	331	26	30	8.3	4.2	2.9	1.9	144	25
3	80	32	863	367	23	26	9.0	4.8	2.5	2.0	53	30
4	83	29	403	258	19	21	9.8	5.7	2.2	1.8	35	33
5	79	27	193	206	18	21	8.3	5.9	2.0	1.8	45	33
6	35	38	130	191	18	22	6.8	5.4	2.0	2.2	40	27
7	23	32	113	169	18	32	6.8	5.4	1.8	4.4	41	24
8	20	28	182	190	17	65	6.5	5.0	1.8	9.0	35	19
9	19	26	352	210	16	40	5.9	5.2	2.1	13	22	26
10	19	54	1630	130	16	27	4.2	5.0	2.5	36	18	31
11	19	58	479	95	13	22	4.2	5.4	2.4	50	23	30
12	20	2180	288	83	14	19	5.2	7.1	1.9	36	20	31
13	20	612	208	70	14	17	5.9	7.7	1.7	23	24	33
14	20	249	162	56	14	15	6.2	8.0	1.5	19	31	25
15	19	156	134	54	14	13	5.0	5.7	1.5	16	36	22
16	19	127	116	39	13	11	4.4	1.4	1.7	195	33	27
17	19	106	103	54	11	9.8	4.6	1.4	1.7	97	25	45
18	19	93	89	62	11	9.0	3.4	4.0	2.0	30	30	42
19	19	81	82	76	10	8.7	4.8	5.4	2.5	21	30	35
20	18	71	74	75	14	8.3	4.4	5.2	3.0	21	29	37
21	24	66	66	67	16	7.7	4.0	6.2	2.0	25	29	33
22	23	53	70	56	6.7	7.4	5.0	5.4	1.7	20	30	28
23	20	47	93	45	2.0	5.7	6.8	3.6	1.9	19	22	30
24	19	32	96	37	12	5.0	6.5	3.0	1.5	18	18	30
25	19	42	99	34	13	8.7	4.4	2.8	1.4	14	24	29
26	20	27	88	32	12	7.7	3.0	2.6	1.6	11	30	21
27	21	33	86	35	15	9.4	3.0	2.6	1.5	10	29	19
28	35	40	446	38	22	11	3.2	2.9	1.9	12	21	18
29	40		411	41	22	9.8	3.6	3.2	1.9	97	25	18
30	46		497	34	22	9.4	4.2	2.9	1.9	51	19	17
31	46		262		22		4.4	3.2		36		24
Mean	33.4	157	260	112	15.9	17.8	5.50	4.54	2.00	28.9	37.7	27.7
Runoff in Ac. Ft.	2050	8750	15960	6640	979	1060	338	279	119	1780	2250	1710

NOTE: This is a permanent station maintained throughout the year under Federal-State cooperation by the U. S. Geological Survey. For total flow of Yuba River near Smartville combine with flows in Table 44.

TABLE 46

FLOW OF YUBA RIVER AT MARYSVILLE (SIMPSON LANE BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1020	822	1540	6280	1760	650	235	173	138	232	432	230
2	949	711	2120	5250	1850	996	288	203	122	203	585	327
3	908	722	4350	5840	2380	952	250	203	140	152	402	354
4	891	788	5670	5370	2470	844	277	210	161	129	436	381
5	891	788	3870	4480	2410	751	274	248	168	120	428	402
6	850	793	3010	4150	2310	718	218	205	189	105	444	368
7	828	799	2560	3990	2180	886	215	196	152	103	440	250
8	816	788	2550	3720	1940	1550	261	191	129	184	428	258
9	810	793	2550	3750	1720	2020	261	193	143	230	428	368
10	805	816	9430	3440	1500	1700	266	159	175	256	420	580
11	805	873	11300	3180	1370	1350	232	143	201	220	424	432
12	822	4610	7870	3040	1280	1110	215	156	203	201	420	413
13	822	16000	5760	2970	1210	952	159	182	198	180	420	345
14	816	11000	4640	2980	1150	828	131	186	152	161	420	232
15	810	6500	4080	3040	1070	729	163	191	140	170	381	235
16	799	4510	3820	3050	1010	655	182	196	182	293	285	324
17	799	3530	3640	3070	983	580	196	156	208	712	282	374
18	799	2910	3580	3000	952	532	196	136	201	610	374	406
19	799	2510	3510	2820	928	500	196	173	201	595	391	406
20	799	2270	3350	2660	898	452	134	196	189	572	406	580
21	793	2060	3130	2670	862	436	105	196	140	590	416	615
22	793	1900	2970	2490	828	413	103	193	122	600	371	620
23	793	1770	3630	2180	812	413	127	193	118	590	271	432
24	788	1650	3880	1970	746	391	140	166	161	580	277	406
25	782	1580	3290	1890	712	318	147	145	191	590	384	354
26	788	1520	2960	1810	670	307	156	138	196	580	406	245
27	788	1510	2730	1780	655	266	131	161	159	576	358	222
28	816	1550	3130	1760	660	250	114	147	136	585	296	213
29	810		4650	1730	630	232	122	180	122	472	342	243
30	816		7030	1720	635	220	161	184	186	600	232	348
31	822		7540		610		161	156		444		345
Mean	827	2717	4327	3203	1264	733	188	179	164	375	387	365
Runoff in Ac. Ft.	50830	150900	266100	190600	77730	43640	11540	11020	9760	23080	23010	22430

NOTE: Station is maintained jointly by the Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. Station is at 7th Street Bridge at Mile 0.9L above mouth. Stage-discharge relationship affected by variable back-water for period February 13 to 15, inclusive.

TABLE 47

FLOW OF BEAR RIVER NEAR WHEATLAND - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	95	95	144	866	55	3.3	0.7	3.6	1.4	4.4	160	56
2	78	84	552	800	45	4.2	2.0	3.0	1.9	4.2	278	57
3	65	80	1100	980	25	3.3	1.5	2.8	3.3	4.2	113	55
4	57	76	1590	824	50	2.8	1.7	2.8	2.5	4.2	95	57
5	57	73	1070	728	226	1.9	1.5	2.2	.8	3.9	89	63
6	57	70	898	635	270	2.0	1.5	1.9	.5	3.9	83	62
7	60	68	832	490	240	4.2	1.9	1.7	.3	5.9	81	62
8	60	66	862	610	256	8.6	2.2	1.5	.2	4.7	83	60
9	60	65	927	668	236	29	2.0	1.4	.2	5.0	78	60
10	64	80	4640	615	208	20	2.5	1.2	.3	8.0	74	60
11	65	77	2550	565	104	15	2.8	1.0	.4	10	73	60
12	64	2800	1470	545	55	10	3.6	.8	.4	10	69	60
13	90	1430	1180	397	46	5.4	3.9	.8	.7	31	66	59
14	140	862	994	290	66	2.0	3.9	.7	.5	94	69	59
15	71	536	908	45	55	2.2	4.4	.7	.4	92	78	59
16	57	483	830	78	28	4.4	4.7	.5	.2	89	92	62
17	57	536	794	413	16	4.4	5.0	.4	.2	100	78	70
18	56	541	778	437	11	4.2	3.6	.4	.4	154	71	84
19	57	541	728	369	10	2.8	3.6	.4	.7	181	68	70
20	58	525	712	240	8.3	1.7	3.3	1.4	1.2	102	66	71
21	57	499	662	157	5.3	2.5	4.2	1.2	1.0	63	65	78
22	56	452	590	297	6.3	2.0	3.9	1.0	.8	74	63	73
23	54	303	625	445	6.3	1.2	3.3	.8	.8	68	59	70
24	54	242	540	389	5.0	1.2	3.3	.7	1.0	64	58	69
25	54	167	595	413	3.3	1.2	2.8	.5	1.2	59	50	68
26	55	26	610	361	1.2	1.5	2.5	.4	1.7	57	51	68
27	59	26	570	233	1.2	2.0	2.8	3.0	3.0	55	50	66
28	68	26	917	138	1.9	6.8	3.3	3.0	3.9	55	51	66
29	92		1240	314	1.7	3.9	4.4	1.9	4.2	139	52	59
30	86		1460	101	1.7	1.9	3.9	1.9	4.2	152	54	46
31	106		956		2.0		3.0	1.7		87		46
Mean	68	387	1043	448	66	5.19	3.02	1.46	1.28	57.6	80.6	63.1
Runoff in Ac. Ft.	4180	21480	64110	26660	4060	309	186	90	76	3540	4790	3880

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.

TABLE 48

FLOW OF RECLAMATION DISTRICT 1001 DRAIN INTO CROSS CANAL* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	0	0	0	0	0	14						
2	0	0	0	0	0	19						
3	0	12	0	29	0	14						
4	0	12	29	0	0	12						
5	0	0	0	0	0	13						
6	0	0	0	0	0	4						
7	0	0	0	0	13	0	NO PUMPING OR GRAVITY FLOW					
8	0	0	28	0	32	6	JULY TO DECEMBER, INCL.					
9	0	8	0	0	32	2						
10	0	0	0	0	30	0						
11	0	0	0	0	23	0						
12	32	24	24	31	29	41						
13	0	0	0	0	11	11						
14	0	0	0	0	0	0						
15	0	18	0	0	0	0						
16	0	10	27	0	37	0						
17	0	0	0	0	3	0						
18	0	0	0	0	0	0						
19	0	0	0	0	0	0						
20	0	0	0	0	41	0						
21	0	0	0	0	47	0						
22	0	21	0	0	47	0						
23	0	0	0	0	0	0						
24	0	0	0	0	0	0						
25	0	0	0	0	0	0						
26	0	0	0	0	0	0						
27	0	0	37	0	0	0						
28	0	0	0	0	0	0						
29	0		0	0	0	0						
30	0		0	0	0	0						
31	0		0		0							
Mean	1.0	3.8	4.7	2	11.1	4.5	0	0	0	0	0	0
Runoff in Ac. Ft.	63	208	288	119	684	270	0	0	0	0	0	0

* Cross Canal, the main drain between Reclamation Districts 1000 and 1001, joins the Sacramento River at Mile 19.6L.

NOTE: This is drainage returned to the Sacramento River via the cross-canal by pumping and gravity.

TABLE 49

FLOW OVER SACRAMENTO WEIR FROM SACRAMENTO RIVER TO YOLO BY-PASS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7						NO FLOW DURING 1947						
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	0	0	0	0	0	0	0	0

NOTE: Elevation--fixed crest 25.0 U.S.E.D.--Movable crest (top of needles) 31.0 U.S.E.D. Weir has 48 gates, each 38 feet in length. Weir is on right bank at Mile 4.2R above Sacramento.

TABLE 50

FLOW OF RECLAMATION DISTRICT 1000 DRAIN (#3 PLANT) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15	Records sufficient to compute only monthly flows.											
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												
Mean	17	26	25	7	0	0	0	118	1339	500	347	106
Runoff in Ac. Ft.	1062	1423	1529	424	0	0	0	234	2656	992	688	211

NOTE: This is drainage from Reclamation District 1000 returned to Sacramento River by pumping and gravity at Mile 6.85L. Additional water returned to Sacramento River from same district at Mile 2.1L. (See Table 51.) Plant operated automatically on float switch.

TABLE 51

FLOW OF RECLAMATION DISTRICT 1000 DRAIN (2ND BANNON SLOUGH) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0		0	0	0						
2		0		0	0	0		0	0	162		0
3		0		0	0	0		0	0	159		0
4	N	0	N	0	0	0	N	0	167	161		0
5	O	0	O	0	0	0	O	0	166	162	N	0
6		0		0	0	0		0	167	0	O	0
7	P	0	P	0	170	170	P	0	167	162		0
8	U	0	U	0	170	0	U	0	0	160	P	0
9	M	0	M	168	170	169	M	0	0	159	U	0
10	P	0	P	0	170	170	P	0	0	0	M	0
11	I	0	I	0	170	0	I	0	167	162	P	0
12	N	0	N	0	0	0	N	0	167	0	I	159
13	G	163	G	0	0	0	G	0	0	161	N	155
14		162		0	168	0		0	166	0	G	0
15		0		0	0	0		0	0	0		0
16		0		0	0	0		0	166	0		0
17		0		0	0	0		0	163	0		0
18		0		169	0	0		0	163	0		0
19		0		0	0	0		0	161	0		0
20		0		0	170	0		0	161	0		0
21		0		0	169	0		0	157	0		0
22		0		0	0	0		0	158	0		0
23		0		169	169	0		0	156	0		0
24		0		169	168	0		0	158	0		0
25		0		0	0	0		0	158	0		0
26		0		0	169	0		0	160	0		0
27		0		0	0	0		0	160	0		0
28		0		0	0	0		0	159	0		0
29				0	0	0		0	158	0		0
30				0	0	0		0	163	0		0
31					0			0	164	0		0
Mean	0	12	0	23	60	17	0	168	5	124	47	0
Runoff in Ac. Ft.	0	645	0	1340	3700	1010	0	333	7400	2870	0	623

NOTE: This is drainage from Reclamation District 1000 returned to the Sacramento River by pumping at Mile 2.1L. Additional water returned to Sacramento River at Mile 6.85L (see Table 50).

TABLE 52

FLOW OF AMERICAN RIVER AT FAIR OAKS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1350	1080	1680	5290	5200	2290	425	219	160	146	1360	611
2	1300	972	2660	4710	6880	3480	398	212	146	149	1750	788
3	1250	1040	4100	5630	7900	2440	362	184	166	155	1560	804
4	1150	1160	5040	5570	7670	2020	341	178	152	166	1370	758
5	1100	1220	3730	4600	7180	1750	321	216	152	141	1200	773
6	1180	1270	3030	4320	6920	1660	309	212	152	128	1300	720
7	1170	1290	2670	4310	6500	1880	301	212	144	111	1080	664
8	1100	1280	2640	4140	5340	2960	282	200	121	222	1000	585
9	1050	1340	2700	4420	4470	3090	267	203	98	242	713	692
10	1050	1510	12100	4280	3850	2410	282	172	116	380	699	699
11	1050	1870	12400	4180	3490	1920	274	163	107	486	881	692
12	1050	8860	7430	4310	3180	1660	271	166	119	592	822	735
13	1070	20100	5800	4500	3040	1470	256	190	131	537	804	743
14	1020	8270	5080	5210	2930	1320	256	193	196	350	766	678
15	1020	5570	4690	5780	3070	1290	246	190	138	341	788	618
16	963	4260	4560	5940	3340	1190	242	169	128	430	773	637
17	898	3560	4680	6300	3550	1160	239	206	181	4980	678	678
18	925	2960	4740	5820	3550	1110	286	152	166	2820	990	758
19	907	2580	4580	5300	3510	1100	282	212	126	1320	847	788
20	925	2360	4320	5660	3480	952	246	169	144	881	788	750
21	963	2160	4140	5780	3380	934	232	141	138	990	728	611
22	954	1950	4000	4800	3300	872	249	146	136	1070	728	611
23	925	1830	4770	3940	3110	781	249	146	126	1140	531	671
24	916	1790	4710	3740	2820	650	196	141	166	926	525	644
25	880	1830	3670	3880	2590	592	253	166	203	822	598	604
26	835	1830	3310	3900	2330	598	249	146	200	579	728	465
27	916	1820	3170	4180	2130	537	206	155	155	555	611	520
28	1120	1870	3730	4290	1990	514	203	160	175	664	618	579
29	1300		5250	4180	1830	486	229	175	155	743	706	503
30	1090		6880	4440	1720	430	263	181	160	1270	664	618
31	1290		6340		1770		225	166		1660		624
Mean	1055	3130	4794	4780	3936	1452	272	179	149	806	887	665
Runoff in Ac. Ft.	64890	173800	294700	284400	242000	86370	16740	10990	8840	49580	52780	40900

NOTE: Station is maintained jointly by Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. It is located on right bank at Mile 19.2R above mouth.

TABLE 53

FLOW OF AMERICAN RIVER AT SACRAMENTO (H ST. BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1440	1330	1890	5420	5100	2150	437	196	144	140	1380	692
2	1410	1140	2220	4860	6710	3340	429	213	149	150	1620	846
3	1350	1100	3920	5440	7780	2520	383	170	140	150	1570	930
4	1220	1310	4910	5910	7760	2110	376	154	144	175	1420	866
5	1150	1380	3770	4720	7280	1770	348	180	149	150	1250	846
6	1260	1430	3060	4340	6960	1620	327	196	149	140	1320	824
7	1270	1450	2730	4320	6710	1840	327	191	149	130	1190	782
8	1190	1460	2640	4160	5600	2710	320	186	140	190	1080	626
9	1120	1490	2700	4410	4600	3050	276	186	130	235	846	720
10	1120	1560	8400	4300	3920	2490	295	160	100	355	772	772
11	1080	2000	13700	4160	3450	1950	307	149	110	563	888	762
12	1110	4500	8250	4320	3140	1600	282	149	100	626	898	804
13	1120	20000	6290	4450	3000	1440	276	180	110	673	846	814
14	1080	10200	5260	5120	2900	1290	276	175	140	468	846	751
15	1040	7280	4720	5830	2970	1240	258	175	175	398	856	682
16	1040	5540	4490	6020	3240	1140	252	170	130	406	846	581
17	930	3790	4530	6440	3430	1120	246	175	140	3870	762	740
18	1010	3020	4640	6080	3500	1070	282	175	175	3150	1010	782
19	1010	2640	4580	5460	3480	1060	276	196	130	1470	964	856
20	996	2440	4260	5640	3430	952	246	175	130	964	888	835
21	1040	2260	4110	5910	3310	930	213	160	130	964	856	762
22	1070	2080	3940	5120	3260	888	224	140	120	1080	846	626
23	1050	1960	4510	4090	3140	814	246	140	120	1200	664	751
24	1040	1900	4900	3770	2860	673	213	140	130	1050	581	751
25	985	1960	3740	3920	2650	626	218	140	196	908	617	740
26	910	1960	3320	3920	2440	626	235	150	224	702	793	536
27	985	1950	3120	4150	2210	563	207	150	160	599	772	528
28	1260	1980	3560	4320	2000	511	180	150	154	644	654	682
29	1490		5100	4160	1860	494	207	150	160	793	772	511
30	1260		6540	4390	1720	477	258	160	154	1050	762	692
31	1460		6690		1740		241	160		1710		720
Mean	1145	3254	4725	4838	3940	1435	279	167	143	809	952	736
Runoff in Ac. Ft.	70410	180700	290600	287900	242300	85420	17180	10300	8490	49750	56670	45240

NOTE: Station is maintained jointly by Division of Water Resources and the Water Resources Branch of the U. S. Geological Survey. Station is located at the "H" Street Bridge and is 6.0 miles above mouth of river. The flows shown may be assumed to be the discharge to the Sacramento River, as American River diversions below this station were negligible in 1947.

TABLE 54

FLOW OF CACHE CREEK AT YOLO - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1		0	3	224								
2		0	5	171								
3		0	677	164								
4		0	1900	195								
5		0	770	168								
6		0	490	145								
7		0	357	124								
8	N	0	282	110	N	N	N	N	N	N	N	N
9	O	0	239	99	O	O	O	O	O	O	O	O
10		0	224	92								
11		0	612	87								
12	F	1520	454	75	F	F	F	F	F	F	F	F
13	L	1930	344	64	L	L	L	L	L	L	L	L
14	O	633	278	50	O	O	O	O	O	O	O	O
15	W	330	239	27	W	W	W	W	W	W	W	W
16		197	206	8								
17		170	181	0								
18		143	161	0								
19		78	145	0								
20		59	130	0								
21		40	118	0								
22		30	102	0								
23		21	84	0								
24		14	77	0								
25		9	68	0								
26		4	54	0								
27		3	40	0								
28		2	62	0								
29			77	0								
30			165	0								
31			290									
Mean	0	185	285	60	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	10280	17520	3580	0	0	0	0	0	0	0	0

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey. Cache Creek is a west side tributary to Yolo By-Pass opposite Mile 7.0 North of Sacramento By-Pass.

TABLE 55

FLOW OF YOLO BY-PASS NEAR WOODLAND* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	16	10	42	126	57	74	32	40	54	30	10	8.0
2	15	13	37	192	51	75	41	41	54	27	9.9	8.4
3	14	14	45	249	44	61	48	42	55	24	8.9	7.6
4	13	16	133	254	31	45	55	43	58	21	8.5	7.8
5	13	15	1140	259	22	36	58	43	61	18	9.1	8.0
6	13	13	927	277	20	28	63	41	62	17	9.1	7.8
7	13	13	748	308	20	25	66	39	59	16	8.4	7.7
8	16	12	634	290	22	24	66	40	58	15	8.0	8.0
9	15	11	550	206	26	25	68	41	60	14	8.7	7.8
10	14	12	476	198	38	25	67	40	64	14	7.6	8.4
11	13	14	386	209	61	26	66	40	68	15	7.8	8.0
12	11	23	492	175	68	26	61	39	69	14	7.7	8.2
13	11	88	581	129	62	25	54	37	71	13	6.8	10
14	11	808	543	99	47	25	50	38	72	12	7.0	10
15	11	1030	492	88	33	22	49	38	72	12	7.2	11
16	10	1260	462	63	25	20	49	40	70	11	7.8	11
17	11	1190	420	48	21	18	53	40	72	12	7.5	11
18	11	1050	340	38	23	16	56	40	72	11	7.8	12
19	11	927	269	32	26	16	58	45	72	11	8.2	12
20	11	716	274	29	34	15	56	47	71	11	6.8	15
21	11	526	271	26	48	15	51	46	69	11	6.8	15
22	11	415	261	26	60	14	48	47	66	11	7.1	14
23	11	340	249	23	72	13	45	51	63	10	6.8	13
24	10	269	233	21	76	12	44	52	59	10	7.0	12
25	10	120	166	21	83	11	42	51	56	11	7.0	11
26	10	81	92	20	80	11	41	52	54	11	7.2	11
27	10	63	64	21	65	13	42	53	49	11	7.1	10
28	10	50	77	22	62	15	42	55	44	11	7.2	10
29	11		109	22	64	19	41	56	39	11	7.3	11
30	10		109	64	71	24	40	56	34	11	7.3	11
31	10		105		68		40	54		11		10
Mean	11.8	325	346	118	47.7	25.8	51.4	44.7	60.9	14.1	7.8	10.2
Runoff in Ac. Ft.	367	9099	10727	3535	1480	774	1592	1387	1827	437	233.6	315.7

* Also known as Yolo By-Pass at Elkhorn.

NOTE: The flow of this station is referred to the recorder at the end of the Sacramento By-Pass except during periods of high water when it is referred to the recorder at the Woodland-Elkhorn highway crossing. To get total flow through Yolo By-Pass below Sacramento, combine this flow with the flow in Table 49 and the flows of Putah Creek. The flow in this table includes the flows of Cache Creek (Table 54), Knights Landing Ridge Cut (Table 31), and Fremont Weir. Station has been operated cooperatively since 1941 by the Division of Water Resources and the Water Resources Branch of the U.S. Geological Survey.

TABLE 56

FLOW OF COSUMNES RIVER AT MICHIGAN BAR - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	192	174	250	664	268	93	15	1.8	0.3	1.4	91	44
2	186	155	383	624	282	112	14	1.6	.1	1.4	121	44
3	164	153	516	1340	289	102	13	2.0	0	1.2	123	44
4	143	150	752	1270	296	91	12	2.0	0	.9	87	44
5	145	150	579	880	292	85	11	2.0	0	1.5	75	50
6	153	153	474	761	286	80	10	1.8	0	1.6	73	56
7	145	158	418	698	282	87	9.4	1.3	0	2.2	72	50
8	136	166	454	648	268	112	9.0	1.4	0	4.0	62	46
9	134	174	481	716	244	119	7.8	1.4	0	3.8	56	44
10	129	216	2610	672	220	104	7.8	1.6	0	6.4	53	44
11	127	237	1980	608	204	84	7.5	1.1	.3	23	50	42
12	123	1300	1340	579	189	70	6.8	1.6	.5	84	47	42
13	121	1860	1030	537	180	59	6.1	1.2	.2	62	46	42
14	125	990	860	509	172	53	5.4	1.6	.2	42	44	42
15	123	734	752	488	166	51	5.4	1.6	.2	31	46	42
16	98	600	664	460	155	46	5.4	.9	.2	30	55	43
17	93	544	593	448	153	43	5.0	1.3	.4	102	84	51
18	106	467	558	430	145	32	5.0	1.2	.1	230	72	69
19	106	412	516	406	129	30	4.2	1.1	0	98	62	80
20	110	380	488	390	132	28	4.2	1.0	.2	66	55	64
21	108	346	448	375	127	27	4.0	.5	.2	56	52	59
22	104	326	418	360	119	23	3.5	.8	.1	62	49	57
23	102	303	460	334	110	22	3.8	.3	0	55	46	56
24	100	286	430	318	102	21	3.0	.7	0	46	46	53
25	100	275	385	306	96	20	3.5	.7	0	39	46	51
26	102	268	360	289	85	18	3.0	.4	0	33	47	50
27	116	254	338	286	85	18	2.6	.7	0	31	46	50
28	166	258	617	278	93	17	2.2	.6	.3	31	46	50
29	183		733	275	93	16	1.4	.6	1.2	35	44	47
30	161		1060	268	80	15	1.8	.2	1.3	42	44	48
31	174		833		84		2.0	.1		87		47
Mean	131	410	703	541	175	55.9	6.3	1.1	.2	42.2	61.3	50
Runoff in Ac. Ft.	8080	22790	43200	32170	10760	3330	386	70	12	2600	3650	3080

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.

TABLE 57

FLOW OF COSUMNES RIVER AT McCONNELL - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	203	178	248	749	248	51				0	75	38
2	194	159	252	630	248	63				0	84	37
3	182	148	450	816	261	91				0	114	37
4	159	144	992	1660	263	60				0	101	36
5	144	142	834	1090	275	54				0	75	34
6	155	144	576	838	266	50				0	63	38
7	155	146	463	732	237	55				0	63	45
8	144	148	417	670	248	64				0	62	43
9	134	157	460	640	241	86	N	N	N	0	51	39
10	130	171	1310	682	219	90	0	0	0	0	48	37
11	124	220	3740	620	200	80				0	44	36
12	122	390	1900	600	184	57	F	F	F	0	41	36
13	115	3130	1260	570	166	47	L	L	L	0	39	36
14	119	2090	966	530	149	35	0	0	0	0	34	38
15	117	961	811	510	147	33	W	W	W	0	39	35
16	110	698	694	485	138	31				0	43	34
17	84	594	631	470	129	27				9	45	38
18	89	517	590	450	120	21				89	69	44
19	90	456	548	430	110	3.6				168	58	65
20	98	411	524	410	110	1.5				80	52	73
21	100	375	501	400	90	1.2				52	46	57
22	95	351	460	380	77	1.0				43	40	51
23	93	323	435	365	70	.8				45	41	49
24	90	303	472	340	71	.6				40	39	48
25	89	286	417	325	49	.4				36	39	39
26	90	272	389	300	50	.2				29	39	40
27	92	261	362	280	44	.1				23	39	41
28	117	252	410	270	44	0				18	41	43
29	175		722	266	45	0				19	38	42
30	162		894	257	53	0				19	38	41
31	153		1060		53					26		41
Mean	127	480	767	559	149	33.5	0	0	0	22.5	53.3	42.3
Runoff in Ac. Ft.	7780	26630	47180	33250	9130	1990	0	0	0	1380	3170	2600

NOTE: Division of Water Resources, U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station. When flow in main channel reaches 4600 c.f.s. water starts to by-pass station. Figures here given include all overflow.

TABLE 58

FLOW OF DRY CREEK NEAR GALT* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	27	24	13	64	1.7		0	1.6	0.3			
2	19	19	19	58	.6		0	1.5	0			
3	16	15	59	115	0		0	1.4				
4	16	14	188	234	0		0	1.0				
5	7.7	13	137	140	0		0	.3				
6	6.3	10	90	100	0		0	1.6				
7	4.7	8.9	65	80	0		0.2	2.4				
8	3.8	7.5	59	69	0		0	2.5				
9	6.6	7.0	61	68	0	N	0	2.5	N	N	N	N
10	4.3	7.7	356	65	0	O	0	1.8	O	O	O	O
11	4.3	14	726	49	0		0.2	0				
12	3.9	161	313	46	0	F	0	0	F	F	F	F
13	3.9	468	198	37	0	L	0	0	L	L	L	L
14	2.4	192	136	30	0	O	0	0	O	O	O	O
15	2.7	120	106	25	0	W	0	0	W	W	W	W
16	3.3	78	84	22	0		0	0.3				
17	4.1	65	71	19	0		0	1.7				
18	3.1	52	56	18	0		0	3.1				
19	1.8	48	45	16	0.1		0	2.4				
20	1.1	40	38	15	0.2		0	1.0				
21	1.0	34	34	14	0.1		0	2.0				
22	1.0	27	32	12	0		0	1.4				
23	3.0	24	30	10	0		1.6	0.9				
24	3.8	22	40	8.4	0		1.1	0.5				
25	2.0	21	35	6.8	0		1.4	0.9				
26	1.1	20	29	6.3	0		1.2	2.4				
27	1.7	18	24	3.8	0		0.9	0.8				
28	2.8	16	22	2.4	0		0	0.1				
29	34		67	3.0	0		0.2	0.3				
30	45		75	3.3	0		1.1	0.5				
31			94		0		1.5	0.3				
Mean	8.5	55.2	107	44.7	0.1	0	0.3	1.1	0.01	0	0	0
Runoff in Ac. Ft.	520	3070	6550	2660	5.4	0	19	70	0.6	0	0	0

* Also known as Dry Creek at Dustin Road.

NOTE: Station is maintained jointly by U. S. Geological Survey and U. S. Bureau of Reclamation.

TABLE 59

FLOW OF MOKELUMNE RIVER AT WOODBRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	461	534	472	261	10	17	13	23	54	142	327	150
2	373	417	178	87	12	15	19	24	34	86	174	160
3	559	295	112	34	37	13	28	34	48	58	92	150
4	625	500	98	20	114	13	49	29	109	37	162	155
5	635	526	88	18	20	13	21	26	208	36	482	251
6	547	536	63	18	10	13	18	28	204	36	297	326
7	593	574	67	15	10	13	16	28	174	36	168	212
8	623	633	65	13	10	12	14	30	83	37	145	172
9	597	609	65	13	11	12	16	34	103	37	131	326
10	565	350	71	142	14	12	16	131	146	39	107	379
11	555	472	145	382	30	11	16	31	142	43	107	343
12	495	518	98	384	11	11	15	26	138	39	136	247
13	291	578	66	355	10	12	16	28	142	34	123	261
14	501	514	58	252	12	14	17	29	109	31	140	154
15	545	524	55	205	12	13	17	30	87	30	148	109
16	599	494	52	183	13	13	19	30	97	29	145	272
17	639	355	51	197	24	13	22	30	121	28	130	363
18	643	502	34	215	16	13	24	26	138	29	100	343
19	551	490	30	258	13	13	26	26	133	33	130	379
20	358	512	74	234	14	13	22	28	119	35	134	408
21	529	572	51	247	14	13	21	29	180	96	138	229
22	629	581	93	274	15	13	21	138	252	284	154	146
23	637	496	90	206	15	14	24	239	223	281	126	297
24	585	305	67	175	16	13	26	99	198	295	108	279
25	535	452	22	122	18	14	24	62	161	289	289	318
26	374	470	111	76	18	14	23	37	150	308	268	284
27	342	464	191	47	45	14	26	97	158	131	303	402
28	497	462	260	20	94	14	25	107	197	174	158	373
29	521		129	11	64	13	23	81	89	332	201	211
30	595		144	11	32	13	23	81	149	332	160	264
31	593		290		20		23	103		313		292
Mean	535	491	109	149	24.3	13.1	21.4	56.3	138	120	176	266
Runoff in Ac. Ft.	32910	27240	6720	8880	1500	781	1320	3460	8220	7360	10480	16370

NOTE: This is a permanent station maintained throughout the year under Federal-Local cooperation by the Water Resources Branch of the U. S. Geological Survey. It is located just below diversion dam of Woodbridge Irrigation District.

TABLE 60

FLOW OF CALAVERAS RIVER AT JENNY LIND - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	102	82	68	171	44	17					0	17
2	86	90	71	134	41	18					0	17
3	78	88	102	129	37	18					0	17
4	73	82	297	213	35	19					31	17
5	64	77	465	213	35	19					41	17
6	61	73	292	177	34	19					32	17
7	60	69	204	154	32	21					29	18
8	58	64	168	134	31	21					25	19
9	54	64	160	121	29	22	N	N	N	N	24	20
10	52	73	994	119	27	23	0	0	0	0	23	21
11	49	119	1580	112	24	23					22	22
12	49	526	709	102	24	20	F	F	F	F	20	22
13	48	1190	409	92	22	18	L	L	L	L	18	22
14	49	556	302	84	22	15	0	0	0	0	18	22
15	49	316	242	78	21	12	W	W	W	W	18	22
16	48	232	201	71	20	9.2					19	22
17	44	189	174	68	19	7.6					20	24
18	42	166	151	62	18	5.2					20	28
19	42	143	137	60	15	2.5					21	32
20	41	124	124	60	15	0					21	33
21	41	109	116	55	13	0					20	31
22	41	100	107	52	12	0					18	28
23	41	96	104	52	10	0					18	26
24	41	94	102	52	10	0					18	24
25	39	84	98	49	8.6	0					18	22
26	41	78	90	48	7.6	0					18	22
27	41	75	84	48	7.2	0					17	22
28	49	73	88	47	7.2	0					17	22
29	77		124	45	11	0					17	22
30	94		137	45	14	0					17	22
31	82		189		16							22
Mean	56.0	180	261	94.9	21.3	10.3	0	0	0	0	19.3	22.3
Runoff in Ac. Ft.	3440	9980	16040	5650	1310	614	0	0	0	0	1150	1370

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.

TABLE 61

FLOW OF STOCKTON DIVERTING CANAL AT STOCKTON*- 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	103	58	47	148	8.2							
2	82	60	45	117	6.6							
3	68	63	49	99	5.4							
4	60	60	92	108	3.0							
5	55	55	407	180	2.6							
6	47	51	339	159	1.0							
7	41	47	215	130	0							
8	37	42	154	117	0							
9	35	41	132	97	0	N	N	N	N	N	N	N
10	31	41	265	86	0	0	0	0	0	0	0	0
11	28	51	1480	82	0							
12	27	240	930	77	0	F	F	F	F	F	F	F
13	25	1290	502	68	0	L	L	L	L	L	L	L
14	24	800	327	60	0	0	0	0	0	0	0	0
15	25	409	246	51	0	W	W	W	W	W	W	W
16	25	256	195	44	0							
17	24	228	159	37	0							
18	22	162	134	34	0							
19	19	132	114	28	0							
20	18	110	103	24	0							
21	17	97	92	28	0							
22	17	82	86	18	0							
23	18	77	80	13	0							
24	17	71	75	13	0							
25	16	68	75	17	0							
26	15	60	68	16	0							
27	16	52	61	14	0							
28	20	47	57	14	0							
29	24		68	11	0							
30	48		94	8.2	0							
31	65		108		0							
Mean	34.5	170	219	63.3	.86	0	0	0	0	0	0	0
Runoff in Ac. Ft.	2120	9420	13490	3770	53	0	0	0	0	0	0	0

* Also known as Calaveras River at Stockton.

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey.

TABLE 62

INFLOW TO FRIANT RESERVOIR (MILLERTON LAKE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1580	1260	1410	1900	3660	1840	1150	1050	700	820	890	730
2	1590	910	1810	2070	4760	1900	1360	760	890	800	690	630
3	1840	1050	1610	1870	5780	1550	1300	800	1140	820	680	880
4	1730	1260	1760	1640	5380	1710	920	1100	980	820	930	560
5	1630	1110	1510	1820	5230	1610	760	930	1040	670	780	740
6	1630	1010	1510	1110	5580	1630	770	1120	980	940	780	610
7	1610	1360	1510	1470	5190	1650	1510	1110	690	950	710	460
8	1530	1260	1510	1630	4860	1700	1160	940	920	580	510	860
9	1560	1260	1510	1570	3420	1700	1550	1280	1120	950	410	710
10	1560	1490	1700	1680	2630	1730	1160	810	600	890	660	490
11	1400	1220	1530	1520	2010	2080	1420	1240	1010	970	560	790
12	1200	1680	1700	1680	2230	2130	820	1180	1130	520	840	540
13	1410	2440	1560	1740	2210	1780	980	1140	940	720	770	540
14	1410	1890	1560	2110	2020	1760	980	960	740	960	710	180
15	1210	1690	1560	2800	2500	1710	1320	1040	1060	960	720	990
16	1410	1680	1770	3210	2670	1950	1430	1070	1000	970	310	690
17	1410	1280	1760	3680	3100	1900	1360	710	960	1010	710	540
18	1210	2130	1950	3410	3060	1960	1410	1110	990	1210	810	790
19	1010	1340	1930	3520	3460	1770	1250	1170	850	820	710	840
20	1260	1770	1920	3460	4180	1730	870	1190	980	820	670	490
21	1220	1210	2080	3410	4130	1760	1300	960	820	1020	620	380
22	1220	1400	2330	2990	4260	1380	1170	990	1120	1080	360	490
23	1370	1560	2140	2340	4580	1320	1360	780	900	1000	460	780
24	1070	1410	2200	2520	3990	1570	1340	740	960	970	720	460
25	860	1610	1840	2320	3430	1320	1320	1130	870	770	470	260
26	1070	1410	2080	1910	3500	1370	1000	1180	790	720	900	710
27	1070	1620	2090	2090	3000	1010	840	990	850	870	210	300
28	1180	1560	2320	1870	2780	1380	1280	1030	530	940	680	410
29	1410		2200	2050	1940	710	1070	940	890	830	630	760
30	1260		2000	2650	2100	1150	1040	820	1060	1080	430	660
31	1110		2200		2270		910	650		1090		660
Mean	1356	1460	1825	2268	3545	1625	1165	997	917	889	644	611
Runoff in Ac. Ft.	83400	81100	112200	135000	218000	96700	71600	61300	54600	54690	38340	37540

NOTE: This is the total mean second feet flow inflowing to Friant Reservoir as computed by the U. S. Bureau of Reclamation, taking into account change in storage, release, spill and evaporation; and represents the natural flow passing the dam site if the dam had not been constructed.

TABLE 63

DAILY CONTENT OF FRIANT RESERVOIR(MILLERTON LAKE)IN ACRE-FEET - 1947

Date	Figure given is amount in storage at end of day											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	282100	314900	346300	357300	332500	403100	348300	242500	142900	99100	95300	110200
2	283800	315300	347500	356500	335900	402300	345200	238400	140600	97300	95300	110800
3	286000	316000	348300	355300	341300	401000	342100	234400	139100	95800	95600	111900
4	288000	317100	349100	353700	345900	400200	338600	231000	137500	94300	96600	112400
5	289800	317900	349100	352200	350600	399300	334800	227300	136000	92500	97300	113300
6	291600	318500	349100	349100	356500	398500	331000	224000	134400	91500	98000	113900
7	293300	319800	349100	346700	361600	397600	328700	220700	132200	90700	98600	114200
8	294700	320900	349100	344800	366000	396800	325700	217100	130500	89300	98800	115300
9	296100	322000	349100	342900	367600	396000	323500	214200	129300	88800	98800	116100
10	297500	323500	349500	341300	367600	395100	320500	210400	127400	88500	99300	116500
11	298600	324500	349500	339400	366400	394700	317900	207500	126300	88500	99600	117500
12	299300	326400	349800	337800	366000	394300	313900	204600	125500	87600	100500	118000
13	300400	329800	349800	336300	366000	393000	310200	201800	124500	87100	101300	118500
14	301500	332100	349800	335600	366000	391400	306500	198700	123100	87100	102000	118300
15	302200	334000	349800	336300	367200	389700	303300	195700	122500	87600	102700	119700
16	303300	335900	350200	337800	368800	388500	300100	192600	122100	88400	102600	120500
17	304400	337000	350600	340200	371300	387200	296800	188800	121500	89300	103300	121000
18	305100	339800	351400	342100	373700	386000	293600	185800	120700	90600	104200	122000
19	305400	340600	352200	344000	376900	384300	290100	182900	119700	91100	104900	123100
20	306200	341700	353000	345600	381500	382300	285900	179800	118900	91400	105500	123500
21	306900	341700	354100	347100	386000	380200	282500	176100	117700	91700	106000	123700
22	307600	342100	355700	347500	390500	377400	278700	172500	117100	91700	106000	124100
23	308600	342800	356900	345900	395500	374500	275300	168400	115800	91900	106200	125100
24	309000	343200	358100	344400	399300	372100	271900	164400	114100	92300	106900	125500
25	309000	344000	358100	342500	401800	369200	268500	161500	112000	92300	107100	125500
26	309400	344400	358100	339800	404000	366400	264500	159000	109700	92200	108200	126400
27	309800	345200	358100	337500	404800	362800	260200	156200	107400	92500	108000	126500
28	310500	345900	358500	334800	405300	359700	256900	153500	104500	93000	108700	126800
29	311900		358500	332500	404400	355300	253400	150900	102500	93300	109300	127800
30	313000		358100	331400	404000	351800	249800	148400	101000	94100	109500	128600
31	313800		358100		404000		246000	145600		94900		129400
Monthly Change Ac. Ft.	+33400	+32100	+12200	-26700	+72600	-52200	-105800	-100400	-44600	-6100	+14600	+20000

NOTE: Reservoir water level recorder maintained by U. S. Bureau of Reclamation.

TABLE 64

FLOW OF SAN JOAQUIN RIVER BELOW FRIANT - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	704	680	1180	2060	2880	2120	2620	2510	2010	1800	692	336
2	704	680	1180	2230	2770	2120	2620	2500	2000	1720	692	336
3	704	680	1180	2230	2770	2040	2560	2500	1830	1600	569	332
4	704	680	1320	2220	2780	1940	2420	2500	1730	1600	440	314
5	704	680	1450	2330	2590	1910	2400	2490	1720	1590	440	294
6	704	686	1450	2430	2300	1880	2390	2470	1710	1460	432	311
7	730	686	1450	2430	2300	1940	2380	2460	1710	1360	422	311
8	808	686	1450	2340	2320	1930	2380	2450	1700	1300	418	311
9	840	692	1450	2270	2300	1930	2370	2440	1670	1220	418	314
10	840	704	1460	2230	2300	1990	2370	2440	1510	1060	418	300
11	840	692	1460	2230	2300	2060	2430	2390	1500	985	418	297
12	840	698	1460	2230	2130	2110	2540	2300	1450	985	392	297
13	840	698	1450	2230	1910	2210	2520	2220	1360	978	372	297
14	840	698	1450	2230	1720	2340	2520	2220	1360	978	372	297
15	840	698	1450	2230	1570	2340	2600	2260	1300	722	372	297
16	840	698	1450	2230	1570	2340	2720	2330	1140	562	372	297
17	840	698	1460	2240	1580	2340	2700	2330	1200	562	372	300
18	847	698	1460	2240	1580	2340	2700	2330	1330	568	376	297
19	847	955	1470	2370	1580	2400	2690	2350	1330	568	376	297
20	847	1190	1470	2440	1590	2490	2690	2440	1400	662	376	297
21	847	1180	1470	2430	1590	2550	2720	2520	1430	868	376	297
22	847	1180	1470	2570	1730	2550	2780	2510	1430	1090	376	297
23	847	1180	1480	2910	1900	2550	2770	2580	1570	928	376	290
24	840	1180	1480	3020	1950	2540	2760	2620	1820	775	376	272
25	840	1180	1560	3020	2030	2540	2740	2520	1940	775	376	272
26	840	1180	1760	3020	2180	2520	2730	2360	1960	768	350	272
27	840	1180	1760	3000	2440	2560	2730	2340	2020	723	318	272
28	801	1180	1810	3000	2380	2640	2670	2330	2020	686	332	272
29	680		1840	2990	2230	2620	2540	2210	1920	686	332	272
30	680		1840	2990	2120	2620	2540	2030	1820	692	336	272
31	680		1840		2120		2520	2020		692		272
Mean	794	858	1499	2480	2113	2282	2585	2386	1630	999	410	297
Runoff in Ac. Ft.	48800	47640	92150	147600	129900	135800	158900	146700	96970	61410	24370	18230

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 268.1L. Daily mean release from Friant Reservoir into San Joaquin River obtainable from this table by subtracting flows of Cottonwood Creek (Table 65).

TABLE 65

FLOW OF COTTONWOOD CREEK NEAR FRIANT - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	8.3	1.5	1.6	0.4								
2	7.0	1.3	2.7	.2								
3	5.5	1.3	2.5	.5								
4	4.8	1.3	2.1	.7								
5	4.5	1.5	1.8	.4								
6	4.5	1.5	1.5	.3								
7	3.9	1.5	1.3	.2								
8	3.0	1.5	1.3	.2								
9	2.7	2.3	1.2	.1								
10	2.7	20.0	1.9	.1	N	N	N	N	N	N	N	N
11	2.7	4.5	2.5	.1	0	0	0	0	0	0	0	0
12	2.7	6.2	1.6	0								
13	3.2	9.2	1.2	0	F	F	F	F	F	F	F	F
14	2.5	5.1	1.0	0	L	L	L	L	L	L	L	L
15	2.1	4.5	.9	0	0	0	0	0	0	0	0	0
16	1.9	4.2	.8	0	W	W	W	W	W	W	W	W
17	1.8	3.9	.7	0								
18	1.8	3.9	.7	0								
19	1.8	3.0	.7	0								
20	1.6	3.0	.7	0								
21	1.6	2.7	.7	0								
22	1.6	2.5	.7	0								
23	1.5	2.3	.6	0								
24	1.3	2.3	.5	0								
25	1.3	2.1	.5	0								
26	1.3	2.1	.4	0								
27	1.5	1.8	.4	0								
28	2.5	1.6	.5	0								
29	3.0		.7	0								
30	1.9		.6	0								
31	1.6		.5									
Mean	2.84	3.52	1.12	.11	0	0	0	0	0	0	0	0
Runoff in Ac. Ft.	175	196	69	6.3	0	0	0	0	0	0	0	0

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey. Cottonwood Creek enters the San Joaquin River at Mile 269.6R.

TABLE 66

FLOW OF SAN JOAQUIN RIVER AT WHITEHOUSE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	716	760	1160	1720	2660	1960	2340	2300	1880	1770	710	354
2	716	760	1140	1840	2560	1970	2320	2300	1860	1760	722	354
3	721	770	1140	2020	2470	1940	2300	2290	1840	1710	716	359
4	726	776	1160	2030	2470	1890	2260	2300	1740	1610	688	354
5	726	782	1210	2040	2480	1790	2120	2300	1630	1590	540	354
6	738	787	1320	2100	2320	1770	2110	2240	1620	1580	510	341
7	754	770	1340	2230	2080	1740	2100	2230	1620	1490	490	332
8	770	754	1340	2200	2060	1790	2090	2240	1630	1370	470	336
9	814	776	1340	2080	2050	1800	2080	2240	1610	1310	450	346
10	844	798	1350	2040	2050	1790	2090	2240	1610	1290	455	341
11	844	814	1400	2000	2060	1820	2100	2250	1490	1150	445	350
12	856	832	1400	1990	2060	1900	2140	2210	1450	1060	436	332
13	863	844	1400	2000	1970	1940	2270	2140	1410	1020	431	332
14	850	892	1400	2000	1790	2020	2280	2060	1330	1010	404	332
15	850	868	1390	1990	1640	2140	2270	2030	1320	992	395	332
16	850	856	1390	1980	1520	2140	2340	2050	1270	899	408	328
17	850	868	1390	2000	1490	2130	2460	2110	1120	683	426	332
18	856	832	1390	2010	1490	2130	2460	2130	1110	628	422	328
19	856	826	1400	2010	1490	2110	2480	2110	1230	612	418	328
20	856	861	1400	2100	1470	2140	2480	2110	1250	606	413	328
21	856	1140	1400	2150	1460	2200	2490	2210	1290	617	418	328
22	862	1170	1400	2140	1460	2300	2510	2280	1360	754	404	328
23	868	1180	1400	2250	1560	2310	2520	2290	1360	992	413	323
24	862	1190	1400	2530	1720	2290	2550	2370	1450	1030	404	318
25	862	1180	1400	2640	1760	2270	2540	2410	1670	826	408	314
26	874	1170	1440	2660	1820	2250	2540	2330	1800	793	404	333
27	892	1170	1590	2680	1990	2240	2540	2170	1830	788	404	296
28	910	1160	1610	2680	2200	2250	2530	2140	1910	766	372	293
29	904		1660	2670	2180	2310	2450	2130	1920	710	354	289
30	820		1720	2660	2070	2340	2330	2060	1850	705	354	289
31	782		1730		1980		2320	1890		705		289
Mean	824	914	1390	2180	1950	2060	2340	2200	1549	1059	463	329
Runoff in Ac. Ft.	50674	50749	85706	129798	119762	122321	143623	135193	92152	65109	27539	20218

NOTE: Station maintained, operated and flow computed by San Joaquin Canal Company. Station is located at Mile 219.9R.

TABLE 67

FLOW OF FRESNO SLOUGH BY-PASS* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	452				0							
2	432				0							
3	398				0							
4	319				0							
5	246				80							
6	201				418							
7	171				52							
8	140				4							
9	135	N	N	N	126	N	N	N	N	N	N	N
10	99	0	0	0	28	0	0	0	0	0	0	0
11	65	F	F	F	3	F	F	F	F	F	F	F
12	53	L	L	L	0	L	L	L	L	L	L	L
13	42	0	0	0	0	0	0	0	0	0	0	0
14	38	W	W	W	0	W	W	W	W	W	W	W
15	27				0							
16	20				0							
17	13				0							
18	0				0							
19	0				0							
20	0				0							
21	0				0							
22	0				0							
23	0				0							
24	0				0							
25	0				0							
26	0				0							
27	0				0							
28	0				0							
29	0				0							
30	0				0							
31	0				0							
Mean	92	0	0	0	23	0	0	0	0	0	0	0
Runoff in Ac. Ft.	5660	0	0	0	1410	0	0	0	0	0	0	0

* Also known as James By-Pass and Fresno Slough Cut-off.

NOTE: Station maintained, operated and flow computed by Kings River Water Association. Station is located on Kerman-San Joaquin highway crossing on Fresno Slough By-Pass 6.0 miles above its confluence with Fresno Slough. Fresno Slough By-Pass enters Fresno Slough at Mile 11.8R above mouth of Fresno Slough.

TABLE 68

FLOW OF SAN JOAQUIN RIVER NEAR MENDOTA - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1220	669	714	243	421	369	433	429	276	199	109	75
2	1080	657	669	276	414	395	437	457	226	188	111	96
3	1060	653	653	341	383	429	429	453	282	188	113	146
4	1020	657	629	334	327	425	317	457	298	190	117	163
5	952	551	613	311	351	425	311	441	298	190	122	157
6	898	288	645	314	609	402	311	410	301	188	122	146
7	867	298	673	295	342	380	311	406	304	182	117	136
8	854	314	681	258	344	373	307	376	298	157	117	82
9	858	341	685	249	351	369	324	369	295	152	117	39
10	890	362	693	273	365	380	320	358	298	149	117	72
11	872	453	693	279	383	391	317	358	288	146	115	87
12	862	533	705	282	369	387	314	355	264	144	115	25
13	854	537	693	279	324	398	314	331	258	134	113	22
14	836	573	665	273	337	425	314	344	252	131	111	21
15	813	605	609	258	365	421	331	369	231	129	109	19
16	804	605	569	243	358	421	348	380	210	127	106	20
17	790	605	569	237	365	433	373	380	202	122	104	19
18	782	613	449	279	380	441	441	376	168	119	102	13
19	777	601	395	337	376	445	441	376	154	117	102	11
20	772	581	344	410	376	437	441	373	154	111	100	11
21	768	718	216	383	365	433	433	358	152	104	98	11
22	777	836	127	324	355	441	425	348	152	102	98	11
23	813	867	124	317	362	449	433	348	168	102	98	11
24	818	867	124	337	365	449	437	344	185	109	94	11
25	777	858	136	398	362	441	437	337	219	111	92	12
26	768	822	193	387	358	441	437	324	231	115	90	12
27	777	782	208	373	398	449	437	327	216	117	88	12
28	800	736	243	380	417	461	429	320	216	122	85	11
29	804		237	387	355	461	425	314	210	122	81	11
30	768		237	398	362	461	421	298	205	111	79	11
31	701		240		365		421	276		111		11
Mean	853	606	466	315	374	421	383	367	234	138	105	47.9
Runoff in Ac. Ft.	52430	33680	28620	18750	23020	25060	23540	22600	13910	8510	6230	2940

NOTE: Station maintained jointly by U. S. Geological Survey and U. S. Bureau of Reclamation. Station is located at Mile 206.2L.

TABLE 69

FLOW OF SAN JOAQUIN RIVER NEAR DOS PALOS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1340	712	698	58	50	105	117	2.4	2.1	1.7	.4	.4
2	1130	691	660	60	68	103	100	3.0	2.1	1.7	.4	.4
3	1060	674	607	62	67	107	98	4.0	1.9	1.7	.4	.4
4	1050	674	554	62	39	107	67	3.0	2.1	1.5	.4	.5
5	1000	677	540	58	26	103	13	3.0	2.2	1.5	.4	.6
6	940	474	534	54	111	100	6.2	3.2	2.4	1.4	.4	.6
7	896	385	558	58	289	94	5.4	3.0	2.4	1.3	.4	.5
8	876	385	576	58	128	94	3.3	3.0	2.4	1.2	.3	.4
9	868	388	586	60	137	94	2.5	3.0	2.4	1.1	.3	.4
10	884	397	600	60	157	98	3.0	3.2	2.4	1.2	.3	.2
11	896	436	610	60	168	115	3.3	3.0	2.4	1.1	.3	.2
12	880	509	624	55	190	96	2.7	2.9	2.4	.8	.3	.2
13	880	551	635	54	159	96	2.7	2.9	2.2	.7	.3	.2
14	868	558	604	52	124	120	2.7	2.5	2.1	.6	.3	.2
15	852	596	565	46	126	130	2.5	2.7	1.9	.5	.3	.2
16	844	621	498	45	124	132	3.8	2.9	1.8	.5	.2	.2
17	836	618	481	48	109	132	4.0	3.0	1.8	.4	.2	.2
18	832	628	454	48	109	137	5.1	2.9	1.7	.4	.2	.1
19	824	624	349	50	111	143	6.2	2.9	1.4	.4	.2	.1
20	816	614	292	60	109	148	5.9	2.2	1.3	.4	.2	.1
21	816	604	166	85	107	148	5.9	1.7	1.3	.4	.3	.1
22	812	756	52	60	103	132	5.9	1.9	1.3	.4	.3	3.5
23	836	816	39	48	103	137	5.7	2.1	1.2	.3	.3	14
24	856	848	33	45	124	137	5.7	2.2	1.3	.4	.3	14
25	840	824	31	48	122	134	5.7	2.4	1.5	.3	.4	13
26	804	792	35	50	124	132	5.7	2.2	1.7	.3	.4	17
27	800	760	36	49	126	130	5.7	2.2	1.8	.4	.4	21
28	812	722	49	48	139	130	5.7	2.1	1.8	.4	.4	21
29	820		60	50	107	132	3.3	2.2	1.8	.4	.4	21
30	808		55	52	92	132	2.7	2.2	1.7	.4	.4	20
31	756		55		100		2.5	2.1		.4		20
Mean	888	619	375	54.8	118	120	16.4	2.65	1.89	.78	.33	5.51
Runoff in Ac. Ft.	54610	34380	23080	3260	7240	7140	1010	163	113	48	19	338

NOTE: Station maintained and operated by Water Resources Branch of the U. S. Geological Survey. Station is located at Mile 186.0L.

TABLE 70

FLOW OF SAN JOAQUIN RIVER NEAR EL NIDO - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	851	430	430	29	36	102	132	3.7	1.6	0.5		0
2	710	412	410	29	33	103	112	3.1	1.0	1.0		0
3	635	401	385	30	43	103	107	4.6	.7	3.4		0
4	615	401	344	31	35	108	104	5.8	.7	3.7		0
5	590	405	325	29	24	106	55	4.9	.7	3.1		0
6	543	333	321	27	45	102	25	4.6	.9	1.3		0
7	509	222	333	29	257	101	16	3.4	.8	1.0		0
8	495	213	346	31	194	97	12	3.4	.8	1.3		0
9	487	220	355	28	122	96	8.6	3.7	.8	1.3	N	0
10	497	220	363	28	138	97	2.8	3.4	.9	2.2	0	0
11	511	236	374	30	146	107	1.9	3.1	.9	4.3		0
12	504	279	377	28	165	106	1.9	2.5	.9	4.9	F	0
13	504	317	388	26	173	108	1.9	1.6	1.0	4.0	L	0
14	499	321	377	27	129	117	2.2	.7	2.8	2.2	O	0
15	495	339	348	25	115	133	1.9	.5	3.4	1.3	W	0
16	485	361	317	24	115	135	2.2	.4	4.3	1.3		0
17	485	363	293	24	115	132	2.2	.3	3.1	1.9		0
18	483	366	289	27	108	131	2.8	.2	3.1	1.6		0
19	483	366	226	28	110	136	2.8	.3	1.0	.7		0
20	478	363	170	32	111	140	3.4	.3	.6	.3		0
21	478	352	128	40	107	145	3.4	.5	.7	.1		0
22	475	421	60	45	104	138	3.4	.4	1.3	0		0
23	485	495	30	33	106	136	3.4	.3	.5	0		0
24	504	519	17	30	110	136	3.4	.4	.2	0		.5
25	504	521	14	31	117	133	3.7	.7	.1	0		2.0
26	480	492	13	33	117	131	3.7	.8	.1	0		3.0
27	475	475	16	35	118	129	3.7	.9	.1	0		3.7
28	483	451	16	33	122	129	4.0	.9	.1	0		4.3
29	490		25	34	122	132	4.0	1.0	.1	0		4.9
30	485		27	35	97	132	4.0	1.3	.3	0		7.0
31	466		27		97		4.0	1.0		0		6.4
Mean	522	368	230	30.4	111	120	20.6	1.89	1.12	1.34	0	1.03
Runoff in Ac. Ft.	32100	20420	14170	1810	6810	7140	1270	116	66	82	0	63

NOTE: Station is maintained jointly by U. S. Geological Survey and U. S. Bureau of Reclamation. Station is located at Mile 168.0R.

TABLE 71

FLOW OF SAN JOAQUIN RIVER AT DELTA BRIDGE* - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	505	331	315	25	32	96	119	0	8	0	0	0
2	460	322	310	20	31	96	102	0	21	0	0	0
3	421	317	299	21	35	99	94	0	49	0	0	0
4	415	315	283	27	38	104	98	0	52	0	0	0
5	406	315	273	33	27	106	68	0	41	0	0	0
6	395	301	266	31	20	104	27	0	15	0	0	0
7	380	221	271	30	105	104	15	0	7	0	0	0
8	372	202	277	33	215	101	8	0	6	0	0	0
9	375	206	279	31	127	98	3	0	5	0	0	0
10	367	209	286	31	121	94	2	0	4	0	0	0
11	372	213	290	31	139	99	1	0	4	0	0	0
12	372	241	292	27	153	106	1	0	32	0	0	0
13	367	264	294	24	168	102	1	0	3	0	0	0
14	365	271	290	25	144	110	0	0	2	0	0	0
15	365	279	277	24	115	124	0	0	2	0	0	0
16	360	286	264	19	114	131	0	0	1	0	0	0
17	358	290	245	16	114	131	0	0	1	0	0	0
18	355	290	243	18	104	122	0	0	0	0	0	0
19	353	292	225	20	101	122	0	0	1	0	0	0
20	350	290	180	20	98	129	0	0	1	0	0	0
21	348	286	151	24	93	134	0	0	1	0	0	0
22	348	301	78	35	93	132	0	0	1	0	0	0
23	353	336	21	29	94	124	0	0	0	0	0	0
24	355	346	0	21	98	126	0	0	0	0	0	0
25	358	346	0	23	109	121	0	0	0	0	0	0
26	348	336	39	20	110	122	0	0	0	0	0	0
27	346	329	12	24	117	119	0	0	0	0	0	0
28	348	322	13	25	121	117	0	0	0	0	0	0
29	350		16	27	126	117	0	1	0	0	0	0
30	350		22	23	104	119	0	3	0	0	0	0
31	350		24		92		0	1		0		0
Mean	373	288	188	25	102	114	17	0	9	0	0	0
Runoff in Ac. Ft.	22940	15980	11570	1500	6260	6760	1070	10	510	0	0	0

* Also called Turner Island Bridge and San Joaquin River near Los Banos.

NOTE: Station maintained, operated and flow computed by U. S. Bureau of Reclamation. Station is located at county road bridge eight miles east and six miles north of Los Banos, Mile 158.7 above mouth of San Joaquin River. An undetermined amount of water by-passes this station through Pick Anderson Slough and other channels.

TABLE 72

FLOW OF SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	1830	988	914	275	243	289	226	99	175	105	67	92
2	1920	953	886	271	251	294	220	93	182	105	68	126
3	1800	925	862	240	255	301	218	96	179	105	73	122
4	1610	897	848	245	258	291	212	106	147	111	80	120
5	1500	890	799	269	280	287	204	119	158	118	81	104
6	1450	886	746	287	287	282	190	114	169	112	89	98
7	1370	838	726	335	271	284	167	104	169	118	89	99
8	1300	665	740	328	280	289	158	109	169	164	78	99
9	1250	608	771	313	382	280	152	122	171	126	76	100
10	1210	605	799	315	348	284	154	101	182	112	78	105
11	1200	596	824	296	328	294	147	109	198	105	79	101
12	1190	608	848	275	348	273	136	117	206	101	87	100
13	1180	659	908	273	360	255	131	119	240	92	87	112
14	1150	802	918	264	380	243	131	112	269	87	81	121
15	1130	922	908	266	368	232	132	120	216	85	83	117
16	1100	950	862	282	338	236	124	120	214	84	85	103
17	1070	918	802	262	320	247	119	107	206	81	87	92
18	1050	897	732	251	308	243	115	106	202	79	91	103
19	1040	869	690	234	294	236	114	112	210	73	87	108
20	1030	858	638	222	298	230	114	131	206	75	85	92
21	1010	838	539	216	287	228	115	129	192	73	84	85
22	998	816	470	230	273	232	117	115	167	65	85	83
23	995	852	390	236	273	230	117	104	152	63	85	79
24	1000	965	315	236	264	222	117	96	139	59	87	75
25	1020	1010	271	232	251	228	114	101	129	57	87	71
26	1020	1010	249	236	251	226	120	107	119	56	89	69
27	998	978	234	232	271	226	117	95	114	57	90	73
28	992	942	232	234	280	224	117	112	106	56	92	80
29	992		240	240	284	212	122	111	109	58	94	90
30	995		238	243	287	220	129	122	104	59	92	92
31	1000		253		280		117	141		62		90
Mean	1206	848	634	261	297	254	144	111	173	87.2	83.9	96.8
Runoff in Ac. Ft.	74180	47080	38980	15550	18240	15110	8860	6840	10310	5360	4990	5950

NOTE: Station is on county bridge on road between Gustine and Stevinson, Mile 129.5 above mouth of San Joaquin River and 5.7 miles above the mouth of the Merced River. Recorder operated by Water Resources Branch of the U. S. Geological Survey. Measurements of flow by U. S. Geological Survey, Bureau of Reclamation and Division of Water Resources. Additional water during high flow periods passes this station via Mud Slough, see Table 73.

TABLE 73

FLOW OF MUD SLOUGH (BRANCHES COMBINED) AT GUSTINE-STEVINSON HIGHWAY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6	75	38										
7												
8										N	N	N
9										O	O	O
10												
11												
12										F	F	F
13										L	L	L
14										O	O	O
15										W	W	W
16												
17				FIGURES ARE RESULTS OF CURRENT-METER MEASUREMENTS								
18			52	MADE ON DATES SHOWN. DAILY MEAN FLOWS FOR JANUARY								
19				TO SEPTEMBER, INCLUSIVE, WERE NOT COMPUTED IN 1947.								
20												
21	48											
22					3							
23												
24												
25			20									
26												
27												
28												
29												
30												
31												
Mean										0	0	0
Runoff in Ac. Ft.										0	0	0

TABLE 74

FLOW OF SAN JOAQUIN RIVER NEAR NEWMAN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2150	1230	1110	529	411	732	427	254	381	236	210	270
2	2230	1190	1070	512	398	716	411	245	361	245	215	289
3	2150	1160	1070	482	384	693	374	254	351	248	218	302
4	1980	1130	1070	478	391	651	381	273	312	233	224	302
5	1850	1120	1040	489	424	620	394	276	299	242	227	286
6	1780	1110	986	509	444	588	394	276	328	233	236	273
7	1690	1080	972	540	438	570	378	236	342	239	245	276
8	1610	945	981	529	411	570	355	242	374	305	239	270
9	1540	860	1010	506	502	536	305	286	355	279	236	270
10	1500	852	1050	506	526	519	318	299	348	260	236	276
11	1480	860	1090	502	523	516	322	312	355	254	236	270
12	1480	896	1110	455	546	475	322	282	351	254	239	266
13	1460	922	1170	448	540	465	318	270	381	245	245	270
14	1450	1020	1190	434	543	448	308	273	438	236	242	286
15	1420	1170	1180	417	536	427	312	282	421	230	245	282
16	1390	1220	1140	417	492	417	299	292	408	227	251	270
17	1360	1190	1070	391	468	417	289	279	361	227	254	257
18	1340	1160	994	368	448	404	295	286	342	221	260	263
19	1330	1130	940	351	451	378	292	276	355	221	257	273
20	1310	1110	880	361	448	374	299	270	358	230	254	266
21	1290	1100	784	358	421	378	289	299	348	221	260	251
22	1280	1070	708	351	634	388	282	286	318	212	266	242
23	1260	1080	637	345	1150	401	279	292	302	210	266	236
24	1260	1180	564	351	1300	394	295	273	289	205	266	230
25	1280	1230	516	355	1340	398	299	270	266	200	266	224
26	1280	1240	489	361	1240	401	295	289	266	195	266	221
27	1260	1200	465	371	1050	401	328	286	254	195	266	224
28	1240	1160	465	394	994	408	345	292	242	195	266	233
29	1240		475	404	963	408	312	312	251	200	266	239
30	1240		478	411	909	424	302	328	248	200	266	245
31	1240		512		800		289	358		205		248
Mean	1496	1093	878	431	649	484	326	282	334	229	247	262
Runoff in Ac. Ft.	91970	60720	53980	25640	39920	28790	20050	17350	19840	14090	14720	16090

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 123.7 above mouth of San Joaquin River and just below the mouth of the Merced River. Combine flow of Merced River Slough, Table 81, to give total flow passing this point.

TABLE 75

FLOW OF SAN JOAQUIN RIVER AT GRAYSON (LAIRD SLOUGH) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	2260	1420	1270	530	420	850	405	275	490	450	305	395
2	2320	1390	1230	530	400	820	415	270	510	475	315	395
3	2350	1360	1200	520	370	790	405	315	490	435	340	405
4	2260	1340	1200	510	385	710	375	380	455	410	350	435
5	2100	1320	1190	505	405	680	375	330	400	340	365	435
6	1990	1300	1160	540	430	630	395	350	395	340	370	405
7	1930	1300	1120	560	445	630	405	360	420	310	380	400
8	1850	1240	1110	540	430	630	385	345	445	370	390	400
9	1790	1140	1120	545	420	630	350	345	470	435	390	395
10	1740	1080	1140	500	480	600	320	400	460	435	385	380
11	1700	1060	1150	515	520	550	325	400	450	410	375	395
12	1690	1150	1150	470	545	560	325	360	435	360	375	380
13	1670	1090	1180	515	550	540	350	315	425	405	385	375
14	1650	1110	1200	515	540	520	375	295	465	405	390	360
15	1620	1200	1230	445	560	520	350	295	505	360	395	370
16	1590	1310	1210	435	540	495	350	330	500	350	405	370
17	1570	1340	1170	410	500	455	330	370	490	360	395	365
18	1560	1320	1100	380	500	430	310	440	455	360	395	350
19	1530	1290	1000	355	500	410	315	425	430	320	405	350
20	1520	1260	940	355	475	370	280	310	460	305	405	360
21	1500	1250	890	370	460	355	290	310	480	300	405	360
22	1480	1230	860	380	450	370	295	325	495	290	400	345
23	1480	1210	790	380	670	385	295	325	460	290	405	340
24	1470	1230	680	360	1080	395	290	395	440	300	405	330
25	1460	1290	600	370	1220	390	275	395	400	295	405	315
26	1450	1320	545	400	1230	370	310	395	385	295	405	315
27	1440	1330	510	405	1130	360	330	425	360	290	405	310
28	1440	1300	510	420	1070	350	355	415	355	290	405	310
29	1430		530	420	1010	375	350	400	350	295	400	315
30	1430		525	405	980	390	305	425	365	295	395	310
31	1430		520		940		275	425		300		330
Mean	1700	1256	969	453	634	519	339	360	441	351	385	365
Runoff in Ac. Ft.	104529	69779	59564	26945	38985	30863	20846	22106	26261	21570	22899	22413

NOTE: Permanent station maintained by Division of Water Resources, City of San Francisco Public Utilities Commission (Hetch Hetchy Water Supply), Modesto Irrigation District and Turlock Irrigation District. Station is at Laird Slough Bridge, Mile 96.05 above mouth of San Joaquin River. High flows by-passing this station through old channel of San Joaquin River are included in this table.

TABLE 76

FLOW OF SAN JOAQUIN RIVER AT HETCH HETCHY AQUEDUCT CROSSING - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3210	2310	2080	940	480	1170	460	390	680	1240	1210	1310
2	3220	2290	2050	960	470	1140	470	385	710	1330	1240	1290
3	3260	2260	2030	910	450	1080	460	400	700	1260	1430	1320
4	3200	2230	2050	890	500	920	450	430	730	1210	1420	1360
5	3060	2210	2030	860	680	880	440	420	685	1180	1510	1380
6	2950	2180	1990	850	815	840	460	420	670	1170	1560	1390
7	2880	2160	1950	820	905	810	475	425	820	1070	1560	1390
8	2820	2130	1940	750	1000	850	460	440	950	1150	1590	1340
9	2760	2060	1890	730	875	860	435	420	900	1230	1590	1310
10	2700	1990	1870	700	700	820	430	430	860	1310	1500	1340
11	2650	1960	1910	680	685	760	420	495	850	1320	1440	1360
12	2610	1960	1870	660	730	760	415	475	830	1270	1510	1360
13	2600	1980	1900	630	710	710	425	420	830	1170	1500	1340
14	2600	2000	1950	715	660	670	440	405	870	1060	1590	1310
15	2580	2080	1950	670	710	650	430	405	980	1140	1610	1290
16	2540	2210	1950	565	690	640	420	420	1170	1140	1660	1280
17	2520	2240	1920	525	620	585	420	380	1230	1140	1600	1300
18	2500	2230	1820	455	640	505	405	390	1210	1150	1510	1330
19	2470	2200	1730	455	655	490	405	470	1250	1070	1680	1290
20	2440	2160	1680	450	625	460	400	420	1250	1000	1710	1340
21	2420	2140	1700	445	585	460	405	410	1310	910	1710	1380
22	2400	2100	1640	440	570	490	400	425	1330	1060	1660	1290
23	2400	2090	1590	440	760	490	400	440	1310	1150	1510	1260
24	2390	2070	1480	450	1220	490	390	475	1300	1170	1450	1260
25	2370	2080	1340	465	1410	480	390	510	1270	1190	1380	1250
26	2360	2140	1300	465	1460	465	395	465	1210	1190	1370	1240
27	2350	2130	1290	470	1480	455	405	485	1160	1140	1370	1230
28	2370	2110	1300	470	1360	450	420	495	1160	1050	1350	1230
29	2430		1350	475	1310	455	430	495	1160	1100	1320	1240
30	2330		1170	470	1270	480	405	525	1160	1190	1310	1250
31	2310		1020		1220		395	580		1210		1260
Mean	2635	2132	1734	627	847	677	424	443	1018	1160	1495	1307
Runoff in Ac. Ft.	162050	118413	106592	37299	52056	40294	26093	27263	60585	71345	88959	80370

NOTE: Permanent station maintained by City of San Francisco Public Utilities Commission (Hetch Hetchy Water Supply) and Division of Water Resources. Station is at Mile 82.65 above mouth of San Joaquin River.

TABLE 77

FLOW OF SAN JOAQUIN RIVER NEAR VERNALIS - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3470	2560	2330	1950	1070	1720	596	466	780	1280	1490	1620
2	3440	2560	2300	2130	1240	1630	588	453	830	1460	1520	1550
3	3480	2520	2260	2060	1830	1490	600	476	805	1390	1740	1560
4	3440	2510	2310	1970	2460	1290	596	558	830	1320	1690	1620
5	3290	2480	2400	1880	2890	1240	558	543	805	1310	1770	1660
6	3140	2470	2300	1760	3090	1180	592	525	750	1280	1830	1760
7	3050	2430	2200	1620	3060	1140	617	522	825	1190	1880	1850
8	2960	2420	2100	1490	3150	1160	596	518	1010	1270	1920	1710
9	2900	2340	2100	1360	2940	1150	558	504	957	1340	1930	1600
10	2830	2270	2070	1330	2190	1100	518	514	924	1440	1840	1760
11	2780	2220	2110	1280	1970	1090	500	588	913	1480	1670	1990
12	2740	2220	2150	1210	1920	1180	500	577	874	1430	1760	1970
13	2720	2250	2260	1140	1690	1060	540	540	891	1350	1740	1860
14	2710	2300	2500	1120	1510	984	565	518	940	1250	1900	1840
15	2670	2410	2540	1000	1370	962	543	547	1030	1290	1980	1690
16	2640	2520	2580	935	1360	902	507	550	1200	1340	2020	1600
17	2610	2550	2610	990	1380	790	500	613	1260	1340	1970	1750
18	2620	2520	2510	1600	1540	693	479	648	1250	1350	1760	1940
19	2650	2460	2440	1950	1700	652	466	638	1270	1280	1910	1840
20	2570	2430	2490	1900	1670	626	469	577	1280	1190	1990	1890
21	2530	2400	2570	1900	1690	613	482	522	1360	1130	2010	2040
22	2480	2390	2380	1950	1800	661	486	562	1390	1240	2040	1770
23	2480	2380	2380	2000	1920	666	469	596	1350	1340	1880	1620
24	2460	2340	2110	1400	2310	652	460	656	1310	1360	1750	1690
25	2460	2340	1880	1200	2590	630	476	674	1300	1380	1640	1680
26	2470	2380	1940	1150	2560	609	482	638	1240	1390	1660	1600
27	2480	2380	2060	1100	2440	609	525	600	1210	1370	1690	1540
28	2500	2350	2150	1050	2230	581	543	600	1210	1290	1660	1500
29	2600		2320	1100	2080	584	536	605	1210	1300	1620	1530
30	2530		2060	1100	1940	630	504	626	1210	1410	1610	1540
31	2550		1640		1830		476	697		1480		1680
Mean	2782	2407	2260	1488	2046	942	527	569	1074	1331	1796	1718
Runoff in Ac. Ft.	171100	133700	138900	88510	125800	56080	32380	35010	63900	81860	106800	105600

NOTE: This is a permanent station maintained 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 and is at Mile 76.7 above mouth of the San Joaquin River.

TABLE 78

FLOW OF MERCED RIVER AT YOSEMITE VALLEY RAILROAD CROSSING - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	34	25	22	23	18	193	33	37	18	3	8	10
2	33	25	23	20	18	167	34	33	20	3	7	10
3	30	24	23	17	23	148	37	29	20	3	7	11
4	29	23	23	17	24	113	48	31	19	3	6	12
5	29	24	23	16	25	67	48	30	22	3	6	11
6	28	23	20	15	20	24	51	27	22	3	6	10
7	29	23	20	15	23	14	46	24	16	3	6	10
8	29	23	20	16	27	17	53	24	11	3	6	10
9	28	23	22	16	31	19	45	20	11	3	7	9
10	28	22	27	13	39	22	45	19	11	4	8	8
11	27	22	29	13	60	19	50	18	11	4	9	9
12	25	24	30	13	55	18	48	22	10	3	8	8
13	25	27	29	12	34	16	46	22	10	3	11	8
14	24	29	29	12	18	15	43	19	12	4	9	10
15	24	27	25	14	8	16	45	17	11	4	10	10
16	24	27	25	15	7	18	50	16	7	4	10	10
17	24	27	24	14	6	16	60	18	6	5	10	7
18	24	28	24	15	8	17	60	18	5	5	10	7
19	24	27	24	20	10	17	56	18	5	5	9	5
20	23	25	25	18	317	16	55	16	5	5	9	5
21	22	25	19	19	1320	20	51	18	5	6	8	5
22	22	25	17	17	1440	34	48	18	5	6	8	6
23	22	25	30	13	1360	36	53	19	4	6	8	6
24	22	25	29	14	1200	36	58	19	4	6	7	6
25	22	24	28	14	840	37	56	19	4	6	8	6
26	22	23	29	15	670	39	40	20	3	7	9	6
27	23	23	27	17	585	36	33	24	3	6	9	6
28	25	22	24	17	323	33	28	27	3	7	9	6
29	24		23	16	212	34	28	24	3	7	9	6
30	25		23	18	187	36	29	23	3	7	9	6
31	25		23		159		30	20		7		6
Mean	26	25	24	16	292	43	45	22	10	5	8	8
Runoff in Ac. Ft.	1580	1370	1510	940	17980	2560	2790	1370	573	286	488	486

NOTE: Station maintained jointly by Division of Water Resources and Merced Irrigation District. Station is at Mile 43.1 above mouth.

TABLE 79

FLOW OF MERCED RIVER AT CRESSEY BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	155	104	93	82	77	301	101	87	93	63	77	105
2	144	104	93	85	77	296	94	86	92	63	81	104
3	138	102	94	86	72	258	97	87	87	65	82	106
4	132	102	98	83	81	216	104	85	92	60	83	106
5	127	101	94	82	79	187	110	91	91	65	85	107
6	124	101	92	81	80	135	105	92	87	68	85	106
7	120	100	91	79	79	100	106	85	93	71	90	105
8	120	98	92	82	82	94	107	77	86	71	88	104
9	119	98	92	81	87	91	113	79	85	70	88	104
10	117	98	102	81	92	88	109	87	81	74	87	104
11	116	96	104	82	101	88	123	80	80	81	88	105
12	113	101	104	79	101	81	123	80	80	77	87	106
13	114	104	104	80	97	82	120	88	86	71	87	107
14	113	121	102	77	86	83	117	93	87	72	90	106
15	110	120	101	75	79	83	113	90	83	71	93	107
16	109	114	97	72	70	77	113	87	81	74	97	109
17	109	109	94	71	68	79	113	87	76	74	100	113
18	106	107	94	68	69	80	116	85	77	75	97	117
19	104	105	93	69	61	82	116	79	79	76	96	113
20	104	102	93	66	52	75	116	80	79	75	97	111
21	104	101	92	72	428	79	113	83	79	74	98	111
22	102	101	90	76	1370	85	111	83	76	74	98	110
23	102	98	87	77	1360	92	106	86	74	75	97	109
24	102	98	91	74	1340	92	109	87	71	74	100	109
25	101	98	92	77	1110	100	111	83	64	72	101	109
26	100	97	92	82	779	101	106	88	60	71	102	109
27	100	96	92	76	676	100	96	87	64	70	104	110
28	104	94	90	80	634	104	87	86	63	70	105	110
29	105		88	82	562	105	83	94	63	74	104	109
30	104		88	79	413	104	80	97	61	77	106	113
31	104		83		303		81	97		75		107
Mean	114	102	94	78	341	118	106	86	79	72	93	108
Runoff in Ac. Ft.	6990	5690	5780	4630	20960	7020	6540	5310	4700	4410	5540	6650

NOTE: Station maintained by Division of Water Resources. Station is at Cressey Bridge - Mile 27.6 above mouth.

TABLE 80

FLOW OF MERCED RIVER NEAR STEVINSON - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	274	184	170	201	155	384	189	145	208	127	136	163
2	253	187	169	183	143	387	173	140	184	134	138	164
3	242	187	170	188	127	346	159	156	173	127	140	164
4	232	185	174	189	131	313	170	156	165	117	140	164
5	226	185	174	194	146	289	187	154	163	114	141	160
6	220	185	172	203	150	272	196	147	172	109	146	158
7	216	184	170	197	145	256	197	128	188	117	148	162
8	212	183	169	178	136	248	183	133	212	124	153	155
9	212	185	168	168	146	230	157	159	177	122	154	155
10	210	185	170	179	172	216	174	192	172	123	155	155
11	208	185	175	176	203	199	178	189	159	127	156	153
12	203	184	175	165	202	205	193	160	154	131	155	152
13	199	188	175	157	184	199	201	156	170	129	156	151
14	201	188	174	159	182	196	193	170	177	126	156	152
15	198	202	173	145	177	185	201	166	199	124	159	151
16	196	202	170	133	166	183	183	177	183	123	162	152
17	192	197	167	127	162	176	184	176	157	125	163	153
18	192	193	166	122	160	162	192	182	150	130	165	157
19	189	189	165	127	174	151	188	164	157	135	164	157
20	187	188	160	150	163	153	193	155	157	130	165	159
21	185	184	162	146	154	166	181	170	148	130	172	157
22	184	183	160	131	508	175	177	164	142	130	174	156
23	185	182	159	124	1060	181	174	181	143	129	174	155
24	185	181	158	129	1140	185	190	168	135	129	174	152
25	185	177	159	137	1140	172	187	167	133	129	172	152
26	184	176	159	140	975	174	189	175	134	127	169	152
27	184	175	158	156	747	172	213	178	128	127	167	152
28	184	174	163	165	685	183	223	173	129	127	166	153
29	185		182	168	640	194	181	193	134	129	165	152
30	187		173	167	558	203	169	202	131	131	163	151
31	185		210		446		160	223		134		153
Mean	203	186	169	160	364	218	185	168	161	126	158	156
Runoff in Ac. Ft.	12490	10310	10410	9530	22370	13000	11380	10310	9590	7770	9420	9560

NOTE: U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station located about 4 miles above mouth. The recording gage operated by the Division of Water Resources at a point 1.1 miles above mouth was discontinued in 1944. This table includes the flow of Merced River Slough (Table 81). Station also known as "Merced River below Stevinson Drain (near Mouth).

TABLE 81

FLOW OF MERCED RIVER SLOUGH NEAR NEWMAN - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13								THERE WAS NO FLOW IN THE SLOUGH IN				
14								1947 EXCEPT 7 DAYS IN MAY AS SHOWN.				
15												
16												
17												
18												
19												
20												
21												
22												
23					20							
24					37							
25					40							
26					22							
27					3.4							
28					1.0							
29					.5							
30												
31												
Mean	0	0	0	0	4.00	0	0	0	0	0	0	0
Runoff in Ac. Ft.	0	0	0	0	246	0	0	0	0	0	0	0

NOTE: This station records the flow which at high stages in the Merced River by-passes the Hills Ferry Road Bridge and reaches the San Joaquin River below the U.S.G.S. station "near Newman", at Mile 122.2 above mouth. Table 80 records the entire flow of the Merced River and the flow in Table 81 is included in Table 80. This is a U. S. Geological Survey and U. S. Bureau of Reclamation cooperative station. Station also known as "Merced River Slough near Hills Ferry Road Bridge."

TABLE 82

FLOW OF TUOLUMNE RIVER AT LA GRANGE BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	626	608	599	39	20	6	7	5	158	599	844	669
2	631	603	599	16	20	6	7	4	210	608	761	683
3	626	603	649	14	19	7	8	5	213	603	944	719
4	626	612	654	16	18	8	8	5	213	599	962	729
5	626	608	654	16	17	8	8	4	324	494	956	729
6	635	603	635	16	22	8	8	4	555	523	962	664
7	635	608	626	16	26	9	8	4	166	603	980	664
8	631	608	523	16	30	8	8	4	163	594	860	678
9	631	603	531	16	30	5	8	4	181	594	673	664
10	631	603	527	16	28	4	9	4	181	590	914	664
11	626	603	503	16	26	4	10	3	184	486	799	673
12	626	603	511	16	26	4	10	4	181	338	944	673
13	621	603	519	16	28	4	10	4	184	486	986	669
14	631	603	519	16	26	5	8	4	590	511	998	669
15	631	603	531	18	31	5	6	4	626	474	998	659
16	631	603	511	18	33	8	4	4	621	519	750	669
17	631	603	560	18	33	7	4	4	626	440	1050	654
18	626	603	548	17	32	6	5	4	621	303	1120	724
19	621	603	552	18	22	6	4	4	635	236	1110	735
20	612	603	556	18	7	6	4	5	635	397	1090	693
21	617	603	552	17	6	6	4	5	631	612	962	698
22	617	603	544	19	7	6	3	5	649	608	783	693
23	621	581	548	20	8	6	3	5	640	608	714	703
24	626	586	544	21	8	8	4	5	626	608	669	703
25	621	603	560	21	8	8	4	5	617	594	683	698
26	617	603	560	21	8	7	4	6	621	463	669	698
27	803	603	552	21	12	7	5	6	608	474	654	703
28	626	599	306	21	7	7	5	15	599	594	654	698
29	617		16	22	6	8	4	31	531	612	649	703
30	608		12	21	6	7	4	22	612	608	664	698
31	617		11		6		5	15		535		703
Mean	630	603	500	19	19	6	6	7	447	526	860	690
Runoff in Ac. Ft.	38760	33460	30770	1100	1140	385	375	403	26580	32360	51180	42400

NOTE: Station maintained jointly by Division of Water Resources and Turlock Irrigation District. Station is at Mile 50.5 above mouth.

TABLE 83

FLOW OF TUOLUMNE RIVER AT ROBERTS FERRY BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	678	659	659	107	55	41	37	26	41	628	703	634
2	678	659	659	118	61	39	37	26	209	640	842	665
3	678	659	678	107	55	37	33	26	221	653	857	678
4	672	659	684	104	55	39	32	27	237	653	930	697
5	672	659	691	101	55	42	32	27	245	585	947	709
6	678	659	691	111	52	42	32	27	522	485	939	716
7	684	659	678	107	52	44	32	27	278	591	947	672
8	678	659	591	101	55	52	30	27	265	562	873	672
9	678	659	579	98	64	46	28	27	261	538	780	684
10	678	659	597	98	55	37	30	27	257	517	766	678
11	672	659	579	88	61	32	30	26	253	428	834	678
12	672	659	585	85	55	28	30	26	249	319	865	684
13	665	659	597	79	55	28	30	24	229	332	989	678
14	659	659	597	79	58	30	30	23	501	469	980	672
15	659	659	616	76	58	33	28	21	634	419	1030	665
16	659	659	585	76	58	33	30	20	653	454	881	678
17	659	659	585	76	58	35	28	22	647	459	898	672
18	659	659	603	76	64	35	28	20	653	340	1090	691
19	659	659	597	76	61	35	27	20	659	278	1080	716
20	659	659	597	76	58	33	27	21	659	368	1070	716
21	659	659	597	76	46	33	28	22	665	634	964	691
22	659	659	597	76	42	37	28	22	659	628	773	697
23	659	659	597	70	41	37	28	23	672	628	722	691
24	659	597	591	58	37	33	28	24	659	634	678	697
25	659	659	597	55	37	32	28	24	640	634	691	691
26	659	659	597	52	39	32	28	26	628	550	691	691
27	716	659	597	55	44	33	32	26	616	490	684	691
28	737	659	556	52	44	35	30	26	609	603	665	691
29	665		201	52	42	35	28	27	556	653	672	691
30	659		132	55	39	35	27	32	634	647	640	684
31	659		111		37		26	42		585		684
Mean	671	657	568	81	51	36	30	25	467	529	849	686
Runoff in Ac. Ft.	41230	36480	34950	4840	3160	2150	1830	1555	27790	32540	50540	42160

NOTE: Station maintained jointly by Division of Water Resources and Modesto Irrigation District. Station is at Mile 39.9 above mouth.

TABLE 84

FLOW OF TUOLUMNE RIVER AT HICKMAN-WATERFORD BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	687	629	664	190	138	133	117	122	135	776	700	675
2	664	641	675	190	138	130	120	122	199	718	1060	725
3	646	641	681	193	138	125	117	128	246	718	964	731
4	629	646	700	187	138	122	112	128	249	706	1100	756
5	629	641	706	181	138	122	110	125	259	681	1140	770
6	629	641	706	181	135	120	110	128	326	551	1150	770
7	641	646	700	181	135	125	110	125	391	681	1150	712
8	641	641	604	169	138	125	110	125	312	641	1100	712
9	635	658	594	163	138	128	110	125	312	614	1010	731
10	629	652	614	155	138	125	110	128	312	589	828	725
11	629	652	604	149	141	122	110	130	312	488	1050	725
12	635	664	599	138	141	122	110	128	312	375	999	731
13	641	652	599	138	144	120	110	128	312	391	1160	718
14	641	646	594	138	138	117	112	125	441	537	1150	718
15	641	641	589	138	141	120	115	125	681	479	1140	700
16	629	658	579	138	141	122	117	125	706	519	1120	700
17	629	658	546	138	138	122	117	128	712	523	902	706
18	635	658	579	138	138	125	117	128	731	395	1210	706
19	629	658	589	138	141	125	117	125	744	333	1250	750
20	629	652	579	138	138	122	117	125	750	428	1210	737
21	629	646	579	138	138	117	120	125	750	725	1150	700
22	629	641	574	138	135	120	120	125	731	718	389	700
23	629	646	604	138	133	120	120	122	756	706	789	693
24	641	570	604	138	133	120	120	122	731	718	706	700
25	641	658	609	138	138	117	120	122	712	725	725	687
26	629	664	614	135	138	120	117	122	725	641	731	681
27	646	664	609	138	144	117	117	122	706	556	712	681
28	802	664	619	138	141	117	117	122	700	675	687	681
29	629		326	138	138	117	115	122	619	750	681	687
30	624		218	138	133	120	115	122	750	744	693	687
31	629		196		133		117	135		670		681
Mean	642	647	582	152	138	122	115	125	521	606	972	712
Runoff in Ac. Ft.	39460	35960	35810	9040	8490	7250	7070	7700	30990	37230	57830	43790

NOTE: Station maintained jointly by Division of Water Resources and Modesto Irrigation District. Station is at Mile 31.7 above mouth.

TABLE 85

FLOW OF TUOLUMNE RIVER AT MODESTO - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	886	856	804	370	267	290	200	234	253	976	819	836
2	869	843	804	370	290	300	200	240	277	882	1130	858
3	859	836	808	380	294	290	190	257	390	844	1030	864
4	849	836	840	380	290	290	190	249	405	844	1180	889
5	843	840	849	403	290	290	189	266	405	830	1240	900
6	840	830	853	380	280	300	200	242	462	724	1220	903
7	846	817	856	370	270	309	210	273	628	763	1240	854
8	836	817	824	360	261	310	225	251	440	830	1260	833
9	846	814	753	370	260	312	230	218	419	840	1130	847
10	849	808	772	340	267	315	231	251	414	910	948	833
11	849	801	766	330	280	300	230	282	419	844	1130	826
12	849	817	772	324	285	282	232	270	416	727	1050	833
13	849	811	808	350	282	273	230	247	432	604	1150	830
14	853	808	785	330	280	260	228	266	443	727	1210	826
15	849	849	779	320	280	250	224	249	745	772	1270	822
16	853	827	753	310	291	240	226	242	816	739	1250	816
17	856	804	715	310	303	230	234	242	826	775	1020	847
18	859	795	731	330	290	220	228	244	833	721	1240	830
19	859	795	731	321	273	210	220	236	840	604	1320	868
20	862	792	731	330	280	200	226	216	850	517	1270	899
21	866	795	728	340	280	198	226	247	844	682	1300	854
22	866	792	731	340	258	210	220	251	844	850	1070	844
23	872	788	731	330	280	220	216	242	872	861	942	840
24	876	753	721	330	303	225	216	232	864	861	872	840
25	876	760	721	321	300	246	224	238	850	861	868	833
26	872	798	728	291	294	240	228	232	840	833	875	826
27	866	808	718	290	285	230	244	228	840	709	861	819
28	1020	808	731	300	280	219	249	234	816	721	844	822
29	889		595	290	290	210	236	236	805	850	847	822
30	859		378	280	280	210	251	244	775	850	836	830
31	846		370		276		247	259		847		826
Mean	864	811	738	336	282	256	223	246	635	787	1081	844
Runoff in Ac. Ft.	53100	45020	45390	20010	17330	15230	13690	15110	37810	48390	64310	51910

NOTE: Station maintained jointly by Division of Water Resources, U. S. Geological Survey, Modesto Irrigation District and U. S. Bureau of Reclamation. Prior to July 11, 1947 station was located at old U. S. 99 Highway Bridge at Mile 15.75 above mouth. Subsequent to July 11, 1947 station was located at the Tidewater Southern R.R. Bridge at Mile 15.92.

TABLE 86

FLOW OF TUOLUMNE RIVER AT TUOLUMNE CITY - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	930	880	855	375	295	315	250	260	290	910	810	860
2	930	870	855	365	315	315	255	260	290	935	930	845
3	925	875	860	375	300	305	220	290	375	880	1070	870
4	915	875	870	380	295	295	250	275	440	875	1170	890
5	910	875	875	375	300	300	250	275	440	875	1290	905
6	910	880	880	375	290	300	255	290	445	825	1300	930
7	910	875	875	365	290	300	250	290	630	755	1330	870
8	905	880	875	355	290	310	240	300	565	860	1350	845
9	900	880	820	380	285	315	240	260	485	880	1250	855
10	900	875	820	365	300	310	240	290	480	910	1030	845
11	900	870	820	360	295	290	240	305	480	895	1070	850
12	900	875	810	350	300	285	240	270	490	830	1120	855
13	900	875	835	370	300	275	250	285	495	690	1200	860
14	895	870	835	345	285	275	245	280	515	625	1330	845
15	895	885	830	340	280	275	245	280	640	795	1350	845
16	890	890	820	325	295	275	250	290	825	760	1370	835
17	890	880	795	320	280	250	250	280	850	760	1120	865
18	890	875	790	325	295	230	250	285	860	760	1230	865
19	890	870	800	315	290	215	250	275	865	640	1430	870
20	890	865	795	325	295	240	250	270	875	540	1420	915
21	885	860	795	340	290	250	255	280	890	555	1430	890
22	885	860	790	340	275	270	250	295	880	785	1220	875
23	885	860	795	335	275	275	250	280	875	810	1010	870
24	885	850	790	340	285	275	240	275	890	810	950	860
25	885	820	790	330	305	275	230	275	890	810	905	865
26	885	855	790	320	305	255	245	275	875	810	905	850
27	880	855	785	325	300	255	250	275	875	710	900	850
28	940	860	785	330	300	260	255	275	875	665	880	855
29	910		750	320	310	275	250	290	860	770	870	845
30	880		525	315	300	270	255	280	800	830	860	845
31	875		410		290		260	300		840		845
Mean	899	869	797	346	294	278	247	281	668	787	1137	864
Runoff in Ac. Ft.	55279	48278	49031	20588	18069	16532	15193	17276	39759	48387	67636	53098

NOTE: Station maintained jointly by Division of Water Resources, City of San Francisco Public Utilities Commission (Hetch Hetchy Water Supply), Modesto Irrigation District and Turlock Irrigation District. Station is 3.35 miles above the mouth.

TABLE 87

FLOW OF DRY CREEK NEAR MODESTO (CLAUSS ROAD BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	38	20	25	32	66	59	46	38	58	33	33	24
2	31	20	24	44	72	71	45	42	53	35	35	24
3	28	20	24	43	53	68	37	44	50	32	46	24
4	26	20	24	55	40	63	40	44	48	29	42	24
5	25	20	24	62	39	66	41	46	47	30	40	25
6	24	20	24	70	46	69	42	43	45	32	36	24
7	23	19	38	65	42	66	38	43	45	31	33	25
8	23	19	36	79	45	62	37	48	41	33	30	25
9	23	19	32	95	42	80	37	49	33	41	30	24
10	24	20	29	95	35	68	35	49	35	42	29	24
11	24	19	27	89	36	64	37	48	37	44	30	24
12	23	20	55	79	44	55	42	44	34	41	31	24
13	22	20	96	72	38	67	42	44	40	37	30	23
14	22	27	59	61	38	64	37	44	44	33	31	23
15	22	109	40	58	48	55	38	48	44	34	32	23
16	21	74	34	54	50	48	39	48	47	37	30	23
17	21	54	30	57	43	47	37	52	39	37	29	24
18	20	41	28	56	37	46	37	51	37	34	28	24
19	20	36	26	57	40	45	40	51	38	31	27	23
20	20	32	25	60	42	44	42	48	44	29	26	23
21	20	31	24	72	35	48	40	50	42	28	25	22
22	20	29	24	73	32	42	39	52	43	38	25	22
23	20	28	23	75	33	47	39	51	41	29	26	21
24	20	28	23	62	35	52	39	48	35	28	25	21
25	19	27	23	57	53	47	42	51	34	27	25	21
26	19	26	22	56	66	40	42	53	30	27	24	21
27	19	25	22	55	50	45	43	53	31	28	24	20
28	19	25	23	52	63	50	44	55	31	28	24	20
29	19		24	58	69	48	43	56	32	28	24	21
30	19		26	50	52	54	39	60	32	30	24	22
31	19		25		54		40	62		32		23
Mean	22	30	31	63	46	56	40	49	40	33	30	23
Runoff in Ac. Ft.	1375	1680	1900	3755	2850	3330	2460	3005	2400	2000	1770	1410

NOTE: Station maintained jointly by Division of Water Resources and Modesto Irrigation District. Station moved to this location, 5.4 miles above Modesto, in 1941 from previous location at Mile 2.9.

TABLE 88

FLOW OF STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	42	60	58	1580	1230	52	25	24	53	30	183	42
2	41	57	75	1440	2280	50	24	24	50	25	160	115
3	44	50	137	1310	3260	79	24	25	47	9	130	127
4	35	58	52	1160	3430	51	26	25	46	8	108	214
5	35	67	48	776	3250	45	26	24	47	11	127	419
6	38	81	34	509	3190	47	22	28	49	13	150	184
7	38	65	29	445	3320	42	20	28	50	9	172	50
8	35	67	19	381	2420	41	21	26	44	12	195	137
9	34	65	16	364	1310	65	22	27	44	12	155	801
10	32	57	90	343	1070	414	23	25	44	23	120	790
11	39	62	127	256	910	229	23	26	45	31	140	559
12	69	95	679	127	608	54	24	26	45	20	170	449
13	48	214	694	81	436	34	25	26	35	8	200	191
14	33	100	674	88	356	34	24	27	21	48	205	57
15	51	79	826	248	402	32	22	28	17	41	109	327
16	44	77	790	723	561	31	21	28	14	33	52	651
17	198	60	703	1700	982	33	20	28	13	20	45	488
18	45	77	869	1680	1110	31	20	26	14	14	88	415
19	28	73	1180	1510	1040	31	19	25	16	35	144	814
20	24	92	1020	1510	1250	26	22	24	50	38	206	466
21	17	83	694	1680	1440	27	20	26	43	33	155	65
22	16	63	518	1510	1460	29	21	27	31	34	130	155
23	21	58	432	644	1500	27	22	27	19	45	50	339
24	26	50	561	509	1320	26	22	24	21	48	92	121
25	16	55	767	453	1130	27	25	35	24	62	206	77
26	15	60	1170	236	924	27	24	51	26	77	140	51
27	13	60	1230	462	718	29	23	51	25	65	121	92
28	50	58	1330	398	423	29	22	50	20	55	109	127
29	81		492	356	287	28	20	51	12	105	100	191
30	63		548	406	191	26	22	50	20	150	50	690
31	62		1750		63		22	48		145		672
Mean	43	73	568	763	1350	57	22	31	33	41	134	319
Runoff in Ac. Ft.	2640	4050	34932	45390	83050	3364	1380	1904	1950	2500	7960	19590

NOTE: Station maintained jointly by Division of Water Resources and Oakdale Irrigation District. Station is at Mile 44.7 above mouth or 5.7 miles above Oakdale.

TABLE 89

FLOW OF STANISLAUS RIVER AT RIVERBANK (BURNEYVILLE BRIDGE) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	125	135	127	1500	537	206	86	77	76	102	262	103
2	125	129	132	1390	1770	162	83	73	84	105	249	154
3	121	124	228	1280	2640	159	83	65	92	100	182	241
4	127	110	181	1130	2990	169	84	69	90	105	175	235
5	115	132	120	952	3060	130	83	70	87	98	240	452
6	111	149	103	687	2860	140	90	68	84	94	260	541
7	113	135	91	650	3010	118	87	70	90	84	259	206
8	110	127	84	539	2630	106	83	73	94	87	301	124
9	105	132	84	520	1380	87	83	75	95	88	254	671
10	101	129	91	514	983	340	74	76	91	94	185	801
11	98	117	310	467	891	393	72	73	90	106	187	694
12	127	138	395	349	735	187	87	77	92	84	232	500
13	125	313	680	240	650	129	86	75	92	76	315	579
14	113	244	671	200	592	114	84	75	80	79	329	205
15	111	188	689	306	605	105	84	80	74	125	310	128
16	107	170	755	484	664	94	79	74	80	110	193	518
17	257	165	710	1260	869	87	79	77	97	94	118	728
18	202	143	682	1530	1060	94	76	76	113	79	149	520
19	107	159	868	1070	1030	91	73	77	109	74	246	583
20	94	176	902	1000	1080	90	73	74	100	88	284	801
21	90	179	496	1110	1280	84	79	80	87	97	250	227
22	86	163	607	1140	1320	88	72	80	84	94	210	129
23	86	139	417	795	1390	84	72	79	80	101	175	478
24	106	128	277	650	1310	82	70	74	82	117	109	304
25	86	114	518	627	1160	79	68	79	87	132	336	243
26	83	128	745	562	1040	77	70	82	97	157	272	267
27	82	129	932	547	919	77	74	80	101	132	246	226
28	90	127	1200	572	720	90	72	79	90	127	185	400
29	157		996	545	556	88	74	80	86	194	277	353
30	151		496	535	467	88	73	83	94	230	173	592
31	133		1210		276		70	77		218		694
Mean	118	151	510	772	1306	128	78	76	90	112	232	410
Runoff in Ac. Ft.	7230	8370	31330	45920	80280	7610	4810	4660	5350	6880	13810	25180

NOTE: Station is maintained jointly by Division of Water Resources, Oakdale and South San Joaquin Irrigation Districts. Station is at Mile 32.0 above mouth.

TABLE 90

FLOW OF STANISLAUS RIVER AT RIPON BRIDGE - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	214	196	176	1490	597	511	164	142	174	160	258	234
2	208	194	178	1460	1090	469	156	154	154	170	324	186
3	202	186	194	1360	1840	368	158	144	160	166	262	232
4	202	178	280	1280	2450	362	174	160	164	158	212	276
5	196	178	234	1120	2680	334	166	156	160	150	220	322
6	190	190	184	906	2600	302	166	146	156	138	270	494
7	190	206	160	802	2600	290	180	140	160	140	282	450
8	190	188	154	687	2670	288	162	136	168	150	276	264
9	184	188	156	634	1890	266	162	136	172	160	328	346
10	182	190	156	610	1280	264	150	140	186	164	238	766
11	178	182	208	581	1240	503	152	142	174	164	190	731
12	178	180	334	516	1050	384	164	142	180	180	214	632
13	202	214	612	415	898	262	162	142	168	166	244	577
14	190	328	696	344	780	224	162	152	168	162	346	459
15	178	268	718	326	715	220	146	148	162	180	370	290
16	186	232	789	423	756	188	140	156	166	200	326	364
17	184	214	796	805	858	180	136	158	162	188	236	667
18	306	198	768	1320	1080	172	152	150	164	170	188	630
19	226	196	877	1370	1150	174	158	148	162	160	208	553
20	182	200	1060	1300	1150	178	148	148	160	156	264	724
21	170	220	937	1350	1280	176	172	150	156	168	320	566
22	164	218	915	1460	1370	170	158	160	152	166	336	316
23	160	200	754	1260	1450	174	156	158	156	162	290	338
24	160	184	638	865	1450	192	160	162	154	168	216	459
25	162	176	729	754	1330	180	150	170	152	178	212	350
26	156	168	1030	691	1200	194	154	162	152	202	350	272
27	152	174	1090	551	1090	178	166	162	154	198	310	236
28	154	176	1200	649	966	174	164	154	150	180	288	260
29	168		1240	612	812	170	154	150	138	170	246	300
30	212		768	577	685	190	150	176	150	272	334	332
31	200		906		601		148	182		268		619
Mean	188	201	611	884	1342	258	158	152	161	175	272	427
Runoff in Ac. Ft.	11560	11150	37560	52600	82530	15350	9700	9370	9590	10740	16180	26270

NOTE: Station maintained jointly by Division of Water Resources, Water Resources Branch of the U. S. Geological Survey, City of San Francisco, U. S. Bureau of Reclamation and the South San Joaquin and Modesto Irrigation Districts. Station is at Highway 99 and is 16 miles above mouth of river.

TABLE 91

FLOW OF STANISLAUS RIVER NEAR MOUTH (MILE 4.3) - 1947

Date	Daily Mean Flow in Second Feet											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	296	230	190	1240	570	584	139	125	148	111	248	286
2	280	227	195	1350	828	542	127	118	136	123	265	232
3	272	219	195	1300	1460	449	150	122	118	116	274	225
4	265	218	239	1220	2060	401	158	127	123	118	234	261
5	259	209	263	1120	2330	375	142	125	139	122	212	276
6	252	212	221	969	2380	368	149	107	107	109	236	373
7	246	225	193	831	2330	356	152	102	112	118	261	461
8	241	225	176	753	2410	350	137	87	117	143	265	331
9	237	218	168	656	2060	316	137	90	121	144	286	257
10	232	218	165	622	1460	316	126	100	123	161	263	510
11	227	216	168	587	1290	417	129	105	120	166	219	674
12	225	210	261	534	1180	451	130	95	113	169	196	630
13	232	214	385	454	966	337	127	105	126	169	223	524
14	237	294	592	381	840	288	123	116	142	160	286	530
15	225	302	625	310	734	292	113	146	120	173	341	368
16	223	268	674	343	745	252	109	117	120	185	328	296
17	225	248	717	510	797	225	106	122	111	173	284	485
18	268	236	700	1070	960	195	108	117	114	158	237	627
19	302	225	736	1250	1060	200	103	106	132	155	221	522
20	245	228	898	1230	1050	186	105	99	127	155	248	584
21	219	236	926	1250	1120	193	107	97	152	157	286	669
22	210	245	791	1320	1200	200	121	111	133	158	333	405
23	203	237	785	1280	1240	196	100	122	117	158	306	318
24	198	221	643	950	1260	174	112	154	105	161	272	447
25	196	210	554	770	1230	168	117	137	95	166	230	385
26	193	198	708	703	1120	176	121	130	97	180	294	320
27	190	193	888	612	1040	181	133	101	116	178	314	280
28	191	193	1010	614	950	168	129	99	136	168	300	265
29	190		1130	614	849	161	108	97	122	161	272	296
30	219		885	590	734	171	112	105	132	181	292	276
31	236		728		658		120	136		236		463
Mean	233	228	542	848	1255	290	124	114	122	156	268	406
Runoff in Ac. Ft.	14350	12640	33340	50450	77180	17230	7640	6980	7290	9580	15920	24940

NOTE: Station maintained jointly by Division of Water Resources, U. S. Bureau of Reclamation, City of San Francisco and Modesto Irrigation District. Station is located 4.3 miles above mouth and 1.6 miles below the now abandoned station at Bret Harte Pump. Also called "Stanislaus River at Mile 4.3."

TABLE 92

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water (1) Ac. Ft. per Acre	Gross Duty of Water (1) Acres per Sec. Ft.	Runoff in % of Normal Sacto. R. at Red Bluff
		General	Rice	Total					
Sacramento River Redding to Sacramento	1939	158800	63900	222700	1301000	3746	5.74	85	50
	1940	119700	64400	184100	1063000	4050	5.65	86	120
	1941	118600	85200	203800	1150000	4314	5.53	88	164
	1942	111200	107700	218900	1279000	4662	5.74	85	129
	1943	107400	115600	223000	1417000	4699	6.24	78	97
	1944	111900	122200	234100	1678000	5502	7.06	69	53
	1945	106500	115100	221600	1676000	5766	7.44	65	76
	1946	117400	124100	241500	1778000	5560	7.24	67	92
	Av. 1939 to 1946	118900	99800	218700	1418000	4787	6.33	78	98
	1947	121600	124000	245600	1707000	5600	6.82	71	54
									Sacto. R. at Red Bluff
Back Borrow Pit Knights Landing Outfall Gates to Highway 20 Bridge	1939	1710	5770	7480	42600	139	5.70	85	50
	1940	3130	3260	6390	20600	89	3.22	151	120
	1941	3890	1970	5860	19500	103	3.33	146	164
	1942	2760	5650	8410	37800	179	4.49	108	129
	1943	2810	11680	14490	74600	279	5.15	94	97
	1944	960	9020	9980	65800	240	6.59	74	53
	1945	1580	5180	6760	38500	161	5.69	86	76
	1946	2060	7880	9940	70900	256	7.13	68	92
	Av. 1939 to 1946	2360	6300	8660	46300	181	5.35	101	98
	1947	2300	9040	11340	73900	254	6.52	75	58
									Sacto. R. at Red Bluff
Colusa Trough above Highway 20 Bridge	1939		1060	1060	32200	109	30.38	16	50
	1940	200	700	900	39400	136	43.78	11	120
	1941	240	1280	1520	30300	106	19.93	24	164
	1942	240	1520	1760	28300	104	16.08	30	129
	1943	600	2770	3370	40700	160	12.08	40	97
	1944	1540	4490	6030	53700	198	8.91	55	53
	1945	200	3880	4080	48500	171	11.89	41	76
	1946	3030	3690	6720	71200	256	10.60	46	92
	Av. 1939 to 1946	760	2420	3180	43000	155	13.52	36	98
	1947	1740	6470	8210	79200	276	9.65	50	58
									Sacto. R. at Red Bluff
Yolo By-Pass and Knights Landing Ridge Cut	1939	2540	2630	5170	33100	116	6.40	76	50
	1940	2500		2500	3840	32	1.54	316	120
	1941	1840	890	2730	9860	44	3.61	135	164
	1942	1730	880	2610	12370	52	4.74	103	129
	1943	1860	1410	3270	18700	84	5.72	85	97
	1944	1540	4230	5770	33360	126	5.78	84	53
	1945	1820	3820	5640	35800	141	6.35	77	76
	1946	1790	3000	4790	30260	112	6.32	77	92
	Av. 1939 to 1946	1950	2100	4050	22160	88	5.47	89	98
	1947	3220	2980	6200	27200	110	4.39	111	58
									Feather R. near Oroville
Lower Butte Creek and Butte Slough	1939	12300	600	12900	36300	91	2.81	173	39
	1940	9600	400	10000	28100	74	2.81	173	116
	1941	9600		9600	27000	40	2.81	173	133
	1942	8700	1000	9700	31900	65	3.29	148	136
	1943	8700	2000	10700	35900	77	3.36	145	115
	1944	7800	1800	9600	33700	60	3.51	138	57
	1945	7800	2100	9900	39600	88	4.00	121	77
	1946	8200	1800	10000	45600	123	4.56	106	85
	Av. 1939 to 1946	9100	1200	10300	34800	77	3.38	144	95
	1947	4500	1100	5600	19800	58	3.54	137	52

(1) Excluding Municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.

TABLE 92 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water (1) Ac. Ft. per Acre	Gross Duty of Water (1) Acres per Sec. Ft.	Runoff in % of Normal Feather R. near Oroville
		General	Rice	Total					
East and West Borrow Pits of Sutter By-Pass and Sacramento Slough	1939	7660	1640	9300	32600	108	3.51	139	39
	1940	8090	650	8740	24300	118	2.78	175	116
	1941	7830	2440	10270	31300	141	3.05	159	133
	1942	5550	1790	7340	22700	88	3.09	157	136
	1943	5380	3040	8420	33100	133	3.93	124	115
	1944	5890	4300	10190	51100	195	5.01	97	57
	1945	4710	7000	11710	54700	199	4.67	104	77
	1946	9380	4920	14300	59200	217	4.14	117	85
	Av. 1939 to 1946	6810	3220	10030	38600	50	3.85	126	95
	1947	8840	3210	12050	48400	180	4.02	121	52
									Feather R. near Oroville
Feather River Mouth to Oroville Bridge	1939	29200	26300	55500	501400	1497	9.03	54	39
	1940	30100	23500	53600	474000	1713	8.84	55	116
	1941	27700	26600	54300	475200	1684	8.75	56	133
	1942	38500	25200	63700	539700	2042	8.47	57	136
	1943	24100	46600	70700	623600	2134	8.82	55	115
	1944	25200	49800	75000	712900	2312	9.51	51	57
	1945	25100	47900	73000	698400	2313	9.57	51	77
	1946	27200	51100	78300	744800	2362	9.51	51	85
	Av. 1939 to 1946	28400	37100	65500	596200	2007	9.10	53	95
	1947	28300	49700	78000	674400	2245	8.65	56	52
									Yuba R. at Smartsville
Yuba River	1939	6640	1900	8540	73100	210	8.56	57	36
	1940	7220	1270	8490	70000	247	8.24	59	115
	1941	7470	1350	8820	73500	221	8.33	58	129
	1942	6660	1120	7780	74700	243	9.60	51	137
	1943	6280	2310	8590	93800	280	10.92	45	126
	1944	7010	2400	9410	93300	273	9.91	49	56
	1945	8810	1090	9900	84200	229	8.51	57	88
	1946	8870	1960	10830	98700	278	9.11	53	96
	Av. 1939 to 1946	7370	1680	9050	82700	248	9.14	53	98
	1947	8280	3630	11910	100085	282	8.40	58	55
									American R. at Fairoaks
American River Mouth to Fairoaks	1939	3060		3060	6650	28	2.17	223	36
	1940	3060		3060	6050	29	1.98	246	118
	1941	3050		3050	5310	25	1.74	279	109
	1942	3130		3130	4170	23	1.33	365	136
	1943	3110		3110	4580	25	1.47	330	135
	1944	3200		3200	4820	25	1.51	323	51
	1945	2940		2940	3860	16	1.31	370	88
	1946	2890		2890	4120	18	1.43	341	100
	Av. 1939 to 1946	3060		3060	4940	24	1.61	301	97
	1947	3670		3670	5910	19	1.61	302	49
									Sacto. R. at Red Bluff
Sacramento River and Tributaries	1939	215300	103800	319100	2059000	6045	6.45	75	50
	1940	176500	94200	270700	1729300	6488	6.39	76	120
	1941	172400	119800	292200	1822100	6678	6.24	78	164
	1942	158500	158100	316600	2030600	7458	6.41	76	129
	1943	153200	185400	338600	2342700	7872	6.92	70	97
	1944	157500	189300	346800	2661300	8931	7.67	63	53
	1945	157300	186000	343300	2680000	9082	7.81	62	76
	1946	180900	198100	379000	2898800	9360	7.65	64	92
	Av. 1939 to 1946	171500	154300	325800	2278000	7739	6.99	70	98
	1947	182400	200200	382600	2736100	9023	7.15	68	58

(1) Excluding Municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.

TABLE 92 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water		Runoff in % of Normal
		General	Rice	Total			Ac. Ft. per Acre	Acres per Sec. Ft.	San Joaquin R. near Vernalis
Old San Jo. River and Tom Paine Slough	1939	38900		38900	81500	242	2.10	232	46
	1940	33000		33000	64600	264	1.96	248	105
	1941	32800		32800	60400	248	1.84	264	127
	1942	33100		33100	61900	254	1.87	260	118
	1943	45700	150	45850	76100	267	1.66	293	117
	1944	47000	240	47240	105700	325	2.24	217	62
	1945	37300	220	37520	106400	369	2.84	171	106
	1946	40000	320	40320	126100	374	3.13	155	92
	Av. 1939 to 1946	38500	120	38620	85300	293	2.21	220	97
	1947	43100	550	43650	136800	423	3.13	155	55
									San Joaquin R. near Vernalis
San Joaquin River Stockton to Vernalis	1939	18700		18700	51200	191	2.74	177	46
	1940	18500		18500	44600	208	2.41	202	105
	1941	19300		19300	40100	195	2.08	234	127
	1942	17900		17900	42200	198	2.36	206	118
	1943	19500		19500	51700	189	2.65	183	117
	1944	20700		20700	59300	185	2.86	170	62
	1945	19900		19900	62300	213	3.13	155	106
	1946	24500		24500	77200	250	3.15	154	92
	Av. 1939 to 1946	19900		19900	53600	204	2.69	180	97
	1947	25100		25100	84400	251	3.36	145	55
									San Joaquin R. near Vernalis
San Joaquin River Vernalis to Fremont Ford	1939	42400	400	42800	120000	409	2.80	173	46
	1940	39400	500	39900	97800	429	2.45	198	105
	1941	39900	500	40400	93400	431	2.31	210	127
	1942	41900	600	42500	104400	461	2.46	198	118
	1943	41100	300	41400	121700	486	2.94	166	117
	1944	42200	1500	43700	138300	440	3.16	153	62
	1945	41600	800	42400	131400	495	3.10	157	106
	1946	43100	1400	44500	160000	520	3.60	135	92
	Av. 1939 to 1946	41400	750	42150	120900	459	2.87	169	97
	1947	43100	1400	44500	181400	554	4.08	119	55
									Merced R. at Exchequer
Merced River Mouth to Yosemite Valley Railroad Crossing	1939	3480		3480	10300	41	2.96	164	45
	1940	3120		3120	9110	36	2.92	166	103
	1941	3570		3570	7590	32	2.13	228	136
	1942	3300		3300	8400	44	2.55	191	120
	1943	3680		3680	11700	50	3.18	153	121
	1944	4510		4510	13500	42	2.99	162	64
	1945	4400		4400	11800	50	2.68	181	103
	1946	4480		4480	14400	59	3.21	151	88
	Av. 1939 to 1946	3820		3820	10850	44	2.84	171	98
	1947	5880		5880	21100	70	3.59	135	53
									Tuolumne R. near La Grange
Tuolumne River Mouth to Roberts Ferry Bridge	1939	864		864	2534	7	2.93	166	46
	1940	1072		1072	2578	10	2.40	202	112
	1941	1295		1295	3147	10	2.43	199	126
	1942	1619		1619	2770	10	1.71	284	120
	1943	1826		1826	2616	9	1.43	339	120
	1944	3161		3161	4101	13	1.30	375	66
	1945	3259		3259	3555	12	1.09	445	106
	1946	3564		3564	4922	15	1.38	352	95
	Av. 1939 to 1946	2082		2082	3278	11	1.57	309	99
	1947	3761		3761	7466	20	1.99	245	55

TABLE 92 (CONT'D)

SUMMARY OF WATER UTILIZATION OF SACRAMENTO-SAN JOAQUIN VALLEYS

	Year	Acreage			Diversion Acre-Feet	Irrigation Draft Average c.f.s. July	Gross Duty of Water(1) Ac. Ft. per Acre	Gross Duty of Water(1) Acres per Sec. Ft.	Runoff in % of Normal Stanislaus R. below Melones
		General	Rice	Total					
Stanislaus River Mouth to Orange Blossom Bridge	1939	6330		6330	16200	52	2.56	190	41
	1940	6900		6900	15700	63	2.28	214	110
	1941	6940	110	7050	16700	56	2.37	205	105
	1942	7100	130	7230	20000	75	2.77	176	117
	1943	7360		7360	22100	73	3.00	162	123
	1944	7920		7920	21800	69	2.75	176	53
	1945	6870		6870	21700	72	3.16	154	100
	1946	6340		6340	26800	82	4.23	115	93
	Av. 1939 to 1946	6970	30	7000	20100	68	2.87	169	93
	1947	6600		6600	30100	88	4.56	106	50
									San Joaquin at Vernalis
San Joaquin River and Tributaries Including Old San Jo. and Tom Paine Slough	1939	110600	420	111020	281800	942	2.54	191	46
	1940	101900	470	102370	234600	1010	2.29	212	105
	1941	103800	590	104390	221300	972	2.12	229	127
	1942	105000	710	105710	239700	1042	2.27	214	118
	1943	119300	490	119790	285900	995	2.39	204	117
	1944	116200	1695	117895	342700	1074	2.91	167	62
	1945	113400	1000	114400	337500	1211	2.95	165	106
	1946	122000	1717	123717	409400	1300	3.31	147	92
	Av. 1939 to 1946	111500	886	112386	294100	1068	2.62	186	97
	1947	127600	1900	129500	461300	1406	3.56	136	55
Sacramento River and Tributaries and San Joaquin River and Tributaries Including Old San Jo. and Tom Paine Slough	1939	325900	104220	430120	2340800	6987	5.44	89	
	1940	278400	94670	373070	1963900	7498	5.26	92	
	1941	276200	120390	396590	2043400	7650	5.15	94	
	1942	263500	158810	422310	2270300	8500	5.38	90	
	1943	272500	185890	458390	2628600	8867	5.73	85	
	1944	273700	190995	464695	3004000	10005	6.46	75	
	1945	270700	187000	457700	3017500	10293	6.59	74	
	1946	302900	199817	502717	3308200	10660	6.58	74	
	Av. 1939 to 1946	283000	155186	438186	2572100	8807	5.87	83	
	1947	310000	202100	512100	3197400	10429	6.24	78	

(1) Excluding Municipal diversions on Sacramento River, the City of Sacramento and the City of Redding.

TABLE 93

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversion in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--"M" STREET BRIDGE - SACRAMENTO - MILE 0.0--													
-- GAGING STATION AT SACRAMENTO - MILE 0.4--													
City of Sacramento	0.8R	1-18" 3-20"	2199	2944	4042	4221	4856	4610	4049	2762	(1)29683	Municipal	
--AMERICAN RIVER - MILE 1.1L--													
--BACK BORROW PIT RECLAMATION DISTRICT 1000 - MILE 1.3L--													
E. Fourness	1.45R	1-8"		5	129	93	75	63	58		423	150	
--RECLAMATION DISTRICT 1000 DRAIN - MILE 2.1L--													
Elmer F. Christophel	2.15L	1-8"	6	13	21	15	16	6	8		85	38	
H. M. Swalley	2.30L	1-5"		3	11	11	11	9	6		51	38	
D. D. Parr	3.15L	1-6"				22	24	24			70	26	
Rose Orchard	3.55R	1-16"		148	208	148	175	113			792	171	
W. E. M. Beardsley Estate	3.75R	1-5"				NO DIVERSION							
M. C. C. Van Loben Sells	4.0R	1-10"				NO DIVERSION							
--SACRAMENTO WEIR - MILE 4.2--													
Reese and Greer	4.65R	1-7"			35	39	43	15	23		155	78	
A. M. Harbinson	5.05R	1-14"			203	44	54	2			303	112	
R. S. Seydel (2)	5.25R	1-8"			93	72	82	71	53		371	139	
A. R. Merkley	5.3R	1-6"			19	24	20				63	59	
Lucy Casselman	5.5R	1-6"			14	17	14				45	35	
A. A. Casselman	5.55R	1-6"			9	14	20				43	40	
K. L. Lovdal	5.7R	1-10"				PLANT REMOVED							
J. E. Bandy	6.0R	1-6"				57	38	48	66		209	48	
Riverside Mut. W. Co.(Natomas)	6.1L	2-18"		289	1635	1707	1584	1570	1146	110	8041	2086	120
O. A. and F. L. White	6.6R	1-6"				14	50	22	25		111	66	
--RECLAMATION DISTRICT 1000 DRAIN #3 - MILE 6.85L--													
E. S. Fisk	7.0R	1-4"				PLANT REMOVED							
Fred C. Jones	7.5L	1-8"		26	6	26	39	18	16		131	100	
M. R. Williamson	7.8L	1-10"			22	19	17	15			73	93	
A. Marty	7.9R	1-8"			3	91	119	27	14		254	(3) 347	
E. D. Willey	7.9L	1-10"		51		81	83	78	5		298	143	
M. Marty	8.3R	1-8" (4)1-10"			42	99	93	39	46		319	(5)	
Blauth Estate	8.5R	1-7"			15	84	47				146	83	
H. Waldeck	8.7R	1-6"			19	69	17	19			124	62	
Mullin and Plato	8.95R	1-6"				NO DIVERSION							
Fong Sik, Fong Shee and Wm Fong (6)	9.3L	1-10"	2	42	114	120	139	71	97		585	256	
Capital Company	9.35R	1-14"			87		112	85	50		334	135	
Fred C. Jones (7)	9.8L	1-14"			69	129	155	114	43		510	276	
Carl Casselman	9.9R	1-12"			72	27	151	95	78		423	123	
Lloyd M. Robbins	10.25L	1-14"			141	230	142	224	78		815	550	
Ray Hughes	10.65R	1-12"						48	21		69	85	
Fiddymint and John Sing, Jr.	10.75L	1-12"				13	44	60	6		123	113	
Joseph Mello (8)	11.1R	(4)1-10" 1-12"			31	61	54	65	31		242	110	
Federal Farm Mortgage Co.	11.6L	1-10"			28		2				30	(9) 80	
--ELKHORN FERRY - MILE 11.9--													
Conaway Ranch	12.0R	4-36"		4343	12068	11449	12818	10934	3924		55536	(10)2460	6081
Thomas O'Connor Estate	12.5R	1-12"				46	62	40	51		199	75	
Gertrude Brown	12.7R	1-6"					7	2	6		15	23	
Frank F. Newman	13.1R	1-12"		6	28	99	55	106	22		316	130	

(1) Additional diversion: January 2041, February 1864, November 2077 and December 2148.
(2) Formerly listed as R. A. Westbrook.
(3) Combined acreage this plant and one at Mile 8.3R. An additional 18 acres irrigated by wells.
(4) 10" unit removed in 1947.
(5) See plant at Mile 7.9R.
(6) Installed in 1946, first listing in 1947.
(7) Formerly listed as Nesbit, Driver and Fong Yen Co.
(8) Formerly listed as Joseph Mellor.
(9) Flooded only. Received additional water from wells.
(10) Includes 1260 acres outside district.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
J. Corey	13.2R	1-8"				NO DIVERSION							
J. DeNigris	13.75R	1-8"			37	47	83	78	6	4	255	70	
Elkhorn Mut. W. Co.(Natomas)	14.1L	1-20" 1-24"		408	3020	2386	2784	2969	1556		13123	3126	369
Joseph Veress	14.25R	1-14"			133	154	111	170	48		616	165	
M. E. Dole	14.4R	1-6"				NO DIVERSION							
Capital Company	15.1R	1-10"				NO DIVERSION							
Central Mut. W. Co. (Natomas)	16.0L	1-24" 1-36" 2-38"		3796	7135	6746	7175	8161	4622	50	(1) 37685	(2) 1594	(2) 6885
Henry Rich (Hershey Plant)	16.27R	1-20"		74	569	561	567	613	446		2830	18	150
H. T. Silvius	16.4R	1-6"				NO DIVERSION							
Henry Rich	16.62R	1-14"			48	62					110	70	
Frank and Ruth Lang (3)	17.4R	1-16"			90	40	13	39			182	80	
Calif. W. States Life Ins. Co.	17.75R	1-16"				NO DIVERSION							
Harms Bros.	18.0R	1-20"				NO DIVERSION							
H. C. Lauppe	18.2L	2-10"			370	242	383	287	213		1495	73	82
M. & J. Scheiber	18.45L	1-12"				55	67	25			147	92	
G. H. Lyall	18.7L	1-8"				57	3				60	40	
SACRAMENTO TO VERONA Totals			2207	12148	30566	29491	32404	30935	16813	2926	157490	(4)13658	(4)13687
Average cubic feet per second			36	204	497	496	527	503	283	49	324		
Monthly use in per cent of seasonal			1.4	7.7	19.4	18.7	20.6	19.6	10.7	1.9			
--VERONA GAGING STATION - MILE 19.6L--													
--CROSS CANAL RECLAMATION DISTRICTS 1000 AND 1001 - MILE 19.6L--													
Arthur Drown (5)	*(0.5S)	1-20"			55	116	145	142	44		(6) 502	140	
Natomas Central Mutual W. Co. (Bennett Subd. Plant)	*(1.0S)	1-10" 1-20"		774	1358	1340	1622	1598	657		7349	57	1187
Natomas Northern Mutual W. Co. (Central)	*(2.0S)	2-24"		2529	3534	3287	3551	4207	1764		18872	(7)	
Natomas Co. (Ben May Plant)	*(3.35N)	1-16"		337	582	803	436	614	275		3047		370
--FEATHER RIVER - MILE 20.9L--													
--SACRAMENTO SLOUGH - MILE 21.2L--													
West Coast Life Ins. Co.	21.7R	1-15"				NO DIVERSION							
Henry Rich (Keller Plant)	22.5R	1-22"			533	153	200				886	180	
A. F. Johnston	26.8L	(8)1-16"			510	532	513	509	373		2437	150	80
Anthony Furlan	26.8L	(8)1-16"			473	495	524	514	271		2277	150	80
--FREMONT WEIR GAGING STATION (WEST END WEIR) - MILE 28.0--													
Gustaf Inglin	28.2R	1-6"		10	22	20	20	21	22		115	40	
Russell Bros.	29.2R	1-12"		8	87	74	90	26	62	19	366	125	
M. R. Richardson (Mrs.)	29.7R	1-8"				NO DIVERSION							
Kate Russell and P. L. Traganza	29.75R	1-8"				NO DIVERSION							
Sebastine Yturralde	29.9L	1-12"				NO DIVERSION							
M. R. Richardson (Mrs.)	30.6R	1-12"				NO DIVERSION							
Floyd Anderson	30.7R	1-6"				4	3				7	15	
Alice E. West	30.9L	1-8"				PLANT REMOVED							
A. C. Huston	31.5R	1-12"			98	9	122	75			304	150	
Mary Anna Richardson	31.75R	1-10"		20	308	294	297	314	200		1433	50	130
M. Alonzo	31.8L	1-6"					1	1			2	4	
Sutter Mutual Water Co. (Portuguese)	32.0L	2-24"		1286	2975	2795	2769	2757	1128	91	13801	1370	551
Collier Bros.	32.5R	1-10"		2	40	38	83	19	19	1	202	98	
Walter Zeigler	33.2L	2-20"		40	415	465	363	432	120		1835	322	110
J. G. Knox	33.35L	1-8"				NO DIVERSION							

* Cross canal - the main drain between R.D. 1000 and 1001, joins the Sacramento River at Mile 19.6L. Distance from Sacramento River and the bank is shown in ().

(1) An additional 4190 acre-feet received from controlled drainage. Also received additional water from wells.
(2) Combined acreage this plant and one at Mile 19.6L (2.0S).
(3) Formerly listed as Henry Rich.
(4) No acreage included for City of Sacramento.
(5) New installation 1947.
(6) Additional water received from wells.
(7) See plant at Mile 16.0L.
(8) Previously listed as 14" unit.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
J. Du Bois (1)	33.5R	1-12"			146	103	174	112			535	99	
Fred Leiser (Mrs.) (2)	33.75L	1-14"		110	652	590	628	621	333		2934		180
Sidney Epperson	33.8R	1-3"				PLANT REMOVED							
Neil Wilson (1)	33.85R	1-6"			29	7	32	21			89	32	
VERONA TO KNIGHTS LANDING			0	5116	11817	11125	11573	11983	5268	111	56993	2982	2688
Totals				86	192	187	188	195	89	2	117		
Average cubic feet per second				9.0	20.8	19.5	20.3	21.0	9.2	0.2			
Monthly use in per cent of seasonal													
--KNIGHTS LANDING GAGING STATION - MILE 34.0--													
--COLUSA BASIN DRAIN - MILE 34.15--													
Commercial Investment Co.	34.85L	1-12"				NO DIVERSION							
Walter Raymond	35.2L	1-7" 1-12"				NO DIVERSION							
Susie M. Donnely	35.8L	1-10"				24	18	22			64	68	
J. Goffitzer	35.85L	1-6"		16	15	7	14	15	19	8	94	17	
Kilgore and Rossi	36.2L	1-14"		173	578	539	499	381	78		2248	160	175
R. H. Bailey	36.45L	1-8"			24	21		20	19		84	52	
Amedio Moroni	36.7L	1-5"				NO DIVERSION							
Robert Bottimore	37.2L	1-14"				NO DIVERSION							
Maybelle J. Bundock	37.75L	1-8"			44	19	12	3			78	108	
Addie Reel	38.4L	1-10"				NO DIVERSION							
C. L. Reel	38.8L	1-10"				97		68			165	100	
F. O. Eastman	39.4L	1-12"				77		46			123	80	
Commercial Inv. Co.(C.L. Reel)	39.8L	1-10"				NO DIVERSION							
William Duffy, Jr.	39.9L	1-6"			14	7	17	2			40	25	
Sutter Mutual Water Co. (State Ranch)	40.6L	2-24" 1-36"		2566	4470	4762	5245	5037	2240	52	24372	3659	1628
El Dorado Ranch	42.0R	1-14" 1-16"			123	267	288	20			(3) 698	510	
Matteoli and Fracchia	42.3L	1-8"				85		58			143	52	
Reclamation District #2047	43.1R	2-50"		7852	11364	11388	11617	11090	2588		55899	(4)1128	(5)7574
El Dorado Ranch	43.1R	1-18"				NO DIVERSION							
Kramer Ranch	43.1L	1-12"				NO DIVERSION							
--RECLAMATION DISTRICT #108 DRAINAGE PLANT - MILE 44.0R--													
John Clauss	44.2L	1-18"		205	860	851	942	882	504	51	4295	(6) 420	(6) 135
John Clauss (Fuchlin)	45.6L	1-14"			232	148	114	142			636	(7)	(7)
P. J. Hiatt	48.7L	2-20"		820	1958	1833	1955	1878	385		8829	630	300
G. J. Hiatt	49.7L	1-14"		135	334	340	345	341	125		1620	53	72
Reclamation District #108	51.1R	2-24" (9) 1-36"		2460	3600	2840	2562	2674	442		14578	(8) 891	(8) 740
Holmes and Westover Co.	51.2L	2-16"		572	1047	1272	1390	991	433		5705	(10)330	315
B. M. Chaplin	52.0L	1-16"				NO DIVERSION							
River Farms Company	52.35R	1-12"		45	292	68	341	284	133	27	1190	363	
George Van Ruiten	52.9L	1-10"			22	65	99	60			246	250	(11)
George Van Ruiten	53.9L	1-12"			56	156	48	144	4		408	(12)	
Broomieside Farm	55.1L	1-20"			60	66	275	73	48		522	300	
Reclamation District #108	56.4R	1-18" 1-30"		230	1350	1437	1402	1450	804		6673	(13)449	(14)720
C. M. Miller	56.42R	1-6"					196				196	(15)106	
C. M. Miller (Asa Morris)	56.65R	1-12"			183	120	212	30			545	(16)	
Broomieside Farm (S.C. Crawford)	56.95L	1-20"		710	1221	909	800	1330	604		5574	(17)546	(17)790

(1) Formerly listed as Sidney Epperson.
(2) Formerly listed as Leiser Bros.
(3) Also received some water from controlled drainage.
(4) All River Farms Co. lands. Also received some water from controlled drainage.
(5) Includes 2050 acres on River Farms Co. lands and 5524 acres on R.D. #108 lands.
(6) Combined acreage this plant and one at Mile 45.6L.
(7) See plant at Mile 44.2L.
(8) All River Farms Company lands.
(9) No operation of 36" pump in 1947.
(10) Includes 25 acres of beans on J. F. White Ranch.
(11) Combined acreage for this plant and one at Mile 53.9L.
(12) See plant at Mile 52.9L.
(13) 220 acres on R.D. 108 lands and 229 acres on River Farms Co. lands. Also receives some water from wells.
(14) All R.D. 108 lands.
(15) Combined acreage this plant and one at Mile 56.65R.
(16) See plant at Mile 56.42R.
(17) This is all Sutter Basin District lands. This is combined acreage this plant and one at Mile 59.8L.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
L. M. Miller (1)	57.0R	1-10"				39	66	167	9	1	282	55	
Lamb Bros.	57.5L	1-16"				NO DIVERSION							
James A. Neilsen and W. H. Saylor	58.2L	1-15"			48	61	151	85	23		368	202	
Alex Grant	58.9L	1-16"				11	107	8			126	65	
I. G. Zumwalt	59.1R	1-12"				NO DIVERSION							
Lamb Bros.	59.8L	(2) 1-8" 1-12" 1-14"		253	499	421	732	531	67		2503	(3)	(3)
Reclamation District #108	59.85R	1-16"				NO DIVERSION							
F. L. Burrell	60.4L	1-10"				NO DIVERSION							
A. Earl Lane	60.5L	1-12"		112	273	319	305	314	142		1465	30	100
Robert Lane	61.35L	1-12"				57	63	70			190	70	
I. G. Zumwalt	61.5R	1-12"			123	150	122	53			448	232	
Samuel Hines	62.3R	1-10"			9	9	5	10			33	16	
Blanche Coulter Brown	62.3L	1-8"				NO DIVERSION							
Jake Locovitch	62.6R	1-8"			37	29	17				83	20	
R. L. Young	62.8L	1-12"			18	92	13	83	7		213	83	
KNIGHTS LANDING TO WILKINS SLOUGH Totals			0	16149	28854	28586	29972	28362	8674	139	140736	11070	12549
Average cubic feet per second			0	271	469	480	487	461	146	2	290		
Monthly use in per cent of seasonal			0	11.5	20.5	20.3	21.2	20.2	6.2	0.1			
--WILKINS SLOUGH GAGING STATION - MILE 62.9--													
Reclamation District #108 (Wilkins Slough)	63.2R	(4) 1-36" 5-42"		15928	24965	22400	23353	21170	4270		112086	331	(5)13083
B. W. Meister	63.65L	1-8"			11	18	13				42	(6) 119	
Sutter Mutual Water Co.	63.75	6-42" 2-48"		22808	44863	37727	42536	39688	18410	1175	207207	16738	13582
--TISDALE WEIR - MILE 64.2L--													
Edward Seaman (7)	63.9L	2-14"			54	75	90	91	62		372	207	280
Ornbaum, Nobles Land & Livestock Co.	64.3R	1-12"			8		20	4	8		40	18	
Tisdale Irrig. & Dr. Co.	64.4L	1-12"		75	446	460	444	441	57		1923	380	
Van Horn Ranch	64.9R	1-14"					46				46	(8) 140	
Juan Valasyuez	65.1R	1-4"			1	4	17	10	4		36	33	
Walter Ettyl (9)	65.7L	1-8"		9	134	145	110	115	15		528	132	
M. P. Schohr	65.8R	1-16"				18		46			64	46	
J. L. Browning	66.4R	1-18"			240	463	602	291			1596	384	
Tisdale Irr. & Dr. Co.	67.1L	1-12" 1-20"		261	945	865	1165	1000	328		4564	(10)567	310
Desmond A. Winship	67.2L	1-10"				NO DIVERSION					(11)		
--RECLAMATION DISTRICT #70 DRAIN PLANT - MILE 68.8L--													
Newhall Land & Farming Co.	67.5L	(12) 1-12" 1-24"		471	1895	2603	2888	2655	780		11292	(13)3500	40
J. L. Browning	69.0R	1-24"				NO DIVERSION							
Faxon, Morton and P. Andreotti	69.2R	1-18"			338	326	224	260	329		1477	220	
--EDDY'S FERRY (GRIMES) - MILE 69.45--													
J. E. Hollenbeck (14)	69.8R	1-4"			10	1					11	7	
H. F. Daly	70.4L	1-10"			19	67	13	52	6		157	(15) 75	
Hoffman, Ritchie, Poundstone and Denny	70.4R	(16) 1-6" 1-20" 1-24"		951	1200	1106	1144	1014	307		5722		(17)550

(1) New installation in 1947.
(2) 8" unit removed in 1947.
(3) See plant at Mile 56.95L.
(4) 36" pump added in 1947 as supplemental unit.
(5) An additional 500 acres irrigated from plant at Mile 70.4R.
(6) 84 acres of this flooded only.
(7) Formerly listed as Edward Seamans.
(8) Flooded only once in July.
(9) Formerly listed as Capital Company.
(10) Includes 140 acres on Winship lands.
(11) See plant at Mile 67.1L.
(12) New additional unit installed in 1947.
(13) An additional 1184 acres of beans served by West Borrow Pit, Mile 25.0R and Mile 28.4R.
(14) Re-listing of old installation.
(15) Includes 37 acres on Rolinder lands.
(16) No operation of 6" and 20" units in 1947.
(17) This is all on R.D. #108 district lands.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Meridian Farms Water Co. #4	71.1L	1-24"		705	1439	802	1352	883	454	6	5641	(1)2126	511
A. B. Armstrong	71.9R	1-12"			98	192	141	28	23		482	140	
Antone Steidlmayer	71.9R	1-12"				NO DIVERSION							
H. and A. Andreotti	72.3L	1-7"			97	103	90	108	15		413	60	
E. B. Vann (Froh)	73.6R	1-10"				NO DIVERSION							
Meridian Farms Water Co. #3	74.8L	(2) 1-10" 1-18"		437	1434	1566	1152	1310	410		6309	574	333
L. B. Westfall	75.3R	1-10"			253		89	24	7		373	140	
J. H. Yates Estate (3)	76.1L	1-10"				114	70	94			278	(4) 130	
M. S. Davis and C. K. Anderson (5)	76.2L	1-8"			48	36	16	23			123	67	
Steidlmayer Bros.	76.5R	1-16"			478		101				579	146	
E. V. Jacobs	77.9L	(6) 1-16"				200	71				271	220	
Sebia Davis Estate	78.2R	1-16"				NO DIVERSION							
Sebia Davis Estate	78.8R	(7) 1-14" 1-24"		1168	2475	1100	1829	1991	646		(8) 9209	500	1340
C. E. Reische	79.0L	1-10"		65	69	84	88	77	33		416	191	
Steidlmayer Bros.	79.0R	1-12"			273	60	121	116		185	755	(9) 306	
Henry Schmidt	79.3R	1-10"	28	30	84	26	73	31	28		300	85	
E. V. Jacobs	79.5L	1-8"			18	16					34	40	
Steve M. Burtis and G. Wood	79.7L	1-10"			35	52	30	18			135	94	
--MERIDIAN BRIDGE - MILE 79.85--													
Meridian Farms W. Co. #1 and #2	80.0L	1-20" 1-24"	104	2266	3898	3645	3320	3706	1375	95	18409	3383	1155
Roger C. Wilbur	80.3R	1-8"		55	8	31	28		1	25	148	54	
Wayne Hall and L. Burrows (10)	81.5L	1-16"		185	524	635	559	553	303		2759	70	(11)200
Wayne Hall (2)	81.8L	1-16"		127	940	800	925	1009	271		4072		(11)200
Steidlmayer Bros.	81.9R	1-20"			803	470	326	267	280		2146	710	
F. T. Reische and L. F. Wood	82.5L	1-12"			43	22	29	50	10		154	75	
J. E. Clark	83.3L	1-14"				NO DIVERSION							
J. E. Clark	83.5L	(12)1-10"		3	3	11	11				28	23	
--BUTTE SLOUGH OUTFALL GATES - MILE 84.0L--													
Steidlmayer Bros.	85.6R	1-12"				NO DIVERSION							
Clifford Reichel	85.8L	1-8"			14	40	26				80	28	
W. H. Halsey	86.1R	1-12"			131	44	161		140	118	594	205	
Lydell Peck	86.1L	1-8"	52	44	111	8	85		44	25	369	70	
Howell Davis (13)	86.2R	1-18"			251	197	94	180	45		767	210	
Lydell Peck	86.6L	1-18"				PLANT REMOVED							
Lloyd Scoggins	86.8L	1-8"	31	4	45	1					(14) 81	45	
Roger Wilbur	86.9R	1-10"	45	72	109	70	160	92	124	57	729	205	
Roger Wilbur	87.4R	1-10"		74	50	42	67	23	44		300	50	
Jacobsen and O'Rourke	87.6L	(15)1-8"		1	48	21	2				72	40	
Swinford Tract Irrigation Co.	87.7R	1-12"	23	17	130	71	103		61		405	136	
Edward K. Lange	88.0R	1-6"			9		18			7	34	18	
Nagel and Locovitch	88.2L	1-10"	34	13	18	46					111	20	
Mayfair Packing Co. (16)	88.7L	1-14"	18	185	69	64	12	27	39		414	170	
Colusa Irrigation Co.	89.2R	1-20"		94	278	125	418	61	135		1111	(17) 450	
Phil B. Arnold	89.25L	1-8"			95	72	36				203	75	
G. A. Berkey	89.26L	1-12"		9	190	125	38				362	100	
WILKINS SLOUGH TO COLUSA													
Totals			335	46057	89697	77169	84306	77508	29064	1693	405829	33853	31584
Average cubic feet per second			5	774	1459	1297	1371	1261	488	28	835		
Monthly use in per cent of seasonal			0.1	11.3	22.1	19.0	20.8	19.1	7.2	0.4			

(1) Also receives water from controlled drainage.
(2) Newly installed unit in 1947.
(3) Formerly listed as J. H. Yates.
(4) Includes 20 acres on Coffman lands.
(5) Formerly listed as Joseph Miller.
(6) Replaces 12" unit formerly listed at this location.
(7) No operation of 14" unit in 1947.
(8) Additional water received from plant at Mile 33.0R on Back Borrow Pit.
(9) 80 acres of this land flooded only.
(10) Formerly listed at B. P. Lillienthal, Trustee.
(11) Cooperative diversion between plants at Mile 81.8L and 81.5L
(12) Replaces 8" unit formerly listed at this location.
(13) New installation in 1946. First listing in 1947.
(14) An additional 104 acre-feet diverted in February.
(15) Replaces 10" pump previously at this location.
(16) Formerly listed as Mrs. W. D. DeJarnatt and Mayfair Packing Company.
(17) Estimated from 1946 data.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--COLUSA BRIDGE AND GAGING STATION - MILE 89.4--													
Lillian and Hattie Boggs	89.7L	(1)1-8"		63	134		1				198	65	
Roberts Ditch Company	90.7R	(2)2-20"		20	521	632	742	646	468	50	3079	(3) 1238	
Paul R. Westfall	91.1L	1-8"			17						17	30	
I. G. Zumwalt	91.6R	1-12"			99		87			78	264	150	
--COLUSA WEIR - MILE 92.4--													
George P. Ahlf	92.5L	(4)1-6" 1-10"		74	368	348	447	408	105		1750	25	170
Brown Ranch	93.0R	1-12"			15	14	12				41	25	
Paul R. Westfall	93.0L	1-8"							20		20	12	
Paul R. Westfall	93.4L	1-10"			96	8	52	93	33	23	305	90	
Tuttle Land Co.	94.3R	(5)1-15" 1-20"		105	72	132	258	55	92		714	167	
I. G. Zumwalt	94.8R	1-12"				NO DIVERSION							
Roger Wilbur	95.24L	(6)1-18"		264	608	472	635	697	162		2838	60	310
George W. Lewis	95.6L	(7)1-20"			725	499	765	910	277		3176		310
Bridget Graham Ranch	95.8L	1-16"		331	906	673	730	789	443		(8)3872		350
I. G. Zumwalt	96.8R	1-15"		28	129	128	128	145	121	75	754	374	
H. Heitman	97.7R	1-12"	2	25	58	55	63	75	38	29	345	114	
Frank N. Beckley	98.0L	1-10"			128	31	34				193	77	
J. L. Erisey	98.3R	1-10"			16	38	22		27		103	51	
Otterson and Boggs	(9)98.6L	1-15"		400	771	600	618	512			(8) 2901		300
D. Boggs	98.8L	1-18"			46	15	16	15			92	47	
B. H. Mitchell Estate	99.0R	1-14"				NO DIVERSION							
J. P. Boggs	99.1L	1-10"		20	311	307	344	454	206		1642	52	(10)110
Terrill and Sartain	99.2L	1-20"				NO DIVERSION							
L. W. Seavers	99.3L	1-10" 1-14"		10	279	214	211	24	69	6	813	(11)262	
Helen Forry	99.8L	1-16"		167	243	57	74		6		(12) 547	32	
St. Patrick Home Ranch	101.1R	1-20"		29	72	83	72	131	91	90	568	140	
Nettie, George and Ella Packer	102.8R	1-20"			3				128	47	178	(13)210	
Charles W. Welch	103.7R	1-16"		240	669	712	802	664	360		(14)3447	75	300
C. W. Tuttle	103.9R	(15)1-16" 1-20"		685	1505	1226	1449	1219	389		6473	241	220
--MOULTON WEIR - MILE 104.0--													
I. G. Zumwalt	104.8L	1-12"			48	59				49	156	130	
Lawrence Boyd (16)	105.5L	1-10"			7	8	8	8	7		38	(17) 15	
Thousand Acre Ranch (H.W.Keller)	106.0R	1-14"		24	87	32	68				211	175	
Howell Davis	106.5R	1-16"				NO DIVERSION							
Capital Company	110.0R	1-12"		103	24	100	72			76	375	130	
I. G. Zumwalt (18)	110.7L	1-16"				72	95	111			278	46	
Capital Company	111.2R	1-6"			7	14					21	27	
--PRINCETON FERRY - MILE 112.0--													
I. G. Zumwalt (18)	112.05L	1-10"				35		36			71	60	
Reclamation District #1004	112.1L	2-30" 1-50"		3871	9524	8348	9370	8788	3422		43323		(19)5323
Princeton-Codora-Glenn I.D.	112.4R	3-24"		2747	5231	4275	4816	4782	1890	374	24115	(20)	(20)
I. G. Zumwalt	112.6L	1-10"			114	216	21	49	20	80	500	213	
Edward L. Steele Estate	115.5L	1-12"			30		17			11	58	28	
COLUSA TO BUTTE CITY													
Totals			2	9206	22863	19403	22029	20611	8374	988	103476	4361	7393
Average cubic feet per second			0	155	372	326	358	335	141	16	213		
Monthly use in per cent of seasonal				8.9	22.1	18.8	21.3	19.9	8.1	.9			

(1) Replaces 6" unit listed at this location in 1946.
(2) Operated only one unit in 1947.
(3) Acreage estimated to be same as that listed in 1946.
(4) Replaces 8" pump formerly listed at this location.
(5) No operation of 15" unit during 1947.
(6) The 8" and 12" units listed at this location in 1946 were removed.
(7) The 16" unit listed at this location in 1946 was removed.
(8) There was some exchange of water between plant at Mile 95.8L and one at Mile 98.6L.
(9) Formerly listed as Mile 98.3L.
(10) Also receives water from pump at Mile 99.8L.
(11) Includes 75 acres on Mitchell lands and 20 acres on Middlecamp lands.
(12) Also furnishes water to plant at Mile 99.1L.
(13) Also served by wells.
(14) Furnished some water to plant on Colusa Trough, Mile 11.7L.
(15) No operation of 16" unit in 1947.
(16) Previously installed, newly located.
(17) Acreage estimated by Mr. Boyd.
(18) New installation 1947.
(19) Also served by gravity from Butte Creek.
(20) See plant at Mile 154.8R.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--BUTTE CITY GAGING STATION - MILE 115.8--													
R. H. Gebicke	115.85L	1-14"			81	7	119	68	58	8	341	60	
W. F. Wright, Jr. (1)	116.7R	1-10"		3	22	32	45	12	15		129	112	
R. H. Gebicke	116.9L	1-12"				NO DIVERSION							
Miller & Wright	117.0R	1-8"				PLANT REMOVED							
Robert T. Miller	122.3R	1-10"			33	12	13	22	6		86	25	
C. T. White (C. Reed)	123.7R	1-6"			18	3	3				24	35	
Howard Leach	123.8R	(2) 1-14"				1	1		1		3	4	
Princeton-Codora-Glenn I.D.	123.9R	3-24"		1997	3800						5797	(3)	(3)
Provident Irrigation District	124.2R	1-36" 4-42"		3896	8353	994	3261	2393			18897	(3)	(3)
F. S. Reager	130.75R	1-6"				NO DIVERSION							
--ORD FERRY - MILE 130.8--													
--STONY CREEK - MILE 136.3R--													
Ed Cramer (4)	131.22L	1-6"				4	60				64	50	
M. & T. Inc. and Parrott Inv. Co.	141.5L	5-24"		703	3470	3800	6035	5040	4179		23227	1359	2268
--OLD CHICO LANDING RAILROAD BRIDGE SITE - MILE 142.1--													
Alameda Putney	143.8L	1-6"		16	22	35	60	47	19		199	35	
Edward Fiero	146.9L	1-6"				PLANT REMOVED							
C. C. Dunning	148.9R	1-10"			37	152	141	120	88		538	146	
--GIANELLA BRIDGE - U. S. BUREAU OF RECLAMATION GAGING STATION AT HAMILTON CITY - 149.5--													
Capital Company	150.0L	1-10"			18			1			19	20	
V. G. Strain	150.8R	1-12" 1-16"	32	345	35	268	332	180			1192	530	
A. Holecek	152.2R	1-6"			23	13	36	27	16	8	123	60	
Maas Brothers	154.6R	(5)1-5"			11	11	11	10	3		46	20	
Maas Brothers	154.7R	(6)1-4"				3		2			5	8	
Glenn-Colusa Irrigation Dist. (7)	154.8R	2-30" 1-42" 2-50" 2-66" 4-72" 1-100"		54815	104319	96237	106169	103077	62716	22246	(8) 549579	(9)22881	(10)39127
Jacinto Irrigation District (7)	154.8R	(11)		1904	2430	2083	2152	3451	1785		13805	8477	
Compton-Delevan Irr. District (7)	154.8R	(11)		774	3719	3729	2519	2152	1121		(12)14014		2811
Provident Irrigation District (7)	154.8R	(11)		973	3355	8253	4471	4771	3116		24939	(13)1048	(13)(14)8421
Princeton-Codora-Glenn I.D. (7)	154.8R	(11)		2713	6315	6629	11014	8370	5722	1486	42249	(15)2190	(15)3453
Maxwell Irrigation District (7)	154.8R	(11)		645	952	1785	2202	2152	1269		(16)9005	(17) 900	
Jonathan Garst	161.7L	1-12"				NO DIVERSION							
--CORNING-VINA BRIDGE - MILE 166.5--													
E. L. Dietz	166.7R	1-3"			3	4	8	7	6	1	29	8	
Guy Whitnack (Mrs.)	166.8R	1-2"			2	2	2	3	3		12	4	
--TEHAMA BRIDGE - MILE 177.5--													
E. B. Noble	184.5R	1-14"				NO DIVERSION							
Coneland Water Co.	187.6L	1-12"					122				122	(18) 115	
Henry Tieden	188.6L	1-8"		2	6	4	6	4	2	1	25	14	
--RED BLUFF BRIDGE - MILE 193.45--													

(1) Formerly listed as Butte City Ranch.
(2) Replaces 3" gas pump formerly listed at this location.
(3) See plant at Mile 154.8R.
(4) Previously operated, first listing 1947.
(5) The 4" unit moved to Mile 154.7R.
(6) Formerly listed at Mile 154.6R.
(7) This is a common point of diversion for Glenn-Colusa, Compton-Delevan, Provident, Princeton-Codora-Glenn and Maxwell Irrigation Districts.
(8) An additional 2083 acre-feet from Stony Creek in April. Includes 2926 acre-feet from gravity from Sacramento River.
(9) Includes 180 acres outside district.
(10) Includes 1598 acres outside district.
(11) Diversion through Glenn-Colusa Irrigation District plant at Mile 154.8R.
(12) Includes 774 acre-feet from controlled drains during the month of April.
(13) Combined acreage for this plant and one at Mile 124.2R, Sacramento River, and plants on Colusa Trough, Miles 20.5R, 24.2R and 27.2R.
(14) An indeterminate amount of this acreage of rice lands re-used for duck clubs.
(15) Combined acreage for this plant and ones at Miles 112.4R and 123.9R
(16) All derived from controlled drainage.
(17) All gun club lands.
(18) This acreage was total amount estimated that was flooded during July before plant shut down for season.

TABLE 93 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER - 1947

Water User	Mile and Bank above Sacramento	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
G. E. Sutton	196.2R	1-3"				NO DIVERSION							
Dave Singletary (1)	196.5L	1-2½"					1	1			2	16	
S. & E. Erickson	196.6L	1-5"	4	7	17	6	23	10	6		73	32	
A. M. Alemeida	197.0L	1-8"				NO DIVERSION							
BUTTE CITY TO RED BLUFF													
Totals			36	68793	137041	124067	138806	131920	80131	23750	704544	38149	56080
Average cubic feet per second			1	1156	2229	2085	2257	2147	1347	386	1450		
Monthly use in per cent of seasonal			0	9.8	19.5	17.6	19.6	18.7	11.4	3.4			
--RED BLUFF GAGING STATION (IRON CANYON) - MILE 198.6--													
C. C. Budd	206.75L	1-10"				NO DIVERSION							
--BEND FERRY BRIDGE - MILE 207.0--													
Emil E. Johnson	209.0L	1-2½"				NO DIVERSION							
J. F. Nunes (2)	213.0R	1-7"				NO DIVERSION							
F. L. Jelly	213.5L	1-2½"						2			2	10	
J. F. Nunes (2)	216.0R	1-3"			10	3	13	17	5		48	15	
W. A. Hunaeus	216.4L	1-3"					6	3	1		10	9	
Haakonson Bros.	217.5L	1-3⅛				43	43	2			88	55	
J. L. Haskins	218.0L	1-5"			38	40	32		9		119	50	
Rio Alto Ranch				9	167	142	244	165	156	47	930	613	
--BATTLE CREEK NEAR COTTONWOOD - MILE 221.5L--													
--COTTONWOOD CREEK NEAR COTTONWOOD - MILE 222.2R--													
--BALLS FERRY BRIDGE - MILE 224.5--													
--ANDERSON BRIDGE - MILE 232.9--													
L. C. Smith	233.0L	1-6"				NO DIVERSION							
Menzel Estate	240.2L	1-12"			91	40	130	135	50	13	459	200	
Anderson-Cottonwood Irr. Dist.	240.5L	3-16" (3)1-24"	14	806	2771	2323	2755	3268	2497	529	(4)14963	(5)16539	
--U.S. BUREAU OF RECLAMATION GAGING STATION - NEAR REDDING - MILE 240.7--													
Jack Graf	241.5L	1-8"				NO AGRICULTURAL USE							
--REDDING ALTURAS FREE BRIDGE - MILE 242.0--													
--REDDING-YREKA BRIDGE - MILE 245.9--													
Anderson-Cottonwood Irr. Dist.	246.0R	Gravity		8598	22034	20634	21556	20771	19348	5914	118855	(6)	(6)
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 246.25--													
Isabell and Maybell Diestelhorst	246.3R	1-8"		2	16	16	30	29	20		113	26	
--OLD REDDING-YREKA BRIDGE - MILE 246.4--													
City of Redding	246.7R	(7)3-8"	149	247	361	307	435	389	375	186	(8) 2449	Municipal	
--GAGING STATION AT KESWICK - MILE 250.5--													
RED BLUFF TO REDDING													
Totals			163	9662	25488	23548	25244	24781	22461	6689	138036	17517	0
Average cubic feet per second			3	162	415	396	411	403	377	109	284		
Monthly use in per cent of seasonal			0.1	7.0	18.4	17.1	18.3	18.0	16.3	4.8			
SACRAMENTO TO REDDING													
Totals			2743	167131	346326	313389	344334	326100	170785	36296	1707104	243180	247962
Average cubic feet per second			45	2809	5633	5267	5600	5304	2870	590	3513		
Monthly use in per cent of seasonal			0.2	9.8	20.3	18.4	20.2	19.0	10.0	2.1			

(1) Formerly listed as J. Keithdriber.
(2) Listed in 1946 report as J. F. Nunez.
(3) This unit has been abandoned.
(4) An additional 9 acre-feet diverted in November for stock water.
(5) Combined acreage for this plant and one at Mile 246.0R.
(6) See plant at Mile 240.5L.
(7) Formerly listed as 2-6" units. Was changed from 2-6" units to 3-8" units in 1945.
(8) Additional water diverted as follows (in acre-feet): January 190, February 133, November 177, and December 159.

TABLE 94

DIVERSIONS AND ACREAGES IRRIGATED -*COLUSA TROUGH - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
I. G. Zumwalt	(2) 2.2L	4-20"		1042	1828	1651	1192	979	841	133	7666	300	1420
J. H. Cave	2.7R(1.55W)	1-12"									(1)		
Capital Gun Club (Frank Ford)	2.7R(1.55W)	1-12" 1-14"									(1)		
Colusa Outing Club	2.7R(1.55W)	1-16"									(1)		
F. Buffum and L.W. Seavers	3.0L	2-16"	345	721	718	492	412	341	55		3084	235	40
Wierdsma Bros.	4.5L	1-12"				PLANT REMOVED							
L. W. Seavers and F.J.Byington	(3) 4.5L	3-16"		236	1349	1443	1154	1022	485		5689		860
Maxwell Irr. Dist. (Plant 2A)	7.0R	1-15" 1-26"				PLANT REMOVED							
San Rafael Land & Title Co. (Plant 3A)	Opp. 7.0R	1-16"									(1)		
Charles Welch	Opp. 7.25R	1-16"									(1)		
S. Ash	7.65R	1-10"				PLANT REMOVED							
S. Ash	8.0L	1-20"		277	885	869	755	798	363		3947		460
Charles Welch	8.0R	1-15"				NO DIVERSION							
El Dorado Sportsmans Club	9.5R	1-15"						23	650	600	1273	(4) 400	
I. G. Zumwalt	9.75L	1-24"		185	1046	954	995	1149	717		5046		427
Lloyd Kahn (5)	10.5L	1-20"			397	541	680	685	288		2591		477
Charles Welch (6)	11.7R	1-14" 2-16" 1-20"		1454	2024	2212	2504	2742	606		11542		(7) 1800
Charles Welch (6)	11.7L	1-12"		100	210	290	300	270	100		1270		200
Del Valley Farms Co. (6)	12.1R	1-10"		96	221	299	80	273	92		1061		180
E. Butler, E. Meyer and J. Jones	12.7L	1-14"							3	107	110	100	
Provident Irrigation Dist. (Delevan Pump)	Opp. 13.5R	1-20"				PLANT REMOVED							
--LATERAL HIGHWAY - BUTTE CITY TO WEST SIDE - MILE 20.5--													
Provident Irrigation Dist. (Willow Creek Plant)	Opp. 20.5R	1-24" 1-36"		208	1212	1899	1918	1673	50	122	7082	(8)	(8)
Walter McGowan	(9)Opp. 21.4R	(10)2-16"			513	521	718	751	437		2940		350
Henry Jameson Estate	22.0R	1-18"		189	757	710	795	809	298		3558		360
Provident Irrigation Dist. (Drain 55)	Opp. 24.2R	Gravity		240	2910	5400	5580	5580	3100		22810	(8)	(8)
Provident Irrigation Dist. (Drain 13)	Opp. 27.2R	1-24"		44	161	138	180	200	87		810	(8)	(8)
Totals			345	4792	14231	17419	17263	17295	8172	962	80479	1035	6574
Average cubic feet per second			6	81	231	293	281	281	137	16	166		
Monthly use in per cent of seasonal			0.4	5.9	17.7	21.6	21.5	21.5	10.2	1.2			

* Main Drain of Reclamation District #2047.
** Mileage along Colusa Trough above Colusa-Williams Highway.
(1) Formerly listed on Colusa Trough, diversions actually from controlled interior drainage channels.
(2) This is the combined plant replacing plants formerly listed at Mile 2.2L and Mile 2.3L.
(3) This is the combined plant formerly listed as separate plants at this mile in 1946.
(4) All gun club lands.
(5) Formerly listed as Ellis, Knowels and Lynn.
(6) New installation in 1947.
(7) Also receives water from plant on Sacramento River, Mile 103.7R.
(8) See plant at Mile 154.8R, Sacramento River.
(9) Mileage correction.
(10) Formerly listed as 1-10" and 1-12".

TABLE 95

DIVERSIONS AND ACREAGES IRRIGATED -*BACK BORROW PIT - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
River Farms Company	0.3L	1-10" 1-20"		1625	1859	2163	1938	2371	934	166	11056	1241	1190
--KNIGHTS LANDING RIDGE CUT JUNCTION - MILE 0.4R--													
John J. Anderson	1.4SR	2-16"		84	274	331	390	328	206		1613		281
Earl L. Wallace and Cecil Hulse	3.4R	1-16"			469	549	577	571	440		2606		320
John C. Cooling	(1) 3.8R	2-16"			890	536	499	500	391		2816		301
W. Crawford	4.35R	1-20"			976	1160	911	272			3319		450
Cornelia Walker (Heidrick Bros.)	(2) 7.2R	1-12" 1-16"		236	459	688	728	401	161		2673	100	400
George E. Youngmark	8.8R	1-14"		192	562	569	640	652	109		2724		415
Hershey Estate	11.15R	(3)1-14"		95	814	832	685	899			3325		335
Hershey Estate	11.15R	1-14" 1-16"		260	845	713	635	592	148		3193		550
Hershey Estate	13.75R	1-16"				NO DIVERSION							
C. M. Mumma	14.75R	1-10"		87	151	131	149	154	28		700	20	90
--COUNTY LINE BRIDGE - MILE 15.25--													
M. T. Emmert	15.75R	1-12"		130	348	415	535	511	84		2023		200
Kate West (H. B. West & Son)	18.1R	1-15" 1-20"				NO DIVERSION							
William West (4)	20.0R	1-15"				194					194	80	
--RECLAMATION DISTRICT 108 - GRAVITY DRAIN - MILE 20.2L--													
Gregory Estate	21.35R	1-15"				NO DIVERSION							
Bean and Brandenburg	22.15R	(5)1-12" 1-14"		218	521	595	539	635	125		2633		400
Aileen B. Armstrong	22.65L	1-16" 1-20"		700	848	992	1145	1152	330		5167		585
--GAGING STATION NEAR COLLEGE CITY - MILE 22.7--													
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 23.0--													
H. H. Balsdon	24.6L	1-16" (6)1-20"		254	537	618	662	510	197		2778	301	130
A. M. Dobrosky and Henry Olin	24.7L	(7)1-12"			2	4	3	75	60		144	160	
Gertrude M. Sherer (Mrs.) (2)	25.3L	1-16"			39	12	13	19			83	98	
--GRIMES--COLLEGE CITY CAUSEWAY (South Line of R.D. 2047)--MILE 25.5--													
Fred Schutz	25.9L	1-16" 1-20"		799	1014	1082	1154	1122	138		5309	150	500
C. W. and M. F. Struckmeyer	27.25L	1-16" 1-20"		999	1473	1618	1378	1175	557		7200	45	910
William S. Wallace Ranch	28.0R	1-12" 1-14"			279	679	530	642	329	146	2605		(8) 1347
--WALLACE CROSSING--(OLD MERIDIAN-WILLIAMS BRIDGE) - MILE 29.2--													
Sebia Davis Estate	32.5L	1-24"				NO DIVERSION							
A. Davis Estate	33.0R	1-14"			228	319	445	426	388	199	2005	(9)	(9)
Davis Estate (10)	33.5R	1-12"			159	159	159				477	(11)	(11)
Davis Estate (2)	33.7L	1-20"					23	74	30		127	(11)	(11)
Mike O'Hair (2)	34.2R	1-18" 1-20"			651	1258	1051	640	327		3927	(11)	(11)
Ord Leachman	34.25L	(12)1-12"			2	139			198		339	100	
Federal Fish and Wildlife Service	36.65R	1-15" 1-20"			365	881	860	964	992	845	4907		640
Federal Fish and Wildlife Service	37.0L	1-15"				NO DIVERSION							
--COLUSA-WILLIAMS HIGHWAY--GAGING STATION--MILE 37.0--													
Totals			0	5679	13765	16637	15649	14685	6172	1356	73943	2295	9044
Average cubic feet per second			0	95	224	280	254	239	104	22	152		
Monthly use in per cent of seasonal			0	7.7	18.6	22.5	21.2	19.9	8.3	1.8			

* 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 Gates just above junction of Borrow Pit with Sacramento River at Knights Landing.

(1) Formerly listed at Mile 2.4R.

(2) New installation in 1947.

(3) The 14" pump was removed in 1947.

(4) Formerly listed as C. R. Suggett.

(5) Newly installed unit in 1947.

(6) Did not operate 20" unit in 1947.

(7) Replaces 8" pump formerly listed for this location.

(8) Combined acreage this plant and ones at Miles 33.0R, 33.5R, 33.7R and 34.2R.

(9) See plants at--Sacramento River, Mile 78.8L and Back Borrow Pit, Mile 28.0R.

(10) See plant at Mile 28.0R.

(11) Formerly listed as J. C. Hornall.

(12) 18" unit listed at this location in 1946 was removed.

TABLE 96

DIVERSIONS AND ACREAGES IRRIGATED - KNIGHTS LANDING RIDGE CUT - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice.
E. L. Wallace	0.8R	1-16" 1-20"		466	1624	1982	1800	1762	495		8129	(1)1050	(1) 655
M. R. Richardson	0.82L	1-14"		218	582	612	720	753	232		3117		252
Ralph W. Pollock	3.5L	(2)1-12"				120	120	120	60		(3) 420	65	
--RECLAMATION DISTRICT 730 DRAIN PLANT #2 - MILE 3.8--													
Kenneth Lowe	4.5R	1-20"				NO DIVERSION							
Ralph W. Pollock	4.55L	1-12"					57	26			83	140	
Hershey Estate	4.7L	1-15"				NO DIVERSION							
John Seiber	4.7R	1-6"				15	31	8			54	20	
Layton D. Knaggs	5.75R	1-14"				NO DIVERSION							
Henry Rich	5.9L	(4)1-10" (4)1-12"		220	550	638	770	725	292		(5) 3195		180
--WEST LEVEE YOLO BY-PASS - MILE 6.3--													
Henry Rich	6.3R	Gravity				75	100	125			300	200	
E. L. Wallace	6.3R	Gravity				175	325	250			750	500	
Totals			0	904	2756	3617	3923	3769	1079	0	16048	1975	1087
Average cubic feet per second			0	15	45	61	64	61	18	0	33		
Monthly use in per cent of seasonal			0	5.6	17.2	22.5	24.5	23.5	6.7	0			

* Mileage downstream from head on Back Borrow Pit near Knights landing. 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 31.

(1) Additional water received from wells.
(2) No operation of this unit in 1947.
(3) Gravity flow only.
(4) Formerly listed as gravity flow. Pumping plant installed in 1947.
(5) An indeterminate amount of this water returned to Yolo By-Pass.

TABLE 97

DIVERSIONS AND ACREAGES IRRIGATED - YOLO BY-PASS (EAST BORROW PIT OR TULE CANAL) - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
T. S. Glide (1)	2.0S	1-20"			440	505	608	510	206		2269		225
Robert Swanston	1.8S	1-16"				NO DIVERSION							
Robert Swanston	1.1S	1-12"				NO DIVERSION							
Robert Swanston	0.7S	1-16"				NO DIVERSION							
Robert Swanston (1)	0.1S	2-16"		102	306	286	393	469	230		1786		450
--NORTH LEVEE SACRAMENTO BY-PASS - RECORDING GAGE - MILE 0.0--													
Robert Swanston	*1.8N	(2) 2-20"			746	874	931	945	151		3647		1000
Ensher, Alexander and Barsoom	2.4N	1-20"			45	9					54	*916	
Ensher, Alexander and Barsoom	3.4N	1-8"				NO DIVERSION							
Ralph Aitken	5.9N	(3) 1-12"			55	40	90	21	7		213	135	
--SACRAMENTO-WOODLAND HIGHWAY - MILE 6.18--													
--SACRAMENTO-WOODLAND RAILROAD CROSSING - MILE 6.2--													
--CACHE CREEK - MILE 7.0N--													
Frank Newman	*7.0N	1-16"				107	155	228	103		593	190	
--RECLAMATION DISTRICT 1600 DRAINAGE PLANT - MILE 10.0--													
Henry Rich (1)	10.3N	(4)2-12"		120	364	476	630	645	338		2573		220
--KNIGHTS LANDING RIDGE CUT - MILE 10.1R--													
Totals			0	222	1956	2297	2807	2818	1035	0	11135	1241	1895
Average cubic feet per second			0	4	32	39	46	46	17	0	23		
Monthly use in per cent of seasonal			0	2.0	17.6	20.6	25.2	25.3	9.3	0			

* Asterisk indicates that land irrigated is in By-Pass area.
** Mileage is given northerly or southerly from North levee of Sacramento By-Pass. Diversions from East Borrow Pit of Yolo By-Pass are primarily from water diverted through Knights Landing Ridge Cut. See Table 31.

(1) New installation in 1947.
(2) One 20" unit installed in 1947.
(3) Formerly listed as 10" unit.
(4) Only 1-12" unit operated during 1947.

TABLE 98

DIVERSIONS AND ACREAGES IRRIGATED - LOWER BUTTE CREEK AND BUTTE SLOUGH - 1947

Water User	*Mile and Bank	Number and Size of Pump	Monthly Diversions and Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
						Lower Butte Creek							
--SACRAMENTO RIVER JUNCTION - MILE 0.0--													
--BUTTE SLOUGH - MILE 0.0--													
Reclamation District #833	1.5L	1-8"				NO DIVERSION							
Reclamation District #833	2.9L	1-36"box		160	175	175	175	175	175		1035	450	
West Butte Farms Co.	3.85L	1-20"			52	201	247	176			676	410	
Reclamation District #1004	3.9R	1-20"				NO DIVERSION							
Butte Lodge Outing Club	4.0R	1-22"				NO DIVERSION							
El Anzar Duck Club	5.35L	1-12"				NO DIVERSION							
Reclamation District #1004	9.3R	1-48" Gravity		400	800	800	800	800	570		(1) 4170	(2) 1059	(2) 455
Butte Basin Gun Clubs	10.0L	Gravity							1200	1200	(3) 2400	(4) 1314	
White Mallard Duck Club	10.2R	1-36" Gravity				NO DIVERSION							
C. R. and G. T. Boyd	11.0L	1-12"				PLANT REMOVED							
L. S. Sydenstricker	12.0L	1-16"				PLANT REMOVED							
Reclamation District #1004	13.2R	Gravity		400	600	600	600	600	600	500	(1) 3900	(5)	(5)
White Mallard Duck Club	13.2R	(6)1-16"		121	5	190	154			190	660	(7) 350	
White Mallard Duck Club	13.2R	1-24"box				NO DIVERSION							
Murdock Land Company	14.4L	1-12"				NO DIVERSION							
--GRIDLEY ROAD - MILE 15.4--													
Murdock Land Company	19.3R	1-14"				NO DIVERSION							
--BIGGS-AFTON ROAD - MILE 19.4--													
Glenn Rice Farms	20.4R	1-18"		522	171	67	233	56			1049		(8) 180
H. W. McGowan	20.9R	1-16"		30	287	99	331	309	112		(9) 1168		70
H. W. McGowan	21.0R	1-16"				NO DIVERSION							
Glenn Harris	(10)21.4R	1-16"				191	121	145			457	180	
--RICHVALE-BUTTE CITY ROAD - MILE 22.5--													
McGowan Ranch	23.0R	1-20"		100	722	571	591	587	290		2861		410
						Butte Slough							
Butte Slough Irrigation Co.	0.3W	Gravity									(11)	(12)	(12)
M. Marty	0.3W	1-12"		52	50	38	50	25	37		252	75	
G.S. and D. C. Smith Estate	1.4E	1-8"				109	150	94			353	(13) 160	
--MAWSON BRIDGE - MILE 2.1--													
C. W. Rowley	2.5W	1-12"		90	22	18	19	18			167	105	
J. E. Smith	3.0W	1-10"				33					33	32	
I. E. Nall Estate	3.5W	1-10"			11	24	19	24	11		89	91	
P. A. Reische	3.7W	1-10"				NO DIVERSION							
Granniman and Feiths	4.08W	1-6"				2	2				4	6	
P. A. Reische	4.1W	1-10"		25	11	85	14	40	9		184	87	
E. V. Jacobs Estate	4.8W	1-10"			22	49	23	22	9		125	121	
Hensen and Jacobs	5.1W	1-12"		29	40	46	21	71	23		230	84	
T. J. Hageman	6.8W	3-8"				NO DIVERSION							
--OLD LONG BRIDGE - MILE 7.5 WEST--													
Totals (Lower Butte Creek and Butte Slough)			0	1929	2968	3298	3550	3142	3036	1890	19813	4524	1115
Average cubic feet per second			0	32	48	55	58	51	51	31	41		
Monthly use in per cent of seasonal			0	9.7	15.0	16.7	17.9	15.9	15.3	9.5			

* Approximate mileage from junction with Sacramento River.

(1) Partially estimated.

(2) Combined acreage for this plant and one at Mile 13.2R.

(3) Additional diversion--November 1000 acre-feet; December 800 acre-feet.

(4) Add duck club lands.

(5) See plant at Mile 9.3R.

(6) Replaces 2-10" units formerly listed at this location.

(7) Of this figure 166 acres used for duck clubs.

(8) Received some water from plant at Mile 20.9R.

(9) Furnished some water to plant at Mile 20.4R.

(10) Formerly listed as Opposite Mile 21.4R.

(11) Flow in Butte Slough, derived from Butte Creek, is controlled by Outfall Gates at its junction with Sacramento River and is thereby retained in Butte Slough to discharge into East and West Borrow Pits of Sutter By-Pass near "Long Bridge." The Outfall Gates are maintained by the Division of Water Resources and are cooperatively operated with the Butte Slough Irr. Co. See Sutter By-Pass Diversions, Table 99.

(12) See acreages under rediversion-West Borrow Pit Sutter By-Pass. A considerable additional but indeterminage 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, Table 36. See East Borrow Pit Sutter By-Pass Diversions, Table 99.

(13) Also served by wells.

TABLE 99

DIVERSIONS AND ACREAGES IRRIGATED - SUTTER BY-PASS AND SACRAMENTO SLOUGH - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
(1)				West Borrow Pit of Sutter By-Pass									
--SOUTHERN PACIFIC RAILROAD CROSSING - MILE 2.5--													
Reclamation District 1500	8.5R	1-18"				200	500	400	100		(2)1200		120
--KNIGHTS LANDING-MARYSVILLE CAUSEWAY - MILE 12.7--													
--SOUTH LEVEE TISDALE BY-PASS - MILE 18.9--													
--RECLAMATION DISTRICT 1660 GRAVITY RETURN - MILE 19.3--													
G. Guisti	23.7R	1-16"		127	438	424	438	438	212		(2) 2077	140	210
Butte Slough Irr. Co. Ltd.	25.0R	Gravity		410	373	282	392	332	109		1898	(3)	
Butte Slough Irr. Co. Ltd.	28.4R	Gravity	301	970	1405	1287	1558	1775	269		7565	(4)(5)6195	
Fred Tarke	28.6R	1-12"				80	79				(2) 159	53	
Frye Bros.	29.0R	1-7"				NO DIVERSION							
--NEW COLUSA-MARYSVILLE HIGHWAY - MILE 29.1--													
--NORTHERN ELECTRIC RAILROAD CROSSING - MILE 29.15--													
(6)				East Borrow Pit of Sutter By-Pass									
R. E. Hughes	*0.95S	1-16"		15	266	280	304	206	41		1112	310	
R. E. Hughes	*0.5N	1-14" (7)1-16"			11	56	5	28			100	200	
Cliff P. Childers	(8)1.4N (0.3)	(9)1-16"		31	29		6				66	80	
Cliff P. Childers	(8)1.4N (1.3)	1-16"		163	551	248	848	727	452		2989		270
E.H. Christensen and Son	(8)1.4N (1.3)	1-16"				NO DIVERSION							
E.H. Christensen and Son	(8)1.4N (1.75)	1-15"				NO DIVERSION							
E.H. Christensen and Son	(8)1.4N (3.3)	1-15"		88	570	692	702	690	471		3213		(10) 610
E.H. Christensen	(8)1.4N (4.0)	1-18"			904	1284	853	630	409		4080		(11)
R. E. Hughes #6	*1.5N	1-14"		85	420	463	646	661	441		2716		300
R. E. Hughes #5	*2.9N	1-14"		19	100	23	43	50			235	120	
R. E. Hughes #4	*4.0N	1-14"		93	455	453	453	547	283	92	1923	44	126
R. E. Hughes #3	*4.5N	1-14"				NO DIVERSION							
Ira Mulligan	*5.7N	1-16"				NO DIVERSION							
R. E. Hughes #2	*5.9N	(12)1-10" 1-14"		21	88	55	348	452	184		1148	160	
O. O. Orrick	7.1N	(13)1-6"		14	75	174	355	452			1070	290	
Ira Mulligan	7.1N	1-16"		42	226	352	146	271	183		1220	160	80

* Asterisk indicates area irrigated is within By-Pass area.
(1) Mileage is given northerly from drainage plant of Reclamation District 1500. Mile 9.15 West Borrow Pit is opposite Chandler.
(2) Partially estimated.
(3) See plant at Mile 28.4R.
(4) Combined acreage this plant and one at Mile 25.0R.
(5) Includes 1184 acres on Newhall Land and Farming Company land.
(6) Mileage is given northerly or southerly from Chandler.
(7) 16" unit not operated during 1947.
(8) Plant is on drain canal which enters By-Pass at this point. Figure in () indicates distance along drain from By-Pass.
(9) Formerly listed as 18" unit.
(10) Combined acreage this plant and one at Mile 1.4N (4.0).
(11) See plant at Mile 1.4N (3.3).
(12) Did not operate 10" unit in 1947.
(13) Did not operate 6" unit during 1947.

TABLE 99 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SUTTER BY-PASS AND SACRAMENTO SLOUGH - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
(1)			East Borrow Pit of Sutter By-Pass (Continued)										
Crepps and Middleton	8.4N	1-12"		183	311	402	384	342	117		1739		220
--RECLAMATION BOARD DRAINAGE PLANT #2 - MILE 10.0N--													
Crepps and Middleton (2)	Opp. 10.0N(8.6N)	1-18"				NO DIVERSION							
Martin Gun Club (3)	*10.0N	1-12"		55	270	294	301	302	110		1332		240
Sutter Home Investment Co.	*12.0N	1-12"		100	400	400	400	200	113		1613		215
Federal Fish and Wildlife Service	*16.3N	1-20"									(4)	(5) 470	
--EAST LEVEE OF WADSWORTH CANAL - MILE 16.5N--													
--RECLAMATION BOARD DRAINAGE PLANT #3 - MILE 16.5N--													
Fred S. Betty (6)	(7)16.5N(1.0R)	1-10"				NO DIVERSION							
C. C. Epperson	(7)16.5N(1.1L)	1-10"				NO DIVERSION							
F. H. Ziegenmeyer	(7)16.5N(1.35R)	1-12"		186	250	250	250	250	186		1372	30	110
A. H. Muns	(7)16.5N(1.36R)	1-12"		186	250	250	250	250	186		1372		160
Youill Joaquin	(7)16.5N(3.0L)	1-10"				NO DIVERSION							
Gilbert Williamson	(7)16.5N(3.6R)	1-10"		33	100	100	100	100	180		613	146	
Fred S. Betty (6)	(8) 16.5N	1-10"			38						38		(9) 180
Fred S. Betty	(8) 16.5N	1-16"		125	375	350	325	325	300		1800		(10)
Mrs. H.C. and C. H. Epperson (11)	(8) 16.5N	1-16"		125	375	350	325	325	300		1800		180
Meyer, Platter, Moorehead, DeWitt Bros., Epperson, and Middleton	19.1N	1-14"		27	157	487	328	362	51		1412	443	
--NEW COLUSA-MARYSVILLE HIGHWAY - MILE 19.98N--													
--NORTHERN ELECTRIC RAILROAD CROSSING - MILE 20.0N--													
			Sacramento Slough (12)										
C. F. Holmes	(12) 0.5R	1-12"				NO DIVERSION							
C. F. Holmes	(12) 1.4R	1-12"			541	555	618	609	258		2581		190
Totals			301	3098	8978	9791	11051	10460	4764	0	48443	8841	3211
Average cubic feet per second			5	52	146	165	180	170	80		100		
Monthly use in per cent of seasonal			0.6	6.4	18.5	20.2	22.8	21.6	9.9				

* Asterisk indicates area irrigated is within By-Pass.
(1) Mileage is given northerly or southerly from Chandler.
(2) Plant is on drain canal which enters By-Pass at this point. Figure in () indicates distance along drain from By-Pass.
(3) Formerly listed as Spurgeon Gun Club.
(4) Undetermined amount of gravity during December.
(5) All duck club lands.
(6) Formerly listed as Fred S. Betty Estate.
(7) Plant is on Wadsworth Canal which enters By-Pass at this point. Figure in () indicates distance up canal from By-Pass.
(8) Plant is on Poodle Creek which enters By-Pass at this location.
(9) Combined acreage this plant and one at Mile 16.5N.
(10) See plant at Mile 16.5N (Fred S. Betty).
(11) New installation 1947.
(12) Mileage is given easterly from drainage plant of Reclamation District 1500 which is at head of slough.

TABLE 100

DIVERSIONS AND ACREAGES IRRIGATED - FEATHER RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Walter Raymond	0.6R	(1)1-18"			27	52	105	172			356	300	
Henry Rutz	1.55L	1-8"				PLANT REMOVED							
Walter Raymond	2.6R	1-20" (2)1-26"				2160	1949	135			4244	885	
Johnston Bros.	3.0L	1-10"			21	84	79	90	57	3	334	(3) 146	
Ralph Taylor	5.6L	1-10"				NO DIVERSION							
A. L. Haymore	6.44L	1-10"		21	98	48	73	101	43		384	141	
M. Scheiber	7.7L	1-10"		68	149	138	135	192	67	65	(4) 814	168	
--NICOLAUS GAGING STATION - MILE 9.3--													
--NICOLAUS BRIDGE - MILE 9.4--													
Bercut Richards	9.75R	1-20"			231	268	321	428	206	118	1572	250	
--MOUTH OF BEAR RIVER - MILE 12.0L--													
Garden Highway Mutual Water Co.	13.1R	1-20" 1-24"		663	2706	2573	2831	2269	1299		12341	1226	838
Feather River Water Company	16.35R	1-14"				PLANT REMOVED							
Farm Lands Co.	17.5L	(5)1-15" (5)1-20"		658	1695	1980	1978	2014	1092		9417	465	1035
G. C. Shannon	18.75R	1-6"				PLANT REMOVED							
Oswald Water District	21.4R	1-16"		187	848	761	750	711	757	258	4272	(3) 598	
--SHANGHAI BEND GAGING STATION - MILE 23.0--													
Reclamation District #784	24.0L	1-20"				PLANT REMOVED							
Hamilton, Broberg and Stuart(6)	25.2R	1-10"				NO DIVERSION							
--MOUTH OF YUBA RIVER - MILE 27.3L--													
--FIFTH STREET HIGHWAY BRIDGE - MILE 28.0--													
--TENTH STREET HIGHWAY BRIDGE - MILE 28.2--													
A. C. Rackerby (7)	32.3R	1-10"			5	10	15				30	15	
G. D. Prindiville	33.3R	1-10"		16	52	73	115	74	10	9	349	144	
J. L. Sullivan, Jr.	33.9R	1-10"	67	21	96	148	182	9	17	19	559	150	
Sutter Butte Canal Company (Sunset Plant)	38.1R	1-26" 2-42"		541	5387	1007	2976	2857	1479		(8)14247	(9)	(9)
Matthews, Sullivan and Prindiville	(10)43.7L(0.4L)	1-18"	22	9	91	133	190	219	165		829	151	
Thomas E. Mathews	(10)43.7L(0.7L)	1-5"				PLANT REMOVED							
Mat. Thomes	(10)43.7L(1.2L)	1-8"	1	12	45	74	12	19	5	1	169	63	
Ray Washburn (11)	(10)43.7L(1.25L)	1-8"				NO DIVERSION							
A. P. Barba	47.4L	1-7"				62	25	27	2		116	40	
A. P. Barba	47.9L	1-12"			160	75	227	273	150	37	922	305	
Robert S. Biggs	48.3L	1-10"				149	56	111	53		369	280	
Edward Dunning	49.0L	1-8"		20	27	59	50	13			169	76	
--GRIDLEY BRIDGE - GAGING STATION NEAR GRIDLEY - MILE 49.7--													
Clyne Ranch	51.0R	1-6"			9	49	84	19	1		162	34	
M. A. Pedroza and Sons (12)	51.1L	1-6"		14	55	59	78	64	59	3	332	62	
Steadman Orchards (13)	51.4R	1-10"			45	87	92	112	2		338	82	
J. F. Fratus	52.1L	1-10"		7	47	32	42	43	38		209	74	
W. F. Shannon	52.5L	1-10"			11	9	21	21			62	31	
F. L. Morris	52.7L	1-8"			20	34	38	9	22		123	42	
Frank Dutra	52.9R	1-6"				PLANT REMOVED							
Ruby Chambers (Mrs.)	53.1R	1-6"		2	15	11	21	7			56	37	
Hearst Estate	55.1L	1-14"		6	187	176	245	254	180	41	1089	232	

(1) Formerly listed as 16" pump.
(2) Operated 26" unit only.
(3) Additional water from wells.
(4) Additional diversion in November for stock water.
(5) These units replace 22" unit listed at this location in 1946.
(6) Formerly listed as Nevada-California Lands, Inc.
(7) Installed in 1946. Not previously listed.
(8) Supplements the diversion at Mile 58.1R.
(9) See plant at Mile 58.1R.
(10) Plant diverts Feather River water backed into Honcut Slough. Mouth of Slough at Mile 43.7L. Distance from Feather River up Slough shown in ().
(11) Formerly listed as E. T. Washburn.
(12) Formerly listed as L. K. Ward.
(13) Formerly listed as Edward Steadman.

TABLE 100 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - FEATHER RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Lena Philips (Mrs.)	57.0L	1-7"				PLANT REMOVED							
Henry Hazelbusch	57.9R	1-9"		15	39	43	46				(1) 143	(1) 48	
Sutter Butte Canal Co.	(2) 58.1R	1-26" 2-42"		10880	47934	42984	42654	38104	26658	8991	(3) 218205	(4)16785	(4)8169
Richvale Irrigation Dist.	(2) 58.1R	Gravity		6393	28169	25260	25066	22392	15666	5284	(3)(5)128230	646	12569
Biggs-West Gridley Irr. Dist.	(2) 58.1R	Gravity		6717	29596	26540	26336	23526	16460	5552	(3)(6) 134727	4380	6668
Western Canal Company	59.7R	Gravity		3990	35062	25593	31263	30161	12673	492	(7) 139234	408	20470
--OROVILLE BRIDGE - MILE 65.0--													
--U.S.G.S. GAGING STATION - MILE 71.0--													
Totals			90	30240	152827	130731	138055	124426	77161	20873	674403	28264	49749
Average cubic feet per second			1	508	2486	2197	2245	2024	1298	339	1388		
Monthly use in per cent of seasonal			0.1	4.4	22.7	19.4	20.5	18.4	11.5	3.0			

(1) Received additional water from Sutter Butte Canal.
(2) This is a common point of diversion for the Sutter-Butte Canal Co., Richvale Irrigation District and Biggs-West Gridley water districts. Diversions are reported separately. The Sutter Butte Canal Company operates a pumping plant at Mile 38.1R.
(3) There is included in these totals 51,395 acre-feet purchased from P. G. & E. Co., however, no segregation was made between districts or companies in this table.
(4) Includes Mile 38.1R.
(5) Approximately 15 per cent of this figure received from controlled drainage.
(6) Additional water from controlled drainage.
(7) Diversions for gun clubs--492 acre-feet in October and an additional 2113 acre-feet in December.

TABLE 101

DIVERSIONS AND ACREAGES IRRIGATED - YUBA RIVER - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
--HIGHWAY 99E BRIDGE (D STREET BRIDGE) - MILE 0.0--													
--YUBA RIVER AT MARYSVILLE - GAGING STATION AT SEVENTH STREET BRIDGE - MIIE 0.9--													
Iona Davis Ray	1.6L	1-3"				15	11				26	7	
W. B. Harrington	1.8R	(1)1-6"			40	22	45	36			143	60	
W. B. Harrington (2)	2.6L	1-5"			15	13	9	10	5		52	18	
Bill Wolfe (3)	3.0L	1-10"			16	87	105	111	12		331	100	
E. O. Rubke	4.1L	1-14"			15	46	46	72	23	1	203	(4) 178	
E. O. Rubke	4.3L	1-10"			4	54	30	58	14		160	(5)	
DiGiorgio Fruit Corp.	4.75L	1-10"				NO DIVERSION							
DiGiorgio Fruit Corp.	5.3L	1-8"				NO DIVERSION							
Scott Hendricks (6)	5.9L	1-10"				PLANT REMOVED							
Scott Hendricks (7)	6.2L	1-10"				66	102	159	42		369	170	
Cordua Irrigation District	11.0R	Gravity		986	4683	5302	6222	5853	3792	2261	(8)29099	3260	(9)1640
Hallwood Irrigation District	11.0R	Gravity		2834	12543	10734	10794	12853	11689	8255	(10)69702	(11)4489	1990
Yuba Consolidated Gold Field Company	14.5L	Gravity									(12)	(12)	(12)
Totals			0	3820	17316	16339	17364	19152	15577	10517	100085	8282	3630
Average cubic feet per second			0	64	282	275	283	312	262	171	206		
Monthly use in per cent of seasonal			0	3.8	17.3	16.3	17.3	19.2	15.6	10.5			

* Approximate mileage along river above Highway "99" crossing at Marysville.

(1) Replaces 5" unit listed at this location in 1946.
(2) New installation in 1947.
(3) Formerly listed as Marysville River Farms Co.
(4) Combined acreage this plant and plant at Mile 4.3L.
(5) See plant at Mile 4.1L.
(6) Removed and replaced by new unit at Mile 6.2L.
(7) New installation replacing unit formerly listed at Mile 5.9L.
(8) Diverted additional water for gun clubs as follows--November 1666 acre-feet, December 1291 acre-feet.
(9) Includes 1005 acres for gun clubs.
(10) Diverted additional water for gun clubs as follows--November 808 acre-feet, December 1565 acre-feet.
(11) An undetermined amount of rice lands reflooded in November and December for gun clubs.
(12) No agricultural use.

TABLE 102

DIVERSIONS AND ACREAGES IRRIGATED - AMERICAN RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GARDEN HIGHWAY BRIDGE - MILE 0.2--													
--AUBURN BOULEVARD BRIDGE - 16TH STREET - MILE 1.9--													
--SACRAMENTO NORTHERN RAILROAD BRIDGE - MILE 2.0--													
--WESTERN PACIFIC RAILROAD BRIDGE - MILE 2.1--													
Sacramento Stucco Company	2.4L	1-5"		2	10	6	5	3	1	2	29	10	
North Sacramento Lands Co.	2.4R	1-6"				NO DIVERSION							
North Sacramento Lands Co.	2.55R	1-5"				NO DIVERSION							
North Sacramento Lands Co.	2.65R	1-7"				NO DIVERSION							
North Sacramento Lands Co.	2.75R	1-7"		2		4	4	4			14	7	
--SOUTHERN PACIFIC RAILROAD BRIDGE - MILE 3.5--													
C. Swanston and Sons	4.2R	1-10"		90							90	90	
C. Swanston and Sons	5.3R	1-10"				NO DIVERSION							
C. Swanston and Sons	5.5R	1-6"				NO DIVERSION							
Louis D. Carlson and John Sanberg	5.7L	(1)1-10"				PLANT REMOVED							
--GAGING STATION - AMERICAN RIVER AT SACRAMENTO - MILE 6.1--													
E. Clemens Horst Co.	6.5R	1-6"			20	36	30				86	50	
E. Clemens Horst Co.	7.5R	1-8"			19	74	28				121	100	
John I. Haas, Inc.	7.8R	1-4"	8	11	2						21	50	
Hagginbottom Land Co.	8.05R	1-10"				NO DIVERSION							
J. H. Kerby	9.0L	1-6"			19	26	34	1			80	40	
Hagginbottom Land Co.	9.2R	1-12"				NO DIVERSION							
J. G. and F. F. Dauenhauer	9.2L	1-8"			8	3					11	40	
Ruth Coleman	9.35L	1-5"				NO DIVERSION							
Ruth Coleman	9.5L	1-5"				NO DIVERSION							
Ruth Coleman	9.55L	1-5"				NO DIVERSION							
Sweem Bros. (2)	10.2R	1-6"			26	10	26	3	17	8	90	40	
Andrew C. Feige, et al. (3)	10.3L	1-10"				NO DIVERSION							
Gold Nugget Orchard Co. (Boyles)	10.4L	1-5"		8	6	9	2		3	1	29	17	
Mucke Sand and Gravel Co.	11.2L	1-6"		4	13	15	25	22	16		95	35	
J. T. Gore	11.5L	(4) 1-4"			19	20	20	55	30		144	50	
William A. Meyer	11.7L	1-4"		5	9	15	13	6	23		71	27	
H. T. Danielson	13.1R	1-5"				NO DIVERSION							
Knapp Corporation	13.3R	1-4"			8	22	28	28	12	6	104	47	
C. W. Deterding and Mrs. May McDonnell	13.9R	1-6"				23	17	10	18	20	88	37	
J. R. Deterding	15.1R	(5)1-4"			24	10	11	4	1		50	30	
Carmichael Irrigation Dist.	16.0R	1-6" 2-12"	300	300	300	840	950	950	950	200	(6)4790	(7) 3000	
Al I. Goddard	17.1R	1-6"				NO DIVERSION							
--GAGING STATION - "AMERICAN RIVER AT FAIROAKS" - FAIROAKS BRIDGE - MILE 19.2--													
Totals			308	422	483	1113	1193	1086	1071	237	5913	3670	0
Average cubic feet per second			5	7	8	19	19	18	18	4	12		
Monthly use in per cent of seasonal			5.2	7.1	8.2	18.8	20.2	18.3	18.1	4.1			

(1) This plant has been removed and land subdivided into
(2) Formerly listed as Dr. J. E. Knauss and Dr. Reiner.
(3) Formerly listed as Guy H. Roddan.
(4) 8" pump was replaced by 4" pump in 1947.
(5) 6" pump has been replaced by 4" pump.
(6) Estimated from previous year's use.
(7) Estimated irrigated suburban lands. No segregation of irrigated acreage available.

TABLE 103

DIVERSIONS AND ACREAGES IRRIGATED - OLD SAN JOAQUIN RIVER - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
Contra Costa Canal	(1) 30.5L		1286	1434	2452	2228	2979	3147	2861	1775	(2)18162	(3)	
Leo Fallman	36.4L	1-16"	6	96	103	129	141	119	108	12	714	165	
East Contra Costa I.D.	(4) 36.5L	2-18" 2-24" 2-30"		4254	7571	5381	7245	3956	2446	534	31387	16060	
Augustus Serge (6)	36.5L	2-6"	3	17	14	15	27	20	14		110	77	
Byron-Bethany Irr. Dist.	(4) 40.9L	1-24" 1-30"	106	3508	4447	3767	4127	3680	2737	889	23261	7600	
M. R. Furtado	44.8L	1-14"	7	64	152	129	200	139	72	40	803	430	
George Ray	45.3L	1-12"				NO DIVERSION							
H. Lindeman & Son	47.2L	1-12"		86	464	219	291	352	202	92	1706	(5) 480	
G. Lindeman (6)	47.2L	1-10"				NO DIVERSION							
West Side Irr. Dist.	47.65R	7-15"	1272	5994	4753	4610	5439	4610	2762	1231	(7)30671	9108	
Vance Brown	48.7L	1-12"		40	19	30	30	40	23		182	60	
Naglee Burke Irr. Dist.	50.4L	1-16" 1-18"	210	1262	1266	1254	1403	1276	1130	290	8091	2931	
Freemont Irrigation Assn.	50.9L	1-16"	32	288	167	178	289	276	113	15	1358	706	
Joe M. Freitas	51.0L	1-8"		9		6	7	7			29	35	
Attilio Casserini	51.2L	1-8"		13		17	20	18			68	36	
Excelsior Ranch #2	52.4L	1-10"		41	18	40	28	13	19		159	111	
A. L. Galli	53.0L	1-8"	1	15	9	13	222	19	7	2	88	60	
--MOUTH OF TOM PAINE SLOUGH - MILE 54.3--													
Totals			2923	17121	21435	18016	22248	17672	12494	4880	116789	37859	0
Average cubic feet per second			48	288	349	303	362	287	210	79	240		
Monthly use in per cent of seasonal			2.5	14.7	18.4	15.4	19.0	15.1	10.7	4.2			

* Distance from mouth of San Joaquin River 4⅛ miles below Antioch (mileage as established by War Department Survey of 1913-15).

(1) This is the point of diversion of the U. S. Bureau of Reclamation Contra Costa Canal at head of Rock Slough.

(2) Additional acre-feet diverted as follows: January 1571, February 1258, November 1600, December 1641.

(3) Water was used for industrial, municipal and small agricultural diversions--no segregation was made.

(4) At junction of Old River and Italian Slough. Pumping plant is located 2 3/4 miles southwest along Italian Slough and extension cut.

(5) Combined acreage this plant and G. Lindeman plant at Mile 47.2L.

(6) Formerly listed as Gus Lindeman.

(7) Includes 813 acre-feet delivered to Tracy-Clover Irrigation District to supplement the well pump supply for that district.

TABLE 104

DIVERSIONS AND ACREAGES IRRIGATED - TOM PAINE SLOUGH DELTA UPLANDS - 1947

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	June	July	Aug.	Sept.	Oct.		General	Rice
Independent Mutual W. Corp. and Company	0.7S	2-18"	10	858	349	775	710	549	582	18	3851	(1)1325	
Independent Mutual W. Corp. and Company	1.5S	1-18"		73	23	57	64	93	32		342	(2)	
George J. Lake (3)	2.1S	1-12"			89	89	89	89	89		445	178	
Holly Sugar Corporation	(4) 2.1S	(5) 1-14"		109	218	218	219	219	109		1092	546	
Tracy-Clover Irrigation District	(4) 2.1S	1-16"				NO DIVERSION						(6) 600	
Pescadero R.D. #2058 (Plant #1)	2.9S	1-12"		74	103	125	192	97	122	39	752	(7) 2629	(7) 546
Pescadero R.D. #2058 (Plant #3)	6.3S	1-12" 1-20" 1-24"	3	1513	2026	1762	2065	2101	1556	255	11281	(8)	(8)
Pescadero R.D. #2058 (Plant #5)	8.3S	1-12"	54	227	204	217	206	249	152	56	1365	(8)	(8)
Pescadero R.D. #2058 (Plant #5A)	9.0S	1-12"	7	210	124	76	190	90	174	46	917	(8)	(8)
Totals			74	3064	3136	3319	3735	3487	2816	414	20045	5278	546
Average cubic feet per second			1.2	51.5	51.0	55.8	60.7	56.7	47.3	6.7	41.2		
Monthly use in per cent of seasonal			0.4	15.3	15.6	16.6	18.6	17.4	14.0	2.1			

* 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.)

(1) This is combined acreage this plant and one at Mile 1.5S.
(2) See plant at Mile 0.7S.
(3) This plant installed in 1946, however was first listed in 1947.
(4) To junction of Tom Paine Slough and dredger cut. Pumping plant is located 1½ miles south along dredger cut.
(5) Replaces 10" and 12" units previously listed at this location.
(6) Acreage estimated--served through West Side irrigation--Old San Joaquin River, Mile 47.65L.
(7) Combined acreage for this plant and those plants at Miles 6.3S, 8.3S and 9.0S.
(8) See plant at Mile 2.9S.

TABLE 105

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER DELTA UPLANDS - 1947
(Stockton to Vernalis)

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	June	July	Aug.	Sept.	Oct.		General	Rice
--GARWOOD BRIDGE - MILE 45.3--													
Flothill Cannery Co.	45.45R	1-8"			41	26	10	59	8		144	88	
A. Jury	45.5R	1-6"	7	7	5	5	5	1			30	20	
C. R. Van Buskirk	45.6R	1-5" 1-8"	41	3	3	1	4	34	10		96	(1) 72	
C. R. Van Buskirk	46.0R	1-4"	7	7	2	15	10	26	7	4	78	(2)	
Carolyn Weston (3)	46.1R	1-3" 1-4"			3	6	15	10	4		38	28	
Carolyn Weston	46.3R	(4) 1-6" 1-10"			1	77	8	34	7		127	60	
Ivy Ranney (Mrs.) (5)	46.65R	1-4" 1-6"				NO DIVERSION							
Frank West	46.85R	1-10"		50	133	102	111	110	66	34	606	160	
Y. Takashiro	47.2R	1-6"			8	7	12	10	3		40	27	
Wolfinger Bros.	47.3R	1-10"		10	9	15	22	17	8		81	47	
Alma A. Haack	48.0R	1-14"		92		50	52	59	29		282	150	
Lee Young	48.3R	1-4½"		4	6						10	(6) 32	
Lee Young	48.5R	1-3"		5	3						8	(7)	
Joe Calcagno, et al.	48.5R	1-6"	1	39	55	38	36	24	19	3	215	(8) 193	
Dr. J. M. Carr (9)	48.55R	1-6"	3	28	10	5	3	3	2		54	8	
G. B. Figari	48.6R	1-5"				NO DIVERSION							
Calcagno Bros. (3)	48.66R	1-8"			7	62	109	88	20	40	326	(10)	
M. O. Cooper Estate	49.0R	1-10"				NO DIVERSION							
Herbert Spangenberg and S. B. Chapman (3)	49.3R	1-14"		30	57	39	64	78	65	8	341	(11)250	
Herbert Spangenberg and S. B. Chapman	49.5R	1-12"		26	23	14	27	13	16	2	121	(12)	
A. A. Rodgers	50.1R	1-10"	5	13	29	45	32	32	32	5	193	67	
--BRANDT BRIDGE - MILE 50.2--													
A. Hirata	50.4R	1-8"		15	9	20	6	15	5		70	30	
R. K. Watanabe and F. Watanabe	50.6R	1-6"	1	3		6	5	3	3		21	5	
D. Toscano	50.8R	1-6"	1	7	9	8	12	16	3		56	37	
Pastorino Bros.	51.0R	(13)1-10" 1-12"		12	52	4	64	72	16	3	223	140	
Philip Esteban	51.2R	1-12"		42	47	42	29	46	21	4	231	88	
Andrew C. Meyer	51.9R	1-8"				PLANT REMOVED							
J. Burchel (3)	52.1R	1-6"		8	31	18	49	26	11		143	50	
D. Santini	52.4R	1-5"		8	2	8	5	6	3	1	33	17	
D. J. Macedo (14)	52.65R	1-6"		57	74	16	86	39	36		308	94	
Silvia Ranch	52.8R	1-8"				PLANT REMOVED							
Joe Widner	53.2R	1-12"	25	108	106	66	149	153	71		678	260	
William Nishimura	53.4R	1-8"		15	9	8	9	13	10		64	25	
I. N. Robinson Jr., and John Domingo	53.7R	1-12"		353	319	372	342	270		36	1692	613	
R. E. Albertson	54.9R	1-10"		20	12	7	21	45	2	1	108	84	
Oakwood Stock Farm	56.0R	1-10"				NO DIVERSION							

* Distance along San Joaquin River from its mouth 4½ miles below Antioch. (Mileage as established by War Department Survey 1913-15.)

(1) Combined acreage this plant and one at Mile 46.0R.
(2) See plant at Mile 45.6R.
(3) New installation in 1947.
(4) No operation 6" unit in 1947.
(5) Formerly listed as Mrs. Ivy Rainey.
(6) Combined acreage this plant and one at Mile 48.5R (Lee Young).
(7) See plant at Mile 48.3R.
(8) Combined acreage this plant and one at Mile 48.66R
(9) Formerly listed as F. Piccardo, Dr. Carr and A. Calcagno.
(10) See plant at Mile 48.5R., Joe Calcagno, et al.
(11) Combined acreage this plant and one at Mile 49.5R.
(12) See plant at Mile 49.3R.
(13) 10" pump is temporary unit.
(14) Formerly listed as Silvia Ranch.

TABLE 105 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER DELTA UPLANDS - 1947
(Stockton to Vernalis)

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	June	July	Aug.	Sept.	Oct.		General	Rice
--JUNCTION WITH MIDDLE RIVER - MILE 56.2L--													
Oakwood stock Farm	57.0R	1-14"	72	180	151	294	317	328	127	67	1536	385	
James Tobin	57.15R	1-7"		63	4	36	51	42			196	41	
Frank DeWar, et al.	57.38R	1-4"				NO DIVERSION							
G. Gardella & Company	57.5R	1-4"	11	5	3	3	5	2	2		31	19	
A. Queirolo	57.65R	1-2½"	1	1							2	2	
A. Queirolo	58.6R	1-3"		3	1						4	8	
R. Mauro	58.7R	1-4"			1	3	2	1	1		8	10	
Del Osso Bros.	58.8L	1-15"	35		20	108		91			254	360	
--MOSSDALE BRIDGE - RECORDING GAGE - MILE 58.9--													
C. C. Abersold	59.25R	1-6"		15	31	18	38	38	16	6	162	80	
H. A. Neistrath	59.3R	1-15"		221	194	177	270	236	133	101	1332	130	
G. Giovacchini (1)	59.5L	1-10"		62	89	89	36	103	105		484	165	
H. A. Neistrath	60.1R	1-6"		25	31	24	43	37	31	4	195	50	
Wendler (Mrs.)	60.5L	1-12"		118	172	78	61	87	58		574	165	
Wendler (Mrs.)	61.3L	1-8"		38	55	25	20	28	18		(2) 184	56	
A. A. Jensen	62.0L	1-12"	77	7	29	48	38	29	8		236	94	
Paradise Mutual Water Co.	62.2L	1-20"		503	492	597	540	630	431		3193	750	
--PARADISE DAM - (HEAD OF PARADISE CUT) - MILE 62.6L--													
Dethlefsen Bros.	62.75L	1-10"				12					12	12	
Dethlefsen Bros.	63.0L	1-18" 1-20"		593	1034	689	729	1161	478	11	4695	1295	
Manuel Brazil	66.7L	(3)3-8"		10	236	63	101	114	91		615	140	
Banta-Carbona Irr. Dist.	67.5L	2-20" 3-24" 1-36"	5035	10245	9162	7214	10570	9260	5205	1466	(4)58157	(5)16798	
Bradford S. Crittenden	70.0L	1-6"		50	57	55	95	66	64	17	404	115	
J. Y. Matsumoto	70.5L	1-10"		10	51		43	27	32		163	125	
Reclamation District #2075	71.0R	1-16"		127	1025	723	830	773	297		(6)3775	1347	
H. J. Mortensen, Borges and Whitman	73.2R	1-12"		85	161	148	211	217	69	2	893	235	
San Joaquin River Club	75.10L	2-6"		35	112	140	134	126	151	238	(7) 936	50	
A. J. Chisholm	78.9R	1-10"					23				(2) 23	45	
Totals			5322	13358	14176	11626	15454	14698	7794	2053	84481	25122	0
Average cubic feet per second			87	224	231	195	251	239	131	33	174		
Monthly use in per cent of seasonal			6.3	15.9	16.7	13.8	18.3	17.4	9.2	2.4			

* Distance along San Joaquin River from its mouth 4⅛ miles below Antioch. (Mileage as established by War Department Survey 1913-15.)

(1) Formerly listed as E. J. Rossi.
(2) Partially estimated record.
(3) 2-8" units newly installed in 1946.
(4) An additional 40 acre-feet diverted in November.
(5) Includes the following acreages outside district: Kasson District--2170 acre-feet; outside contracts--220 acre-feet.
(6) Additional water received from adjacent slough on these lands.
(7) Additional acre-feet diverted as follows: January - 174; February - 25, November - 147; December - 178.

TABLE 106

DIVERSIONS AND ACREAGES IRRIGATED - SAN JOAQUIN RIVER - 1946
(Vernalis to Fremont Ford Bridge)

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	June	July	Aug.	Sept.	Oct.		General	Rice
--U.S.G.S. GAGING STATION - SAN JOAQUIN RIVER NEAR VERNALIS - MILE 76.7--													
--STANISLAUS RIVER - MILE 79.7R--													
--MAZE ROAD BRIDGE - MILE 81.85--													
W. C. Blewett Estate	81.95L	3-12"	139	438	265	296	374	370	170	157	(1) 2209	620	
El Solyo Ranch Company	82.0L	1-12" 3-18"	2108	3439	4469	3676	4347	3926	2577	691	(2)25233	3313	544
--GAGING STATION - SAN JOAQUIN RIVER AT HETCH HETCHY WATER SUPPLY CROSSING - MILE 82.65--													
--TUOLUMNE RIVER - MILE 91.0R--													
West Stanislaus Irr. Dist.	91.8L	3-26"	5881	14259	12177	11874	15416	13974	6964	1215	(3)81760	(4)22285	
J. B. Erkenbrecher #1	(5)91.8L	1-14"				NO DIVERSION							
Frank Sarmento (Mr. & Mrs.)	(5)91.8L	(6) 2-16"		484	243	327	374	128	439	113	2108	925	
J. B. Erkenbrecher #3	(5)91.8L	1-16"	7	31	65	44	67	74	39	8	335	75	
Rancho Dos Rios (7)	95.8R	1-10"	77	55	214	228	274	46	36	8	938	235	
--LAIRD SLOUGH BRIDGE - GAGING STATION - SAN JOAQUIN RIVER NEAR GRAYSON - MILE 96.05--													
Rancho El Pescadero	98.9L	1-18"	95	519	626	459	507	448	265	132	(8) 3051	750	
--PATTERSON BRIDGE - MILE 104.4--													
Patterson Water Company	104.4L	1-14" 1-18" 3-20" 1-26"	3247	9848	7801	8360	10586	6466	5486	125	(9) 51919	(10)13443	160
Chase Brothers (11)	104.5R	1-10"		213	251	158	224	254	280	258	1638	150	
M. L. Simmons (12)	104.52L	1-5"	3	2	5	6		5	1	1	23	9	
Patterson Ranch Company	109.9L	1-12" 3-16"		2077	1653	1889	1459	1738	754	257	(13)9827	505	651
Roy Ustick	112.55R	1-16"	43	149	149	181	199	176	133	53	1083	345	
--CROWS LANDING BRIDGE - MILE 113.4--													
Laura C. Johnson	113.5R	1-10"				PLANT DISMANTLED (14)							
A. J. Silveria	113.85R	1-6"				NO DIVERSION							
A. J. Silveria	114.35R	1-8"	6	7	17	6	13	16	12	1	(15)78	24	
Stewart C. Galt	114.63R	1-8"	14	17	38	7	42	45	23	19	205	60	
G. L. Dutcher (16)	115.05R	1-10"				33	23	22	20		98	27	
L. B. Crow	116.05L	1-14"	24	73	61	138	150	105	104	11	666	200	
Howard Bell	116.95R	1-12"	14	34	38	43	24	19	15		187	110	
--MERCED RIVER SLOUGH - MILE 122.2R--													
--U.S.G.S. GAGING STATION - SAN JOAQUIN RIVER NEAR NEWMAN - MILE 123.7--													
--MERCED RIVER - MILE 123.75R--													
--FREMONT FORD BRIDGE - GAGING STATION - MILE 129.5--													
Totals			11658	31645	28072	27725	34079	27812	17318	3049	181358	43076	1355
Average cubic feet per second			190	532	457	466	554	452	291	50	374		
Monthly use in per cent of seasonal			6.4	17.5	15.5	15.3	18.8	15.3	9.5	1.7			

*Mileage along San Joaquin River from its mouth 4⅛ miles below Antioch. (Mileage established by War Department Survey of 1913-15.)

(1) Received an additional 50 acre-feet from plant at Mile 82.0L in May.
(2) Furnished 50 acre-feet to plant at Mile 81.95L. Additional water diverted: January - 194 acre-feet, February 474 acre-feet.
(3) Diverted 312 acre-feet in February, 233 acre-feet in November and 131 acre-feet in December.
(4) Approximately 1540 acres of this land was double-cropped. However, the double cropped acreage listed once.
(5) Pump is on cut leading to West Stanislaus Irrigation District plant.
(6) Formerly listed as 2-14" pumps.
(7) Formerly listed as Dos Rios Ranch.
(8) Additional water diverted in November - 1 acre-foot.
(9) Additional water received from Patterson Ranch Company.
(10) Approximately 216 acres of this figure double-cropped. However, the double-cropped acreage listed once.
(11) Formerly listed as Silva and Freitas Ranch.
(12) Formerly listed as L. W. Long.
(13) Furnished some water to plant at Mile 104.4L.
(14) Replaced by plant at Mile 114.63R.
(15) Additional water diverted in February - 3 acre-feet.
(16) Reinstallation at old point of diversion.

TABLE 107

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1947
FREMONT FORD TO FRIANT DAM

Table Extended on Opposite Page

(The following table arranged from data furnished by U. S. Bureau of Reclamation.)

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	--FREMONT FORD BRIDGE - GAGING STATION - MILE 129.5 ABOVE MOUTH--							1
2	Arch Stevinson	133.76R	(1)	0	0	0	0	2
3	--DELTA BRIDGE - GAGING STATION - 158.7 ABOVE MOUTH--							3
4	Erreca Farms	161.4R	(2)1-14"	0	0	0	89	4
5	Erreca Farms	161.9R	(3)1-18"	0	0	156	188	5
6	Erreca Farms	(5)163.6R	Gravity	NO DIVERSION				6
7	D. L. McNamara	(6)163.6R	(7)1-16"	0	0	36	75	7
8	--GAGING STATION - NEAR EL NIDO - MILE 168.0--							8
9	--GAGING STATION - NEAR DOS PALOS - MILE 186.0--							9
10	San Luis Canal Co.	(8)186.6L	Gravity	0	329	9033	16312	10
11	Allen Sapiro	194.83R	1-6"	PLANT REMOVED				11
12	--FIREBAUGH BRIDGE - MILE 198.4--							12
13	Ivan N. Zaninovich	205.11L	(10)1-6"	0	0	0	4	13
14	Ivan N. Zaninovich	205.33L	(12)1-7"	0	0	5	0	14
15	Ivan N. Zaninovich	205.59L	(13)1-5"	0	0	0	4	15
16	Antone Zaninovich	206.02R	1-4"	0	0	0	1	16
17	--GAGING STATION - NEAR MENDOTA - MILE 206.2--							17
18	--MENDOTA DAM - MILE 208.63 ABOVE MOUTH AND MILE 61.0 BELOW FRIANT DAM (14)--							18
19	San Joaquin Canal Co. (15)	(16)208.63	Gravity	3090	7337	33400	71942	19
20	Firebaugh Canal Co.	(16)208.63	2-24" 2-36" 1-42"	10	1884	9017	10808	20
21	Grasslands Water Association	(16)208.63	Gravity	0	0	0	401	21
22	Dr. E. L. Mott (18)	(16)208.63	Gravity	0	0	0	456	22
23	Panoche Water (19)	(16)208.63	Gravity	0	0	0	0	23
24	Sam Hamburg (20)	(16)208.63	Gravity	0	0	0	0	24
25	--FRESNO SLOUGH - MILE 208.91--							25
26	James M. Theusen	(21)217.0L	Gravity	0	0	0	0	26
27	Charles Gotfried (23)	(21)217.0L	Gravity	0	0	446	1603	27
28	--LONE WILLOW SLOUGH - MILE 219.8R ABOVE MOUTH--							28
29	Columbia Canal Co.	219.8R	Gravity	1059	292	5040	6151	29
30	Breakwater Duck Club	(25)219.8R	Gravity	0	0	0	0	30
31	Dave Hay	(26)219.8R	Gravity	0	0	0	0	31
32	Ray Flanagan	(26)219.8R	Gravity	0	0	508	4510	32
33	W. P. Roduner	219.8R	Gravity	DIVERSIONS DISCONTINUED DURING 1947				33
34	Joe S. Perry	219.8R	Gravity	DIVERSIONS DISCONTINUED DURING 1947				34
35	--GAGING STATION - AT WHITEHOUSE - MILE 219.83 ABOVE MOUTH--							35
36	Aliso Water Association	(28)226.2R	Gravity	549	204	252	4931	36
37	R. E. Jones	232.65L	1-6"	NO DIVERSION				37
38	--HEAD OF GRAVELLY FORD CANAL - MILE 232.8R ABOVE MOUTH--							38
39	Gravelly Ford Water Ass'n. (29)	232.8R	Gravity	0	0	236	984	39
40	William Bucknoff	233.66R	1-6"	0	3	4	25	40
41	W. A. Kochergen	234.00R	1-7" 1-6"	NO DIVERSION				41
42	M. Nazaroff	234.62L	1-5"	0	0	0	0	42

* Mileage listed are miles above mouth of San Joaquin River.
(1) Size of unit not listed.
(2) Replaced 8" pump March 1947.
(3) Replaced 10" pump December 1947.
(4) Pumped drainage water in August, September and November.
(5) Head of East Side Canal. Point of diversion is siphon in E. S. Canal 0.3L below Head.
(6) Pump located below East Side Canal 1.4R below Head. Major source of water was Sand Slough joining East Side Canal at 1.0R below Head.
(7) Replaced 14" pump March 1947.
(8) This is at Head of Temple Slough.
(9) Includes some double cropping and interplanting.
(10) Formerly located at mile 206.0L.
(11) Acreage combined under plants at mile 205.11L, 205.33L and 205.59L.
(12) Installed March 1947.
(13) Installed March 1947.
(14) Mouth of Cottonwood Creek is 0.1 miles below Friant Dam.
(15) Includes Main Canal, Helm Canal, Outside Canal and Helm Ditch. Excludes diversions through Outside Canal to Dr. E. L. Mott and Panoche Water Distribution Association. Also excludes Sam Hamburg's diversions from June 15 through September 15.
(16) Point of delivery is considered to be Mendota Pool.
(17) Scattered flooding of grazing land and duck ponds.
(18) Rediverted from Outside Canal by means of 2-12" pumps on intake channel at mile 18.24L below Head and 2-12" pumps on intake channel at mile 19.24L below Head. Plants installed in 1947.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
1											
2	0	0	0	12	10	35	12	8	77	20	0
3											
4	35	82	104	11	0	0	0	0	321	60	0
5	62	0	0	29	12	0	4	0	(4)451	500	0
6											
7	55	42	136	89	54	0	0	0	447	60	0
8											
9											
10	17296	18040	22395	22449	14648	9257	6274	3763	139796	(9)33326	0
11											
12											
13	0	1	2	2	0	0	0	0	9	(11) 45	0
14	0	5	4	4	0	0	0	0	18	(11)	(11)
15	8	0	8	10	2	0	0	0	32	(11)	(11)
16	0	0	1	1	0	0	0	0	3	10	0
17											
18											
19	67435	66614	82252	75030	47914	15527	6024	4664	481229	(9)125520	6233
20	9273	8793	9231	8787	5423	1500	2517	1900	69143	(9) 21585	2550
21	5529	4223	2696	96	5629	22458	4260	9442	54734	(17)70000	0
22	640	637	690	552	0	13	205	0	3193	1484	400
23	76	133	364	841	4258	6017	3677	231	15597	22338	0
24	0	998	2348	1628	694	0	0	0	5668	5940	0
25											
26	0	0	0	0	0	238	6	8	252	(22) 60	0
27	0	0	0	0	0	0	0	0	2049	(24)2500	0
28											
29	3771	4780	5528	5629	4084	3396	1765	522	42017	(9)16326	180
30	0	0	0	0	22	226	4	65	317	(22) 90	0
31	464	2079	276	0	0	0	0	0	2819	(27)4600	0
32	2432	1785	2251	3326	988	0	0	337	16137	4070	1200
33											
34											
35											
36	3094	585	317	190	173	643	567	337	11842	(24)25000	0
37											
38											
39	0	0	0	0	0	0	0	0	1220	(30)	0
40	52	35	28	21	41	18	0	0	227	60	0
41											
42	0	3	19	0	0	3	1	0	26	(31) 30	0

(19) Rediverted from Outside Canal by means of 3-30" and 1-24" pumps on intake channel at mile 23.58L below Head. Plant installed in 1947.
(20) Rediverted from Outside Canal by means of 3-24" pumps on intake channel located at mile 25.75L below Head. One new pump installed in 1947. Except for June 15--September 15 period, water was received from San Joaquin Canal Co.
(21) Head of Mowry Canal.
(22) Duck ponds.
(23) Formerly listed as Fresno Ranch.
(24) Scattered flooding of grazing land.
(25) Point of rediversion is on Lone Willow Slough at mile 2.2R below Head.
(26) Delivery is through Chowchilla Canal rediverting from Lone Willow Slough 2.3R miles below Head.
(27) Scattered flooding of grazing land. This is total acreage owned, but number of acres flooded is not known.
(28) Head of Aliso Canal.
(29) Formerly listed as El Peco Ranch.
(30) No acreage listed. Practically all water diverted was lost by seepage in transit.
(31) Additional water received from Fresno Irrigation District.

TABLE 107 (CONT'D)

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1947
FREMONT FORD TO FRIANT DAM

Table Extended on Opposite Page

(The following table arranged from data furnished by U. S. Bureau of Reclamation.)

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversion in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
43	E. Areta	234.68L	1-4"	0	0	4	0	43
44	Wheeler	(2)235.021S	(3)	DOMESTIC USE (INCLUDING FAMILY GARDEN)				44
45	J. A. Kochergen	235.03R	1-5"	NO DIVERSION				45
46	G. V. Hart	235.03L	1-3"	NO DIVERSION				46
47	E. F. Carlson	235.43R	1-5"	0	0	16	17	47
48	Madera Irrigation District (Wm. Talmasoff)	236.28R	1-6"	INCLUDED IN MADERA IRRIGATION DISTRICTS DIVERSIONS AT MILE 270.13				48
49	Morello Winery	237.33L	1-8"	0	0	146	69	49
50	Anna E. Beatty	237.43L	(5)1-6"	0	0	0	0	50
51	J. Peterson	237.98R	1-6"	0	0	18	12	51
52	--SKAGGS BRIDGE - MILE 238.18 ABOVE MOUTH--							52
53	D. Verduzco	239.45R	1-6"	0	0	0	0	53
54	Scheidt	239.79L	(3)	PLANT REMOVED				54
55	--BOWSER RECORDER STATION - MILE 242.41L ABOVE MOUTH--							55
56	G. D. Maneely	242.71L	(3)	PLANT REMOVED				56
57	P. J. Vincent	243.84R	(6)1-6" 1-6"	0	0	24	67	57
58	Lionel Steinberg	244.86L	1-7"	0	0	0	20	58
59	C. L. Hammer	245.36R	1-6"	0	0	42	58	59
60	Lionel Steinberg	245.81L	1-6"	0	0	0	0	60
61	Josephine Jasper	246.15L	1-5"	0	0	0	0	61
62	Josephine Jasper	246.34L	1-8"	0	0	0	19	62
63	J. Reed	246.73L	1-5"	0	0	7	19	63
64	Mike Jura	246.98L	1-4"	0	0	0	28	64
65	Brockway	247.33R	(3)	NO DIVERSION				65
66	--HERNDON BRIDGE - MILE 247.38 ABOVE MOUTH--							66
67	Sam Deanda	247.50R	1-5"	0	0	0	5	67
68	Frank, James & Adolph Oberti	247.64R	1-5"	0	0	29	70	68
69	Frank, James & Adolph Oberti	247.65R	1-4"	0	0	0	24	69
70	San Joaquin Light & Power Company	247.82R	1-3"	0	0	10	10	70
71	--HERNDON RECORDER STATION - MILE 248.31L ABOVE MOUTH--							71
72	Bud Bradburn	248.51L	1-3"	0	0	8	1	72
73	John Danisi	248.72L	1-5"	0	0	35	7	73
74	--SANTA FE RAILROAD CROSSING - MILE 249.23 ABOVE MOUTH--							74
75	Moosios, Moosios & Valhas	249.51R	1-4"	0	0	0	1	75
76	Moosios, Moosios & Valhas	250.56R	1-6"	0	0	1	58	76
77	Moosios, Moosios & Valhas	250.76R	1-7"	0	0	0	0	77
78	H. Jackson	250.88L	(3)	PLANT REMOVED				78
79	D. M. Fulsom	251.19L	1-4"	NO DIVERSION				79
80	Sandstone Land & Cattle Company	251.46L	(9)1-5"	0	0	3	8	80
81	W. A. McGillivary	(10)251.83L	(3)	NO DIVERSION				81
82	W. A. McGillivary	(10)251.93L	(3)	NO DIVERSION				82
83	West Coast Life Insurance Company	(10)252.03L	(3)	NO DIVERSION				83
84	Geo. F. Seeman	252.79L	1-5"	NO DIVERSION				84

(1) Additional water received from Fresno Irrigation District.
(2) Point of diversion and place of use is on island in midstream.
(3) Size of unit not listed.
(4) Estimated.
(5) Listed in 1946 as 4" pump.
(6) Installed June 1947. Two 6" pumps now at this location on same meter.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
43	1	1	8	0	5	0	0	0	19	(1) 20	0
44										(4) 1	0
45											
46											
47	45	40	54	42	35	4	0	0	253	52	0
48											
49	101	136	221	202	27	0	105	118	1125	(1) 244	0
50	0	1	1	0	0	0	0	0	2	1	0
51	17	55	62	18	9	0	0	0	191	83	0
52											
53	0	13	12	31	46	0	0	0	102	39	0
54											
55											
56											
57	40	56	105	61	58	8	0	0	419	146	0
58	41	15	57	0	0	0	0	28	161	(1) 140	0
59	91	83	86	36	38	19	5	0	458	84	0
60	0	13	0	0	0	0	0	0	13	35	0
61	2	1	0	0	0	0	0	0	3	15	0
62	23	0	2	0	0	0	0	0	44	(7) 8	0
63	5	10	20	8	10	9	0	0	88	90	0
64	24	23	0	0	0	0	0	0	75	30	0
65											
66											
67	3	7	3	0	0	0	0	0	18	8	0
68	52	43	49	45	42	29	0	0	359	(8) 111	0
69	4	0	3	2	2	0	0	0	35	(8)	
70	19	18	24	23	16	8	0	0	128	30	0
71											
72	8	6	15	6	3	0	0	0	47	20	0
73	27	32	13	8	5	0	0	0	127	40	0
74											
75	4	1	0	0	0	0	0	0	6	21	0
76	50	27	63	37	69	1	0	0	306	34	0
77	0	4	0	7	4	0	0	0	15	3	0
78											
79											
80	0	0	0	0	0	0	0	0	11	15	0
81											
82											
83											
84											

(7) Additional water can be obtained from wells and from Fresno Irrigation District.
(8) Acreage combined under plants at mile 247.64R and 247.65R.
(9) Listed in 1946 as 4" pump.
(10) Plant located on river slough.

TABLE 107 (CONT'D)

DIVERSIONS AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1947
FREMONT FORD TO FRIANT DAM

Table Extended on Opposite Page

(The following table arranged from date furnished by U. S. Bureau of Reclamation.)

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
85	D. M. Fulsom (1)	253.10L	(2)1-4"	0	0	0	0	85
86	D. M. Fulsom (1)	253.38L	1-5"		NO DIVERSION			86
87	Fred Russell	253.79R	1-6"	0	0	2	12	87
88	Howard & Epperson	254.57R	(4)		NO DIVERSION			88
89	Howard & Epperson	254.82	1-5" 1-6"		NO DIVERSION			89
90	Bullard Ranch	254.98L	1-7"	0	0	41	98	90
91	War Dads Memorial (5)	255.05L	1-4"		NO DIVERSION			91
92	McEacherm & Larson	(6)254.98IS	1-5"		NO DIVERSION			92
93	McEacherm & Larson	(6)255.28IS	1-5"		NO DIVERSION			93
94	McEacherm & Larson	(6)255.33IS	1-5"		NO DIVERSION			94
95	McEacherm & Larson	255.34R	1-7"	0	0	11	10	95
96	McEacherm & Larson	(6)255.84IS	1-6"	0	0	20	39	96
97	McEacherm & Larson	255.84R	1-5"		NO DIVERSION			97
98	McEacherm & Larson	256.40R	(7)1-5"	0	0	0	0	98
99	McEacherm & Larson	256.52R	1-5"		NO DIVERSION			99
100	W. W. Pitman	256.60R	1-5"	0	0	0	10	100
101	Richard Holland	257.09L	1-7"		NO DIVERSION			101
102	Richard Holland	257.70L	1-8"	0	0	20	58	102
103	L. D. Cobb	258.08R	1-7"	0	0	0	33	103
104	--NEW LANES BRIDGE - MILE 258.33 ABOVE MOUTH--							104
105	R. J. Curtis	258.39L	1-7"	0	0	0	0	105
106	W. E. Roberts (9)	258.50L	1-4"	0	0	0	0	106
107	W. E. Roberts (9)	258.66L	(11)1-24"	0	0	0	0	107
108	W. E. Roberts (9)	258.80L	(12)1-6"	0	0	0	0	108
109	--LANES BRIDGE RECORDER STATION - MILE 258.93L ABOVE MOUTH--							109
110	W. E. Roberts (9)	259.07L	1-8"		NO DIVERSION			110
111	J. E. Cobb	259.30R	(4)		NO DIVERSION			111
112	J. E. Cobb	259.39R	1-7"	2	2	4	34	112
113	--SITE OF OLD LANES BRIDGE - MILE 259.78 ABOVE MOUTH--							113
114	Marjorie E. Sims (14)	259.80L	(15)1-6"	0	0	4	3	114
115	R. C. Arnold	261.53R	1-6"	0	0	0	85	115
116	E. G. Rank	(16)262.07IS	1-6"		NO DIVERSION			116
117	Isabel Burnham	262.13R	1-6"		NO DIVERSION			117
118	D. M. Fulsom	262.27L	1-7"	0	0	15	123	118
119	R. W. Fewel	262.43L	1-5"	0	0	0	13	119
120	E. G. Rank	262.48L	1-5"	0	0	0	22	120
121	Richard Holland	262.66R	1-7"	0	13	42	53	121
122	Isabel Burnham	263.40R	1-7"	0	0	0	0	122

(1) Formerly listed as West Coast Life Insurance Company.
(2) Listed in 1946 as 6" pump.
(3) Double cropped - Tomatoes and Sudan grass.
(4) Size of unit not listed.
(5) Formerly listed as Fresno State College.
(6) Point of Diversion and place of use is on island in midstream.
(7) Installed in 1947. Replaces 5" pump formerly at same location.
(8) Includes 8 acres of cotton irrigated by J. E. Cobb pump at mile 259.39R.
(9) Formerly listed as Geo. E. Howe.
(10) Acreage combined under plants at Miles 258.50L, 258.66L and 258.80L.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
85	1	2	2	1	1	0	0	0	7	(3)10	0
86											
87	4	18	5	11	4	2	0	0	58	23	0
88											
89											
90	86	54	110	0	2	0	0	0	391	47	0
91											
92											
93											
94											
95	0	0	9	0	0	0	0	0	30	63	0
96	38	43	44	38	42	1	0	0	265	17	0
97											
98	0	28	61	0	0	0	0	0	89	40	0
99											
100	19	22	26	24	17	1	0	0	119	38	0
101											
102	20	0	35	16	28	6	0	0	183	30	0
103	23	31	14	34	10	0	0	0	145	(8)90	0
104											
105	0	21	25	12	30	7	0	0	95	25	0
106	0	3	1	9	7	0	0	0	20	(10)60	0
107	0	20	7	52	23	4	0	0	106	(10)	
108	0	12	7	1	0	0	0	0	20	(10)	
109											
110											
111											
112	15	53	39	57	31	14	0	0	251	(13)38	0
113											
114	0	27	29	78	21	0	0	0	162	43	0
115	0	0	77	85	43	0	0	0	290	98	0
116											
117											
118	149	115	187	139	67	4	0	0	799	(17)245	0
119	30	36	47	28	26	0	2	0	182	(18)72	0
120	34	30	41	23	30	0	0	0	180	(19)22	0
121	61	59	56	62	31	38	27	2	444	96	0
122	123	188	153	127	75	0	0	0	666	60	0

(11) Installed in 1947. Replaces 5" pump formerly at same location.
(12) Installed in 1947. Replaces 6" pump formerly at same location.
(13) Does not include 8 acres of cotton belonging to L. D. Cobb irrigated by this pump.
(14) Formerly listed as J. C. Cobb.
(15) Installed October 1946. Replaces 5" pump formerly at same location.
(16) Point of diversion and place of use is on island in midstream.
(17) Additional water received from wells.
(18) Additional water received from E. G. Rank pump at mile 262.48L.
(19) Does not include additional acreage of F. W. Fewel served by this pump.

TABLE 107 (CONT'D)

DIVERSION AND ACREAGE IRRIGATED - UPPER SAN JOAQUIN RIVER - 1947
FREMONT FORD TO FRIANT DAM

Table Extended on Opposite Page

(The following table arranged from data furnished by U. S. Bureau of Reclamation.)

Item No.	Name	*Mile and Bank	No. and Size of Pump	Monthly Diversion in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
123	Isabel Burnham	263.42R	1-6"		NO DIVERSION			123
124	H. W. Ball	263.63L	(1)		GRAVEL WASH WATER			124
125	H. W. Ball	264.08L	1-10"		NO DIVERSION			124
126	W. F. Ball	264.83L	(2)1-4"	0	0	0	16	126
127	V. D. Roullard	265.40L	1-4"	0	0	0	5	127
128	B. B. Durando	267.56L	1-6"	0	0	0	34	128
129	--BELOW FRIANT GAGING STATION - MILE 268.13L ABOVE MOUTH--							129
130	--FRIANT BRIDGE - MILE 268.88 ABOVE MOUTH - MILE 0.65 BELOW MOUTH OF COTTONWOOD CREEK AND MILE 0.75 BELOW FRIANT DAM--							130
131	Wishon Watson Company	269.18R	1-5"	0	0	0	49	131
132	Wishon Watson Company	269.20R	(1)		PLANT REMOVED			132
133	--COTTONWOOD CREEK - MILE 269.53R							133
134	FREMONT FORD TO FRIANT DAM							134
135	Totals			4710	10064	58635	119674	135
136	Average Cubic Feet Per Second			77	181	954	2011	136
137	Monthly Use in % of Seasonal			0.5	1.2	6.8	14.0	137
138	Madera Irrigation District	269.63R	(3)Gravity	0	0	3318	14348	138
139	C. L. Fluto	269.13R	REDIVERSION FROM MADERA CANAL DISCONTINUED DURING 1947					139
140	--FRIANT DAM - MILE 269.63 ABOVE MOUTH OF SAN JOAQUIN RIVER AND 0.1 MILE ABOVE MOUTH OF COTTONWOOD CREEK--							140

(1) Size of unit not listed.
(2) Installed March 1947. Replaces 7" pump formerly at same location.
(3) Point of delivery is considered to be at "Canal Side". Points of diversion are at Hildreth Creek Turnout Mi. 13.1L, Fresno River Wasteway Mi. 18.8L, Dry Creek Mi. 24.2L, Berenda Creek Mi. 30.4L and Ash Slough Mi. 35.6L. All mileage listed above are below Head of Madera Canal.

TABLE 108

DIVERSIONS AND ACREAGE IRRIGATED - FRESNO SLOUGH AND FRESNO SLOUGH BY-PASS* - 1947

Table Extended on Opposite Page

(The following table arranged from data furnished by U. S. Bureau of Reclamation.)

Item No.	Name	**Mile and Bank	No. and Size of Pump	Monthly Diversions in Acre-Feet				Item No.
				Jan.	Feb.	Mar.	Apr.	
1	E. P. Jennings	2.9L	1-10"	0	0	0	0	1
2	Charles Sachs	(1)8.2L	(2)	0	0	0	138	2
3	Traction Ranch	9.6R	(3)1-20"	0	0	0	290	3
4	--CONFLUENCE OF FRESNO SLOUGH BY-PASS AT MILE 11.8R ABOVE MOUTH OF FRESNO SLOUGH--							4
5	Traction Ranch	11.8R	(5)	0	0	286	725	5
6	Kerman Cattle Co.	(6)11.8R	1-12"	0	0	0	130	6
7	James Irrigation District "N" Booster	13.25R	1-24" 1-20" 1-14"	0	0	1008	1339	7
8	J. W. Wilson	13.5L	1-12"	0	0	87	0	8
9	Tranquillity Irr. Dist., Lift No. 1	14.1L	2-24"	0	0	2405	3946	9
10	Tranquillity Irr. Dist., Lift No. 2	15.9L	1-24" 1-30" (8)1-30"					10
11	Total			0	0	3786	6568	11
12	Average Cubic Feet Per Second			0	0	62	110	12
13	Monthly Use in Per Cent of Seasonal			0	0	7.8	13.5	13

* Water in Fresno Slough is derived from surplus flows of King's River via Fresno Slough By-Pass and from San Joaquin River by Mendota Pool backwater created by Mendota Dam.
** Mileage listed is Fresno Slough mileage above its mouth on San Joaquin River. Mouth of Fresno Slough at Mile 208.93L above mouth of San Joaquin River and Mile 60.7L below Friant.

(1) Point of diversion was at 10.9L in 1946.
(2) Four pumps in operation - size not listed.
(3) Replaced 12" pump April 1947.
(4) Acreage combined under plants at Mile 9.6R and 11.8R.
(5) Size of pump not listed. Diverted from Fresno Slough By-Pass 0.75R miles above confluence.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
123											
124											
125											
126	2	20	15	11	4	1	0	0	69	26	0
127	10	4	5	3	4	0	0	0	31	13	0
128	13	4	41	72	32	18	0	0	214	153	0
129											
130											
131	27	54	46	0	0	35	49	15	275	42	0
132											
133											
134											
135	111434	110264	130530	120116	84849	59540	25504	21440	856760	336245	10563
136	1812	1853	2123	1953	1426	968	429	349	1183		
137	13.0	12.9	15.2	14.0	9.9	7.0	3.0	2.5			
138	14008	11224	16218	13837	1828	0	0	0	(4)74781	(5)140000	0
139											
140											

(4) Total includes diversion from Wm. Talmasoff pump at mile 236.28R. This pump diverted 15 A. F. in June and 27 A. F. in July for a total of 42 A. F.

(5) This is net acreage considered irrigable under ultimate development.

Item No.	Monthly Diversions in Acre-Feet								Total Ac. Ft.	Acreage Irrigated	
	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		General	Rice
1	167	184	86	218	44	0	0	0	699	360	180
2	0	0	1015	1807	0	0	0	0	2960	2700	0
3	909	422	1047	787	104	22	0	0	3581	(4) 324	(4)1156
4											
5	584	471	157	458	15	0	0	0	2696	(4)	(4)
6	182	115	90	88	84	113	0	0	802	(7)2000	0
7	139	543	2220	2594	1055	635	116	0	9640	5386	75
8	0	46	30	30	0	0	0	0	193	180	0
9	2701	3543	5736	6115	2805	581	139	0	(9)27971	(10)6471	(10)1287
10									(9)	(10)	(10)
11	4682	5324	10381	12097	4107	1351	255	0	48542	17421	2698
12	76	89	169	197	69	22	4	0	67		
13	9.6	11.0	21.4	24.9	8.5	2.8	0.5	0			

(6) Diverted from Fresno Slough By-Pass 4.5R miles above confluence.

(7) Scattered flooding of grazing land and duck ponds.

(8) Installed April 1947.

(9) Diversions combined under plants at Mile 14.1L and 15.9L.

(10) Acreage combined under plants at Mile 14.1L and 15.9L.

TABLE 109

DIVERSIONS AND ACREAGES IRRIGATED - MERCED RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
--GAGING STATION - MERCED RIVER NEAR MOUTH - MILE 1.1--													
Stevinson Water District #1	1.8R	1-10"				NO DIVERSION							
Stevinson Water District #2	3.8R	1-20"		523	380	511	615	568	403	164	3164	495	
Milton Gordon	4.0L	1-10"	16	22	17	17	35	39	11		157	42	
--GAGING STATION - NEAR STEVINSON - MILE 4.6--													
Salvador DeAngelis	4.8L	1-12"	11	8	7	18	17	3	12		76	30	
Maria DeAngelis	5.8L	1-12"		47	21	91	68	35	35		297	80	
J. F. Peck	(1) 6.1L	1-15"		219	260	148	296	276	117		1316	200	
Stevinson Water District	(2) 7.1L	(3)1-20"						413	680	148	1241	1000	
James F. Corado	8.5L	1-12"		18	51	1	73	17	9		169	69	
Manuel Clemintino	8.85L	1-12"		61	15	45	84	17			222	85	
Samuel B. McCullagh	9.4L	1-12"		85	65	127	117	120	42	25	581	233	
Joe R. Jacinto	9.6L	1-12"		49	71	66	62	57	56	16	377	115	
R. W. Adams and Mrs. J. B. Silva (4)	10.35L	1-8" 1-10"	57	271	220	316	409	267	166	54	1760	404	
R. E. Prusso	10.8R	1-6"				8	10	10	4		32	6	
Taz LaFollette	10.84L	1-12"		162	45	185	131	73	45		641	140	
R. E. Prusso and John Vierra	10.85L	1-5" 1-12"		163	67	138	136	126	33		663	146	
J. Rebello	11.6L	1-12"		77	82	85	77	93	20		434	90	
Tony Vierra	11.6L	1-8"		122	180	66	157	181	128	9	843	126	
--MILLIKEN BRIDGE - MILE 11.65--													
E. and J. Gallo Winery Ranch	12.35L	1-10"		17	14	23	36	27			117	100	
Soren Husman	12.36L	1-6"		2	51	25	46	24	12		160	45	
E. & J. Gallo Winery Ranch	12.85L	1-10"	4	79	50	49	87	94	10		373	160	
E. & J. Gallo Winery Ranch	16.5L	1-10"	12	25	28		109	34			208	150	
C. J. Carpenter	17.05L	1-7"		3	10	11	12	8	4	4	52	17	
Eusibia Goth (5)	17.7L	1-5"				NO DIVERSION							
J. H. Thomas (6)	18.15L	1-6"	4	5	21	22	20	18	19	5	114	29	
J. H. Thomas	18.4L	1-6"				PLANT REMOVED							
C. P. Hockett (6)	18.5L	1-4"		9	6	8	10	6	5		44	23	
S. P. Magsalay (6)	19.8L	1-6"	5	25	13	7	6	4	2	1	63	14	
Frank P. Dutra (6)	19.8L	1-6"			7	5	8	9	7		36	18	
John Reininghaus	20.4L	1-6"		23	23	19	25	28	19		137	(7) 81	
W. J. Hoskins	20.6R	1-6"	6	14	21	26	19	17	9	4	116	31	
W. J. Hoskins	20.65R	1-4"				NO DIVERSION							
--HIGHWAY 99 BRIDGE - MILE 21.04--													
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 21.05--													

(1) Formerly listed as 18" unit.
(2) Formerly listed at Mile 6.55L.
(3) Replaces 18" pump formerly listed at this location.
(4) Formerly listed as R. W. Adams and J. B. Silva Estate.
(5) Formerly listed as Sylvia Gotte.
(6) New installation 1947.
(7) Additional water received from wells.

TABLE 109 (CONTINUED)

DIVERSIONS AND ACREAGES IRRIGATED - MERCED RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
A. C. Jorgensen #1	21.05R	1-6"	7	4	11	10	9	13	7		61	27	
A. C. Jorgensen #2	22.2R	1-16"	69	227	146	165	277	205	54	8	1151	270	
A. C. Jorgensen #3A	23.25R	1-6"	3	3	4	4	4	4	4	4	30	6	
A. C. Jorgensen #3	23.3R	1-12" 1-15"	27	112	69	92	109	109	64	27	(1) 609	192	
A. C. Jorgensen #4	23.6R	1-8"			8	9					17	20	
Manuel A. Bettencourt	23.8R	1-6"		6	10	14	10	3	7		50	28	
Warren F. McConnell	24.2L	1-5"					7				7	12	
Warren F. McConnell	(2)24.2L	1-6"				NO DIVERSION							
T. Nishihara	24.6R	1-6"		25		15	5	23	14		82	(3)240	
T. Nishihara	25.0R	(4) 2-5"		25	64	33	40	57	25	6	250	(5)	
T. Nishihara	25.5R	1-6"		113	62	51	64	60			350	(5)	
Merced River Farms Assn.	26.3R	1-8"	2	165	86	187	146	136	48		770	111	
W. C. Magneson	26.55R	1-5" (6) 2-6"		2	14	22	14	12	8		72	32	
W. C. Magneson	27.0R	1-6"			16	5	11	3			35	8	
--SANTA FE RAILROAD CROSSING - MILE 27.05--													
--GAGING STATION - MERCED RIVER AT CRESSEY - MIIE 27.6R--													
W. C. Magneson	27.6R	1-10"		19	220	105	132		128		604	155	
T. Nishihara	27.8R	1-4" 1-6"	1	6	9	12	9	6	5		48	30	
M. Uyekubo	28.1R	1-5"	4	3	7	6	11	8	4		43	20	
John Farie	28.4R	1-5"			7	12	6	9	8		42	18	
J. Campadonica	28.6R	1-6"				10	8	6	8		32	12	
Oliver Alves	28.6R	1-8"			50	50	28	53	22		203	80	
Anthony Demchille	29.1R	1-7"			21	21	6	20	5		73	54	
Anthony Demchille	29.75R	1-6"		13	24	9	16	13	2		77	23	
Manuel Silva	29.9R	1-6"				NO DIVERSION							
Manuel Silva	29.9R	1-6"			79	18	88	70	25		280	70	
Rose and Schaefer	30.7L	1-6"		27	26	12	24	23	24	13	149	(7) 90	
Manuel Silva	30.95R	1-12"			233	87	144	338	89	29	920	160	
Rose and Schaefer	31.1L	1-8"		22	43	40	65	43	28	12	253	(8)	
Manuel Silva	31.5R	1-6"			45	85	144	149	67		490	60	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) - MILE 32.52--													
Robert J. Ramsey	33.1R	1-6"		11	58	192	126	69			456	(9) 200	
Robert J. Ramsey	33.55R	1-6"		47	85	77	153	91	24		477	(10)	
Reinero Bros.	39.2L	1-24"box		4	6	12	21	8			51	65	
--GAGING STATION - MERCED RIVER AT YOSEMITE VALLEY R.R. CROSSING - MIIE 42.1--													
Totals			228	2863	3128	3372	4342	4095	2518	529	21075	5912	
Average cubic feet per second			4	48	51	57	71	67	42	9	43		
Monthly use in per cent of seasonal			1.1	13.6	14.8	16.1	20.6	19.4	11.9	2.5			

(1) Partially estimated.
(2) Formerly listed at Mile 24.5L.
(3) Also served by plants at Miles 25.0R and 25.5R.
(4) 1-5" unit temporarily installed in 1947.
(5) See plant at Mile 24.6R.
(6) 6" unit installed in 1947.
(7) Combined acreage this plant and one at Mile 31.1L.
(8) See plant at Mile 30.7L.
(9) Combined acreage this plant and one at Mile 33.55R.
(10) See plant at Mile 33.1R.

TABLE 110

DIVERSIONS AND ACREAGES IRRIGATED - TUOLUMNE RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
E. T. Mapes	1.9R	1-20"	116	227	228	292	314	459	773	322	(1) 2731	(2)2300	
J. DeSouza and J.B. Silva	2.2R	1-6"		14	76	53	50	29	13		235	39	
Katheiser Bros. (3)	3.1R	1-16"					2				2	(3) 42	
--GAGING STATION - TUOLUMNE RIVER AT TUOLUMNE CITY - MILE 3.35--													
Bancroft Fruit Farms	4.1R	1-12"	33	40	56	72	75	74	12	24	386	75	
Bancroft Fruit Farms	5.0R	1-10"	35	100	115	119	153	107	91	28	(4) 748	160	
Eugene Boone, Galen Hartwich and William Podesto	7.1R	1-10"	56	191	148	168	112	58	79	52	864	124	
W. F. Duffy	7.2R	1-7"	2	11	7	14	21	12	11		78	(5) 133	
Ella T. Rahilly (Miss.)	7.8L	1-10"	NO DIVERSION										
W. F. Duffy	8.4R	1-10"	41	125	141	112	213	160	106	1	899	(6)	(6)
Leland Martin (7)	9.4L	1-12"			95	76					171	85	
Tuolumne Cooperative Farms, Inc.	10.2R	1-10" (8) 1-14"		80	59	61	70	73	52		395	53	
Kenneth H. Durand	15.25R	1-5"		17		6	4				27	34	
G.B. and L. D. Podesto	15.75R	1-3"		9	11	3	5	2			30	17	
--OLD HIGHWAY BRIDGE - MILE 15.75--													
--SOUTHERN PACIFIC RAILROAD (MAIN LINE) - MILE 15.8--													
--GAGING STATION - TUOLUMNE RIVER AT MODESTO - MILE 15.92--													
--TIDEWATER SOUTHERN RAILROAD BRIDGE - MILE 15.92--													
--HIGHWAY 99 BRIDGE - MILE 16.05--													
--DRY CREEK CONFLUENCE - MILE 16.5R--													
W. L. Bowron	20.1R	1-8"		9	16	12	12	16	8	2	75	23	
L. R. Hughson (Mrs.)	20.3R	1-8"		25	12	2	33	29	18		119	35	
Ray L. Heimann (Mrs.) (9)	20.5R	(10)1-12"			43	24	50	41	22		180	(2) 83	
--SANTA FE RAILROAD - MILE 21.6--													
L. DeMartini Co.	29.6L	1-7"			25	25					50	(2) 68	
Firpo Ranch	30.2L	1-10"		16	31	7	27	25	8		114	70	
--SOUTHERN PACIFIC RAILROAD - (OAKDALE BRANCH) - MILE 31.5--													
--GAGING STATION - TUOLUMNE RIVER AT HICKMAN BRIDGE - MILE 31.7--													
George Sawyer	39.8R	1-6"		29	69	66	104	50	36	10	364	(2) 420	
--GAGING STATION - TUOLUMNE RIVER AT ROBERTS FERRY - MILE 39.9--													
--GAGING STATION - TUOLUMNE RIVER AT LA GRANGE - MILE 50.5--													
Totals			283	893	1132	1112	1245	1135	1229	439	7468	3761	
Average cubic feet per second			5	15	18	19	20	18	21	7	15		
Monthly use in per cent of seasonal			3.8	12.0	15.2	14.9	16.5	15.2	16.5	5.9			

(1) Additional water was diverted as follows: February - 10 acre-feet, November - 14 acre-feet, and December - 7 acre-feet.
(2) Also served by wells.
(3) Received additional water from Modesto Irrigation District.
(4) Additional water diverted in February - 2 acre-feet.
(5) Combined acreage this plant and one at Mile 8.4R.
(6) See plant at Mile 7.2R.
(7) Formerly listed as Harley Hise.
(8) 14" unit added in 1947.
(9) Formerly listed as Ray L. Heimann.
(10) Replaces 10" unit formerly listed at this location.

TABLE 111

DIVERSIONS AND ACREAGES IRRIGATED - STANISLAUS RIVER - 1947

Water User	Mile and Bank above Mouth	Number and Size of Pump	Monthly Diversions in Acre-Feet								Total Diversion March to October Acre-Feet	Acreage Irrigated	
			Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.		General	Rice
Chris Baron	1.1R	1-6"				13		6	5		24	20	
E. W. Hawkins (Mrs.)	1.8R	(1) 1-6"				26	7	18	13		64	35	
C. M. Carroll (2)	2.9R	1-8"				4	8	1	11	12	(3) 36	40	
C. M. Carroll	(4) 3.0R	(5) 1-6"		11	28	17	22	20	15	2	115	38	
R. D. March	4.0R	1-5"	NO DIVERSION										
--GAGING STATION - STANISLAUS RIVER NEAR MOUTH - MILE 4.3--													
Overton Ranch (D. F. Koetitz) (6)	5.25L	1-12"	87	122	162	67	164	193	153	71	1019	225	
Reclamation District 2064	5.9R	1-14" 1-16"	320	897	1107	1267	1490	1258	842	99	(7)7280	1259	
Reclamation District 2075 (8)	5.95R	2-16"	306	1625	1913	1462	1705	1811	1293	373	(9)10488	2110	
Henry Pelucca	6.7L	1-15"			79	2	56	50			187	35	
C. C. Updike	8.2L	1-12"						39	37	10	86	125	
Caswell Bros.	9.8R	1-16"	132	333	354	421	367	350	288	102	(10)2347	369	
N. E. Cannon	10.0R	1-10"	86	198	269	251	302	241	214	33	(11)1594	(12)160	
D. F. Koetitz	10.1L	1-10"	226	311	143	277	269	235	207	185	1853	308	
Joseph Hertle	10.5L	1-10"	2	23	20	31	20	20	11		127	60	
--SOUTHERN PACIFIC RAILROAD BRIDGE - (MAIN LINE) - MILE 15.9--													
--GAGING STATION - STANISLAUS RIVER NEAR RIPON - MILE 16.0--													
A. Girardi	17.0L	1-12"		62	230	65	178	250	143	77	1005	255	
Edward B. Regan	18.5R	1-10"		77	75	110	124	124	42	14	566	130	
Allen Ranch (Dr. Rollin Reeves)	20.75R	1-14"	47	455	182	269	310	194	36	2	1495	360	
Heath Ranch	20.9L	1-5"			10						10	16	
B. Bonora	21.75R	1-10"			24	14	16				54	70	
J. L. Merrill (13)	22.3R	1-10"				NO DIVERSION							
--MODESTO-ESCALON BRIDGE - MILE 28.15--													
--SANTA FE RAILROAD CROSSING - MILE 31.85--													
--GAGING STATION - STANISLAUS RIVER AT RIVERBANK - (BURNEYVILLE BRIDGE) - MILE 32.0--													
Oakdale Irrigation District (Riverbank Pump)	32.9L	1-12"				NO DIVERSION							
Oakdale Irrigation District (Crawford Pump) (14)	35.9L	1-14"		130	245	272	247	209	117	21	(15)1241	525	
Oakdale Irrigation District (Brady Pump) (14)	37.0L	1-12"		76	92	76	132	66	35	7	484	458	
--SOUTHERN PACIFIC RAILROAD (OAKDALE BRANCH) - MILE 39.0--													
--GAGING STATION - STANISLAUS RIVER AT ORANGE BLOSSOM BRIDGE - MILE 44.7--													
Totals			1206	4320	4933	4644	5417	5085	3462	1008	30075	6598	
Average cubic feet per second			20	73	80	78	88	83	58	16	62		
Monthly use in per cent of seasonal			4.0	14.4	16.4	15.4	18.0	16.9	11.5	3.4			

(1) Replaces old 6" unit listed at this location in 1946.
(2) Formerly listed as A. J. Chisholm.
(3) Diverted an additional 9 acre-feet in December.
(4) Moved from 3.1R.
(5) Replaces 5" unit listed at 3.1R in 1946.
(6) Formerly listed as Winfield S. Overton Estate.
(7) Received 207 acre-feet from plant at Mile 5.95R.
(8) Formerly listed as McMullin Reclamation District 2075.
(9) Furnished 207 acre-feet to plant at Mile 5.9R. Additional diversion: November 93 acre-feet, December 86 acre-feet.
(10) Diverted 5 acre-feet in February.
(11) Diverted an additional 15 acre-feet in November.
(12) This acreage listed as 200 acres in 1946.
(13) Formerly listed as Riverside Ranch.
(14) Oakdale Irrigation District for season of 1947 maintained plants at Miles 35.9L and 37.0L to supplement District gravity supply.
(15) Additional water diverted in February - 37 acre-feet.

TABLE 112

AVERAGE MONTHLY DIVERSIONS IN PER CENT OF SEASONAL FOR SACRAMENTO AND SAN JOAQUIN VALLEY STREAMS

	Period of Record	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.
SACRAMENTO VALLEY			Per Cent of Seasonal Diversion						
Sacramento River - Redding to Sacramento	1939 to 1947	0.6	7.1	17.8	19.0	20.6	19.6	11.5	3.8
Feather River - Oroville to mouth	1939 to 1947	0	4.5	18.2	18.9	20.7	19.2	12.7	5.8
Yuba River - Smartville to mouth	1939 to 1947	0.2	4.9	13.9	17.5	18.3	17.7	15.2	12.3
American River - Fairoaks to mouth	1939 to 1947	1.0	3.1	6.2	20.5	28.3	21.8	15.1	4.0
DELTA UPLANDS									
Old San Joaquin River	1939 to 1947	2.2	9.8	16.1	17.9	21.2	17.3	10.9	4.6
Tom Paine Slough	1939 to 1947	1.5	8.6	15.2	18.0	19.5	18.8	13.9	4.5
San Joaquin River below Vernalis	1939 to 1947	3.1	12.6	15.4	14.4	22.5	19.0	9.5	3.5
SAN JOAQUIN VALLEY									
San Joaquin River - Fremont Ford Bridge to Vernalis	1939 to 1947	2.9	10.2	15.5	16.0	22.6	18.8	11.1	2.9
Merced River - Yosemite Valley Railroad Crossing to mouth	1939 to 1947	0.6	6.8	13.6	19.1	24.1	19.5	12.8	3.5
Tuolumne River - La Grange to mouth	1939 to 1947	2.3	8.0	15.6	17.1	19.6	18.9	13.3	5.2
Stanislaus River - Orange Blossom to mouth	1939 to 1947	1.5	8.6	14.7	18.1	20.2	18.7	12.5	5.7

TABLE 113

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947

SACRAMENTO RIVER - SACRAMENTO TO REDDING

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	63636	202428	227491	233319	230319	209735	90708	43412	1301048
1940	1802	18073	182534	218505	249012	228765	119951	43988	1062630
1941	1883	5274	157567	228387	265229	259557	177189	55029	1150115
1942	1991	11727	187657	268091	286655	278848	186708	61298	1278975
1943	1769	61409	257673	276759	288930	288024	190456	51915	1416935
1944	3236	155666	310227	305633	338429	318184	180858	65917	1678150
1945	2134	117302	316912	305333	346868	326148	200601	60473	1675771
1946	7968	187267	333991	328508	341952	326956	179671	71666	1777979
1947	2743	167131	346326	313389	344334	326100	170785	36296	1707104
Average Acre-Feet	9685	102920	257820	275325	299081	284702	166324	54444	1449856
Average c.f.s.	158	1730	4193	4627	4864	4630	2795	885	2984
Monthly Diversion in per cent of Seasonal	.6	7.1	17.8	19.0	20.6	19.6	11.5	3.8	

* See 1946 Water Supervision Report for prior years.

TABLE 114

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 TO 1947

FEATHER RIVER - OROVILLE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	3583	71539	99567	90960	92044	83292	37752	22620	501357
1940	188	2207	84408	95502	105337	93454	59182	33695	473973
1941	0	2448	70513	72971	103334	100433	78451	47090	475240
1942	0	0	61352	113416	125530	122146	86814	30435	539693
1943	0	13290	101599	125318	131210	123282	93309	35495	623503
1944	205	43792	130779	126206	142128	133130	85924	50747	712911
1945	0	26056	130729	133918	142224	132832	92953	39682	698394
1946	47	53967	156398	140210	145235	132948	82010	33985	744800
1947	90	30240	152827	130731	138055	124426	77215	20873	674403
Average Acre-Feet	457	27060	109797	114359	125011	116216	77068	34958	604919
Average c.f.s.	7	455	1786	1922	2033	1890	1295	569	1245
Monthly Diversion in per cent of Seasonal	0	4.5	18.2	18.9	20.7	19.2	12.7	5.8	

* See 1946 Water Supervision Report for prior years.

TABLE 115

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 TO 1947
YUBA RIVER - SMARTVILLE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	176	8986	13174	12890	12889	12739	8304	3955	73113
1940	0	1326	9377	14114	15190	11798	10780	7383	69968
1941	0	2624	10589	13076	13574	13419	10672	9576	73530
1942	0	36	5703	14736	14955	14841	13086	11349	74706
1943	0	1903	10622	15237	17203	16972	16610	15252	93799
1944	1665	7327	13857	15601	16786	15532	13311	9185	93264
1945	0	4338	9815	15479	14112	13848	13046	13590	84228
1946	0	7222	15231	15845	17082	16356	13940	13010	98686
1947	0	3820	17316	16339	17364	19152	15577	10517	100085
Average Acre-Feet	205	4176	11743	14813	15462	14962	12814	10424	84598
Average c.f.s.	3	70	191	249	251	243	215	170	174
Monthly Diversion in per cent of Seasonal	.2	4.9	13.9	17.5	18.3	17.7	15.2	12.3	

* See 1946 Water Supervision Report for prior years.

TABLE 116

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947
AMERICAN RIVER - FAIROAKS TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	73	380	932	1616	1699	1151	557	246	6654
1940	44	339	488	1216	1785	1038	686	456	6052
1941	150	253	379	836	1531	1202	673	285	5309
1942	0	0	13	678	1395	1187	789	104	4166
1943	0	0	54	941	1513	1226	753	94	4581
1944	0	6	113	980	1566	1211	790	153	4819
1945	0	8	119	909	1017	894	760	149	3856
1946	0	10	228	1022	1104	889	766	105	4124
1947	308	422	483	1113	1193	1086	1071	237	5913
Average Acre-Feet	64	158	312	1035	1423	1098	761	203	5053
Average c.f.s.	1	3	5	17	23	18	13	3	10
Monthly Diversion in per cent of Seasonal	1.0	3.1	6.2	20.5	28.3	21.8	15.1	4.0	

* See 1946 Water Supervision Report for prior years.

TABLE 117

ANNUAL COMPARATIVE MONTHLY DIVERSIONS IN ACRE-FEET 1939 TO 1947
OLD SAN JOAQUIN RIVER - DELTA UPLANDS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	7728	12880	8746	12055	13453	9855	4977	1669	71363
1940	0	1015	9527	10943	14091	10217	6148	3306	55247
1941	0	447	5492	11541	13087	10009	7382	2909	50867
1942	0	516	7175	11077	13143	11425	6740	2878	52954
1943	0	2048	11293	12463	13745	11945	7568	3104	62166
1944	2921	11827	13918	13224	16911	15667	10753	4694	89915
1945	595	7544	16791	17092	19809	14818	10873	4433	91955
1946	4640	14371	17736	16948	19662	18238	9914	4927	106436
1947	1637	15687	18983	15788	19269	14525	9633	3105	98627
Average Acre-Feet	1947	7371	12185	13459	15908	12966	8221	3447	75503
Average c.f.s.	32	124	198	226	259	211	138	56	155
Monthly Diversion in per cent of Seasonal	2.2	9.8	16.1	17.9	21.2	17.3	10.9	4.6	

* See 1946 Water Supervision Report for prior years.

TABLE 118

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947

TOM PAINE SLOUGH - DELTA UPLANDS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	763	1620	1218	1703	1414	1789	1015	645	10167
1940	0	159	1509	1974	2129	1612	1133	873	9389
1941	0	0	1406	1972	2163	1788	1704	529	9562
1942	0	0	1292	1852	2434	1930	1158	278	8944
1943	0	891	2526	2728	2629	2578	2041	589	13982
1944	84	1630	2186	2466	3046	2852	2487	1019	15770
1945	34	539	2527	2792	2891	3153	2144	377	14427
1946	874	2588	2756	3145	3324	3732	2490	798	19707
1947	74	3064	3136	3319	3735	3487	2816	414	20045
Average Acre-Feet	203	1166	2062	2439	2641	2547	1888	614	13560
Average c.f.s.	3	20	34	41	43	41	32	100	28
Monthly Diversion in per cent of Seasonal	1.5	8.6	15.2	18.0	19.5	18.8	13.9	4.5	

* See 1946 Water Supervision Report for prior years.

TABLE 119

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947

SAN JOAQUIN RIVER - VERNALIS TO FREMONT FORD BRIDGE

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	7044	17485	17212	18955	25161	21288	10366	2505	120016
1940	555	4547	15524	18950	26396	17707	10769	3365	97813
1941	0	302	13633	15486	26484	20840	12725	3947	93417
1942	573	2044	14158	17059	28352	25384	12575	4235	104380
1943	0	4417	20849	20115	29913	25046	16595	4789	121724
1944	4790	21177	22013	20102	27066	24430	14554	4128	138260
1945	1327	14036	21325	21383	30463	25540	15202	2087	131363
1946	6967	21399	24961	23751	32002	28792	17026	5144	160042
1947	11658	31645	28072	27725	34079	27812	17318	3049	181358
Average Acre-Feet	3687	13006	19750	20352	28879	24093	14126	3694	127597
Average c.f.s.	59	219	321	343	470	392	237	60	263
Monthly Diversion in per cent of Seasonal	2.9	10.2	15.5	16.0	22.6	18.8	11.1	2.9	

* See 1946 Water Supervision Report for prior years.

TABLE 120

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947

SAN JOAQUIN RIVER-DELTA UPLANDS - STOCKTON TO VERNALIS

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	4012	9394	5398	6901	11721	8744	3862	1178	51210
1940	4	4638	6974	7011	12805	7978	3300	1932	44642
1941	4	1086	6162	5944	12007	8735	4384	1762	40084
1942	188	2232	5210	6602	12203	9651	4014	2085	42185
1943	0	3169	10172	8940	11617	10886	5142	1793	51719
1944	1110	10346	8439	8039	11349	11489	6261	2275	59308
1945	7	6476	12035	9658	13109	12537	7090	1793	62705
1946	5246	13974	10681	9238	15347	13071	6727	2875	77154
1947	5322	13337	14168	11615	15439	14676	7782	2052	84391
Average Acre-Feet	1766	7184	8804	8216	12844	10863	5396	1972	57044
Average c.f.s.	29	121	143	138	209	177	91	32	117
Monthly Diversion in per cent of Seasonal	3.1	12.6	15.4	14.4	22.5	19.0	9.5	3.5	

* See 1946 Water Supervision Report for prior years.

TABLE 121

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947
MERCED RIVER - YOSEMITE VALLEY RAILROAD CROSSING TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	38	951	1791	2162	2520	1803	808	236	10309
1940	2	220	1541	2275	2206	1597	949	317	9107
1941	0	0	870	1644	1995	1537	1306	236	7588
1942	0	14	475	1619	2716	2005	1207	363	8399
1943	0	198	1782	2249	3077	2258	1680	474	11718
1944	84	1117	1845	2535	2564	2466	2071	820	13501
1945	30	558	1696	2292	3058	2500	1552	132	11818
1946	231	1380	1595	2393	3608	2787	1720	684	14398
1947	228	2863	3128	3420	4322	4077	2499	529	21066
Average Acre-Feet	68	811	1636	2288	2896	2337	1532	421	11989
Average c.f.s.	1	14	27	38	47	38	26	7	25
Monthly Diversion in per cent of Seasonal	0.6	6.8	13.6	19.1	24.1	19.5	12.8	3.5	

* See 1946 Water Supervision Report for prior years.

TABLE 122

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947
TUOLUMNE RIVER - LA GRANGE BRIDGE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	160	149	414	501	455	558	193	104	2534
1940	3	19	577	415	642	436	335	151	2578
1941	0	122	519	685	603	607	438	173	3147
1942	7	75	443	462	645	683	343	112	2770
1943	0	116	354	541	542	520	360	183	2616
1944	80	304	517	665	778	801	656	300	4101
1945	33	463	535	630	748	723	376	47	3555
1946	216	565	765	734	940	889	559	254	4922
1947	283	893	1132	1112	1245	1135	1229	439	7466
Average Acre-Feet	87	301	584	638	733	706	499	196	3743
Average c.f.s.	1	5	9	10	12	11	8	3	8
Monthly Diversion in per cent of Seasonal	2.3	8.0	15.6	17.1	19.6	18.9	13.3	5.2	

* See 1946 Water Supervision Report for prior years.

TABLE 123

ANNUAL COMPARATIVE MONTHLY DIVERSION IN ACRE-FEET 1939 TO 1947
STANISLAUS RIVER - ORANGE BLOSSOM BRIDGE TO MOUTH

Year*	March	April	May	June	July	August	September	October	Seasonal Diversions
1939	198	1848	2201	2873	3222	3310	1752	827	16231
1940	217	682	2143	3330	3858	2924	1741	851	15746
1941	12	392	2696	3173	3413	3228	2466	1280	16660
1942	240	356	2533	4242	4590	3972	2721	1360	20014
1943	3	873	3439	4241	4458	3935	3518	1598	22065
1944	186	2013	3266	3565	4246	4292	2659	1603	21830
1945	0	2664	3013	3869	4431	4136	2866	681	21660
1946	862	3316	3780	4563	5046	4832	2754	1655	26808
1947	1206	4320	4933	4644	5417	5085	3462	1008	30075
Average Acre-Feet	325	1829	3112	3833	4298	3968	2660	1207	21232
Average c.f.s.	5	31	51	64	70	65	45	20	44
Monthly Diversion in per cent of Seasonal	1.5	8.6	14.7	18.1	20.2	18.7	12.5	5.7	

* See 1946 Water Supervision Report for prior years.

TABLE 124

COMPARATIVE SEASONAL DIVERSIONS AND ACREAGES IRRIGATED - SACRAMENTO RIVER 1939-1947

Year		River Sections							Total Reach Redding to Sacramento
		Redding to Red Bluff	Red Bluff to Butte City	Butte City to Colusa	Colusa to Wilkins Slu	Wilkins Slu to Knights Ldg.	Knights Ldg. to Verona	Verona to Sacramento	
1939	Seasonal diversion acre-feet	141403	587358	29668	292226	89153	21496	139744	1301048
	Average cubic feet per second	291	1209	61	601	183	44	288	2677
	Acreage irrigated - rice	0	32917	750	17360	3667	0	9159	63853
	Acreage irrigated - general	13423	58185	6802	51711	13120	2727	12800	158768
1940	Seasonal diversion acre-feet	116052	479028	15683	249532	70974	34057	97304	1062630
	Average cubic feet per second	239	986	32	513	146	70	200	2187
	Acreage irrigated - rice	0	31754	463	19475	4024	1541	7134	64391
	Acreage irrigated - general	9696	43885	6354	41548	7318	1318	9611	119730
1941	Seasonal diversion acre-feet	135305	493667	16903	305187	95969	25970	77114	1150115
	Average cubic feet per second	278	1016	35	628	197	53	159	2367
	Acreage irrigated - rice	0	40183	530	30716	6786	1013	5968	85196
	Acreage irrigated - general	12205	45217	6772	37039	7923	980	8445	118581
1942	Seasonal diversion acre-feet	119216	553834	37714	335431	116200	26820	89760	1278975
	Average cubic feet per second	245	1140	78	690	239	55	185	2632
	Acreage irrigated - rice	0	49299	2668	39415	8957	660	6664	107663
	Acreage irrigated - general	13513	47696	5123	30095	5425	1476	7898	111226
1943	Seasonal diversion acre-feet	139086	594046	60963	333715	136688	35934	116503	1416935
	Average cubic feet per second	286	1222	125	687	281	74	240	2916
	Acreage irrigated - rice	0	55316	4275	35777	9299	1115	9817	115599
	Acreage irrigated - general	14362	62663	4765	29580	4594	1250	9052	126266
1944	Seasonal diversion acre-feet	155303	715850	77255	405665	142341	31565	150171	1678150
	Average cubic feet per second	320	1473	159	835	293	65	309	3453
	Acreage irrigated - rice	0	56620	5743	32161	14459	1573	11686	122242
	Acreage irrigated - general	15324	40614	4475	32591	8086	1997	8781	111868
1945	Seasonal diversion acre-feet	143229	690859	85269	409292	162825	21776	162521	1675771
	Average cubic feet per second	295	1432	175	842	335	45	334	3449
	Acreage irrigated - rice	0	48715	5574	34461	12994	795	12476	115015
	Acreage irrigated - general	15390	36103	4680	28843	9607	2506	9266	106395
1946	Seasonal diversion acre-feet	163925	729606	98953	402022	159077	38680	185716	1777979
	Average cubic feet per second	337	1501	203	827	327	80	382	3659
	Acreage irrigated - rice	0	53195	6445	30828	13995	2485	17187	124135
	Acreage irrigated - general	15373	38934	8719	30861	10923	2024	10722	117556
	Acre feet per Acre	10.5	7.9	6.6	6.5	6.4	8.6	5.7	7.3
1947	Seasonal diversion acre-feet	138036	704544	103476	405829	140736	56993	157490	1707104
	Average cubic feet per second	284	1450	213	835	290	117	324	3513
	Acreage irrigated - rice	0	56080	7393	31584	12549	2688	13687	123981
	Acreage irrigated - general	17517	38149	4361	33853	11070	2982	13658	121590
	Acre feet per Acre (1)	7.7	7.5	8.8	6.2	6.0	10.1	4.7	6.8
	Average 1939 - 1947								
	Seasonal diversion acre-feet	139062	616532	58432	348767	123774	32588	130703	1449856
	Average cubic feet per second	286	1270	120	718	255	67	269	2984
	Per cent of total reach	9.6	42.5	4.0	24.1	8.6	2.2	9.0	100.0
	Acreage irrigated - rice	0	47120	3760	30197	9637	1319	10420	102453
	Acreage irrigated - general	14089	45716	5784	35125	8674	1918	10026	121331

(1) Excluding such diversions for municipal use as City of Sacramento and the City of Redding.

TABLE 125

RICE ACREAGE IN CALIFORNIA

A Comparison of Total Rice Acreage in California with Rice Acreage Irrigated from the Sacramento and San Joaquin River Systems Covered by Sacramento-San Joaquin Water Supervision

Rice Acreage							
Year	Total in State (1)	Irrigated from Sacramento & San Joaquin River Systems	Ratio in Per cent (2)	Year	Total in State (1)	Irrigated from Sacramento & San Joaquin River Systems	Ratio in Per cent (2)
1924	90000	89000	99	1936	138000	104000	75
1925	103000	95000	92	1937	132000	109000	82
1926	149000	129000	87	1938	125000	95000	76
1927	160000	123000	77	1939	120000	104000	87
1928	132000	101000	76	1940	118000	94000	80
1929	95000	74000	78	1941	153000	120000	78
1930	110000	88000	80	1942	207000	159000	77
1931	125000	126000	100	1943	237000	186000	77
1932	110000	91000	83	1944	246000	200000	81
1933	108000	87000	80	1945	249000	187000	75
1934	108000	92000	85	1946	253000	200000	79
1935	100000	78000	78	1947	237000	215000(3)	91
				Average 1924-1947	150000	123000	82

(1) As reported by Federal-State Crop Reporting Service.
(2) Ratio of acreage on Sacramento and San Joaquin River Systems to total State acreage.
(3) Rice acreage on Upper San Joaquin River included in 1947 but excluded under this heading for previous years.

TABLE 126

MAXIMUM RECORDED SALINITY AT PRESENTLY INDICATIVE BAY AND DELTA STATIONS

1937 - 1947, INCLUSIVE*

YEAR	1937	1938	1939	1940	(2)1941	1942	1943	1944	1945	1946	1947
Sacramento-San Joaquin Runoff in per cent of Normal**	80	170	43	115	137	129	114	56	86	92	54
Station (1)	Maximum Recorded Salinity in Parts of Chlorine per 100,000										
	San Francisco, San Pablo and Suisun Bays										
Point Orient	1700	1700	1920	1840				1730	1800	1740	1880
Point Pinole										1530	1680
Hercules										1510	1700
Point Davis	1460	(2)1460	1840	1760				1520	1340	1660	1650
Grand View								1530	1430	1500	1800
Crockett										1400	1790
Benicia								1390	1230	1200	1510
Martinez									1000**	1110	1340
Bullshead Point	1270	1160	1640	1340							
West Suisun										1020	1350
Port Chicago										950	1240
Nichols										800	1160
O & A Ferry	660	256	1180	720				730	260	350	610
Innisfail Ferry	700	330	1360	790				790	440	450	820
Pittsburg									160	210	500
	Sacramento River Delta										
Collinsville	490	86	1040	450	195	190	340	470	114	170	450
Emmaton	102	7	580	140							
Three Mile Slough Bridge	120		590					161	7	8	125
Rio Vista Bridge	33		405					55	4	5	27
Isleton Bridge			250					5	3	5	5
	San Joaquin River Delta										
Winter Island									123	133	490***
Antioch	350	51	920	440	158	140	312	400	96	109	470
Millers Harbor									64	93	300
Jersey	102	9	500								
Opposite Jersey	136							164	6		
Webb Pump	25	8	265	27				52	5	8	45
Opposite Central Landing	11	10	138	15				20	5	8	20
Dutch Slough	28	11	225	42				69	8	13	84
East Contra Costa Irr. Dist.			32					14	11	20	19
Victoria										11	19
Clifton Court Ferry			19								16
South Fabian											19
Grant Line Bridge											17
Mossdale	12	12	16	14				13	10	12	18
Banta-Carbona Irr. Dist.											18
Vernalis - U.S.G.S. Gaging Sta.											18***

* For maximum salinities recorded 1924-1936 see previous reports.
** Normal taken as 50-year mean (1889-1939) of natural runoff at foothill stations of major tributaries.
*** Estimated
(1) For location and description see Table 127.
(2) Sampling by State discontinued in 1941 and resumed in 1944 in cooperation with the U. S. Bureau of Reclamation.

TABLE 127

DESCRIPTION OF ACTIVE SALINITY OBSERVATION STATIONS - 1947

(Refer to previous Water Supervision Reports for description of stations which have been discontinued.)

STATION	Miles from Golden Gate (1)	Time Interval (2) Hours	Time Interval (2) Mins.	LOCATION
				SAN FRANCISCO, SAN PABLO AND SUISUN BAYS
Point Orient	12.3	2	20	North end of San Francisco Bay, East Shore, one-half mile south of Point San Pablo Wharf of Standard Oil Company.
Point San Pedro	15.0	2	30	South end of San Pablo Bay, West Shore of San Pedro Strait, one-quarter mile north of Point San Pedro.
Point Pinole	19.0	2	50	South Shore of San Pablo Bay, at Point Pinole on wharf of Atlas Powder Company.
Hercules	22.7	3	10	South Shore of San Pablo Bay, at Refugio Point on wharf of Hercules Powder Company.
Point Davis	25.2	3	15	East end San Pablo Bay, South Shore, Oleum Wharf of Union Oil Company
Grand View	25.2	3	15	Northwest shore of San Pablo Bay at mouth of Petaluma Creek.
Crockett	27.7	3	30	West end of Carquinez Strait, South Shore, 0.2 mile east of Carquinez Bridge on wharf of C. and H. Sugar Refining Corporation.
Benicia	32.5	3	50	East end of Carquinez Strait, North Shore, 1.1 mile west of Southern Pacific Co. railroad bridge at Benicia Arsenal.
Martinez	32.7	3	50	East end of Carquinez Strait, South Shore, 1.0 mile west of Southern Pacific Co. railroad bridge, at Municipal Ferry Slip.
West Suisun	37.0	4	10	West end of Suisun Bay, North Shore, 2.5 miles northeast of Southern Pacific railroad bridge at service pier of U. S. Maritime Commission, Reserve Fleet Mooring area.
Port Chicago	41.0	4	20	South Shore of Suisun Bay at U. S. Naval ammunition loading wharf below Point Chicago.
Nichols	42.7	4	25	South Shore of Suisun Bay, on Middle Point at wharf of General Chemical Company.
O & 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 one mile east of junction with Cutoff Slough, near North end of Grizzly Island.
Pittsburg	48.0	5	00	East end of Suisun Bay, South Shore, at Pittsburg Yacht Harbor.
				SACRAMENTO RIVER DELTA
Collinsville	50.8	5	25	Sacramento River, North Bank at junction with San Joaquin River.
Three Mile Slough Bridge	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.
Isleton Bridge	68.7	6	30	Sacramento River, one mile upstream from Isleton.
				SAN JOAQUIN RIVER DELTA
Winter Island	53.1	5	50	Upper end of Winter Island, north shore New York Slough at junction of Broad and New York Sloughs.
Antioch	54.9	5	55	San Joaquin River, at City Water Works pumping plant.
Millers Harbor	58.2	6	10	South Shore San Joaquin River at Antioch Bridge.
Webb Pump	72.0	7	00	False River, two miles below Old River Junction.
Opposite Central Landing	72.0	7	00	Mokelumne River, on Andrus Island directly opposite Central Landing on Bouldin Island.
Dutch Slough	73.0	7	05	At Bethel Island Bridge.
East Contra Costa Irr. Dist.	86.7	8	20	Indian Slough, at East Contra Costa Irrigation Dist. pumping plant.
Victoria Island	89.6	8	35	Old River at Borden Highway Crossing.
Clifton Court Ferry	94.2	9	10	Old River just below junction with Grant Line Canal.
South Fabian	100.0	9	40	Old River, two miles East of Bethany.
Grant Line Bridge	101.0	9	50	Grant Line Canal, 5.5 miles above junction with Old River, at Tracy Road Crossing.
Mossdale Bridge	108.5	10	50	San Joaquin River at U. S. 50 Highway Crossing about 3 miles southwest of Lathrop.
Banta-Carbona Irrig. Dist.	119.0	11	00	San Joaquin River at Banta-Carbona Irrig. Dist. Intake Canal.
Vernalis U.S.G.S. Station	127.0	11	00	San Joaquin River at Durham Ferry Bridge, above tidal influence.

(1) Mileage measured to station along main channel. For stations off the main channel, the mileage shown is the same distance along the main channel to a point whereon the time of the occurrence of the tidal phase is the same as that of the observation station.

(2) Time interval between high tide at Golden Gate and time for taking samples at station.

TABLE 128

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	JANUARY - 1947							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient			1480	1420	1430	1450	1310	1330
Point San Pedro	1090	1410	1300	1280	1280	1370	1320	1360
Point Pinole	1100	1210		1220		1270		
Hercules	1070	1190	1130	1070	1020	1130		980
Point Davis	1160	1170	1120	1030		940	1020	1030
Grand View	880	870	920	910	940	940	930	970
Crockett	950	1100	960	900	910	950	830	880
Benicia						e550		
Martinez	620	780	530	620	770	720	520	550
West Suisun	450	640	330	480	b620	450	400	420
Innisfail Ferry	166	170	190	190	b190	190	220	
Port Chicago	380	460	330	a450		460	390	480
Nichols	390	290	430	430	270		210	
O & A Ferry	47	170	61	74	86	110	a120	70
Pittsburg	5	27	15	14		24	21	13
	Sacramento River Delta							
Collinsville	4	14	a4	9	3	10		4
Three Mile Slough Bridge	2	4		3	2	1	2	2
Rio Vista Bridge	2	2	2	1	1	3	1	1
Isleton		2	1	1	2	2		
	San Joaquin River Delta							
Winter Island	5	16	a11	12	13	11	a10	9
Antioch	6	12	10	9	8	10		13
Millers Harbor	6	7	7	6	6	5	7	5
Webb Pump		7	a5	6	5	a5	a5	5
Opposite Central Landing	3	4	a2	2	3	5	a1	2
Dutch Slough	10	6	a8		b6	6	a7	5
East Contra Costa I.D.		7	10	ab9	10	9	a10	10
Victoria	a10	6	6	7	7	8	7	7
Clifton Court Ferry*		6	6	7	7	9	7	6
South Fabian**							a10	a8
Mossdale	a6	a5	a6	6	a8	a7	a7	7
	FEBRUARY - 1947							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1440	1610	1530	1390	1350	1310	1330	
Point San.Pedro	1330	1400	a1270	1210	1080	e1040	1180	
Point Pinole		1280		1140	1010			
Hercules	1140	1220	1180	950	700	740	970	
Point Davis	1030	1150	1110	720		740	940	
Grand View	1030	1000	950	880	890	850	830	
Crockett	960	1070		760	590	570		
Benicia	680	860	660	480	380	390	370	
Martinez	700	620	550	bkn	390		420	
West Suisun	540	310	490	290	150	16	220	
Innisfail Ferry	b170	200	200	200	130		62	
Port Chicago	650	390	320	180	70	a18	a66	
Nichols			370	6			230	
O & A Ferry	78	102	176	19	5	5	24	
Pittsburg	18	26	20	9	5	5	5	
	Sacramento River Delta							
Collinsville	12	29	13	3	3		2	
Three Mile Slough Bridge	1	2	2		1	1	3	
Rio Vista Bridge	2	2	2	1	2	2	2	
Isleton	1		1	1	1	2		
	San Joaquin River Delta							
Winter Island	15	21	16	9	4	5	3	
Antioch	10	14	13	7	5	3		
Millers Harbor	6	8	8		5	4	4	
Webb Pump		a6	5	8	4	5	7	
Opposite Central Landing	5	2	2	1	4	a1	2	
Dutch Slough	6	6	7	7	8	8	6	
East Contra Costa I.D.	11	10	10	10	19	a20	21	
Victoria	7	9	9	9	12	9	10	
Clifton Court Ferry	7	7	9	11		9	8	
South Fabian	8	a9	9	b10	11	10	9	
Grant Line Bridge***		7	12	8	9		ab8	
Mossdale	a6	a7	9	ab12	a9	a9	7	

* New station - established January 3, 1947.
** New station - established January 24, 1947.
*** New station - established February 5, 1947.
(a) Taken at low high tide.
(b) Taken on following day.
(e) Taken on preceding day.

TABLE 128 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Station	MARCH - 1947							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1340	1130	1140			1290	1400	b1200
Point San Pedro	b1280	1170	a940	710	1220		a1000	
Point Pinole		1030			990			
Hercules	1000	a850	820	710	740		880	940
Point Davis	950	770	760	750	690	780	770	730
Grand View	780	820	790	730	770	820	850	820
Crockett	760	640	660	510	590	730	690	670
Benicia	650	470	330	180	380	370	490	460
Martinez	560	230	120		150	270	380	420
West Suisun	400	240	20	38	220	160	130	190
Innisfail Ferry	66	b76	72	53	92	60	a64	58
Port Chicago	420	70	25	b32	98	185	156	b98
Nichols	220	90	15	4		52		144
O & A Ferry	18	12	*7	3	3	7	18	11
Pittsburg	5	6	a5	6	4	5	a3	4
	Sacramento River Delta							
Collinsville	3	2	2	2	1	2		2
Three Mile Slough Bridge	2				2	1		1
Rio Vista Bridge	2	2	1	1	1	1	1	2
Isleton	1	2	2	1	1		a1	1
	San Joaquin River Delta							
Winter Island	4	6	a4	5	2	4	4	
Antioch	3	5	4	3	3	4	3	3
Millers Harbor	3	5	5	6	4	4	3	a3
Webb Pump	5	6	5	6	5	a5	4	
Opposite Central Landing	4	a2	3	1	2	2	3	3
Dutch Slough	6	7	10	8	7	a6	6	7
East Contra Costa I.D.	14	14	12	12	11	a11	11	11
Victoria	10	10	9	8	9	7	7	8
Clifton Court Ferry			a8	10	7			9
South Fabian	8	b8	7	9	9	a7	a8	ab11
Grant Line Bridge	7	8	9	8	7	7	9	9
Mossdale	7	a8	10	6	a6	a6	9	7

Station	APRIL - 1947							
	1300	1300	1300		1480	1560	1500	
	San Francisco, San Pablo and Suisun Bays							
Point Orient		Station discontinued						
Point San Pedro								
Point Pinole	1120			a1070	a1220	a1260		a1320
Hercules	a760	760	550	a1020	a1160	1210	1260	e1070
Point Davis	810	580	430	910	970	1150	1150	e1120
Grand View	810	900	860	850	850	990	970	e990
Crockett	650	490	480	890	1040	1030	900	e920
Benicia	460		250		640	810	690	620
Martinez	130	120	170	510	470	580	540	450
West Suisun	160	22	74	146	260	400	480	330
Innisfail Ferry	49	b70	71	ab61	a65	a72	78	a78
Port Chicago	a14	8	a6	162	385	260	310	150
Nichols	30		6	b250	70		240	220
O & A Ferry	2	a4	3	a33	a16	a31	29	a47
Pittsburg	6	a4	3	b10	a5	a14	18	a11
	Sacramento River Delta							
Collinsville	2		3	a3	a1		13	a2
Three Mile Slough Bridge	1	2	1	b2	2	2	1	1
Rio Vista Bridge	1	1	1	b2	1	1	1	1
Isleton	1		b1				ab1	1
	San Joaquin River Delta							
Winter Island	4	a5	3	a2		a6	11	a8
Antioch	3	a3	4	3	5	4	6	6
Millers Harbor	3	4	4	b3	4	4	b6	5
Webb Pump			5	a6	a5		3	a4
Opposite Central Landing	3	3	1	a3	a1	1	2	a4
Dutch Slough	7	6	7	7	12	5	5	6
East Contra Costa I.D.	11	a12	14					
Victoria	9	10	b11	b8	9	9	10	12
Clifton Court Ferry	9							8
South Fabian	8		9	b13	a13	15	10	10
Grant Line Bridge	7	7	10	a11	12	7	8	9
Mossdale	a8		11	b13	15	6	8	11

(a) Taken at low high tide.
(b) Taken on following day.
(e) Taken on preceding day.

TABLE 128 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Stations	MAY - 1947							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1580	1440	1480	1470		1650	1640	e1610
Point Pinole	1330		1320	1320				
Hercules	1170	1240	1110	1200	1360	1340	1340	e1350
Point Davis		1180	880	1140	1120	1340	1250	e1350
Grand View	1060	1100	1110	1180	1130	1130	1170	e1220
Crockett	a1000	1200	700	910	1140	1380	1220	e1240
Benicia	810		520	720	e920			980
Martinez		770	490	a520	690	860	780	810
West Suisun	350	520	430	b340	620	1000	600	640
Innisfail Ferry	a76	b90	b92	a90		b250	a270	a250
Port Chicago	450	a290	a170	210	a520	800	590	740
Nichols		130	240	b60		550	550	
O & A Ferry	a60	a69	33	ab30	a95	a196	150	a170
Pittsburg	a20	a21	15	bkn	a30	a70	a112	a70
	Sacramento River Delta							
Collinsville	a3	a3	13	a6		108	a109	a56
Three Mile Slough Bridge	1	8	2	2	2		b3	3
Rio Vista Bridge	1	1	1	2		3	b2	3
Isleton	2	a2	1	b2	a1	1		2
	San Joaquin River Delta							
Winter Island	a11	a12	11	a7		a72	a78	a48
Antioch	8	12	9	b7	13	73	49	35
Millers Harbor	a6	8	5	b5	7	37	b19	20
Webb Pump	a4	a4		4		3	a6	
Opposite Central Landing	a2	5	3	a3	a3	4	a4	a4
Dutch Slough	a6	4	4	a5	a4	4	a6	
East Contra Costa I. D.	11	10	9		5	5	a7	a8
Victoria	10	10	8	b6	6	8	ab8	
South Fabian	a12	12	5	b7	8	10	b7	6
Grant Line Bridge		4	6	b7	9	9	4	6
Mossdale	11	3	3	b8	8	6	a4	5

Stations	JUNE - 1947							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1620	1640	1500	1650	1720	1680		e1750
Point Pinole				a1470				a1550
Hercules	1370	1360	1220	1260	1390	1410	1530	e1480
Point Davis	1280	1340	1090	1250	1420	1340	1390	1420
Grand View	b1130	1260	1300	1280	1300	1320	1370	1330
Crockett	a1090	1080		1210	1180	1310	1410	1430
Benicia	970		740	1040	1130	1030	1080	1140
Martinez	810	870	600	770	a710	1110	1150	1050
West Suisun	730	650	390	b720	930	850	720	930
Innisfail Ferry	a250		a160	b230	a270	330	ab350	
Port Chicago	bkn	b550	430	660	a530	860	880	920
Nichols		230	340	b570	710	390	800	620
O & A Ferry	a250	a120	120	a90	a210	370	bkn	a340
Pittsburg	a52	a37	a39	48	a57	a84	a200	a178
	Sacramento River Delta							
Collinsville	a72		a42	a15		202	a194	a230
Three Mile Slough Bridge	4	3	6		3	5	b10	14
Rio Vista Bridge	2	3	b2	b1	2	3	b3	3
Isleton	3		b2		a2	4		2
	San Joaquin River Delta							
Winter Island	a38	ab40	a32	a30	a48	122	154	a136
Antioch	47	46	a22		87	101	130	164
Millers Harbor	31	27	b14	b16	33	62	b72	108
Webb Pump	a6	6	a6	a5	a6			a9
Opposite Central Landing	a3	5		a5	a3	5	a6	a5
Dutch Slough	a7	6	a6	a6	a6	7	a9	bkn
East Contra Costa I. D.	7	6	a7	b7	a9	8	bkn	9
Victoria	b7	6	ab7	b7	8	8	b7	8
South Fabian	7	7	a11	b13	13	14		13
Grant Line Bridge	8	b11		11	14		16	
Mossdale	7	10	a10	b12	15	17	a16	15

(a) Taken at low high tide.
(b) Taken on following day.
(e) Taken on preceding day.

TABLE 128 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTC-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Stations	JULY - 1947							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	b1740	1760	1700	1760	1780	1770	1780	1840
Point Pinole	a1540			a1590	a1580			a1660
Hercules	b1460	1520	1490	1540	e1580		e1640	b1610
Point Davis	b1410	1460	1410	1500	1570	1490	1570	b1570
Grand View	1400	1470		1490	1530	1570	1560	c1610
Crockett	b1400		1380	1460	1560	1480	1520	
Benicia	b1220	1150	1190	1330	1350	1210	1310	
Martinez	a1160	b1150	980	1180	1120	a1110	1200	b1300
West Suisun	1080	920	800	b1090	1190	840	990	1220
Innisfail Ferry	a430		ab450	a470	520	630	a620	650
Port Chicago	b930	980	890	1100	b1180	e1140	1070	b1180
Nichols			620	900		890		
O & A Ferry	a370	450	a430	a440	a470	a680	a470	a580
Pittsburg	a220	a280	320	a310	a330	310	a390	a450
	Sacramento River Delta							
Collinsville	a210		a270	a280	a330	a370	a340	a400
Emmaton **			e20			b70		
Three Mile Slough Bridge		27		26	70	56	55	77
Rio Vista Bridge	b4	f4	5	2	7	4	b4	b6
Isleton	b3		a4	a2	a4			a2
	San Joaquin River Delta							
Winter Island	a170	270			a260		a270	a320
Antioch	226	240	220	a160	360	300	330	400
Millers Harbor	b140	f60	130	a126	230		240	b170
Jersey			a32	a25	a31	a102		59
Webb Pump	a7	9	a9	a11	26	a24	a20	a26
Opposite Central Landing	a5	5	a7	a6	a7	a11	a9	a10
Dutch Slough	a13	16	bkn	a19	27	a27	a31	a41
East Contra Costa I. D.	b10	9	a9	7	8	a8	a9	
Victoria	b7	7	a9	8	7		bkn	b7
Clifton Court Ferry		a10			9	b9		b9
South Fabian	b13	5	ab17		13		13	b11
Grant Line Bridge	b16			16	14	15	a16	15
Mossdale	b15	6	a14	17	16	a18	a16	b15
Below Banta Carbona I. D.*				15	17	a17	ae18	15
At Vernalis*				15	16	a16	ae16	a16

Stations	AUGUST - 1947							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1810	1830	1860	1860	1840		1850	1790
Point Pinole					1640			
Hercules	a1670	a1700	1660		1700	a1670		1610
Point Davis	1610	1600	1630	b1620	1610	1650	1560	1620
Grand View	1630	1640	1640	b1670	a1680	1630	1630	1660
Crockett	1560	a1600	1620	b1630	af1600	1540	1590	a1470
Benicia	1430	1320		b1430			1430	1360
Martinez		1240	1200	b1340		1150	1320	1140
West Suisun	1160	1110	1250	1350	1100	1010	b1180	1060
Innisfail Ferry	ab670	670	750	730	a780	820	a750	
Port Chicago	1190	920	1090	1240	1210	1040	960	1060
Nichols		e940	740	b1160	1100	1030	1050	
O & A Ferry	a590	560	a530	a610	a610	a530	a580	a560
Pittsburg	a390	f500	420	a420	a490	470	a370	ab350
	Sacramento River Delta							
Collinsville	a400	450	a280	a390	a450	a360	a350	f380
Three Mile Slough Bridge	a70	86	99	e125	104	90	b82	78
Rio Vista Bridge	5	f5	21	b14	6	13	b7	7
Isleton		2		b4	4	3	3	
	San Joaquin River Delta							
Winter Island	a350	340			370	a330	a350	
Antioch		310	b380	470	350		b380	a350
Millers Harbor	c150		210	a160	330	270	b300	170
Jersey		102	a60	a70	b168	a79		
Webb Pump	32	39	a32	a41	45	a39	a40	a39
Opposite Central Landing	a11	15	a9	a14	20	a12	a14	a13
Dutch Slough	50	46	a39	a55	a84	a57	ab56	a55
East Contra Costa I. D.	b9	8	a7	ab12	10	a11	b13	14
Victoria	9	9	af11	b10	11	b13	b14	16
Clifton Court Ferry		8		b10		a10	ab10	12
South Fabian		12		b11	11		b14	b19
Grant Line Bridge	12	14		13	15			f15
Mossdale	18	16	a15		17	b16	b14	15
Below Banta Carbona I. D.		16	b15					
At Vernalis		5	b14					

* New Station - established July 3, 1947
** New Station - established July 10, 1947
(a) Taken at low high tide.
(b) Taken on the following day.
(c) Taken two days later.
(e) Taken on preceding day.
(f) Taken two days earlier.

TABLE 128 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Stations	SEPTEMBER - 1947							
	2	6	10	14	18	22	26	30
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1810	1800	1810	1870	1840	1880	e1720	1750
Point Pinole	a1680		a1650					
Hercules	1600				1670		1560	
Point Davis	1520	1560	1650	1560	1490	1500	b1480	1430
Grand View	1680	b1710	1710	1700	1800	1700	b1720	1720
Crockett	a1520	1790	1520		1500	1320	b1260	1440
Benicia	1350	1300	1430	1510	1250	1300	b1140	1130
Martinez		1240						
West Suisun	a990	1060	1260	1200	1100	1100	980	760
Innisfail Ferry	a740	a740	a750	a750	a740	a710	ab700	
Port Chicago	1060	1210	1210	1100	1020	940	860	810
Nichols		1020	1080		880			750
O & A Ferry	a540	a550	560	520	bkn	a400	350	370
Pittsburg	a390	460	a290	a350	340	240	a160	210
	Sacramento River Delta							
Collinsville	a320	a330	a280	a310	280	370	a136	180
Three Mile Slough Bridge	78	71		a48	37	31	b16	
Rio Vista Bridge	17	f5	b26	9	3	3	b3	5
Isleton	5	a3	4			4		3
	San Joaquin River Delta							
Winter Island	350	a320		310	300			170
Antioch	300	340	360	350	140	230	160	140
Millers Harbor	a220	f230	b270	260		170	110	100
Jersey	ae86	e124	ab84			63	34	49
Webb Pump	40	35	a34	39	37	a20		22
Opposite Central Landing	19	a11	a12	a13	17	10	a5	10
Dutch Slough	62	53	a51	55	50	a41	a36	37
East Contra Costa I. D.	14	a13	b17	16	19	16	a16	15
Victoria	14	15	b16	19	ab15	b12	b14	9
Clifton Court Ferry	a12	a14	a14	16	13	a11	10	a10
South Fabian				16		a12	b9	
Grant Line Bridge	b17	ac12	c12	c13		c11		a10
Mossdale	b17	a12	b10	11	a9	a8	b7	a7
Below Banta Carbona I. D.	15							

Stations	OCTOBER - 1947							
	San Francisco, San Pablo and Suisun Bays							
Point Orient	1780	1760	1740	1820	1640	1580	1620	bkn
Point Pinole	1590		1490	1530		1350	1270	1430
Hercules				1430			e1240	
Point Davis	1420	1520	1360	1310	1230	960		1270
Grand View	1640		1610	1660	1570	1570	1490	1440
Crockett	1390	1510		1340	1070	a960	1200	1260
Benicia	1080	1270		1090	910	740	1030	
Martinez		1240	b1010	1030	780	a610		800
West Suisun	730	d1090	e740	660	640	b670	810	870
Innisfail Ferry	b600	560	ab580	b520	490	450	b410	
Port Chicago	810	990	810	750	730	550	680	b740
Nichols	390	860	c590	700	550			
O & A Ferry	340	a350	a360	280	270	140	180	230
Pittsburg	180	270	a170	150	100	50	44	49
	Sacramento River Delta							
Collinsville	180	a150		132	a80	34	36	93
Three Mile Slough Bridge			bkn	8	3	4	4	6
Rio Vista Bridge	3	f2	b6	3	2	1	3	3
Isleton	4	3				1	3	2
	San Joaquin River Delta							
Winter Island			a128	110	a62	42	38	
Antioch	bkn	190	144	94	70	29	24	36
Millers Harbor	90	f94	90	60	48	22	18	26
Jersey	a33	24			14			
Webb Pump	25		a18	bkn	4	12		10
Opposite Central Landing	10	a8	a6	8	3	12	5	a4
Dutch Slough	35	a26	a27	22	a20	22	16	a17
East Contra Costa I. D.	a15	a16	a15	19	a18	16	23	16
Victoria	11	10	b11	9		9	12	
Clifton Court Ferry	a10	a10						
South Fabian	a11		b11					
Mossdale	a8	a9	b9	a9	a10	12	ab8	a11
Grant Line Bridge	ac9		c9		c10	f12	c11	

(a) Taken at low high tide.
(b) Taken on following day.
(c) Taken two days later.
(e) Taken on preceding day.
(f) Taken two days earlier.

TABLE 128 (CONT'D)

SALINITY OBSERVATIONS, SACRAMENTO-SAN JOAQUIN DELTA AND UPPER BAYS

Samples taken by local observers approximately one and one-half hours after high high tide.
Salinity expressed in parts of chlorine per 100,000 parts of water.

Stations	NOVEMBER - 1947							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1610	bkn	1650		1540		1470	1700
Point Pinole		a1220	1300	1410				
Hercules			1180			a1250	1360	a1180
Point Davis	1150		1230	1090	1150	1170	1340	1290
Grand View	1440	1470	1430		1400		1310	1340
Crockett		910	1160	1060	850	1030	1280	1210
Benicia		710	850	950	740	780	990	
Martinez	730	460		a580	660	680		910
West Suisun	740	370	560	510	460	680	790	840
Innisfail Ferry	390	b380	280	270	b320	b340	340	370
Port Chicago	600	410	590	710	a460	660	740	b700
O & A Ferry	170	a60	90	150	a80	140	190	230
Pittsburg	55	18	16	34	a24	26	28	157
Sacramento River Delta								
Collinsville	a28	a15	15	29	a12	17	31	108
Three Mile Slough Bridge	4	5	2	4	3		4	6
Rio Vista Bridge	2	f3	1	1	11	5	2	1
Isleton					2			
San Joaquin River Delta								
Winter Island	43	a20	21		25	17		79
Antioch	31	13	12	18	18	14	20	74
Millers Harbor	c15		10	12	11	8	11	31
Webb Pump	12		8	9		9	11	a8
Opposite Central Landing		a4	5	a5		3	4	
Dutch Slough	a15	a17	10	11	a11	10	9	11
East Contra Costa I. D.	ab12	a12	15	17	a14	13	18	11
Victoria		b11	12	8	8	8	13	10
Clifton Court Ferry					7	9		
South Fabian			a9	a8			a9	
Mossdale	a8	a8	a7	a9	a7	6	a10	a10
Grant Line Bridge	ab10			10	a9			c10

Stations	DECEMBER - 1947							
	2	6	10	14	18	22	26	30
San Francisco, San Pablo and Suisun Bays								
Point Orient	1830	1640	1600	1610	1640	1570	1660	1700
Point Pinole			1410					1390
Hercules		1360						
Point Davis	1200	1240	1240	1140	1290	1230	a1340	1300
Grand View	a1250	1410	1270	1290	1260	1170	1090	1080
Crockett	1150	1250	990	1060	1090	1130	1280	1230
Benicia	890	940	1060	1050	750	800	1090	
Martinez	890		850	920	650		920	890
West Suisun	640	650	520	820	b500	880	b870	710
Innisfail Ferry	360	370	b340	b350	360	350	400	440
Port Chicago	e700	690	b680	850	440	800	850	e750
O & A Ferry	260	bkn	170	230	200	240	290	320
Pittsburg	a49	105	80	100	52	57	130	a80
Sacramento River Delta								
Collinsville	a56	48	62	55	46	67		a71
Three Mile Slough Bridge	3	3	4	2	3			
Rio Vista Bridge	4	f1	2	3	1	3	2	2
Isleton	1			3		1		
San Joaquin River Delta								
Winter Island	a47	ab59	62	a44				ab74
Antioch	49	36	35	53	a29	56	74	94
Millers Harbor	24	b19	22	26	a17			
Webb Pump	a9	8						a10
Opposite Central Landing	5	6	5	a2	a3	6	5	a3
Dutch Slough	a9	7	9	9	8	10	9	a11
East Contra Costa I. D.	12	11	18	a13	a12	14	12	12
Victoria		8	5	11	9	9	12	10
Clifton Court Ferry	10	9	16		10	9	8	
South Fabian		12					ab9	
Mossdale	a12	9	a10	a8	8	7	a10	a10
Grant Line Bridge	a11	10		a10	10	7	ac9	

(a) Taken at low high tide.
(b) Taken on following day.
(c) Taken two days later.
(e) Taken one day earlier.
(f) Taken two days earlier.

TABLE 129

DAILY SALINITY OBSERVATIONS TAKEN AT WEST SUISUN STATION
NORTH SHORE, WEST END OF SUISUN BAY - 1947

Samples taken by U. S. Maritime Commission, Reserve Fleet Mooring Area, approximately one and one-half hours after high high tide

Date	Salinity expressed in parts of chlorine per 100,000 parts of water											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	420	370	190	200	360	600	1000	1160	1010	720	730	890
2	450	540	400	160	350	730	1080	1160	990	730	740	640
3	490	670	520	90	440	700	1000	1180	1050	750	680	680
4	460	530	360	12	400	720	940	1040	930	780		610
5	500		240	32	410	690	910	1070	980	1130		600
6	640		240	22	520	650	920	1110	1060	1090	370	650
7	530	310	89	38	420	570	910	960	1110	900	300	470
8	520	310	25	20	510	670	850	1020	1230	810	420	710
9	380	390	50	270	390	670	730	1030	1230	740	710	530
10	330	490	20	74	430	390	800	1250	1260		560	520
11	280	470	40	42	430	360	870	1300			640	
12			23	70	370	440	940	1210	1120		680	510
13	770	270	22	200	410	580	1140		1210	880		500
14	480	290	38	146				1350	1200	660	510	820
15	390	180	64	270	340	720	1090	1210	1000	700	490	770
16	470	140	330	320	560	950	1100	1250	1170	710	590	570
17	480	160	250	340	540	930	1180	1300	1110	710	680	690
18	510	150	220	260	620	930	1190	1100		640	460	
19	480	130	146	260	820	1060	1190	1080	1090	720	660	500
20	500	16	255	250	880	1020	1090		1010	840	640	710
21	450	18	220	270	1000	770	1060	970	1060	520	710	530
22	450	16	160	400	950	850	850	1010	1100		680	880
23	460	19	90	360	710	780	870	1050	1100	670	520	800
24	410	28	26	390		710	930	1230	1060	540	560	690
25	380	165	88	460		a880	970	1250		590	840	590
26	400	220	130	480	600	a720	990		980	810	790	
27	410	310	200	450	510	810	1190	1180	960	820	660	870
28	630	170	160	460	510			1170	920	740	900	970
29	480		190	170		790	1150	1070	820	850	1020	950
30	420		190	331	640	930	1220	1060	760	870	840	710
31	320		215		610		1240	1030		590		

TABLE 130

DAILY SALINITY OBSERVATIONS TAKEN AT PORT CHICAGO STATION
U. S. NAVAL AMMUNITION LOADING WHARF - 1947

Samples taken by U. S. Marine Corps approximately one and one-half hours after high high tide.

Date	Salinity expressed in parts of chlorine per 100,000 parts of water											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	370	520	a310			720	910	1160	1090		630	700
2	380	650	a410	a14	450			1190	1060	810	600	
3		630	180	45	540		930	1180		880	640	660
4	450	500		17	340	430	960	1070		950	550	680
5	460	360	200	12	320	710		1040	1030	810	370	
6	460	390	70	8	a290		980	a1090	1110	990	410	690
7		210	100	88	130	550	950	1080	1100	930	a380	450
8	490	420	27	8	250	480		1110	1140	830	a480	670
9	a500	250	48	18	180	a450	a880	1110	1150	870	a520	680
10	330	320	25	a6	a170	430	890	1090	1210	810	590	
11	400	a220	6	18	240	470		1260	1110	710	580	a680
12	a370	640	31	126	340	460	970	1220		a570	480	a760
13	a520	350		46	390	610	900	1250	1110		a580	a740
14	a450	180		162	210	660	1100	1240	1100	750	710	a850
15	a650	110	32	285	a340	890	1120	1090	1100	770	570	a640
16	a480	90	48	330	510	840			1030	820		650
17	430	90	54	410	680	770	1260	1230	930	810	a430	550
18	a200	70	98	385	a520	530		1210	1020	730	a460	440
19	420	80	a14	280		950	1180	1110		530		680
20	a360	144	a22	180	760	1010			1030		560	670
21	470	16	a22	290	820	830	1140	a950	900	390	a380	740
22	460	18	185	260	800	860		1040	940	550	660	800
23	510	44	114	250		820		1080	860	a450	330	
24	450	12	a26	230		770	860	1120	920	670	700	700
25	430	260	172		740	850	1100	1130	900	630	730	860
26	390	a66	156	310	590	880	1070	960	860	680	740	850
27	380	300	48	130	600	810	1060	1150		700	830	940
28	580	126	116	300	630	940			940	700	a780	930
29	380		180	a340	a490	730	1270	1160	860	750	820	750
30	480			150	740	920		1060	810	710		
31	570		98		720		1180	1030		740		

TABLE 131

COMPARATIVE ANNUAL MINIMUM 10-DAY FLOW TO DELTAS OF SACRAMENTO AND SAN JOAQUIN RIVERS AND AREA OF EACH AFFECTED BY SALINITY ENCROACHMENT GREATER THAN 100 PARTS OF CHLORINE PER 100,000 PARTS OF WATER

Year	Flow for Minimum 10-day period (1)					Runoff in % of Normal*			Area Affected by Salinity					
	Sacramento River at Sacramento		San Joaquin River at Vernalis		Sacramento and San Joaquin to Delta	Sacramento and San Joaquin to Delta	At Sacramento	At Vernalis	All Deltas		Sacramento and Mokelumne		San Joaquin	
	Date	c.f.s.	Date	c.f.s.	c.f.s.				% of Total	Acres (2)	% of Total	Acres (3)	% of Total	Acres
1920		(4)540		(4)450		52	48	66	15.1	65800	7.7	33500	7.4	32300
1921						118	126	95	2.1	9150	2.0	8715	0.1	435
1922						103	95	123	2.9	12600	2.4	10420	0.5	2180
1923						76	70	88	2.1	9150	2.0	8715	0.1	435
1924	7/14	858	7/26	407	1280	28	30	24	50.0	217500	18.4	80100	31.6	137400
1925	8/7	2860	8/29	743	3730	86	84	88	3.6	15630	3.1	13450	0.5	2180
1926	7/28	1460	8/21	586	2080	60	63	56	18.5	80500	8.5	37000	10.0	43500
1927	8/23	3560	8/23	1300	4850	121	127	104	2.9	12600	2.4	10420	0.5	2180
1928	8/15	2660	8/22	866	3550	84	89	70	5.7	24800	3.7	16100	2.0	8700
1929	7/18	2460	8/12	590	3090	44	44	46	7.1	30900	4.2	18300	2.9	12600
1930	8/5	2500	8/9	735	3230	65	71	53	5.4	23500	3.8	16500	1.6	7000
1931	7/20	-79	7/21	211	131	30	32	27	73.8	321000	30.2	131000	43.6	190000
1932	8/11	1980	9/10	1030	3030	78	69	106	5.7	24800	3.4	14800	2.3	10000
1933	8/21	1450	8/14	607	2070	48	46	54	9.8	42600	5.2	22600	4.6	20000
1934	7/20	1150	8/14	346	1530	43	45	37	37.5	163000	17.8	77500	19.7	85500
1935	8/12	2920	8/12	922	3940	91	87	103	2.9	12600	2.4	10420	0.5	2180
1936	8/20	2540	8/17	1040	3600	96	92	104	2.6	11600	2.2	9840	0.4	1760
1937	8/16	1720	8/24	1020	2820	80	70	105	3.5	15200	2.6	11280	0.9	3920
1938	8/12	5190	8/27	2130	7365	170	167	180	0	0	0	0	0	0
1939	8/5	630	7/25	610	1315	43	43	46	29.0	126000	17.0	74000	12.0	52000
1940	8/12	2550	8/9	1080	3620	115	118	105	4.2	18300	3.0	13000	1.2	5300
1941	8/24	4190	9/14	1480	5800	137	143	127	1.2	5100	1.2	5100	0	0
1942	8/22	3740	8/20	1520	5300	129	133	118	1.2	5100	1.2	5100	0	0
1943	8/17	2600	8/4	1480	4140	114	111	117	2.8	12200	2.2	9600	0.6	2600
1944	8/13	2790	8/9	1033	3830	56	54	62	7.2	31300	4.8	20800	2.4	10500
1945	8/24	6560	8/1	1530	8180	86	79	106	0.2	1000	0.2	1000	0	0
1946	8/7	6460	8/5	1160	7640	92	92	92	0.6	2500	0.6	2500	0	0
1947	7/7	4700	7/21	477	5270	54	54	55	7.5	32400	5.0	21500	2.5	10900

* Normal = 50 year mean (1889-1939).

(1) Does not include inflows from Mokelumne and Calaveras Rivers, Yolo By-Pass and other minor tributaries.

(2) Delta area taken at 435,000 acres which includes all lands, levees, water surfaces, etc., within Delta boundary.

(3) Sacramento and Mokelumne deltas combined as the Sacramento River contributes a large flow to Mokelumne River Delta through Georgiana and Three Mile Sloughs.

(4) No continuous record. Lowest discharge measured.

TABLE 132

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SACRAMENTO RIVER BELOW SHASTA DAM														
1/13/47	10:00	579.35	5842					0.0	88	5.1	6.6			110
2/10/47	11:00	578.3	4400					0.0	74	5.1	6.1			100
3/10/47	11:30	577.93	3700					0.0	73	3.9	4.7			95
4/14/47	2:30	577.70	3387					0.0	71	4.3	8.5			120
5/12/47	11:00	579.72	6516					0.0	84	11.0	6.1			110
6/9/47	11:15	579.07	5250					0.0	67	4.9	4.2			96
7/14/47		580.24	7506					0.0	65	7.0	6.6			87
8/11/47		580.26	7525					0.0	64	4.5	6.6			92
9/9/47	11:05	579.30	5658					0.0	64	5.3	7.5			85
10/13/47	3:20	578.50	4450					0.0	63	6.2	1.9			110
11/10/47	3:30	578.13	3838					0.0	76	13.0	5.6			94
12/8/47	3:45	578.15	3860	Sample broken in transit - no analysis made.										
SACRAMENTO RIVER AT COLUSA BRIDGE														
1/7/47	10:15	42.00	6590					0.0	78	6.8	8.5			110
2/4/47	4:00	40.27	5075					0.0	87	12.0	7.5			120
3/3/47	2:40	41.70	6300					0.0	85	8.3	8.0			100
3/31/47	11:30	42.60	7150					0.0	79	7.0	7.5			130
5/2/47	4:45	40.40	5100					17.0	61	13.0	8.0			120
6/2/47	11:00	40.53	5500					4.9	66	6.7	6.1			110
7/1/47	1:00	40.12	4832					0.0	100	7.0	7.5			140
8/4/47	3:10	40.08	4790					0.0	76	6.2	10.0			100
9/2/47	11:30	39.45	4150					0.0	77	8.6	7.5			100
10/1/47	9:20	39.14	4083					0.0	76	12.0	5.6			90
11/4/47	12:30	43.85	9000					0.0	56	12.0	4.7			94
12/1/47	10:20	40.28	5400					0.0	74	9.0	5.4			140
COLUSA TROUGH AT STATE HIGHWAY 20														
1/7/47	10:00	0.65	105					29.0	290	240.0	130.0			810
2/4/47	3:45	0.18	54					34.0	280	240.0	140.0			840
3/3/47	3:10	1.78	260					0.0	290	280.0	210.0			1200
3/31/47	11:15	0.20	56					39.0	280	150.0	150.0			960
5/5/47	11:20	0.60	98					22.0	180	110.0	61.0			420
6/2/47	11:30	6.21	1060					17.1	170	55.0	36.0			330
7/1/47	12:00	2.20	320					0.0	210	72.0	45.0			370
8/4/47	2:40	3.20	477					0.0	220	66.0	48.0			370
9/2/47	10:40	4.67	726					0.0	220	70.0	42.0			370
10/1/47	8:45	2.62	381					0.0	210	8.6	39.0			350
11/4/47	12:15	2.38	370					0.0	220	120.0	57.0			480
12/1/47	11:15	0.80	95					20.0	300	250.0	150.0			1000
COLUSA TROUGH AT KNIGHTS LANDING														
1/8/47	10:00	19.62						44.0	300	250.0	150.0			880
2/4/47	9:30	19.44						63.0	260	270.0	180.0			970
3/4/47	9:40	21.00						37.0	160	140.0	83.0			530
4/2/47	9:10	23.90						0.0	77	2.8	8.5			130
5/2/47	9:10	22.20						0.0	210	120.0	78.0			480
6/3/47	2:30	24.50						9.8	190	65.0	46.0			360
7/2/47	9:25	23.75						0.0	280	140.0	110.0			620
8/4/47	9:45	24.80						0.0	260	87.0	64.0			470
9/2/47	9:55	24.50						0.0	230	67.0	48.0			370
10/1/47	10:20	21.95						0.0	230	9.9	49.0			390
11/4/47	10:45	23.35						0.0	200	130.0	66.0			500
12/3/47	9:45	19.08						28.0	310	26.0	140.0			880
SACRAMENTO RIVER AT KNIGHTS LANDING														
1/8/47	10:30	18.71						0.0	84	8.8	10.0			120
2/4/47	10:00	17.16						0.0	87	9.1	8.5			120
3/4/47	10:00	21.27						12.0	43	40.0	24.0			230
4/2/47	9:40	25.32						7.3	74	5.6	6.6			120
5/2/47	9:45	14.90						18.0	79	28.0	18.0			170
6/3/47	2:30	17.50	6300					0.0	100	20.0	18.0			170
7/2/47	9:45	13.92	3800					0.0	110	33.0	24.0			190
8/4/47	10:35	14.86	4430					0.0	110	19.0	19.0			170
9/2/47	11:05	15.30	4800					0.0	100	23.0	17.0			160
10/1/47	10:00	16.20	5500					0.0	93	6.6	6.5			160
11/4/47	11:00	22.98	12000					0.0	73	18.0	2.8			90
12/3/47	10:26	16.78	5850					0.0	91	15.0	6.9			130

* All samples taken between 6:00 A.M. and 6:00 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SACRAMENTO SLOUGH DRAIN														
1/8/47	10:45	14.89						0.0	250	10.0	50.0			320
2/4/47	10:10	13.90						0.0	260	13.0	65.0			350
3/4/47	10:15	19.90						24.0	330	55.0	400.0			1200
4/2/47	10:00	23.30						0.0	74	5.2	13.0			120
5/2/47	10:00	13.60						54.0	200	57.0	200.0			630
6/3/47	1:30	15.15						0.0	190	14.0	55.0			280
7/2/47	10:42	12.06						44.0	200	15.0	120.0			460
8/4/47	11:00	12.70						0.0	230	9.5	78.0			350
9/2/47	11:25	13.60						0.0	230	12.0	70.0			330
10/1/47	11:30	13.74						0.0	220	3.7	35.0			320
11/4/47	12:15	18.40						0.0	220	15.0	37.0			270
12/3/47	10:51	13.70						14.0	240	16.0	82.0			400
FEATHER RIVER AT NICOLAUS														
1/8/47	11:30	23.50	2620					0.0	61	7.7	6.1			83
2/4/47	11:05	23.02	2050					0.0	64	11.0	4.2			86
3/4/47	11:15	32.17	14500					0.0	62	7.2	2.8			95
4/2/47	10:45	32.08	15200					0.0	42	5.0	1.9			66
5/2/47	11:05	24.10	3300					0.0	50	10.0	4.2			82
6/3/47	1:30	22.50						0.0	60	5.6	4.7			91
7/2/47	12:05	20.40	200					21.0	75	9.5	7.5			120
8/4/47	12:30	20.75	870					0.0	75	6.2	6.6			92
9/2/47	1:15	20.40	610					0.0	87	8.6	6.6			100
10/1/47	1:30	22.12	1340					0.0	85	7.0	4.7			110
11/4/47	1:25	24.08						0.0	41	17.0	2.8			88
12/3/47	1:00	22.94	2300					0.0	69	11.0	5.4			90
SACRAMENTO RIVER AT VERONA														
1/8/47	12:00	14.00	10200					0.0	74	8.0	7.5			100
2/4/47	11:30	13.09	9500					0.0	81	13.0	29.0			150
3/4/47	11:30	19.20	22000					0.0	82	8.4	4.7			110
4/2/47	11:00	22.37	29400					0.0	45	5.1	3.8			90
5/2/47	11:30	12.24	8000					0.0	55	12.0	6.6			89
6/3/47	11:15	13.32						0.0	84	8.0	12.0			120
7/2/47	12:45	10.23	5000					24.0	94	18.0	35.0			200
8/4/47	1:10	10.92	5400					0.0	120	17.0	30.0			190
9/2/47	2:05	11.28	5850					0.0	140	19.0	31.0			210
10/1/47	2:00	12.27	7400					0.0	92	58.0	7.5			130
11/4/47	1:55	17.09	16000					0.0	66	18.0	6.6			100
12/3/47	1:23	12.79	8150					0.0	73	11.0	3.1			90
AMERICAN RIVER AT FAIR OAKS BRIDGE														
1/21/47	1:30							0.0	32	3.0	5.2			51
2/10/47	9:55							0.0	30	1.1	8.9	1.0		49
3/21/47	9:45							0.0	28	5.0	3.3			48
4/4/47	10:30	5.40		5.8	3.9	3.4	1.1	0.0	34	4.2	3.8		0.2	58
8/5/47	11:25			7.5	2.1	9.4	1.2	0.0	39	3.3	8.0		4.9	67
10/2/47	1:45	10.00		9.4	3.2	5.0	0.3	0.0	45	1.6	6.1		0.0	65
SACRAMENTO RIVER AT SACRAMENTO (M STREET BRIDGE)														
1/20/47	8:50	4.00						0.0	88	7.1	12.0			130
2/10/47	10:30	10.50						0.0	60	5.6	8.9	1.4		110
3/20/47	3:05							0.0	51	7.0	6.6			90
4/3/47	12:45	0.42		7.6	4.4	50.0	0.4	0.0	43	6.7	5.2		0.2	68
5/27/47	2:30	3.50		13.0	7.1	17.0	0.3	0.0	73	13.0	16.0		0.4	120
7/3/47	1:10	1.96		23.0	11.0	22.0	0.3	0.0	120	17.0	22.0		0.3	180
8/5/47	3:35	1.75		18.0	13.0	27.0	1.5	0.0	120	22.0	26.0		4.2	190
9/9/47	9:00	2.10		20.0	15.0	31.0	1.5	0.0	140	21.0	32.0		0.4	220
10/1/47	3:30	2.50		23.0	13.0	19.0	1.7	0.0	130	14.0	16.0		0.0	180
11/5/47	11:00	15.10		10.0	34.0	11.0	0.9	0.0	58	8.6	6.6		0.5	97
12/3/47	3:20	3.65		18.0	8.5	16.0	1.2	0.0	92	12.0	9.3		0.0	130
SACRAMENTO RIVER AT HEAD OF SNODGRASS SLOUGH														
1/20/47	9:47	5.30						0.0	84	7.6	11.0			120
2/17/47	9:15	11.00						0.0	56	9.5	9.0			130
3/19/47	9:30	7.19						0.0	60	14.0	8.0			110
5/22/47	12:00	5.35		13.0	7.7	15.0	1.8	0.0	70	11.0	19.0		0.5	120
8/6/47	9:40	5.65		17.0	11.0	31.0	2.8	0.0	120	20.0	30.0		5.3	200
11/5/47	11:45	5.90		11.0	4.7	9.0	0.9	0.0	58	7.0	8.5		0.7	97

* All samples taken between 6:00 A.M. and 6 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SACRAMENTO RIVER AT WALNUT GROVE														
1/20/47	10:20	1.10		13.0	7.6	15.0	1.7	0.0	81	10.0	12.0		0.4	120
2/17/47	10:00	8.60		9.1	5.8	7.6	0.5	0.0	49	9.3	7.5		0.6	99
3/19/47	9:57	5.90		11.0	5.8	9.0	4.2	0.0	63	9.6	8.0		0.4	100
4/3/47	3:15	7.05		8.8	4.9	6.0	1.8	0.0	52	4.9	5.6		1.0	82
5/22/47	11:30	1.70		14.0	6.8	13.0	0.3	0.0	69	13.0	17.0		0.0	120
7/1/47	4:30	2.40		21.0	15.0	24.0	0.7	0.0	110	20.0	28.0		0.9	180
8/5/47	1:40	0.19		15.0	9.1	40.0	2.1	0.0	120	19.0	30.0		6.3	190
9/9/47	10:20	1.40		20.0	14.0	32.0	0.7	0.0	130	22.0	35.0		0.9	220
10/1/47	1:45	1.61		23.0	16.0	27.0	1.9	18.0	120	17.0	20.0		0.9	200
11/5/47	12:40	5.00		14.0	5.4	9.2	0.7	0.0	68	7.0	7.0		0.7	110
12/4/47	9:20	2.61		14.0	7.2	12.0	0.9	0.0	85	6.6	11.0		0.0	120
SACRAMENTO RIVER AT COLLINSVILLE														
1/20/47	11:50	6.32									44.0			
2/27/47	12:00	6.60						0.0	48	10.0	11.0			96
3/19/47	12:00	6.00						0.0	58	12.0	9.4			110
4/14/47	11:25	4.12		11.0	6.7	12.0	0.5	0.0	64	12.0	12.0		0.3	99
5/27/47	10:15	5.20		25.0	41.0	300.0	1.4	0.0	62	84.0	510.0		0.0	1110
7/3/47	6:50	4.50		66.0	140.0	1100.0	3.4	0.0	120	280.0	1900.0		0.0	3700
8/6/47	12:30	2.22		85.0	210.0	1700.0	6.9	0.0	92	440.0	2900.0		1.2	6000
9/9/47	1:30	4.70		83.0	210.0	1700.0	3.1	0.0	120	440.0	2900.0		0.2	6100
10/10/47	2:40	5.05		46.0	85.0	510.0	1.5	0.0	130	170.0	1000.0		0.0	2300
11/17/47	9:45			16.0	14.0	53.0	1.4	0.0	87	24.0	81.0		0.0	260
12/3/47	10:15	5.11		27.0	36.0	240.0	1.0	0.0	92	72.0	410.0		0.0	930
SAN JOAQUIN RIVER BELOW FRIANT DAM														
1/17/47	10:55	4.10						0.0	25	1.2	5.0			35
2/17/47	11:00	3.88						0.0	19	1.0	4.2			33
3/21/47	10:15	4.90						0.0	19	1.2	4.2			48
4/21/47	1:50	5.87						0.0	19	2.1	4.2			33
5/19/47	1:10	5.02						15.0	19	2.0	4.2			52
6/25/47	10:45	5.95						0.0	11	0.3	2.8			28
7/23/47	2:30	6.17						0.0	11	1.6	3.3			24
8/20/47	3:55	5.89						0.0	14	1.5	3.3			26
9/25/47	1:15	5.40						0.0	26	9.5	1.9			36
10/23/47	11:25	4.18						0.0	25	11.0	1.9			54
11/24/47	10:30	3.25	365	3.0	0.4	3.4	1.0	0.0	15	2.1	3.3		0.2	30
12/29/47	2:00	2.94	255					0.0	17	2.9	3.9			34
SAN JOAQUIN RIVER AT MENDOTA POOL														
1/20/47	11:10	9.50						0.0	25	2.4	5.5			47
2/17/47	11:10	13.50						0.0	22	2.3	5.2			40
3/24/47	9:10	13.59						0.0	22	0.9	4.7			46
4/21/47	10:35	13.88						0.0	19	2.1	5.2			39
5/19/47	9:35	14.33						16.0	6.8	1.6	4.7			53
6/23/47	8:50	13.66						0.0	13	1.0	4.7			33
7/21/47	8:50	13.52						0.0	12	0.4	3.3			30
8/18/47	9:00	13.50						0.0	14	0.9	4.2			30
9/22/47	9:15	13.52						0.0	20	7.8	1.2			39
10/20/47	9:55	12.57						0.0	25	10.0	2.8			57
11/25/47	9:50	13.66		4.7	1.3	5.5	1.0	0.0	26	3.7	3.8		0.7	43
12/22/47	10:25	9.84						0.0	29	3.7	5.0			52
SAN JOAQUIN RIVER AT TEMPLE SLOUGH														
1/20/47	3:00	4.15						0.0	25	5.0	5.5			43
2/17/47	3:20	3.63		4.8	1.0	6.5	1.9	0.0	26	2.7	5.6		0.4	53
3/24/47	12:40	1.50						0.0	38	3.1	9.4			77
4/21/47	2:25	1.84						0.0	22	1.1	6.1			50
5/19/47	3:05	1.88						11.0	14	3.5	5.6			55
6/23/47	2:10	2.03						4.9	9.9	5.9	4.2			37
7/21/47	1:20	0.87						0.0	18	0.8	4.2			36
8/18/47	1:20	0.76						0.0	39	1.1	7.5			49
9/22/47	1:15	0.64						0.0	44	7.8	3.3			60
10/20/47	1:40	0.58						0.0	41	12.0	3.8			80
11/25/47	9:00	0.57						0.0	45	4.1	4.7			57
12/22/47	9:30	0.51						0.0	49	4.1	5.8			69

*All samples taken between 6:00 A.M. and 6:00 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SAN JOAQUIN RIVER AT HEAD OF CHAMBERLAIN SLOUGH														
1/21/47	10:05	3.38						0.0	12	2.8	10.0			50
2/18/47	1:00	2.81		4.9	1.2	6.4	1.9	0.0	28	2.5	5.6		0.4	58
3/24/47	2:40	0.54						0.0	43	1.5	2.8			73
4/22/47	1:40	0.79						0.0	31	1.9	10.0			62
5/20/47	11:40	1.41						0.0	30	5.2	6.6			60
6/24/47	10:40	1.54						0.0	21	1.9	5.6			32
7/22/47	10:30	0.27						0.0	72	2.5	13.0			110
8/19/47	9:20	0.33						0.0	93	2.9	15.0			140
9/23/47	9:30	0.33						0.0	79	9.9	11.0			100
10/21/47	9:20	0.44						0.0	81	22.0	11.0			96
11/25/47	11:00	0.40						0.0	100	5.8	14.0			140
12/23/47	8:55	0.39						0.0	110	6.6	17.0			160
SAN JOAQUIN RIVER AT FREMONT FORD BRIDGE														
1/21/47	2:30	62.55						0.0	50	38.0	87.0			240
2/18/47	2:00	62.11						0.0	69	44.0	50.0			210
3/25/47	1:25							0.0	99	100.0	190.0			600
4/22/47	1:50	59.65						0.0	99	91.0	150.0			510
5/20/47	12:15	59.91						32.0	46	50.0	89.0			310
6/24/47	12:30	59.54						17.0	51	50.0	95.0			280
7/22/47	1:40	58.90						0.0	97	73.0	140.0			440
8/19/47	11:34	58.84						0.0	100	60.0	110.0			380
9/23/47	12:35	59.11						0.0	110	59.0	95.0			370
10/21/47	2:45	58.54						5.1	110	120.0	230.0			720
11/25/47	2:00	58.70						0.0	140	160.0	270.0			820
12/23/47	3:00	58.57		78.0	49.0	270.0	2.2	0.0	160	250.0	423.0		1.1	1200
SAN JOAQUIN RIVER ABOVE MOUTH OF MERCED RIVER														
1/22/47	8:45							0.0	69	50.0	62.0			250
2/19/47	9:35							0.0	93	82.0	81.0			340
3/26/47	9:05							0.0	130	230.0	290.0			980
4/23/47	9:00							0.0	110	170.0	220.0			720
5/21/47	1:35							9.8	100	89.0	130.0			460
6/25/47	11:45			27.0	16.0	86.0	0.6	0.0	77	77.0	120.0		0.4	370
7/23/47	8:35			50.0	33.0	120.0	1.9	0.0	120	130.0	210.0		0.9	680
8/20/47	10:50			37.0	21.0	120.0	0.9	0.0	120	100.0	160.0		0.5	520
9/24/47	10:40			37.0	21.0	120.0	1.9	0.0	130	100.0	160.0		0.9	530
10/22/47	12:15			90.0	68.0	240.0	1.4	0.0	160	270.0	380.0		0.7	1200
11/26/47	9:30							0.0	170	260.0	370.0			1100
12/24/47	11:10			91.0	68.0	360.0	2.4	0.0	170	380.0	540.0		2.8	1600
MERCED RIVER AT STEVINSON DRAIN														
1/21/47	4:05	1.95						0.0	120	7.4	13.0			160
2/18/47	3:30	1.90						0.0	88	5.0	24.0			170
3/25/47	3:00	1.62						0.0	120	5.9	18.0			170
4/22/47	3:30	1.38						6.1	48	5.8	35.0			140
5/20/47	3:10	1.44						49.0	56	23.0	23.0			220
6/24/47	6:00	1.74						9.8	82	6.5	17.0			110
7/22/47	4:10	1.71		14.0	4.8	29.0	2.1	5.2	86	8.2	21.0		1.1	140
8/19/47	2:40	1.57						0.0	110	5.8	19.0			140
9/26/47	3:25	1.36		17.0	4.7	37.0	1.5	0.0	120	6.2	35.0		1.6	170
10/21/47	10:40	1.46						0.0	140	32.0	17.0			200
11/25/47	2:25	1.74						24.0	120	7.8	40.0			230
12/23/47	11:00	1.60		18.0	7.0	28.0	1.0	0.0	130	8.6	17.0		4.6	180
SAN JOAQUIN RIVER BELOW MOUTH OF MERCED RIVER (AT HILLS FERRY BRIDGE)														
1/22/47	9:15	4.10						0.0	92	35.0	48.0			230
2/19/47	12:05	3.79						0.0	89	83.0	84.0			340
3/26/47	11:55	2.19						0.0	130	150.0	190.0			650
4/23/47	10:45	1.77						0.0	110	130.0	170.0			580
5/21/47	12:25	1.91						0.0	100	94.0	130.0			430
6/26/47	10:50	1.94						0.0	69	74.0	110.0			330
7/23/47	8:15	1.63						0.0	100	77.0	130.0			450
8/20/47	10:15	1.54						0.0	110	67.0	110.0			440
9/24/47	10:15	1.66						0.0	130	100.0	110.0			400
10/22/47	11:50	1.45						0.0	130	98.0	140.0			540
11/26/47	9:55	1.70						0.0	140	120.0	170.0			590
12/24/47	10:40	1.55						0.0	140	130.0	200.0			630

*All samples taken between 6:00 A.M. and 6:00 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SAN JOAQUIN RIVER NEAR LAIRD SLOUGH BRIDGE														
1/23/47	10:45	30.09						0.0	96.0	61.0	76.0			300
2/20/47	11:30	29.57						0.0	100.0	78.0	73.0			430
3/27/47	9:15	27.25		53.0	34.0	170.0	5.5	0.0	150.0	190.0	230.0		0.7	810
4/24/47	10:50	26.79						0.0	160.0	150.0	180.0			670
5/22/47	11:45	27.15						0.0	140.0	98.0	120.0			490
6/26/47	11:30	26.84						20.0	110.0	93.0	120.0			460
7/24/47	2:00	26.55						0.0	160.0	120.0	180.0			590
8/21/47	1:45	26.63						0.0	170.0	120.0	150.0			570
9/25/47	11:55	26.79						0.0	160.0	100.0	120.0			580
10/23/47	11:30	26.50						0.0	190.0	140.0	190.0			770
11/26/47	1:00	27.00						0.0	280.0	130.0	170.0			640
12/24/47	9:20	26.70						0.0	170.0	170.0	220.0			780
TUOLUMNE RIVER AT TUOLUMNE CITY														
1/23/47	12:15	29.46						0.0	72.0	5.6	60.0			190
2/20/47	12:30	29.36						0.0	62.0	7.5	53.0			210
3/27/47	12:35	29.08						0.0	73.0	3.7	66.0			220
4/24/47	12:25	27.85									140.0			
5/22/47	3:40	27.64						39.0	67.0	10.0	150.0			410
6/26/47	5:00	27.57						0.0	150.0	3.7	150.0			410
7/24/47	4:30	27.51						0.0	160.0	6.2	160.0			480
8/21/47	3:30	27.64						0.0	160.0	63.0	140.0			480
9/26/47	4:20	29.28		17.0	5.4	28.0	1.7	0.0	62.0	4.9	54.0		1.1	190
10/23/47	12:40	24.28						0.0	73.0	11.0	48.0			170
11/26/47	1:35	29.35						0.0	55.0	4.5	53.0			180
12/24/47	10:50	29.24						0.0	56.0	2.9	57.0			180
SAN JOAQUIN RIVER AT EL SOLYO PUMPS														
1/24/47	10:40	20.93		22.0	11.0	52.0	4.4	0.0	87.0	40.0	72.0		0.7	270
2/21/47	9:10	20.55						0.0	97.0	49.0	79.0			310
3/28/47	9:30	19.30						0.0	100.0	71.0	130.0			440
4/25/47	12:10	17.67						0.0	140.0	55.0	180.0			570
5/22/47	11:50	18.78						0.0	140.0	150.0	82.0			510
6/27/47	11:40	17.15						0.0	150.0	51.0	170.0			510
7/25/47	4:00	16.80						0.0	160.0	43.0	200.0			590
8/22/47	3:30	17.10						0.0	170.0	43.0	170.0			540
9/26/47	4:20	18.80		26.0	12.0	56.0	1.4	0.0	98.0	35.0	84.0		0.9	300
10/24/47	3:30	18.98						0.0	100.0	65.0	95.0			340
11/28/47	9:15	19.29						0.0	100.0	46.0	100.0			340
12/26/47	3:30	19.10						0.0	92.0	54.0	110.0			380
STANISLAUS RIVER AT BRET HARTE PUMP														
1/24/47	10:10	21.23		21.0	9.5	16.0	5.2	0.0	130.0	6.7	12.0		2.1	170
2/21/47	8:45	21.39						0.0	120.0	14.0	12.0			170
3/28/47	8:40	23.90						0.0	40.0	3.6	3.3			69
4/25/47	11:45	23.35						0.0	49.0	4.0	3.8			85
5/22/47	5:20	24.70						0.0	32.0	2.9	2.8			38
6/27/47	11:15	21.12						0.0	110.0	11.0	12.0			140
7/25/47	11:00	21.08						0.0	130.0	6.6	13.0			180
8/22/47	11:00	20.90						0.0	140.0	6.4	13.0			170
9/26/47	11:30	20.70						0.0	140.0	9.0	3.7			200
10/24/47	11:05	21.24		23.0	12.0	18.0	1.0	0.0	130.0	20.0	9.4		2.3	170
11/28/47	12:30	21.78						0.0	87.0	6.6	4.7			110
12/26/47	12:05	21.79						0.0	97.0	7.8	7.8			140
SAN JOAQUIN RIVER NEAR VERNALIS														
1/24/47	2:35	8.53						0.0	93.0	38.0	71.0			270
2/21/47	10:05	8.25						0.0	100.0	48.0	77.0			290
3/28/47	1:30	7.90						0.0	72.0	38.0	78.0			270
4/25/47	12:55	6.60						0.0	86.0	20.0	80.0			270
5/23/47	3:10	7.61						0.0	69.0	24.0	63.0			210
6/27/47	4:40	5.40						0.0	150.0	37.0	140.0			460
7/25/47	1:00	5.08						7.7	140.0	35.0	160.0			490
8/22/47	12:25	5.14						0.0	170.0	36.0	150.0			490
9/26/47	3:10	6.46						0.0	100.0	33.0	76.0			260
10/24/47	12:45	6.65						0.0	110.0	60.0	85.0			310
11/28/47	10:05	7.05		26.0	14.0	58.0	1.0	0.0	96.0	38.0	84.0		1.1	300
12/26/47	2:50	6.98						0.0	89.0	43.0	94.0			330

* All samples taken between 6:00 A.M. and 6:00 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										Total Solids
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	
SAN JOAQUIN RIVER AT MOSSDALE BRIDGE														
1/21/47	11:25	2.80						0.0	93.0	35.0	68.0			260
2/18/47	10:57	3.24						0.0	95.0	37.0	75.0			270
3/20/47	11:20	2.80						0.0	74.0	35.0	62.0			260
4/15/47	11:00	1.12		35.0	15.0	73.0	5.9	0.0	120.0	37.0	120.0		0.9	380
5/26/47	1:40	3.95		14.0	5.4	28.0	1.2	0.0	58.0	12.0	40.0		1.1	150
6/30/47	4:00	1.77		48.0	20.0	88.0	1.5	0.0	140.0	36.0	170.0		1.8	500
8/4/47	12:40	1.90		44.0	17.0	88.0	4.0	0.0	170.0	29.0	160.0		3.9	490
9/8/47	2:35	2.00		38.0	16.0	75.0	1.4	0.0	150.0	38.0	120.0		0.4	430
10/1/47	12:15	1.97		30.0	16.0	55.0	0.7	0.0	100.0	37.0	79.0		1.2	310
11/6/47	1:00	2.85		24.0	11.0	51.0	1.7	0.0	88.0	37.0	75.0		1.2	280
12/2/47	1:05	2.75		30.0	14.0	58.0	0.9	0.0	94.0	40.0	90.0		3.2	320
SAN JOAQUIN RIVER AT GARWOOD BRIDGE														
4/15/47	10:35	3.5		34.0	13.0	61.0	6.2	0.0	120.0	31.0	100.0		0.5	330
5/27/47	1:15	4.80		24.0	7.2	36.0	0.7	0.0	96.0	17.0	51.0		1.1	210
6/30/47	1:10			44.0	17.0	82.0	7.9	20.0	130.0	37.0	130.0		1.2	420
8/4/47	1:30	1.80		35.0	15.0	97.0	3.3	0.0	190.0	28.0	130.0		1.4	420
9/8/47	3:30	3.40		42.0	19.0	88.0	3.3	0.0	200.0	28.0	140.0		0.0	460
10/1/47	10:00	3.10		35.0	15.0	56.0	1.2	0.0	130.0	29.0	79.0		0.5	320
11/6/47	11:00	2.95		24.0	12.0	52.0	1.0	0.0	92.0	35.0	76.0		1.8	290
12/2/47	10:55	4.20		30.0	13.0	60.0	0.7	0.0	100.0	38.0	89.0		3.2	320
STOCKTON SHIP CHANNEL AT BURNS CUT-OFF														
1/21/47	10:05	3.60						0.0	97.0	23.0	71.0			280
2/18/47	10:10	3.82						0.0	100.0	44.0	75.0			320
3/20/47	10:27	4.50						0.0	88.0	36.0	68.0			280
4/15/47	10:09	4.28		26.0	13.0	47.0	3.8	0.0	93.0	32.0	82.0		0.9	290
5/26/47	2:45	4.15		26.0	11.0	53.0	1.8	0.0	96.0	23.0	80.0		2.3	270
6/30/47	12:33	2.4		37.0	13.0	60.0	7.1	0.0	150.0	29.0	100.0		1.2	340
8/4/47	2:50	2.00		35.0	15.0	79.0	2.6	0.0	150.0	33.0	130.0		2.1	400
9/8/47	11:00	4.40		44.0	20.0	92.0	2.6	0.0	220.0	30.0	130.0		0.5	490
10/1/47	9:25	4.20		39.0	28.0	64.0	1.0	0.0	160.0	37.0	130.0		0.4	390
11/6/47	11:30	4.35		32.0	16.0	71.0	1.4	0.0	120.0	41.0	110.0		1.9	380
12/2/47	10:25	5.42		29.0	11.0	57.0	0.7	0.0	98.0	35.0	85.0		4.0	300
MOKELUMNE RIVER AT CENTRAL LANDING														
1/20/47	10:55			15.0	8.3	20.0	2.2	0.0	79.0	17.0	21.0		0.5	140
2/17/47	10:45			7.7	5.1	6.9	1.2	0.0	43.0	8.1	7.0		0.5	98
3/19/47	10:40			12.0	6.0	9.9	4.8	0.0	71.0	9.5	12.0		0.5	110
4/14/47	1:05			15.0	7.5	17.0	4.0	0.0	65.0	15.0	24.0		0.7	130
5/27/47	12:00			16.0	8.2	25.0	0.5	0.0	68.0	19.0	35.0		0.7	160
7/3/47	8:00			19.0	13.0	31.0	1.4	0.0	94.0	23.0	43.0		0.9	170
8/8/47	8:00			22.0	16.0	66.0	0.5	0.0	110.0	32.0	96.0		1.0	330
9/9/47	3:30			23.0	19.0	79.0	1.2	0.0	130.0	34.0	120.0		0.4	490
10/10/47	4:25			23.0	16.0	37.0	1.0	0.0	110.0	23.0	55.0		0.9	240
11/10/47	4:30			16.0	11.0	28.0	1.7	0.0	83.0	21.0	47.0		0.2	190
12/3/47	12:15			23.0	12.0	34.0	0.5	0.0	94.0	28.0	47.0		2.1	200
INDIAN SLOUGH AT E.C.C.I.D. INTAKE														
1/20/47	2:40							24.0	270.0	110.0	130.0			620
2/18/47	1:05							5.0	270.0	59.0	200.0			780
3/20/47	12:55							27.0	230.0	130.0	150.0			700
ROCK SLOUGH AT CONTRA COSTA CANAL INTAKE														
1/20/47	1:55	1.82						0.0	110.0	79.0	76.0			360
2/18/47	2:10							0.0	110.0	56.0	90.0	2.3		350
3/19/47	1:48	2.00						0.0	110.0	74.0	95.0			390
4/14/47	1:50			27.0	14.0	58.0	5.1	12.0	81.0	55.0	85.0		0.7	330
5/26/47	12:15	2.20		25.0	12.0	49.0	0.7	0.0	78.0	45.0	73.0		1.2	280
7/1/47	8:00	1.50		25.0	14.0	42.0	1.0	0.0	84.0	38.0	61.0		0.9	230
8/8/47	10:00			27.0	16.0	61.0	1.0	0.0	100.0	42.0	110.0		0.5	340
9/8/47	3:30	0.90		30.0	22.0	120.0	1.5	0.0	100.0	58.0	190.0		0.4	550
10/6/47	2:00	1.75		38.0	26.0	100.0	1.7	0.0	130.0	58.0	170.0		0.7	500
11/6/47	2:15	1.49		38.0	20.0	78.0	1.5	0.0	120.0	82.0	120.0		1.6	450
12/4/47	1:15	2.00		30.0	16.0	64.0	0.7	0.0	100.0	51.0	98.0		2.3	360

* All samples taken between 6:00 A.M. and 6:00 P.M.

TABLE 132 (CONT'D)

COMPLETE OR PARTIAL ANALYSIS OF THE WATERS OF THE SACRAMENTO, SAN JOAQUIN RIVERS, THEIR TRIBUTARIES AND THEIR DELTAS

DATA COPIED FROM UNITED STATES BUREAU OF RECLAMATION COMPILATION

Date of Sample	Time of Sample*	Draw Down or G. H.	Depth or c.f.s.	Parts per Million										
				Ca	Mg	Na	K	CO_3	HCO_3	SO_4	Cl	B	NO_3	Total Solids
SAN JOAQUIN RIVER NEAR WEBB POINT (OPPOSITE MOKELUMNE RIVER MOUTH)														
4/15/47	2:30			18.0	9.0	29.0	4.7	0.0	76.0	27.0	44.0		0.5	190
5/26/47	10:50			15.0	8.3	27.0	0.8	0.0	63.0	22.0	40.0		1.4	160
7/3/47	4:35			23.0	8.7	44.0	0.2	0.0	86.0	29.0	61.0		2.1	230
8/12/47	8:00			27.0	27.0	160.0	1.2	0.0	110.0	55.0	250.0		0.5	650
9/8/47	2:45			29.0	28.0	160.0	1.5	0.0	120.0	57.0	270.0		0.4	670
10/6/47	12:35			28.0	23.0	100.0	1.9	0.0	120.0	44.0	160.0		0.9	460
11/10/47	4:00			20.0	14.0	45.0	0.9	0.0	93.0	28.0	69.0		0.9	250
12/3/47	12:30			20.0	14.0	45.0	1.0	0.0	98.0	32.0	64.0		1.4	250
OLD RIVER AT CLIFTON COURT FERRY														
1/20/47	3:05							0.0	96.0	41.0	71.0			290
2/18/47	12:00							0.0	110.0	57.0	67.0			370
3/20/47	12:30							0.0	76.0	34.0	58.0			250
4/15/47	11:45			27.0	13.0	55.0	4.7	0.0	88.0	37.0	88.0		0.0	300
5/26/47	1:00			22.0	9.7	45.0	1.5	0.0	82.0	28.0	71.0		0.4	240
6/30/47	3:15			37.0	18.0	66.0	0.2	0.0	160.0	43.0	100.0		0.9	410
8/4/47	12:05			24.0	12.0	60.0	1.9	0.0	94.0	46.0	83.0		4.9	310
9/8/47	1:50			40.0	19.0	84.0	1.7	0.0	140.0	46.0	140.0		0.5	590
10/1/47	10:50			28.0	15.0	56.0	0.9	0.0	110.0	39.0	80.0		1.2	310
11/6/47	1:50			30.0	14.0	63.0	1.2	0.0	100.0	49.0	93.0		0.9	350
12/2/47	12:30			26.0	15.0	59.0	1.0	0.0	100.0	42.0	90.0		4.9	320
SAN JOAQUIN RIVER AT ANTIOCH														
1/20/47	1:00	3.10									65.0			
2/17/47	1:15	3.54						0.0	74.0	29.0	49.0			200
3/19/47	1:05	3.02						0.0	69.0	30.0	34.0			160
4/15/47	12:40	1.55		15.0	7.2	18.0	4.1	0.0	70.0	17.0	24.0		0.5	130
5/26/47	10:15	2.70		24.0	39.0	280.0	3.6	0.0	60.0	81.0	470.0		0.0	1000
7/1/47	5:30	1.70		43.0	82.0	570.0	1.4	0.0	87.0	260.0	1000.0		0.2	2000
8/4/47	2:40			85.0	190.0	1500.0	1.0	0.0	110.0	380.0	2600.0		0.4	5300
9/8/47	10:30	1.65		58.0	130.0	990.0	2.4	0.0	120.0	270.0	1700.0		0.2	3700
10/6/47	11:10			44.0	69.0	430.0	1.0	0.0	140.0	130.0	750.0		0.2	1700
11/10/47	1:00			20.0	18.0	75.0	1.9	0.0	100.0	34.0	120.0		0.0	360
12/4/47	11:15	2.21		23.0	27.0	150.0	0.7	0.0	94.0	44.0	270.0		0.0	650

* All samples taken between 6:00 A.M. and 6:00 P.M.

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES
SACRAMENTO – SAN JOAQUIN WATER SUPERVISION
1947
LEGEND
POINTS OF DIVERSION
SALINITY OBSERVATION STATIONS
STREAM GAGING STATIONS
DRAINAGE PUMPING PLANTS
SACRAMENTO-SAN JOAQUIN DELTA AREA
REDDING
RED BLUFF
WILLOWS
ORO VILLE
NEVADA CITY
MARYSVILLE
YUBA CITY
AUBURN
PLACERVILLE
WOODLAND
SACRAMENTO
NAPA
VALLEJO
FAIRFIELD
JACKSON
SAN ANDREAS
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SAN RAFAEL
STOCKTON
SONORA
OAKLAND
SAN FRANCISCO
MODESTO
REDWOOD CITY
SAN JOSE
MARIPOSA
MERCED
MADERA
FRESNO
HANFORD
TRACY
LIVERMORE
PACIFIC OCEAN
SACRAMENTO-SAN JOAQUIN DELTA

PLATE 3