STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

REPORTS OF THE
DIVISION OF WATER RESOURCES
EDWARD HYATT, STATE ENGINEER

REPORT ON

WATER MASTER SERVICE

ON

SHASTA RIVER AND ITS TRIBUTARIES

SISKIYOU COUNTY, CALIFORNIA

1936 SEASON

BY

Harrison Smitherum
Senior Hydraulic Engineer

Sacramento, California
March, 1941

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DIVISION OF WATER RESOURCES
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March 20, 1941

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention Mr. Gordon Zander
Supervising Hydraulic Engineer

Dear Sir:

Herewith is submitted a report covering water master service within the Shasta River Water Master District, Siskiyou County, California, during the 1936 season.

The report presents a general description of the work and a discussion of the results obtained. Records of precipitation, runoff and other pertinent data are included.

Respectfully submitted,

HARRISON SMITHERUM
Senior Hydraulic Engineer

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GENERAL DESCRIPTION OF WORK

The diversions from Shasta River and its tributaries were administered by the Shasta River Water Master during the 1936 season under the authority described in the Report on Water Master Service for 1934.

The boundaries of the Shasta River Water Master District were changed by order of the Division of Water Resources, under date of December 30, 1935. The lands watered from Willow Creek and its tributaries were excluded from the District. This change was made in accordance with the provisions of section 37 of the Water Commission Act for the best interests of the District. A certified copy of said order entitled "Order Changing Shasta River Water Master District, Siskiyou County, California, and Containing a Description of all of the Lands Within said District as so Changed" was filed on about December 31, 1935, in the office of the County Recorder of Siskiyou County, as provided for in section 37f of said Water Commission Act.

The flow of Willow Creek and its tributaries is such that to serve any practical purpose, water master service on that stream system is required more than a month in advance of the time when necessity exists for such service on the other streams within the District, and during the period, normally from April 1 to October 1 of each season, when the other streams require administration of diversions there is little or no water available from Willow Creek and its tributaries. Due to these conditions, it became apparent that the most practical and economical supervision of the distribution of water within the Shasta River Water Master District required the exclusion of the lands watered from Willow Creek and its tributaries.

The Shasta River Water Master District as now constituted embraces 29,975 acres of irrigated land, served by 292 diversions. The above figures do not include some 19,500 acres of land under the Montague Water Conservation District System which are also within the boundaries of the Water Master District. Only a small part of this latter acreage is under irrigation and under tentative reorganization plans of the Montague Water Conservation District it is proposed to reduce the acreage within the Montague Water Conservation District to about 2500 or 3000 acres.

The writer entered upon his duties in the field as Shasta River Water Master on April 3, and continued in that capacity up to October 1, when water master service was suspended for the 1936 season.

DISCUSSION OF RESULTS FOR THE 1936 SEASON

Precipitation

Precipitation data from records kept at Mount Shasta City and Montague are presented in Tables 1 and 2, at the end of this report. Table 1 also gives the monthly precipitation as recorded at Edgewood for the seasonal years 1934-35 and 1935-36.

The total precipitation for the 1935-36 season was 22-27 inches or 96 per cent of the mean for the 47 seasonal years 1889 to 1936. Of this total 15.64 inches, or 70 per cent, fell during the period October 1 to April 1 as compared to the long time mean of 79 per cent for the same period. The precipitation for the remaining six months of the season, 6.63 inches or 30 per cent of the season's total, was 9 per cent above the normal for that period. The total snowfall as recorded at Mount Shasta City for the 1935-1936 season was 48.0 inches as compared with a normal of 104 inches.

Water Supply

One additional stream flow measuring station was established and maintained during the 1936 season. This station was installed on February 29, on Shasta River at the Rowe Ranch by the Montague Water Conservation District for the purpose of measuring the inflow to Lake Dwinnell Reservoir. The water diverted from Parks Creek into Shasta River through the M.W.C.D. Parks Creek Canal is included in the flow measured at this station. The records of discharge at this station, together with like

records for the several other measuring stations are presented in Tables 3 to 11, inclusive, submitted at the end of this report.

A comparison of the runoff at the several stations for 1934, 1935 and 1936 is given below.

Name of Stream	Total runoff April 1 to October 1: Acre Feet		
	1934	1935	1936
Shasta River above Edson-Foulke Yreka Ditch	4420	8510	7440
Parks Creek	2550	6100	6560
Shasta River at Rowe Ranch		* 4620	4720
Shasta River ar Grenada Pump (May 1 to Sept.1)	18500	19200	19700
Little Shasta River	850	5630	6520
Big Spring	12400	12200	12100
Carrick Spring	2090	2090	2050
Oleland Spring	2400	2420	2400

Distribution

Distribution during the 1936 season was in accordance with the practices established in 1934, a description of which is contained in the reports on water master service for that season. The results accomplished in each of the several sections into which the stream system has been divided follow.

Shasta River above junction of Boles Creek

The main regulation on this section of the stream was confined to the Hammond-Scott Ditch and the R. Dow Ditch, both from Eddy Creek, and the Edson-Foulke Yreka Ditch from Shasta River below the junction of Eddy Creek. The use of water under each of these ditches is by right of appro-

priation and the ditches were regulated in accordance with the allotments and with the priorities defined in the Shasta River Decree.

The Hammond-Scott Ditch was regulated to 8.91 cubic feet per second for Hammond and 0.20 cubic foot per second for Cooper, a total of 9.11 cubic feet per second, from April 6 to June 21. On June 21, the ditch was regulated to 6.75 cubic feet per second to conform to paragraph 26 of the Shasta River Decree. On June 27, the flow of Eddy Creek had decreased to 6.60 cubic feet per second and subsequent to that date the entire flow of the creek was turned into the Hammond-Scott Ditch. Paragraph 26 of the Shasta River Decree provides that the Hammond-Scott Ditch should be reduced to 2.00 cubic feet per second on July 21, however, this provision was not exercised because the flow of Eddy Creek had decreased to 2.64 cubic feet per second by that date and it was impracticable to turn such a small amount of water into the dry bed of Eddy Creek. On July 27, the flow of Eddy Creek was 2.00 cubic feet per second and decreased to 1.2 cubic feet per second on September 30.

The R. Dow Eddy Creek Ditch was regulated to its allotment of 1.55 cubic feet per second up to June 3; 1.00 cubic foot per second from June 3 to 20 and to zero flow on June 20.

The Edson-Foulke Yreka Ditch was regulated to its full allotment of 29.0 cubic feet per second (28.2 c.f.s. for Edson and Foulke Company, et al. and 0.80 c.f.s. for Cooper) whenever such amount of water was available. The water supply was sufficient to supply such allotment as follows:

Period	Per cent of allotment
April 1 to 12	62
April 12 to June 24	100
June 24 to July 15	49
July 15 to 31	18
August	7
September	6

The remaining ditches on this section of the stream are those of Hammond Brothers, Ira Dow, Dobbins Ranch (Roxanna Dow, et al.) and R. Dow above the Edson-Foulke Yreka Ditch intake and the Dobbins Ranch (Roxanna Dow, et al.), King Brothers, R. E. Cavanaugh and J. V. Enos (Gussie Behnke) below said Edson-Foulke Yreka Ditch. These ditches serve riparian lands and both appropriative and riparian rights are claimed by the owners.

Although the upper group of ditches, except the Dobbins Ditch No. 5 and the Hammond Dale Creek Lower Ditch, are inferior in priority to the Edson-Foulke Yreka Ditch, they have been operated for many years past without regard to this priority. Also, the practice over a long period of years prior to the Shasta River proceeding has been to disregard the priorities as between the various ditches in the group. These practices in the use of water vary greatly from the appropriative rights defined in the Shasta River Decree and it was impracticable to attempt any regulation based upon said appropriative rights. Regulation of the ditches, therefore, was made on the basis of a compromise between these practices and the conflicting appropriative rights by distributing the available water on an equal and correlative basis, with the amounts of

water set forth in the Shasta River Decree as the basic allotments. The relative location of these ditches on the stream system, the high percentage of return flow from irrigation and the regimen of the flow of the streams from which they divert are such that very little regulation is required. The Hammond Durney Mill Ditch from Shasta River was regulated from time to time to afford an equitable supply of water for the I. Dow Ditch.

The water available for the lower group of ditches fails whenever the flow of Shasta River drops to a flow of 29.0 cubic feet per second and the Edson-Foulke Yreka Ditch owners elect to exercise their superior priority to that amount of water. Regulation to the benefit of these ditches was confined mainly to the Edson-Foulk Yreka Ditch and the regulation of the various ditches to their respective amounts of water when water was available. After the water supply failed, the shortage reached the head of each ditch in about the order in which the priority of the ditch is fixed in the Shasta River Decree and little or no regulation was required.

Shasta River below junction of Boles Creek, and Boles Creek

Distribution of the available water supply in 1936, like that in 1934 and 1935, was a compromise between the water rights as defined in the Shasta River Decree and the practices in the use of water which had grown up under riparian and other claims of right not determined in the Shasta River proceeding. The available water was distributed using

the amounts of water fixed in the Shasta River Decree as the basis of the allotments to the various ditches but under a grouping of allotments and in a priority order based upon established practices.

The allotments to be supplied to each group of water rights are tabulated below in the priority order in which the distribution was made.

Group of Water Rights	Total of allotments c.f.s.
1 Boles Creek and Shasta River above Arbaugh Weir	12.85
2 Mills Ranch at and below Arbaugh Weir	8.85
3 M.W.C.D. (Rowe & I. B. Mathews Co.)	
4 Jones, McKee Co., M.W.C.D.	11.85
Soule, Dennis and Terwilliger	19.64
5 M.C.W.D. (35,000 acre-feet from Shasta River)	

Group 1 covers the water rights on Boles Creek and Shasta River down to the Arbaugh Weir at the McMahon Ranch. Group 2 includes the water rights on the Mills properties below the Arbaugh Weir. Group 3 covers the water rights from Shasta River appurtenant to the A. E. Rowe and I. B. Mathews properties, which are in Lake Dwinnell Reservoir. Group 4 embraces all the water rights below the I. B. Mathews Company ranch which were affected by the construction and operation of Lake Dwinnell Reservoir. Group 5 covers the inchoate right of the Montague Water Conservation District to 35,000 acre feet per annum from Shasta River for storage in Lake Dwinnell Reservoir under Application 3544, Permit 2452, as amended in 1938.

The groups listed above involve all the water rights from Boles Creek and Shasta River down to and including the E. S. Terwilliger Lower Ditch. However, because of the construction and operation of Lake Dwinnell Reservoir, actual regulation was confined to the ditches down to and in-

cluding the Mills ditches, Groups 1 and 2. The water allotted to the ditches below the Mills Ranch, under Groups 3, 4 and 5, is stored in Lake Dwinnell Reservoir and is re-distributed from storage rather than as direct flow. Regulation of the ditches below the reservoir and operation of the reservoir is described hereinafter under "Shasta River below Lake Swinnell Reservoir".

One hundred per cent allotments were delivered to the ditches in Groups 1 and 2 up to June 23. From June 23 to August 11, approximately 100 per cent allotments were delivered to Group 1 and 50 per cent allotments to Group 2. The drop in deliveries to Group 2 was due to haying on the Mills Ranch. On August 11 the ditches in Group 1 were cut to 50 per cent allotment but were subsequently raised so that the percentage delivery for August and September was 75 and 71 per cent, respectively.

Shasta River Below Lake Dwinnell Reservoir

The operation of Dwinnell Reservoir during the 1936 season is summarized below.

Date	Storage		Inflow to Reservoir	Total Draft	Measured Delivery Acre feet		Seepage and Evaporation Loss from Reservoir
	On Hand	Draft			District	Below Dam	
	Acre feet	Acre feet	Acre feet	Acre feet			Acre feet
April 1	5460						
May 1	4900	560	2660	3220	1089	610	1521
June 1	2925	1975	1540	3515	1557	814	1144
July 1	1605	1320	440	1760		524	1236
Aug. 1	285	1320	60	1380		705	675
Aug. 11	0	285	20	305		106	199
		5460	4720	10180	2646	2759	4775

Delivery to the water right owners below the reservoir commenced on April 14 and continued until August 11, when the available water in the reservoir was exhausted.

Delivery of water for District use commenced on April 14 and continued to May 20, curtailment on that date being necessary on account of the prior rights below the reservoir.

A summary of the deliveries made from the reservoir to the water right owners below the dam is set forth in the following tabulation.

Name of Water Right Owner	Allotment as per Agreement Acre feet	Amount delivered from Lake Dwinnell Reservoir for 1936 Season	
		Acre feet	Per cent of Allotment
J. L. Jones	198	198	100
John Soule	692	637	92
J. W. and Mary Dennis	696	527	76
McKee Company	1200	1195	99
E. S. Terwilliger	596	202	34
Totals	3382	2759	82

A summary of the operation of Dwinnell Reservoir for the eight year period since its completion is shown in the following tabulation.

Year	Maximum Amount of Water in Reservoir During year Acre feet	Amount of Water Used by the District	Period of Use		Amount of Water in Reservoir When District Use Ceased Acre feet
			From	To	
1929	4500	--	--	--	--
1930	10500	5000	May 5	July 4	2800
1931	4250	0	--	--	2800
1932	5500	2000	May 15	June 15	2000
1933	6500	4750	April 21	July 16	2200
1934	5000	1500	April 10	April 23	2800
1935	5700	2700	May 10	June 2	3000
1936	6020	1560	April 14	May 20	3250

A summary of the deliveries from Dwinnell Reservoir to water right owners downstream from the reservoir for the eight year period of operation is set forth in the following tabulation.

Year	Jones	Soule	Dennis	McKee	Terwilliger	Total	
						Acre feet	Per cent of Allotments
1929	--	--	--	--	--	--	--
1930	190	485	465	923	--	2060	61
1931	198	473	473	909	--	2050	61
1932	--	--	--	--	--	--	--
1933	198	692	687	1130	101	2810	83
1934	159	692	461	922	159	2390	71
1935	198	609	600	1075	234	2720	80
1936	198	637	527	1195	202	2759	82

1929 - Records of deliveries missing
1930-1931 Records of delivery to Terwilliger missing
1932 Records of deliveries missing

Table sets forth the diversion from Parks Creek to Lake Dwinnell Reservoir during the 1936 season.

Table 6 sets forth the inflow to Dwinnell Reservoir during the 1936 season.

Table sets forth the diversion from Dwinnell Reservoir through the Montague Water Conservation District Shasta River Canal during the 1936 season.

Beaughan Creek

One measurement was made during the 1936 season at the 8.0 rectangle weir located at the head of the creek. The results are given below.

Date	Gage Height in feet	Discharge c.f.s.
7-13-36	0.335	5.12

This measurement was used as a basis for determining the percentage of second priority allotments throughout the 1936 season.

Carrick Creek

Distribution on this stream during the 1936 season was confined largely to the first, second, third, fourth, fifth and ninth priorities from Stone Creek. Sufficient water was available to deliver 100 per cent allotments to all priorities except the ninth until about August 1. From August 1 to the end of the season the seventh priority received an average of about 50 per cent allotment. The ninth priority received an average of about 60 per cent allotment until about July 1 after which date no water was available for this priority class. The discharge in cubic feet per second of Carrick Spring is shown in Table of this report.

Parks Creek

Distribution on Parks Creek for the 1936 season followed the practices initiated during the past two seasons with little modification. Table 4 sets forth the discharge in cubic feet per second of Parks Creek above the Duke north ditch.

A summary of the distribution made during the 1936 season is set forth in the following tabulation.

Month	Measured Water Supply c.f.s.	Distribution in Per Cent of Priority Allotments			
		Duke 1	Caledonia 2	Foulke 3	Robertson 4, 6, 11, 12 and 15
April	46.7	100	100	88	90
May	36.3	100	100	100	98
June	16.5	100	100	70	50
July	4.8	78	12	0	0
August	2.4	40	0	0	0
Sept.	2.4	40	0	0	0

The fifth priority rights from the North Branch of Parks Creek were supplied with 100 per cent of their allotments until about June 15. However, the water available to these rights failed entirely on about July 1.

The 21st and 24th priority rights of M. A. Silva on the extreme lower end of Parks Creek received 100 per cent allotments throughout the season.

Big Springs

Under agreement between Stallcup and the Big Springs Irrigation District, 7.50 cubic feet per second of water was delivered to the Stallcup Ditch through the Big Springs Irrigation District's pumping plant. The Big Springs plant started operation on April 6th and continued until October 2. Water was delivered to Stallcup continuously during the period April 13 to June 8, at which time he turned approximately 6.00 cubic feet per second to the District for a period of about ten days. This practice was repeated for a period of about ten days each in July, August and September. Louie

Bros. diverted an average of ten cubic feet per second throughout the entire irrigation season April 1 to September 30.

Table 7 sets forth the discharge of Big Springs during the 1936 season.

Lower Shasta River

The Grenada Irrigation District started operation on April 20 with one unit pumping about 16 cubic feet per second. The second unit was put in operation on April 22 also pumping 16 cubic feet per second or a total of about 32 cubic feet per second for both units. Both units continued in operation until May 25. Subsequent to this date and throughout the remainder of the season only one unit was operated. The pumping plant was shut down entirely 23 days during the season from April 20 to September 24, on which date the plant was closed for the season.

The flow available to the water users below Montague Bridge for the 1936 season is set forth in Table 9 of this report.

Little Shasta River

A summary of the distribution during the 1936 season is shown in the following tabulation.

Month	Available Water Supply		Distribution in per cent of Priority Allotments						
	Cubic Feet per Second	Per cent of Total Allotment*	1	3	4	5	6	7
April	45.9	59	100	100	80	85	65	65
May	48.0	62	100	100	81	100	75	50
June	21.9	28	100	100	80	45	0	0
July	11.6	15	100	100	52	1	0	0
August	9.9	13	100	95	8	0	0	0
September	9.7	12	95	98	0	0	0	0

* Per cent of total allotments for first, third, fourth, fifth, sixth and seventh priorities.

The discharge of Little Shasta River above Harp ditch is set forth in Table 10 of this report.

Intermittent measurements of the discharge of Cleland Springs are set forth in Table 11.

TABLE 1

Average of Precipitation at Mount Shasta City and Montague - 1889 to 1936 (1)

Monthly, seasonal and average amounts in inches

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Seasonal
1930-31	0.41	1.26	0.77	3.59	1.19	1.16	0.41	0.24	2.71	0.00	0.00	0.94	12.68
1931-32	1.95	.92	6.81	2.32	1.13	1.77	1.39	3.20	.50	.19	.00	.00	20.18
1932-33	.46	3.50	2.35	4.98	.64	5.86	.57	1.28	.34	.12	.00	.20	20.30
1933-34	1.24	.02	5.38	2.13	3.16	1.46	1.64	1.16	1.54	.58	.40	.24	18.95
1934-35	2.77	5.29	1.48	4.00	1.63	1.87	3.96	.34	.05	.22	.26	.31	22.18
1935-36	1.14	.96	3.04	6.00	3.76	.74	1.96	1.46	2.11	.34	.62	.14	22.27
Totals	74.40	136.97	171.58	192.46	158.42	129.38	78.40	60.07	32.66	10.90	11.85	30.50	1087.59
Mean 47 yrs.	1.58	2.91	3.65	4.10	3.37	2.75	1.67	1.28	.70	.23	.25	.65	23.14

(1) See 1930 Water Master Report for records 1889-1930

Precipitation at Edgewood--Elevation 2952 feet

1933-34											.38	0.00	
1934-35	1.30	3.53	1.08	1.65	1.15	2.62	2.58	.43	.57	.38	.06	.21	15.56
1935-36	.81	.82	1.51	3.15	1.65	1.22	1.09	1.04	.45	.15	.00	.13	12.02

TABLE 2

Monthly Precipitation for Seasonal Year 1935-36
Compared with Mean Monthly Precipitation -
1889 to 1936

Month	Monthly Mean-47 yrs.		Monthly 1935-36		Snowfall at Mt. Shasta City in inches	
	Inches	per cent of total	Inches	per cent of total	Normal	1935-36
October	1.58	6.8	1.14	5.1		
November	2.91	12.6	.96	4.3		
December	3.65	15.8	3.04	13.7	25.3	4.0
January	4.10	17.7	6.00	26.9	37.0	21.5
February	3.37	14.6	3.76	16.9	19.4	7.0
March	2.75	11.9	.74	3.3	17.8	6.5
April	1.67	7.2	1.96	8.8	4.4	9.0
May	1.28	5.5	1.46	6.6		
June	.70	3.0	2.11	9.5		
July	.23	1.0	.34	1.5		
August	.25	1.1	.62	2.8		
September	.65	2.8	.14	0.6		
Totals	23.14	100.0	22.27	100.0	103.9	48.0

TABLE 3

Daily Discharge in Cubic Feet per Second

SHASTA RIVER ABOVE EDSON-FOULKE YREKA DITCH

April 1 to September 30, 1936

Day	April	May	June	July	Aug.	Sept.
1	19.0*	35.5	29.7	15.2	3.6	1.2
2	19.0*	38.3	24.1	14.7	3.6	1.4
3	19.0*	39.7	22.9	14.3	3.6	1.5
4	19.2	47.8	24.7	13.9	3.4	1.6
5	17.7	43.3	24.1	13.9	3.2	1.7
6	14.7	36.2	29.7	13.0	3.0	1.5
7	14.7	32.9	47.0	12.5	2.8	1.4
8	15.7	32.9	40.4	13.0	2.8	1.6
9	15.7	36.2	32.9	16.7	2.4	1.8
10	17.7	43.3	29.0	13.0	2.2	1.8
11	27.7	50.2	28.3	11.7	2.0	1.7
12	40.4	57.4	29.0	10.4	2.0	1.7
13	46.2	66.9	31.5	10.0	1.8	1.8
14	55.0	75.9	39.0	9.6	1.6	2.0
15	55.8	59.2	44.0	9.2	1.7	2.2
16	57.4	51.0	36.9	8.8	1.7	2.0
17	56.6	44.7	34.8	7.2	1.6	2.0
18	53.4	42.5	30.9	6.6	1.7	1.8
19	51.8	41.1	27.1	6.3	1.6	1.7
20	51.0	36.9	25.9	6.0	1.5	1.7
21	54.2	32.9	25.3	5.7	1.5	1.7
22	58.3	30.9	27.1	5.4	1.5	1.6
23	60.8	30.9	28.3	5.1	1.6	1.7
24	60.8	34.1	29.0	4.8	1.5	1.8
25	53.4	36.2	27.1	4.8	1.3	1.7
26	48.6	37.6	25.3	4.5	1.3	1.4
27	47.0	47.0	21.8	4.2	1.1	1.5
28	43.3	55.0	19.7	4.2	.9	1.5
29	44.0	40.4	17.7	4.2	.9	1.5
30	37.6	36.2	16.2	3.9	.9	1.5
31		29.7		3.6	1.0	
Total Sec. Ft. Days	1175.7	1322.8	869.4	276.4	61.3	50.0
Mean Sec. Ft.	39.2	42.7	29.0	8.92	1.98	1.67
Total Ac. Ft.	2330	2620	1720	548	122	99.2

* Discharge estimated

TABLE 4

Daily Discharge in Cubic Feet Per Second

PARKS CREEK ABOVE DUKE NORTH DITCH

April 1 to September 30, 1936

Day	April	May	June	July	Aug.	Sept.
1	11. *	34.3	23.3	6.8	2.8	2.4
2	11. *	36.9	20.5	6.4	2.9	2.6
3	11.2	40.1	18.8	6.1	2.9	2.6
4	11.5	51.7	17.5	5.6	2.9	2.6
5	10.6	44.5	16.2	5.5	2.5	2.7
6	11.0	36.1	19.0	5.4	2.6	2.6
7	13.2	33.7	33.1	5.3	2.7	2.5
8	15.9	36.1	32.2	5.2	2.7	2.3
9	17.2	41.4	26.0	6.4	2.7	2.3
10	21.5	48.5	22.3	7.5	2.1	2.3
11	36.4	51.9	21.4	7.0	2.3	2.3
12	52.2	55.5	20.3	6.1	2.5	2.3
13	62.4	59.4	18.4	5.4	2.5	2.3
14	73.1	63.8	17.1	5.2	2.5	2.4
15	80.0	48.8	19.3	5.0	2.5	2.4
16	85.8	40.6	17.1	4.9	2.5	2.4
17	77.8	37.0	15.8	4.8	2.4	2.4
18	74.0	35.9	14.7	4.7	2.3	2.4
19	70.5	32.9	14.1	4.6	2.3	2.4
20	68.7	27.9	13.8	4.4	2.2	2.3
21	70.3	25.5	13.0	4.1	2.2	2.3
22	73.6	22.9	12.2	3.9	2.2	2.3
23	77.4	22.3	10.8	3.7	2.2	2.2
24	73.5	22.8	9.9	3.6	2.2	2.2
25	63.3	24.5	9.2	3.5	2.2	2.2
26	54.9	24.7	8.4	3.4	2.2	2.2
27	52.6	25.3	7.9	3.3	2.2	2.2
28	45.3	29.2	7.5	3.2	2.2	2.2
29	39.9	25.1	6.9	3.1	2.2	2.1
30	35.1	24.5	7.0	2.9	2.2	2.1
31		22.7		2.8	2.2	
Total Sec. Ft. Days	1400.9	1126.5	493.7	140.8	75.0	70.5
Mean Sec. Feet	46.7	36.3	16.5	4.83	2.42	2.35
Total Acre Ft.	2780	2230	979	297	149	140

Discharge

* Estimated

TABLE 5

Discharge in Cubic Feet per Second

Carrick Spring

April 5 to September 22, 1936

Day	April	May	June	July	Aug.	Sept.
1			5.68			5.63
2						
3						
4						
5	5.72				5.62	
6						
7						
8						
9						
10			5.68	5.66		5.58
11						
12						
13						
14						
15				5.64		
16						
17						
18						
19		5.72			5.58	
20						
21						
22	5.70				5.62	
23		5.68	5.63			
24		5.68				
25				5.62		
26	5.77					
27						
28				5.63		
29			5.66			
30						
31						
Mean Sec. Feet:	5.73	5.69	5.66	5.64	5.61	5.61
Total Acre Feet:	341	350	337	347	345	334

Total Acre Feet - 6 Month Period 2050

TABLE 6

Discharge In Cubic Feet per Second

SHASTA RIVER AT HOWE RANCH

February 29 to September 22, 1936

Day	Feb.	March	April	May	June	July	Aug.	Sept.
1		49.0	17.7	25.0	12.0	2.0	0.6	0.1
2		42.0	17.4	24.0	10.8	1.6	.6	.1
3		38.5	20.9	25.5	9.6	1.4	.6	.1
4		30.0	28.5	41.7	8.1	1.3	.6	.1
5		28.0	23.7	41.7	4.7	1.2	.5	.1
6		28.0	18.8	29.3	3.5	1.2	.5	.1
7		28.0	14.7	22.1	12.0	1.2	.5	.1
8		25.0	9.6	15.5	16.7	1.0	.5	.1
9		25.0	9.9	15.5	10.2	1.0	.4	.1
10		24.0	10.5	19.5	6.2	1.0	.4	.1
11		23.0	13.7	27.3	6.7	1.0	.4	.1
12		23.0	19.5	32.3	5.0	1.0	.4	.1
13		23.0	41.7	44.0	4.8	1.0	.3	.1
14		22.0	62.2	79.5	7.0	1.0	.3	.1
15		18.5	76.5	55.1	19.8	1.0	.3	.1
16		17.0	79.5	31.4	23.3	1.0	.3	.1
17		16.0	82.5	23.3	15.6	.9	.3	.2
18		16.0	76.5	18.4	9.9	.9	.3	.2
19		17.0	75.3	18.8	7.5	.8	.3	.2
20		17.0	67.7	16.7	4.9	.8	.3	.3
21		18.5	63.3	13.0	4.5	.7	.2	.3
22		17.0	71.7	10.5	3.7	.7	.2	.5
23		15.0	72.3	10.2	3.1	.7	.2	
24		16.3	76.5	10.5	2.0	.7	.2	
25		17.4	61.1	6.5	2.0	.7	.2	
26		16.7	50.5	7.2	2.0	.7	.2	
27		18.1	49.0	9.6	2.0	.7	.2	
28		15.0	45.5	37.2	2.0	.6	.2	
29	55.6	12.7	44.0	28.1	2.0	.6	.1	
30		12.0	38.6	20.9	2.0	.6	.1	
31		17.0		15.3		.6	.1	
Total Sec. Ft. Days		685.7	1339.3	775.6	223.7	29.6	10.3	
Total Acre Feet		1360	2660	1540	444	59	20	

TABLE 7

Discharge in Cubic Feet per Second

BIG SPRINGS

April 7 to September 28, 1936

Day	April	May	June	July	Aug.	Sept.
1						
2		32.7				
3			33.5		33.9	34.1
4						
5		32.5				
6				35.4		
7	28.1					34.2
8				33.7		
9		32.6				
10	29.8				33.9	
11			33.9			
12						
13					33.3	
14						33.8
15						
16	30.1	33.2				
17			33.8			
18						
19						
20	30.2			33.6	34.3	
21						
22						
23						35.1
24		33.9				
25	32.3					
26						
27						
28	32.5					33.6
29		33.5	35.0	32.9	34.2	
30		33.8				
31						
Mean Sec. Ft.	30.5	33.2	34.0	33.9	34.1	34.2
Total Acre Ft.	1810	2040	2020	2080	2100	2040

Total Acre Feet - 6 Mo. Period 12100

TABLE 8

Daily Discharge in Cubic Feet per Second

SHASTA RIVER AT GRENADA PUMP

April 24 to September 24, 1936

Day	April	May	June	July	Aug.	Sept.
1		86.5	107	74.9	71.9	80.3
2		88.8	97.4	76.8	74.7	78.6
3		85.8	94.8	75.8	74.7	80.3
4		85.8	89.0	75.0	73.3	79.4
5		85.0	95.4	75.0	72.1	80.4
6		85.8	95.1	77.4	73.4	86.0
7		85.1	99.1	75.8	71.4	81.4
8		84.6	98.2	74.2	73.4	82.6
9		77.8	97.3	77.4	75.0	81.0
10		78.3	96.4	77.8	78.3	77.8
11		72.9	97.3	79.0	74.2	80.2
12		73.8	96.4	86.7	78.6	81.0
13		72.9	90.3	91.3	74.6	84.3
14		78.7	86.4	83.0	69.6	79.4
15		77.9	87.3	78.5	72.0	75.5
16		76.2	82.0	79.0	71.2	82.6
17		78.3	80.3	73.5	74.6	78.6
18		91.8	76.2	74.4	73.0	80.9
19		84.0	80.6	74.2	76.2	78.0
20		84.2	77.0	79.1	77.0	80.3
21		83.5	76.2	79.1	76.2	82.9
22		83.5	76.9	78.3	77.8	81.1
23		83.5	79.4	76.8	73.8	89.0
24	84.6	83.5	78.6	75.2	76.4	89.8
25	84.2	79.8	79.5	73.6	76.4	
26	84.2	82.0	77.0	72.0	76.4	
27	86.3	86.5	74.6	72.8	74.8	
28	92.0	95.4	76.2	70.0	74.8	
29	92.0	106.	75.0	73.0	72.4	
30	90.4	114.	74.6	72.8	73.2	
31		116.		72.0	78.1	
Total Sec. Ft. Days	613.7	2647.9	2581.5	2374.4	2309.5	1951.4
Mean Sec. Ft.	87.7	85.4	86.0	76.6	74.5	81.3
Total Acre Ft.	1220	5250	5120	4710	4580	3870

TABLE 9

Daily Discharge in Cubic Feet per Second

SHASTA RIVER NEAR MONTAGUE

April 3 to September 28, 1936

Day	April	May	June	July	Aug.	Sept.
1		48.5	120	11.7	12.1	17.5
2		90.8	134	16.9	13.8	18.1
3	130	85.5	94.4	27.5	16.9	20.0
4	126	63.8	50.0	23.8	20.0	17.5
5	124	65.4	45.6	15.5	32.2	17.5
6	122	63.8	50.0	14.2	65.4	30.3
7	111	62.2	50.0	17.5	16.4	47.1
8	94.4	59.0	50.0	15.5	13.4	50.0
9	96.2	41.6	50.0	20.0	13.4	34.4
10	75.3	39.0	57.5	19.3	14.2	19.3
11	57.5	40.3	92.6	16.4	15.9	15.1
12	59.0	50.0	90.8	15.1	13.8	13.1
13	59.0	45.6	87.3	20.7	14.6	16.9
14	50.0	40.3	89.0	22.9	11.4	20.0
15	48.5	22.1	57.5	20.0	11.2	20.0
16	53.0	18.7	34.4	21.4	15.5	44.2
17	36.6	19.3	28.4	27.5	15.1	62.2
18	34.4	22.1	23.8	15.1	11.4	39.0
19	44.2	22.1	20.7	13.1	11.9	26.5
20	51.5	23.8	16.9	13.8	15.1	30.3
21	50.0	23.8	17.5	14.6	12.8	39.0
22	53.0	17.5	18.7	16.4	12.8	60.6
23	32.2	15.5	16.4	13.1	13.4	53.0
24	24.7	20.0	13.8	11.9	11.7	67.0
25	30.3	22.9	12.3	13.4	12.1	80.4
26	32.2	40.3	13.8	18.7	13.8	82.1
27	29.4	36.6	11.7	13.1	13.8	78.7
28	34.4	32.2	11.7	11.9	13.4	83.8
29	37.8	47.1	12.8	12.5	15.1	
30	51.5	65.4	13.1	14.6	15.1	
31		99.8		12.5	15.5	
Total Sec. Ft. Days:	1748.1	1345.0	1384.7	520.6	503.2	1103.6
Mean Sec. Ft.	62.4	43.4	46.2	16.8	16.2	39.4
Total Acre Ft.	3470	2670	2750	1030	998	2190

TABLE 10

Daily Discharge in Cubic Feet per Second

LITTLE SHASTA RIVER ABOVE HARP DITCH

April 1 to September 30, 1936

Day	April	May	June	July	Aug.	Sept.
1	11.0	44.2	25.6	6.6	3.7	3.2
2	11.0	44.2	24.0	6.6	3.6	3.4
3	11.0	49.6	22.3	6.6	3.6	3.4
4	11.2	55.8	21.3	6.4	3.6	3.3
5	11.2	51.0	20.8	6.2	3.8	3.4
6	19.8	47.6	21.3	5.8	3.6	3.3
7	28.0	46.9	22.9	6.0	3.5	2.9
8	28.0	46.9	29.2	6.4	3.6	3.0
9	28.0	46.2	21.8	8.0	3.6	3.0
10	35.4	46.2	19.8	6.4	3.5	3.0
11	42.8	46.2	18.3	5.8	3.5	3.1
12	49.6	45.6	19.8	5.7	3.5	3.1
13	49.6	46.2	17.8	5.7	3.5	3.2
14	51.0	47.6	16.9	5.3	3.4	3.2
15	53.7	45.6	17.3	5.1	3.4	3.2
16	54.7	44.2	15.1	4.7	3.4	3.1
17	52.4	42.2	14.3	4.5	3.4	3.1
18	51.0	40.8	13.9	4.5	3.4	3.0
19	51.0	40.8	13.1	4.4	3.1	3.0
20	49.6	39.4	12.3	4.4	2.7	3.0
21	47.6	37.4	11.2	4.3	3.3	2.9
22	47.6	36.0	10.6	4.2	3.2	2.8
23	51.0	34.7	9.9	4.0	3.2	2.8
24	54.7	33.4	9.5	4.0	3.2	2.7
25	49.6	32.8	8.9	4.0	3.2	2.7
26	47.6	32.2	8.3	3.9	3.2	2.6
27	47.6	31.0	6.8	3.8	3.1	2.7
28	44.2	32.8	6.8	3.8	3.1	2.7
29	45.6	31.0	6.8	3.8	3.1	2.8
30	44.2	34.0	6.8	3.7	3.1	2.8
31		26.8		3.7	3.1	
Total Sec. Ft. Days	1179.7	1279.3	473.4	158.3	104.2	90.4
Mean Sec. Ft.	39.3	41.3	15.3	5.11	3.36	3.01
Total Acre Ft.	2340	2540	939	314	207	179

TABLE 11

Discharge in Cubic Feet per Second

CLELAND SPRINGS

April 11 to September 28, 1936

Day	April	May	June	July	Aug.	Sept.
1						
2						6.67
3		6.54			6.53	
4					6.53	6.73
5						
6			6.81	6.53		
7						
8					6.53	
9						6.70
10						
11	6.92			6.53		
12					6.51	
13					6.51	
14						
15						
16		6.66				6.73
17						
18	6.41		6.66			6.70
19					6.58	
20				6.53		
21						
222						
23						6.72
24		6.72			6.59	
25	6.54					6.77
26			6.53		6.59	
27			6.53			
28					6.67	
29						6.72
30		6.74				
31						
Mean Sec. Ft.	6.62	6.66	6.63	6.53	6.56	6.72
Total Acre Ft.	394	410	394	402	403	400

Total Acre Feet 6 Mo. Period 2400

Daily Discharge in Cubic Feet per Second

MONTAGUE WATER CONSERVATION DISTRICT SHASTA RIVER CANAL

April 14 to May 31, 1936

Day	April	May	Remarks
1		51.1	
2		51.1	
3		52.6	Note:
4		55.6	
5		53.8	Record
6		51.8	includes
7		51.8	water
8		51.4	delivered
9		51.4	to McKee
10		50.8	Company
11		49.8	
12		43.3	
13		40.2	
14	3.8	40.6	
15	7.5	40.6	
16	7.5	39.9	
17	22.8	38.9	
18	49.8	38.9	
19	42.6	38.6	
20	45.6	21.5	
21	47.0	7.5	
22	48.0	7.5	
23	47.4	7.4	
24	49.1	7.4	
25	51.1	7.1	
26	50.8	6.4	
27	50.8	6.9	
28	51.1	7.4	
29	48.7	7.5	
30	49.8	7.5	
31		7.5	
Total Sec. Ft. Days	673.4	993.8	
Mean Sec. Ft.	39.6	32.0	
Total Acre Ft.	1340	1970	

Daily Discharge in Cubic Feet per Second

MONTAGUE WATER CONSERVATION DISTRICT PARKS CREEK CANAL

April 1 to May 31, 1936

Day	April	May
1	0.0	10.9
2	.0	9.7
3	.0	10.0
4	.0	20.8
5	.0	17.2
6	.0	15.2
7	.0	12.4
8	.0	8.5
9	.0	11.7
10	.0	17.2
11	.0	21.5
12	9.4	28.8
13	21.2	33.1
14	51.7	39.0
15	45.7	23.6
16	41.5	16.0
17	46.4	10.9
18	40.5	6.9
19	32.2	2.3
20	33.1	1.8
21	37.0	.8
22	37.0	.0
23	43.1	.0
24	41.0	.0
25	29.7	.0
26	22.6	.0
27	22.0	.0
28	21.2	16.2
29	20.0	13.8
30	14.5	10.3
31		4.9
Total Sec. Ft. Days	609.8	363.6
Mean Sec. Ft.	20.3	11.7
Total Acre Ft.	1210	721