DEPARTMENT OF PUBLIC WORKS

STATE OF CALIFORNIA

REPORTS OF THE

DIVISION OF WATER RESOURCES

EDWARD HYATT, STATE ENGINEER

REPORT ON WATER MASTER SERVICE on SHASTA RIVER AND TRIBUTARIES SISKIYOU COUNTY, CALIFORNIA During the Season of 1938

By

Harrison Smitherum
Senior Hydraulic Engineer

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

CULBERT L. OLSON
GOVERNOR OF CALIFORNIA

FRANK W. CLARK
DIRECTOR

STATE OF CALIFORNIA

Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

June 13, 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 1938 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 SMITHERMAN

Senior Hydraulic Engineer

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REPORT ON

WATER MASTER SERVICE

ON

SHASTA RIVER AND TRIBUTARIES

SISKIYOU COUNTY, CALIFORNIA

DURING SEASON OF 1938

INTRODUCTION

The Shasta River Water Master District was created by order of the Division of Water Resources under date of March 1, 1933, to embrace the water rights on Shasta River and its tributaries in Siskiyou County, California, excepting certain tributaries and springs named in said order, as established by Decree of the Superior Court, Siskiyou County, California, in the Shasta River Proceeding No. 7035, entered on December 30, 1932. Subsequent to creation of the district, the boundaries were changed to exclude the water rights on Willow Creek and its tributaries by "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", dated December 30, 1935.

Water master service in the Shasta River Water Master District was carried on throughout the 1938 season in accordance with the "Distribution of Water" procedure contained in Sections 37 to 37f, inclusive, of the Water Commission Act. Such service extended over the period from April 1 to October 1. Harrison Smitherum, Water Master, Shasta River Water Master District, administered the distribution of water from the streams within the district during the entire period.

DISCUSSION OF RESULTS

Precipitation

Data on precipitation, as compiled from records kept at Mt. Shasta City and Montague are presented in Tables 1 and 2 of this report. Table 1 also sets forth the monthly precipitation at Edgewood from August 1, 1934 to October 1, 1938.

Based upon the data presented in the above mentioned tables, precipitation for the 1937-38 season was 36.02 inches or about 154 per cent of the mean for the 49 year period 1889 to 1938. Of this total 89 per cent fell during the period October 1 to April 1, as compared to the long time mean of 80 per cent for the same period. The total snowfall as recorded at Mt. Shasta City for the 1937-38 season was 158 inches as compared to the normal of about 103.5 inches or about 153 per cent of normal.

Water Supply

Measuring stations, equipped with water stage recorders were maintained at the stream gaging stations listed below. Intermittent measurements of the various springs within the area were also obtained. The records of discharge for the several streams and springs are presented in Tables 3 to 9, inclusive, submitted at the end of this report.

Shasta River above Edson - Foulke Yreka Ditch
Parks Creek above Edson - Foulke Parks Creek Ditch
Shasta River at Edgewood Bridge
Shasta River near Montague
Little Shasta River above Harp Ditch

The gaging station on Shasta River near Edgewood is maintained by the Montague Water Conservation District throughout the winter period of each season.

Measuring stations equipped with water stage recorders were also maintained on streams, reservoirs and diversion conduits at critical con-

trol points, as an aid in the distribution of the available water supply. A list of these stations follows:

Shasta River at Grenada Pumps
Little Shasta River at Rose Dam
Beaughan Creek at Long-Bell Lower Weir
Carrick Creek at Jackson Weir
M.W.C.D. Parks Creek Canal at Head
Lake Dwinnell Reservoir
Dennis - Terwilliger Weir
Soule Weir
M.W.C.D. Shasta River Canal at Head
McKee Weir
Big Springs Lake

Water supply conditions during the 1938 season were entirely satisfactory from the standpoint of irrigation supply. Sufficient water was available throughout the entire season to meet all irrigation demands.

A comparison of the runoff for the past six seasons is presented in the following tabulation:

Name of Stream	Runoff in Acre Feet April 1 to October 1				
	1934	1935	1936	1937	1938
Shasta River above Yreka Ditch	4420	8510	7440	13600	*19100
Parks Creek above Duke N.Ditch	2550	6100	6560	11000	*14400
Little Shasta River	850	5630	6520	5680	** 6060
Beaughan Spring	2020	1960	1860	1820	1950
Big Springs	12400	12200	12100	12100	—
Carrick Spring	2090	2090	2050	2020	2110
Cleland Spring	2400	2420	2400	2410	2790

* Does not include April runoff

** Period May 14 to September 30, inclusive.

Distribution

Distribution for the 1938 season followed the practices initiated during the past four seasons with little modification. The results accomplished in the several sections in to which the stream system has been

divided follow:

Shasta River Above Confluence of Boles Creek

The water supply available to this area is the summation of the flow of Shasta River above the Edson-Foulke Yreka Ditch, set forth in Table 3 hereof, and the combined discharge of the Dow Eddy Creek Ditch and the Hammond-Scott Ditch diverting from Eddy Creek. A summary of the distribution for the 1938 season is set forth in the following tabulation:

Month	Average Available Water Supply c.u.ft per sec.	Distribution in per cent of Priority Allotments		
		Hammond Scott	Foulke et al.	Dow
April		100	100	100
May	162	100	100	100
June	120	100	100	100
July	41.7	56	45	70
Aug.	14.6	36	39	0
Sept.	8.4	36	19	0

This area had sufficient water during the irrigation season prior to August 1 to satisfy all irrigation demands, subsequent to this date there was considerable more water available than is normally expected.

Shasta River below Junction of Boles Creek and Boles Creek

One hundred per cent allotments were available for all priorities except the storage rights of Montague Water Conservation District, throughout the entire 1938 season.

Shasta River below Lake Dwinnell Reservoir

Water master service on this section of the stream system involves the operation of the Montague Water Conservation District's Lake Dwinnell Reservoir. The water master in cooperation with the District

exercises control over deliveries from the reservoir both to the District and to water right owners below the reservoir, who are entitled to water from the reservoir in accordance with agreements with the District.

Delivery of water to the water right owners below the reservoir commenced on April 19 and continued until October 1. There was about 2800 acre feet of storage remaining in the reservoir on October 1.

Delivery of water for District use commenced on April 19 and continued until September 30. During the 1938 season the District supplied Big Springs Irrigation District 8200 acre feet and Stallcup and Sons 1780 acre feet through the Shasta River Canal. The District distributed 3530 acre feet within the Montague Water Conservation District boundaries.

Summaries of operation of the reservoir during the 1938 season are given in the following tabulations:

OPERATION OF LAKE DWINNELL RESERVOIR DURING THE 1938 SEASON

Date	Storage: On hand Ac. Ft.	Storage: Increase Ac. Ft.	Storage: Draft Ac. Ft.	Inflow to Reservoir Ac. Ft.	Total Draft Ac. Ft.	Measured Deliveries Ac. Ft.: District	Measured Deliveries Ac. Ft.: Below Dam	Seepage and Evaporation Loss from Reservoir Ac. Ft.
April 1	31600							
May 1	31800	200		9510	9310	873	139	8298
June 1	29700		2100	10000	12100	4789	665	6646
July 1	25600		4100	7470	11570	4675	436	6459
Aug. 1	15000		10600	820	11420	5792	264	5364
Sept.1	7260		7740	320	8060	4343	361	3356
Oct. 1	2850		4410	320	4730	2608	296	1826
TOTAL		200	28950	28440	57 190	23080	2161	31949

Deliveries by District

Montague W.C.D.	3530
Big Springs I.D.	8200
Stallcup & Sons Co.	1780
Total	13510

Deliveries from Lake Dwinnell Reservoir to Prior Water Right Owners Below Reservoir During 1938 Season.

Name of Water Right Owner	Allotment as per agreement Ac. Ft.	Amount delivered from Montague Reservoir for 1938 Season	
		Acre Feet	Per Cent of Allotment
J. L. Jones	198	198	100
John Soule	692	*	*
J.W. and Mary L.Dennis	696	*	*
McKee Company	1200	1073	90
E. S. Terwilliger	596	*	*

* Excessive seepage from reservoir during 1938 season provided sufficient flow in River Channel to meet all irrigation requirements for these parties.

Submitted at the end of this report in Tables 11, 12, 13, 14 and 15, respectively, are records as follows:

Table 11 - Daily Discharge in Cubic Feet per Second, M.W.C.D. Parks Creek Canal at Head. June 1 to June 21, 1938, inclusive.

Table 12 - Daily Storage on Hand in Acre Feet, Lake Dwinnell Reservoir, October 27, 1937 to September 30, 1938.

Table 13 - Daily Discharge in Cubic Feet per Second, M.W.C.D., Shasta River Canal, April 19 to September 30, 1938.

Table 14 - Record of Deliveries to Prior Water Right Owners from Lake Dwinnell Reservoir 1929 to 1938, inclusive.

Table 15 - Record of Operation of Lake Dwinnell Reservoir, 1929 to 1938, inclusive.

Beaughan Creek

Two measurements were made during the 1938 season at the 8.0 rectangular weir, Long-Bell Upper Weir, located at the head of the Creek. The results are given below.

Date	Gage Height in feet	Discharge Cu. Ft. per Sec.
June 20, 1938	0.35	5.45
August 18, 1938	0.335	5.12

These amounts of water were sufficient to supply 66 per cent and 62 per cent respectively, of the total second priority allotments of 8.28 cubic feet per second. Distribution to the second priority water right owners was made in accordance with these percentages during the 1938 season.

The Long-Bell Lumber Company diverts practically the entire flow of Beaughan Creek and, after use thereof at its saw mill, the downstream users' share of the available water, which is 65 per cent of the measured flow at the Long-Bell Upper Weir is returned to the Creek at the Long-Bell Lower Weir. Based on the respective measurements, the amounts of water that should have been delivered to the lower users was 354 cubic feet per second and 3.33 cubic feet per second. A record of the delivery over the Long-Bell Lower Weir is presented on Table 10 at the end of this report.

Carrick Creek

Distribution on this stream during the 1938 season was confined largely to the first, second, third, fourth, fifth and ninth priorities from Carrick Creek and the fifth and seventh priorities from Stone Creek.

A summary of the distribution on Carrick Creek is set forth in the following tabulation:

Month	Average net Available Water Supply: Cu. Ft. Per Sec.	Average net Available Water Supply: % of total allotments	Distribution in percent of priority allotments: 1st to 5th inclusive	7th	9th
April			100	100	100
May	8.70	103	100	100	100
June	8.00 8.00	95	100	100	46
July	7.50	89	100	90	0
Aug.	7.20	85	100	60	0
Sept.	7.10	84	100	50	0

Parks Creek:

Distribution on Parks Creek for the 1938 season was in accordance with the practices followed during the past four seasons with little modification.

A summary of the distribution made during the 1938 season is set forth in the following tabulation.

Month	Measured water supply cu.ft.per sec.	Distribution in per cent of priority allotments: Duke 1	Caladonia 2	Foulke 3	Robertson 4, 6, 11, 12, 15
April		100	100	100	100
May	134	100	100	100	100
June	74.0	100	100	100	100
July	16.3	100	100	72	38
Aug.	7.1	99	62	5	9
Sept.	5.3	87	0	0	10

Records of the flow available for the above distribution are given in Table 4 of this report.

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

The Big Springs Irrigation District and Stallcup and Sons were supplied with irrigation water from Lake Dwinnell Reservoir throughout the 1938 season by means of the Montague Water Conservation District Shasta River Canal.

Lowe Brothers received 100 per cent allotments from Big Springs Lake during the entire season

Lower Shasta River

The following tabulation sets forth the average diversion made by the Shasta River Water Water Association and the Grenada Irrigation District during the 1938 season along with the water supply available to the water users below Montague Bridge during the same period.

Month	Average available water supply Flock et al., cu.ft.per.sec.	Average diversion Shasta River Water Association cu.ft.per.sec.	Average diversion Grenada Irrigation District cu.ft.per.sec.
April		27.9*	
May	256.	34.0	24.1
June	154.	41.3	24.2
July	113.	39.1	14.8
August	90.6	42.0	15.9
September	95.1	41.3**	15.8

* Started 7:00 A.M. April 26
** Stopped 6:00 P.M. September 15.

The daily discharge in cubic feet per second of Shasta River at Montague Bridge is set forth in Table 6 of this report.

The daily diversions in cubic feet per second of Shasta River Water Association are set forth in Table 15 of this report.

Little Shasta River

A summary of the distribution during the 1938 season is shown in the following tabulation.

Month	Available Water Supply: cu. ft. per sec.	Available Water Supply: % of total allotment	Distribution in per cent of Priority Allotments: 1	3	4	5	6	7
April		*	100	100	100	100	100	100
May	86.0	110	100	100	100	100	100	100
June	39.5	51	100	100	100	100	14	0
July	18.5	24	100	100	100	27	0	0
Aug.	14.2	18	100	100	100	7	0	0
Sept.	14.0	18	100	100	100	7	0	0

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

The flow of Little Shasta River above Harp Ditch is set forth in Table 7 of this report.

Intermittent measurements of the discharge of Cleland Springs are recorded in Table 9 of this report. It is interesting to note the increase in flow of the Springs during the 1938 season evidently due to the heavy precipitation during the 1937-38 winter months.

TABLE 1

Average of Precipitation at Mount Shasta City and Montague - 1889 to 1938 (1)

Monthly, seasonal and average amounts in inches

Season	October	November	December	January	February	March	April	May	June	July	August	September	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
1936-37	.02	.00	2.01	3.92	4.91	6.70	1.86	.50	3.20	.15	.00	.26	23.53
1937-38	2.31	6.88	4.54	4.25	8.17	5.88	1.74	.97	.16	.18	.00	.94	36.02
Totals	76.73	143.85	178.13	200.63	171.50	141.96	82.00	61.54	36.02	11.23	11.85	31.70	1147.14
Mean 49 Yrs.	1.57	2.93	3.64	4.09	3.50	2.89	1.67	1.26	.73	.23	.24	.65	23.40

Precipitation at Edgewood - Elevation 2952

1933-34											.38	.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
1936-37	.00	.00	.41	1.90	1.28	3.53	.86	1.06	1.27	.00	.00	.33	10.64
1937-38	1.52	3.49	4.24	3.47	5.45	5.16	.96	.89	.35	.08	.00	.60	26.21

TABLE 2

Monthly Precipitation for Seasonal Year 1937-1938

Compared with Mean Monthly Precipitation 1889 to 1938.

Month	Monthly mean-49 years: inches	per cent of total	Monthly 1937 - 1938 inches	per cent of total	Snowfall at Mt.Shasta City in inches normal	1937-1938
October	1.57	6.7	2.31	6.4		
November	2.93	12.5	6.88	19.1		
December	3.64	15.6	4.54	12.6	24.9	7.0
January	4.09	17.5	4.25	11.8	37.0	26.0
February	3.50	15.0	8.17	22.7	19.4	107.0
March	2.89	12.3	5.88	16.3	17.8	17.0
April	1.67	7.1	1.74	4.8	4.4	1.0
May	1.26	5.4	.97	2.7		
June	.73	3.1	.16	0.5		
July	.23	1.0	.18	0.5		
August	.24	1.0	.00	0.0		
September	.65	2.8	.94	2.6		
TOTALS	23.40	100.0	36.02	100.0	103.5	158.0

TABLE 3

DAILY DISCHARGE IN CUBIC FEET PER SECOND

SHASTA RIVER ABOVE YREKA DITCH

May 1 to September 30, 1938

Day	May Gage height	May Dis-charge	June Gage height	June Dis-charge	July Gage height	July Dis-charge	August Gage height	August Dis-charge	September Gage height	September Dis-charge
1		142.	2.48	146.	1.80	63.0	1.23	19.9	0.94	5.80
2	2.46	142.	2.53	154.	1.75	58.7	1.22	19.3	.94	5.80
3	2.35	125.	2.56	160.	1.72	56.2	1.20	18.0	.93	5.40
4	2.25	110.	2.58	164.	1.65	50.2	1.17	16.4	.92	5.10
5	2.18	100.	2.61	169.	1.60	46.0	1.16	15.9	.87	3.90
6	2.17	98.8	2.63	172.	1.57	43.7	1.16	15.9	.87	3.90
7	2.18	100.	2.59	166.	1.56	43.0	1.15	15.4	.88	4.10
8	2.28	115.	2.54	156.	1.57	43.7	1.16	15.9	.91	4.80
9	2.35	125.	2.45	140.	1.55	42.2	1.16	15.9	.91	4.80
10	2.43	137.	2.35	125.	1.55	42.2	1.13	14.3	.89	4.30
11	2.48	146.	2.35	125.	1.53	40.7	1.13	14.3	.89	4.30
12	2.58	164.	2.35	125.	1.50	38.5	1.13	14.3	.89	4.30
13	2.67	180.	2.30	118.	1.48	37.0	1.12	13.8	.88	4.10
14	2.85	213.	2.25	110.	1.48	37.0	1.12	13.8	.88	4.10
15	3.10	261.	2.21	104.	1.47	36.2	1.11	13.3	.87	3.90
16	2.95	232.	2.20	103.	1.45	34.7	1.08	11.7	.85	3.50
17	2.70	186.	2.15	96.0	1.44	34.0	1.03	9.4	.85	3.50
18	2.54	156.	2.05	82.0	1.40	31.2	.98	7.4	.85	3.50
19	2.43	137.	1.98	72.6	1.37	29.1	.98	7.4	.85	3.50
20	2.37	128.	1.95	69.0	1.36	28.4	.97	7.0	.85	3.50
21	2.34	124.	1.97	71.4	1.35	27.7	.97	7.0	.85	3.50
22	2.38	130.	2.04	80.6	1.37	29.1	.96	6.6	.84	3.30
23	2.46	142.	2.08	86.2	1.36	28.4	.96	6.6	.83	3.10
24	2.57	162.	2.06	83.4	1.34	27.1	.96	6.6	.85	3.50
25	2.60	168.	2.02	77.8	1.31	25.1	.96	6.6	.86	3.70
26	2.67	180.	2.03	79.2	1.28	23.2	.96	6.6	.86	3.70
27	2.66	178.	1.98	72.6	1.30	24.5	.97	7.0	.93	5.40
28	2.57	162.	1.92	65.4	1.32	25.8	.97	7.0	1.12	13.80
29	2.53	154.	1.88	60.6	1.32	25.8	.96	6.6	1.13	14.30
30	2.52	153.	1.85	57.0	1.26	21.9	.96	6.6	1.17	16.40
31	2.48	146.			1.25	21.2	.94	5.8		
Total Sec. Ft. Days		4690.8		3290.8		1115.5		352.3		156.80
Mean Sec. Ft.		151.5		109.7		36.0		11.36		5.23
Total Ac. Ft.		9310		6530		2210		699		311

Total Acre Feet - 5 Month Period 19,100

TABLE 5
DAILY DISCHARGE IN CUBIC FEET PER SECOND
SHASTA RIVER - EDGEWOOD
October 27, 1937 to September 30, 1938

Day	October	November	December	January	February	March	April	May	June	July	August	September
1		26.2	138.0	79.5	140.0	740.0	114.0	233.0	158.0	33.3	4.1	4.3
2		27.0	138.0	98.0	215.0	720.0	114.0	197.0	203.0	34.5	4.0	5.2
3		27.9	140.0	85.5	155.0	278.0	116.0	155.0	217.0	36.3	5.9	5.2
4		28.3	144.0	81.0	114.0	237.0	128.0	132.0	237.0	32.1	5.9	5.4
5		28.3	123.0	100.0	98.0	207.0	106.0	111.0	247.0	28.3	5.1	5.9
6		29.2	114.0	98.0	211.0	193.0	81.0	103.0	247.0	22.3	5.4	5.9
7		29.2	113.0	94.8	215.0	183.0	81.0	101.0	235.0	17.4	6.7	6.5
8		29.7	114.0	90.0	209.0	174.0	94.8	103.0	221.0	13.2	7.2	6.7
9		29.2	160.0	75.0	318.0	168.0	135.0	130.0	187.0	12.6	8.0	4.8
10		67.5	770.0	70.5	340.0	158.0	132.0	140.0	153.0	12.2	5.9	3.6
11		211.0	1120.0	64.7	253.0	155.0	132.0	149.0	160.0	13.8	4.3	3.6
12		147.0	518.0	66.1	170.0	231.0	132.0	158.0	168.0	14.0	3.8	4.6
13		137.0	356.0	69.0	137.0	345.0	123.0	187.0	140.0	12.8	5.1	4.8
14		138.0	257.0	158.0	227.0	207.0	111.0	235.0	121.0	13.8	4.8	4.6
15		126.0	233.0	211.0	201.0	217.0	111.0	324.0	113.0	12.8	3.6	4.3
16		153.0	178.0	195.0	178.0	465.0	145.0	292.0	109.0	11.6	4.3	4.0
17		158.0	153.0	201.0	158.0	257.0	183.0	241.0	101.0	10.8	5.1	4.0
18		130.0	123.0	164.0	155.0	227.0	239.0	187.0	82.5	9.4	5.4	3.4
19		170.0	90.0	130.0	149.0	243.0	255.0	155.0	66.1	6.8	5.9	4.0
20		568.0	79.5	118.0	144.0	223.0	237.0	123.0	55.3	6.8	5.9	5.9
21		320.0	72.0	114.0	153.0	183.0	223.0	114.0	60.7	6.8	5.6	6.7
22		274.0	67.5	138.0	153.0	158.0	207.0	109.0	56.7	6.8	5.1	6.5
23		318.0	64.7	82.5	181.0	207.0	207.0	116.0	58.0	7.6	5.4	6.2
24		284.0	64.7	63.4	217.0	158.0	237.0	151.0	58.0	6.2	4.0	5.1
25		233.0	64.7	58.0	211.0	168.0	207.0	160.0	55.3	5.0	4.3	4.3
26		227.0	84.0	56.7	207.0	168.0	179.0	178.0	54.0	4.0	5.4	4.8
27	30.6	197.0	91.6	59.4	211.0	164.0	181.0	178.0	53.0	4.0	4.8	5.9
28	31.0	168.0	90.0	63.4	227.0	158.0	191.0	162.0	51.1	4.0	4.8	10.7
29	32.7	155.0	85.5	60.7	—	144.0	178.0	155.0	50.2	4.0	6.2	10.7
30	28.3	144.0	94.8	54.0	—	130.0	215.0	145.0	49.2	4.0	4.6	10.7
31	26.2	—	84.0	144.0	—	118.0	—	138.0	—	4.0	3.6	—
Total Sec. Ft. Days	148.8	4580.5	5925.0	3143.2	5347.0	7384.0	4794.8	5062.0	3767.1	411.2	160.2	158.9
Mean Sec. Ft.	29.8	152.7	191.1	101.4	191.0	238.2	159.8	163.3	125.6	13.3	5.17	5.3
Total Acre-Ft.	293.0	9090.0	11800.0	6240.0	10600.0	14600.0	9510.0	10000.0	7470.0	815.0	318.0	315.0

TABLE 4

DAILY DISCHARGE IN CUBIC FEET PER SECOND

PARKS CREEK--ABOVE DUKE N. DITCH

May 1 to September 30, 1938

Day	May	June	July	August	September
1	158.	119.	30.2	9.40	5.50
2	129.	125.	28.7	9.20	5.70
3	94.6	130.	27.3	9.00	5.60
4	82.8	135.	24.1	8.80	5.40
5	76.4	140.	22.3	8.60	5.40
6	76.4	135	20.5	8.40	5.40
7	79.6	125	20.0	8.20	5.60
8	91.4	111	19.7	7.90	5.30
9	116.	92.5	18.7	8.00	5.00
10	126.	79.2	18.7	8.00	4.90
11	136.	79.2	18.6	7.80	4.90
12	154.	79.2	19.1	7.10	4.80
13	184.	71.9	17.6	7.10	4.90
14	220.	69.1	16.8	7.20	4.90
15	249.	67.7	16.1	7.20	5.00
16	217.	64.9	14.4	7.50	5.10
17	166.	58.2	13.2	7.00	5.20
18	139.	49.5	13.1	6.90	5.20
19	114.	45.2	13.1	6.90	5.40
20	102.	44.2	12.9	6.60	5.30
21	104.	45.2	12.4	6.30	5.10
22	116.	46.0	11.8	5.80	4.80
23	141.	44.8	11.1	5.70	4.70
24	136.	42.8	10.6	5.80	4.90
25	154.	39.9	10.2	5.80	4.90
26	166.	39.0	9.60	6.00	4.90
27	150.	38.0	10.2	6.00	4.90
28	129.	35.2	12.6	5.90	6.80
29	125.	34.4	12.4	5.80	6.80
30	115.	32.7	10.6	5.70	7.20
31	111.		10.0	5.60	
Total Sec. Ft. Days	4158.2	2218.8	506.6	221.2	159.5
Mean Sec.Ft	134.1	73.96	16.34	7.14	5.32
Total Ac. Ft. -	8250	4400	1000	439	316

Total Acre Feet - ~~Six~~ Five month Period - 14,400

TABLE 6

DAILY DISCHARGE IN CUBIC FEET PER SECOND

SHASTA RIVER NEAR MONTAGUE
(May 14 to September 25, 1938)

Day	May	June	July	August	September	
1		242	103	120	68.6	
2		230	109	111	68.6	
3		214	111	103	71.9	
4		192	115	107	80.4	
5		162	138	115	85.5	
6		144	146	96.2	90.8	
7		128	138	85.5	99.8	
8		130	107	83.8	96.2	
9		136	103	82.1	94.4	
10		154	100	73.6	92.6	
11		148	94.4	75.3	89.0	
12		156	96.2	75.3	96.2	
13		188	103.	70.3	85.5	
14	254	178	109.	67.0	78.7	
15	333	160	120	75.3	87.3	
16	396	152	122	81.3	107.	
17	328	160	124	92.6	107.	
18	278	148	119	102.	107.	
19	254	150	100	107.	109.	
20	232	162	85.5	105.	111.	
21	220	136	87.3	98.0	111.	
22	216	107	85.5	92.6	113.	
23	218	126	92.6	96.2	109.	
24	224	140	98.0	96.2	107.	
25	230	134	92.6	92.6	111.	
26	220	134	96.2	89.0		
27	216	134	118.	89.0		
28	260	130	154.	92.6		
29	254	122	158.	85.5		
30	238	124	144	78.7		
31	238		130	70.3		
Total Sec. Ft. Days	*4609	4621	3499.3	2809	2377.5	**
Mean Sec. Ft.	* 256	154	113	90.6	95.1**	~~Year~~ Period
Total Ac. Ft.	*9140	9160	6940	5570.	4710. **	35500

* 18 day period
** 25 day period

TABLE 7

DAILY DISCHARGE IN CUBIC FEET PER SECOND

LITTLE SHASTA RIVER ABOVE HARP DITCH

May 14 to September 30, 1938

Day	May	June	July	August	September
1		54.60	15.90	7.40	5.10
2		52.40	15.90	7.20	5.10
3		50.20	15.00	7.20	5.10
4		49.10	14.60	7.00	5.10
5		47.00	14.20	6.80	5.10
6		44.90	13.80	6.60	5.10
7		43.90	13.40	6.60	5.20
8		41.80	12.70	6.60	5.20
9		39.10	12.40	6.60	5.10
10		37.20	12.10	6.40	4.90
11		39.10	11.80	6.40	4.90
12		40.00	11.50	6.20	4.70
13		34.40	11.20	6.20	4.70
14	99.20	31.10	10.90	6.10	4.50
15	116.00	29.70	10.60	6.10	4.30
16	104.00	29.00	10.90	6.10	4.30
17	95.30	27.60	12.10	6.10	4.30
18	88.80	26.90	10.60	6.10	4.30
19	82.30	25.50	9.80	5.90	4.30
20	77.10	24.30	9.30	5.80	4.30
21	75.80	23.70	9.30	5.80	4.30
22	73.40	22.50	8.80	5.60	4.30
23	73.40	21.30	8.30	5.40	4.30
24	72.20	20.70	8.30	5.40	4.30
25	71.00	20.10	8.00	5.30	4.30
26	71.00	19.00	8.00	5.30	4.30
27	68.60	18.60	8.30	5.20	4.30
28	67.40	18.60	8.80	5.20	5.10
29	65.00	18.60	8.30	5.20	5.10
30	60.30	17.20	8.00	5.20	5.10
31	58.00		7.60	5.10	
Total Sec. Ft. Days	1418.80	968.10	340.40	188.10	141.00
Mean Sec. Ft.	78.80	32.27	10.96	6.07	4.70
Total Ac. Ft.	2810.00	1920.00	675.00	373.00	280.00

TABLE 8

DISCHARGE IN CUBIC FEET PER SECOND

CARRICK CREEK

April 1 to September 30, 1938

Day	April	May	June	July	August	September
1						
2						
3						
4						
5						5.77
6					5.85	
7			5.80	5.80		
8						
9						
10						
11				5.79	5.85	
12				5.78		5.76
13				5.82		
14				5.81		
15						5.76
16				5.84		
17						
18		5.82			5.85	
19						
20				5.85		
21						
22						
23						
24						
25				5.85		
26					5.85	
27						
28			5.85	5.85		
29						
30			5.85			
31						
Mean Sec. Ft.	5.82	5.82	5.82	5.82	5.85	5.76
Total Ac. Ft.	346.00	358.00	346.00	358.00	360.00	342.00

Total Acre Feet - 6 months' period -- 2110

TABLE 9

DAILY DISCHARGE IN CUBIC FEET PER SECOND

CLELAND SPRING

April 1 to September 30, 1938

Day	April	May	June	July	August	September
1						8.91
2						
3						
4					8.02	
5						9.01
6						
7				7.49		
8						
9						
10						
11					8.06	
12						
13						
14		7.10		7.37		
15						9.14
16						
17						
18						
19						
20						
21				7.64		
22			7.18			9.40
23						
24						
25					8.39	
26						
27						
28				7.66		
29						10.04
30			7.18			
31						
Mean Sec. Ft.	7.0	7.1	7.18	7.54	8.12	9.30
Ac. Ft.	417.00	435.00	427.00	462.00	498.00	554.00

Total Acre Feet - 6 Months' Period --- 2790

TABLE 10

DAILY DISCHARGE IN CUBIC FEET PER SECOND

BEAUGHAN CREEK AT LONG-BELL LOWER WEIR

April 23 to September 30, 1941.

Day	April	May	June	July	August	September
1		4.87	3.16	4.24		3.51
2		4.87	3.16	4.40		3.51
3		4.24	2.68	4.48		3.51
4		4.16	1.70	4.48		3.44
5		4.40	2.23	4.09		3.29
6		4.71	3.22	3.51		2.88
7		4.79	2.81	3.22	3.79	2.81
8		4.63	3.09	3.22	3.65	3.02
9		4.32	3.72	3.04	3.09	3.58
10		3.94	4.16	2.95	3.09	3.96
11		3.94	4.40	3.02	3.22	4.24
12		4.16	4.32	3.09	3.22	3.94
13		4.48	3.65	3.22	4.09	3.58
14		4.55	3.51	3.36	3.65	3.44
15		4.95	3.36	3.22	3.58	3.51
16		4.40	3.29		3.29	3.51
17		3.86	3.29		3.29	3.51
18		3.79	3.65		3.29	3.44
19		3.86	3.79		3.44	3.36
20		3.86	4.24		4.29	3.36
21		4.40	3.94		3.94	3.36
22		4.40	3.79		3.65	3.36
23	5.68	3.79	3.94		3.36	3.51
24	6.02	3.58	3.94		2.65	3.65
25	5.52	3.44	3.91		3.00	3.58
26	4.63	3.51	3.29		3.80	3.79
27	4.55	3.65	3.36		4.40	3.44
28	5.03	3.79	3.51		3.86	3.94
29	5.19	3.72	3.51		3.65	3.79
30	5.03	3.58	4.09		3.09	3.79
31		3.22			3.29	
Total Sec.Ft. Days	41.65	127.86	104.71	53.54	87.67	105.61
Mean Sec. Ft.	5.21	4.12	3.49	3.57	3.51	3.52

TABLE 11

DAILY DISCHARGE IN CUBIC FEET PER SECOND
PARKS CREEK CANAL, 1938

June 1 to June 21, 1938

Day	June
1	20
2	49
3	63.5
4	73.0
5	73.0
6	73.0
7	67.0
8	59.5
9	47.5
10	37.5
11	37.5
12	39.0
13	28.5
14	25.5
15	23.0
16	23.0
17	19.5
18	21.0
19	8.0
20	4.5
21	3.2
Total Sec. Ft.	795.7
Mean Sec. Ft	37.9
Total Ac. Ft.	1580.0

Water turned out of canal on this date due to slide at dam

TABLE 12
LAKE DWINNELL RESERVOIR
STORAGE IN ACRE FEET
October 27, 1937 to September 30, 1938

Day	October	November	December	January	February	March	April	May	June	July	August	September
1		82	3990	11600	14400	22900	31500	31900	29600	25100	14700	7050
2		90	4050	11700	14700	24300	31400	32000	29600	24700	14400	6840
3		106	4110	11700	15500	26200	31100	32100	29600	24400	14100	6670
4		122	4140	11800	15800	26600	31100	32000	29700	24000	13800	6460
5		138	4170	11800	16100	27000	31000	31800	29800	23600	13500	6260
6		154	4170	11800	16200	27500	31000	31600	29900	23200	13200	6060
7		178	4200	11900	16500	27700	30900	31400	30100	22900	13000	5860
8		194	4200	11950	16800	27900	30800	31100	30200	22500	12700	5660
9		218	4230	11950	17400	28000	30800	30900	30200	22200	12400	5460
10		226	4350	11950	18300	28200	30700	30800	30200	21800	12100	5320
11		442	5240	11950	19200	28300	30600	30700	30000	21400	11900	5140
12		591	7890	11950	19800	28400	30400	30500	30000	21000	11700	4980
13		730	8870	12000	20200	28900	30400	30400	29900	20700	11500	4800
14		790	9500	12100	20300	29200	30300	30400	29800	20300	11200	4640
15		840	10000	12200	20400	29500	30300	30400	29700	20000	10900	4480
16		900	10400	12500	20600	29800	30300	30800	29400	19700	10700	4290
17		970	10600	12800	20800	30600	30300	30900	29200	19400	10400	4140
18		1060	10800	13000	20900	30900	30400	31000	29000	19000	10200	3990
19		1160	11000	13200	21100	30900	30500	30900	28700	18700	10000	3810
20		1260	11100	13300	21200	31200	30800	30800	28400	18400	9700	3670
21		1410	11100	13400	21500	31300	30900	30700	28200	18100	9500	3500
22		1950	11200	13400	21600	31400	31100	30400	27900	17700	9200	3330
23		2480	11300	13600	21700	31400	31200	30300	27600	17400	9010	3250
24		3080	11400	13700	21900	31600	31200	30200	27100	17100	8820	3170
25		3390	11400	13700	22200	31600	31500	30100	26800	16800	8490	3100
26		3610	11400	13800	22300	31600	31500	30000	26400	16500	8250	3050
27	50	3780	11500	13800	22600	31700	31500	30000	26000	16200	8070	3000
28	50	3840	11500	13900	22600	31700	31700	29900	25800	15900	7840	2950
29	50	3900	11500	14000		31700	31700	29800	25800	15600	7660	2900
30	50	3930	11600	14100		31700	31800	29700	25600	15200	7480	2850
31	58		11600	14300		31600		29700		15000	7260	

Note: Add 0.30' to all gage readings February 14 to August 6, inclusive.

TABLE 13

DAILY DISCHARGE IN CUBIC FEET PER SECOND

M.W.C.D. SHASTA RIVER CANAL

April 19 to September 30, 1938.

Day	April	May	June	July	August	September	
1		64.0	71.0	110	84.2	62.5	
2		64.5	67.1	109	83.8	62.5	
3		67.5	67.7	109	83.4	62.2	
4		77.7	67.7	108	83.0	60.2	
5		83.0	67.7	108	82.6	59.6	
6		83.0	67.7	107	82.2	59.6	
7		83.0	67.7	107	81.8	59.6	
8		83.0	74.0	106	81.2	60.7	
9		83.0	81.0	106	80.8	61.8	
10		83.0	81.0	106	80.4	61.5	
11		84.0	81.0	105	80.0	60.7	
12		84.0	85.0	105	79.5	60.0	
13		84.5	87.0	104	79.0	58.8	
14		86.0	89.0	104	78.5	58.5	
15		86.0	95.0	103	78.1	58.2	
16		82.0	97.0	103	77.7	57.8	
17		83.0	97.0	102	77.3	57.5	
18		83.0	97.0	96	76.8	57.2	
19	31.5	86.5	97.0	89.5	76.4	56.0	
20	31.5	86.0	97.0	89.0	76.0	55.0	
21	31.5	83.0	97.0	88.5	75.5	54.7	
22	31.5	83.0	101.0	88.0	75.0	33.1	
23	31.0	83.0	105.0	87.5	74.6	11.2	
24	35.3	83.5	105.0	87.0	74.2	12.6	
25	38.5	83.5	111.0	86.5	73.8	14.5	
26	38.0	83.0	117.0	86.0	69.8	14.0	
27	38.0	83.0	39.0	86.0	64.1	14.0	
28	44.0	76.0	00.0	85.5	65.0	13.0	
29	53.3	71.0	28.0	85.0	64.5	13.0	
30	62.8	71.0	113.0	84.5	64.0	13.0	
		71.0		84.0	68.4		
Total Sec. Ft. Days	*466.9	2487.7	2451.2	3025.0	2371.6	1383.0	165 day period
Mean Sec.Ft.	* 38.9	80.2	81.7	97.6	76.5	46.1	73.8
Total Ac.Ft	*926	4930	4860	6000	4700	2740	24200

*12 day period

TABLE 14

RECORD OF DELIVERIES TO PRIOR RIGHT OWNERS FROM
LAKE DWINNELL RESERVOIR

1929 to 1938, inclusive.

Year	Jones	Soule	Dennis	McKee	Terwilliger	Total Acre-feet	Total % 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
1937	198	633	489	1200	120	2690	80
1938	198	-	-	1073	-	1271	38

1929 - Records of deliveries missing
1930-31- Records of delivery to Terwilliger missing
1932 - Records missing
1938 - Soule, Dennis and Terwilliger had sufficient water from reservoir seepage to supply irrigation demands.

TABLE 15

RECORD OF OPERATION OF LAKE McNEELL RESERVOIR
1929 to 1938, inclusive

Year	Reservoir Storage on April 1	Inflow April 1 to Sept. 30	Total Available Water Supply	Maximum storage in Reservoir		Delivery from Reservoir				Total	Storage in Reservoir when delivery to M.N.C.D. ceased	Seepage and Evaporation Loss
						M. N. C. D.		Prior Rights				
				Acre-feet	Date	Acre-feet	Period	Acre-feet	Period	Acre-feet		
1929				4500	-	* -		-		-	-	
1930				10500	March 14	5000	May 5 to July 4	2060	April 23 to Sept. 5	7060	2800	
1931				4250	April 4	0		2050	April 1 to July 25	2050	2800	
1932	5500			5500	March 20	2000	May 15 to June 15	no record		2000	2000	
1933	5200			6500	May 3	4750	April 21 to July 16	2810	April 10 to Sept. 3	7560	2200	
1934	4850			5000	April 5	1500	April 10 to April 23	2390	April 5 to July 22	3890	2800	
1935	5000	4620	9620	5700	May 10	2700	May 10 to June 2	2720	April 9 to Aug. 11	5420	3000	4200
1936	5460	4720	10180	6020	March 3	1560	April 14 to May 20	2760	April 14 to Aug. 11	4320	3250	5860
1937	5940	14040	19980	9800	May 6	7360	May 5 to Sept. 15	2690	April 26 to Sept. 9	10050	0	9930
1938	31600	28440	60040	32100	May 3	** 23910	May 1 to Sept. 30	1270	May 1 to Sept 30	25180	2850	34860

* In 1929 the District used water only for puddling its canal.

** Includes 831 acre-feet wasted through outlet to prevent increase in reservoir level and 9980 acre-feet delivered by District to Stallcup and Big Springs Irrigation District.

TABLE 16

DAILY DISCHARGE IN CUBIC FEET PER SECOND

SHASTA RIVER WATER ASSOCIATION PUMPING PLANT

April 26 to September 15, 1938

Day	April	May	June	July	August	September
1		28.0	40.3	42.0	42.0	42.0
2		28.0	42.0	42.0	42.0	42.0
3		28.0	42.0	42.0	42.0	42.0
4		28.0	42.0	28.0	42.0	42.0
5		28.0	42.0	29.5	42.0	42.0
6		28.0	42.0	42.0	42.0	42.0
7		0	42.0	42.0	42.0	42.0
8		0	42.0	42.0	42.0	42.0
9		13.7	42.0	42.0	41.6	42.0
10		14.0	40.3	42.0	42.0	42.0
11		18.8	42.0	42.0	42.0	42.0
12		42.0	42.0	42.0	42.0	42.0
13		42.0	32.7	33.3	42.0	42.0
14		42.0	37.1	42.0	42.0	42.0
15		42.0	42.0	33.3	42.0	31.5**
16		42.0	42.0	42.0	42.0	
17		42.0	42.0	38.5	42.0	
18		42.0	42.0	42.0	42.0	
19		42.0	42.0	42.0	42.0	
20		42.0	42.0	42.0	42.0	
21		42.0	41.7	42.0	42.0	
22		42.0	42.0	42.0	42.0	
23		42.0	42.0	42.0	42.0	
24		42.0	42.0	42.0	42.0	
25		42.0	42.0	42.0	42.0	
26	*12.2	42.0	42.0	36.7	42.0	
27	42.0	42.0	42.0	10.5	42.0	
28	42.0	42.0	36.7	36.7	42.0	
29	15.5	42.0	42.0	42.0	42.0	
30	28.0	42.0	42.0	42.0	42.0	
31		42.0		42.0	42.0	
Total Sec. Ft. Days	139.7	1054.5	1238.8	1212.5	1301.6	619.5
Mean Sec. Ft	27.9	34.0	41.3	39.1	42.0	41.3
Total Acre Ft.	277.00	2090.00	2460.00	2400.00	2580.00	1230.00

Total Acre Feet -- 6 months' period -- 11,040

* Started operations 7:00 A.M.
** Stopped operations 6:00 P.M.