STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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

REPORT ON

WATER MASTER SERVICE

WITHIN

SURPRISE VALLEY WATER MASTER DISTRICT

MODOC COUNTY, CALIFORNIA

1939 SEASON

BY
J. W. MCPARTLAND
Water Master

SACRAMENTO, CALIFORNIA

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EDWARD HYATT, STATE ENGINEER
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Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Mr. Gordon Zander,
Supervising Hydraulic Engineer

Dear Sir:

The annual report covering water master service within the Surprise Valley Water Master District, Modoc County, California, during the 1939 season, is submitted herewith.

The report covers a general description of the work and a summary of the distribution of water on each of the nine streams within the district. Records of precipitation, run-off and other pertinent data are included.

Respectfully submitted,

J. W. MCPARTLAND
Water Master

JM:eb

FOR VICTORY
BUY
UNITED
STATES
SAVINGS
BONDS
AND STAMPS

INTRODUCTION

The Surprise Valley Water Master District, County of Modoc, State of California, was created by order of the Division of Water Resources, entered January 10, 1939, by consolidating therein the Cedar Creek, Soldier Creek, Owl Creek, Emerson Creek, Mill Creek, Deep Creek, Cedarville (Pine Creek) and Rader Creek Water Master Districts, theretofore created by orders of the Division of Water Resources, and by adding thereto the water rights on Eagle Creek. The district embraces such territory as to include all the water rights on the above named streams as ascertained and determined by court decrees, by agreements in writing which have been recorded and by permits and licenses of the Division of Water Resources issued subsequently to any adjudication. The various instruments which define the water rights on the several streams are as follows:

Cedar Creek:- Decree in the case of D. H. Lighty v. John R. Cook, et al., No. 1206, Superior Court, Modoc County, entered May 22, 1901. This decree ascertained and determined the rights in and to foreign water conveyed from Thoms Creek (a tributary of the North Fork of Pit River) across the Cedar Pass divide into Cedar Creek; decree in the case of W. E. Hill, et al. v. Herman Acty, et al., No. 2343, Superior Court, Modoc County, entered February 15, 1923, which established the rights in and to the natural flow of Cedar Creek; and agreement Re Right of Jake Rechsteiner to Divert Water from Cedar Creek, dated June 18, 1936.

Soldier Creek:- Decree in the case of San Francisco Cattle Loan Co., et al. v. C. M. Crampton, et al., No. 2405, Superior Court, Modoc County, entered November 28, 1928, and rights initiated by Application No. 2908, filed June 27, 1922, License No. 1566; Application No. 2935, filed July 20, 1922, License No. 1613; Application No. 3033, filed September 15, 1922, License No. 1648; and Application No. 3185, filed December 18, 1922, License No. 1850.

Owl Creek:- Decree in the case of C. E. Cummins, et al. v. Wiley Allen, et al., No. 2410, Superior Court, Modoc County, entered April 29, 1929 and the right initiated by Application 2842, filed May 6, 1922, License No. 1985.

Emerson Creek:- Decree in the case of Frederick A. Murphey, et al. v. W. G. Warren, et al., No. 2840, Superior Court, Modoc County, entered March 25, 1930.

Mill Creek:- Decree in the case of George M. Warrens v. G. A. Wimer, et al., No. 3024, Superior Court, Modoc County, No. 3024, entered December 19, 1931.

Deep Creek:- Decree in the case of E. R. Teyeryar, et ux., v. Mrs. M. L. Benner, et al., No. 3101, Superior Court, Modoc County, entered January 25, 1934.

Pine Creek:- Decree in the case of Even R. Gaustad, et. ux., v. R. E. McCulley, et al., No. 3391, Superior Court, Modoc County, entered December 7, 1936.

Rader Creek:- Decree in the case of Franklin J. Powers, et al. v. E. E. Woodruff, et al., No. 3626, Superior Court, Modoc County,

entered June 4, 1937.

Eagle Creek:- Decree in the case of Arthur J. Harris, et ux. v. Sarah L. Adams, et al., No. 3284, Superior Court, Modoc County, entered November 5, 1937.

A petition requesting water master service, signed by more than fifteen per cent of the owners of the conduits, ditches and other means of diversion from the streams within the Surprise Valley Water Master District was received by the Division of Water Resources on January 12, 1939, and on March 15, 1939, J. W. McPartland, was appointed Water Master, Surprise Valley Water Master District, all in accordance with the procedure provided for by Section 37a of the Water Commission Act.

Water master service in the Surprise Valley Water Master District for the 1939 season covered the regulation of diversions on the various streams within the district 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 March 19 to September 30. J. W. McPartland, served as water master throughout the entire period under the immediate supervision of Harrison Smitherum, Supervising Water Master.

WATER SUPPLY

Precipitation

Table 1 contains the precipitation data at Cedarville. The monthly and seasonal precipitation for the period of water master service in Surprise Valley and a comparison of the 1938-1939 seasonal precipitation with the 1894-1939 mean are shown in the table. The seasonal

precipitation for 1938-1939 was 85.0 per cent of the mean.

Table 2 contains the results of the snow surveys made annually at the three courses in the Upper Pit River watershed. Considering the two snow courses on the Warner Range, namely Eagle Peak and Cedar Peak, it is seen that the water content of the snow on these two courses was 52.0 per cent and 47.4 per cent respectively of their deduced normals. A mean between these two figures is 49.7 per cent which should be indicative of the run-off compared with normal of the streams included in this report.

Stream Flow

Measuring stations equipped with water stage recorders were maintained on the streams within the Surprise Valley Water Master District as listed below.

Mill Creek above diversions.
Soldier Creek above diversions.
Pine Creek above North and South Channels.
Cedar Creek above diversions.
North Deep Creek above diversions.
South Deep Creek below Espil Ditch.
Owl Creek below Allen-Arreche Ditch.
Rader Creek above Parshall Flume Division Structure.
Eagle Creek one-half mile below mouth of canyon
Emerson Creek above diversions.

As nearly as is practicable the measuring station is located above the uppermost ditch diverting from the stream. On Pine Creek the measurements were made by means of two 4.0 foot Parshall Flumes, which also serve to divide the water into the North and South Channels of Pine Creek. The other stations were rated by means of current meter measurements taken at various stages of the streams throughout the period of water master service.

The records of discharge for the above named streams are presented in Tables 3 to 11, submitted at the end of this report. The

adequacy of the water supply to fill the requirements on the several streams is discussed for each stream under the following chapter.

DISTRIBUTION OF WATER

Distribution on the various streams within the district was in accordance with the allotments and priorities set forth in the respective decrees, agreements and water filings heretofore noted under "Introduction". A summary of the results accomplished and of any difficulties encountered on each separate stream is given below.

Mill Creek

All ditches diverting from Mill Creek were in use during the 1939 season. The record of daily discharge of Mill Creek above diversions for the 1943 season is submitted in Table 3 at the end of this report.

The water supply was sufficient to meet all demands of the 1st priority rights from April 1 to July 15. Subsequent thereto the supply decreased to 65 per cent of 1st priority allotments on August 1, averaged about 50 per cent during August and 45 per cent throughout September. The 2nd priority rights received 100 per of allotments up to July 5, Thereafter the water supply decreased rapidly until there was no water available for the 2nd priority rights subsequent to July 15. The 3rd priority rights averaged about 73 per cent of allotments for April, 56 per cent for May and 10 per cent up to June 25, after which date there was no water available for this class of rights. Water was available for the 4th priority rights only from April 1 to 9, inclusive.

The flow of Brown Creek was of short duration with insufficient water to supply the 1st right of 0.80 cubic foot per second of

M. Stewart.

Rotation was practiced in Rutherford Creek between the Vernon and Warren Ranch from April 12 to June 5. Very little water reached the Rutherford Swamp area after April 30, which caused a shortage of crops to the users who depend upon this source for their water.

The Bennett collecting ditch averaged approximately 25 per cent of their total allotment from this source during the entire season.

Soldier Creek

All ditches on Soldier Creek were open during the 1939 season, with all users irrigating whenever the water was available. Water was not available for the permit rights at any time during the season. The daily discharge of Soldier Creek above all diversions has been tabulated in Table 4.

Rotation was practiced from March 19 until June 7. During the first part of April sufficient water was available to fill the required allotment, after that Soldier Creek diminished in flow rapidly with only 4.00 cubic feet per second available on May 27 for the lower users period. During the remainder of the season only sufficient water was available for the 1st priority rights.

Simpson and Daniel Canyons supplied sufficient water for the Daniels Ranch during the months of March and April only.

Pine Creek

Rotation was commenced on March 29, the water going to the North Fork of Pine Creek users to the extent of 132.5 acre-feet of water. On April 3 the entire flow of Pine Creek was turned to the

South Fork users. A total of 100.0 acre-feet of water was required for this irrigation. The third rotation was commenced on April 8 and the water was turned to the North Fork users. A total of 228.0 acre-feet was required for this irrigation. On April 28 the flow of Pine Creek having receded to 4.00 cubic feet per second, the water was turned to the McCulley and Gaustad Ranches. On May 3 the total flow of Pine Creek approximately 2.50 cubic feet per second, was turned into the Cressler Ditch for the use of the South Fork users but due to the rapid decrease in flow no water was available for the Harry Hill Ranch. By May 19 the flow had further receded to about 0.40 cubic feet per second and did not reach the E. Hill Ranch, therefore, the entire flow of Pine Creek was given to John Freeborn for the remainder of the season.

The daily discharge of Pine Creek above all diversions for the period of water master service has been tabulated in Table 5.

Cedar Creek

Table 6 is a tabulation of the daily discharge including the water from Thoms Creek Ditch which was opened on April 9, and ceased to flow on May 22.

The Thoms Creek ditch water delivered at its points of re-diversion was used between the Kerr and Wallace ranches together with their apportionment of Cedar Creek water.

The flow of Cedar Creek was sufficient to supply the 1st priority rights 100 per cent of allotments up to May 9. For the remainder of May the flow averaged 58 per cent of 1st priority allotments, 24 per cent for June, 8 per cent for July and 6 per cent during

August and September. The flow available to the 2nd priority rights averaged about 47 per cent of allotments for April, with no water available after April 30. The 3rd priority rights received some water during the first week in April, due to curtailed use on the McCulley Ranch, but none was available thereafter.

Deep Creek

Sufficient water from the North and South Forks of Deep Creek was available for all users including the 4th and 5th priorities during the first six days of April. Thereafter the flow diminished so that no water was available for the 2nd and 3rd priority rights after April 10. The 1st priority rights averaged 100 per cent of allotments up to April 12, 90 per cent throughout the remainder of April, 26 per cent for May, 11 per cent for June and 5 per cent for July. During June and July the flow in both North and South Forks of Deep Creek was sufficient only for garden and stock water.

The combined flow of the North and South Forks of Deep Creek has been tabulated in Table 7.

Owl Creek

The Cummings and Caldwell Ranches did not use their respective allotments of water from Owl Creek during the first part of April, the Allen-Arreche Ditch was opened on April 8 and closed for the season on April 17, during which period it was used only intermittently as the creek fluctuated.

During the latter part of April and for the months of May and June the flow of Owl Creek was apportioned to the respective priority users for irrigation purposes. By July 1st sufficient water was avail-

able only for the 1st priority rights.

All ditches on Owl Creek were used during the season except the Cook Ditch.

The record of daily discharge of Owl Creek below the Allen-Arreche Ditch has been tabulated in Table 8.

Rader Creek

The flow of Rader Creek was sufficient to supply the irrigation demands from April 1 to May 20. On May 20 the McCulley-Hudspeth Ditch was opened with one-seventh of the total flow of Rader Creek or 1.60 cubic feet per second being diverted. On July 10 the McCulley-Hudspeth Ditch was closed for the season.

On July 18, the main creek below the division was closed off for the season and Power's water was delivered by the way of the Powers-Miura Ditch.

Garden and stock water was available throughout the season for Woodruff, Minto, Powers and Miura Ranches.

The daily discharge of Rader Creek ~~at~~ above the ~~four~~ Parshall Flume division ~~section~~ structure has been tabulated in Table 9, the daily discharge above all diversions has been tabulated in Table 9A.

Eagle Creek

Due to the poor run-off of Eagle Creek, rotation of the irrigation water was practiced during the 1939 season. The rotation was commenced on May 5, with the consent of all the water users. The available water was split equally between the Upper Pabst (Scott), Murphy and Nolan Ranches and the Meyers, Lower Pabst and Harris Ranches and was allocated to the users in each group by days in accordance with their respective water rights. The schedule followed for the upper

group was C. Nolan - 2 days, Murphy - 2 days, Upper Pabst (Scott) - 4 days, and for the Lower group, Meyers - 2 days, Lower Pabst - 3 days and Harris - 1 day. Considerable water was picked up in Eyster slough from Eagle and Emerson Creeks for use on the Harris Ranch. The rotation schedule proved satisfactory in that nearly normal crops were produced on the several ranches.

On June 24 the rotation schedule was discontinued, Eagle Creek having diminished in flow with approximately only 1st and 2nd priority water available.

The daily discharge of Eagle Creek one-half mile below the mouth of the canyon has been tabulated in Table 10. The daily discharge above all diversions has been tabulated in Table 10A.

Emerson Creek

The 1st priority rights received 100 per cent of allotments throughout April, May and June and averaged 65 per cent for July, 60 per cent for August and 55 per cent for September. The flow was sufficient to supply the 2nd priority rights an average of 94 per cent of allotments for April, 64 per cent for May and 20 per cent for June. There was no water available for the 2nd priority right after June 29. During the months of May and June, Mr. Coontz, renter on the Hill Ranch, interfered with the lateral (Hill Tap) off of the Eyster Ditch. This interference caused considerable difficulty in delivery of water to Mr. Cook, who owns 25 per cent of the 1st priority water and all the 2nd priority water in the Eyster Ditch. The Hill Tap allotment is 25 per cent of the 1st priority water in the Eyster Ditch.

A six inch Parshall Flume was installed in the Hill Tap off the Eyster Ditch and the regulation was taken over by the water master.

No water was delivered to the owners of the 3rd and 4th priorities during the season of 1939.

The Brown and Warren Ranches rotated their combined allotments during the season, this was handled by the respective parties.

The daily discharge of Emerson Creek above all diversions has been tabulated in Table 11.

VIOLATION OF DECREES OR CONTROVERSIES

The water right owners cooperated fully with the water master during the entire season of 1939, there were no controversies over the regulation of diversions from the various streams. Some difficulty arose between Mr. Coontz and Mr. Cook over the diversion of the water in the Eyster Ditch from Emerson Creek, but was overcome by the water master taking charge of the diversion.

RECOMMENDATIONS

A desirable improvement in the handling of the distribution of water in the district could be made if more adequate headgates and measuring devices were installed. It is recommended that new structures should be installed and some of the old structures be removed and replaced with new ones. This work should be done when time and material are available.

TABLE 1

PRECIPITATION AT CEDARVILLE, CALIFORNIA, 1894-1939. ELEVATION 4,675 FEET
Monthly, Seasonal and Average Amounts in Inches

Season	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Seasonal
1930-1931	1.64	.59	1.22	.18	.67	.66	1.68	.58	.25	2.25	.00	.00	9.72
1931-1932	.33	3.20	.96	1.85	2.23	.70	1.97	1.87	.53	.22	T	T	13.86
1932-1933	T	.15	.78	1.20	1.31	.81	.63	.86	1.06	.26	.25	T	7.29
1933-1934	.42	1.23	T	.87	1.37	1.44	.98	.19	.94	1.14	.00	.13	8.71
1934-1935	.52	.61	2.01	.85	1.32	.73	1.67	2.94	.32	.00	T	.00	10.97
1935-1936	.13	1.08	.42	1.48	5.60	2.31	1.38	.16	.64	.41	.16	.10	13.87
1936-1937	.59	T	.03	.57	1.93	2.17	1.57	1.18	.42	.72	.30	.00	9.48
1937-1938	.09	1.44	3.15	5.51	1.07	2.34	3.98	1.60	1.24	.45	.30	T	21.17
1938-1939	.50	1.36	1.37	.58	1.77	1.19	1.14	.35	.46	.53	1.03	.03	10.31
Mean 1894-1939	.54	1.03	1.50	1.48	1.74	1.51	1.47	.91	.92	.67	.21	.16	12.14
1938-1939 in Per Cent of Total Mean	4.1	11.2	11.3	4.8	14.6	9.8	9.4	2.9	3.8	4.4	8.5	0.2	85.0

NOTE: See Soldier Creek reports for record prior to 1930-31.

TABLE 2

DIVISION OF WATER RESOURCES

SNOW SURVEY - UPPER PIT RIVER

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Eagle Peak Course - Elev. 7500 ft. Date of Survey	4/3	4/1	3/30	3/30	4/2	4/10	4/9	3/29	3/31	3/30	4/40
Depth of Snow - Inches	24.3	13.3	43.8	38.1	9.9	66.1	52.0	47.3	71.3	27.2	38.4
Water Content - Inches	11.0	5.2	18.7	14.3	3.3	22.6	22.0	17.5	23.6	10.4	15.6
Density - Per cent	45.3	39.1	42.6	37.5	33.3	34.2	42.3	37.1	33.1	38.2	40.6
Deduced Normal Water Content								20.0	20.0	20.0	20.0
% of Deduced Normal	55.0	27.0	94.0	71.5	16.5	113.0	110.0	87.5	118.0	52.0	78.0
Record Average - In.								14.32	15.35	14.8	14.9
% of Record Average	78.0	36.3	131.0	100.0	23.0	158.0	154.0	122.0	153.7	70.5	104.7
Cedar Pass Course - Elev. 7200 ft. Date of Survey	3/31	3/31	3/26	3/28	3/31	3/27	4/5	4/10	3/26	3/28	3/22
Depth of Snow - In.	29.3	22.1	49.2	43.9	2.2	56.4	68.2	54.2	79.1	28.2	35.9
Water Content - In.	13.0	8.0	19.8	16.3	0.9	21.1	26.2	21.6	25.2	10.5	14.6
Density - Per cent	44.4	37.6	40.3	37.1	40.8	37.4	38.4	40.0	31.8	37.2	40.7
Deduced Normal Water Content								22.2	22.2	22.2	22.2
% of Deduced Normal	58.7	36.1	88.4	73.4	4.1	98.2	118.0	97.4	114.0	47.4	65.8
Record Average - In.								15.9	16.9	16.3	16.1
% of Record Average	82.0	50.4	118.0	102.5	5.7	133.0	165.0	136.0	149.1	64.4	90.7
Adin Mountain Course Elev. 6500 ft. Date of Survey	3/27	3/27	3/24	3/27	4/1	4/17	3/26	4/7	4/8	3/31	4/7
Depth of Snow - In.	13.3	6.1	30.0	37.6	0	45.9	47.2	37.4	61.4	17.5	10.8
Water Content - In.	6.1	2.9	13.3	14.1	0	18.8	20.0	16.7	28.1	8.1	4.3
Density - Per cent	45.6	47.3	44.3	37.5	0	40.9	42.3	44.8	45.8	46.2	39.8
Deduced Normal Water Content								16.1	16.1	16.1	16.1
% of Deduced Normal	37.9	18.0	82.5	87.6	0	116.6	124.3	104.0	174.	50.2	26.7
Record Average - In.								11.5	13.3	12.8	12.0
% of Record Average	53.0	25.2	115.6	122.5	0	163.7	174.0	145.2	211.3	63.3	35.8

TABLE 3

Daily Discharge in Cubic Feet Per Second
MILL CREEK ABOVE DIVERSIONS
March 22 to September 21, 1939

Day	March	April	May	June	July	Aug.	Sept.
1		23.2	18.6	12.0	2.80	1.10	.85
2		25.0	18.4	11.5	2.50	1.10	.85
3		27.8	18.1	10.5	2.80	1.00	.85
4		31.0	17.9	9.00	4.30	1.10	.85
5		27.0	17.6	7.00	4.30	1.10	.85
6		24.9	17.4	6.70	4.20	1.00	.85
7		25.8	17.1	6.70	3.90	1.00	.85
8		30.4	16.9	6.70	3.60	1.00	.85
9		27.0	16.6	6.70	3.20	1.00	.80
10		20.6	16.3	6.10	3.00	1.00	.80
11		19.3	16.1	5.70	2.50	1.00	.85
12		18.8	15.8	5.70	2.20	.90	1.10
13		16.7	15.6	5.20	2.00	.90	1.10
14		14.8	15.6	5.00	1.80	.90	1.00
15		14.4	15.4	5.20	1.70	.90	1.00
16		14.4	15.4	6.30	1.70	.90	.90
17		14.8	15.4	6.00	1.60	.90	.90
18		17.0	14.9	6.00	1.60	.90	.85
19		20.0	14.6	6.00	1.70	.90	.85
20		20.0	14.4	5.20	1.70	.90	.85
21		18.8	14.4	4.40	1.60	.90	.85
22	22.0	17.6	14.2	4.20	1.60	.90	
23	22.0	17.0	14.2	4.00	1.60	1.00	
24	22.0	16.7	14.0	3.90	1.50	1.10	
25	22.6	15.7	13.8	3.80	1.30	1.10	
26	25.8	16.2	13.5	3.80	1.10	1.00	
27	19.3	17.0	13.3	3.80	1.10	.90	
28	16.2	17.6	13.0	3.60	1.20	.85	
29	15.2	17.6	12.8	3.20	1.30	.85	
30	17.0	17.6	12.4	2.80	1.20	.85	
31	20.0	-	12.4	-	1.10	.85	
Total	202.1	604.7	476.1	176.7	67.7	29.8	18.7
Mean	* 20.2	20.2	15.4	5.89	2.18	.96	xx .89
Run-off in Acre-feet	400	1200	945	350	135	59 *	37

Total run-off Period of record, --184 days. Total run-off -- 3130 acre-feet.
* 10 days
xx 21 days

TABLE 4

Daily Discharge in Cubic Feet per Second
SOLDIER CREEK ABOVE DIVERSIONS
March 27 to September 21, 1939

Day	March	April	May	June	July	Aug.	Sept.
1		20.0	11.6	3.60	1.90	.95	.70
2		25.4	10.4	3.60	1.80	.95	.70
3		30.4	9.40	3.60	1.90	.90	.75
4		27.0	8.80	3.60	2.40	.90	.75
5		25.8	7.90	3.60	2.70	.90	.80
6		20.0	7.20	3.60	2.60	.90	.80
7		21.2	7.20	3.40	2.60	.90	.80
8		27.0	6.90	3.40	2.30	.90	.85
9		20.0	6.80	3.40	2.00	.90	.85
10		18.0	6.80	3.20	1.80	.90	.90
11		18.6	6.70	3.00	1.60	.90	.90
12		16.0	6.80	2.80	1.50	.90	.90
13		14.0	6.70	2.60	1.40	.90	.90
14		16.0	6.70	2.60	1.30	.90	.90
15		14.0	5.80	2.60	1.30	.90	.90
16		18.0	5.80	3.80	1.30	.90	.90
17		18.0	5.20	5.00	1.20	.90	.85
18		20.0	5.20	5.20	1.10	.90	.85
19		20.4	5.40	3.80	1.10	.95	.85
20		20.4	5.40	3.10	1.10	.95	.80
21		20.4	7.20	2.90	1.00	.95	.80
22	14.2	19.2	6.80	2.80	.95	.90	
23	14.2	18.5	6.70	2.60	.95	.85	
24	14.2	18.0	5.00	2.60	.95	.85	
25	14.2	15.0	4.20	2.60	.95	.80	
26	15.2	15.0	4.20	2.30	.90	.80	
27	14.2	13.6	4.00	2.20	.95	.80	
28	15.4	15.0	3.80	2.00	.95	.75	
29	12.0	15.4	3.80	1.90	.95	.75	
30	14.2	14.0	3.60	1.90	.95	.70	
31	14.2		3.60		.95	.70	
Total	140.0	574.3	195.6	93.3	45.35	27.05	17.45
Mean	* 10.0	19.1	6.31	3.11	14.6	.90	xx .83
Run-off in Acre-Feet	278.	1140.	388.	185.	90.	54.	35.

Period of record - 1840 days. Total run-off - 2170 acre-feet.

* 10 days
xx 21 days

TABLE 5

Daily Discharge in Cubic Feet per Second
Pine Creek Above Diversions
March 29 to May 19, 1939

Day	March	April	May
1		14.0	3.00
2		14.0	2.75
3		13.5	2.50
4		13.5	2.50
5		13.0	2.00
6		12.5	2.00
7		11.0	1.60
8		10.5	1.50
9		9.50	1.50
10		7.50	1.20
11		7.50	1.00
12		7.00	1.00
13		6.50	1.00
14		6.00	.90
15		5.85	.80
16		5.85	.70
17		5.70	.50
18		5.60	.50
19		5.40	.40
20		5.20	
21		5.00	
22		5.00	
23		4.70	
24		4.60	
25		4.50	
26		4.50	
27		4.00	
28		3.80	
29	8.00	3.60	
30	8.50	3.50	
31	9.00		
Total	25.5	222.8	27.35
Mean	* 8.50	7.19	** 1.44
Run-off in Acre-feet	50.6	442.	54.

Period of record - 52 days.
Total run-off - 545 acre-feet.

* 3 days
** 19 days

TABLE 6

Daily Discharge in Cubic Feet per Second
CEDAR CREEK ABOVE DIVERSIONS
April 3 to June 13, 1939

Day	April	May	June
1		7.60	1.90
2		6.80	1.90
3	21.8	6.60	1.80
4	20.0	6.20	1.80
5	18.6	6.20	1.80
6	17.4	5.60	1.70
7	16.6	5.40	1.70
8	15.0	5.10	1.70
9	14.2	4.60	1.60
10	13.0	4.60	1.60
11	12.6	4.40	1.50
12	12.2	4.10	1.40
13	11.8	3.70	1.20
14	11.4	3.50	
15	11.4	3.50	
16	10.0	3.00	
17	8.60	2.90	
18	10.0	2.40	
19	13.2	2.60	
20	13.2	2.60	
21	11.8	3.20	
22	10.6	3.20	
23	10.0	3.00	
24	12.2	2.80	
25	11.4	2.60	
26	9.40	2.40	
27	8.20	2.20	
28	8.00	2.00	
29	8.60	2.00	
30	8.00	2.00	
31		2.00	
Total	349.2	118.8	21.6
Mean	* 12.5	3.83	** 1.66
Run-off in Acre-feet	690.	235.	43.

Period of record - 72 days.
Total run-off - 970 acre-feet.

* 28 days
** 13 days

TABLE 7

Daily Discharge in Cubic Feet per Second
NORTH AND SOUTH DEEP CREEKS ABOVE
DIVERSIONS
April 3 to July 22, 1939

Day	April	May	June	July
1		8.70	1.90	.80
2		8.70	1.80	.80
3	38.0	8.20	1.80	.80
4	35.4	7.70	1.80	1.10
5	32.3	7.30	1.70	1.10
6	30.0	6.70	1.70	1.10
7	27.2	6.00	1.70	1.00
8	24.8	5.40	1.70	.90
9	21.9	5.00	1.60	.90
10	19.2	4.80	1.60	.80
11	16.6	4.60	1.50	.80
12	15.9	4.30	1.40	.60
13	14.9	4.10	1.30	.60
14	14.9	4.10	1.40	.50
15	14.0	4.20	2.20	.50
16	13.7	4.30	2.20	.50
17	14.0	4.30	2.20	.50
18	15.1	4.20	2.20	.50
19	15.1	4.20	2.30	.50
20	15.3	4.00	2.20	.50
21	15.1	4.20	1.40	.50
22	15.1	4.30	1.20	.50
23	16.0	4.20	1.10	
24	16.7	4.00	1.10	
25	14.7	3.70	1.00	
26	13.5	3.50	1.00	
27	12.3	3.30	1.00	
28	11.5	2.90	.90	
29	10.7	2.50	.90	
30	9.30	2.00	.80	
31		2.00		
Total	513.2	147.4	46.6	15.8
Mean	* 18.3	4.76	1.56	** .72
Run-off in: Acre-feet	1020.	292.	92.	31.

Period of record - 111 days.
Total run-off - 1440 acre-feet.

* 28 days
** 22 days

TABLE 8

Daily Discharge in Cubic Feet per Second
OWL CREEK BELOW ALLEN-ARRECHE DITCH
April 7 to September 21, 1959

Day	April	May	June	July	August	September
1		23.0	17.4	6.50	2.40	1.80
2		23.0	16.8	6.40	2.40	1.80
3		23.6	15.9	6.40	2.40	1.80
4		23.0	16.6	6.20	2.40	1.80
5		23.6	13.1	8.80	2.40	1.80
6		24.3	12.3	6.20	2.40	1.80
7	20.7	24.3	12.3	5.40	2.40	1.80
8	23.0	25.6	12.3	5.20	2.40	1.80
9	20.7	27.0	12.3	4.50	2.40	1.80
10	17.4	27.0	12.3	4.20	2.10	1.80
11	16.8	25.6	12.3	4.00	2.10	1.80
12	17.8	19.0	12.3	4.00	2.10	1.80
13	15.0	18.4	12.0	4.00	2.10	1.80
14	13.2	19.5	12.8	3.50	2.10	1.80
15	13.2	22.4	13.1	3.30	2.10	1.70
16	14.0	21.7	14.6	3.30	2.10	1.70
17	16.8	20.7	13.1	3.20	2.10	1.70
18	19.5	19.0	12.8	3.00	2.10	1.70
19	22.4	19.0	11.6	3.00	2.10	1.70
20	22.0	16.8	10.5	3.00	2.10	1.70
21	21.0	16.8	9.80	2.70	2.10	1.70
22	20.0	16.4	9.20	2.70	2.00	
23	18.4	15.4	8.80	2.70	2.00	
24	19.0	15.0	8.40	2.70	2.00	
25	17.8	14.4	8.30	2.70	2.00	
26	17.4	14.4	8.40	2.70	2.00	
27	18.4	15.9	7.60	2.70	2.00	
28	23.0	17.8	6.80	2.20	2.00	
29	23.0	21.1	6.60	2.20	2.00	
30	22.4	21.7	6.50	2.20	2.00	
31		19.0		2.40	2.00	
Total	452.9	634.4	346.8	122.0	66.8	37.1
Mean	* 18.9	20.5	11.6	3.94	2.15	** 1.77
Run-off in Acre-feet	900.	1260.	688.	242.	133.	74.

Period of record -- 168 days.
Total run-off - 3300 acre-feet.

* 24 days
** 21 days

TABLE 9

Daily Discharge in Cubic Feet per Second
RADER CREEK ABOVE PARSHALL FLUME DIVISION
April 1 to September 21, 1939

Day	April	May	June	July	August	September
1	10.0	12.0	10.1	2.80	.80	.50
2	10.0	11.7	9.60	2.60	.80	.50
3	11.8	11.7	9.00	2.50	.70	.50
4	11.8	11.7	8.90	2.30	.70	.50
5	10.6	12.0	8.50	2.10	.70	.50
6	10.6	11.7	8.90	2.00	.70	.50
7	11.3	11.7	8.90	1.80	.70	.50
8	11.3	11.7	8.50	1.80	.70	.50
9	11.0	12.0	8.50	1.80	.70	.50
10	11.0	12.3	8.30	1.80	.60	.50
11	10.8	11.7	8.10	1.80	.60	.50
12	10.5	11.3	8.00	1.70	.60	.50
13	10.0	11.8	7.70	1.70	.60	.50
14	9.40	10.6	8.00	1.70	.60	.50
15	9.00	11.1	8.00	1.60	.60	.50
16	9.00	11.3	7.70	1.60	.60	.50
17	9.00	11.3	7.70	1.50	.60	.50
18	10.0	11.3	7.50	1.50	.60	.50
19	11.8	11.3	6.40	1.40	.50	.50
20	11.5	10.2	4.60	1.40	.50	.50
21	11.3	9.40	4.00	1.30	.50	.50
22	11.1	9.00	3.80	1.30	.50	
23	11.1	8.50	3.50	1.20	.50	
24	10.6	8.30	3.50	1.10	.50	
25	10.0	8.10	3.50	1.10	.50	
26	10.0	7.70	3.50	1.00	.50	
27	10.2	7.70	3.50	1.00	.50	
28	11.3	8.00	3.00	.90	.50	
29	12.0	8.90	3.00	.90	.50	
30	12.0	10.0	3.00	.80	.50	
31		11.8		.80	.50	
Total	319.8	327.8	197.2	48.8	18.4	10.5
Mean	10.7	10.6	6.57	1.57	.59	* .50
Run-off in Acre-feet	635.	650.	390.	96.8	36.5	20.8

Period of record - 174 days.
Total run-off - 1830 acre-feet.

* 21 days

TABLE 9A

Daily Discharge in Cubic Feet per Second
RADER CREEK ABOVE DIVERSIONS
April 1 to September 21, 1949

Day	April	May	June	July	August	September
1	10.5	12.5	11.8	3.00	1.00	.70
2	10.5	12.1	11.3	2.80	1.00	.70
3	12.3	12.1	10.7	2.70	.90	.70
4	12.3	12.1	10.6	2.50	.90	.70
5	11.1	12.4	10.1	2.30	.90	.70
6	11.1	12.1	10.6	2.20	.90	.70
7	11.8	12.1	10.6	2.00	.90	.70
8	11.8	12.1	10.1	2.00	.90	.70
9	11.5	12.4	10.1	2.00	.90	.70
10	11.5	12.7	9.90	2.00	.80	.70
11	11.3	12.1	9.60	2.00	.80	.70
12	10.8	11.7	9.50	1.90	.80	.70
13	10.5	12.2	9.20	1.90	.80	.70
14	9.90	11.0	9.50	1.90	.80	.70
15	9.50	11.5	9.50	1.80	.80	.70
16	9.50	11.7	9.20	1.80	.80	.70
17	9.50	11.7	9.20	1.70	.80	.70
18	10.5	11.7	9.00	1.70	.80	.70
19	12.3	11.7	7.70	1.60	.70	.70
20	12.0	12.0	5.60	1.60	.70	.70
21	11.8	11.1	5.00	1.50	.70	.70
22	11.6	10.7	4.20	1.50	.70	
23	11.6	10.1	3.90	1.40	.70	
24	11.1	9.90	3.90	1.30	.70	
25	10.5	9.60	3.90	1.30	.70	
26	10.5	9.20	3.90	1.20	.70	
27	10.7	9.20	3.90	1.20	.70	
28	11.8	9.50	3.20	1.10	.70	
29	12.5	10.6	3.20	1.10	.70	
30	12.5	11.8	3.20	1.00	.70	
31		13.9		1.00	.70	
Total	334.8	355.5	232.1	55.0	24.6	14.7
Mean	11.2	11.5	7.74	1.78	.79	* .70
Run-off in Acre-feet	665.	705.	460.	110.	49.	29.

Period of record - 174 days.
Total run-off - 2020 acre-feet.

* 21 days

TABLE 10

Daily Discharge in Cubic Feet per Second
EAGLE CREEK ONE-HALF MILE BELOW MOUTH OF CANYON
April 4 to September 21, 1939

Day	April	May	June	July	August	September
1		26.0	20.0	5.80	3.50	2.00
2		27.0	17.6	5.80	2.90	2.00
3		27.0	17.6	5.20	2.80	1.90
4	13.0	28.2	16.8	6.30	2.80	1.90
5	13.0	26.0	14.2	6.00	2.80	1.80
6	12.2	21.0	12.2	5.80	2.80	1.80
7	14.2	22.6	11.6	4.90	2.80	1.80
8	16.0	26.2	12.2	4.70	2.70	1.80
9	13.6	30.0	13.4	4.00	2.70	1.80
10	13.6	26.2	13.4	4.00	2.70	1.80
11	13.6	17.6	13.4	4.00	2.50	2.00
12	13.0	16.8	14.2	4.00	2.20	2.30
13	10.5	16.8	13.4	4.00	2.20	2.00
14	8.90	18.6	13.4	4.00	2.20	2.00
15	8.90	26.0	12.8	3.80	2.20	1.80
16	8.90	26.2	11.0	3.50	2.10	1.80
17	10.5	24.0	11.0	3.30	2.10	1.80
18	12.2	20.0	11.0	3.10	2.10	1.80
19	16.0	18.6	11.0	3.10	2.10	1.80
20	17.5	15.0	10.0	3.10	2.10	1.80
21	20.0	14.2	9.30	3.10	2.10	1.80
22	21.0	12.8	8.60	3.10	2.10	
23	19.8	11.0	8.60	2.90	2.70	
24	18.6	10.0	8.20	2.90	2.30	
25	15.0	10.5	8.20	2.90	2.20	
26	13.0	11.6	7.80	2.90	2.10	
27	13.6	16.0	6.60	2.90	2.10	
28	18.6	21.0	6.30	3.10	2.10	
29	24.2	27.0	6.00	3.80	2.10	
30	24.2	30.0	6.00	3.80	2.10	
31		24.0		4.00	2.00	
Total	403.6	647.9	345.8	123.8	74.2	39.5
Mean	* 14.9	20.9	11.5	4.00	2.39	** 1.88
Run-off in Acre-feet	800.	1285.	685.	245.	147.	78.

Period of record - 171 days.
Total run-off - 3240 acre-feet;

* 27 days
** 21 days

TABLE 10A

Daily Discharge in Cubic Feet per Second
EAGLE CREEK ABOVE DIVERSIONS
April 4 to September 21, 1939

Day	April	May	June	July	August	September
1		27.3	21.1	6.40	4.10	2.60
2		28.3	18.7	6.40	3.50	2.60
3		28.3	18.7	5.80	3.40	2.50
4	13.6	29.5	17.8	6.90	3.40	2.50
5	13.6	27.3	15.2	6.60	3.40	2.40
6	12.8	22.3	12.8	6.40	3.40	2.40
7	14.8	23.9	12.2	5.50	3.40	2.40
8	16.6	27.5	12.8	5.30	3.30	2.40
9	14.2	31.3	14.0	4.60	3.30	2.40
10	14.2	27.5	14.0	4.60	3.30	2.40
11	14.2	18.9	14.0	4.60	3.10	2.60
12	13.6	18.1	14.8	4.60	2.80	2.90
13	11.1	18.1	14.0	4.60	2.80	2.60
14	9.50	19.3	14.0	4.60	2.80	2.60
15	9.50	27.3	13.4	4.40	2.80	2.40
16	9.50	27.5	11.6	4.10	2.70	2.40
17	11.1	25.3	11.6	3.90	2.70	2.40
18	12.8	21.3	11.6	3.70	2.70	2.40
19	16.6	19.3	11.6	3.70	2.70	2.40
20	18.1	16.3	10.6	3.70	2.70	2.40
21	20.6	14.8	9.90	3.70	2.70	2.40
22	21.6	13.4	9.20	3.70	2.70	
23	20.4	11.6	9.20	3.50	3.30	
24	19.2	10.6	8.80	3.50	2.90	
25	15.6	11.1	8.80	3.50	2.80	
26	13.6	12.2	8.40	3.50	2.70	
27	14.2	16.6	7.20	3.50	2.70	
28	19.2	22.1	6.90	3.70	2.70	
29	24.8	28.1	6.60	4.40	2.70	
30	24.8	31.1	6.60	4.40	2.70	
31		25.1		4.60	2.60	
Total	419.8	681.3	366.1	142.4	92.8	52.1
Mean	* 15.5	21.9	12.1	4.59	2.99	** 2.48
Run-off in Acre-feet	835.	1350.	725.	280.	185.	105.

Period of record - 171 days.
Total run-off - 3480 acre-feet.

* 27 days
** 21 days

TABLE 11

Daily Discharge in Cubic Feet per Second
EMERSON CREEK ABOVE DIVERSIONS
April 1 to September 21, 1939

Day	April	May	June	July	August	September
1	15.6	15.7	8.50	3.40	2.50	1.60
2	15.0	15.8	8.00	3.50	2.00	1.60
3	16.4	16.0	8.00	3.50	1.90	1.70
4	17.3	13.5	7.50	4.00	1.90	1.70
5	16.4	11.8	7.00	4.50	1.80	1.70
6	16.1	11.8	6.50	4.00	1.80	1.70
7	17.2	12.0	6.00	3.50	1.80	1.60
8	17.8	12.0	6.00	3.00	1.80	1.60
9	15.5	11.8	6.00	2.90	1.80	1.60
10	11.2	11.8	5.40	2.70	1.70	1.50
11	15.0	11.6	5.50	2.70	1.70	1.50
12	13.7	11.6	6.00	2.70	1.70	1.60
13	15.0	11.3	6.00	2.70	1.70	1.70
14	13.7	11.3	6.50	2.70	1.70	1.70
15	13.4	11.2	7.50	2.70	1.70	1.80
16	13.7	11.0	7.00	2.60	1.70	1.80
17	14.0	10.5	6.50	2.50	1.70	1.70
18	14.7	10.5	6.00	2.50	1.70	1.70
19	16.4	10.5	6.00	2.40	1.70	1.70
20	18.4	10.2	5.70	2.40	1.70	1.60
21	18.6	10.0	5.00	2.30	1.70	1.60
22	18.4	9.50	5.00	2.30	1.70	
23	15.8	9.00	4.80	2.20	1.70	
24	15.0	9.00	4.80	2.20	1.60	
25	14.0	8.60	4.60	2.10	1.60	
26	13.7	8.60	4.50	2.10	1.60	
27	13.7	8.60	4.20	2.20	1.60	
28	13.7	8.60	4.00	2.80	1.60	
29	14.0	8.60	3.80	2.80	1.60	
30	15.0	8.60	3.40	3.00	1.60	
31		8.60		2.90	1.60	
Total	458.4	339.6	175.7	87.8	53.9	34.7
Mean	15.3	10.9	5.86	2.83	1.74	* 1.65
Run-off in Acre-feet	910.	675.	350.	175.	105.	69.

Period of record - 174 days.
Total run-off - 2280 acre-feet.

* 21 days