DEPARTMENT OF PUBLIC WORKS

STATE OF CALIFORNIA

REPORTS OF THE

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer

REPORT ON

WATER MASTER SERVICE

ON

BURNEY CREEK

SHASTA COUNTY, CALIFORNIA

1930 SEASON

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By T. Russel Simpson, Senior Hydraulic Engineer

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Sacramento, California
January, 1932

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STATE OF CALIFORNIA

Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

January 23, 1932

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Dear Sir:

Attention: Mr. Gordon Zander,
Supervising Hydraulic Engineer

There is submitted herewith a report covering water master service on Burney Creek, Shasta County, California, during the period from May 1st to September 30, 1930.

The report describes the methods and practices followed in the distribution of the waters of Burney Creek in accordance with the Black vs. Grinnell decree, and presents the results obtained under the distribution.

Respectfully submitted,

T. Russel Simpson

Senior Hydraulic Engineer

ORGANIZATION

Walter E. Garrison	Director of Public Works
Edward Hyatt	State Engineer

Harold Conkling	Deputy State Engineer

Gordon Zander
Supervising Hydraulic Engineer

T. Russel Simpson	Senior Hydraulic Engineer
Robert Startt	Water Master

GENERAL DESCRIPTION OF WORK

Water master service was conducted on Burney Creek during the 1930 season in accordance with the provisions of the decree in the case of Ednah M. Black vs. Martha B. Grinnell, et al.

The Water Commission Act of California, in Section 37, provides that whenever the rights to water on a stream system have been determined, a water master district may be created by the State to facilitate the handling of water master service on the stream. This procedure was followed and an order was entered by the State Engineer on September 11, 1929, creating the Burney Creek Water District (now Burney Creek Water Master District).

After the creation of the Burney Creek Water Master District, a petition signed by the owners of more than fifteen per cent of the conduits within the district was received by the Division of Water Resources requesting appointment of a water master to distribute the water in the district. Acting upon the petition the Division appointed T. R. Simpson and Robert Startt as water masters for the district.

Water master service was commenced in the Burney Creek Water Master District on May 1, 1930, and was terminated for the season on October 1, 1930.

All of the diversions from Burney Creek, except the Braden Ditch, were opened during the 1930 season. The water under the rights of the Red River Lumber Company and of Ednah M. Black was stored in the Black Reservoir until May 20th. The outlet of the Black Reservoir was open during the first eight days of May, and although there was surplus water in Burney Creek during this period at the head of the Braden Ditch, no water was diverted through the Braden Ditch.

Repair work on the highway bridge over the Greer-Cornaz Ditch delayed opening this ditch to full capacity until May 21st.

The water of Richard Haynes was used by Salve Bue from July 24th to July 31st for potato irrigation. Mr. Haynes then used the Bue allotment during the following period.

There was a surplus of water in Burney Creek during the first two weeks in May. The flow of the creek receded from 100 per cent allotment on May 20th to 35 per cent allotment on July 14th. After July 14th for the remainder of the season the flow fluctuated between 35 and 25 per cent allotment.

The minimum flow stage of Burney Creek during 1930 was slightly less than that during 1929.

DISCUSSION OF RESULTS FOR SEASON

The precipitation at Hat Creek for the seasonal year, commencing on October 1, 1929, and terminating on September 30, 1930, has been compared with the precipitation for other years during which investigations and water master service have been conducted on Burney Creek and has been tabulated in Table 1 of this report. The precipitation during 1923 and 1927 was considered nearly normal, whereas the other seven years of record, including 1930, were subnormal.

Table 2 is a tabulation of the daily discharge of Burney Creek above all diversions during the 1930 season. Plate 1 graphically shows the water supply that is tabulated in Table 2. The gross demand on the water supply, including irrigation allotments, minimum flow allotments and channel losses, is also shown on Plate 1.

Table 3 shows the water deliveries on Burney Creek during the 1930 season expressed both in cubic feet per second and in per cent of full allotments. The minimum flow allotments and channel losses on Burney Creek are small.

Table 4 shows crop yields from typical lands irrigated from Burney Creek in 1930. The crop returns for the 1930 season were, for the most part, subnormal. This was partly due to deficient water supply and partly to late spring frosts and frosts in August. Both the first and second cuttings of alfalfa were frosted prior to maturation. The potatoes and gardens were also injured by the frost on August 23, 1930.

A concrete channel control with a removable weir was installed in Burney Creek below the Haynes Power House. The labor and trucking were furnished by the water users. The cost of materials was $35.00.

CONTROVERSIES

Since the construction of the water tight dam in Burney Creek at the head of the Greer-Cornaz Ditch, the wells in the town of Burney have been going dry during the latter part of the summer. This is a source of some friction between the ditch owners, the well owners, and the water master. If sufficient water is passed over the Greer-Cornaz Dam to reach the State Highway through the town of Burney, the water level is maintained in the wells. The wells are quite sensitive of the effect of the flow in the stream, as the water will raise or fall in the wells within 12 hours of corresponding changes in the stream. A flow of about 0.15 cubic foot per second past the Greer-Cornaz Dam will maintain a flow in the creek down to the State Highway.

D. M. Desmond made a claim for the place of measurement of his allotment to be at some point below the State Highway crossing on Burney Creek. The channel loss is considerable below the highway and it appears that the decree contemplated a measurement of his allotment at the head of the Cayton Ditch.

RECOMMENDATIONS

All of the measuring devices in the conduits diverting from Burney Creek are antiquated devices in poor condition. These should be replaced with Parshall Measuring Flumes as fast as the old ones become unserviceable.

FINANCIAL STATEMENT

Under the provisions of Section 37f of the Water Commission Act, all funds collected in a water master district are kept separate and placed in a fund to the credit of that district.

There is submitted on the following page a statement of the funds collected and expenditures during the calendar year 1930 for the Burney Creek Water Master District.

FINANCIAL STATEMENT

BURNEY CREEK WATER DISTRICT FUND

CALENDAR YEAR 1930

RECEIPTS

Contributed by State	$300.00	
Contributed by Taxpayers	300.00	
		$600.00

DISBURSEMENTS

Water Master Compensation	$288.62	
Water Master Travel Expense	125.54	
Cost of Publication of Financial Statement	22.50	
Contingencies	7.05	
		433.71

BALANCE 156.29

TABLE 1

Precipitation Data

Hat Creek, Shasta County - Elevation 3010 Feet

Monthly, Seasonal and Average Amounts of Precipitation in Inches

Season	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Seasonal
1921-22	0.30	0.47	3.82	0.85	6.41	2.13	0.38	1.91	1.40	0	0.60	0	18.27
1922-23	1.58	2.26	4.85	2.36	0.32	0.03	2.04	1.18	3.29	0.17	0.30	1.70	20.08
1923-24	1.16	0.37	1.46	1.30	1.31	1.04	0.73	T	T	0	0.34	0.10	7.81
1924-25	2.28	1.40	1.99	1.01	4.12	1.12	1.37	1.98	1.49	0.09	0.18	1.86	18.89
1925-26	0.53	2.26	0.48	2.57	2.45	0.75	2.39	1.06	0	0.04	0.10	0.01	12.69
1926-27	1.18	4.41	0.88	1.63	4.70	1.77	2.89	2.01	0.63	T	T	0.29	20.39
1927-28	0.87	4.84	0.36	1.33	1.36	4.87	1.05	1.76	0.08	0.14	0.14	0.16	16.96
1928-29	0.50	2.69	2.64	0.92	1.65	1.17	1.85	0.05	1.52	0	0	0.10	13.09
1929-30	0.40	0	3.02	4.36	3.64	1.12	1.61	1.40	0.13	0	0	1.78	17.46
Mean	0.98	2.08	2.17	1.81	2.88	1.56	1.59	1.26	0.95	0.05	0.18	0.67	16.13

TABLE 2.

CONTINUOUS RECORD OF DAILY DISCHARGE IN CUBIC FEET PER SECOND OF BURNEY CREEK ABOVE AIL DIVERSIONS FOR THE PERIOD MAY 1 to SEPTEMBER 30,1930

Day	May	June	July	August	September	
1	80.0	21.0	11.0	7.50	8.50	
2	130	20.0	11.0	7.50	7.50	
3	105	20.0	11.0	7.50	7.50	
4	80.0	19.0	10.5	7.50	7.50	
5	55.0	17.0	10.5	7.50	7.50	
6	55.0	16.0	10.5	7.50	7.50	
7	55.0	16.0	10.5	7.50	7.50	
8	50.0	16.0	10.5	7.50	7.50	
9	45.0	16.0	10.5	7.50	7.50	
10	40.0	15.5	10.5	7.50	10.00	
11	40.0	15.0	10.0	7.50	10.00	
12	38.0	15.0	10.0	7.00	9.00	
13	37.0	15.0	9.50	7.00	9.00	
14	36.0	14.0	9.00	7.00	9.00	
15	36.0	13.0	9.00	7.00	9.00	
16	35.0	13.0	9.00	7.00	9.00	
17	34.0	13.0	9.00	7.00	9.00	
18	31.0	13.0	9.00	7.00	9.00	
19	27.0	13.0	9.00	7.00	9.00	
20	24.0	13.0	9.00	7.00	9.00	
21	27.0	13.0	9.00	7.00	9.00	
22	24.0	13.0	8.80	7.00	8.50	
23	22.0	12.5	8.80	8.50	8.50	
24	21.0	12.5	8.80	8.50	8.50	
25	22.0	12.5	8.80	8.50	8.50	
26	22.0	12.5	8.50	8.50	8.50	
27	22.0	12.5	8.50	8.50	8.50	
28	23.0	12.5	8.00	8.50	8.50	
29	24.0	12.5	8.00	8.50	8.50	
30	23.0	11.5	8.00	8.50	8.50	
31	22.0	---	8.00	8.50	---	
Total Sec. Ft. Days	1380.0	438.5	292.2	236.0	255.0	
Mean Sec. Ft.	44.5	14.6	9.43	7.61	8.50	17.0
Max. Sec. Ft.	130	21.0	11.0	8.50	10.0	130
Min. Sec. Ft.	21.0	11.5	8.00	7.00	7.50	7.00
Total Acre Ft.	2740	870	579	468	506	5160

TABLE 3.

WATER DELIVERIES ON BURNEY CREEK - 1930 SEASON

Irrigation Period	Dates	Average Flow of Burney Creek Above all Diversions Cu. Ft. per Sec.	Average Irrigation Delivery Cubic Feet per Second		Average Irrigation Delivery Per Cent of Allotments	
			West Side Users	East Side Users	West Side Users	East Side Users
1	May 5 to May 15	45.6	25.9	Surplus	100	75
2	May 15 to May 25	28.1	Surplus	25.3	12	100
3	May 25 to June 4	21.8	22.0		85	
4	June 4 to June 14	16.0		15.2		60
5	June 14 to June 24	13.1	12.9		50	
6	June 24 to July 4	12.0		11.4		45
7	July 4 to July 14	10.3	10.3		40	
8	July 14 to July 24	8.96		8.80		35
9	July 24 to Aug. 3	8.16	7.80		30	
10	Aug. 3 to Aug. 13	7.45		6.80		27
11	Aug. 13 to Aug. 23	7.00	6.50		25	
12	Aug. 23 to Sept. 2	8.50		7.60		30
13	Sept. 2 to Sept. 12	8.00	7.30		28	
14	Sept. 12 to Sept. 22	9.00		8.40		33
15	Sept. 22 to Oct. 2	8.50	7.80		30	

May June July August September

25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30

80
70
60
50
40
30
20
10

Cubic Feet per Second

HYDROGRAPH OF BURNEY CREEK SHOWING WATER SUPPLY ABOVE ALL DIVERSIONS 1930

Demand on Water Supply

Deficiency

25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30 5 10 15 20 25 30

PLATE 1