DEPARTMENT OF PUBLIC WORKS

STATE OF CALIFORNIA

PUBLICATIONS OF THE

DIVISION OF WATER RESOURCES

EDWARD HYATT, State Engineer

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PINE CREEK COURT REFERENCE

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REPORT ON WATER MASTER SERVICE ON PINE CREEK IN SURPRISE VALLEY MODOC COUNTY, CALIFORNIA DURING SEASON OF 1934

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By Leslie C. Jopson, Assistant Hydraulic Engineer

Sacramento, California

March 1, 1935

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During the 1934 Irrigation Season

STATE OF CALIFORNIA

Department of Public Works

SACRAMENTO

DIVISION OF WATER RESOURCES
401 PUBLIC WORKS BUILDING

March 1, 1935

EDWARD HYATT, STATE ENGINEER
CHIEF OF DIVISION

Mr. Harold Conkling
Deputy State Engineer
Sacramento, California

Attention: Mr. Gordon Zander,
Supervising Hydraulic Engineer

Dear Sir:

A report covering the investigation and water master service on Pine Creek in Surprise Valley, Modoc County, California, during the 1934 season, is submitted herewith.

This report includes a brief description of the regulation and distribution of the waters of Pine Creek in accordance with the provisions of the agreement entered into by the various parties in the case of Even R. Gaustad, et ux., vs. R. E. McCulley, et al., on March 20, 1934, and a discussion of the results that were accomplished thereby.

Run-off records and other pertinent hydraulic data are included, together with a financial statement showing the cost of the investigation, and the sources from which such cost was met.

Respectfully submitted,

Leslie C. Jopson
Assistant Hydraulic Engineer

ORGANIZATION

Earl Lee Kelly	Director of Public Works
Edward Hyatt	State Engineer
Harold Conkling	Deputy State Engineer

Gordon Zander

Supervising Hydraulic Engineer

T. Russel Simpson	Senior Hydraulic Engineer
Leslie C. Jopson	Assistant Hydraulic Engineer

GENERAL DESCRIPTION OF WORK

The investigation and water master service was commenced on Pine Creek on March 19, 1934. The investigation was carried on as a continuation of the work done in 1932 and in 1933. The water master service was in conformity with an agreement entered into by the water users and the Division of Water Resources whereby the Division was to appoint a water master to regulate the diversions from the stream. The agreement, which was for the 1934 irrigation season only, provided certain schedules of allotments and priorities to govern the distribution of the water. A copy of the agreement has been incorporated herein as an appendix at the end of the report.

Water master service was terminated for the season on June 19, 1934.

Mr. Leslie C. Jopson, Assistant Hydraulic Engineer, was in charge of the investigation and water master service during the season.

All the ranches included in the rotation schedule in the agreement received approximately their proportion of the available water according to the agreement in 1934. The only ranch claiming a water right, better than a flood water right, which did not receive water in 1934 was the George M. Tierney Ranch.

A rotation schedule similar to that set forth in the 1934 agreement was in effect on the Creek when water master service was commenced on March 19, 1934. This schedule was modified to some extent to fit the schedule in the agreement and was continued through the season. The amounts of water set forth in the rotation schedule in the agreement were changed to some extent due to the indefinite water supply.

DISCUSSION OF RESULTS FOR SEASON

Table 1, in the back of this report, gives the rainfall by months during the past ten years at Cedarville, the mean for the period of record from 1894 to 1934, and the precipitation in 1934 in percent of the total mean. The precipitation in 1933-34 was 70.3 per cent of the total mean.

Table 2 is a record of the water supply in Pine Creek above all diversions from March 19, to May 16, 1934.

Table 3 is the estimated net available water supply on the stream during the period of delivery to the general irrigation rights. The Royce Garden Ditch continued to divert the water needed for garden purposes after the termination of use of water on the lower ranches.

Table 4 gives a comparison of the water deliveries on Pine Creek with the allotments as set forth in the aforementioned agreement. During the 32 day period shown, the average delivery of water was 10 per cent of the total allotments.

Table 5 gives the estimated crop yields on various ranches on Pine Creek. Very little of the alfalfa was irrigated in 1934 and most of the meadow was not irrigated more than once. Considering the shortage of water the crops were fair. The Plate at the end of the report shows the water supply available for diversion in 1932 and in 1934 compared with the allotments of water in 1934.

There were no changes made in structures or measuring devices in 1934.

The season of use in 1934 was too short to permit a checking of the channel loss measurements made in previous years, however, the losses appeared to be no greater than heretofore, and in the case of the Cressler Ditch appeared somewhat smaller, as a measurement made thereon on May 10, 1934 indicated a loss of 0.40 cubic foot per second.

There was little comment on the handling of the water in 1934 except from Mr. George Tierney who objected to the priority tentatively given to him in the agreement. He was not allowed to divert any water during the 1934 season but registered a decided objection to this procedure as he claims a better water right than that allowed him in the agreement.

RECOMMENDATIONS

The water supply was too short in 1934 to permit any conclusions to be drawn as to the adequacy of the schedule of priorities and allotments incorporated in the agreement used in 1934. It is consequently recommended that the same schedule, with such minor modifications as may appear desirable, be used for another year.

FINANCIAL STATEMENT

The cost of continuing the investigation and conducting water master service on Pine Creek in 1934 was met partly by contribution by the state, partly by contribution of the water users and partly by money advanced by the Division of Water Resources' Revolving Fund as provided in Chapter 854, Statutes of 1913. The money advanced from the revolving fund was used to cover the deficit in collections. The fund must be reimbursed by the delinquent water users who have made the advance necessary.

The amount assessed against the water users for the investigation and water master service in 1934 was $150.01.

TABLES

TABLE 1

PRECIPITATION

Cedarville, California

Season	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Seasonal
1924-25	0.25	2.06	1.86	1.66	1.08	1.34	0.61	0.65	1.59	0.49	0.29	0.30	12.18
1925-26	1.34	1.57	1.31	1.25	1.06	1.18	.13	1.26	1.07	T	.09	.09	10.35
1926-27	.15	.53	2.73	1.16	1.82	2.02	1.73	.81	.95	.35	T	T	12.25
1927-28	.32	.86	2.87	.86	.92	.75	2.93	.81	T	.55	.00	.00	10.87
1928-29	.40	.15	1.43	.42	2.08	.59	1.20	1.85	.29	1.98	.00	T	10.39
1929-30	.07	.19	.00	3.02	3.39	1.53	.83	.51	.67	T	.02	T	10.23
1930-31	1.64	.59	1.22	.18	.67	.66	1.68	.58	.25	2.25	.00	.00	9.72
1931-32	.33	3.20	.96	1.85	2.23	.70	1.97	1.87	.53	.22	T	T	13.86
1932-33	T	.13	.78	1.20	1.31	.81	.63	.86	1.06	.26	.25	T	7.33
1933-34	.42	1.23	T	.87	1.37	1.44	.98	.19	.94	1.14	.00	.13	8.71
Mean 1894 to 1934	.56	.98	1.59	1.54	1.74	1.52	1.47	.91	1.00	.68	.22	.17	12.38
1933-34 in per cent of total mean	3.4	10.0	0.0	7.0	11.1	11.6	7.9	1.5	7.6	9.2	0.00	1.0	70.3

TABLE 2

CONTINUOUS RECORDS OF DAILY DISCHARGE IN CUBIC FEET PER SECOND OF PINE CREEK AT ROYCE GARDEN FOR THE PERIOD MARCH 19TH TO MAY 16TH, 1934

Day	March	April	May	
1		5.10	1.00	
2		4.50	.80	
3		3.70	.60	
4		3.30	.55	
5		2.90	.35	
6		2.50	.25	
7		2.30	.25	
8		2.10	.25	
9	No	1.90	.20	
10		1.70	.20	
11		1.50	.15	
12		1.40	.15	
13	Record	1.30	.15	
14		1.20	.15	
15		1.10	.10	
16		1.00	.10	
17		.90		
18		.80		
19	2.40	.60	No	
20	2.40	.40		
21	2.40	.35		
22	2.35	.35		
23	2.35	.40	Record	
24	2.20	.40		
25	6.20	.45		
26	3.40	.40		
27	4.60	.40		
28	6.40	.35		
29	9.30	.30		
30	7.60	.40		
31	7.10	--		
Total Sec. Ft. Days	*58.70	44.00	**5.25	59 Day Period
Mean Sec. Feet	4.52	1.47	.33	1.83
Maximum Sec. Feet	9.30	5.10	1.00	19.30
Minimum Sec. Feet	2.20	.30	.10	.10
Total Ac. Ft.	116	87.2	10.4	214

* 13 day period
** 16 day period

Gage heights from Automatic Water Stage Recorder

TABLE 3

ESTIMATED NET WATER SUPPLY AVAILABLE FOR DIVERSION BY USERS BELOW CHANNEL DIVISION FOR THE PERIOD MARCH 19TH TO APRIL 20TH, 1934

Day	March	April	May	
1		2.55		
2		2.45		
3		1.40		
4		1.25		
5		1.00		
6		.75		
7		1.80		
8		1.60		
9		1.00		
10		.80		
11	No	.50		
12		.75		
13	Record	.80		
14		.70		
15		.60		
16		.50		
17		.40		
18		.30		
19	1.00	.10		
20	1.00		No	
21	1.00			
22	.95		Delivery	
23	.95	No		
24	.80			
25	4.70			
26	2.10			
27	3.35	Delivery		
28	3.85			
29	6.25			
30	4.60			
31	4.10			
Total Sec. Feet Days	*34.65	**19.05		32 Day Period
Mean Sec. Feet	2.67	1.00		1.68
Maximum Sec. Feet	6.25	2.55		6.25
Minimum Sec. Feet	.80	.10		.10
Total Acre Feet	68.7	37.8		106.

*13 day period
**19 day period

TABLE 4

WATER ALLOTMENTS ON PINE CREEK COMPARED WITH NET AVAILABLE WATER SUPPLY DURING

1934 SEASON

Period	Water Supply in Acre Feet		Net Water Supply Available in Cubic Feet per second		Per Cent of Allotments Delivered to Diversions	Diversion System Using Water
	At Recorder Station	At Points of Diversion	At Recorder Station	At Points of Diversion		
3/19 to 3/28	65.8	34.1	3.56	1.85	11	*South Branch
3/28 to 4/6	86.1	52.9	4.66	2.86	17	North Branch
4/6 to 4/19	37.3	19.8	1.41	.75	5	*South Branch
Totals & Means	189.2	106.8	2.98	1.68	10	

Total allotments - 16.48 cubic feet per second.

*Cressler Ditch used as a by-pass channel for the South Channel between the head of the ditch and Diversion 4.

TABLE 5

ESTIMATED CROP YIELDS ON TYPICAL LANDS IRRIGATED FROM PINE CREEK 1934

Owner	Crop	Acres	Total Yield		Yield per Acre	
			Sacks	Tons	Sacks	Tons
Bowers, Frank	Alfalfa Hay	5		8		1.6
	Alfalfa Seed	5	1100#		220#	
Gaustad, Even R.	Alfalfa Hay	22.6		56		2.0
	Grain Hay	35.9		33		.9
	Meadow Hay	47.3		33		.7
	Wheat	5.8	51		8.8	
	Pasture	49.7		Poor		
Hill, Harry L. & Alice M.	Alfalfa Hay	45.0		50		1.1
	Meadow Hay	27.6		10		.4
	Wheat	4.0	50		12	
	Pasture	21.3		Poor		
Hill, W. E.	Alfalfa Hay	70.0		45		.6
	Meadow Hay	47.0		8		.2
	Wheat	3.0	30		10	
	Pasture	8.8		Poor		
Hill, Ray	Alfalfa Hay	25.0		18		.7
	Meadow Hay)	35.0	used for pasture - Poor			
	Pasture)			Poor		

APPENDIX

A G R E E M E N T

Re Distribution of Waters of Pine Creek
During the 1934 Irrigating Season

WHEREAS there is a suit entitled, "Even R. Gaustad, et ux., vs. R. E. McCulley, et al.," pending in the Superior Court of California, in and for the County of Modoc, in which the rights to water, from Pine Creek in Surprise Valley in said county and state, of all the parties hereunto subscribed are involved, and

WHEREAS the Division of Water Resources of the Department of Public Works of the State of California as referee for said court has made an investigation and report on the water supply and use of water from said creek, and

WHEREAS it appears from the data collected by said Division that it may be possible to work out an allocation of the waters of said Pine Creek among the parties hereto that will be acceptable to all of said parties and afford the basis for a consent judgment in said proceedings, and

WHEREAS the parties hereto desire that a tentative allocation of the waters of said stream system be administered by the said Division of Water Resources during the 1934 season as a demonstration of what may be accomplished,

NOW THEREFORE IT IS HEREBY STIPULATED AND AGREED by and between each and every party hereunto subscribed and among all of said parties, that said Division of Water Resources may undertake to distribute the waters of said Pine Creek among the various parties hereunto subscribed as hereinafter set forth, it being understood and agreed that the following plan of distribution and apportionment of water shall be for the period from March 22nd to September 30th, in 1934, only, and subject to such provisions as are hereinafter contained, to-wit:

1. If on March 22, 1934, the total flow of Pine Creek measured at the mouth of the canyon of said creek is in excess of 4 cubic feet per second, then the total flow of said creek shall be turned into the North Branch thereof for the use of R. E. McCulley, Even R. Gaustad, and Raymond Hill

upon their respective lands involved in said action, said water to be prorated among said parties in accordance with their respective allotments set after their names as follows:

Name	Allotment Cubic Feet per Second
R. E. McCulley	2.50
Even R. Gaustad	2.50
Raymond Hill	0.60

and the entire flow of said creek shall be kept in said North Branch thereof until, either the cumulative amount of water that has been diverted from said North Branch is equal to 140 acre feet, or the total flow measured at the head of said North Branch has exceeded 12 cubic feet per second: provided however, that the allowance for channel loss between the mouth of the canyon and the points of diversion shall not exceed 6 acre feet per day.

2. When the parties hereinbefore named in paragraph 1 shall have received a cumulative amount of water through the head of the North Branch of Pine Creek equal to 140 acre feet and the flow at the head of said North Branch has not exceeded 12 cubic feet per second, then the entire flow of Pine Creek shall be turned into the South Branch thereof for the use of Harry L. Hill, W. E. Hill and Everett F. Hill, upon their respective lands involved in said action, said water to be prorated among said parties in accordance with their respective allotments set after their names as follows:

Name	Allotment Cubic Feet per Second
Harry L. Hill	1.80
W. E. Hill	2.25
Everett F. Hill	1.55

and the entire flow of said creek shall be kept in said South Branch thereof until, either the cumulative amount of water that has been diverted from said South Branch is equal to 140 acre feet, or the total flow measured at the head of said South Branch has exceeded 12 cubic feet per second; provided however, that the allowance for channel loss between the mouth of the canyon

and the points of diversion shall not exceed 6 acre feet per day.

3. When the total flow of Pine Creek measured at the channel division exceeds 12 cubic feet per second or when the rights described in paragraphs 1 and 2 hereof have received the equivalent of one rotation cycle of 280 acre feet from said North and South Branches as hereinbefore provided, then the entire flow of Pine Creek shall be rotated between the North Branch and the South Branches of Pine Creek for the use of R. E. McCulley, Even R. Gaustad, Raymond Hill, Frank Bowers, J. B. Cloud, Harry L. Hill, W. E. Hill and Everett F. Hill upon their respective lands involved in said action, said water to be prorated among said parties in each branch in accordance with their respective allotments set after their names as follows:

North Branch	
Name	Allotment cubic feet per second
R. E. McCulley	2.50
Even R. Gaustad	2.50
Raymond Hill	.60
Frank Bowers	1.20
J. B. Cloud	.10
South Branch	
Harry L. Hill	1.80
W. E. Hill	2.25
Everett F. Hill	1.65
Raymond Hill	1.20

and the entire flow of said creek shall be kept in one branch thereof until, either the cumulative amount of water that has been diverted from that branch is equal to 170 acre feet, or the total flow measured at the head of said branch exceeds 15 cubic feet per second; provided however that the allowance for channel loss between the mouth of the canyon and the various diversions on either branch shall not exceed 6 acre feet per day.

4. The cycle of rotation of alternate use of the total flow between the North and South Branches hereinbefore provided in paragraphs 1, 2 and 3 shall be carried on throughout the season, except as otherwise hereinafter provided in paragraph 9, but shall be suspended during such times as the total flow of Pine Creek measured at the point of division of said creek between the North and South Branches hereof is equal to or greater than 15 cubic feet per second, said cycle of rotation to be resumed from the position therein which obtained at the time of the last suspension when the total flow again recedes below 15 cubic feet per second.

5. At all times when the total flow of Pine Creek, measured at the division between the North and South Branches thereof, is equal to or greater than 15 cubic feet per second, then 7.50 cubic feet per second shall be diverted into the North Branch and 7.50 cubic feet per second into the South Branch of said creek for proration among the parties hereinbefore named in paragraph 3 in accordance with their respective allotments set forth in said paragraph 3 and the excess flow of said creek over and above 15 cubic feet per second to the extent of 2.50 cubic feet per second shall be diverted into the North Branch of said creek for the use of George M. Tierney upon his lands involved in said action.

6. At all times when the total flow of Pine Creek, measured at the division between the North and South Branches thereof, is in excess of 17.50 cubic feet per second, then said excess flow to the extent of 1.65 cubic feet per second shall be turned into said North Branch for the use of R. E. McCulley upon his lands involved in said action.

7. Charles W. Royce shall at all times be entitled to divert from the natural flow of Pine Creek through the Royce Ditch 0.08 cubic foot per second for domestic purposes and for the irrigation of 0.7 acre of garden situated on his land involved in said action; provided, however, that the water to supply said allotment shall first be taken from the flow of a spring located near the head of said Royce Ditch, and any deficiency, in the flow of said spring below said allotment, may then be made up by diversion from Pine Creek.

8. Any flow in Pine Creek, over and above that necessary to supply all allotments hereinbefore made, shall be divided equally between the North and South Branches of said Pine Creek for the use of J. B. Cloud and Raymond Hill upon their respective lands involved in said action.

9. After the period of melting of the snows on the Warner Range of mountains, near the close of the irrigation season, when the total flow of Pine Creek measured at the point of division between the North and South Branches thereof has receded to 4 cubic feet per second, then the total flow of said creek shall be turned into the North Branch thereof for the use of R. E. McCulley and Even R. Gaustad upon their respective lands involved in said action and the entire flow shall be kept in said North Branch until such time as said flow fails to reach through to their lands, and then all of said flow shall be turned into the Cressler Ditch for the remainder of the season for the use of Everett F. Hill, W. E. Hill and Harry L. Hill upon their respective lands involved in said action.

10. Nothing in this agreement shall be construed to entitle any party to divert, at any time, a quantity of water in excess of that necessary and being put to beneficial use.

11. The said Division of Water Resources shall have power and authority to deviate from the plan of trial distribution hereinbefore provided if in its opinion any changes are necessary or convenient in order to expedite the accomplishment of the purpose of said trial distribution.

12. The points of measurement of all allotments hereinabove provided shall be at the respective points of diversion from Pine Creek and its branch channels.

13. Nothing herein contained shall be construed as an admission by any party that his legal rights or the rights of any other party are as herein provided; and that the distribution of water in accordance with this agreement shall not in any manner prejudice the rights which are now claimed or may hereafter be asserted by any of the parties hereto.

14. Said Division of Water Resources may appoint a water master to distribute the waters of Pine Creek, as hereinabove provided for, during the 1934-season and that said water master shall have power and authority to inspect and regulate the diversions of all the parties hereto in accordance with this agreement, and in the exercise of such authority may enter upon the lands of said parties for the purpose of such inspection and regulation, and may establish and maintain such gaging stations and measuring devices and require such diversion works, headgates, and measuring devices in said stream and diversion ditches as may be necessary or convenient. The several ditch owners shall furnish the necessary labor and material for the construction and installation of said diversion works, headgates, and measuring devices for their respective ditches.

15. In order to meet the costs of such distribution by the water master during the 1934 season, the parties hereto agree to pay to the Division of Water Resources on or before April 1, 1934, their respective assessments as set forth in Schedule 1, hereunto annexed and made a part hereof.

IN WITNESS WHEREOF the parties hereto have affixed their hands and seals this 20th day of March, 1934.

Even Gaustad

Harry L. Hill

W. E. Hill

C. W. Royce

Ray Hill

Everett F. Hill

Frank Bowers

R. E. McCulley

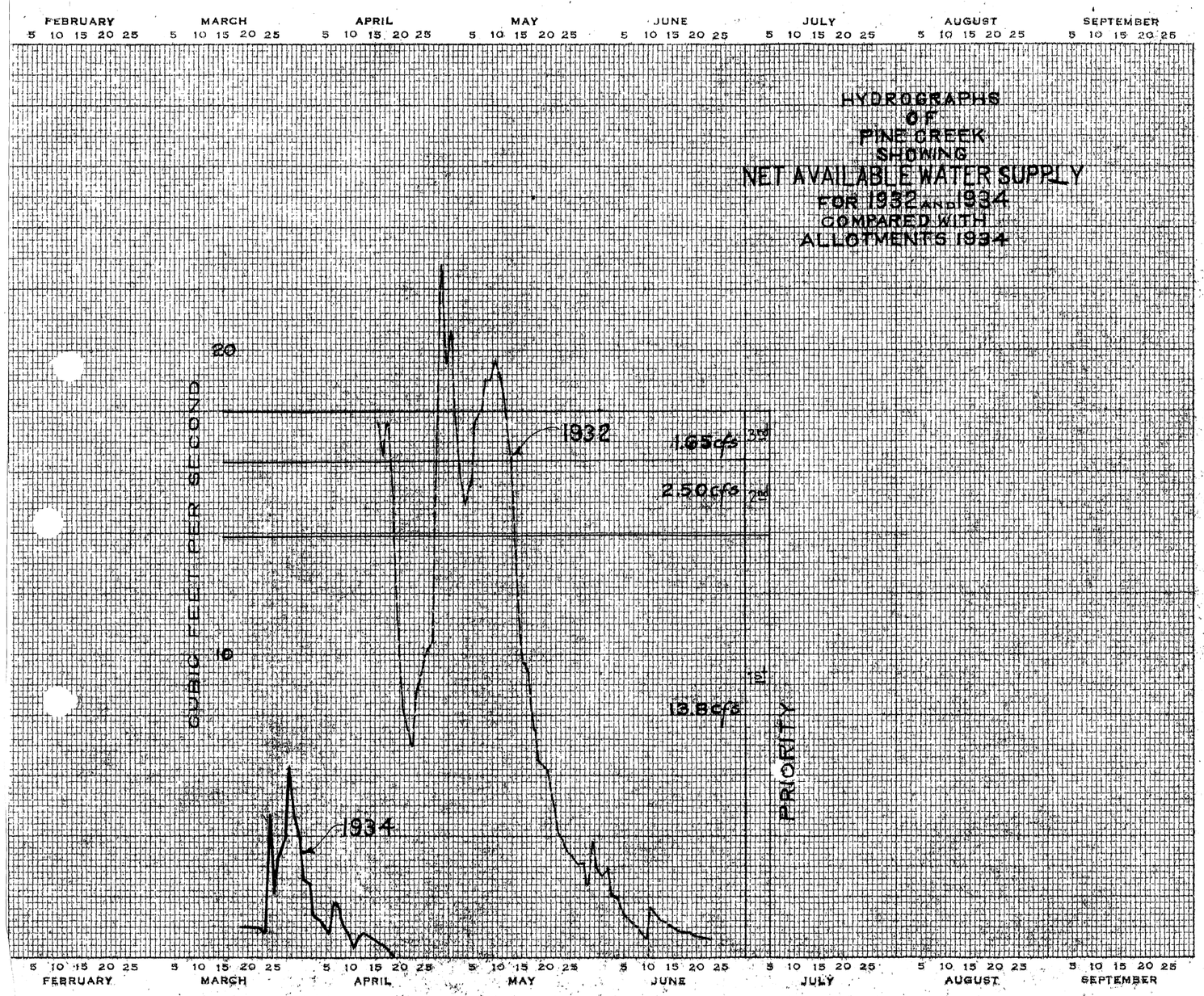
SCHEDULE 1

APPORTIONMENT OF COST OF WATER MASTER SERVICE

TO WATER USERS FROM PINE CREEK DURING 1934 SEASON

Name of Owner	Allotment cubic feet per second	Totals of apportionment
Frank Bowers	1.20	11.33
J. B. Cloud	.20	3.14
Even R. Gaustad	2.50	21.98
Everett F. Hill	1.65	15.02
Harry L. Hill	1.80	16.25
Raymond Hill	1.80	16.25
W. E. Hill	2.25	19.93
Robert E. McCulley	2.50	21.98
Chas. W. Royce	.08	2.15
Geo. M. Tierney	2.50	21.98
Totals	16.48	150.01

PLATES


HYDROGRAPHS
OF
PINE CREEK
SHOWING
NET AVAILABLE WATER SUPPLY
FOR 1932 AND 1934
COMPARED WITH
ALLOTMENTS 1934
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
5 10 15 20 25
CUBIC FEET PER SECOND
20
10
1932
1934
1.65cfs 3rd
2.50cfs 2nd
13.8cfs 1st
PRIORITY