STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS

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

REPORT ON

WATER MASTER SERVICE

ON

NORTH FORK OF PIT RIVER AND ITS TRIBUTARIES

EXCEPT FRANKLIN CREEK

MODOC COUNTY, CALIFORNIA

1939 SEASON

BY

H. K. von Bergen
Assistant Hydraulic Engineer

Sacramento, California
January 1940

TABLE OF CONTENTS

	Page
INTRODUCTION -	1
DISCUSSION OF RESULTS	
Precipitation during 1939 - - - - - - - - - - - - - - - -	1
Water Supply during 1939 - - - - - - - - - - - - - - - -	2
TABLES	
1. Division of Water Resources Snow Survey - Upper Pit River - - - - - - - - - -	5
2. Division of Water Resources Precipitation - Upper Pit River - - - - - - - - -	6
3. Mean Daily Discharge North Fork Pit River below Rattandorff's Ranch, April 1 to Sept. 30, 1939	7
4. Mean Daily Discharge Parker Creek near Mouth April 1 to Sept. 30, 1939 - - - - - - - - - - - -	8
5. Mean Daily Discharge North Fork Pit River below Mouth of Thoms Creek, April 1 to Sept. 30, 1939	9
6. Combined Discharge North Fork Pit below Thoms Creeks and Parker Creek at Mouth, April 1 to July 30, 1939 - - - - - - - - - - - - - - - - - -	10
7. Mean Daily Discharge Parker Creek at Fogarty's Ranch, April 9 to Sept. 30, 1939 - - - - - - - -	11
8. Mean Daily Discharge Thoms Creek at Highway Crossing, April 1 to July 30, 1939 - - - - - - -	12
9. Mean Daily Discharge Joseph Creek below Couch Creek, April 1 to August 31, 1939 - - - - - - - -	13
10. Mean Daily Discharge Linville Creek below Power House, April 1 to August 31, 1939 - - - - - - - -	14
11. Water Crop of North Fork Pit and Pine Creek Compared to Water Content on Cedar Peak and Eagle Peak, April 1 - - - - - - - - - - - - - - - - - -	15
PLATES	
1. Hydrograph Combined Flow Parker Creek at Mouth and North Fork Pit below Thoms Creek - - - - - -	16
2. Hydrograph of Parker Creek at Fogarty Ranch - -	17

3. Hydrograph of Thoms Creek at Highway Crossing - - 18

4. Hydrograph of Joseph Creek below Wilson Ranch - - 19

5. Hydrograph of Linville Creek below Power House - 20

APPENDIX "A"

INTRODUCTION

An agreement was entered into by all of the water users on the North Fork of Pit River and all its tributaries except Franklin Creek at a meeting held in Alturas on April 5, 1939. The agreement, attached hereto under Appendix "A" provided for a distribution of water among the various water users on the North Fork of Pit River Stream System in accordance with the provisions and schedules contained in the "Order of Determination, Determining and Establishing the Several Rights In and to the Water of North Fork of Pit River and All Its Tributaries Except Franklin Creek, Modoc County, California", this Order having been entered February 10, 1939, in Book 1 of Orders of Determination, Page 484, Division of Water Resources of the Department of Public Works of the State of California.

Water master service was provided on the North Fork of Pit River Stream System in accordance with Section 37 of the Water Commission Act.

Water master service commenced on about April 10 and continued until October 1, 1939. The work of water distribution in the area along Linville Creek and Joseph Creek was done by J. V. Common, Assistant Water Master; along Thoms Creek by J. B. McFarlland, Deputy Water Master and along Parker Creek and the North Fork of Pit River by E. E. von Bergen, Water Master.

All of the diversion systems throughout the area were operated or observed at various times during the 1939 season as the available water supply warranted and all regulations of diversions were made in accordance with and under the provisions of the agreement hereinbefore mentioned.

DISCUSSION OF RESULTS

Precipitation during 1939

The results of snow surveys made annually by the Division of

Water Resources in the upper Pit River watershed is shown in Table 1 at the end of this report. Table 1 is arranged to show the water content of the snow pack at the beginning of the runoff period (assumed to be during the period from April 1 to July 31) in comparison with a normal water content deduced from a long period of flow of Pit River at Idalpom and also compared to the normal of records covering a period of the last ten years.

Table 2 of this report gives the monthly and the annual records of precipitation at Jess Valley, Alturas, and Bieber for the past ten years and the monthly and annual mean at Alturas computed from 30 years of past record. Compared to the mean annual precipitation based on the ten year record last past the precipitation at Jess Valley for the season of 1938-1939 was 83% of normal and at Alturas 68% of normal.

Water Supply During 1939

The mean daily discharge of the North Fork Pit River below the Bettendorff Ranch at the Chalk Cliff obtained from a continuous record of gage height is shown in Table 3 of this report.

A comparison of the water supplies of the North Fork Area recorded at this station is given in the following tabulation:

Year	April	May	June	July	Aug.	Sept.	Seasonal Total
1929	2000	992	1200	191	141	120	4,650
1930	4390	3360	441	220	61	136	8,650
1931	204	70	109	70	54	131	617
1932	12900	16200	2900	94	62	77	32,200
1936	15400	4750	1330	159	* 60	* 80	21,800
1937	11830	3300	290	160	* 60	* 80	15,710
1938	30000	16000	1540	513	201	71	50,300
1939	2840	316	378	206	104	* 89	3,930

* Estimated

Table 4, at the end of this report, gives the mean daily discharge of Parker Creek near its mouth from April 1 to September 30, 1939. The

station is located about one quarter mile above the Alturas-Lakeview highway. The mouth of Parker Creek is below the North Fork Pit River diversions of M. R. Woody, Lauer and the United States Indian Service.

Table 5 shows the discharge of the North Fork of Pit River below the mouth of Thoms Creek and includes all the water contributed by all the main tributaries except Parker Creek.

Table 6 is the combined discharge shown on Table 4 and 5 and is the total supply for the allotments on the North Fork of Pit River except the allotment of M. R. Woody. Plate 1 is a graphic comparison of the supply of water tabulated in Table 6 and the allotments of water on the North Fork of Pit River below the North Fork register station.

Table 7 is a tabulation of the mean daily discharge of Parker Creek at Fogarty's Ranch for the period April 9 to September 31, 1939 and Plate 2 is a graphic comparison of that discharge and the allotments below that station.

Table 8 is a tabulation of the mean daily discharge of Thoms Creek at the Alturas-Cedarville Highway crossing for the period April 1 to July 31 and Plate 3 is a graphic comparison of the water supply at that station and the allotments below that station.

Table 9 is a tabulation of the mean daily discharge of Joseph Creek below the mouth of Couch Creek and Plate 4 is the graphic comparison of that discharge and the allotments below that station.

Table 10 is a tabulation of the mean daily discharge of Linville Creek below the Power House for the period April 1 to August 31 and Plate 5 is a graphic comparison of that discharge and the allotments below that station.

Table 11, at the end of this report, gives the basic data for a comparison of the full natural flow of the North Fork of Pit River from

April 1 to July 31 to the water content of the snow on Eagle Peak and Cedar Peak. As indicated the normal water content deduced by comparison with Pine Creek is 31.6 inches and the normal runoff for the North Fork is 24,400 acre feet. The snow measurement on April 1, 1939 indicated a runoff of 20.9/31.6 per cent of 24,400 or 16,000 acre feet and the actual runoff was 12,000 acre feet or somewhat less than that indicated by the water content measured on April 1st. The 12,000 acre feet were obtained from the actual measured runoff at the recording station plus the amount of water estimated to have been consumed for irrigation, etc. upstream from the recording station and which would have otherwise run off and contributed to the flow recorded.

REMARKS

The irrigation season of 1939 began in the latter part of March with the event of warm weather and an abundance of water for a short time. Thereafter, in April and May a shortage of water, as shown in Plates 1 to 5, and cold, poor growing weather caused a crop shortage. In general the meadow grass and alfalfa crops were about 50% to 75% of normal and fall irrigation was practically nil due to water shortage.

The Hughes dam and division canal headgates were rebuilt and considerable work has been performed by the Indian Service in replacing and repairing diversion dams and headworks on the X.L. Ranch.

TAILINGS

TABLE 1

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	
Depth of Snow - Inches	24.3	13.3	43.8	38.1	9.9	66.1	52.0	47.3	71.3	27.2	
Water Content - Inches	11.0	5.2	18.7	14.3	3.3	22.6	22.0	17.5	23.6	10.4	
Density - Per cent	45.3	39.1	42.6	37.5	33.3	34.2	42.3	37.1	33.1	38.2	
Deduced Normal Water Content								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	
Record Average - In.								14.32	15.35	14.8	
% of Record Average	78.0	36.3	131.0	100.0	23.0	158.0	154.0	122.0	153.7	70.5	
Cedar Peak 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	
Depth of Snow - In.	29.3	22.1	49.2	43.9	2.2	56.4	68.2	54.2	79.1	28.2	
Water Content - In.	13.0	8.0	19.8	16.3	0.9	21.1	26.2	21.6	25.2	10.5	
Density - Per cent	44.4	37.6	40.3	37.1	40.8	37.4	38.4	40.0	31.8	37.2	
Deduced Normal Water Content								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	
Record Average - In.								15.9	16.9	16.3	
% of Record Average	82.0	50.4	118.0	102.5	5.7	133.0	165.0	136.0	149.1	6.44	
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	
Depth of Snow - In.	13.3	6.1	30.0	37.6	0	45.9	47.2	37.4	61.4	17.5	
Water Content - In.	6.1	2.9	13.3	14.1	0	18.8	20.0	16.7	28.1	8.1	
Density - Per cent	45.6	47.3	44.3	37.5	0	40.9	42.3	44.8	45.8	46.2	
Deduced Normal Water Content								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.	108.5	
Record Average - In.								11.5	13.3	12.8	
% of Record Average	53.0	25.2	115.6	122.5	0	163.7	174.0	145.2	211.3	63.3	

TABLE 2

Division of Water Resources

Precipitation-Upper Pit River

		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Season
Jess Valley	1929 - 30			2.41	2.72	2.01	1.29	1.01	1.57	.13	.02	.05	1.94	13.15
	1930 - 31	.90	1.19	.13	.80	.88	1.64	.39	1.01	.61	.00	.28	.43	8.29
Elev. 5400 Ft.	1931 - 32	1.67	2.24	1.58	2.20	.74	2.45	3.37	2.64	.53	.11	.00	.08	17.61
	1932 - 33	.24	.52	1.64	3.09	.85	1.03	1.84	1.55	.19	.08	T	.72	11.73
	1933 - 34	.90	.07	1.14	1.36	1.58	2.04	.65	1.77	2.32	.11	.10	.40	12.44
	1934 - 35	.61	2.67	2.12	1.53	2.02	1.71	4.37	2.25	.00	T	.09	T	17.37
	1935 - 36	2.49	1.13	2.17	3.67	2.94	1.44	0.92	1.11	1.67	.38	.37	.91	19.20
	1936 - 37	.00	.00	1.06	2.78	2.43	1.72	1.83	.37	1.00	1.89	.00	.28	13.86
	1937 - 38	1.41	3.45	4.42	1.25	2.56	4.13	2.60	1.23	1.22	1.30	.00	.54	24.11
	1938 - 39	1.87	1.59	.40	1.66	1.87	1.54	.59	.81	.87	.80	.15	.60	12.75
	10 Yr. Record Mean	1.13	1.43	1.71	2.11	1.79	1.80	1.76	1.48	.85	.47	.10	.59	15.32
Alturas	1929 - 30	.54	.00	1.60	2.24	1.77	1.14	.64	.90	.10	T	.03	1.00	9.96
	1930 - 31	1.15	.57	.23	.67	.67	1.03	.46	.06	.57	.00	T	.64	6.05
Elev. 4460 Ft.	1931 - 32	1.33	1.54	2.50	1.65	.46	1.10	1.51	1.26	.29	.00	.00	.00	11.64
	1932 - 33	.07	.33	1.53	3.15	.23	.70	1.44	1.08	.24	.31	.70	.42	10.20
	1933 - 34	1.00	.00	.74	.54	.94	.87	.42	2.01	1.88	.00	.00	.59	8.99
	1934 - 35	.52	2.02	1.56	2.52	1.23	1.44	2.74	.81	.00	.12	T	.03	12.99
	1935 - 36	1.25	.57	1.54	4.93	2.95	.72	.56	1.03	.82	.19	.18	.49	15.20
	1936 - 37	.01	.03	.96	2.05	2.44	1.63	.97	.27	.30	.15	.00	.06	8.87
	1937 - 38	1.11	3.75	5.68	1.01	2.24	3.21	1.04	0.53	0.71	.98	.00	.43	20.72
	1938 - 39	1.56	.98	.07	.93	.45	.98	.28	.33	.56	.78	.08	.57	7.47
	10 Yr. Record Mean	.86	0.98 1.18	1.64	1.98	1.34	1.28	1.00	.84	.52	.25	.10	.42	11.21 11.40
	30 Yr. Record Mean	.82	1.18	1.39	1.77	1.29	1.38	1.05	.89	.63	.41	.24	.54	11.59
Bieber	1929 - 30	.83	.00	4.51	3.78	2.75	.67	.92	1.54	.02	T	.20	1.25	16.47
	1930 - 31	.43	.90	.28	1.38	1.98	1.44	.26	1.37	.31	T	.04	.59	8.98
Elev. 4200 Ft.	1931 - 32	2.25	1.18	4.09	1.94	.69	1.25	1.72	1.23	.20	.22	.00	T	14.77
	1932 - 33	.86	.73	1.78	3.39	.31	2.57	1.28	2.59	T	T	T	.42	13.93
	1933 - 34	2.16	.00	1.67	1.17	1.79	1.33	.12	1.93	.56	.21	.00	.50	11.44
	1934 - 35	1.05	3.23	1.89	2.51	1.60	2.91	4.75	1.01	.04	.02	.00	.04	19.05
	1935 - 36	1.96	.38	2.69	5.56	3.40	.95	.80	.81	.75	.10	.10	.54	18.04
	1936 - 37	.10	.00	1.70	2.03	5.05	1.85	1.46	.36	1.04	.18	.00	.10	13.87
	1937 - 38	2.10	5.30	5.46	1.92	4.62	6.59	1.01	0.54	0.60	0.70	.00	.45	29.29
	1938 - 39	1.30	.95	.59	1.83	.46	1.28	.68	.55	.31	.60	.00	.47	9.02
	10 Yr. Record Mean	1.31	1.27	2.47	2.54	2.27	2.08	1.30	1.19	.37	.20	.04	.47	15.47

TABLE 11

WATER CROP APRIL 1 TO JULY 31 OF NORTH FORK OF PIT RIVER AND ITS TRIBUTARIES COMPARED WITH PINE CREEK NEAR ALTURAS AND SNOW WATER CONTENT AT EAGLE PEAK AND CEDAR PEAK ON APRIL 1

Year	Natural Flow of Pine Creek Acre-feet	Natural Flow Of No. Fk. Pit River Acre-feet	Snow Water Content, Eagle Peak and Cedar Peak Inches
1919	5,925		
1920	6,675		
1921	10,260		
1922	7,700		
1923	6,110		
1924	5,100		
1925	7,920		
1926	6,199		
1927	10,080		
1928	7,640		
1929	5,495		
1930	5,894	15,400	23.0
1931	2,615	7,400	13.2
1932	10,300	50,600	38.5
1933	5,885		30.6
1934	3,455		4.2
1935	9,293		42.7
1936	9,300	23,600	48.2
1937	5,510	21,700	39.1
1938	12,890	55,100	46.8
1939	4,604	12,000	20.9
Average, 1930,31, 32,36,37,38,39	7,500	35,500	33.0
21 year Mean	7,035	24,400	31.0

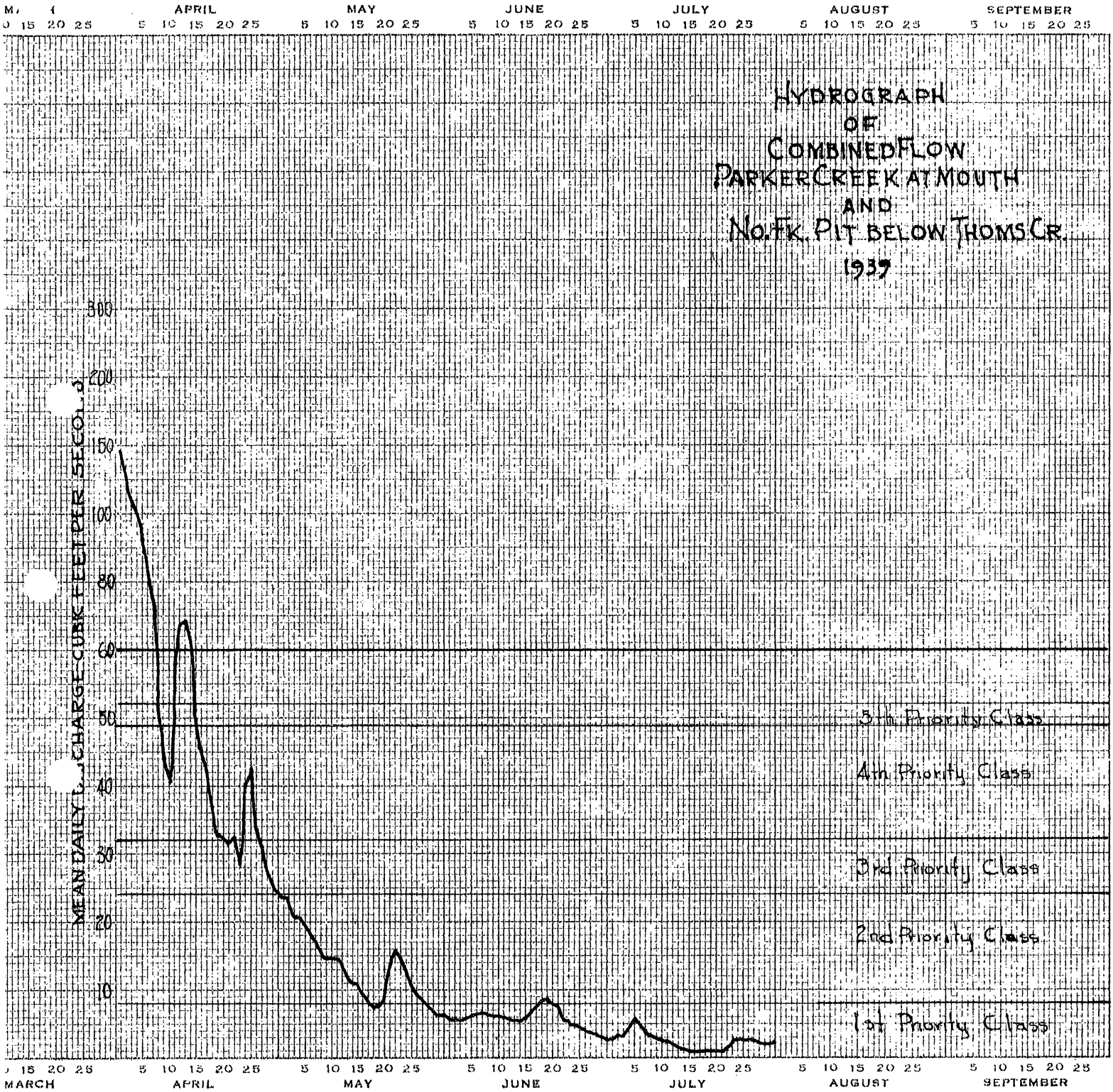
HYDROGRAPH
OF
COMBINED FLOW
PARKER CREEK AT MOUTH
AND
NO. FK. PIT BELOW THOMS CR.
1937
MEAN DAILY DISCHARGE CUBIC FEET PER SECOND
300
200
150
100
80
60
50
40
30
20
10
5th Priority Class
4th Priority Class
3rd Priority Class
2nd Priority Class
1st Priority Class
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

PLATE 1

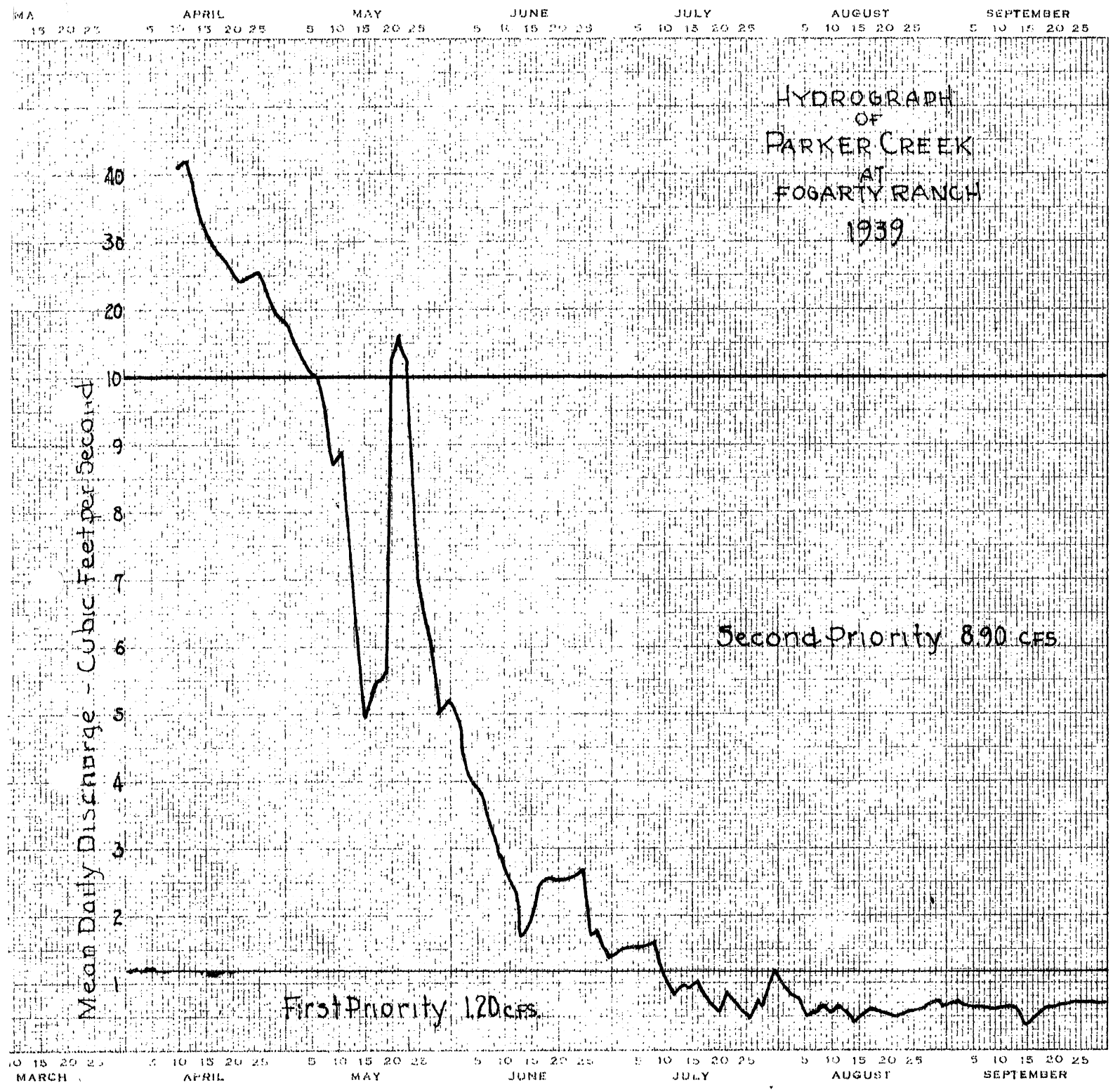
HYDROGRAPH
OF
PARKER CREEK
AT
FOGARTY RANCH
1939
Mean Daily Discharge - Cubic Feet per Second
Second Priority 8.90 CFS
First Priority 1.20 CFS
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

PLATE 2

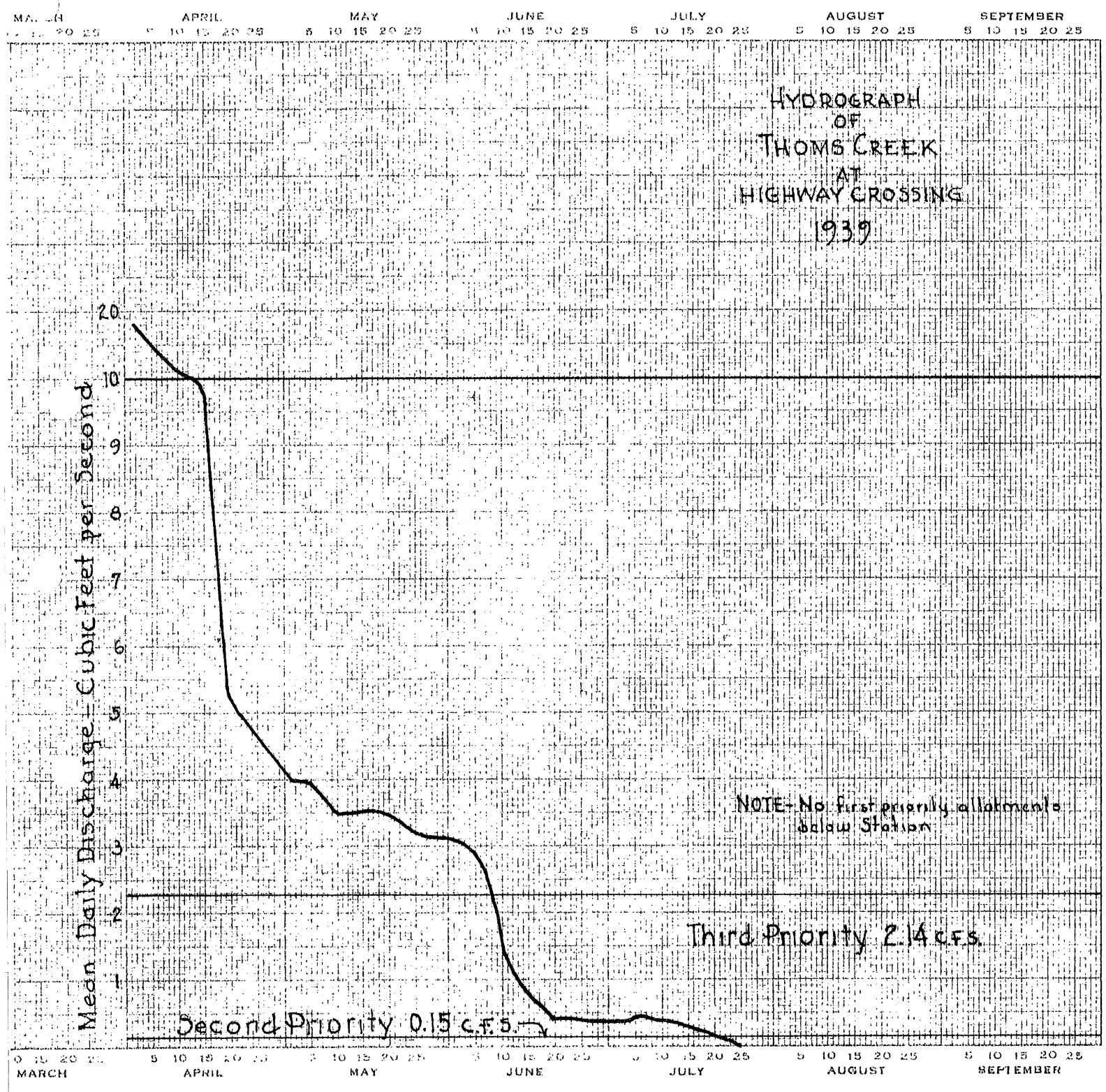
HYDROGRAPH
OF
THOMS CREEK
AT
HIGHWAY CROSSING
1939
Mean Daily Discharge - Cubic Feet per Second
20
10
9
8
7
6
5
4
3
2
1
NOTE- No first priority allotments below Station
Third Priority 2.14 c.f.s.
Second Priority 0.15 c.f.s.
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

PLATE 3

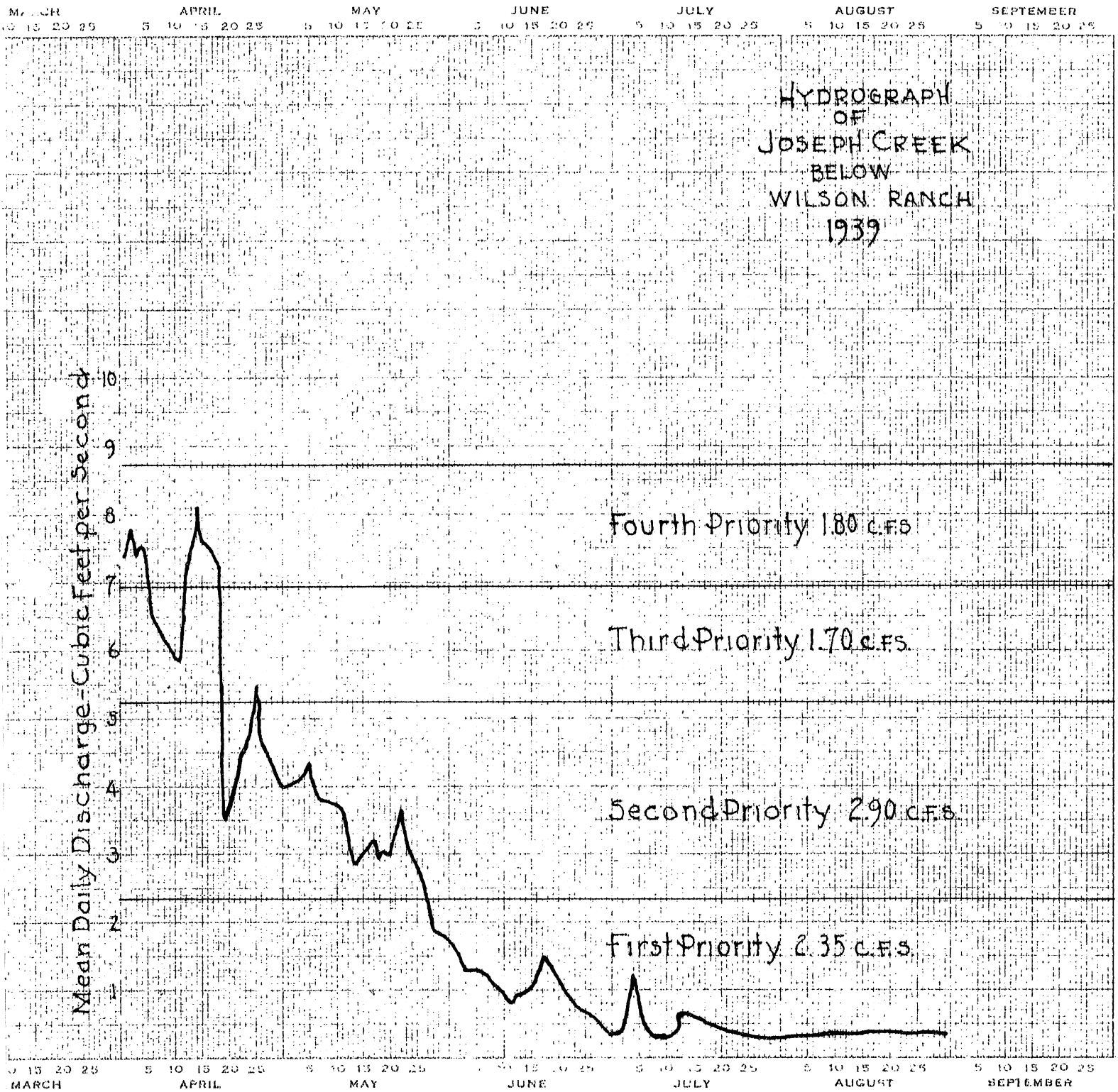
HYDROGRAPH
OF
JOSEPH CREEK
BELOW
WILSON RANCH
1939
Mean Daily Discharge-Cubic Feet per Second
Fourth Priority 1.80 C.F.S.
Third Priority 1.70 C.F.S.
Second Priority 2.90 C.F.S.
First Priority 2.35 C.F.S.
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

PLATE 4

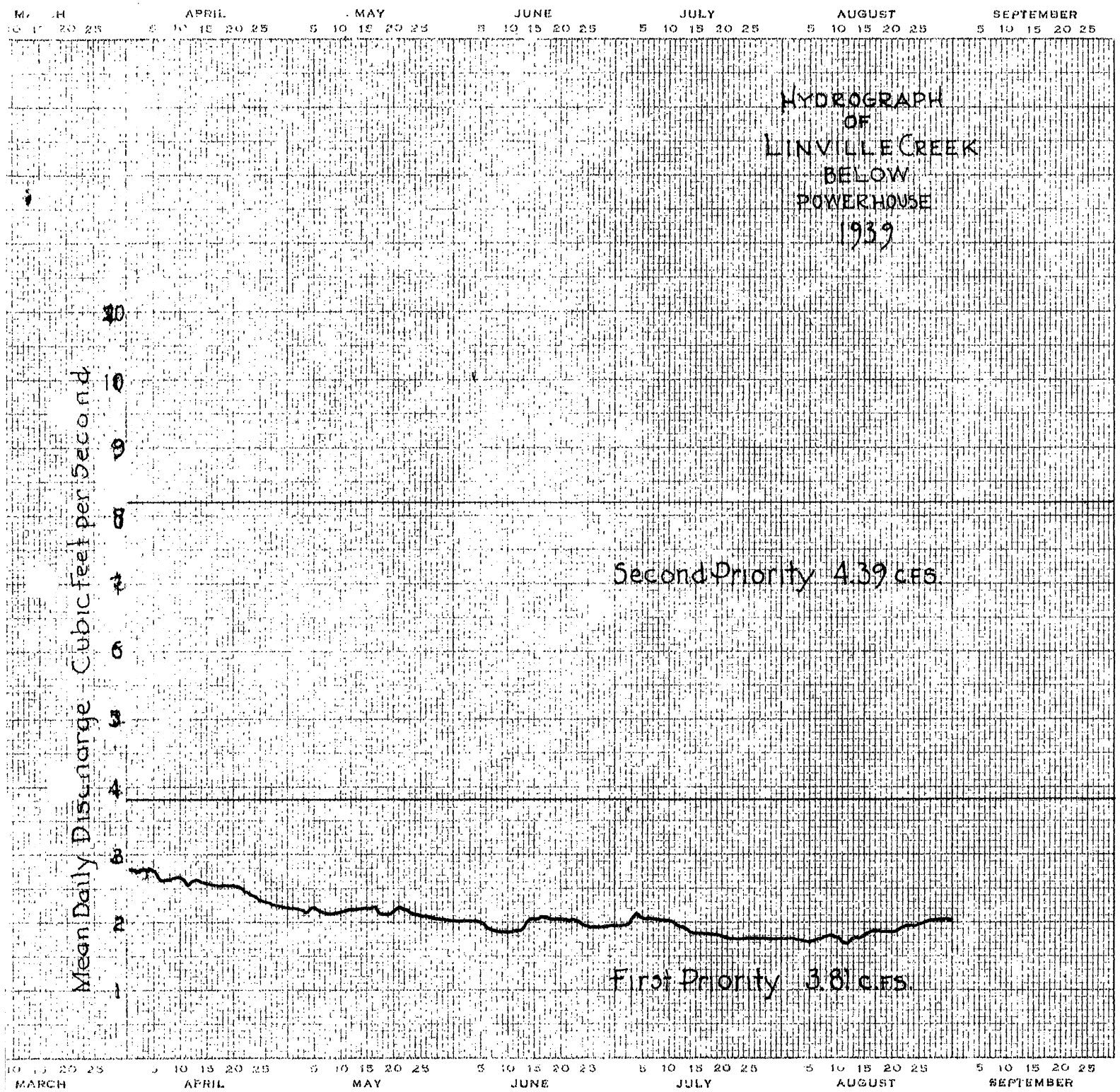
HYDROGRAPH
OF
LINVILLE CREEK
BELOW
POWERHOUSE
1939
Second Priority 4.39 C.F.S.
First Priority 3.81 C.F.S.
Mean Daily Discharge - Cubic feet per Second
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER

PLATE 5

c
o
p
y

APPENDIX "A"

BEFORE THE DIVISION OF WATER RESOURCES
DEPARTMENT OF PUBLIC WORKS OF THE STATE OF CALIFORNIA

In the Matter of the Determination of the Rights of the Various Claimants to the Water of North Fork of Pit River and All its Tributaries Except Franklin Creek, in Modoc County, California	)	1939 AGREEMENT FOR TRIAL DISTRIBUTION

WHEREAS, an "Order of Determination" determining and establishing the several rights in and to the water of the North Fork of Pit River and all its tributaries, except Franklin Creek, in Modoc County, California, has been entered of record in the above entitled proceeding in the office of the Division of Water Resources of the Department of Public Works, State of California, and

WHEREAS, a certified copy of said Order of Determination has been filed with the clerk of the Superior Court of the State of California, in and for the County of Modoc and a copy thereof has been sent by registered mail to each person who has filed proof of claim in said proceeding, and

WHEREAS, the claimants hereunto subscribed desire continuation of water master service under State supervision during the 1939 season,

NOW THEREFORE IT IS HEREBY AGREED by and between each and every claimant hereunto subscribed and among all of said claimants, that said Division of Water Resources may undertake to distribute the waters of said North Fork of Pit River and all its tributaries, except Franklin Creek,

among the various claimants hereunto subscribed during the period from April 5 to September 30, in 1939, only, and subject to such provisions as are hereinafter contained, to-wit:

1. The waters of said North Fork of Pit River and all its tributaries, except Franklin Creek, shall be distributed to the various claimants hereunto subscribed in accordance with the plan of distribution set forth in said Order of Determination, a copy of which is hereunto annexed, and by this reference thereto is incorporated herein and made a part hereof.

2. Said Division of Water Resources may appoint a water master to distribute the waters of North Fork of Pit River and its tributaries, as herein provided for, during the 1939 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 in said stream system and diversion conduits as may be necessary or convenient. The several ditch owners shall furnish the necessary labor and material for the construction and installation of diversion works, headgates and measuring devices for their respective ditches.

3. It is finally agreed that in order to meet the costs of such distribution by the water master during the 1939 season, the parties hereto will pay to the division of Water Resources on or before May 1, 1939, the amount of $600.00, which amount shall be apportioned among the various parties hereto in accordance with the assessments set forth in Schedule "A" hereunto annexed and made a part hereof.

IN WITNESS WHEREOF the parties hereto have affixed their hands and seals this 5th day of April, 1939.

Frank McArthur
M. J. Gloster
(P. D. McDowell
(L. Gayle McDowell
H. A. Heesch
J. T. Laird Estate
By Reuel A. Laird
N. L. Pepperdine
Modoc County Bank in liquidation
By George H. Mills, Special Deputy,
Superintendent of Banks
G. B. Dorris
Grace F. Ponner (By E. C. Ponner)
John B. Faulkner
J. W. Watkins
C. C. Clarke and Belle Clarke
Martha E. Page
Ella Russell
Chas. Bettandorff
Rufus S. Carter et al.
Alice Porter
Leland C. Porter
B. F. Lynip by C. A. Raker
Bolliger and Keller by C. A. Raker
Bessie Jackson C. A. Raker
W. J. Dorris
W. E. Minard
Elenta Fogerty
By C. Fogerty
J. M. Reyes
Wm. Stanton
Harold A. Stiner
Howard J. Stiner
Alfred DeWitt
Estate of Phear E. Porter and J. C. Porter
by James C. Porter
Willie DeWitt and Clara Mae DeWitt, Alturas Calif
Chet Gibson Alturas
Pearl F. Gibson "
Georgia M. Jones Alturas
W. S. Trumbo Alturas
P. S. Dorris Alturas
Clyde Hays "
C. A. Spaulding "