STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

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GOODWIN J. KNIGHT, Governor

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REPORT ON

WATERMASTER SERVICE

IN

BIG VALLEY WATERMASTER SERVICE AREA

MODOC AND LASSEN COUNTIES, CALIFORNIA

1954 SEASON

Sacramento, California
December, 1954

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SUBMISSION TO, AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, L. C. Jopson, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, submit this "Report on Watermaster Service in Big Valley Watermaster Service Area, Modoc and Lassen Counties, California, 1954 Season".

/s/ L. C. Jopson
Principal Hydraulic Engineer

I, Harvey O. Banks, Assistant State Engineer, Division of Water Resources, Department of Public Works of the State of California, approve this "Report on Watermaster Service in Big Valley Watermaster Service Area, Modoc and Lassen Counties, California, 1954 Season".

/s/ Harvey O. Banks
Assistant State Engineer

I, A. D. Edmonston, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, approve and adopt this "Report on Watermaster Service in Big Valley Watermaster Service Area, Modoc and Lassen Counties, California, 1954 Season", as a report of the Department of Public Works.

WITNESS my hand and the seal of the Department of Public Works of the State of California, this 20th day of January, 1955.

DEPARTMENT OF PUBLIC WORKS
STATE OF CALIFORNIA

By /s/ A. D. Edmonston
A. D. Edmonston
State Engineer

(SEAL)

ORGANIZATION

STATE DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

Frank B. Durkee . . . . . Director of Public Works

A. D. Edmonston . . . . . State Engineer

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INTRODUCTION

This is the twentieth annual report on watermaster service in the Big Valley Watermaster Service Area, and covers the period of water distribution in 1954 beginning April 1 and terminating September 30.

The service area was created by order of the Division of Water Resources on November 13, 1934, to include all the water rights on Pit River in Big Valley as determined by agreement in writing entitled "Agreement Determining Right to Water and Use Thereof from Pit River in Big Valley in Modoc and Lassen Counties, California" dated October 16, 1933. The boundaries of the service area were enlarged by order dated March 11, 1949, to include the water rights on Ash Creek and its tributaries in Modoc and Lassen Counties, California, as established by decree entered by the Superior Court, Modoc County, California, on October 27, 1947, in the case of Charles A. Gerig vs. C. W. Clarke Co., et al., No. 3670. Watermaster service has been provided during each irrigation season since the service area was created, and annual reports have been prepared to show the work accomplished during each season.

The report is presented under four headings as follows: Introduction, Water Supply, Distribution of Water, and Changes in Ownership of Lands and Water Rights. Following the text are tables presenting precipitation data at Bieber, water supply records at various locations within the area, and a plate showing hydrographs of Pit River near Canby, Pit River near Bieber, and releases from Roberts Reservoir.

WATER SUPPLY

Precipitation

Data on precipitation at Bieber as compiled from records of California Cooperative Snow Surveys for the period October 1, 1953, to September 30, 1954, are shown in Table 1. The precipitation for the period was 15.09 inches which is equivalent to about 93 per cent of the 50 year mean.

The water content of the snow on April 1 at four stations in the upper Pit River area as compiled from the bulletin "Water Conditions in California, April 1, 1954", is presented in the following tabulation:

Snow course	Elevation, in feet	Water content of snow, in inches		Per cent of mean
		50 year computed mean	1954	
Eagle Peak	7,500	18.2	16.0	88
Blue Lake Ranch	7,300	13.6	10.3	76
Cedar Pass	7,200	19.9	14.6	73
Adin Mountain	6,500	13.8	9.1	66

The water content of the four stations was about 76 per cent of the combined normal.

Stream Flow

Records of daily discharge of Pit River at the United States Geological Survey gaging stations near Canby and near Bieber for the period

April 1 to September 30, 1954, are presented in Tables 2 and 3, respectively. These records were obtained from preliminary records of the United States Geological Survey. During the irrigation season the flow passing the Canby station is assumed to be the amount available for distribution in Big Valley. At the beginning of the season, however, additional water is available from small tributaries between Canby and Lookout Dam in Big Valley.

The water passing the United States Geological Survey gaging station near Canby was comprised of natural flow of Pit River plus drainage from stored water released from Big Sage Reservoir and other reservoirs within the drainage area. In the latter part of the season the natural flow contribution was small.

The United States Geological Survey station near Bieber is located at the lower end of Big Valley. Water passing the station is either excess water or return flow from irrigated lands in the valley.

Releases from Roberts Reservoir were measured by an 8-foot parshall flume equipped with an automatic water level recorder and are presented in Table 4. Water is released from Roberts Reservoir into Pit River and then rediverted by the shareholders of the reservoir.

Hydrographs of Pit River near Canby, Pit River near Bieber, and releases from Roberts Reservoir prepared from data presented in Tables 2, 3, and 4, respectively, are shown on Plate 1. A comparison of the available water supply, water requirements, and return flow is shown graphically on this plate.

Stream gaging stations, equipped with automatic water stage recorders, were maintained on Willow Creek near Knudson Ranch, Rush Creek

above Round Valley, and Ash Creek at Adin. The records of daily discharge at these stations are presented in Tables 5, 6, and 7, respectively.

DISTRIBUTION OF WATER

The water rights in the Big Valley Watermaster Service Area are grouped as follows:

Schedule 2 of the Big Valley agreement which defines first and superior allotments to the various water users from Pit River;

Schedule 3 of the Big Valley agreement which defines allotments to the various water users from Pit River in the second priority class;

Schedule 3 of the Ash Creek decree which defines rights to the use of water from Rush Creek;

Schedule 4 of the Ash Creek decree which defines rights to the use of water from Butte Creek;

Schedule 5 of the Ash Creek decree which defines rights to the use of water from Willow Creek;

Schedule 6 of the Ash Creek decree which defines rights to the use of water from Ash Creek.

In conjunction with distribution of water from Pit River according to the rights as set forth above, the watermaster regulates the re-diversions from Pit River of water released from Roberts Reservoir.

A discussion of water supply and use for the 1954 season follows.

Pit River in Big Valley (Schedules 2 and 3)

Lookout Dam, at the upper end of the valley, was put in operation on May 11. From then until July 11 sufficient water was available

to satisfy all second priority rights and a portion of third priority rights. From July 11 until September 10 water was available to satisfy only 40 per cent of the second priority allotments. Thereafter, sufficient water was available to satisfy all irrigation demands.

The first irrigation rotation began May 11 and was finished May 28; the second rotation began on May 29 and was finished on June 20; the third rotation began June 21 and was finished July 9.

During the period from July 10 until July 30, when irrigation had ceased on most lands due to haying operation, water was diverted at the Bieber dam and was used to irrigate a portion of the lands on the east side and all of the lands on the west side of the country road, which leads to the Ernest Babcock and Kate Gerig ranches.

On July 30 Gerig dam was replaced and water released from Roberts Reservoir to fill the river dam and to irrigate the Ward Kramer, Oral Gerig, Peter Gerig, and Lester Babcock ranches and to supply stock water to the Dally Knox (Peter Gerig) ranch. Roberts Reservoir was closed on August 7.

Roberts Reservoir was reopened on August 17 when water was released from Hot Springs Valley. From that time until September 9 all lands except those of McArthur and Britton (formerly Avilla) were irrigated. These two ranches received a partial irrigation during this period, but a greater amount of land could have been irrigated if the river dams had been properly maintained. Roberts Reservoir was closed August 21.

Water was again released from Hot Springs Valley on September 7. From that date until the end of the season sufficient water was available to satisfy all irrigation demands in all priorities.

A summary of the distribution of the natural flow of Pit River is presented in the following tabulation:

Priority	Percent of allotments available				
	April	May	June	July	August	September
First	Surplus	100	100	100	100	100
Second	Surplus	100	100	59	29	54
Third	Surplus	100	55	0	0	0
Fourth	Surplus	100	0	0	0	0

Roberts Reservoir

Releases from Roberts Reservoir are measured through an 8-foot parshall flume. The amounts of water used by individual shareholders are measured by weirs or rated sections for those shareholders who divert water from Pit River by ditches. The amounts of water used on the Oral Gerig, Peter Gerig, and Ward Kramer ranches are computed assuming an irrigation use of one-half an acre-foot per acre of irrigated land. These ranches use wild flooding entirely, and it is impossible to measure the water which flows onto the ranch and the amount of water which leaves the ranch.

A summary of water used by individual shareholders is presented in the following tabulation:

Name of shareholder	Number of shares	Amount of water, in acre-feet
Peter Gerig	5	132
Oral Gerig	3	95
Ward Kramer	2	150
Merlin Kennedy	1	0
Whaley Land and Cattle Company	1	30
Cyril R. Mamath W. H. Hunt Estate Company	1) 2)	279
Lester Babcock Clarence Hawkins	3) 1)	438
Lewis Monchamp	1	not measured
TOTALS	20	1,124

Water used by Lewis Monchamp is not rediverted from Pit River, but is diverted directly from the reservoir. Consequently the amount used has not been measured by the watermaster. Most of the water used by Cyril R. Mamath and W. H. Hunt Estate Company is used to irrigate both ranches at the same time. It has not been necessary to determine the amount used by each ranch. The water used by Lester Babcock and Clarence Hawkins is rediverted from Pit River through the Watson ditch. The two shareholders rotate the water between the two ranches.

Ash Creek and Tributaries

Distribution from Ash Creek and tributaries during the 1954 irrigation season followed the methods and practices initiated in past seasons with little or no modification. Summaries of the distribution on each of the streams are set forth in the following paragraphs:

Rush Creek (Schedule 3). The water supply was in excess of total allotments for the entire season except for the period between September 2 and September 14 when 99 per cent of total allotments was available.

Butte Creek (Schedule 4). The water supply was in excess of total allotments until about June 5. Subsequent to this date the flow decreased steadily and reached a nearly constant flow of about 1.4 cubic feet per second during August and September.

A summary of the water distribution made during the 1954 season is shown in the following tabulation:

Month	Percentage of allotments delivered	
	First priority	Second priority
April	100	100
May	100	100
June	100	45
July	70	0
August	56	0
September	56	0

Willow Creek (Schedule 5). The water supply was sufficient to fulfill all allotments until May 17. By July 5 the flow had stabilized and remained constant until the end of the irrigation season, supplying about 40 per cent of second priority.

A summary of the distribution made during the 1954 season is shown in the following tabulation:

Month	Percentage of allotments available			
	First priority	Second priority	Third priority	Fourth priority
May	100	100	71	55
June	100	52	0	0
July	100	41	0	0
August	100	41	0	0
September	100	41	0	0

Ash Creek (Schedule 6). The available flow in Ash Creek was sufficient to satisfy all allotments until about June 10. Throughout the

remainder of the irrigation season water was available for full allotments for first and second priorities.

A summary of the distribution made during the 1954 season is presented in the following tabulation:

Month	Percentage of allotments available				
	First priority	Second priority	Third priority	Fourth priority	Fifth priority
April	100	100	100	100	100
May	100	100	100	100	100
June	100	100	75	0	0
July	100	100	10	0	0
August	100	100	10	0	0
September	100	100	10	0	0

CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS

The changes in ownership of lands and water rights which have occurred subsequent to filing "Statement for Big Valley Watermaster Service Area, Counties of Modoc and Lassen, California, for 1954" and which will be included in the 1955 statement for the service area, are listed in the following tabulation:

Tract number	Name of water right owner appearing in 1954 statement	Name of water right owner to appear in 1955 statement	Amount of water in cubic-feet per second
6-31	Miller J. P. and Miller, Clara	W. H. Hunt Estate Company	15.44
6-72	Lane, Nora and Elkins, Georgia R.	W. H. Hunt Estate Company	2.10
6-79	Nash, John W. and Nash, Justine O.	Fedrick, William	0.45

TABLE 1

PRECIPITATION AT SIEBER, LASSEN COUNTY, CALIFORNIA
1953-1954

In Inches

Month	Normal precipitation	1953-1954 precipitation
October	1.80	0.82
November	1.75	2.01
December	2.21	0.80
January	2.44	2.76
February	2.35	2.12
March	1.86	3.19
April	1.28	1.31
May	1.28	0.21
June	0.41	1.36
July	0.23	0
August	0.14	0.40
September	0.48	0.11
TOTALS	16.23	15.09

TABLE 2

DAILY MEAN DISCHARGE OF PIT RIVER NEAR CANBY

April 1 to September 30, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1	284	389	96	68	41	40
2	237	362	96	40	43	43
3	224	322	104	45	40	36
4	228	241	121	78	32	25
5	275	241	152	115	28	20
6	448	205	136	73	36	57
7	530	149	115	62	38	119
8	598	143	152	623	26	126
9	535	136	190	316	23	129
10	394	192	162	146	21	130
11	337	179	241	110	19	112
12	289	245	347	80	27	154
13	280	216	384	68	67	172
14	280	124	327	62	84	147
15	307	21	312	58	77	120
16	312	14	266	68	77	100
17	307	42	166	66	88	74
18	312	35	93	51	87	65
19	322	217	80	44	109	61
20	332	216	62	38	86	59
21	322	133	49	38	68	62
22	303	115	53	38	62	76
23	280	107	68	38	66	63
24	266	73	169	40	77	53
25	262	60	143	38	74	58
26	245	70	101	37	69	63
27	303	110	78	29	59	83
28	342	121	99	31	49	52
29	421	104	83	42	39	36
30	454	80	76	31	36	40
31	---	78	---	28	37	---
Mean	334	153	151	84	54	79
Runoff in acre-feet	19,890	9,400	8,970	5,160	3,340	4,710

Total for period - 51,470 acre-feet

TABLE 3

DAILY MEAN DISCHARGE OF PIT RIVER NEAR BIEBER

April 1 to September 30, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1	924	626	35	41	14	34
2	854	590	38	37	10	22
3	808	525	35	36	7.4	17
4	820	485	45	41	5.7	19
5	889	382	62	25	4.8	22
6	1,120	301	72	8.5	4.2	22
7	1,510	196	68	6.7	3.4	23
8	1,570	283	126	26	2.8	33
9	1,430	257	146	25	2.4	23
10	1,320	200	136	212	2.0	28
11	1,110	81	267	180	2.2	22
12	924	40	218	124	2.4	38
13	814	28	235	94	3.7	100
14	775	63	323	73	7.8	91
15	749	160	350	63	2.6	43
16	730	86	274	33	1.2	30
17	710	52	50	22	1.0	34
18	674	32	38	18	0.8	41
19	650	14	41	21	0.8	38
20	638	10	158	28	1.0	34
21	626	8.5	147	26	0.8	38
22	608	51	73	19	0.6	28
23	568	135	57	17	0.8	58
24	525	94	46	18	0.8	66
25	485	57	25	17	3.7	53
26	460	46	20	17	4.8	36
27	475	36	21	17	4.0	35
28	495	22	30	24	12	43
29	562	121	48	16	22	40
30	590	43	43	16	12	36
31	—	47	—	14	14	—
Mean	814	164	108	42.4	5.0	38.2
Runoff in acre-feet	48,420	10,060	6,400	2,610	309	2,280

Total for period - 70,079 acre-feet.

TABLE 4

DAILY MEAN RELEASES FROM ROBERTS RESERVOIR

April 1 to September 30, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1	N	N	N	N	37	N
2	O	O	O	O	42	O
3					40	
4	R	R	R	R	40	R
5	E	E	E	E	40	E
	L	L	L	L		L
6	E	E	E	E	38	E
7	A	A	A	A	28	A
8	S	S	S	S	0	S
9	E	E	E	E	0	E
10					0	
11					0	
12					0	
13					0	
14					0	
15					0	
16					23	
17					37	
18					37	
19					37	
20					36	
21					10	
22					0	
23					0	
24					0	
25					0	
26					0	
27					0	
28					0	
29					0	
30				18	0	
31				35	0	
Mean				1.7	14.3	
Releases in acre-feet				105	883	

Total for period - 988 acre-feet.

TABLE 5

DAILY MEAN DISCHARGE OF WILLOW CREEK NEAR KNUDSON RANCH

June 19 to September 22, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1				4.0	3.5	3.8
2	N	N	N	3.9	3.5	3.8
3	O	O	O	3.9	3.5	3.8
4				3.8	3.5	3.8
5	R	R	R	3.8	3.5	3.8
	E	E	E			
6	C	C	C	3.7	3.5	3.8
7	O	O	O	3.7	3.5	3.8
8	R	R	R	3.6	3.5	3.8
9	D	D	D	3.6	3.5	3.8
10				3.5	3.5	3.8
11				3.5	3.6	3.8
12				3.5	3.6	3.8
13				3.5	3.7	3.8
14				3.5	3.7	3.8
15				3.5	3.8	3.8
16				3.5	3.8	3.8
17				3.5	3.9	3.9
18				3.5	3.9	3.9
19			4.6	3.5	4.0	3.9
20			4.5	3.6	4.2	4.0
21			4.4	3.6	4.2	4.0
22			4.4	3.6	4.1	4.0
23			4.3	3.6	4.1	
24			4.3	3.6	4.0	N
25			4.2	3.6	4.0	O
26			4.2	3.6	3.9	R
27			4.1	3.6	3.9	E
28			4.1	3.6	3.9	C
29			4.1	3.5	3.8	O
30			4.0	3.5	3.8	R
31			---	3.5	3.8	D
Mean			4.3	3.6	3.8	3.8
Runoff in acre-feet			101	222	231	167

Total for period 721 acre-feet.

TABLE 6

DAILY MEAN DISCHARGE OF RUSH CREEK ABOVE ROUND VALLEY

June 19 to September 22, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1			5.5	4.9	4.4	4.3
2			5.5	4.9	4.4	4.3
3	N	N	5.5	4.8	4.4	4.3
4	O	O	5.4	4.8	4.4	4.3
5			5.4	4.8	4.4	4.3
	R	R				
6	E	E	5.4	4.8	4.4	4.3
7	C	C	5.4	4.8	4.4	4.3
8	O	O	5.3	4.7	4.4	4.3
9	R	R	5.3	4.7	4.4	4.3
10	D	D	5.3	4.7	4.3	4.3
11			5.3	4.7	4.3	4.3
12			5.3	4.6	4.3	4.3
13			5.3	4.6	4.3	4.3
14			5.2	4.6	4.3	4.3
15			5.2	4.6	4.3	4.3
16			5.2	4.6	4.3	4.3
17			5.2	4.5	4.3	4.3
18			5.2	4.5	4.3	4.3
19		5.6	5.1	4.5	4.3	4.3
20		5.6	5.1	4.5	4.3	4.3
21		5.6	5.1	4.5	4.3	4.3
22		5.6	5.1	4.5	4.3	4.3
23		5.6	5.0	4.5	4.3	
24		5.6	5.0	4.5	4.3	N
25		5.6	5.0	4.5	4.3	O
26		5.6	5.0	4.4	4.3	R
27		5.5	5.0	4.4	4.3	E
28		5.5	4.9	4.4	4.3	C
29		5.5	4.9	4.4	4.3	O
30		5.5	4.9	4.4	4.3	R
31		5.5	—	4.4	4.3	D
Mean		5.6	5.2	4.6	4.3	4.3
Runoff in acre-feet		143	309	282	266	187

Total for period 1,187 acre-feet.

TABLE 7

DAILY MEAN DISCHARGE OF ASH CREEK AT ADIN

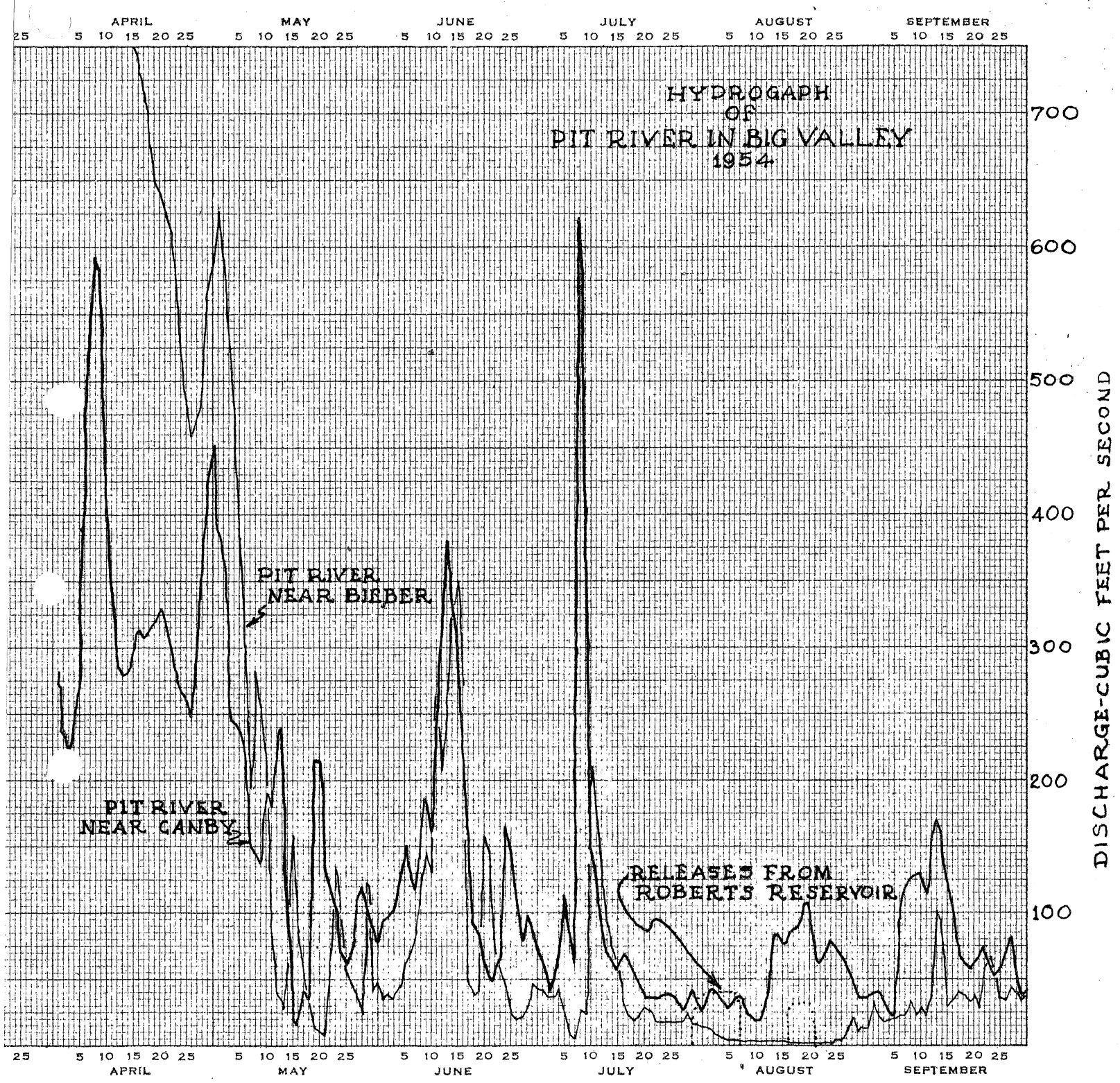
June 19 to September 22, 1954

In Cubic Feet per Second

Day	April	May	June	July	August	September
1				19.5	20	19
2				19.5	20	20
3	N	N	N	19.5	20	21
4	O	O	O	19.5	20	20
5				19.5	20	20
	R	R	R			
6	E	E	E	20	20	20
7	C	C	C	20	20	20
8	O	O	O	20	20	20
9	R	R	R	20	20	20
10	D	D	D	20	20	20
11				20	21	20
12				20	21	20
13				19.8	21	21
14				19.8	22	21
15				19.6	22	20
16				19.6	22	20
17				19.6	22	21
18				19.4	23	21
19			22	19.4	23	22
20			21	19.2	23	22
21			20	19.2	22	
22			19.6	19.2	22	23
23			18.9	19.0	21	23
24			18.5	19.0	21	
25			18.1	19.0	20	N
						O
26			18.3	19.2	20	
27			18.5	19.5	20	R
28			18.8	19.5	19.5	E
29			19.1	19.8	19.5	C
30			19.5	19.8	19.0	O
31			----	20.0	19.0	R
						D
Mean			19.4	19.6	20.8	20.6
Runoff in acre-feet			460	1,196	1,273	899

Total for period 3,828 acre-feet

PLATE 1


HYDROGAPH
OF
PIT RIVER IN BIG VALLEY
1954
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
25 5 10 15 20 25
700
600
500
400
300
200
100
DISCHARGE-CUBIC FEET PER SECOND
PIT RIVER
NEAR BIEBER
PIT RIVER
NEAR CANBY
RELEASES FROM
ROBERTS RESERVOIR