STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF WATER RESOURCES

EARL WARREN, Governor

C. H. PURCELL, Director of Public Works

A. D. EDMONSTON, State Engineer

REPORT ON WATERMASTER SERVICE IN BUTTE CREEK WATERMASTER SERVICE AREA

Butte County, California

1950 SEASON

Sacramento, California

March, 1951

SUBMISSION TO, AND ADOPTION BY
DEPARTMENT OF PUBLIC WORKS

I, L. C. Jopson, Supervising Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby submit the within contained report entitled "Report on Watermaster Service in Butte Creek Watermaster Service Area, Butte County, California, 1950 Season".

/s/ L. C. JOPSON
Supervising Hydraulic Engineer

I, Gordon Zander, Principal Hydraulic Engineer, Division of Water Resources, Department of Public Works of the State of California, hereby approve the within contained report entitled "Report on Watermaster Service in Butte Creek Watermaster Service Area, Butte County, California, 1950 Season".

/s/ GORDON ZANDER
Principal Hydraulic Engineer

I, A. D. Edmonston, State Engineer and Chief of the Division of Water Resources, Department of Public Works of the State of California, hereby approve and adopt the within contained report entitled "Report on Watermaster Service in Butte Creek Watermaster Service Area, Butte County, California, 1950 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 day of , 195 .

DEPARTMENT OF PUBLIC WORKS

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

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INTRODUCTION

The Butte Creek Watermaster Service Area, which includes the water rights on Butte Creek between its confluence with Little Butte Creek and the Western Canal Crossing at Nelson Dam, was created by order of the State Engineer on January 7, 1943. The water rights within the service area are set forth in the Butte Creek decree No. 18917, entered by the Superior Court, Butte County, California.

Watermaster service, as provided in Part 4 of Division 2 of the Water Code of California, was commenced for the 1950 season on June 1 and terminated September 30. D. C. Beaumont, Deputy Watermaster, was in charge of the distribution of water under the direction of P. E. Stephenson, Senior Hydraulic Engineer.

WATER SUPPLY

Precipitation

Monthly precipitation data at Chico, California as compiled from records of the U. S. Weather Bureau are presented in Table 1. The total precipitation for the 1949-50 season was 76.6 per cent of the 80-year mean.

Stream Flow

Water supply and diversion records were collected at seven stations equipped with water stage recorders in 1950. The location of the stations and their purposes are as follows:

Butte Creek U.S.G.S. Station below Covered Bridge

This station, located below the confluence of Butte Creek and Little Butte Creek, is used to measure the combined foreign water and natural flow which is available at the Parrott Dam located two and one-half miles downstream.

The discharge at this station is comprised of natural flow without regulation and foreign water after regulation by the Pacific Gas and Electric Company to meet power demands. The daily mean flow of the 1949-50 water year is set forth in Table 2.

Hendricks Canal

This station is located a short distance above the confluence of the Hendricks Canal with the Butte Creek Canal. The entire flow recorded at this station consists of foreign water from the West Branch of Feather River which is commingled with Butte Creek water in De Sabla Reservoir for use in generating hydroelectric power at the De Sabla and Centerville power plants of the Pacific Gas and Electric Company. The daily mean discharge for the period from June 9 to September 25, inclusive, is tabulated in Table 3.

Parrott Ditch

The station is located near the head of the Parrott Ditch, above the Crouch and Hale takeouts and gives a record of the amount of water diverted for the use of the Parrott, M. & T., Dayton Mutual Water Company and Miller (Hale) interest. The mean daily discharge for the period from June 6 to September 27, inclusive, is tabulated in Table 4.

Butte Creek below Parrott Dam

The flow at this station, located immediately below the Parrott Dam, is the water supply available for filling the natural flow rights on Butte Creek below Parrott Dam. The mean daily discharge for the period from June 5 to September 26, inclusive, is set forth in Table 5.

Upper Colony Ditch

The flow at this station, located near the head of the ditch, is a portion of the water diverted by the Durham Mutual Water Company. The daily mean discharge for the period from June 5 to September 28, inclusive, is tabulated in Table 6.

Butte Creek above Lower Colony Dam

The flow at this station, located below the Baxter Pump, is the water supply available for diversion through the Lower Colony Ditch. The daily mean discharge at this station for the period from June 21 to September 27 is set forth in Table 7.

Lower Colony Ditch

In order to get a continuous record of the flow in the Lower Colony Ditch, it was necessary to maintain two recorders. One of which was located immediately above the Lower Colony Dam which measured the upstream head on the orfice gate leading to the Lower Colony Ditch; the other, located in the Lower Colony Ditch immediately below the takeout, measured the downstream head on this orfice. This method of recording the flow in this ditch was necessary because at times water is spilled into the Lower Colony Ditch from the Upper Colony Ditch and also at times a diversion dam is placed in the Lower Colony Ditch a short distance below the head of the ditch.

Current meter measurements taken during 1950 established a coefficient for the Lower Colony orifice gate of 0.7.

Table 8 contains a tabulation of the mean daily flow from June 5 to September 29, however, it should be noted that the tabulated

flows prior to July 28, are the results of spot measurements and estimated flows.

DISTRIBUTION OF WATER

General

Distribution during the 1950 Season was based upon the water supply available at the U.S.G.S. gaging station. The flow at this station comprises natural flow of Butte Creek and foreign water brought over from the West Branch of Feather River through the Hendricks Canal.

Prior to about June 15, the flow of Butte Creek plus foreign water was large enough to supply near maximum capacity flow through the De Sabla and Centerville power plants. Under this condition there was very little fluctuation of flow in Butte Creek due to the foreign water.

After June 15, the total water available at the De Sabla Power Plant was less than that required for continuous operation and it was necessary for the power company to regulate the foreign water by storage in De Sabla Reservoir during periods of low power demands and draw on this storage to supply the peak power demands. The results of this operation was an increasing fluctuation of flow in Butte Creek at the U.S.G.S. gaging station as the flow of the creek decreased.

In order to determine a mean value of the natural flow of Butte Creek it was necessary to average the daily flow of Butte Creek at the U.S.G.S. station and the flow in the Hendricks Canal over seven day periods. The period used extended from Monday through Sunday as it was found that the reservoir was generally recharged over the weekends.

Foreign water delivered into Butte Creek stream system from the

West Branch of Feather River varied from a high of 66 cubic feet per second in June to 27 cubic feet per second during the latter part of July. The natural flow of the West Branch of Feather River was supplemented with stored water from Philbrook and Round Valley Reservoirs beginning August 1, to raise the amount of foreign water from about 30 c.f.s. to about 47 c.f.s. at which it remained during the remainder of the 1950 season.

The available natural flow of Butte Creek was ample to fill all rights set forth in Schedule 7 of the decree until July 1. Prior to July 1, water was available for diversion by the owners of the various surplus class rights. Subsequent to July 1 the available natural flow decreased until on July 10 only first priority rights were filled. Minimum natural flow occurred during the week following September 4, when water was available for only 69 per cent of the first priority rights.

Parrott Diversion

The foreign water present in the Butte Creek stream system plus a portion of the natural flow (19 c.f.s. 1st priority) is diverted into the Parrott Ditch. According to the court "Memorandum and Order" dated May 10, 1949 the full natural flow entitlement of the users below Parrott Dam must be provided at all times without undue fluctuations caused by the intermittent presence of foreign water. In order to better accomplish this regulation a combination weir and orifice structure was placed at the head of the Parrott Ditch.

This structure was regulated so that, during the periods of daily low flow (i.e. when no foreign water is present) the natural flow entitlement of the Parrott Ditch passed through the orifice. During periods of high flow, caused by the release of foreign water from storage.

the water level behind Parrott Dam would raise and a major portion of the foreign water would pass over the weir into the Parrott Ditch.

At all times the full natural flow entitlement of the users below Parrott Dam passed through an orifice in the dam. The increased head on this orifice during the periods of high flow caused a mean daily average of about 10 cubic feet per second in excess of the entitlements to pass the dam.

U. S. Plant Garden Pump

The Plant Garden Pump, rated at 1,000 g.p.m., operated approximately six hours a day, five days a week throughout the 1950 season. This represents a use considerably less than their entitlement (2.0 c.f.s. 1st priority) and consequently no regulation of this diversion was attempted.

Compton-Entler-Marybill Diversion and the Upper Colony Diversion

These two diversions are located on opposite sides of Butte Creek immediately behind the Upper Colony Dam. This dam which is about 120 feet long was maintained at a height of approximately 16 inches.

The foreign water passing the Parrott Dam caused very little fluctuation in the above named diversions because of the long crest of the Upper Colony Dam. Such fluctuations amounted to approximately one cubic foot per second between "high" and "low" flow in the Compton-Entler-Marybill diversion and less than three cubic feet per second in the Upper Colony Ditch.

The Compton-Entler-Marybill Ditch was regulated to divert its total 1st priority allotment of 10 cubic feet per second on June 15. This regulation was reduced on August 9, to 9 cubic feet per second and remained unchanged throughout the 1950 season.

The Durham Mutual Water Company elected to receive approximately 60 per cent of their allotment through the Upper Colony Ditch. The remainder of this entitlement plus the entitlements of the Van Nuys, Wakefield and Baxter pumps were passed over and through the Upper Colony Dam along with the foreign water which had passed Parrott Dam.

Van Nuys, Wakefield and Baxter Pumps

These pumps, located between the Upper and Lower Colony Dams have an aggregate total first priority entitlement allotment of 4.61 cubic feet per second. A recorder was maintained during a portion of the season below the Upper Colony Dam and another above the Lower Colony Dam in order to obtain a record of diversion of these pumps. It was determined that these pumps operated largely during the daylight hours and diverted an average amount somewhat less than their continuous flow allotment and therefore no regulation of these diversions was attempted.

Lower Colony Diversion

The Lower Colony Dam was maintained at a height of about three and one-half feet thus providing considerable storage in the rather flat channel behind the dam. The Lower Colony headgates were regulated to provide the Durham Mutual Water Company with the remainder of its entitlement until September 20, when the irrigation requirements were so reduced that Lower Colony headgate was closed.

Occasionally, for short periods of time, the flow reaching the Lower Colony Dam was less than the full entitlement due to the pumps upstream diverting an amount in excess of their continuous flow allotments. During such periods it was necessary to draw from the storage behind Lower

Colony Dam in order to provide the Lower Colony Ditch with the remainder of its entitlement. This storage was recharged during the night when the pumps were not operating.

The foreign water passing Parrott Dam caused an average fluctuation of about three cubic feet per second between "high" and "low" flow in the Lower Colony Ditch.

A daily mean of approximately six cubic feet per second of the foreign water passed below the Lower Colony Dam and was picked up at the Adam's Dam for use on the lands of E. L. Adams.

A comparison of the total entitlement to the amount diverted by the Durham Land Colony, is set forth in Table 10 and is also shown graphically on Plate III.

SUMMARY

The requirements set forth in the court "Memorandum and Order" dated May 10, 1949 were complied with during the 1950 season and such compliance resulted in a loss to the Parrott and M. & T. Corporation and the Dayton Mutual Water Company of approximately 10 second-feet of the foreign water present in the Butte Creek stream system. The facilities available for handling the foreign water at the Parrott Diversion are not adequate for a more satisfactory distribution of this water.

The method of operation during 1950 varied from the methods practiced during previous years in that the "weir-orifice" structure installed at the head of the Parrott Ditch had not been previously used. The use of this structure represents an improvement over previously practiced methods of distribution as it aided materially in leveling the flow of Butte Creek below

Parrott Dam.

The hydrographs on Plates 1, 2 and 3 show the daily mean flow of Butte Creek at the U.S.G.S. station, Butte Creek below the Parrott Ditch, Parrott Ditch and combined diversion by the Upper and Lower Colony Ditches together with minimum daily flows and entitlements at all except the U.S.G.S. station.

CHANGES IN OWNERSHIP OF LANDS AND WATER RIGHTS

No changes in ownership of lands and water rights occurred subsequent to filing "Statement for Butte Creek Watermaster Service Area, County of Butte, State of California, for 1950".

TABLE 1

PRECIPITATION - CHICO, BUTTE COUNTY
Elevation 189 Feet

Month	Mean Precipitation (80 Yr. record) Inches	Precipitation 1949-1950 Inches	1949-1950 Per cent of Total Mean
October	1.27	.00	0.0 %
November	2.69	.93	3.8 %
December	4.53	1.51	6.2 %
January	4.86	5.64	23.2 %
February	4.25	4.76	19.5 %
March	3.15	2.31	9.5 %
April	1.76	1.65	6.8 %
May	.99	.83	3.4 %
June	.31	.22	.9 %
July	.02	.00	0.0 %
August	.02	.35	1.4 %
September	.50	.46	1.9 %
Total	24.35	18.66	76.6 %

TABLE 2

BUTTE CREEK NEAR CHICO, CALIFORNIA
October 1, 1949 to September 30, 1950

Daily Discharge in Cubic Feet per Second

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	100	87	105	105	158	390	566	668	337	162	111	111
2	94	100	122	122	155	380	579	689	318	156	127	113
3	100	87	102	87	175	360	566	612	304	159	124	108
4	92	87	87	97	2,810	350	522	560	277	156	144	113
5	100	97	110	100	3,750	400	540	546	277	147	127	116
6	100	92	102	92	3,800	450	865	534	269	147	116	108
7	100	92	119	102	1,400	400	969	498	269	141	130	113
8	90	90	105	122	872	380	1,140	469	256	135	127	116
9	92	213	110	119	668	360	962	469	252	122	119	116
10	92	278	100	155	710	340	812	463	236	153	122	98
11	97	185	102	116	619	320	752	446	252	122	119	132
12	94	136	100	116	522	310	745	469	244	132	124	119
13	97	113	92	127	463	310	858	480	244	141	103	122
14	87	116	97	158	435	300	752	504	265	127	130	116
15	90	116	113	119	435	300	717	522	248	119	119	116
16	87	116	105	223	486	300	710	516	248	113	116	116
17	87	113	171	747	469	350	696	516	218	119	116	122
18	92	110	152	886	435	446	717	504	206	122	106	132
19	108	116	178	435	419	829	731	480	206	122	111	138
20	97	113	110	326	424	812	760	480	199	119	98	116
21	100	108	127	859	376	626	798	469	192	124	116	111
22	92	102	113	827	366	943	820	480	189	106	106	108
23	90	108	108	828	392	805	775	480	189	89	111	116
24	100	108	102	578	366	858	724	474	189	124	113	113
25	90	108	110	349	413	858	689	463	189	94	113	119
26	92	108	97	266	400	724	682	435	185	106	113	113
27	92	108	110	239	400	689	689	413	179	113	113	116
28	94	108	100	274	400	640	654	403	179	108	113	111
29	94	116	102	231		592	605	376	172	103	108	108
30	87	100	100	206		560	586	361	168	103	108	116
31	92	[illegible]	100	185	—	572	—	351	—	116	113	—
Totals	2,919	*3,531	*3,451	*9,196	*22,318	*15,954	*21,981	*15,130	*6,956	* 3,900	*3,616	*3,472
Mean	94.2	118	111	297	797	515	733	488	232	126	117	116
Acre feet	5,790	7,000	6,840	18,240	44,270	31,640	43,600	30,010	13,800	7,740	7,170	6,890

Total acre-feet - 223,000

* Total - 112,424

TABLE 3

Daily Discharge in Cubic Feet Per Second
HENDRICKS CANAL
JUNE 9 TO SEPTEMBER 25, 1950

Day	June	July	August	September
1		58	49	45
2		56	49	46
3		55	47	47
4		52	46	47
5		52	47	45
6		52	47	46
7		50	47	46
8		48	47	45
9	63	46	45	46
10	64	47	45	46
11	65	40	45	45
12	65	39	45	47
13	66	42	46	47
14	65	41	45	47
15	65	40	45	47
16	65	39	44	48
17	64	38	40	46
18	65	36	45	50
19	65	35	45	43
20	63	33	40	46
21	62	33	38	46
22	61	29	45	48
23	61	28	46	47
24	63	27	44	47
25	62	26	46	47
26	61	32	46	
27	61	37	47	
28	61	33	46	
29	59	32	41	
30	58	33	39	
31		31	40	
Total Sec. Ft. Days	1,384	1,240	1,387	1,160
Mean Sec. Ft.	63	40	45	46
Total Ac. Ft.	2,746	2,460	2,752	2,301

Total discharge 109-day period - 10,259 acre-feet.

TABLE 4

Daily Discharge in Cubic Feet Per Second
PARROTT DITCH
JUNE 6 TO SEPTEMBER 27, 1950

Day	June	July	August	September
1		60	35	49
2		59	43	49
3		57	46	48
4		53	59	51
5		49	53	50
6	119	65	46	47
7	120	39	48	50
8	118	35	51	57
9	115	38	39	55
10	113	43	44	41
11	122	49	44	62
12	116	44	50	52
13	115	56	37	53
14	120	51	50	51
15	117	38	48	51
16	120	43	48	52
17	103	47	47	53
18	100	39	47	65
19	97	46	42	49
20	92	45	38	31
21	93	52	50	21
22	85	29	47	16
23	81	26	41	16
24	79	37	44	16
25	79	33	43	16
26	73	35	45	16
27	69	37	46	16
28	73	40	47	
29	71	34	46	
30	67	32	47	
31		37	48	
Total Sec. Ft. Days	2,457	1,348	1,419	1,133
Mean Sec. Ft.	98	43	46	42
Total Ac. Ft.	4,874	2,674	2,815	2,248

Total discharge 114-day period - 12,611 acre-feet

TABLE 5

Daily Discharge in Cubic Feet Per Second
BUTTE CREEK BELOW PARROTT DITCH
JUNE 5 TO SEPTEMBER 26, 1950

Day	June	July	August	September
1		97	68	58
2		95	64	57
3		97	69	58
4		99	72	56
5	122	100	69	56
6	122	100	64	55
7	120	98	70	55
8	121	98	70	57
9	122	93	68	58
10	123	88	68	57
11	122	82	68	60
12	118	83	68	57
13	118	86	64	58
14	124	83	67	58
15	118	79	67	58
16	118	75	66	57
17	103	77	61	59
18	98	70	62	67
19	100	71	63	89
20	87	70	60	88
21	89	74	61	79
22	91	70	63	87
23	89	61	65	86
24	93	69	65	84
25	93	69	60	77
26	93	68	60	80
27	91	69	61	
28	91	70	61	
29	89	67	58	
30	93	66	59	
31		70	58	
Total Sec. Ft. Days	2,449	2,494	1,999	1,711
Mean Sec. Ft.	94	80	64	66
Total Ac. Ft.	4,858	4,947	3,965	3,394

Total discharge 114-day period - 17,164 acre-feet

TABLE 6

Daily Discharge in Cubic Feet Per Second
UPPER COLONY DITCH
JUNE 5 TO SEPTEMBER 28, 1950

Day	June	July	August	September
1		40	34	27
2		39	35	27
3		39	35	27
4		39	35	27
5	48	39	35	27
6	47	39	35	27
7	47	39	35	27
8	47	41	35	27
9	47	40	34	27
10	47	40	34	26
11	47	39	35	26
12	47	37	35	26
13	42	37	35	26
14	43	37	35	26
15	50	37	35	26
16	45	37	34	26
17	47	37	32	26
18	43	36	33	27
19	43	35	31	27
20	38	34	31	27
21	44	33	31	27
22	44	34	31	27
23	43	33	31	27
24	42	34	29	27
25	41	34	26	27
26	39	34	27	27
27	39	34	27	27
28	39	33	27	27
29	38	33	27	
30	40	33	26	
31		33	27	
Total Sec. Ft. Days	1,107	1,129	992	748
Mean Sec. Ft.	43	36	32	27
Total Ac. Ft.	2,196	2,239	1,967	1,483

Total Discharge 116-day period - 7,885 acre-feet

TABLE 7

Daily Discharge in Cubic Feet Per Second
BUTTE CREEK ABOVE LOWER COLONY DAM
JUNE 21 TO SEPTEMBER 27, 1950

Day	June	July	August	September
1		39	17	19
2		39	17	19
3		34	22	20
4		40	27	20
5		33	27	22
6		33	27	22
7		29	20	18
8		28	22	17
9		25	22	21
10		24	22	20
11		24	22	17
12		22	23	16
13		28	24	18
14		27	24	16
15		27	22	16
16		27	22	19
17		24	17	23
18		22	20	27
19		22	20	36
20		20	21	38
21	35	23	22	40
22	36	22	20	42
23	38	20	19	40
24	40	17	20	42
25	43	17	24	39
26	42	17	27	40
27	42	17	27	40
28	43	20	24	
29	42	21	24	
30	40	19	23	
31		17	20	
Total Sec. Ft. Days	401	777	688	707
Mean Sec. Ft.	40	25	22	26
Total Ac. Ft.	795	1,542	1,364	1,402

Total discharge 99-day period - 5,103 acre-feet

TABLE 8

Daily Discharge in Cubic Feet Per Second
LOWER COLONY DITCH
JUNE 5 TO SEPTEMBER 28, 1950

Day	June	July	August	September
1		*22	17	17
2		*20	15	17
3		*20	16	17
4		*20	17	17
5	*39	*21	17	17
6	*18	*20	17	17
7	*21	*22	15	17
8	*22	*20	16	17
9	*23	*21	16	17
10	*24	*21	16	18
11	*24	*20	17	**14
12	*26	*21	17	**11
13	*29	*20	17	**15
14	*27	*20	14	16
15	*27	*20	16	16
16	*30	*20	12	16
17	*28	*20	14	16
18	*26	*20	15	13
19	*25	*19	17	13
20	*22	*18	17	**10
21	*19	*20	17	**10
22	*25	*19	17	** 0
23	*20	*18	17	** 0
24	*21	*17	18	** 0
25	*21	*17	18	** 0
26	*23	*17	18	** 0
27	*22	*17	18	** 0
28	*22	18	17	** 0
29	*23	18	17	
30	*20	17	17	
31		17	17	
Total Sec. Ft. Days	627	600	509	321
Mean Sec. Ft.	24	19	16	12
Total Ac. Ft.	1,244	1,190	1,009	637

Total discharge 116-day period - 4,080 acre-feet.
* Estimates and Spot Measurements
** Flow reduced to this amount at the request of the water users.

TABLE 9

Combined Daily Discharge
UPPER AND LOWER COLONY DITCHES
JUNE 5 TO SEPTEMBER 28, 1950

Day	June	July	August	September
1		62	51	44
2		59	50	44
3		59	51	44
4		59	52	44
5	87	60	52	44
6	65	59	52	44
7	68	61	50	44
8	69	61	51	44
9	70	61	50	44
10	71	61	50	44
11	71	59	52	40
12	73	56	52	37
13	71	57	52	41
14	70	57	49	42
15	77	57	51	42
16	75	57	46	42
17	75	57	46	42
18	69	56	48	40
19	68	54	48	40
20	60	52	48	*37
21	63	53	48	*37
22	69	53	48	*27
23	63	51	48	*27
24	63	51	47	*27
25	62	51	44	*27
26	62	51	45	*27
27	61	51	45	*27
28	61	51	44	*27
29	61	51	44	
30	60	50	43	
31		50	44	
Total Sec. Ft. Days	1,734	1,729	1,501	1,069
Mean Sec. Ft.	67	55	48	39
Total Ac. Ft.	3,440	3,429	2,976	2,120

Total discharge 116-day period - 11,965 acre-feet
*Flow reduced to this amount at request of water user.

TABLE 10

COMPARISON OF DELIVERIES OF WATER FROM BUTTE CREEK TO ENTITLEMENTS
JUNE 1950

(All figures indicate cubic feet per second)

Day	Flow at U.S.G.S. Station	Flow in Hendricks Canal	Hendricks Canal less 5%	Natural flow of Butte Cr.	Butte Creek Below Parrott Dam: Nat. Flow Entitlement	Butte Creek Below Parrott Dam: Flow Delivered	Parrott Ditch: Nat. Flow Entitlement	Parrott Ditch: Total Entitlement	Parrott Ditch: Flow Delivered	Durham Colony Ditches: Nat. Flow Entitlement	Durham Colony Ditches: Flow Delivered
1	337										
2	318										
3	304										
4	277										
5	277					122					87
6	269					122			119		65
7	269					120			120		68
8	256					121			118		69
9	252	63	61 (3 day mean)	186 (3 day mean)	123 (3 day mean)	122	63 (3 day mean)	124 (3 day mean)	115	51.25 (3 day mean)	70
10	236	64				123			113		71
11	252	65				122			122		71
12	244	65				118			116		73
13	244	66				118			115		74
14	265	65				124			120		70
15	248	65	62 (7 day mean)	177 (7 day mean)	123 (7 day mean)	118	54 (7 day mean)	116 (7 day mean)	117	51.25 (7 day mean)	77
16	248	65				118			120		75
17	218	64				103			103		75
18	206	65				98			100		69
19	206	65				100			97		68
20	199	63				87			92		60
21	192	62				89			93		63
22	189	61	59 (7 day mean)	134 (7 day mean)	115 (7 day mean)	91	19 (7 day mean)	78 (7 day mean)	85	51.25 (7 day mean)	69
23	189	61				89			81		63
24	189	63				93			79		63
25	189	62				93			79		62
26	185	61				93			73		62
27	179	61				91			69		61
28	179	61				91			73		61
29	172	59	56 (7 day mean)	116 (7 day mean)	97 (7 day mean)	89	19 (7 day mean)	75 (7 day mean)	71	51.25 (7 day mean)	61
30	168	58				93			67		60

TABLE 10 (Cont'd.)

COMPARISON OF DELIVERIES OF WATER FROM BUTTE CREEK TO ENTITLEMENTS
JULY 1950

(all figures indicate cubic feet per second)

Day	Flow at U.S.G.S. Station	Flow in Hendricks Canal	Hendricks Canal less 5%	Natural flow of Butte Cr.	Butte Creek Below Parrott Dam: Nat. Flow Entitlement	Butte Creek Below Parrott Dam: Flow Delivered	Parrott Ditch: Nat. Flow Entitlement	Parrott Ditch: Total Entitlement	Parrott Ditch: Flow Delivered	Durham Colony Ditches: Nat. Flow Entitlement	Durham Colony Ditches: Flow Delivered
1	162	58				97			60		62
2	156	56				95			59		59
3	159	55				97			57		59
4	156	52				99			53		59
5	147	52				100			49		60
6	147	52	48.5	95.5	76.5	100	19	67.5	65	51.25	59
7	141	50				98			39		61
8	135	48				98			35		61
9	122	46				93			38		61
10	153	47				88			43		61
11	122	40				82			49		59
12	132	39				83			44		56
13	141	42	39	90	71	86	19	58	56	51.25	57
14	127	41				83			51		57
15	119	40				79			38		57
16	113	39				75			43		57
17	119	38				77			47		57
18	122	36				70			39		56
19	122	35				71			46		54
20	119	33	32	83	65	70	18	50	45	48.5	52
21	124	33				74			52		53
22	106	29				70			29		53
23	89	28				61			26		51
24	124	27				69			37		51
25	94	26				69			33		51
26	106	32				68			35		51
27	113	37	30	77	60.4	69	17	47	37	45	51
28	108	33				70			40		51
29	103	32				67			34		51
30	103	33				66			32		50
31	116	31				70			37		50

(7 day mean)

TABLE 10 (Cont'd.)

COMPARISON OF DELIVERIES OF WATER FROM BUTTE CREEK TO ENTITLEMENTS
AUGUST 1950

(all figures indicate cubic feet per second)

Day	Flow at U.S.G.S. Station	Flow in Hendricks Canal	Hendricks Canal less 5%	Natural flow of Butte Cr.	Butte Creek Below Parrott Dam: Nat. Flow Entitlement	Butte Creek Below Parrott Dam: Flow Delivered	Parrott Ditch: Nat. Flow Entitlement	Parrott Ditch: Total Entitlement	Parrott Ditch: Flow Delivered	Durham Colony Ditches: Nat. Flow Entitlement	Durham Colony Ditches: Flow Delivered
1	111	49				68			35		51
2	127	49				64			43		50
3	124	47				69			46		51
4	144	46	43	81	63.5	72	17.5	60.5	59	47	52
5	127	47				69			53		52
6	116	47				64			46		52
7	130	47				70			48		50
8	127	47				70			51		51
9	119	45	44	76	59.5	68	16.5	60.5	39	44.2	50
10	122	45				68			44		50
11	119	45				68			44		52
12	124	45				68			50		52
13	103	46				64			37		52
14	130	45				67			50		49
15	119	45				67			48		51
16	116	44				66			48		46
17	116	40	41	73	57	61	16	57	47	42.5	46
18	106	45				62			47		48
19	111	45				63			42		48
20	98	40				60			38		48
21	116	38				61			50		48
22	106	45				63			47		48
23	111	46				65			41		48
24	113	44	42	70	55	65	15	57	44	41	47
25	113	46				60			43		44
26	113	46				60			45		45
27	113	47				61			46		45
28	113	46				61			47		44
29	108	41				58			46		44
30	108	39				59			47		43
31	113	40				58			48		44

(7 day mean)

TABLE 10 (Cont'd.)

COMPARISON OF DELIVERIES OF WATER FROM BUTTE CREEK TO ENTITLEMENTS
SEPTEMBER 1950

(all figures indicate cubic feet per second)

Day	Flow at U.S.G.S. Station	Flow in Hendricks Canal	Hendricks Canal less 5%	Natural flow of Butte Cr.	Butte Creek Below Parrott Dam: Nat. Flow Entitlement	Butte Creek Below Parrott Dam: Flow Delivered	Parrott Ditch: Nat. Flow Entitlement	Parrott Ditch: Total Entitlement	Parrott Ditch: Flow Delivered	Durham Colony Ditches: Nat. Flow Entitlement	Durham Colony Ditches: Flow Delivered
1	111	45	(7 day mean) 41	(7 day mean) 69	(7 day mean) 54	58	(7 day mean) 15	(7 day mean) 56	49	(7 day mean) 40	44
2	113	46				57			49		44
3	108	47				58			48		44
4	113	47	(7 day mean) 44	(7 day mean) 67	(7 day mean) 52.5	56	(7 day mean) 14.5	(7 day mean) 58.5	51	(7 day mean) 39	44
5	116	45				56			50		44
6	108	46				55			47		44
7	113	46				55			50		44
8	116	45				57			57		44
9	116	46				58			55		44
10	98	46				57			41		44
11	132	45	(7 day mean) 45	(7 day mean) 75	(7 day mean) 59	60	(7 day mean) 16	(7 day mean) 60.5	62	(7 day mean) 44	*40
12	119	47				57			52		*37
13	122	47				58			53		*41
14	116	47				58			51		42
15	116	47				58			51		42
16	116	48				57			52		42
17	122	46				59			53		42
18	132	50	(7 day mean) 45	(7 day mean) 74	(7 day mean) 58	67	(7 day mean) 16	(7 day mean) 61	65	(7 day mean) 43	40
19	138	43				89			49		40
20	116	46				88			31		*37
21	111	46				79			21		*37
22	108	48				87			16		*27
23	116	47				86			16		*27
24	113	47				84			16		*27
25	119	47				77			16		*27
26	113					80			16		*27
27	116								16		*27
28	111										*27
29	108										*27
30	116										

* Reduced at request of Durham Colony.

PLATE I

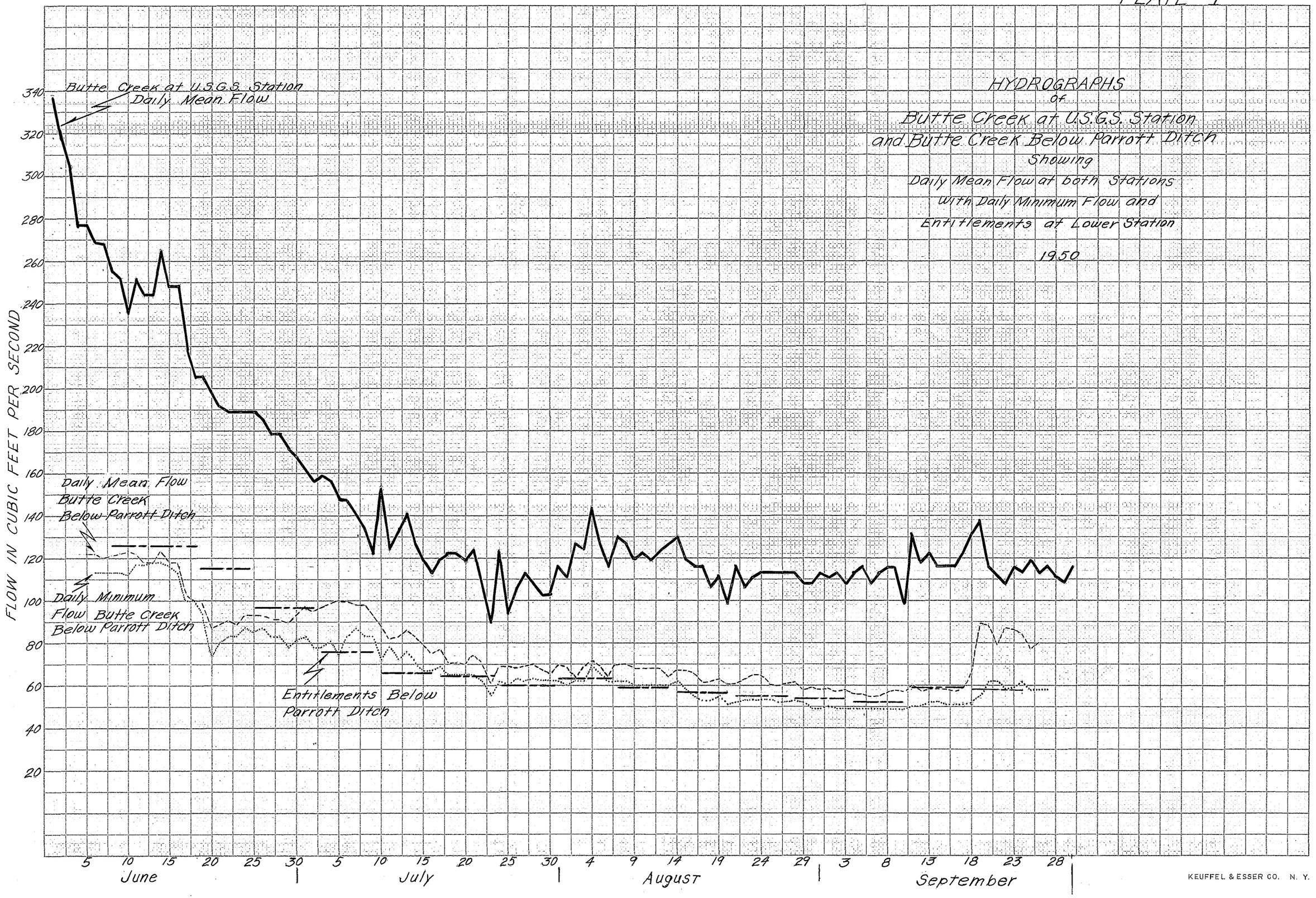

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PLATE II

HYDROGRAPHS of PARROTT DITCH

Showing Daily Mean, Daily Maximum and Daily Minimum Flows With Total & Natural Flow Entitlements

1950

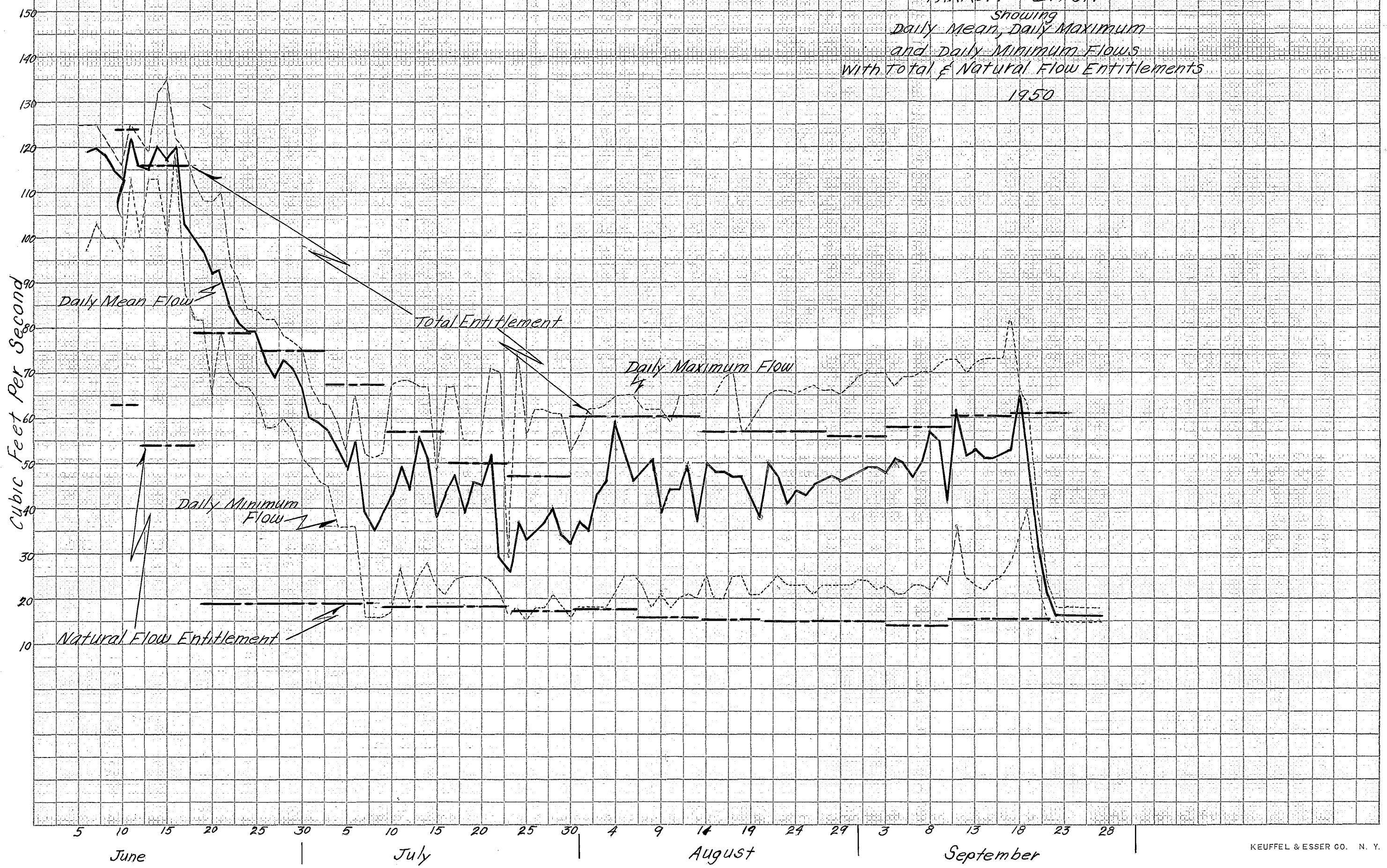

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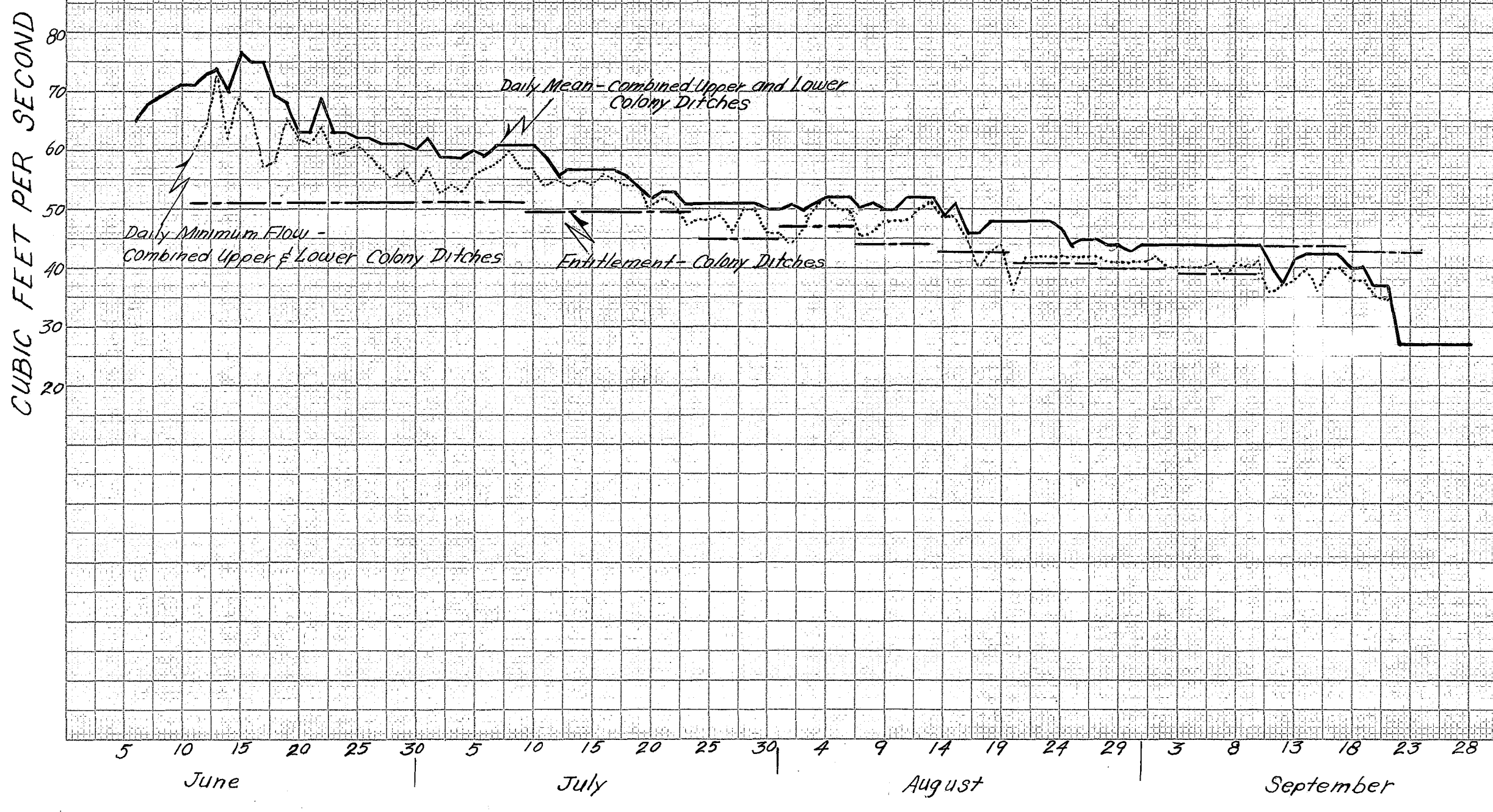
PLATE III

HYDROGRAPHS of COMBINED FLOW UPPER & LOWER COLONY DITCHES

Showing Daily Mean and Daily Minimum Flows and Entitlements of the Colony Ditches

1950



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