<u>1957</u> ANNUAL REPORT

A. RALPH OWENS, DIVISION ENGINEER Irrigation Division No. 1

Mr. J. E. Whitten, State Engineer State of Colorado State Capitol Building Denver, Colorado

Dear Mr. Whitten:

I hereby present the Annual Report of the Office of Division Engineer of Irrigation Division No. 1, for the year 1957.

Weather-wise, the year has been one of surprise. Precipitation and soil moisture deficient for several years continued so until April when amounts ranging from 1.50 inches at Sterling to 6.85 inches at Boulder were recorded. These amounts were exceeded during May, ranging from 4.49 inches at Sterling to 9.27 inches at Boulder. The snowpack in our mountain areas normally diminishes during April, but this year continued to increase through April and May. Due to cool weather, the snow melt was slow, permitting the many "off channel" reservoirs to fill - Maximum storage being reached about July 1st when reports from the water commissioners gave a total of 1,163,500 acre feet. Storage May 1st for all purposes was 665,000 acre feet, deducting municipal and Colorado Big Thompson storage, left a balance of 362,000 acre feet which was 74% of the average for this date. November 1st total 888,000 acre feet - Of this amount, 470,000 is for irrigation, or 240% of the average carry-over.

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Probably the best yardstick of the water supply of this basin is the "date of water call". The most senior being to supply 1885 priority in Water District No. 2 - this existed but a short time. For several short periods, Water District No. 1 called water junior to 1888. However, for the greater part of the season "No Demand" was made on upstream areas. It is difficult to think back to 1956 when for only brief periods, water rights junior to 1871 were supplied.

The excellent water supply is reflected by the crops which are much above normal; this is particularly true of the Henrylynn and Riverside Irrigation Districts and all of South Park which have been well nigh "ham strung" for several years. The past six weeks of cool moist weather have hampered sugar beet and corn for grain harvests. Any considerable amount of snow and cold weather would cause a heavy loss on the sugar beet crop.

Return flow is very much better than a year ago. The index station for this is the flow at Kersey - November 1956 average was 367 c.f.s. - Measurements late October and early November indicate that the average November flow will be 1050 c.f.s. By about January 1st when reservoirs will all be filled to safe levels, the flow at Kersey will probably exceed 1500 c.f.s. and at Julesburg, 2000 c.f.s.

No reservoir dams were lost this year, though they were filled to capacity for a longer than normal period. Several were in danger and might well have been lost with considerable damage to property, if not life. Promptly lowering the water level is believed to have saved two.

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The third probably was saved by virtue of a heavy dam, as the capacity of the outlet pipe is too small to lower the water level rapidly.

The City of Colorado Springs placed the sealer face on Montgomery reservoir dam this fall, completing that unit of their Hoosier Pass transmountain system. This dam is entirely of loose rock which passes water freely. The sealing face consists of a 12 inch blanket of asphaltic concrete.

The Trans-mountain diversions this season were curtailed during the period of maximum runoff due to lack of need for immediate use and lack of storage space for later use. The total diverted to the basin was 281,324 acre feet. Of this amount, the Colorado Big Thompson Project was responsible for 192,200 acre feet and the City of Denver, 51,000 acre feet.

The controversy over stock water dams continues. One on Beaver Creek in Water District No. 1 was removed during the season, and after the close of the season some channel work was done with a dragline. Several dams (not stock) remain. A meeting, sponsored by the Soil Conservation Service, was held at Anton during the summer at which time our position on this matter was outlined to the farmers. It is hoped that this will bear fruit with farmers and Soil Conservation Service men in that area. Two small dams on Box Elder Creek in Water District No. 1 were also removed because they interfered with irrigation rights.

The long continued controversy between Colorado and Wyoming users of the waters of the Laramie River were finally resolved. Under the new agreement or compact, Colorado has gained approximately 10,000 acre feet annually. The figures now are:

- 3 -

Trans-mountain diversion from the Laramie River..19,875 acre ft. Divertible to Colorado meadow land before July 31st..27,700 " " " " " " " after " .. 1,800 " " For the 4,845 acres of meadow land, the per acre diversions reduce to: 5.7172 prior to July 31st and 0.3715 after July 31st

Confirmation of this negotiated compact was obtained in time to operate under it this season. Water was so plentiful in Wyoming this year that no complaints were received about our refusal to charge natural overflow water against the ranchers' allotments.

The flow of Sand Creek was so heavy that Wyoming water users made no complaints.

The administration of the Big Thompson Project water, the amounts delivered to the several stream systems, and the problems encountered therewith will be contained in the report of Special Deputy State Engineer, C. E. Schnurr.

Tabulations of Water Commissioners' Annual Reports, Amounts of Water in Storage, Totals of Trans-Mountain Diversions and Amounts Diverted by the several users from the Laramie River and Tributaries accompany and form a part of this report.

Respectfully submitted,

& Quend

Division Engineer Irrigation Division No. 1

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Name of Diversion	From Dist.	To Dist.	Source of Supply	Diverted Acre Ft.	Totals Ac.Ft.
Boreas Pass	36	8	Blue River	462	
*Hoosier Pass	36	10	17 17	7,025 *	7,487
Berthoud Pass	51	7-2	Colo. River	566	
Moffat Tunnel	51	6-7-8	11 11	46,400	
Wms.Fork Tun.	51	7-8	n n	4,641	
Adams Tunnel	51		11 11	192,200	
Eureka Ditch	51	4	11 ft	124	
Grand River D.	51	3	11 · 11	15,980	259,911
Cameron Pass D	• 47	3	Michigan River	63	
Michigan Ditch	47	3	11 11	1,079	1,142
Wilson Supply (Sand Creek)	48	3	Sand Creek	923	923
J Deadman Ditch	48	.3	Laramie River	360	
Laramie Poudre Tunnel	48	3	SE 59	15,047	
Skyline Ditch	48	3	17 TT	3,479	
Columbine Ditc	h 48	3	ft 11	0	
Bob Creek Ditc	h 48	3	11 11	0	
Lost Lake Ditc	h 48	3	TI 11	0	18,886
			Grand Total		281.324

TRANS-MOUNTAIN DIVERSIONS

* Not included in Grand Total

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Din V	ision #1	Aore	Ft. in Stor	age lat of h	ionth		19_ <u>57</u>	
Dist.	Uee	June 1	July 1	August 7	September 1	October 1	November 1	T
1	Dist. Irrig.	141,699	140,958	123,651	79,268	47,873	66,163	
	Big Thomp.					· · · · · · · · · · · · · · · · · · ·		
	Municipal		ا نه د منبع مراسط مرا					
	Total		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					
2							and a strength of the strength	
11	Dist. Irrig.	50,759	71,003	57.437	51,121	31,487	34,591.	
	Big Thomp.	· · · · · · · · · · · · · · · · · · ·				· · · · · · · · · · · · · · · · · · ·	a de la compansión de la c	
	Municipal	· •	en e			، ، ، ، به هریا به اهت		
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	Dist. Irrig.	131,032	162,649	148,261	115,097	100.855	121,030	
	Big Thomp.	127,412	136,225	128,270	104,160	84.389	77.574	
3	Impicipal	6,147	8,470	8,154	8,027	6.642	6.642	
	Total	264.591	307.344	284.685	227.281	191.886	205.246	
								1877
	Dist. Irrig.	109.146	117.240	97.932	93.764	80.587	80 587	
2	Rig Thom	83.489	93,805	93,805	80.798	63 786	60 200	-
	hunicipal							
	Total	192.635	211.045	191.737	173.962	152 372	110 797	
i k								
	Dist Treia	31. 775	36 00.	25 001	20 LOF	00 700	00.00	-
Ψ,	Rig Them	243 (42		375754	JU,007	. 2022	20,441	
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	LOVAL							* * * * * *
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	Big Thomas		E 005	5400	50,60/	~ ~7,000	27,109	
	bug inomp.	25 1.50	1, 2,205	12 516	17,113	5,779	7,265	
enti in internetti int	Total	58,889	84.686	81,534	83.380	40,990	47,078	
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°1 ≤≰	The set	30 007	20,000	20 262	01 KIE			
	MTAC. ILLIR.	10,007	10,000	27,203	22,021	22,000	24, /01	
i ni i	for al	٥ <u>دلومل</u>	10,710	11,795	26 550	11,692	9,641	-
	Change Canal	42,142	40,110	7 444 9 29	10,004	3/4.3/42	32,412	- [
5	Warteinel	10 100	10.003	2,071	4,270	4,000	4,391	
	Autorpar	1(1109		1.232	17,444	17.444	15,062	- f i
(9	N A T A	0.053	0.000					
n	bist irrig.	8,971	8,700	7,931	7,613	6,800	6,956	·∤ · e€
	Nunicipal			a di gra	and the second s		المشيودين بالارا الم	· · · · .
	TOTAL			+	-	· · · · · · · · · · · · · · · · · · ·		19 2
2 3 .	<u>r</u>	e en el composition de la comp					· · · · ·	4
	Dist. Irrig.	00 (00	6,700	6,700	6,700	6,500	6,500	
	Nunicipal	ರ೭,೦೮೮	0,0,011	152,904	195,289	194,504	195,598	
	Total		123,350	189,604	201,989		202,098	+
64	· · · · · · · · · · · · · · · · · · ·	100 010	100 /07			e en a construction de la construcción de la construcción de la construcción de la construcción de la construcc		-
	Dist. Irrig.	109,347	122,037	113,107	76,188	50,427	66,624	
Tot	als							
•	Irrigation	644,120	731,012	653,635	:515,348	411,331	469,742	
· ·	Big Thomp.	215,867	235,235	227,697	190,071	153,954	145,039	
- 	Municipal	143,461	197,307	262,631	280,084	277,280	273,221	
	Grand Total	1,000,4440	<u>774 و 704 و 4</u>	191479703	700,077	044,707	000,002	

Division #1 Acre Ft. in Storage lat of Month

19<u>57</u>____

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	17.00	Dec. 1956	Jan. 1957	Feb. 1957	March 1957	April 1957	May 1957	2
	Diet Trrig	22.367	45,725	56,214	71,759	86,591	108,371	
	Rig Thoma				· .	, 1 ,	ې سرمېنې هم و وو د ا	
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2	A ¥ ¥@#							
	Dist Trria	7.755	12.445	16,697	16,697	17,304	30,367	
	Big Them	10122						
	Municimel							
	Total							-
· · · · · · · · · · · · · · · · · · ·								
·	Dist. Trrig.	21.553	29.157	32.168	36,193	40,054	54,307	
•	Big Thomas	1.5 802	56.820	69,660	83.907	101.407	119,342	
	Wunicipal	1,708	4.708	4,708	4,708	4,708	4,708	
	Total	75.063	90,685	106,536	124,808	146,169	178,357	4-14-14-14
1		1. 1. 1						
5 . P	Dist. Irrig.	19.373	22,459	22,531	23,034	24,145	43,183	
	Rig Thomas	30,323	40.816	50.161	65.885	75.177	80,083	1 2
	Municipal	ريدرونار						
	Total	49,696	63,275	72,692	88,919	99,322	123,266	;
								f · · ·
	Dist. Trrig.	7.227	9,085	11,119	13,034	14,071	24,333	
•	Big Thomp.		1				4	
	Nunicinal							
	Total							
		1						
	Dist. Trrig.	7.345	8,376	9,155	9,732	10,283	17,969	. (*)
· .	Big Thomp.	2,269	2,269	2,237	2,243	2,237	2,237	
	Wunicipal	14.164	13,660	13,236	13,203	9,983	6,294	1
	Total	23,778	24,305	24,618	25,178	22,503	26,500	
. 7								
	Dist. Irrig.	1,174	2,844	4,554	6,237	6,514	9,975	
	Nunicipal	9,572	8,827	6,226	14,097	4,676	9,304	
	Total	10,746	11,671	.10,780	10,334	11,190	19,279	-
8							a second second second	-
	Municipal	16,420	15,587	16,327	16,303	14,335	17.714	
. 9			,					
	Dist Irrig.						e e t	• • • •
	Municipal							
	Total	1,694	2,268	2,792	2,908	2,955	6,311	<u> </u>
2	3						- y	- and the second
	Dist. Irrig.	•						سر (ا
	Municipal	49,984	48,728	48,658	49,396	52,550	63,756	
	Total							ي مۇرىد بىل قېرىك
6.	4 1 1 1 1							
	Dist. Irrig.	10,749	27,110	38,379	51,565	55,780	67,266	
Ť	otals							
	Irrigation	102,237	159,469	193,609	253,833	257,697	362,082	
	Big Thomp.	78,394	99,905	122,058	152,035	178,821	201,662	; ; ;
	Municipal	78,428	91,510	89,155	87,707	86,252	101,776	
	Grand Total	259,059	350,884	404,822	493,575	522,770	065,520	

Year	May 1	November 1	May 1 in % of Normal	Nov. 1 % of Normal	
19 38	314,019	345,829	64	176	
1939	579,578	41,842	117	21	3055
1940	242,892	45,075	49	<u>AV-1938-</u> 22 May 1 -	493,431
1941	311,425	155,188	63	79 Nov.1 -	195,487
1942	533,002	350,255	108	179	
1943	628,397	161,921	127	88	
1944	563 ,588	132 ,258	114	68	
1945	456,907	348,079	97	178	
1946	509,884	162,197	103	88	
1947	522,501	307,760	106	157	
1948	598,680	151,688	121	78	
1949	435,006	259,855	88	132	
1950	507 ,8 47	117,058	103	60	
1951	404,734	286,460	82	141	
1952	674,975	244,932	136	125	
1953	637,992	198,884	129	101	
1954	541,842	90,554	110	49	
1955	413,533	118,939	84	60	
1956	295,334	44,039	60	22	
1957	362.082	469,742	74	240	

WATER IN STORAGE SOUTH PLATTE RIVER SYSTEM

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Irrigation Only -- Figures in Acre Feet

OFFICE OF STATE ENGINEER OF COLORADO Diversions from Laramie River and Tributaries - 1 9 5 7 -Recapitulation - Totals for Season

	Amount Diverted Day Second Feet	Amount Diverted Day Second Feet
Name of Ditch	to July 31st	After July 31st
Hiller - Boswell		
Stuck Nomen	612 1 7	0
warren	04 <i>)</i> •41	U
Mansfield & Enlg.		
Mansfield No. 2	735-24	64.46
	1990	04040
Forrester No. 1		
Grace Cr. & Enlg.	1,026.39	0.96
Detro No. 1		
Detro No. 2	1.1.0°	-
Lower La Garde	445.85	0
Jimmy Cr. (Net) La Garde minus Lower L.G.		
La Garge No. 1 Sobritan	916.19	٥
Schurcher	745+16	U
Yelton	323 • 48	0
Homestead No. 1 (Big Jenkins) Homestead No. 2 (Little Jenkins)		
Nellie	773.70	140.56
Martin No. 1 Martin No. 2 & Enlg. Wright	1,745.88	161.33
Brown - Nun Cr. Cabin Davy		
Forrester - Brown Cr. Stubb	799•79	32.00
Link No. 1 Link No. 2 Smith - Brown Cr.		
Upper Hills	528.84	18.35
Brown Porter Cr.	50.70	16.92
Lamb	470.16	12.93

Laramie River Diversions - Continued

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Name of Ditch	Amount Diverted Day Second Feet to July 31st	Amount Diverted Day Second Feet After July 31st
British Cr.		
Comet		
Homestead - McIntyre Cr.		
Lower Grant		
opper Grant		
Stuart No. 1.	105 31	
Stuart No. 2	485+34	28.48
Brinker		
McIntyre		
Pine Creek & Enlg.	304.72	0
Glendevey		
Talmadge	53 - 51	10 01
TOTAL CARE))•)±	L) +04
Lower Jim		
Trollope		
Ward No. 1		
Ward No. 2	544.82	0
· · · · · · · · · · · · · · · · · · ·		-
Jim minus Lower Jim		
Jim No. 2		
Lone Tree		
Ollie		
Timothy	1,165.93	215.37
		And the same of the same tax
Total Meadow Land Diversion	11 212 01	505 00
ICCAI MEAUOW MAIN DIVERSION	• 11, ~4,) • 74	705.20
Summer through Inla 21 Alletmon		
Total Diverted	t 11.263.96 day second t	feet on $\frac{27,700}{22,302}$ H
Total Unused balance		5 200 H
	Total	27 701 1
		• ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
Summary after July 31 - Allotmen	t	1800 A.F.
fotal Diverted		705.20 day safe
		1398.7 A.F.
Fotal Unused Balance		401.3 **
		1800 Acre Feet

WATER CONTAISSIONERS ANNUAL REPORTS

<u>1957</u>

ACRE FEET WATER USED

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Dist. No.	Direct Flow	Reservoir	Big Thompson Froject	Total	Acres Irrigated	First Day Used	last Day Used
-1	248,752	107,727		356,479	158,659	May 1	0ct 22
2	373,791	72 , 166	2,932	454,389	233,420	May 1	Oct 31
ę	328,293	87,983	51,449	467,730	265,840	May 5	Oct 31
4	163,170	20,772	768 67	213, 336	150,340	May 21	Oct 31
5	101,438	11,364	8,116	120,963	096 - 111	Mar 22	0ct 19
6	116,330	7,187	221	123,738	174,290	Apr 15	0ct 25
2	88,145			88,145	116 , 738	Feb 23	Nov 1
¢	135,592	550		136,142	18,574	Apr 10	0ct 21
. 6	25,865	1,443		27,308	15,471	Mar 22	Oct 31
23	141,197			761 ° 11	44,846	Mar 11	Aug 15 [°]
47*	386,000 Es	د ر د		386,000	128,556		
48	+ 23 , 701			23,701	4,845	May l	Nov 16
6 4	199,383	96,042		295,425	158,933	Feb 26	0et 31
65 _	17.081			17,081	8,320	Apr 27	Oct 30
Total 2	2,348,793	411,234	92,612	2,852,639	1,590,842		,

* No Water Commissioner Until September

ANNUAL REPORT FOR WATER YEAR 1957

SPECIAL DEPUTY STATE ENGINEER - LOVELAND OFFICE

NORTHERN COLORADO WATER CONSERVANCY AREA - IRRIGATION DIVISION NO. 1

The 1957 water year will, no doubt, be recorded as one of the best in the history of irrigation in this Northern Colorado Water Conservancy District area. The snow pack in the mountains during the winter months was much higher than normal and this, combined with an unusually high precipitation during the months of April and May, resulted in one of the highest stream runoff records for each of the streams in this area.

The peaks of precipitation and runoff occurred at the right time to enable all the reservoirs to fill (except those that had small inlets of had their inlets damaged by high water) which was the first time this had happened for several years. During the period of free water or no call by decrees below the mouth of the Big Thompson River, The Colorado-Big Thompson Project facilities stored a total of 11,166 day second feet or 22,150 acre-feet of Big Thompson River water:--11,480 acre-feet was stored in Carter Lake and 10,670 acre-feet was stored in Horsetooth Reservoir. There was very little holdover storage at the end of the 1956 irrigation season, but because of the situation as explained above, nearly all the reservoirs were filled by the beginning of this season. The peak runoff generally occurs between the first and fifteenth of June, but this year, it occurred on the last of June or the first part of July. This caused an unusually high runoff for the month of July and the first part of August which, without using storage water, took care of most irrigation demands by the various ditches.

Prior to this year, all original orders for "project" water went first to the water commissioners or Special Deputy State Engineer, thence to the Special Deputy State Engineer, thence to the Northern Colorado Water Conservancy District. However, this year, according to a directive issued by the State Engineer, the method was changed. All orders for "project" water by the various irrigation companies were given directly to the Northern Colorado Water Conservancy District. They were then given to the Special Deputy State Engineer, who then compiled and dispatched them to the various water commissioners within whose district said "project" water would be distributed. This was a good year to make this change because there were only about half as many ditches calling for "project" water as in previous years. There were no problems which could not or were not handled in a satisfactory manner. However, because of the small numbers of orders handled, the testing of this procedure could not be entirely conclusive. Since the procedure would be the same regardless of the number of orders, I see no reason for the results to be any different even with a maximum number of orders. There would be, of course, a noticeable increase in the amount of work and time involved for the Special Deputy State Engineer to process the maximum number of orders.

The above normal precipitation and high runoff caused some damage to irrigation facilities. Several irrigation ditch diversion dams along the St. Vrain Creek were out of service for a short time. However, by the time water was needed for irrigation, they had been either temporarily or permanently repaired. The greatest damage to lands and irrigation facilities occurred along the Little Thompson River and its tributaties. Maintenance was heavy along several of the irrigation ditches, especially where they were located along steep hillsides. The most expensive repairs of this type were to the Hansen Feeder Canal where not only cleaning of the rock slides was necessary but, also, the replacement of several feet of concrete lining.

There were 120,871.8 acre-feet of "project" water ordered for delivery to the water users within the District this year. The distribution to the various districts was as follows:

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DISTRIBUTION OF PRO	JECT WATER	ORDERED	FOR	THE	VARIOUS	WATER	DISTRICTS
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(Note: Quantities given are in acre-feet based on one second foot for 24 hours equals 2 acre-feet)

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Water District	Suppl y		Grand Total
No. 1			0.0
No. 2	Via Boulder Creek & Platte Valley Canal Via Big Thompson River by exchange	1,912.8 1,020	2,932.8
No. 3	Direct from proj. canals including replacement To Poudre River	2,478.4 76,675.4	79,153.8
No. 4	Via Hansen Feeder Canal direct Via St. Vrain Supply Canal direct To Little Thompson River To Big Thompson River	1,615.3 82.3 7,126.0 20,492.8	29 , 316.4
No. 5	To St. Vrain Creek direct Direct from project canals	6,318.0 2,151.0	8,469.0
No.6	To Boulder Creek Direct from project canals Total orders for 1957 season	639.8 360.0	<u> </u>

The amounts of water ordered and delivered each month by individuals and ditch companies in each district will be found in the tables at the end of this report.

In these tables, the amount of water ordered by the several ditch companies and individuals is not necessarily the same amount of water delivered to them, except where delivery is made direct from the "Project Canals". Where this is true, the ordered amount is considered, for all practical purposes, to be the delivered amount and these amounts are furnished by the Conservancy District. In the case where several ditch companies and individual users have their water delivered to a natural stream as a carrier, the total of all their orders is delivered to them at this common delivery point. Here the total of all orders is measured and a comparison or check is made of the total amount of water delivered. These figures are shown in the tables. The actual amount of water

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delivered, then, to each individual or ditch company, is administered by the water commissioner of each water district involved and would be the amount ordered less the carrying charge assessed. The carrying charges are variable depending upon several conditions. However, a basic carrying charge for each water district has been outlined by the State Engineer.

From November 1, 1956 to October 31, 1957, inclusive, there was delivered from the Colorado River, as measured through the 15-foot Parshall Flume at the East Portal of Adams Tunnel, 99,173.8 day second feet or 196,720 acre-feet. (This water was used for producing power by the U.S.B.R. The water was first taken through Mary's Lake and Estes Power plants and then discharged into the afterbay of the Estes Power plant, which is called Lake Estes, and here the water is mixed with the Big Thompson River water. Water from both the Big Thompson River and the "Project" is measured into and out of Lake Estes.

During this same period, 139,029.5 day second feet or 275,760 acre-feet of water were diverted from Lake Estes as measured through the measuring flume called Estes-Foothills Canal at West Portal near Estes Park. This amount includes 41,976 day second feet or 83,260 acre-feet of Big Thompson River water which was determined daily as "Operation Skim". Part of this was stored legally by the "Project" and the balance was returned to the Big Thompson River at the Big Thompson delivery point from the Hansen Feeder Canal.

The following is a summary of water in the Estes Park area. All values are in acrefeet, based on l c.f.s. x 1.983471, for the period of November 1, 1956 to October 31, 1957, inclusive:

339-950
5579750
338,583

Loss or Difference

1,367

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The next area in sequence is called the Carter Lake area. The same period is considered and values are also as before. The summary is as follows:

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275,760		
444		
1.830		
21,630		
· · · · · · · · · · · · · · · · · · ·		299.661
		-//9-04
84.274		
133,210		
17	217.501	
	, , , , , , , , , , , , , , , , , , ,	
7.250		
117		
1.820		
11,550	20.737	
		238,238
		67 1.06
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		1 ,2 26
	275,760 444 1,830 21,630 84,274 133,210 17 7,250 117 1,820 11,550	275,760 <u>444</u> 1,830 <u>21,630</u> 84,274 133,210 <u>17</u> 217,501 7,250 <u>117</u> 1,820 <u>11,550</u> <u>20,737</u>

The next area in sequence to the north is called the Horsetooth area. The same period is considered and values are also as in the other areas considered above. The summary is as follows:

INFLOW TO AREA From Hansen Feeder Canal less turnouts Storage - November 1, 1956	131,612 33,307	164 , 919
OUTFLOW FROM AREA		
20 ft. Parshall to Poudre River	64,970	
10 ft. Parshall to Poudre Valley Ditch	12,413	
Direct from Hansen Supply Canal	742.6	
Direct via Dixon Feeder Canal	866.8	
Replacement deliveries	869.0	79,861.4
Gain in Storage should be		85.057.6
Actual Gain		77,442.0
Loss in Area		7,615.6

The next area in sequence to the south is called Boulder Reservoir area. The same period is considered as in the other areas above and the values are in acre-feet based as above. The summary is as follows:

-5-

INFLOW TO AREA			
10 ft. Parshall Flume	4,807		
Boulder Reservoir storage - 11/1/56	2,126	6,933	
OUTFLOW FROM AREA		-	
Releases from Boulder Feeder Canal Turnouts To Boulder & Whiterock Ditch To Boulder Creek at 10 ft. Parshall To Dry Creek	194 360 2,723 166	3.443	
Storage should be		3,490	
Actual Storage Storage Should be Total GAIN in Area			7,365 3,490 3,875
IOUAL ONIN IN MICA			ر انور

SUMMARY	OF	<u>GAINS</u>	AND	LOSSES	OF	PROJECT	AREAS	LISTED	ABOVE
Est Car Hor	tes rtei rset	area r Lake tooth a	- area area	Loss - a - Loss - Loss	5 -	1 1 <u>7</u>	,367 ,226 ,615.6	0.5	008 6
								5 0 L	200.0
Boi	ılde	er Rese	ervoi	ir ar ea	- (Gain -		3,8	375.0

Overall Project - Loss -

After the "Project" water is released into Boulder Creek, that part of the water which is ordered by the Platte Valley Ditch Company for Water District No. 2 is picked up into the Lower Boulder Ditch, thence, through the Coal Ridge Extension Ditch to the Coal Ridge Waste Way Lake where it is stored and released to the South Platte River. The amounts of water measured into this Lake as measured through the 8-foot Parshall Flume are as follows:

6,333.6

	JUNE	JULY	AUGUST	SEPT.	OCT.	TOTALS
Day second feet	190.4	233 .7	65 5. 4	494.5	0	1 574
Acre-Feet	378	464	1300	981	0	3120
<u>Coal</u> Ri	dge <u>Waste</u> Lake Outl	<u>et at 8-fo</u>	oot Parshal	l Flume		
Day second feet	0	49.2	632 .6	443.8	97	1222.6
Acre-Feet	0	97.6	1250	880	192	2420

-6-

Without taking into consideration evaporation, seepage, and releases, the above figures show that there should be 700 acre-feet of storage in Coal Ridge Waste Way Lake as of November 1, 1957.

This is the third year for the diversion of Big Thompson water at Estes Park by the U.S.B.R. in what we call "Operation Skim". This year has probably established a record for some time for the amount of water used and the total number of days involved. "Skim" started on April 16 and operated continuously until September 26. There was no change in administrative procedures for this phase of the project for this year. There was, however, additional facilities provided by the Bureau which helped in the administration. The 15-foot Parshall Flumes above and below Lake Estes were increased in height so that a more accurate measurement could be made at high flows. The flumes will now measure up to approximately 850 second feet before the water flows over the top. This was a decided help this year, since the flows were this high or higher for a number of days. Even with the added facilities, the administration of this phase of the project takes a number of hours of extra work and requires a watchful eye twenty-four hours a day from the day it starts until the day it ends. The monthly diversions at Estes Park, as determined daily for "Operation Skim", are as follows:

	APRIL	MAY	JUNE	JULY	AUGUST	SEPT.	OCT.	TOTALS	
Day Sec. ft.	384	4,837	16,593	14,881	4,628	653	0	41,976	
Acre-Feet	762	9,590	32,910	29 ,52 0	9,180	1300	0	83,260	
Skim Water Returned to Big Thompson River from Hansen Feeder Canal At South of Big Thompson Siphon at 15-Foot Parshall Flume									
Day Sec. Ft.	380	4,674	7,310.1	13,955.4	4,713	683	0	31,715	
Acre-Feet	754	9,270	14,500	27,680	9,350	1 ,35 0	0	62,900	
$\frac{Project}{South}$	Deliver	ed <u>to</u> Thomps	Big Thom on Sipho	pson <u>Rive</u> n at <u>15-F</u>	r <u>From</u> Ha oot Parsh	ansen Fe Mall Flu	eder <u>Canal</u> me	<u>. At</u>	
Day Sec. Ft.	0	0	0	892.6	1,557.5	5 4,969	3,351.2	10,770.3	
Acre-Feet		0	0	1,770	3,090	9,860	6,650	21,370	

APRIL	MAY	JUNE	JULY	AUGUST	SEPT .	OCT.	TOTALS
-------	-----	------	------	--------	--------	------	--------

	Big	Thompson	<u>River</u> Parsh	Diverted all Flume	and Stor at West	red as l Portal	Measured (of Dille	Tunnel	<u>the</u>	<u>8-Foo</u> t
Day Sec. Acre-Feet	Ft.	0 0	0 0	870 1 ,7 30	51 101	0 0	0 0	0 0		921 1,830
			17 æ		ontition		oomo foo	+ bead	~n 7	o f a

(Note: All foregoing quantities are in acre-feet based on 1 c.f.s. for 24 hours times 1.983471)

The difference between first and second totals above show that 20,360 acre-feet of Big Thompson River water was stored in the Project system. This, together with the Big Thompson River water diverted to the Project system via the Dille Tunnel, makes a grand total of 22,190 acre-feet of Big Thompson River water stored in the "Project" system. This grand total was computed another way and found to be 22,150 acre-feet which is a very close check.

Dams in this area were checked frequently throughout the season. As far as sight inspection could determine, no major dams were ever in danger. One small dam in the middle of the Big Elk Meadows series of dams on the West Fork of the Little Thompson River was cut to prevent the meadow from washing out at the end of the dam. A complete report of this area was sent in at an earlier date.

One more power plant is being constructed as a part of the Colorado-Big Thompson Project and is scheduled to be completed and in operation in 1959. It is located at the entrance to the Big Thompson Canyon just below the Handy Dam. The completion of this phase of the project will add to the complicated system of stream measurements and control. I hope that the advanced planning has been adequate so that the necessary equipment for proper administration has been included in the original design.

A total of 265 current meter measurements of streams and ditches were made during this year. Most of these measurements were made by Mr. Dean Thompson, the hydrographer working out of this office. The hydrographic work in this office is more than can be handled by

-8-

a personnel of two during regular working hours. During the irrigation season, there are a minimum of thirty-four gaging stations operating that have to be checked and the data compiled. The charts from these stations must be worked each week and data kept current. The charts and data from five of these stations must be worked, checked and kept up to date the year around. Fifteen of the total number of stations are stream gaging stations, nine of which have their annual data published. None of the ditches in the various water districts have been included in the total number of gaging stations mentioned above.

Snow surveys were made at the Hour Glass Lake course on the Cache la Poudre drainage by Mr. Wilkinson, Mr. Thompson and myself. Equipment for some of these surveys was rented from the City of Greeley.

It is important for the equipment in this office to be adequate to aid the personnel in efficiently and promptly processing the work which it has to turn out. We have been able to get by with the old, well-used machines so far. Recently, however, the old calculator began to give us trouble and I sent it in for repairs. Up to the present time, it has not been returned nor replaced. It is imperative that one be obtained before the next irrigation season starts. I have employed stenographers from time to time when it was absolutely necessary and they have been unable to use the old typewriter which we now have. At the present time, the only office machine which we have is a small, portable adding machine, which is adequate, but which needs cleaning. More work could be turned out more efficiently if we had an additional adding machine.

The Bureau of Reclamation employees are to be commended for their excellent cooperation. Mr. K. W. Dickey and his personnel, the Estes Park Power Plant operators and dispatchers at the Flatiron office have given me excellent assistance, especially in "Operation Skim".

I wish to thank the Northern Colorado Water Conservancy District for the office space and its secretarial help in answering the phone, taking messages, etc. when it was necessary for me to be out of the office.

CARLES AND

-9-

They also furnished two short-wave mobile units for the hydrographer and for me. I believe these units helped this year and during a maximum water year would probably prove to be invaluable.

The following tables give a detailed distribution of "Project" water and other hydrographical data and are included as an integral part of this report.

It should be noted that, in previous reports, the "Project" canals connected with the Horsetooth Reservoir have been called the "Horsetooth Feeder Canal" and the "Horsetooth Supply Canal". These are now known and so recorded in this report as the "Hansen Feeder Canal" and the "Hansen Supply Canal".

Respectfully submitted,

I So hourt

Clark E. Schnurr Special Deputy State Engineer

ANNUAL REPORT FOR WATER YEAR 1957 SPECIAL DEPUTY STATE ENGINEER - LOVELAND OFFICE

Colorado-Big Thompson Project Water Ordered and Delivered to Water Users in Water District No. 3 During Season of 1957

NOTE: Unless otherwise specified, all quantities are in Acre Fest. 1 c.f.s. for 24 hours = 2 acre fest.

From Mansen Supply Canal to Poudre River as Ordered

Ditch Company	<u>Anno</u>	Julx	Anguot	<u>September</u>	<u>October</u>	Tetal
North Roudre		6,193.4	11,075.0	891.6	3,089.8	21,189.8
P. Va. & Lake		55. 0	78.2		21.0.0	241.00 373.2
Water Sup. & Stor.			1,499.8	10,195.8	4,266.8	15,962.4
Ideal Coment			40.6	32.6		74.2
New Hercer				536.8		536.8
LAF: UG: RO: Z Articar			218.6	440.0	QX+Q	027.5 1.38.8
larimer & Weld		1.433.4	11,891.6	9,200.0	11.750.0	34.275.0
Lake Canal			1,429.8	1,095.8		2,525.6
Box Elder Channel		76.4	125.4	38.2		240.0
		19-0				16.0
Exclange				135.8	<u> </u>	202.8
TOTAL-POUDRE RIVER	0.0	7,714.2	26,519.6	22,959.0	19,482.6	76,675.4

Delivered to Users Direct from Hansen Supply Canal

Brewster	2.	4 35.4	0	68.	8
Janta	10.	2 0	0	40.	2
K11burn	32.	6 27.2	0.6	60.	4
Graves	33.	0 27.0	0	60.	Ô
Granley, City of	277	0 122.2		1911 - AND	2
Banning	44	à <u>a</u>	si .o	120	ā.
11074 X 4115		a a a a a a a a a a a a a a a a a a a 			
					1
TOTAL-BANSIN SUPPL	1 0.0 476.	Z ZLL.8	24.0	0.0 742.	0

Delivered to Users from Dixon Feeder Canal

이 문화를 다고 말했다. 강화를 비슷하지 않는 것	아님께 가지 아니 않아요. 아이는 것	그렇다는 아이에 생긴 사람이 망가로 위	전성은 사람 것도 것 되는 것 사람은 것 같아.		
Desert of Acedo	~ 그 월 도 안 속동 속옷입니다.	백년도 문설없이 나는 사람이다.	26.2kg 및 2011 - 2017 - 2017	101.8	LO1-8
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	and a constant of the second	and and a second	난 이곳의 가는 낮도 봐야 같아요?	tang sa sa sa sa sa sa	0.040
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an na ta	동안에 가장 귀엽에 가장 가장을 가려요?	시간 관계적 시험을 물건 성격을 얻는다.	에 걸려 있어? 이 동네는 것 같은 것이다.	ምረምአ	t <u>31701</u>

(Water District No. 3 - Continued)

Combined Total of Orders Delivered to Poudre River as Measured Through 201 Parshall Flume from Hanson Supply Canal

	<u>dune</u>	dala yana	<u>st</u> <u>September</u>	<u>October</u>	Total
Second Fest Acre Fest		3,906 13,3 7,750 26,5	62 11,509 00 22,830	3,975 7,890	32,742 64,970
<u>Winds</u>	er Extension of	<u>f Hansen Supp</u>	ly Canal at 10' P	arshall Flume	
Second Feet Acre Feet			67.2 191.8 33 3 80	5,998.7 11,900	6,257.7 12,413
	Monree Cana	Lat 101 Parel	nall Flume		
Second Fest Acre Feet	3,945 7,820 10	5,292 5,3 5,500 10,5	27 6,072 70 12,040	383 760	21,019 41,690

Note: All acre feet quantities in above three tables is based on 1 c.f.s. for 24 hours x 1.983571.

The total of the first two tables (77,383 acre feet) was the amount delivered from the total amount ordered (76,675.4 acre feet). This shows an over-delivery of 707.6 acre feet, or about 0.9 of one percent over-delivery.

Annual Report for Water Year 1957 Special Deputy State Engineer - Leveland Office

Colorado--Big Thompson Project Water Ordered and Delivered to Water Users in Water District No. 4 During Season of 1957

NOTE: Unless otherwise specified, all quantities are in Acre Feet. 1 c.f.s. for 24 hours = 2 acre feet.

Project! Orders to Big Tempson River from Hansen Feeder Canal

<u>Ditch Company</u>	<u>Juma</u>	<u>duly</u>	<u>Angust</u>	<u>September</u>	<u>October</u>	Total
Handy				330.0	370.0	700.0
Loveland Home Supply		1,587.4	1,550.0	1,797.6	2,395.0	7,330.0
Louden George Rist		8.0	29.0	674.sZ	840.6 1,920.0	1,775.0
Greeley-Loveland Parmers			3(2•⊻	0,000.0 227.4	1,774+8	8,149.8 227.4
Hillsboro Buckhorn Exchang	•	180.8	70.0 46.4	20.0 32.0		96.0 259.2
Platte Valley Ex Total to Big The	change [‡] speen Riv	0 107 ⁴⁴⁴	1,020.0	0	0	<u>1.020.0</u> 21,512.8
Potal Nater User	s Water I	district No.	• 4			20,492.8

* This amount is for Water District No. 2 and is included in the first total so that a comparison can be made to actual deliveries.

**This compares to actual total delivery of 21,370 acre feet or an under-delivery of 142.8 acre feet, or about 0.7 of one percent. The monthly distribution of this delivery was given earlier in this report.

"Project' Water Ordered by Buckhorn Water Users Association From Nameon Teeder Canal

Ditch Cespany	Aune	<u>July</u>	<u>Angust</u>	<u>September</u>	<u>October</u>	Tetal
Cottomrood Creek	0	9	O	17.4		17-4
Devine Light	2.0 7.8	12*** 33.6	30.6	8.4	ă.	107.8
Marten's Smith	0 0	21.2 57.0	2.8 6.0	14.0 30.0		38.0 9 3 .0
(Olin) Van Hees Seence	0	66.0 15.1	27.8 0	32.2 U	32.0 0	158 15.1
Union	8.0	372.2	127.4	193.4	145.6 28.2	846.6
Hock	0	12.6	7.8	Č.	0	20.4
Heaberg Total for Season	4. 2	1903				1,615.3

(Water District No. 4 - Continued)

Pumped Birect from St. Vrain Supply Canal August September Ditch Company July Total June October 1.8 10.8 2.0 7.0 Bennet Bramlet 4.0 25.8 16.9 24.8 71.5 82.3 Total 3.449

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9	ombined Total	of Above Del:	ivered to Lit	tle Thomson	Water
	Veers as Nees	wed The ough	Deo 11-Deot. Re	ruinall Plamos	
Second Fost		48.9 1.3	16.9 1 ,	<i>35</i> 0 7.	.9.9 3.655.
Acre Feet*		97 2.5	M 3.	.080 1,4	7,257

*Based on 1 c.f.s. for 24 hours times 1.983471

This shows that there was an over-delivery of 131 acre feet, or about 1.8 percent. In all cases, however, the ordered amount in acre feet is based on 1 c.f.s. for 24 hours times 2.

ANNUAL REPORT FOR WATER YEAR 1957 SPECIAL DEPUTT STATE ENGINEER - LOVELAND OFFICE

<u>Colorado-Big Thempson Project Water Ordered and</u> <u>Delivered to Water Users in Water District No. 5</u> <u>During Season of 1957</u>

NOTE: Unless otherwise specified, all quantities are in Acre Feet. 1 c.f.s. for 24 hours = 2 acre feet.

Project! Water Ordered for Users to be Delivered to St. Vrain River

Ritch American Anna Anly Inquet Senter	ihan Antahan Ratal	;
TICUL WADDENT GOUG CALL MAKANA MARA		
Alter of Terminal		
Managemente Cuque de la compace de la compac	229.8 854.0	
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	Ø∗# 70∗# 333•5	1.1.1
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Combined Total of Above Orders of Project Water Delivered to

Parsenall Plyman Basys Impage of Bad of St. Dards Surely down

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This shows 429 Acre Feet more water delivered to St. Vrain River than ordered, or approximately 6.3 per cent.

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ANNUAL REPORT FOR WATER YEAR 1957 SPECIAL DEPUTY STATE ENGINEER - LOVELAND OFFICE

Colorado-Big Thempson Project Water Ordered and Delivered to Water Users in Water District No. 6 During Season of 1957

NOTE: Unless otherwise specified, all quantities are in Acre Fest. 1 c.f.s. for 24 hours = 2 acre fest.

Project! Water Ordered for Delivery to Boulder Creek

Ritch Company	August Bor	tember October Totals	
<u> Maria Arikana</u>			
City of Boulder		15.8 132.0 347.8	2 2 2
Leggett			1
Lover Boulder		60.0 Kan n 1912.8	
Flatte Valley*	1911-19	27.8 0 67.8	100
Maria I Britan Berry		**9 K52 K	25. 0

* This was ordered for Water District No. 2. The total orders to this District (No. 6) is less this amount from the above total, or 639.8 were fost from this source.

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** This total or the amount ordered compares to total acre feet immediately above which shows that 170.4 acre feet more water was delivered than was ordered, or approximately 7 percent of the ordered amount.

The	Followi	ng Tables	: <u>Give t</u>]	he Month	ly Discha	rge in	Day Secon	d Feet	anc
A	cre Feet	(d.s.f.	x 1.983/	471) at	the Gagin	g Stati	ons as In	dicated	8.

season November 1, 1956, through October 31, 1957, Inclusive

(Continued on Next Fage)

	<u>NOVINBER</u>	<u>DECEMBER</u>	<u>JANUART</u>	TEBRUARY.	WARCH	APRIL
<u>Adams 1</u>	<u>mnel at E</u>	<u>et Portal N</u>	<u>ear Estes</u>	Park at 15	Parshall P	Lune
Day Second Feet Acre Feet	11,653.3 23,110	11,444 22,700	13,661 27,100	14,155 28,080	14,350 28,460	11,438 22,690
<u>Retes. Fo</u>	<u>ethille Car</u>	<u>al at Ratin</u>	<u>g Section</u>	<u>at West Po</u> r	<u>tal near Be</u>	æs Park
Day Second Fest Acrs Feet	11,005 21,830	11,175 22,170	13,398 26,570	13,953 27,680	14,224 28,210	11,835 23,470
<u>Big Tagapson Ri</u>	<u>eer at 18'</u>	<u>Pareball F</u>	une above	Lake Totes	<u>at Betos Pa</u>	<u>t. Colorado</u>
Day Second Feet Acre Port	535 1,060	334.4 703	265.4 526	280 555	370.8 735	1,158 2,300
Big Thompson Bir	<u>ær et 151</u>	<u>Parehall 81</u>	<u>we kelo</u> r	Luke Retes	<u>mar Boten (</u>	<u>Mark, Colorad</u>
Day Second Fost Acre Post	582 1,150	419 831	353. 701	3 308 611	403 799	937 1,860
<u>Pish Crook a</u>	<u>t 5º Paroha</u>	<u>11 Flume, ab</u>	ove Lake	<u>lates por j</u>	ietes Park. 1	<u>Salerade</u>
Day Second Feet Acre Peet	魗	2.1 4.2	ż	5 2+5 5 5+0	9.8 19.4	253.8 503
Hansen Feeder C	inal at Bat	<u>ing Section</u>	North of	<u>Bic Thomps</u>	<u>n Siphon ne</u> r	u <u>r Brake, Col</u>
Day Second Feet Acre Fest	6,692 13,270	5,739 11,380	6,752 13,390	7 ,465 14,810	9,554 18,950	1,125 18,100

Values of winter months during December, January, February, March, and part of April for Fish Creek Station at Estes Park were estimated; also for the months of January, February, and parts of December for the Station on Big Thompson River at Estes Park, The Following Tables Give the Monthly Discharge in Day Second Fest and Acre Fest (d.s.f. x 1.983471) at the Gaging Stations as Indicated.

Season Nevember 1, 1956, through October 31, 1957, Inclusive

(Continued from Preceding Page)

	ШĽ	JUNE	<u>aux</u>	AUGUST	SEPTEMBER	<u>OCTOBER</u>	TOTAL
kin	<u>ns Tunnel at B</u>	t <u>st Portal I</u>	<u>iear Nates)</u>	<u>Park at 151</u>	Parehall P)		
Day Second Apro Fest	Feet 3,352.4 6,650	85.0 169	297.•5 471	2,659.5 5,280	4,899.1 9,720	11,239 22,290	99,173. 196,720
	<u>a Feethills Ca</u>	<u>ml at Rati</u>	<u>ur Beetion (</u>	<u>ut West Per</u>	<u>tal Near Bet</u>	<u>as Park</u>	
Day Second Apro Peet	Peet 8,415.4 16,690	16,5 8 7 32,900	15,090 29,930	7,013 13,910	5,459.1 10,630	10 ,87 3 . 21 , 570	139.029. 275,760
<u>Dir Thomps</u>	on fiver at 15 1	[Parahall]	<u>'lune above</u>	<u>Lake Setes</u>	<u>at Estes P</u>	178. Color	<u>atto</u>
Day Second Atro Foot	Feet 7,072 14,090	24,708 49,010	22,898 45,420	7,574 15,020	2,363 4,690	1,528 3,030	69,106. 137,080
<u>Ric Thompo</u>	en <u>River et 15</u> 1	<u>Pershall</u>	<u>Plume below</u>	<u>Leke Estes</u>	near Zates	Park, Col	enado
Bay Second Acre Feet	Feet 3,538 7,020	9,083 18,020	8,478 16,820	3,463 6,870	1,874 3,720	1,620 3,210	31,058. 61,610
<u>Pish Çi</u>	<u>æk at 51 Parel</u>	all <u>Klune</u> (ibovo Lako J	inten near l	letes Park.	<u>Colorado</u>	
Bay Second Acro Foot	Pest 1,146 2,270	612 1,210	107.1 212	44.3 87.9	18.1 35.9	14.2 28.2	2,214. 4,390
Hancon Post	<u>ler Canal at Ra</u>	ding Geotic	<u>n North of</u>	<u>Big Theres</u>	<u>on Siphon ne</u>	<u>ar Drake.</u>	<u>_Colo.</u>
Day Second Acre Feet	Feet 3,475.2 6,890	4,944.5 9 , 810	1,666 3,300	1,750 3,470	2,668 5,290	7,334 14,550	67,164. 133,210

WATER IN STORAGE SOUTH PLATTE RIVER SYSTEM

Irrigation Only - Figures in Acre Feet

** * *	May 1	November 1	May 1 in 5 of Normal	Nov. 1	1
1938	314,019	345,829	64	176	
1939	579,578	41,842	117	21	and the second
1940	242,892	45,075	49	22	Avg 1938-1955 May 1 493,431
1941	311,425	155,188	63	7 9	Nov 1 195,487
1942	533,002	350,255	108	179	
1963	628,397	161,921	127	88	
1944	563,588	132,258	114	68	
1945	456,907	348,079	97	178	
1946	509,8 84	162,197	103	88	
1947	522,501	307,760	106	157	
1948	598,680	151,688	121	78	
1949	435,006	259,855	88	132	•
1 95 0	507,847	117,058	103	60	
1951	404,734	286,460	82	141	
1952	674,975	244,932	136	125	
1953	637,992	198,884	129	101	
1954	541,842	9 0,554	110	49	
1955	413,533	118,939	84	60	
1956	295,334	44,039	60	22	
1 95 7	362,082	469,742	74	240	

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	Die 1956	Jan 1957	765. 16W	Rener 1852		Mar 1987
	22,367	44.785	M.E.A.	1 Pipt]	66,10	
			TR			131-26
in the tool			ALL Y	I FILL		
	?					
Mint. Intir.	7.159	12,445	16.697	16.421	17.344	1. 30.3
Budician1						
ELL!						
Tin. Irrig.	24,553	29 157	32 161	- 36,193	1 40 Of	- 54,30
M.s. Thomp.	45,802		69.664	1 0 .001	. antiser	
ter i Bintalpall	1 4.708	4.768		1.704	4.769	
- Intel	75.963	90.685	1105.536	124.005	146,169	
				+ + + + +		+++
F Bint, Irrig.	19,373	22.459	22,53	21.934	- 24 249	
The These	30,323	60,816	50,161	65,883	- 75,377 1	
Putteinel	in the	La	503 C		-	75 57
	47,070	07,2617	1<1074		77274	
Tim. Irrig.	1,221			12,424	4,011	
TIE Thoup,						
Funicipal						
TOTAL						
	7 416	9 276	G. 1 C.	0.922	30 20	17
WARLS SET BE	0_260	2.269	2.237	2.913	2.247	2.94
	11. 164	13 440	12.916	13. 902	0 043	4. 20
	23.978	24.305	2.61	25.178	22.50	16 Ke
Tinte	1.174	2.844	4.354	6.237	6,50m	4.9.9
Dinfeinel	9.572	8.827	6.226	1.071	1.6%	
fotal	10,746	11.671	.10,780	10,334	11,190	
Mundeipel	16.420	15.587	16.120	14,101	14.335	12.21
Plat Lottes			See Section Section			
Mundelpal						
Tental .	1.694	2.268	2.792	2.904	2,915	.
						- P1 , E
Qist. Irrig.	الالم المحج والمحج	an a				
Buntelpal	49,984	48,728	L. 48.658	49.3%	52,550	1. 63.75
Alet. India.	10.749	27.110	38.379	51.505 1		67.80
tetala.						
Irrist ion	1041431	4270A97		422 1925	421.971	
Hig Thomp.	10,374	776743		4742977	A CHAL	
Fieldipil	1 79.444	1 7-14 7-14 186- 641	1 101 100	1.00 2.94		
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