C.C. HEZMALHALCH
DEPUTY STATE ENGINEER

Alamosa, Colorado.
September 20, 1942.

Mr. M. C. Hinderlider,
State Engineer,
Denver, Colorado.

Dear Sir:

Following is a tabulated list of irrigation activities in the division, including stream flow, reservoir storage, diversion to ditches and crop conditions.

Soil conditions were favorable for an early spring planting and crops got off to a good start. There was no late spring frost to damage crops. The early September freeze did considerable damage to late vegetables, however, it was a benefit to potatoes, killing the vines, which ripened the tubers so that early in October they were in fine marketing conditions.

Stream flow on all water sheds was above average. Ditches carried an adequate supply for irrigation well into August and practically no crops in the Division suffered. The general crop conditions were very favorable and prices satisfactory.

The storage in the principal reservoirs started the season with a record fill and came in at time when needed to supplement the stream flow, and ended the season with 90,858 acre feet.

Ditch owners have co-operated with water officials and no complaints have come to this office. No arrests for unlawful diversion.

Yours truly,

Walter D Carroll

Walter D. Carroll,
Irrigation Division
Engineer,
Division No. 3

WATER COMMISSIONER'S DITCH REPORT

No. of Water District	No. of Priorities Reported	First day Water was Used	Last day Water was Used	Maximum No. days water was carried from stream	No. of acre feet used by all ditches	No. of acres that can be irrigated
20	419	4-1	11-29	224	606122	500588
21	76	3-21	11-15	224	92373	73599
22	187	4-1	11-15	231	337304	187104
24	98	3-1	11-15	261	42088	22445
25	96	4-1	11-15	238	99704	210416
26	116	4-1	11-15	228	84695	58514
27	77	4-1	9-30	199	17750	13770
35	70	4-1	11-15	194	118176	47108
				Total	1398212	1113544

Comparison of acre feet of water delivered to ditches from streams.

1933	1086736
1934	700740
1935	1589432
1936	1157522
1937	1110519
1938	1371624
1939	994770
1940	769141
1941	
1942	1398212

WATER COMMISSIONER'S CROP AND DITCH REPORT

Water District	No. Acres of Alfalfa	No. Acres Native Hay	No. Acres Cereals	No. Acres Pasture	No. Acres Garden Peas
20	63,662	47,319	43,273	111,313	3,442
21	7,326	9,418	6,350	6,778	4,006
22	14,001	29,919	19,742	15,775	3,648
24	2,427	2,810	6,078	2,162	243
25	1,363	45,282	1,037	39,615	2
26	3,184	31,175	547	12,857	20
27	713	4,475	187	13,217	138
35	3,355	16,099	3,655	3,869	872
	96,031	186,497	80,869	205,586	12,371

Water District	No. Acres Potatoes	No. Acres Sugar Beets	No. Acres Beans	No. Acres Field Peas	No. Acres Cabbage
20	29,507	3,249	111	12,783	184
21	1,788	271	474	3,009	159
22	2,163	518	644	4,988	242
24	450	10	2,193	4,497	733
25	55		1	62	
26	5				
27	344		19	173	
35	132	108	151	2,975	456
	34,444	4,156	3,593	28,487	1,774

Water District	No. Acres Lettuce	No. Acres Cauliflower	No. Acres Sweet Clover	No. Acres Summer Plow	No. Acres Spinach
20	930	304	47,806	3,172	227
21	58	95	3,427	371	
22	32	317	11,646	992	
24	127	1,501	355		
25			623	110	
26					
27	5		667		3
35	60				10
	1,212	2,217	64,524	4,645	240

WATER COMMISSIONER'S CROP AND DITCH REPORT (CONT'D)

Water District	No. Acres Other Crops	Total Acres Irrigated
20	5,536	372,818
21	103	43,633
22	804	105,431
24	892	24,478
25	2	88,152
26	10	47,798
27	3	19,944
35		31,742
	7,350	733,996

Comparison of Acres Irrigated for 10 Year Period		Comparison of acre feet of water delivered to ditches & canals over 10 year period.	
1933	880,934	1933	1086786
1934	638,766	1934	700740
1935	755,724	1935	1589432
1936	663,724	1936	1157522
1937	646,082	1937	1110519
1938	702,392	1938	1371664
1939	715,332	1939	994770
1940	664,267	1940	769141
1941	717,656	1941	
1942	733,996	1942	

Comparison of Cost of Administration expenses,
Water Commissioners and Deputies.

	1940		1941		1942	
	Water Com.	Deputies	Water Com.	Deputies	Water Com.	Deputies
20	808	2290	1640	1580	1816	1885
21	1422	400	1206	405	1392	420
22	1124	72	1038	170	1146	620
24	1788	660	1656	660	1728	690
25	1374		1248		1200	
26	1416		1272		1386	
27	1554		1359		1494	
35	1104		996		1052	
	Total $14012		Total $13208		11214	3615
					Total $14829	

Cost per acre for administration

1940 02.1 1941 01.9 1942 02.2

WATER COMMISSIONER'S RESERVOIR REPORT - 1942
AMOUNT OF WATER, IN ACRE FEET, IN STORAGE, ON 1ST DAY OF EACH MONTH FROM DECEMBER 1, 1941 TO NOVEMBER 1, 1942

	Rio Grande (Farmer's Union) Reservoir Cap. 51,113 A.F.	Santa Maria Reservoir Cap. 53,565 A.F.	Continental Reservoir Cap. 26,716 A.F.	Sanchez Reservoir Cap. 103,155 A.F.
12-1-41	47083	24563	9163	33294
1-1-42	46675	24671	10000	33368
2-1-42	46873	25191	10000	33149
3-1-42	46873	25217	10000	33077
4-1-42	47922	25742	10000	32932
5-1-42	49084	26878	10000	37918
6-1-42	49502	39074	14793	56552
7-1-42	49222	42066	22039	62393
8-1-42	27345	32947	19576	49248
9-1-42	8073	13362	16704	40819
10-1-42	7227	13413	16526	40327
11-1-42	5767	13413	16449	39192
	Maximum Storage June 29,1942 51,113 A.F.	Maximum Storage June 22,1942 42,067 A.F.	Maximum Storage August 1, 1942 19,776 A.F.	Maximum Storage June 25, 1942 64,668 A.F.

	Terrace Reservoir Cap. 17,700 A.F.	La Jara Reservoir Cap. 14,052 A.F.	Mountain Home Reservoir Cap. 19,150 A.F.	Smith Reservoir Cap. 6,212 A.F.	Cove Lake Reservoir Cap. 9710 A.F
12-1-41	7808	3636	10888	5336	384
1-1-42	7499	3331	11326	5336	384
2-1-42	7499	3331	11546	5336	384
3-1-42	7619	3331	11781	5336	384
4-1-42	7145	3460	12000	5336	651
5-1-42	9103	5521	14447	5336	5160
6-1-42	11538	8214	16358	5336	6015
7-1-42	11584	7880	15310	5336	4080
8-1-42	5363	7880	10383	3641	1862
9-1-42	1647	4386	5301	2805	253
10-1-42	0	4623	5200	3210	212
11-1-42	0	3331	5431	3342	161
	Maximum Storage June 20, 1942 15,260 A.F.	Maximum Storage June 1, 1942 8,214 A.F.	Maximum Storage June 6, 1942 16,674 A.F.	Maximum Storage Dec. 1,1941 to July 1,1942 5,336 A.F.	Maximum Storage May 23,1942 6,480 A.F.

AMOUNT OF WATER, IN ACRE FEET, IN STORAGE ON
MAY 1, 1942 and NOVEMBER 1, 1942.

	Salazar Reservoir Cap. 120 A.F.	Archuleta Reservoir Cap. 98 A.F.	Hunters Lake Reservoir Cap. 48 A.F.	Spruce Lake No. 1 Reservoir Cap. 103 A.F.
May 1	20	76	48	103
Nov. 1	40	0	48	0

	Spruce Lake No. 2 Reservoir Cap. 69 A.F.	S. Dude Ranch Reservoir Cap. 125 A.F.	Road Canon Reservoir Cap. 2800 A.F.	Poage Reservoir Cap. 260 A.F.
May 1	69	112	2800	261
Nov. 1	0	23	2800	0

	Lost Lakes Reservoir Cap. 1066 A.F.	Shaw Reservoir Cap. 638 A.F.	Metroz Reservoir Cap. 128 A.F.	Bristol Head Reservoir No. 1-2 Cap. 954 A.F.
May 1	1066	280	176	987
Nov. 1	0	0	88	0

	Beaver Park Reservoir Cap. 4434 A.F.	Regan Lake Reservoir Cap. 1200 A.F.	Chenoweth Reservoir Cap. 40 A.F.	Eastdale No. 1 Reservoir Cap. 3468 A.F.
May 1	728	1200	0	390
Nov. 1	0	1200	0	0

	Goin's Lake Reservoir Cap. 40 A.F.	Humphries Reservoir Cap. 842 A.F.	Trout Lake Reservoir Cap. 198 A.F.	Wright's Lake Reservoir Cap. 120 A.F.
May 1	40	842	198	120
Nov. 1	0	842	0	0

AMOUNT OF WATER, IN ACRE FEET, IN STORAGE ON
MAY 1, 1942 and NOVEMBER 1, 1942.

	Ruby Lake Reservoir Cap. 120 A.F.	Hermit Lake No. 1 Reservoir Cap. 360 A.F.	Hermit Lake No. 2 Reservoir Cap. 360 A.F.	Grace Lake Reservoir Cap. 605 A.F.
May 1	120	360	360	605
Nov. 1	120	360	360	605

	Sowards Lakes Reservoir Cap. 200 A.F.	Goose Creek Reservoir Cap. 232 A.F.	Wee Ruby Lake Reservoir Cap. 150 A.F.	Fuchs Lake Reservoir Cap. 200 A.F.
May 1	200	232	186	211
Nov. 1	200	0	0	45

	Squaw Creek Reservoir Cap. 158 A.F.	Bergey's Lake Reservoir Cap. 28 A.F.	Spring Creek Reservoir Cap. 120 A.F.	Botefur Reservoir Cap. 8 A.F.
May 1	158	28	120	0
Nov. 1	158	28	0	0

	Lake Cliff Reservoir Cap. 20 A.F.	Troutvale No. 2 Reservoir Cap. 435 A.F.
May 1	20	196
Nov. 1	20	196

COMPARISON ACRE FEET OF WATER CARRIED FROM RESERVOIRS.

1933	97058
1934	62391
1935	102537
1936	111607
1937	149247
1938	131930
1939	139771
1940	57975
1941	135009
1942	75370

This amount represents the net delivered to ditches and canals. Ten per cent was deducted from 83636 for river loss in carrying.

COMPARISON ACRE FEET STORAGE IN RESERVOIRS MAY 1, & Nov. 1,

Year	May 1st	Nov. 1st
1933	56875	29080
1934	47489	11087
1935	28216	64361
1936	84419	43294
1937	79910	36060
1938	93520	82051
1939	120635	14759
1940	39161	12113
1941	47435	113183
1942	97396	42617

POTATOES

The potatoe crop will break all previous records as to yield and quality this season. The acreage is 20,000 more than in 1941 with yield much higher than normal. Numerous growers in Rio Grande County report as high as 400 sacks per acre while 275 to 350 sacks are not uncommon. At present 50 % of the estimated 8,000 cars have been shipped leaving approximately 4,000 in storage.

Price for the Ted Still strain of dark red McClures are bringing top prices for U.S. No. 1 and they are in good demand in eastern markets.

Some Psylia was in evidence, but was generally controlled by spraying. There was some black leg for which there seems to be no remedy.

A dehydration plant has been installed in Monte Vista by the American Food Product Corporation and is now ready for operation with enough egg size and cull potatoes in sight for a years run. The plan is to run the plant on eight hour shifts. They expect to process 570 cars this season. The entire output will be delivered to the government ofr our armed forces and lease lend for our allies. One hundred and twenty people will be employed in the operation of the plant.

SWEET CLOVER

There was an increase of 30,000 acres of sweet clover due to the growing demand for summer pasture. A great many lambs were grazed on sweet clover and put on the market as feeders, fully as good as those grazed on forest range with a saving of a grazing fee. A considerable acreage was harvested for seed which is bringing 5¢ a pound on the market. Some clover was cut and stacked for hay. The increase in dairying is expected to mean a larger demand for sweet clover as pasture.

PASTURE

Pasture over the Division was good and will be consumed with the cattle and sheep during the winter.

ALFALFA

The alfalfa crop this season showed a sharp gain in acreage, with normal yield and the quality was excellent, as the two cuttings were put up without rain. Price will be $12.00 baled.

WILD HAYS

Wild hay acreage will show a 15,000 increase over 1941, with local demand the crop will be mostly consumed in the valley. Price ranges around $10.00 baled.

CEREALS

Cereal Crops showed a 10,000 acre increase over 1941, with quality and yield good, prices very favorable.

Hail

A destructive hail storm struck the south end of the valley in July, doing $50,000 damage to the market of garden pea crop.

RANGE

Range conditions were not satisfactory owing to drouth in the mountains, as the percipitation data will show. As a result of this lack of moisture on the lower range the cattle were brought out 20 days earlier than customary. The higher sheep ranges were better and the sheep came out in fair condition.

A serious threat to the vegetable growers in the southern end of

the valley came in the appearance of the Army Worm which attacked several fields of market garden peas. The loss reported was considerable.

Percipitation over the Division was much below normal.

Very little pumping was done as direct irrigation was sufficient.

SUGAR BEETS

The sugar beet growers of the San Luis Valley have completed the harvesting of a crop valued at over a quarter of a million dollars at the present price outlook.

The yield this year is running high as a result of favorable late growing conditions. Average for the San Luis Valley is 12 tons per acre, while many fields run 15 to 18 tons. Sugar content averages 18% with several fields showing 20% sugar. Acreage in the valley is 4,156, being almost double the 1941 acreage.

BEANS

The bean crop was satisfactory as to yield and quality and prices at $5.25 per cwt. makes a good return to the farmer. Acreage was normal and demand good as the government is taking the output for the army.

FIELD PEAS

The field pea crop shows an increase of 18,000 acres over 1941. The increase acreage was stimulated by the government demand for the army and it will take all the crop that will inspection and pay $5.25 per cwt. for No. 1 quality.

Vegetable Shipments for 1948

Potatoes	6000	Cars
Cotton Seed	1334	Cars
Cauliflower	968	Cars
Mixed Vegetables	609	Cars
Lettuce	385	Cars
Spinach	51	Cars
Cabbage	979	Cars
Tomatoes	1	Car
Total	7927	

TRANS-MOUNTAIN DIVERSION

PIEDRA	Delivered to	McKenzie Ditch	810	acre	feet
	"	" Minor "	240	"	"
		Total	1050	"	"
SQUAW PASS	"	" Rio Grande Canal	374	"	"
	"	" McDonald Ditch	700	"	"
		Total	1074	"	"
WENIMUCHE	"	" Raber-Lohr	855	"	"
	"	" Geo. Fuchs	245	"	"
		Total	1100	"	"
SPRING CREEK	"	" Minor Ditch	25	"	"
TREASURE PASS	"	" Midland Ditch	20	"	"

COMPARISON OF SNOW COURSE DATA RIO GRANDE WATERSHED

	Depth of Snow in Inches				Water Content in Inches			
	1939	1940	1941	1942	1939	1940	1941	1942
Wolf Creek								
January	-	-	69.0	52	-	-	14	9.2
February	-	32.7	66.8	41.1	-	8.7	18.3	11.7
March	67.2	53	75.6	74.9	19.7	15.6	25.1	20.1
April	61.7	41	106.9	82.9	23.1	15.9	37.2	29.1
May	40.4	23.2	108.2	77.4	18.3	98	45.2	32.9
Upper Rio Grande	-	-	-	-	-	-	-	-
Jan.	-	-	-	-	-	-	-	-
February	-	30	30	-	3.8	1.3	5.2	-
March	19.	16.5	30	-	4.4	3.0	6.7	-
April	00.	00.	33	23.5	0.0	0.0	8.	5.7
May	-	-	34.5	0.00	-	-	10.4	-
Santa Maria								
January	-	-	18	8.4	-	-	4.	2.
February	15.4	8.9	23.8	13.6	3.6	1.6	5.6	2.2
March	16.6	10.6	26.5	18.6	3.7	2.2	5.1	3.9
April	-	25	25	16.6	-	7.3	7.3	3.4
May	-	27	16.1	00.0	-	9.0	7.4	0.0

COMPARISON OF SNOW COURSE DATA RIO GRANDE WATERSHED

	Depth of Snow in Inches				Water Content in Inches			
	1939	1940	1941	1942	1939	1940	1941	1942
Cumbres Pass								
January	-	-	48	47.7	-	-	11	9
February	56	35.4	71.6	36.8	12.5	10	20.3	10.1
March	80.7	57.7	82	57.7	22.8	18.8	26.5	16.1
April	46.8	40.2	99.8	71.1	18.3	17.1	37.	24.5
May	13.1	14.9	15.0	-	5.6	7.6	4.0	-
Silver Lakes								
January	-	-	20	12.6	-	-	4	19
February	-	11.8	26.5	11.9	-	2.1	5.6	2.1
March	26.0	14.2	23.5	18.6	4.4	3.3	6.1	3.1
April	12.0	1.2	28.7	18.8	3.3	0.5	8.7	4.6
May	-	-	20.1	2.8	-	-	8.3	0.5
Ft. Garland-Jan.	-	-	24	10.5	-	-	5	1.6
February	-	-	23.4	7.5	-	-	5.4	1.5
March	-	12.1	24.5	14.	-	3.0	6.7	2.8
Mpril	-	-	37	-	-	-	14.3	-
May	-	-	18.8	00.0	-	-	5.4	00
River Springs								
January	-	-	14	8.	-	-	4	2
February	-	16.7	25.8	13.9	-	2.3	5.9	2.7
March	-	-	22.4	-	-	-	-	4.4
April	16.4	6.2	27.9	24.6	4.6	2.0	6.8	6.7
May	0.7	-	-	-	0.3	-	14.1	4.3

COMPARISON OF SNOW COURSE DATA RIO GRANDE WATERSHED

	Depth of Snow in Inches				Water Content in Inches			
LaVeta Pass	1939	1940	1941	1942	1939	1940	1941	1942
January	-	-	29	12.5	-	-	6.	1.5
February	-	15.2	29.0	16.7	-	3.0	6.4	2.5
March	43.8	34.0	30.5	24.3	10.5	7.7	8.0	3.7
April	22.6	15.5	41.5	27.5	7.2	5.5	13.	7.2
May	-	-	36.3	29.	-	-	13.8	11.3
Summitville								
January	-	-	55	58	-	-	12	14.1
February	-	43.0	62	56.8	-	11.9	13	15.3
March	54.0	52.0	65	78.5	14.1	15.8	19.2	22.3
April	55.6	38.0	95.5	82.5	15.2	14.0	31	22.1
May	47.8	38.0	100.3	88.4	16.0	15.0	37.5	29.2
Culebre								
January	-	-	26	20.9	-	-	7	4.5
February	-	20.0	37.4	22	-	4.5	9.6	5.
March	-	40.3	46.2	35.5	-	11.2	12.7	8.
April	-	28.2	55.2	38.3	-	11.6	16.6	11.4
May	-	10.4	99	51	-	4.2	21.5	19.2

6/30/1941

CLIMATOLOGICAL DATA 1942
Percipitation in Inches

	Alamosa	Center	Manassa	Del Norte	Cumbers	Jarosa	Hermit
Jan.	0.20	0.13	0.24	T.	1.73	0.16	0.28
Feb.	0.11	0.13	0.20	0.67	3.72	0.34	1.02
Mar.	0.68	0.45	0.71	0.77	5.93	0.72	0.55
Apr.	3.06	2.48	2.50	3.84	8.08	4.66	3.12
May	.00	T	T	T	0.55	0.21	0.10
June	0.35	0.71	0.34	0.59	1.23	0.84	0.45
July	0.57	0.74	0.42	0.70	2.71	0.37	1.71
Aug.	0.40	0.42		1.01	1.82	1.00	1.41
Sept.	1.51	0.61	1.18	0.82	2.93	1.66	1.27
Oct.	0.16	0.19	0.20	0.26	0.32	0.45	1.69

	Monte Vista	Saguache
Jan.	0.02	0.27
Feb.	0.59	0.14
Mar.	1.32	0.14
Apr.	3.30	1.36
May	T	T
June	0.51	0.37
July	0.54	0.35
Aug.	.54	--
Sept.	0.63	No report
Oct.	0.80	No report

CLIMATOLOGICAL DATA 1942

TEMPERATURE in Degrees Fahrenheit

		Alamosa	Center	Manassa	Del Norte	Cumbres	Jarosa	Hermit
Jan.	High	53.	50	55	53		48.	55
	Low	*30	23	-26	-15		-26	-34
	Mean	14.6	16.9	15.8	21.6		19	12.4
Feb.	High	50	50	53	51		50	44
	Low	-18	-1[illegible]	-15	-15		-11	-38
	Mean	21.6	20.8	23.1	22.4		24.7	10
Mar.	High	57	58	59	55		58	48
	Low	-3	1	-2	0		-7	-17
	Mean	29	29.2	30.3	31		31.4	18.3
Apr.	High	69	68	68	70		67	65
	Low	16	16	17	18		18	5
	Mean	44.7	42.6	43.5	44.4		44.4	36.1
May	High	81	82	78	80		79	71
	Low	20	19	18	26		19	14
	Mean	50.4	49.6	49.8	51		51.1	41.7
June	High	85	84	95	87		86	77
	Low	33	31	35	33		32	22
	Mean	59.2	57.3	58.6	60.2		59.8	50
July	High	87	87	87	88		92	85
	Low	38	38	34	39		38	30
	Mean	63.3	62.2	63.2	64.3		65	56.4
Aug.	High	84	82	84	85	73	86	81
	Low	36	38	37	42	35	39	27
	Mean	61.7	60.4	62	62.8	53.6	65.1	55.2
Sept.	High	80	80	80	80	70	80	78
	Low	25	26	24	29	24	26	20
	Mean	54.8	54.1	56.4	56.7	47.5	57.5	48.9
Oct.	High	77	73	79	76	65	79	72
	Low	7	11	11	12	3	12	6
	Mean	44.2	46.6	45.3	47.2	37.2	45.8	38.8

CLIMATOLOGICAL DATA 1942 (Cont'd.)
TEMPERATURE in Degrees Fahrenheit

		Monte Vista	Saguache
Jan.	High	50	49
	Low	-18	-20
	Mean	16.8	18
Feb.	High	51	47
	Low	-17	-16
	Mean	21.9	22.2
Mar.	High	62	56
	Low	-1	7
	Mean	31.3	31
Apr.	High	72	70
	Low	2	16
	Mean	45.3	39.2
May	High	84	79
	Low	21	23
	Mean	51.4	49.1
June	High	89	84
	Low	33	30
	Mean	60.4	58.1
July	High	92	86
	Low	39	39
	Mean	65.3	63.2
Aug.	High	87	
	Low	40	
	Mean	63.4	
Sept.	High	81	
	Low	29	No report
	Mean	56.1	
Oct.	High	74	
	Low	13	No report
	Mean	45.1	

IMPROVEMENTS AND REPAIRS

In District No. 35 a new diversion dam headgate and measuring flume was installed at a cost of $1,000. Extensive repairs to headgates and dams in all districts in the division as well as dredging and otherwise improving ditches and canals.

FLOOD DAMAGE

A devistating flood occurred on Sangre de Cristo Creek where head gates and flumes were washed away and ditches filled with debris and silt costing ditch owners and highways $10,000 for repairs.

FLOOD CONTROL PROJECT AT ALAMOSA

An extensive survey by the army engineers was made in the vicinity of Alamosa. Contemplated dykes on the south side of the Rio Grande were planned to prevent the river overflowing its banks and flooding the town, also dredging and deepening the channel for a mile above and a mile below town where silt has accumulated, reducing the carrying capacity of the stream from 5000 second feet to less than 1500 second feet.

FLOOD CONTROL PROJECT AT CREEDE, COLORADO

Army engineers made an extensive survey of Willow Creek, through Creede, contemplating widening and deepening the channel through the town.

Both projects have the approval of the army, but construction is being held up for the duration.

MUNICIPAL WATER SUPPLY

All municipal water works in the division are functioning properly. Gravity lines at Antonito, Del Norte, and Creede are in good condition. Pumping plant at Alamosa and artesian well supplies at Monte Vista, Sanford, and La Jara have ample supply of water.

RURAL ELECTRIFICATION ADMINISTRATION

Owing to priority regulations the proposed construction of 270 miles was held up for the duration.

ARETSIAN AND PUMPING WELLS

There were no new artesian wells of any consequences put down this year, and owing to the adequate supply of water for irrigation there was very little pumping from shallow wells.

ACTIVITIES OF THE RESETTLEMENT PROJECT

There are about 99 units in this project, which average about 75 acres of land in cultivation per unit. Some of this land has been farmed two years, while some of it has been farmed for four years.

A great deal of progress was made during the 1942 crop year. Many acres of seeded alfalfa and sweet clover from the 1941 crop year held over in good shape, and were available for hay and pasture during 1942.

The general program on the project at this time is still land development. By this we mean the development of the land by planting of leguminous crops in addition to manure, the leaching of the land by irrigation, and any other operations which tend to bring new raw land into a proper state of cultivation.

At the present time this area is not yet ready for a large acreage of cash crops requiring land that is well built up and late watering. However some of these crops were grown this year. The majority of the crops planted consisted of feed crops and grain seeded with alfalfa and sweet clover.

The Monte Vista Canal furnishes water for 33 of these units, while 66 of them receive their water from the Commonwealth Canal.

There are about 2000 acres of alfalfa on the project area, about 2000 acres of sweet clover for seed and pasture, about 750 acres of cash row crops, and about 2000 acres of grain seeded with legumes.

The majority of the units on this project are advancing very swiftly towards the time when they will be average with the agriculture of this community.

In about two years many of the units will be ready for a larger acreage of cash crops. In the meantime, as at the present, the majority of the income on these farms is from livestock. There are about 800 milk cows on these units, about 3000 head of ewes and about 6000 hogs. Almost every unit has a poultry flock of at least 200 laying hens.

Walter D Carroll
Irrigation Div. Engineer
Div 703

Monte Vista, Colorado
September 25, 1942

Mr. M. C. Hinderlider,
State Engineer,
Denver, Colorado.

Dear Mr. Hinderlider:

Following is my annual report for the irrigation season of 1942, Water District No. 20.

The first three months of the year were spent largely in the office preparing detailed record forms for ditches, reservoirs and trans-mountain diversions, notifying ditch companies as to needed new structures and repairs on old ones and assisting the Forest Service each month on snow surveys.

So far as actual rainfall is concerned during the irrigation season, we have experienced one of the driest years on record, not having a general rain from April snows until a somewhat general rain September 1st, as recorded at the Del Norte station, the total rainfall from May 1st to October 1st -- five months, was 3.12 inches.

With this drought condition existing during the growing season had it not been that the reservoirs were all filled to capacity and that the ground or sub-water was abnormally high this spring, we would have experienced a very serious situation.

It might be well to mention further the "sub" or ground water because the elevation of the water table is so very important and relates so closely to irrigation methods and results in a large portion of the San Luis Valley. The sub-water was held at a very high level all last fall, the past winter and spring; places where it was from 20 to 34 feet to the water table last spring at the beginning of the watering period was only 10 to 12 feet this spring. The additional water required to make up the difference would have depleted our reservoir supplies and left us short at a very critical time in the growing season.

With the official Snow Survey for the Rio Grande water shed in Colorado showing plus 3.29 inches departure from normal and knowing that the mountains were saturated with heavy fall rains and snows it was believed by most old-time irrigation men that we would experience a uniform late run in the river with it holding up well above normal but instead we started on a decree basis on June 28 compared with July 23 in 1941, almost a month earlier; however it must be noted that the river did not reach an extreme low level until near the close of the season.

RESERVOIRS:

Rio Grande: The Rio Grande Reservoir, or known locally as the Farmers Union commenced spilling Oct. 25, 1941 and the river flow was carried through the spillway all winter. The five foot splash gates were raised on the crest of the spillway on June 25 and storage was stopped on June 26 at gage height 90.0 or 51,113 acre feet maximum storage for the season.

With 68 days continuous discharge from June 28 to Sept. 5 and average release of 645 acre feet per day making a total of 43,886 acre feet delivered leaving 7,227 acre feet yet in storage.

Recently an inspection was made of the tunnel, especially the section adjacent to the gates, being the large concrete pillars and steel plates on the outside gate tunnel walls. It was found that some breaking down of the concrete has occurred along the lower 2 or 3 feet of the large pillars evidently due to the very high velocity and pressure in the narrow tunnels. These tunnels are the same width as the gates allowing no expansion or increase of area for a distance of about 24 feet thus exposing the concrete walls to very high velocities.

It was agreed by members of the board and the Superintendent in charge of the reservoir that heavy steel plates about 4 feet high be securely anchored to the concrete walls in the form of a steel jacket completely covering the lower half of the large concrete piers. The ends of the steel plates would be attached by welding to the steel now in place some four feet distant from the gates and be continous around the pier and fitted closely to the floor. The defective places in the concrete will then be filled by grouting using a pressure gun through holes tapped in the steel plates.

It is evident that projecting stone on the north or left wall extending out past the wall line is reducing the velocity at the outlet of the gate tunnel thus greatly reducing the discharge as well as adding to the action of the water in damaging the concrete on the opposite wall. Some of this protruding stone should be removed and was so recommended.

Repairs this fall to the concrete pillars will depend upon the ability to secure the heavy steel plates required.

Santa Maria Reservoir:

The Santa Maria was filled to capacity again this year, completing storage June 22nd with a total of 42,005 acre feet. Release for irrigation commended on July 10th and was continuous until Sept. 2nd, with a total draw down of 28,592 acre feet leaving in storage to date 15,413 acre feet.

As in the case of the Farmers Union Reservoir there will perhaps be a light demand for reservoir water yet this season for late flooding should the river flow prove insufficient.

The repairs on the roof of the concrete tunnel adjacent to the gate chamber made last year and reported to you in detail, seems to be standing up in good shape. An inspection of the tunnel will be made later this fall and repairs made that seem necessary. Any appreciable defects or openings in conduits in the center of dams might well be considered serious and cannot be watched too closely.

The loss through Alderman hill making up seepage creek was very heavy during the summer indicating no apparent sealing in that area, being about 10 second feet at this time.

Santa Maria Reservoir continued:

With the assistance of Mr. Brees three measurements were made, with much difficulty due to extremely high velocities, in the wooden inlet flume, looking to establishing a suitable curve and rating table. These measurements were made at the point where a Bristol clock and recorder had been installed by Mr. Dan S. Jones, Jr. some years ago but had never been used; this station seems necessary in conjunction with two more yet to be worked out which I have mentioned to you previously, namely one above the diversion works and one immediately below. As I say, this all seems necessary in order to be able to make proper distribution of the water in North Clear Creek as related to the two reservoirs, the Santa Maria and the Continental. With these three stations established and used, I feel that valuable water now lost could be stored and considerable controversy between the two companies avoided.

Continental Reservoir:

This has been Continental's best year, only for certain conditions relating to minor repairs on the spillway and the removal of some large boulders from same, the reservoir could very easily have been filled. Total storage was 22,245 acre feet or 83 per cent of capacity which is 26,716 acre feet. The total released for irrigation was 5,709 acre feet leaving in storage 16,636 acre feet.

Much of the water released was sold to farmers on ditches with late water rights, had it not been available, pumping, no doubt, would have been resorted to which in turn would have greatly hindered in maintaining suitable top moisture on the adjacent farms in drawing down the sub or ground water level.

The section of the spillway wall damaged last spring by the very large boulder has not yet been repaired and not all the stone removed from the upper section of the spillway. I have been promised that this will be taken care of this fall.

Beaver Park Reservoir:

A detailed report was made to you covering repairs on the gate tower at the Beaver dam last spring. The work consisted of placing a continuous re-inforced concrete liner from the floor of the tower to the circular section a total of about 40 feet in height, with three concrete landings or floors properly spaced and poured monolithic with the walls; this new work included the closing of the broken out section or opening beside the frame of the upper gate.

Although the leakage loss was very great it was believed that the repairs on the tower and around the gates diminished the loss considerably, at least the useable storage was greatly increased over that of last season and, I am told, for many years past. This additional storage supply meant a great deal to water users on the San Luis Canal as the river diversion was cut off on July 31st. The maximum available storage was 1,510 acre feet on July 15th.

Beaver Park Reservoir, Continued:

Together with the Board of Directors this summer after the reservoir was empty, a study was made looking to placing an earth blanket over the area above the dam between the inlet channel and the right bank adjacent to the dam and against this part of the dam; this being the section apparently where most of the seepage originates. This study was also reported to you somewhat in detail. It is not known at this time what will be done this fall in the way of actual repairs at the dam.

Terrace Reservoir:

The Terrace Reservoir though not strictly in my district, some of the operating features have been under my observation due perhaps to its location as related to other water officials in the Valley. The maximum storage was 15,034 acre feet or 2,666 acre feet short of capacity.

Nothing was done the past year in the matter of building a new spillway to replace the old wooden structure, ~~but some promotional effort has been made~~ Plans however have been approved for a rubble stone masonry ~~or rubble~~ structure, ~~I am informed that Mr. Boyce Tipton, Engineer, has been engaged to furnish plans and specifications for this work.~~ of much greater capacity than the old spillway, and preparations were made to start construction of the new spillway early in 1943.

Small Reservoirs:

All small reservoirs were filled to capacity this last spring so far as reported and those I was able to visit and two or more, were emptied. Little or no work has been done on the dams or spillways of these small reservoirs this season.

The annual reservoir report for this district which will be completed a little later will give in detail maximum storage, amounts discharged, the ditches to which deliveries were made and the amounts to each ditch, etc.

At the larger reservoirs guards were maintained during the storage and irrigation season to protect against acts of sabotage.

New Structures and Repairs on River and Ditches:

Some work was done in District No. 20 in the way of new structures and repairs to old ones as follows:

A section of the loose rock diversion dam for the Del Norte Irrigation District was washed away by the spring floods and replaced by stone filled cribbing; the head gate on the Minor ditch was repaired and a new measuring flume installed; a new shelter house for recorder was built on the Independent No. 2 ditch; the Rio Grande Canal Company spent approximately $1400.00 on stone fill and rip-rap on the river above their diversion dam and above Del Norte as bank protection against flood damage, the Fish ditch installed a new 3 foot steel headgate; the Excelsior ditch installed two 48 inch steel gates at their head works; and the Costilla ditch dredged about two miles of their canal below the measuring flume near the headgate.

On Sept. 4th assisted by Mr. Brees with two parties using two current meters a seepage or return-flow study was made on the Rio Grande river from the State bridge above Del Norte to Alamosa, ~~finding~~ which disclosed that the return above the Gunbarrel road near Monte Vista was 66 cu.ft. per sec. and from Monte Vista to Alamosa was 94 cu.ft. per sec. a total return of 160 cu.ft. per sec. This compares with 74 sec. feet and 93 sec. feet respectively or a total of 167 sec. feet from a similar study made August 27, 1941.

We have enjoyed one of the best years in the San Luis Valley insofar as general crop production is concerned, with very heavy yields and prices for most products above normal. The small vegetable industry has proven very profitable with some fields of head lettuce selling as high as $280.00 per acre in the field. Potato men predict nine to ten thousand carloads of potatoes for the valley and numerous growers are reporting excellent yields, some running as high as 400 sacks per acre, while 275 and 350 sacks per acre are not uncommon.

We will go into the winter with the water table higher than normal and about 35,000 acre feet of water stored in the reservoirs.

Respectfully submitted,

D. H. Mathias

D. H. Mathias,
Special Deputy State Engineer.