

1948

Monte Vista, Colorado
November 23, 1948

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

Dear Mr. Hinderlider:

At the conclusion of another irrigation season comes the time for a summing up of events and conditions in the various districts which seem to be of sufficient importance to be included in our annual reports to you.

The irrigation season in District 20 started with an apparent abundant snow supply. Snow surveys indicating nearly a million acre feet run-off for the Rio Grande River at the Del Norte station. It is interesting to note that the water supply forecast for the Del Norte station issued by the U. S. Weather Bureau as of March 1st 1948, was 930,000 acre feet as compared with 933,800 actual run-off.

The Rio Grande River was out of its natural channel almost the entire distance from several miles above Monte Vista to below Alamosa for a sustained period of about five weeks. The time of the flood stage being from about the middle of May until the 20th of June, with a surplus passing the Alamosa station from about April 20th to July 1st.

Strange as it may seem, almost immediately after the flood subsided, it was necessary to go on appropriations. The river dropped from 5,000 c.f.s. on June 18th to 2,200 c.f.s. on July 7th.

Reservoirs.

The reservoirs in the district with the exception of the Santa Maria and a small one or two filled and spilled, but the demand on them due to one of the longest dry periods on record, so far as precipitation in the surrounding mountains and the Valley was concerned, left them depleted far below that anticipated early in the season.

Rio Grande Reservoir (Farmer's Union)

The Rio Grande Reservoir, better known locally as the Farmer's Union has a capacity of 51,113 acre feet and carried over as of October 31st 1947, 10,451 acre feet; started spilling over the crest of the concrete spillway on May 18th.

On June 15th permission was granted to raise the five foot flash gates on the crest of the spillway and on June 17th water was spilling over the wooden flash gates a gain of 5,280 acre feet in two days.

Rio Grande Reservoir Cont'd.

The steel for the new trash-rack structure was fabricated a year or two ago and is stored at Center Colorado, but nothing has been done toward actual construction; awaiting the time the reservoir will again be empty and the river discharge sufficiently low to permit installation.

The total draw-down of the Rio Grande Reservoir this season was 39,365 acre feet leaving in storage 11,748 as of October 29th at which time storage was permitted again.

Santa Maria Reservoir.

The amount of water in storage in the Santa Maria Reservoir, October 31, 1947, was 2,754 acre feet. The maximum storage in 1948 was 34,040 acre feet with a total draw-down of 18,179 acre feet leaving in storage October 29th, when storage was again permitted, of 15,861 acre feet.

Rather extensive repairs were carried on this past summer and fall at the Santa Maria Reservoir. The work consisted of the removal of some 380 lineal feet of an old wooden flume or ditch lining in the main inlet canal and replacing it with a reinforced concrete structure. Also the old wooden 4ft by 5ft wooden conduit under the floor of the canal, at the same section, was replaced by a concrete box; this conduit is used and is quite necessary for winter storage. The total cost of the new concrete work was about \$18,000.00

The outlet gates of the reservoir have been partially controlled hydraulically from water pressure from the reservoir but naturally effective only to a certain point of draw-down of the water in the reservoir. Preparation is now under way to install fully hydraulic controlled gates by use of oil pressure.

Continental Reservoir.

In storage in the Continental Reservoir, October 31 1947, was 1,555 acre feet, filling and spilling for the first time on June 13th.

The total draw-down and delivered to ditches was 21,960 acre feet, leaving in storage October 29th 1948, 4,756 acre feet.

As the reservoir was filling, particularly above previous high water level, observation was made as to the condition of the earth-fill dam. It was noted that nothing new seemed to develop in the way of seepage through the dam; only those small leaks of clear water which have been apparent years past.

The spill-way at the Continental functioned well with no hydraulic-jump apparent and the stilling pool dissipated the tail water with little velocity or turbulence.

Beaver Park Reservoir.

After the completion of the concrete conduit at the Beaver Dam last fall, 1947, it was then the desire of the owners to proceed with the placing of an earth blanket in front of and against the face of the old dam, but weather conditions prevented further work last fall.

Beaver Park Reservoir Cont'd.

In August, last, contract was let and earth moving equipment consisting of carryalls, bulldozers, jumbo levelers, etc., was moved onto the job. It was soon obvious that this type of equipment could move dirt much more economical than by use of shovel and trucks.

Material was taken largely from the rather steep slope on the left bank of the reservoir an average haul of approximately 1,000 feet.

In the early stage of construction where exceptionally good material seemed most necessary, a very heavy earth or clay was taken much farther from the dam on the left bank or floor of the reservoir and mixed with the lighter material from the slope forming a mixture which appeared to be very impervious and offered good compaction.

A study was made to see if anything could be done to improve the condition of the concrete tower. By use of a transit it was found that the tower was out of plumb at least 14 inches from the square base section to the top, leaning away from the face of the dam, up stream. If the tower could not be straightened it was desirable at least to attempt to anchor it in by some method to prevent further movement. The anchor or tie was made by placing heavy steel rods through the top of the dam and anchoring them at the back of the dam against the rock wall, then by use of a heavy steel band around the tower near the top and the use of heavy cables, all the attention it was thought the system would withstand was applied by turn buckles. Little if any movement of the tower was realized but by leaving the ties in place further movement may be prevented.

With the gates closed a study was made of the lower section of the outlet tunnel from gates to the portal. The only place there seemed to be any dislodgement of stone or concrete lining was at a point about 15 or 20 feet below the gates near the top and on the right hand wall of the tunnel; approximately a cubic yard of material has been dislocated. Without pressure on the dam it could not be determined whether there would occur any leakage at this point, but I am of the opinion there will not be. I say this because there is no indication of any scouring or washing off of a black film at the point, which is deposited throughout the tunnel length. I did recommend, however, that the cavity be filled with concrete while the contractors were still on the job but the owners were not inclined to attempt the work this fall.

The work done on the gates and gate stems seems to have proven most satisfactory, with little effort required now to raise or lower either gate; just how they will operate under pressure is a question but I feel sure the condition is much improved.

The repairs on the gates and stem consisted in adjusting the stem guides and a thorough cleaning of the gates and gate guides and the stems and stem guides; also a generous use of oil and a waterproof grease.

When in the tunnel below, with the gates down and a considerable head of water over the gates, I found practically no loss of water at any point around the gates, a condition I am sure has not existed for many years.

Beaver Park Reservoir Cont'd.

The placing of the earth fill has been more extensive than was first planned, with some 20,000 or 25,000 cubic yards of material deposited in front of the entire length of the old dam.

It could be observed during the placing of the materials that many leaks were being stopped; the reservoir does not completely drain. The most extensive and perhaps most serious leak was stopped when the work first started by filling a very large sinkhole, well out in the water to the right and above the new trash rack. When this hole was filled, what had been a very serious leak at the toe of the dam from under the bottom of the old spillway, dried up completely.

So also, it was observed while sluicing materials into the rock section on the right bank that muddy water would show up below at the toe of the dam, but with continuous washing in of the materials finally no more water could be forced into the cavities and leakage below would cease.

A two and one half-inch heavy duty centrifugal pump was used throughout the time of the construction for careful sluicing materials into the rock sections. I feel sure that much has been accomplished in making the dam water tight.

The Beaver Reservoir filled to a maximum gauge height of 64.3 or about 10 feet below the high water line.

Terrace Reservoir.

When the new masonry spillway at the Terrace Reservoir was constructed in the spring of 1943, proper back-fill was not at the time completed. Also at that time it was found that the main dam did not have sufficient freeboard, largely due, no doubt, to settlement. This last summer all backfilling around the new spillway, the raising of the spillway dyke and the main dam was built up to specified elevation.

The problem of raising the main dam, in places some four or five feet, was simplified greatly due to the fact that a shoulder about 20 to 25 feet in width was left, when the dam was built, on the lower slope about 35 to 40 feet below the crest of the dam. This berm was used for the starting point of the new fill and a 20 to 25 foot wide section was carried up to the new crest. The completed top width is about 20 feet.

Stone rip-rap was placed on the new section of the face of the dam and on the face of the dyke at the spillway.

At a meeting in Monte Vista, last summer with the board of directors of the Terrace District, which you attended, permission was granted to raise the crest of the new spillway a maximum of 24 inches. During the discussion of the matter it was brought out that adequate freeboard had been established and with the raising of the spillway dyke and all necessary backfill completed such increase in the highwater line seemed justified.

It is to be noted that such approval will not necessarily increase the original capacity for it is apparent that sediment deposited will about replace the additional storage on top.

Terrace Reservoir Cont'd.

The Terrace Reservoir filled and spilled again this season at the time of the peak run-off. The gaging station on the Alamosa River showing a peak of 1,660 c.f.s. on June 3rd.

On the morning of June 4th, with a Mr. Kertzhof, of the Army Engineers, I visited the Terrace Reservoir and we estimated there was 500 or 600 C.F.S. going over the spillway, and judging from the wash below there had been at least twice that amount going over during the night before. The spillway was carrying the water at the time very smoothly and with ^{out} turbulence.

Some time after the spill, I examined the spillway again and found it in very good condition. The bed-rock at the foot of the spillway indicated ~~no~~ signs of breaking up or dislodgment; in fact, the wash or channel below, a distance of about a quarter of a mile from the spillway to the river, shows only large boulders and bed-rock the entire length.

Small Reservoirs.

Little work was done the past season in the way of repairs on the small reservoirs. The only one worthy of mention was at Trout Lake consisting of some additional fill on the dam and dyke completing the enlargement project carried on there in the summer of 1947.

Almost nothing was done to repair the dams at Hermit Lakes and Troutvale #1 on South Clear Creek. When I visited them I found the water level was being held down to an elevation about as prescribed by you after your visit to these reservoirs in the summer of 1947.

It is my understanding that the owners of Hermit Lakes and Troutvale Lakes have determined that all the water impounded hereafter in these lake will be used only for fish culture and not for irrigation.

Canals and Ditches.

Rather extensive repairs and improvements have been made and are now under way on some of the larger canals in the district.

The Monte Vista Canal is just completing a new concrete control structure equipped with steel radial gates. This replaces a very old wooden structure known as the lower headgate on the canal situated about a mile below the river gates; also a fine concrete structure equipped with steel radial gates, constructed about ten years ago.

The rebuilding of the diversion dam at the head-works of the Monte Vista Canal was made necessary by the damage done by the prolonged high water stage of the river.

The cost of the construction at and near the head-works of the Monte Vista Canal this season amounts to approximately \$20,000.00 dollars.

The Rio Grande Canal last fall and winter replaced their old waste gate and sand-trap structure with concrete and steel gates and long runs of the new flat corrugated pipe leading to sand traps across the canal. This structure is located between the diversion gates and the measuring flume.

This fall water was turned off at the Rio Grande Canal on October 20th to permit the construction of an extensive concrete check and gate structure on the main canal about a mile and one half below the diversion works.

The work completed last spring and the construction now under way will cost the Rio Grande Canal Company about \$40,000.00 dollars.

The total water delivered to the canals and ditches from the Rio Grande River in water District #20 this season was 634,147 acre feet compared with 630,524 for the season of 1947 and 452,001 acre feet in 1946, with 550,000 acre feet as average or normal delivery. Included in the total for this year was 75,473 acre feet of reservoir water and 1,812 acre feet of trans-mountain diversion water delivered, leaving a direct river diversion of 556,862 acre feet.

The grand total for the Rio Grande River and its tributaries for water delivered to all ditches in District #20 for the season was 682,344.

Pumping.

Little pumping for irrigation was necessary with a good supply of water in storage in the reservoirs.

The matter of control of the water being pumped from irrigation wells for irrigation as to rights and decrees has come to our attention in the San Luis Valley rather recently and offers some interesting problems and developments.

Crops.

The farmers generally have enjoyed one of the best years as to crop production and prices in the history of the San Luis Valley.

Some of the vegetable or garden crops especially cabbage and cauliflower, as to price, did not fare so well but in District #20 these crops are not so extensively raised.

Flood Damage.

Some mention should be made in this report of the damage caused by floods along the Rio Grande River in this district.

The river bottom comprising some of the very best land and a large acreage was under water for weeks destroying many acres of cultivated crops and causing great damage to meadows and hayland.

The rebuilding of highways and roads damaged by flood, cost the counties thousands of dollars as well as money spent in an attempt to keep the river within its channel.

There was as many as four bridges across the river washed out; one of them a steel span and the other a wooden bridge on the Creede road at Wasson.

It would be extremely difficult to estimate the total flood damage in the district but it might be conservative to say that it would be around \$150,000 to \$200,000.

Long distance recording equipment.

The Stevens Remote Control or long distance recording equipment was installed and put in operation about July 1st.

It is now possible to read the river gages of the Del Norte and Monte Vista stations from a chart on a recorder in the Monte Vista office.

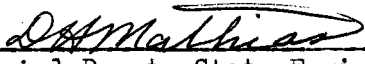
The equipment is quite satisfactory and accurate to one one-hundreth of a foot, but a more suitable battery should be provided at the sender station as the Radio-B-battery used, apparently breaks down to rapidly.

Administration.

Administration problems were few, but the excessive run-off of the river in the early part of the season and the very abrupt drop and low stage so soon after the floods surely illustrates again the great need for larger hold-over storage. The small reservoirs we have are fine but they just do not fit the run-off situation.

Finally, I wish to refer to the very fine co-operation existing among the ditch tenders and water officials as well as with the water users through the past season, bringing to a close a very satisfactory irrigation year.

Respectfully submitted.


Special Deputy State Engineer.

M. C. HINDERLIDER
STATE ENGINEER
C. C. HEZMALHALCH
DEPUTY



L. T. BURGESS
CHIEF HYDROGRAPHER
W. T. BLIGHT
OFFICE ENGINEER

STATE OF COLORADO
OFFICE OF STATE ENGINEER
DIVISION OF WATER RESOURCES
- DENVER 2 -

Alamosa, Colorado,
February 9th., 1948.

SUBJECT:



Mr. M. C. Hinderlinder,
State Engineer,
State Capitol Building,
Denver, Colorado.

Dear Mr. Hinderlinder:

Have your letter of January 30th., concerning my 1945 report for Weminuche transmountain diversion.

I report these transmountain diversions just as Mr. Mathias reports them to me, and that is the way he reported it in 1945.

Since receiving your letter I have checked with him and he advises that this 1945 Weminuche report can be divided as follows:

Raber-Lohr - 1614 acre feet.
Fuchs - 526 acre feet.

✓ 289,722

Yours very truly,

Roy B. Heilman
Roy B. Heilman.

Alamosa, Colorado,
November 26, 1948.

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

Dear Mr. Hinderlider:

Herewith is submitted my annual report as Irrigation Division Engineer for Division No. 3. This report includes tabulated summarized statements of the reports from the Water Commissioners of the various districts of diversions to ditches, crop acreages and reservoir storage.

The run off in the districts on the west side of the Valley was above normal, especially so in District No. 20, due to flood conditions; however, the diversions to ditches were about normal. In the rest of the Division there were no flood stages, the spring run off was fair and held up fairly well. Most of the reservoirs on the West range were filled and finished the season with some water in storage. The reservoirs in the East range did not fill to capacity, but did store enough water so that they finished the season with some water in storage.

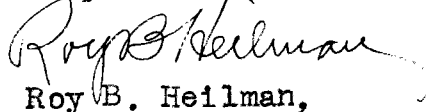
There have been practically no rains either in the Valley or in the mountains since the first week in July. This caused an increased demand for reservoir water, and artesian and pump wells were again used to supply supplemental water where reservoir water was not available.

The range in the mountains was good the fore part of the season, but dried up the latter part, causing a large number of livestock to be brought out of the mountains several weeks earlier than usual. Also the stream flow since July has depleted the mountains of water to such an extent that they are drier than they have been for several years.

On the whole crops were good. The hay crop in the north end of the Valley was the best for many years. The potato yield increased while the shipment of other vegetables decreased. Livestock came through the season in good condition.

The few administrative problems, which came up, were settled locally.

Respectfully submitted,


Roy B. Heilman,

Irrigation Division Engineer,
Division No. 3.

SUMMARY
WATER COMMISSIONERS' DITCH REPORTS
 1948

No. of Water District	Number of Ditches Reporting	First Day Water was carried	Last Day Water was carried	No. Days Water carried	No. of Acre Feet Carried by all
20	191	3-31	11-9	224	682343
21	66	4-1	10-31	214	114826
22	116	4-1	10-31	214	261285
24	64	4-1	10-31	214	63376
25	53	4-1	10-31	214	49695
26	57	4-2	10-31	213	72282
27	33	4-15	10-31	200	15208
35	77	4-4	10-31	211	61469
Total for Division					1320484

These figures include Reservoir water and Trans-Mountain Diversions.

WATER COMMISSIONERS' DITCH REPORTS

1948

Number of Acres

Water District	No. Acres That Can Be Irrigated	Alfalfa	Natural Grass	Cereals	Pasture	Garden Peas
20	504168	62012	52671	70578	93852	2209
21	68021	6181	12744	11136	8715	3228
22	191576	13555	26595	23111	20968	1169
24	24115	4075	2670	12295	2806	652
25	132965	975	28035	1514	91521	
26	60142	2412	31159	955	11872	
27	16170	852	4002	192	4798	10
35	39188	2262	13848	3918	2109	89
Totals:	1036345	92324	171724	123699	236641	7357

Number of Acres

Water District	Potatoes	Sugar Beets	Beans	Field Peas	Cabbage	Lettuce
20	31365	630	38	9847	520	1696
21	2312	127	286	3961	201	147
22	2150	116	584	3611	25	25
24	1782	5	1519	8233	215	155
25	3					
26	10					
27	41		3	198		
35	503		79	2001	511	249
Totals:	38166	878	2509	27851	1472	2272

Number of Acres

Water District	Cauliflower	Sweet Clover	Spinach	Summer Flow	Other Crops	Total Irrigated
20	567	28869	93	2849	1492	359288
21	247	2615		1210	67	53177
22	96	7691		425	319	100440
24	1468	836			985	37696
25		217				122265
26					10	46418
27					338	10434
35	422	669	45	250	368	27323
Totals:	2800	40897	138	4734	3579	757041

SUMMARY

WATER COMMISSIONERS' RESERVOIR REPORTS

1948

Acre Feet in Storage

Name of Reservoir	Water District No.	Capacity in Acre Feet	May 1, or Amount Available	Nov. 1 1948	Total Acre Feet Delivered
Rio Grande	20	51113	51113	11748	35518
Santa Maria	20	43565	34040	15861	16304
Continental	20	26716	26716	4756	19764
San Luis Valley	20	4434	1480	00	1332
Metroz	20	188	188	98	82
Sowards	20	?	150	00	134
Lake Cliff	20	31	31	00	25
Spruce No. 1	20	51	51	?	36
Spruce No. 2	20	105	105	70	32
Fuchs	20	237	237	00	212
Troutvale No. 1	20	510	Not used		
Troutvale No. 2	20	257	" "		
Squaw	20	140	140	21	108
Poage	20	157	80		72
Shaw	20	490	245	87	144
Bristolhead No. 1	20	151	00		
Bristolhead No. 2	20	804	00		
Road Canon	20	395	273		240
Regan	20	975	500		498
Lost Lakes	20	966	966	174	720
Spring Creek	20	145	76	42	30
Meadow Lake	20	114	114	48	65
S.U.Dude	20	120	100		92
Goose Lake	20	232	212		170
Trout Lake	20	298	298	00	270
Terrace	21	17700	17700	456	17024
La Jara	21	14052	7785	1750	2071
Cove Lake	22	7910	6004	00	6004
Sanchez	24	103155	12053	3100	31061
Eastdale No. 1	24	3468	1270	00	1168
Salazar No. 1	24	142	60	25	610
Mountain Home	35	19150	9581	706	14662
Smith	35	5336	5336	2940	7300
Totals for Division		303107	171504	41882	155748

RESERVOIR STORAGE - 1948 - DIVISION NO. 3

AMOUNTS IN STORAGE IN ACRE FEET.

	Rio Grande	Santa Maria	Continental	Sanchez	Terrace
	<i>Sanchez</i>	✓	✓		✓
1-1-48	18490	4282	2219	8598	5346
2-1-48	20664	4891	2600	8671	5603
3-1-48	22372	5475	3000	8600	5739
4-1-48	24208	5770	4000	9267	6015
5-1-48	30500	7537	8903	12053	106.50
6-1-48	45832	24281	20680	20116	17700
7-1-48	50413	34036	26716	20093	15348
8-1-48	29013	30370	16756	9299	6254
9-1-48	11748	20832	4756	3878	2020
10-1-48	11748	16072	4750	2425	621
11-1-48	12015	15861	4756	3100	456
12-1-48	13400	15815	5104		872

	MT. Home	Smith	Cove Lake	La Jara
	✓			
1-1-48	7234	4481		
2-1-48	7306	4622		
3-1-48	8354	5336		
4-1-48	8354	5336		
5-1-48	9581	5336	00	
6-1-48	13426	5336	3845	3770
7-1-48	5510	4869	4335	7785
8-1-48	5309	3842	2780	7374
9-1-48	2003	2805	434	4673
10-1-48	531	1996	00	3376
11-1-48	706	2940		2194
12-1-48	1205	3514		1751

VEGETABLE SHIPMENTS

1948 Season

Lettuce	366	carloads
Mixed Vegetables	655	"
Spinach	21	"
Garden Peas	572	"
Cabbage	301	"
Carrots	55	"
Cauliflower	932	"
Potatoes	9515	"
Total	12417	

Potatoes estimated and include shipments by trucks.

1948 - SUMMARY

TRANS-MOUNTAIN DIVERSIONS

	Acre Feet
Weminuche -	
Raber Lohr	1582
Geo. Fuchs	318
Treasure Pass	29
Squaw Pass	150 ✓
Spring Creek (Tabor)	163 ✓
Total	2242

COMPARISON FOR 10 YEAR PERIOD

	No. of Acres Irrigated.	Acre Feet of Water Delivered to Ditches.
1939	<i>4656</i> 715332	<i>53459</i> 994770
1940	664267	769141
1941	717654	1635840
1942	733996	1398212
1943	769680	1123219
1944	749625	1557569
1945	746751	1318180
1946	698431	912394
1947	742289	1351229
1948	757041	1320484
Totals -	<u>7295066</u>	<u>12401038</u>
Average -	729,507	1,240,035