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DIVISION OF WATER RESOURCES

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January 18, 1982

Jeris A. Danielson
State Engineer
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1313 Sherman St.
Denver, Colorado 80203

Dear Jeris:

On behalf of the staff of Irrigation Division 3, I submit herein the Annual Report for 1981.

I would like to express special thanks and recognition to the Division 3 personnel for their excellent performance in fulfilling their various responsibilities of water administration. They have been the stabilizing force in a period of great turmoil and change in the San Luis Valley.

Respectfully submitted,

Steven E. Vandiver
Steven E. Vandiver, P.E.
Division Engineer

SEV:ct



1981
ANNUAL REPORT
DIVISION OF WATER RESOURCES
DIVISION III

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COLORADO DIVISION OF WATER RESOURCES

DIVISION 3 ANNUAL REPORT - 1981

I. INTRODUCTORY STATEMENT

Water Division 3 includes about five million acres of land. Approximately one-half of this land is federally owned, including national forests, public domain, wildlife refuges and the Great Sand Dunes National Monument.

Of the remaining 2 1/2 million acres of private land in the area, about 500,000 acres is irrigated crop land, 250,000 acres permanent pasture or hay, 500,000 acres woodland and 1,250,000 acres is range land consisting of sage, chico, and natural grasses.

Division 3 includes all land in Colorado which drains into the Rio Grande River. The area is more specifically referred to as the San Luis Valley. It is located in south central Colorado and includes all or part of the counties of Saguache, Rio Grande, Alamosa, Conejos, Costilla, Hinsdale, Mineral, and Archuleta. The Division is bounded on the north and west by the Continental Divide, on the east by the Sangre De Cristo Mountains, and on the south by the Colorado-New Mexico state line. The Valley floor, at an average elevation of 7,600 feet is nearly flat, sloping generally from north to south at a grade of 4 to 10 feet per mile. The area along the Rio Grande in

the vicinity of Alamosa has a slope of only 0.6 of a foot per mile.

Soils of the Valley range from coarse gravel and rock next to the mountains to a fine blow-sand texture toward the center. The finer textured soils are underlain by sand and gravel with clay lenses beginning generally at a depth of 60 feet.

The growing season between frosts ranges from a minimum of 75 to a maximum of 120 days. Precipitation averages about seven inches a year on the Valley floor. Hail storms are common during the growing season and weather modification has been practiced in some previous years to reduce crop damage. The prevailing winds blow from south to west and are strongest in the spring.

The main crops raised by irrigation are alfalfa, potatoes, barley, oats, natural grass, hay, lettuce and pasture. Cattle and sheep are feed-lot and field pasture fed in the winter months and transported to mountain ranges in the summer. Crop yields are high and the quality is good.

The headwaters of the Rio Grande River are in Hinsdale County on the west side of the Valley. The Rio Grande flows generally west to east through the Valley turning south at Alamosa. Major tributaries to the main stem of the Rio Grande are the South Fork of the Rio Grande and

the Conejos River at La Saúces. The Los Pinos and San Antonio Rivers are tributary to the Conejos River east of the town of Manassa. The San Antonio River heads in New Mexico and flows into Colorado. The Los Pinos heads in the Cumbres Pass area in Colorado, flows into New Mexico and then back into Colorado. The Conejos River heads in the San Juan Range near Platoro. The streams flowing into the Closed Basin (Saguache, San Luis, Carnero, and LaGarita Creeks, and their tributaries) are not tributary as surface water to the Rio Grande. Costilla and Culebra Creeks and their tributaries are not now considered tributary to the Rio Grande above Lobatos, although future studies could change the status of Culebra Creek.

Agriculture continues to be the predominant economic factor in the San Luis Valley. Several small towns exist as supply centers for the agricultural industry. Adams State College, a liberal arts college offering both graduate and undergraduate degrees, is at Alamosa, the largest town in the Valley.

Manufacturing is primarily based on the region's resources. Perlite is processed in the Antonito area by Grefco, Johns-Manville, and Silbrico Corp. The Homestake, Emperius, Platoro and Summitville mines produce gold, silver, lead and copper. Lumber mills and potato starch plants round out the major part of the manufacturing sector. In

1970, the Gerry Division of Outdoor Industries, Inc. located in a new plant to manufacture ski parkas in Alamosa. There are, also, two new corporations being formed in the Valley for the distilling of alcohol for fuel purposes. The first, San Luis Valley Protein Corporation, located outside of Monte Vista has completed construction, and is in the process of starting production of 100% alcohol using barley. The second, Colorado Agri-Fuel Corporation, is just starting construction, and they will be using both potatoes and barley in arriving at 100% proof alcohol for fuel purposes. Also, in 1981, the Alamosa Mushroom Plant was finished, and is now ready to start production. At full production, the plant will produce approximately 120,000 pounds of mushrooms a week. With the vast amount of high quality potatoes grown in the San Luis Valley, local officials are attempting to find a major processor to locate in the area.

During the late fall of 1981, the City of Alamosa undertook the geothermal test well project on it's southern city limits. After considerable seismic testing by several groups including the School of Mines, this location was chosen to be as good as any available. The nearly \$800,000 provided by the Department of Energy (DOE) ran out when the hole was 7,150 feet deep. After consid-

erable testing and cleaning, the well is only able to produce 130° water at a rate less than 100 gallons per minute. This is far from the city's expectations of 600 gallons per minute at 180°. Testing and cleaning efforts are still in progress hoping to find a better source of hot water in the hole. This well was intended to be used for developing the industrial park, particularly for a malt barley plant that was to come into the Alamosa area.

Tourism continues to be another of the major factors in the economy of Division 3. The excellent skiing, hunting, fishing and outdoor activities attract many thousands of tourists to the San Luis Valley area. Many of the smaller mountain towns such as South Fork, Creede, Crestone and Platoro come alive in June and then settle back to normal in November. Tourists seem to have ignored the high cost of gasoline in 1981 and appeared in good numbers.

Snow pack in the surrounding mountains was poor for the 1981 water year. The rain in the latter part of the summer was the only thing which made some crops. The precipitation data will be discussed in detail later in this report.

Subdivision developers continue to be active in the San Luis Valley, involving the Division of Water Resources in the evaluation of water resource availability. The Planning Section in Denver and this office have spent a considerable amount of time and effort in this evaluation as required by statutes, and in the review of Plans of Augmentation submitted to the Water Court. Fortunately, input from the Division of Water Resources is both sought and carefully considered by the Division III Water Court.

The difficulties of water administration in the San Luis Valley continue to increase. The principal water users groups continue to remain alienated, and one of our biggest challenges is to remain neutral and unbiased in our thinking concerning the problems of these groups. As a result of this thinking plus new policies adopted by the Division of Water Resources this year, Division 3 becomes more and more involved in the court room. Much of our time is spent reviewing water right applications and preparing for court cases.

B. WATER RESOURCE RELATED PROJECTS

<u>Sponsor</u>	<u>Owner/Project</u>	<u>Status</u>
Rio Grande Water Conservation District (RGWCD)	Flowing well control program	Over 3,294 wells now have controlled heads installed. 2,844 2" thru 12" valved. 450 2" thru 12" plugged.
RGWCD	Norton Drain	Maintenance to improve access, water delivery, and monitoring.
RGWCD and USGS	Observation well network. Exploration holes (Costilla)	Added 3 new wells to network, total now 69 wells. One piezometer installed in Death Valley well, 3 more + water table piezometers to be installed.
RGWCD, USGS, CWCB, BUREC	Closed Basin Project	See special report next page.
San Marco Pipeline	Water supply for coal slurry pipeline	See unresolved court litigation.
RGWCD	Sprinkler Inventory	1980 final count 1541 sprinklers. 1981 preliminary count approximately 1650.
USGS, RGWCD	Conejos Seepage Investigation	Will be complete in Sept., 1982.
USGS, RGWCD	Water Quality, North of Rio Grande River (Nitrogen content)	Continuing.

<u>Sponsor</u>	<u>Owner/Project</u>	<u>Status</u>
SCS (PL 566)	Trinchera Watershed ditch lining and structure	Phase 4, holding, waiting on funds from owners.
RGWCD	San Luis Valley Water Resource Committee	Continuing with regular meetings.
RGWCD	Well Monitoring with permanent recorders	Several recorders now in place.
City of Alamosa, Dept. of Energy	Geothermal well.	Cleaning and pump testing are continuing at this time.

CLOSED BASIN PROJECT
(A Special Report)

Contracts

1. A 40' by 60' metal warehouse building was completed in October.
2. A contract for an Office and Laboratory Building of approximately 6500 square feet was awarded during the month of October. Thirteen percent of the work has been completed.
3. A contract for Test Wells and Observation Wells, Stage 3 and Stage 4 was completed in October.
4. A contract for Stage 1-2 Salvage Wells, Phase 1, consisting of 25 wells, ranging in capacity from .25 to 1.0 c.f.s. was awarded in May. Forty-seven percent of work has been completed.
5. A contract for Stage 1-2 Salvage Wells, Phase 2, consisting of 18 wells of .25 c.f.s. capacity was awarded in September. At years end no wells had been drilled under this contract.

Total cost of construction contracts awarded was \$1,099,220.

Design Data

Design data for Stage 1-2 conveyance channel and laterals progressed during the year, with anticipated transmittal to Engineering and Research Center, Denver, during January 1982.

Real Estate

Rights in 55, 1 acre well sites were acquired from State, Federal, and private landowners for construction of the various salvage wells under construction.

Wildlife Mitigation

For Stage 1-2, the Bureau of Reclamation, in conjunction with the United States Fish and Wildlife Service, Bureau of Land Management and the State of Colorado Division of Wildlife, formulated a plan to substitute 800 acre-feet of water per year from proposed wells, on the Alamosa Wildlife Refuge, and 300 acre-feet per year, from proposed wells, on the Blanca Wildlife Habitat Area. In addition, for wildlife mitigation for Stages 3,4, and 5, a plan was proposed to develop approximately 4,600 acres of wildlife habitat in the Russell Lakes Area.

A supplement to this Project's Environmental Impact Statement, regarding the above plans is being reviewed by various Federal Agencies prior to submittal to the Environmental Protection Agency.

Observation Well Monitoring

Two hundred seventy-eight observation wells along the conveyance channel, laterals and project boundary are read monthly.

Twenty-six pilot and sixty-four miscellaneous observation wells are read monthly. Recorders have been installed by the USGS at nine of the twenty-six pilot wells.

Thirty-seven experimental wells are read each month. Recorders have been installed at seven of these wells.

Fifty artesian wells are read every three months.

Test Well 1-3 is being pumped at a continuous rate of 575 G.P.M. in conjunction with this Project's Vegetation Study and long term drawdown test.

Personnel

During the year, project personnel increased from 15 to 42 permanent and part-time employees.

This special report was submitted to the Division 3 Water Resources by Lindell H. Elfrink, Project Construction Engineer.

II. PERSONNEL

The calendar year 1981 could only be described with the word "change" as far as personnel is concerned. Before the end of the year, we lost four of the "old timers" and the knowledge and history that they possessed. Elwin "Jake" Parker started it all when he retired on February 27, 1981. Jake started in 1951 in District 22 on the Conejos River. He became a 1042 well commissioner in the fall of 1973, and worked in the Alamosa office until he retired. Lewis "Sandy" Waddington retired next, on April 17, 1981, leaving his assistant division engineer position, which he's held since April, 1975. Previous to that, he was a hydro from the fall of 1971 to April 1975. Lyle Alspaugh, longtime water commissioner in District 20, retired May 31, 1981. Lyle has worked for the State since 1949 and probably deserved the rest. As if losing these people weren't enough, D. H. McFadden, "Mac", then decided to retire on September 15th, 1981 to resume work in the oil and gas exploration consulting field. Doug Reimold replaced Jake Parker on March 9, 1981, and worked as our "1042" man until September 25, 1981 when he quit to move to Cortez.

Steven E. Vandiver was appointed acting division engineer on September 16, 1981, and acted in that capacity until November 20, 1981, when he was appointed division engineer. As of January 1, 1982, we are still several positions short. They are an assistant division engineer, a 1042 well commissioner, one hydrographer and 3 part/time water commissioners. Because of the new hiring freeze, it's doubtful we'll be able to fill any of these soon.

PERSONNEL

<u>Name</u>	<u>Position 1/</u>	<u>Dist.</u>	<u>Mos. Worked 2/</u>	<u>Mileage 3</u>	
				<u>State</u>	<u>Personal</u>
McFadden, D. H.	Supr. WRE	Div	10.5 (retired)	9,414	
Waddington, L. A.	Sr. WRE	Div	5.5 (retired)		
Vandiver, S. E.	Sr. WRE	Div	FTE	11,148	
DeProspero, B.	WRE A	Div	FTE	15,182	
Brinton, S.	WRE A	Div	FTE	16,324	
Tipton, C.	Sr. Sec.	Div	FTE		
Parker, E.	WC C	Div	4 (retired)	9,427	
Riemold, D.	WC A	Div	6 (quit)		
Alspaugh, L. R.	WC C	20	7 (retired)		1,549
Nash, M. E.	WC C	20	FTE	16,465	3,342
Smith, T.	WC B	20	6 now FTE		12,811
Gonzales, L. B.	WC C	21	12 (8)		11,601
Morch, K. S.	WC B	21	7 (9)		9,060
Simons, L.	WC C	22	FTE		19,451
Sorensen, D.	WC B	22	FTE		12,421
O'Cana, G.	WC B	24	8 (8)		6,495
Lamm, H.	WC C	25	10 (8)		13,320
Lovato, T.	WC B	26	9 (8)		8,701
Alspaugh, P.	WC B	27	8 (6)		9,296
Escherman, C.	WC B	35	8 (8)		8,181
Total Mileage Div. 3 =				77,960	116,228

1/ This chart is for November 1, 1980 through October 31, 1981

2/ Months reported for water commissioners include annual leave taken and work in office on data bank. Numbers in parentheses show funded months.

3/ Personal vehicles includes 4-wheel drive. Mileage for 4-wheel vehicles is 3,868 miles.

111. WATER SUPPLY

A. Snowpack

The snowpack during the winter of 1980-81 was poor to say the least. It was only slightly above the 1977 snowpack which was our record drought year. The month of April showed poor precipitation while the temperatures were much above normal. This combination of weather elements resulted in a rapid deterioration of the mountain snowpack conditions in surrounding mountains. Snowpack in the Upper Rio Grande Basin in Colorado on May 1, 1981 was 29% of normal compared to 66% of normal on April 1, 1981. At the Rio Grande Del Norte station, the forecasted streamflow was 50% of average.

As a result of the poor snowpack, we experienced a very dry start to the irrigation season. The peak flow at Rio Grande near Del Norte was 3540 cfs on June 8, 1981, and the peak on the Conejos near Mogote was 1570 cfs on June 9th. Our early forecasts (May 1) were for 300,000 AF on the Rio Grande and 150,000 on the Conejos. This was a rather low estimate as it turned out because of

a rather unusual wet spell we had during the middle and late summer.

B. Precipitation - Summer

The poor snow pack did not produce a very good outlook for the farmers and ranchers. But Mother Nature stepped in and provided some relief in the form of rain. Starting in May and continuing through September, the Valley received above average precipitation and virtually saved many of the farmers and ranchers, who were without senior decrees or wells. This relief was not without it's disadvantages. Later in the summer, this rain kept many crops from being harvested on time or kept them wet after they had been cut and before the hay could be baled or the grains combined.

On August 7, 1981, a major rain and hail storm occurred over much of the San Luis Valley. Alamosa received nearly one inch of precipitation. Many grain and alfalfa fields were damaged by this storm. Our water commissioner in District 25, Henry Lamm, lost his entire grain crop under his sprinkler during the storm. But damage was rather spotty over the entire Valley, and overall damage was less than 10%.

As a result of these rains, the river held up to an acceptable level during the late summer months. This increased our forecast for the river, and caused us to make curtailments on the Rio Grande of 10% during the summer and to shut the Conejos off on October 9, 1981. Rainfall after October 9th made our commitment for us, and we allowed recharge on both rivers from November 25th to the end of the year.

The period reported is the summer growing season from May 1 through September 30. Normal precipitation (1931-1960 average) for the period at National Oceanic and Atmospheric Administration reporting stations is 6.28 inches. The average annual precipitation is approximately 7 inches on the Valley floor.

PRECIPITATION AND DEVIATION FROM NORMAL (FROM NOAA REPORTS)
(Inches of precipitation)

Station	May <u>1/</u>		June		July		August		Sept	
	1	2	1	2	1	2	1	2	1	2
Alamosa	0.99	0.37	0.95	.43	1.43	.26	1.94	.79	1.40	.69
Blanca	1.54	.67	.67	-.04	1.26	.15	--	--	1.28	--
Center	0.79	.08	1.11	.50	1.46	.46	1.68	.42	.78	.09
Del Norte	1.53	.77	.84	.10	3.22	1.74	2.65	.96	.77	-.09
Great Sand Dunes	0.89	--	1.05	--	1.72	--	3.09	--	.95	--
Hermit	2.25	1.13	.50	-.38	5.10	2.97	1.70	-.49	.85	.51
Manassa	0.77	.13	1.40	.76	1.78	.62	2.50	1.05	.77	.06
Rio Grande Reservoir	2.43	--	1.16	--	4.90	--	3.90	--	1.36	--
Saguache	1.18	.43	1.62	.91	2.01	.48	1.38	-.15	1.00	.16
Wolf Creek	1.04	--	2.43	--	3.89	--	3.47	--	2.48	--
Average	1.34	.44	1.17	.48	2.68	.85	2.48	.68	1.16	.01

Column 1 - Precipitation.

Column 2 - Deviation from normal.

Data from the table indicate about 141% of normal precipitation for the period. Several major rainstorms occurred from the middle of July to October in and around the San Luis Valley. This unusual amount of rainfall was very helpful considering the very low snowpack.

C. Floods

Because of the low snowpack and absence of any storm cells over the mountains, no flooding of any kind occurred.

D. GENERAL

WATER BUDGET - DIVISION 3
Water Year 1981

WATER YIELD:

<u>Water Resource</u>	<u>Yield (1000 AF)</u>
1. Inflow from gaged and estimates on unged streams. <u>1/</u>	753.4
2. Valley floor precipitation not accounted for in previous item.	<u>1500.0</u>
Total	2253.4

Diversion and Depletions:

<u>Item</u>	<u>Diversion (1000AF)</u>	<u>Depletions (1000AF)</u>
Directflow diversions	670	335
Wells	est. 1400	est. 980
Non-beneficial use (ET)		est. 800
Municipal <u>2/</u>		4
State line delivery		107.2
Underflow leaving division		est. <u>50</u>
	Total	2276.2

Summary:

<u>Item</u>	<u>Acre Feet</u>
Total water yield	2253.4
Total water depletion	<u>2276.2</u>
Change in underground storage	Total -22.8

1/ Estimated at entrance to Valley floor.

2/ Estimated for towns in the Valley on the basis of withdrawals from Alamosa Municipal Wells.

WATER BUDGET

Alan Davies, Davis Engineering, doing consulting work for the Rio Grande Water Conservation District, has computed that a test area in the Closed Basin area north of the Rio Grande was depleted approximately 157,000 AF this past year. This is, of course, an area of high density large pump wells, and I am assuming that the unusual rainfall on the entire Valley floor compensated for the high depletions in the pumping areas. I am, also, assuming that several of the estimated numbers used by my predecessors are nearly correct. This report agrees very closely with the report by W. W. Wheeler mentioned in the Underground Water Section. Both contend the water table is dropping in the Closed Basin 0.6 foot/year.

E. UNDERGROUND WATER

Groundwater has become the top subject in the San Luis Valley in the past year. Between it and the Rio Grande Compact, we do little else. The information needed by the Denver office plus their new attitude on groundwater has changed things drastically.

February 27, 1981 was a very important date for Division 3 this year. On that date, the State Engineer ordered his staff to no longer grant any well permits for any new appropriation of water without an approved plan of augmentation other than approved exempt wells. This was done after a series of reports concerning the depletion of groundwater in Division 3 were presented to the State Engineer. The most prominent report was "Water Resources Investigation, Groundwater in the Closed Basin, San Luis Valley, Colorado," by W. W. Wheeler and Associates, Inc. which was completed in early February, 1981.

As a result of this restriction of new wells, there has been a considerable outcry from water attorneys and their clients. We have spent considerable time this past year explaining this new policy to the general public. Their concern and confusion is expected when you consider what the policies on well permits have been

during previous administrations. Under Jeris' administration, a general tightening of all of the guidelines and policies has occurred. This has included a strict interpretation of the statutes, and it is a welcome sign that we will eventually have a good, solid set of guidelines to go by when considering well permit applications.

We have, also, started an inspection program for all replacement and alternate point of diversion well permit applications to assure that the original wells are there in the first place. Along with this, we are requiring a considerable amount of information before processing these applications.

All these new policies have provided an atmosphere conducive to litigation. Every water attorney around is being approached by water users or potential water users, to represent some novel new theme to try to get a well or expand a surface right. We are, and will become more and more involved in this litigation. The only benefit from this litigation will hopefully be large amounts of good engineering on both sides of each question, and a good decision from the judge, providing us with further guidelines as to what is acceptable,

and what will cause injury to other vested rights.

The Closed Basin Project is in full swing. New permitted wells are being drilled on a regular basis, and test pump wells are being observed, thus collecting a large amount of data to be used in the engineering of the project. The 62 wells in Stage 1-2 should be complete by September 1982. The layout of the main conveyance channel and the laterals in Stage 1-2 is nearing completion. Also, a computer model on quality will be in by the summer of 1982.

This is a tremendous engineering undertaking, and it is only possible by having the extremely competent people which are now working on the project. They have been very helpful on providing any information which we might need.

Again this year, we were able to undertake a recharge program on both the Rio Grande and Conejos systems. Because of our projected overdelivery at the end of November on the Rio Grande Compact on both systems, we were able to split the Conejos at the little river, split the San Antonio at the bifurcation, and run between 100 - 225 cfs into 3 large canals on the Rio Grande to help us recharge the underground aquifers. I feel this

is a worthwhile project as long as senior ditches don't need the water for young alfalfa in an open warm fall. We had some icing problem in all of the system, but we overcame these problems by various means. The Conejos had to shut down on December 18, 1981 because of the ice problems near Manassa. The San Antonio and the large canals on the Rio Grande were able to at least run some water through the end of the year.

F. TRANS-MOUNTAIN DIVERSIONS (November 1, 1979-October 31, 1980)

	<u>Ditch</u>		<u>Source</u>	<u>District</u>		<u>Preliminary Acre Feet</u>
				<u>From</u>	<u>To</u>	
Don La Font No. 1	<u>1/</u>		Piedra R.	78	20	28
Don La Font No. 2	<u>2/</u>		Piedra R.	78	20	193
Pine River Weminuche Pass	<u>3/</u>		Pine R.	31	20	353
Tabor Diversion	<u>4/</u>		Spring Cr.	62	20	667
Treasure Pass Diversion	<u>5/</u>		San Juan R.	29	20	227
Weminuche Pass	<u>6/</u>		Pine R.	31	20	2,130
Williams Squaw Pass	<u>7/</u>		Williams Cr.	29	20	0
Tarbell	<u>8/</u>		Cochetopa Cr.	28	26	286
Medano & Jackson Ditches	<u>9/</u>		Medano	35	16	Est. 250 <u>10/</u>

Recipient

- 1/ Colorado Division of Wildlife
- 2/ Colorado Division of Wildlife
- 3/ Paul Weaver, L. B. McClung, Bill Buttman
- 4/ Colorado Division of Wildlife
- 5/ Falk Brothers
- 6/ Colorado Division of Wildlife
- 7/ Navajo Development, Inc.
- 8/ Mel Coleman, George Ward, C. J. Weiss
- 9/ Cuerno Verde Ranch, Gardner, Colorado
- 10/ From Division 3 to Division 2

G. RESERVOIR STORAGE

<u>Name</u>	<u>Capacity in A. F.</u>	<u>Wtr. Dist. Number</u>
Alberta Park	598	20
Beaver Park	4,434	20
Big Meadows	2,437	20
Big Ruby	94	20
Bristol Head No. 1	121	20
Bristol Head No. 2	804	20
Continental	22,679	20
Cove Lake (Failed April 1974)	6,380	22
Downing	30	20
Eastdale No. 1	3,519	24
Eastdale No. 2	3,041	24
Fuchs	238	20
Goose Lake	232	20
Grace	--	20
Hay Press Park	200	20
Hermit No. 1	385	20
Hermit No. 2	407	20
Hermit No. 3	192	20
Hot Springs	3	20
Humphreys	842	20
Hunters Lake	39	20
Jumper Creek	38	20
La Jara	14,056	21
Lost Lake (Lower)	966	20
Loch Haven	24	20
Lost Lake (Upper)	68	20
Love Lake	24	20
Meadow Lake (McCrone)	174	20
Meadow Lake (Wright)	115	20
Metroz (Lower Basin)	396	20
Metroz (Upper Basin)	84	20
Mill Creek	43	20
Mountain Home	18,595	35
Platoro	60,000	22
Poage	261	20
Regan's Lake	823	20
Rio Grande	51,113	20
Rito Hondo	561	20
Road Canyon No. 1	1,367	20
Road Canyon No. 2	84	20
Saguache	294	26
Salazar No. 1	234	24

<u>Name</u>	<u>Capacity in AF</u>	<u>Water District Number</u>
Salazar No. 2	135	24
Sanchez	103,155	24
Santa Maria	45,070	20
Shaw Lake	681	20
S. Lazy U. Dude Ranch	106	20
S. Lazy U. Dude Ranch NO. 2	42	20
Smith	5,651	35
Sowards No. 1-A	8	20
Sowards	35	20
Sowards NO. 3	19	20
Sowards No. 4	45	20
Spring Creek	97	20
Spruce Lake No. 1	98	20
Spruce Lake No. 2	105	20
Squaw Lake	162	20
Stabilization (Head)	260	24
Streams Lake	41	20
Terrace	17,233	21
Trout	198	20
Troutvale No. 1	201	20
Troutvale No. 2	257	20
Trujillo Meadows	913	22
Wee Ruby	186	20
Willow Creek	--	24

IV. AGRICULTURAL SUMMARY FOR THE SAN LUIS VALLEY - 1981

The growing season was characterized by rather poor surface water supplies and a 95 day frost-free growing season. This was measured on the day at 32°F. or below, June 16th to the first day at 32°F. which occurred September 19th. Then after September 19th, we continued to have nighttime temperatures above 32°F. for several days. An excessively long period of high evapotranspiration occurred during the early part of the growing season. This, along with the poor water supply, resulted in undue stress to the crops. Then the rains came from July to October and caused a considerable amount of difficulty in harvesting crops. Yields of some crops were suppressed for the above reasons.

The table on the next page is the only information available at this time by the Extension Service on crop production.

CROP SUMMARY

<u>Crop</u>	<u>Acres 1/</u>	<u>Yield 1/</u>
Barley (malt)	88,000	70 bu.
Barley (Feed)	15,000	85 bu.
Wheat	12,000	75 bu.
Alfalfa hay	100,000	1.8 tons
Grass hay	100,000	0.8 tons
Oats	11,000	65 bu.
Lettuce	6,000	500 ctn.
Potatoes	3,000	250 cwt.
Spinach	1,500	400 bu.
Cabbage	310	285 cwt
Carrots	140	230 cwt.

1. Preliminary Figures

This report was compiled by Roy Pattison, San Luis Valley Area Extension Director.

FINAL 1980 AGRICULTURAL PRODUCTION FIGURES

Dollars on all crops by counties

Alamosa	24,242,500
Conejos	15,943,600
Costilla	11,928,100
Mineral	24,000
Rio Grande	50,381,200
Saguache	<u>26,781,700</u>

TOTAL \$129,301,100

1980 Barley

A.	21,000	a	1,573,000	bu.
C.	20,000	a	1,629,000	bu.
Cos.	5,500	a	424,000	bu.
M.	0			
RG.	37,000	a	2,923,000	bu.
S.	21,000	a	1,820,000	bu.

1980 Hay

A.	42,000	a	90,700	tons
C.	73,000	a	123,000	tons
Cos.	18,500	a	42,200	tons
M.	500	a	400	tons
RG.	35,000	a	69,900	tons
S.	60,000	a	108,800	tons

Alfalfa

	29,000	a
	40,000	a
	15,000	a
	0	
	18,000	a
	23,000	a

1980 Oats

A.	3,800	a	213,000	bu.
C.	2,700	a	128,000	bu.
Cos.	500	a	38,000	bu.
M.	0			
RG.	3,600	a	254,000	bu.
S.	2,400	a	133,000	bu.

1980 Spring Wheat

A.	1,800 a	141,000 bu.
C.	2,100 a	168,000 bu.
Cos.	6,600 a	561,000 bu.
M.	0	
RG.	9,000 a	785,000 bu.
S.	10,500 a	756,000 bu.

1980 Potatoes

A.	6,800 a	305 cwt.
C.	1,500 a	275 cwt.
Cos.	1,400 a	310 cwt.
M.	0	
RG.	21,500 a	300 cwt.
S.	5,300 a	300 cwt.

PRELIMINARY FIGURES ON 1981 LIVESTOCK

Cattle and Calves - 1981

A.	13,500
C.	38,000
Cos.	7,000
M.	500
RG.	15,500
S.	34,500

Sheep - 1981

A.	12,000
C.	30,000
Cos.	4,000
M.	0
RG.	12,000
S.	11,000

Hogs - 1981

A.	800
C.	9,000
Cos.	500
M.	0
RG.	2,200
S.	3,000

Miscellaneous Information about the San Luis Valley

1980 Census

Alamosa	11,761	31%
Conejos	7,686	20%
Costilla	3,013	08%
Rio Grande	10,495	28%
Saguache	3,913	10%
Mineral	806	02%
	<u>37,674</u>	<u>99%</u>

1981 Assessed Valuation

Alamosa	47,361,580	26%
Conejos	16,623,610	09%
Costilla	32,434,670	18%
Rio Grande	44,346,790	25%
Saguache	21,463,190	12%
Mineral	17,872,880	09%
	<u>\$180,102,720</u>	<u>99%</u>

V. COMPACTS

A. COSTILLA CREEK COMPACT

The 35th Annual (40th) Meeting was held on May 1, 1981 in Sante Fe, New Mexico. D. H. "Mac" McFadden, Division Engineer, attended the meeting along with Jeris A. Danielson, State Engineer. I am not able to comment as to the content of the meeting as I was not there, and Mac did not have a set of notes which I can interpret.

A report by the USGS did spell out several items which are of interest.

Runoff in the Costilla Creek basin during calendar year 1980 as determined at the gage, Costilla Creek near Costilla (at canyon mouth), was 40,100 AF. This is 149 per cent of the 20-year average (1961-1980), and 133 per cent of the 39-year average.

Storage in Costilla Reservoir was as follows:

Date	Storage in Acre Feet
12/31/1979	8,100
4/30/1980	9,990
9/30/1980	4,330
12/31/1980	5,500

From reading the advisor's report and the water-

master's report from the meeting, I concluded that adequate water was available during the 1980 water year. If any particulars are needed about the administration, computations or proceeding involved, these are readily available either here in Alamosa or in Denver.

B. RIO GRANDE COMPACT

The Rio Grande Compact offered a challenge to all involved again this year. As was stated in the Costilla Compact section, "Mac" McFadden and "Sandy" Waddington were involved in the Compact, until September and April respectively. Therefore, much of the detail about Compact problems this year will have to be omitted due to my now knowing what transpired.

Because of the rather low snowpack that was mentioned previously in this report, the forecasts for the Compact stations were correspondingly low. The State's initial forecast at the beginning of April predicted 190,000 AF for the Conejos Index and 365,000 AF for the Rio Grande Del Norte Index. Mac's initial forecast on the 1st of April was 150,000 AF on the Conejos

and 325,000 on the Rio Grande.

Their estimates were used until a rain pattern developed in Division 3 in late summer and fall when the Rio Grande estimate has to be raised somewhat. As it turned out, the rain did cause the Rio Grande Index to increase. The preliminary figures for the 1981 calendar year show the Rio Grande near Del Norte Index to be 410,000 AF and the Conejos Index to be 169,300 AF. The following table will illustrate the preliminary computations for the system for 1981:

	<u>Rio Grande</u>	<u>Conejos</u>	<u>Total</u>
Index	410,000	169,300	579,400
Obligation	100,800	29,600	130,400
Actual Delivery	97,700	32,400	130,100
Credit	<u>7,700</u>	<u>2,300</u>	<u>10,000</u>
Overdelivery	4,600	5,100	9,700

Even with the rain, the routine operations for the Compact went relatively smooth, and the curtailment schedule, outlined below, reflected the upward trend of the estimated annual yield with time on both the Rio Grande and Conejos Rivers.

CURTAILMENT SCHEDULE FOR 1980-1981

RIO GRANDE RIVER

1. March 23 begin - no curtailment.
2. 10% curtailment, June 9, 1981.
3. 10% curtailment, June 12, 1981, Out-of-Priority Storage.
4. No curtailment, Oct. 6, 1981, Stopped out-of-priority storage.
5. 100% curtailment, Nov. 1, 1981.
6. 100 CFS recharge Nov. 25, 1981.
7. 200 CFS recharge Dec. 11, 1981.
8. 100% curtailment, Dec. 31, 1981.

CONEJOS RIVER

1. March 27, 1981 begin at 10% curtailment.
2. May 1, 1981 - no curtailment.
3. 10% delivery reinstated effective May 9, 1981.
4. No curtailment, effective May 29, 1981.
5. 100% curtailment effective Oct. 9, 1981. Revision of Platoro storage figures back to July.
6. November 25, 1981, split Conejos at little river and San Antonio at bifurcation.
7. Dec. 18, 1981, Conejos back into main channel at Conejos' request.
8. Dec. 31, 1981, 100% curtailment.

The Engineer's Advisors meeting was held February 25, 1981 with representatives of all three states, the Army Corps of Engineers and Water and Power Resources attending. The final figures concerning the deliveries for the 1980 year were summarized as follows:

DELIVERIES BY COLORADO AT THE STATELINE

Accrued Debit, January 1, 1980	699,300 AF
Scheduled delivery in 1980	427,100 AF
Actual delivery in 1980	451,700 AF
Annual credit before adjustments	24,600 AF
Reduction in debit for evaporation of water held in reservoirs	100 AF
Accrued debit, December 31, 1980	674,600 AF

The 42nd annual meeting of the Rio Grande Compact Commission was held at El Paso, Texas on March 26, 1981. No major change was made for the coming year except that the storage of direct flow rights in Platoro would not be allowed in 1981 as was in 1980.

VI. DAMS

A. See Roster for List of Dams.

B. Inspection, Failures, Restrictions and Stop Orders

Yearly inspection of high hazard dams proceeded normally this year. The inspections made this year are as follows as supplied by John Shurer.

1980 - 1981 Fiscal Year

Regular Inspection:				Construction Inspection:		
<u>High</u>	<u>Hazard</u>	<u>Moderate</u>	<u>Low</u>	<u>High</u>	<u>Moderate</u>	<u>Low</u>
2	0	2		3	0	0

The number of inspection made since July 1, 1981 are 12 regular inspections and zero construction inspections.

Two major dams have been involved with major construction this year. Terrace Reservoir is in the final stages of finishing their project involving their new outlet tube and valve. As of this report, they need only one solenoid to finish everything up. Santa Maria Reservoir had some potentially serious problems develop this year. Portions of the concrete outlet tunnel has sloughed off the top and side of the tunnel. Several of these areas had developed into rather large holes with dimensions of up to 36" dia. The placed fill material above this concrete had

sloughed in and created large cavities above the tunnel. This occurred both above and below the gates in the dam. As a result of this, water was migrating into the holes above the gates and coming back into the outlet tunnel below the gates. Barry Nelson, engineer for Santa Maria Reservoir Company, discovered the damage, and immediately lowered the reservoir, and contacted the dam safety branch in Denver. Eric Wilkinson came down and inspected the dam with Barry, representatives of W. W. Wheeler, and myself. Plans were started immediately to repair the tunnel. It was finally decided that a new lining would be placed in the tunnel and this was completed in the late fall.

Several other dams are continuing engineering for work to be done as a result of the Army Corps of Engineers' inspections several years ago.

VII. WATER RIGHTS

A. Data Bank Entries

Sandy Waddington, Assistant Division Engineer before his retirement, submitted to Denver all corrections available and new information for the 1981 Tabulations and Abandonment lists. These were printed by July 1, 1981; however, the legislations extended the deadline to July 1, 1983 as the new publishing date for the Tabulations.

B. Referee Findings and Decrees

SUMMARY OF WATER COURT DECREES

Number of applications received from January 1, 1981 through December 31, 1981: 81CW1 - 81CW198

Types of claims received from January 1, 1981 through December 31, 1981:

517	wells
11	ditches
257	springs
13	reservoirs
3	creeks
1	dam
2	springs and pipelines
10	pipelines
15	surface
3	lakes
110	ponds and wetlands
1	pass diversion
1	seep
943	U. S. Various rights (i.e. storage, reserved, gulches, creeks, reservoirs, ponds, other specific claims etc.)
1887	TOTAL

Number of cases terminated from January 1, 1981 through December 31, 1981: 146 cases.

Structures terminated from January 1, 1981 through December 31, 1981:

1287 wells
26 ditches
1 lake
3 reservoirs
1 meadow diversion
1 mine pit
3 springs
4 creeks
1 pond
1 pipeline
(2 Complaint cases)

1330 TOTAL

Breakdown of types of cases filed on, from January 1, 1981 through December 31, 1981:

Plans of Augmentation	3
Water Storage Rights	9
Complaint cases	3
Conditional application	21
Application to make absolute	2
Underground water rights	59
Change in water right	51
Surface	21
Application for reserved water right	22
Application for absolute and conditional rights	3
Application for absolute non-tributary right	1
Application for water right	<u>3</u>
TOTAL	198

The number of cases pending as of December 31, 1981 is 327.

C. Unresolved Court Litigation

It seems that unresolved court litigation is the only kind we have. Several cases were heard in 1981, and many more are lined up for 1982. Some of these come as a result of the tightening of regulations on the use of wells and changes which may involve them.

Two cases which have been put on the "back burner" pending a final Supreme Court decision on W-3466 are:

1. W-3394 - Middlemist/San Luis Valley Irrigation Well Owners, Plan of Augmentation.
2. W-3560 - People vs. Mogote-Northeastern Ditch.

W-3466 Proposed Rules and Regulations for Division 3

This case is still awaiting the transcript to be finished. At last report, January 6, 1982, over 5,000 of the estimated 7,000 pages have been completed. A new deadline of April 9, 1982 has been set for the court recorder, Jim Kalana, to finish the transcript.

W-3894 People vs. Reed

After many more weeks of trial in 1981, the testimony was finally concluded in November and we are presently waiting for a decision by the judge.

W-3379 Application for Water Rights of the River
Ranch Grazing Association

Still active and will probably resume at the conclusion of W-3894.

W-3665 San Marco Pipeline

After much legal haggling and a judge's request for an amended application to resolve the stream of which the wells are tributary, the San Marco project submitted an amended application which has been contested, and the State has asked for it to be dismissed.

W-3864 Herr Hans Hardt, Plan of Augmentation

The participants are now attempting to draw-up a stipulation to resolve this issue.

W-3596 Town-Center Plan of Augmentation

Still pending.

W-3959 Valley Ranches

Still pending.

Ted Cook

Several application of Ted Cook's are pending.

VIII. ORGANIZATIONS

A. Water Conservation and Water Conservancy Districts

Rio Grande Water Conservation District
Mr. Ralph Curtis, Manager
Alamosa, Colorado 81101

Conejos Water Conservancy District
Mr. Leland Holman, Secretary
Manassa, Colorado 81141

San Luis Valley Conservation District
Mr. William DeSouchet, Attorney
Alamosa, Colorado 81101

Trinchera Water Conservancy District
Mr. William Cruff, President
Blanca, Colorado 81123

Costilla Water Conservancy District
Mr. Maclovio Martinez
San Luis, Colorado 81152

B. Water Users Associations

Alamosa-LaJara Creeks Water Users Protective Ass'n.
Mr. John Shawcroft, President
Alamosa, Colorado 81101

Association of Senior Water Rights
Mr. James Higel, President
Alamosa, Colorado 81101

Monte Vista Water Users Association
Mr. Leland Ullstrom, President
La Jara, Colorado 81140

Rio Grande Canal Water Users Association
Mr. John Wright, President
Monte Vista, Colorado 81144

C. Ditch Companies and Irrigation Districts

The listing of ditch companies and irrigation districts is no longer a part of this report. All of the information carried under this heading is in the data bank, and will be available in the printout of the district summaries.

1981
ANNUAL SUMMARY - DIVISIONS
ACRE FEET (11-1-80 thru 10-31-81)

Divisions	Diversions To Storage	Storage To Irrigation	CURRENT YEAR		TRANS MOUNTAIN	
			Acres Irrigated	Export	Div to Div	Import
804		26,564	308,389			3,598
868		24	34,652			
242		0	158,789			
390	2,026	9,316	31,330			
108	0	0	12,833			
966	0	0	7,131			286
598	0	0	5,511			
468		11,306	10,340	250		
444	2,026	47,210	568,975	250		3,884

per.

Divisions	RECREATION			ACTUAL STORAGE		
	Diversions To Storage	Hydro Power	Storage - Wild life Parks	For Year All Reservoirs	#Decree Appl.	#Water Court Appl
+			9,777			
			6,944			
			913			
2						
6			17,634			198

X. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

This year proved to be a year of frustration on one hand, and the beginning of a new era on the other.

The personnel situation literally deteriorated to near nothing as the year went along. The loss of four of the most knowledgeable people in the Division 3 staff presented many problems which we are, and will be trying to overcome for sometime. Jake Parker's knowledge of the southern half of the Valley, Lyle Alspaugh's knowledge of the west end, and Sandy and Mac's knowledge of the water situation in general will be sorely missed.

On the other hand, we have a core of people that are left that I feel will perform in a thoroughly professional manner. Even with all the trials and tribulation this year, we are still here and performing our duties as best as we can under the shortage of personnel. I am confident that, if we can fill our vacate positions with a group of interested, hardworking and intelligent people, we can again get on top of the situation. We have

had many good and encouraging comments from various individuals and groups, and most have offered their help and support.

Administration of the water in Division 3 went fairly smoothly this year. No major problems occurred. The unusual rain in the late summer and fall was extremely helpful, even though it did cause some harvest problems. We would have had another very dry year had the rains not come.

The new regulations and tightening of the issuance of well permits which started in February 1981, was the only course of action which could properly be taken under the present situation, and will in the long run prevent further injury to other vested water rights.

I applaud Jeris for taking this unpopular stand and sticking with it.

The court has been generally favorable to the State this year in its' decisions. This period of abundant, intense litigation will need to be handled with extreme caution. Many of the decisions' which will be made in 1982 and following years will be very important to the direction of water

administration in the San Luis Valley. We can only hope the water judge is presented good, solid engineering data, and that he will make his judgments, on that basis, provided he stays within the guidelines of the statutes. We are, of course, extremely interested in the outcome of many of the cases coming up because they are representative of many others which could follow. The right decision in these cases could eliminate many other cases and save many people a large amount of money.

B. Recommendations

The past year has seen a great deal of change in direction as far as the issuance of permits for new groundwater appropriations in Division 3. This hardline stance on new well permits is a much needed and long past due change in policy. This stance should be reinforced with court decisions, and a new attitude toward this subject developed. Because of the declining water tables on the Valley floor, it is an absolute necessity to shut down new appropriations of underground water until such time we can determine what the situation is concerning this groundwater.

I would like to thank the Denver staff for their solid support during the past few months. It has been a very difficult situation in Division 3 because of the lack of help due to the shortage of personnel. I would recommend that the only way that any real progress is going to be made in the Division is the personnel situation be remedied as soon as possible. Nothing can be accomplished except putting out the "brush fires" with the small staff we now have. I would recommend an all out push to convince the legislators and governor of our dire situation.

I would, also, like to thank all the staff we have remaining for their courageous and faithful work, and for sticking with me in a very difficult time.

Sincerely submitted,



Steven E. Vandiver, P.E.
Division Engineer