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DIVISION OF WATER RESOURCES

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January 17, 1983

Jeris A. Danielson
State Engineer
Division of Water Resources
1313 Sherman Street
Denver, CO 80203

Dear Jeris:

On behalf of the staff of Irrigation Division III, I submit herein the Annual Report for 1982.

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

Respectfully submitted,

Steven E. Vandiver
Division Engineer
Division III

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1982
ANNUAL REPORT

DIVISION OF WATER RESOURCES

DIVISION III

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COLORADO DIVISION OF WATER RESOURCES

DIVISION III ANNUAL REPORT - 1982

I. INTRODUCTORY STATEMENT

Water Division III 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 III 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 Sauces. 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 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 Crop. 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 a new plant to manufacture ski parkas in Alamosa. There are, also, two new corporations formed in the Valley for the distilling of alcohol for fuel purposes. The first, San Luis Valley Protein Corporation, located close to Monte Vista has completed construction and is in production of 100% alcohol using barley. The second, Colorado Agri-Fuel Corporation, has finished construction, and they are using both potatoes and barley in arriving at 100% proof alcohol for fuel purposes. In April, 1982, the Alamosa Mushroom Plant started production and is now producing approximately 100,000 pounds of mushrooms a week. To get this plant started has been quite a process. With the vast amount of high quality potatoes grown in the San Luis Valley, local officials are still 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

considerable testing and cleaning, the well was only able to produce 130° water at a rate less than 100 gallons per minute. This was far from the city's expectations of 600 gallons per minute at 180°. Another \$90,000 was obtained from DOE and the hole was deepened to 7,750 feet in 1982. The well didn't produce any better at this level and at present the well is in limbo. 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. The malting plant has since declined the location offer.

Tourism continues to be another of the major factors in the economy of Division III. 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 1982 and appeared in good numbers.

Snow pack in the surrounding mountains was very unusual for the 1982 water year. The Conejos Basin had a large snowpack and the Rio Grande was approximately normal. The rain in the latter part of the summer was the only thing which made some crops and also ruined many others. 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. For the first time this fall a list of all the augmentation plans was made and now proper administration can start.

The difficulties of water administration in the San Luis Valley continue to increase. The principal water users groups continue to remain alienated, mostly because of the rules and regulations code, 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 III 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 3,425 wells now have controlled heads installed. 2,844 2" thru 16" valved. 470 2" thru 12" plugged.
RGWCD	Norton Drain	Maintenance to improve access, water delivery, and monitoring. Condemnation suit pending.
RGWD 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.
RGWD, USGS, CWCB, BURREC	Closed Basin Project	See special report next page.
San Marco Pipeline	Water supply for coal slurry pipeline	See unresolved court litigation.
RGWCD	Sprinkler inventory	1981 final count 1724 sprinklers. 1982 preliminary count approximately 1759.
USGS, RGWCD	Conejos Seepage Investigation	Was completed in Sept., 1982. Not published to date.
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	Well not successful as geothermal well.
DWR	Comsat/ERT	3 platform sites to monitor stage at lower compact station. 4-6 more proposed.

CLOSED BASIN PROJECT
(A Special Report)

Contracts

1. A contract for Stage 1-2 Salvage Wells, Phase 1, consisting of 15 wells, ranging in capacity from .25 to 1.0 c.f.s. was completed in August.
2. A contract for Stage 1-2 Salvage Wells, Phase 2, consisting of 18 wells in the capacity of .25 c.f.s. was completed in October.
3. A contract for Stage 1-2 Salvage Wells, Phase 3, consisting of 15 wells in the capacity of .25 c.f.s. was awarded in June and completed in October.
4. Stage 1-2 Salvage Wells, Phase 4 - - Six salvage wells ranging in capacity from .25 to .50 c.f.s. Bid opening for this contract will be January 6, 1983. Following completion of Phase 4, there will be a total of 58 salvage wells in Stage 1-2.
5. A contract for Aquifer Test Wells, Stage 3, consisting of 11 wells was awarded in June and completed in September.
6. A contract for Test Wells and Observation Wells, Stages 4 and 5 consisting of 7 test wells was awarded in November with all work expected to be completed during March, 1983.
7. A contract for Fencing Well Sites, Stage 1-2, Phase 1, consisting of fencing 10 well sites, was awarded in November and completed in December.
8. A contract for Fencing Well Sites, Stage 1-2, Phase 2, consisting of fencing 11 well sites was awarded in December.
9. Office and Laboratory Building - Our office took possession of the building during November with all work expected to be completed during the month of December.

Design Data

Design data for the Stage 1-2 pipe laterals and conveyance channel were submitted to the Engineering and Research Center, Denver, in January, 1982. Design data for Stage 1-2 Phase IV and Stage 3 salvage wells, Stage 4 and 5 test and observation wells, Stage 4 and 5 aquifer test wells, and fencing of Stage 1-2 Phase 1 salvage wells were submitted to the Regional Office, Amarillo, during the year. Development of Stage 3 lateral and conveyance channel design data is proceeding as scheduled.

Real Estate

Rights in 17 observation well sites and 144.62 acres of lateral system for Stage 1-2 were acquired from State, Federal and private landowners. Acquisition began for lands needed for the Stage 1-2 portion of the conveyance channel and for observation and test wells in Stages 4 and 5.

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 Stage 3,4, and 5, a plan was

formulated to develop approximately 4,600 acres of wildlife habitat in the Russell Lakes Area.

The above plans along with a supplement to the Project's Environmental Impact Statement are awaiting Congressional approval.

Geology

Two hundred eighty-nine (289) observation wells located along the conveyance channel and lateral alignments are read quarterly. Two hundred thirty-seven (237) observation wells along the project boundary are read on a monthly basis.

Test Well 3-1 is being monitored at a continuous pumping rate of 575 g.p.m. in conjunction with this Project's Vegetation Study and long term drawdown test.

Ninety-three (93) wells ranging in depth from 90 to 200 feet deep have been physical logged and completed in final geologic form.

One hundred fifty-three (153) penetration resistance tests were performed on laterals for Stage 1-2.

From two to eight gamma logs per well site were made at one hundred fifty-four (154) locations. These logs and the recommendations of the Project Geologist were used to determine the depth of the confining layer.

Written text, soils logs, plan and profile drawings, water level contour maps and pipeline corrosion surveys for Reach A and B of the canal and Stage 1-2 laterals were finalized in report form.

Materials

All materials investigations for the channel and laterals for Stage 1-2 are complete.

Clay to be used for channel lining was found to be dispersive which resulted in changing from compacted earth to a thin PVC membrane lining.

Water quality tests were conducted on all salvage wells drilled this year. Also, random trace metal samples were taken and sent to the E & R Center in Denver for analyzing.

Materials investigations in Stage 3 are continuing and are approximately eighty percent complete.

All contract materials were tested for specification requirements.

Observation wells were established along the project boundary to be used by the Rio Grande Water Conservation District.

Inspection

Members of the Project office and the E & R Center investigated five well screens with a downhole TV camera and found no deterioration in either steel or plastic screens.

Cultural Resources

The archeological field work required prior to construction was completed for Stages 1-2 and 3. Consultation with appropriate regulatory agencies for Stage 1-2 was completed and completion is anticipated for Stage 3

in early 1983.

Surveys

Surveys for horizontal and vertical control, cross sections, locations and detail topography were performed for the conveyance channel and lateral system facilities in Stage 1-2.

Locations and elevations for Stage 3 experimental and salvage wells are 90 percent complete.

Ground control for Stages 3, 4 and 5 canal alignment aerial photogrammetry was established.

Personnel

On November 30, 1982, forty-four (44) employees moved into the new Project Office, located at 10900 Highway 160 East, Alamosa, Colorado. The new telephone number is 589-5855.

This special report prepared by Lindell H. Elfrink,
Project Construction Engineer, Closed Basin Project

II. PERSONNEL

As if 1981 didn't bring enough change in personnel, 1982 tried to rival it. February 1st Steve Witte transferred from Denver to become the Assistant Division Engineer. He has filled that position admirably. Kathy Logan came on board as a part-time water commissioner and worked with the hydros from May 3 to August 6. Ben Cannon started as a part-time water commissioner on May 5 and is on an eleven-month appointment in District 20. Paul Clark transferred from the Department of Revenue on May 10 and filled the vacant "1042" well commissioner job. On July 2 Scott Brinton transferred to Durango to be their hydrographer. Then on July 12 Wayne Schieldt transferred from the Denver hydro office to Alamosa. This still left the Alamosa office one hydro short. Then on August 9 Leo Simons, commissioner in District 22, and Paul Clark traded positions. Leo has worked in the office in Alamosa since and Paul has worked as a deputy water commissioner on the Conejos River, District 22. On November 1st Charlene Tipton transferred to Greeley to be their secretary. This left a large hole in our staff but luckily it was filled quickly and efficiently November 1 by Sue Edling who transferred from Adams State College in Alamosa. Then on December 1 our vacant hydro position was filled by CSU graduate Bruce Whitehead from Fort Collins. We thought we were finally finished filling vacancies when Bennie DeProspero resigned December 9 to go to work for the Marine Corps in

Virginia. This left us one position short in our staff at the end of the year. It must be noted that at this time Division III has an excellent staff and only because of their hard work have we been able to continue our work during this time of personnel turnover.

We will miss all of those who have gone as well as the knowledge they possessed. At this time, every position in the Alamosa office has turned over in the last 13 months. This next year will be a real test of all the office personnel trying to get up to speed and do the job facing them.

PERSONNEL
Division Office

<u>Name</u>	<u>Position</u>	<u>Status</u>	
Vandiver, Steven E.	Supr. WRE	FTE	
Witte, Steven J.	WRE C	FTE	Transferred to Div. III Feb. 1, 1982
Tipton, Charlene	Sr. Sec.	FTE	Transferred to Greeley Nov. 1, 1982
Edling, Sue	Sr. Sec.	FTE	Transferred from Adams State College Nov. 1, 1982
DeProspero, Bennie V.	WRE B	FTE	Resigned Dec. 9, 1982
Brinton, Scott	WRE B	FTE	Transferred to Durango July 3, 1982
Schildt, Wayne I.	WRE B	FTE	Transferred to Div. III July 12, 1982
Whitehead, Bruce	WRE A	6 mo temp	Dec. 1, 1982

FIELD STAFF (Water Commission)

Name	Position	Dist	Months Worked	Months Assigned	Mileage 3 Personal
Nash, M. E.	WC C	20	FTE		*21,762
Smith, T.	WC B	20	FTE		9,732
Cannon, B.	WC A	20	6	(11)	8,063
Logan, Kathy			3		
Gonzales, L. B.	WC C	21	9	(8)	11,303
Morch, K. S.	WC B	21	7.5	(6)	6,510
Simons, L.	WC C "1042" Comm. Div		FTE		7,553
Sorensen, D.	WC B	22	FTE		9,790
Clark, P.	WC B	22	FTE		5,087
O'Cana, G.	WC B	24	8	(8)	5,860
Pacheco, David	Engr Aide		2		
Lamm, H.	WC C	25	10	(8)	8,813
Lovato, T.	WC B	26	10	(9)	6,967
Alsbaugh, P.	WC B	27	7	(6)	4,501
Escherman, C.	WC B	35	8	(7)	6,618
Total Mileage Div. III =					90,797

*State Mileage Not Included in Total Mileage
 Personal vehicles includes 4-wheel drive. Mileage for 4-wheel
 vehicles totals 1,845 miles.

This chart is for November 1, 1981 through October 31, 1982.

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

VEHICLE REPORT

Vehicle Number	1981-82 Fiscal Year	Mileage 1982 Calendar Year
5003 1978 Plymouth Volare	5413	6808
5077 1981 Dodge Pickup	10938	8260
5594 1977 Dodge Pickup	12650	11544
5806 1978 Dodge Pickup	13560	13370
4225 1981 Dodge Pickup	23029	21108
3283 Matador	1688	167

III. WATER SUPPLY

A. SNOW PACK

The snowpack during the winter of 1981-82 was rather unusual to say the least. Because of rather unusual weather patterns the Conejos Drainage received a much larger snowpack than the other parts of the valley. A strip across the continental divide from roughly Wolf Creek Pass to Monarch Pass was skipped by several large storms and as a result the Saguache and northern part of the Rio Grande Drainage were deficient in their snowfall. By the first of May only the high altitude snow above 10,000 feet remained. The snow coverage either showed very poor on the low courses or good on the high courses which made for much controversy over the initial stream flow forecasts.

The initial forecast was near normal in the Valley except for the Conejos Drainage which showed above normal. The initial forecast on the main streams were 607,000 af on the Rio Grande and 410,000 af on the Conejos. As the runoff developed the weather turned very cold in June and delayed and flattened the normal runoff pattern. This caused two things to happen: 1) the junior rights on both rivers received little water and 2) it provided a longer irrigation period for the middle rights.

The recharge that was run on both rivers in the fall of 1981 helped considerably in our opinion. Approximately 11,650 a.f. was run into the Farmers Union, (5,250), Rio Grande (3,600), and Monte Vista Canal (2,800). This couldn't have helped but recharge many wells for this coming year.

This fall on the Rio Grande (1982) the Farmers Union, the Rio Grande Canal, the Prairie Ditch, the Chicago Ditch, and the New Ditch have run some recharge water. Several ditches on the Conejos system also ran some recharge water. The diversions were interrupted several times because of the weather, but an open fall enabled a couple of the ditches to run at least through December. The amounts diverted are listed below.

Rio Grande River	A.F. Diverted for Recharge Nov. 13-Dec. 31, 1982
Rio Grande Canal	2,520
Farmers Union Canal	4,900
Rio Grande Lariat Ditch	200
Prairie Ditch	540
Chicago Ditch	650
New Ditch	350
Conejos River	
Little River North	1,090
Manassa #3 Ditch	632
Romero Ditch	40
Seledonia-Valdez Ditch	24
San Juan & San Rafael Ditch	244
Los Sauces Ditch	488
Northeastern Ditch	42
Antonito Ditch	208
Mogote Ditch	1,184
San Antonio River	
Sincero Ditch	277
Rincones	56

E. GENERAL

1. Water Budget

The water budget as presented in the past will not be done this year because at least one-half to two-thirds of the material was estimated or guessed at and it appears ludicrous to continue trying to make "a silk purse out of a sow's ear."

A depletion study in the Closed Basin and the latest update prepared by Alan Davies of Davis Engineering follows. The first page outlines the study area; the second indicates change in storage; the third shows areas of change from March, 1982-September, 1982; the fourth shows change from September, 1981 to 1982.

The January, 1983, calculations have only recently been done, and the preliminary figures indicate that a positive change of approximately 150,000 a.f. has occurred in the last three months of 1982. This surely reflects the large diversions into the Closed Basin this year, the unusual fall rains in the area, and the recharge water that was run into the area in November and December. This, at the least, is very encouraging in that it reversed the depletions of the last two years.

SAN LUIS VALLEY GROUND WATER TABLE MEASUREMENTS

TAKEN _____

BY

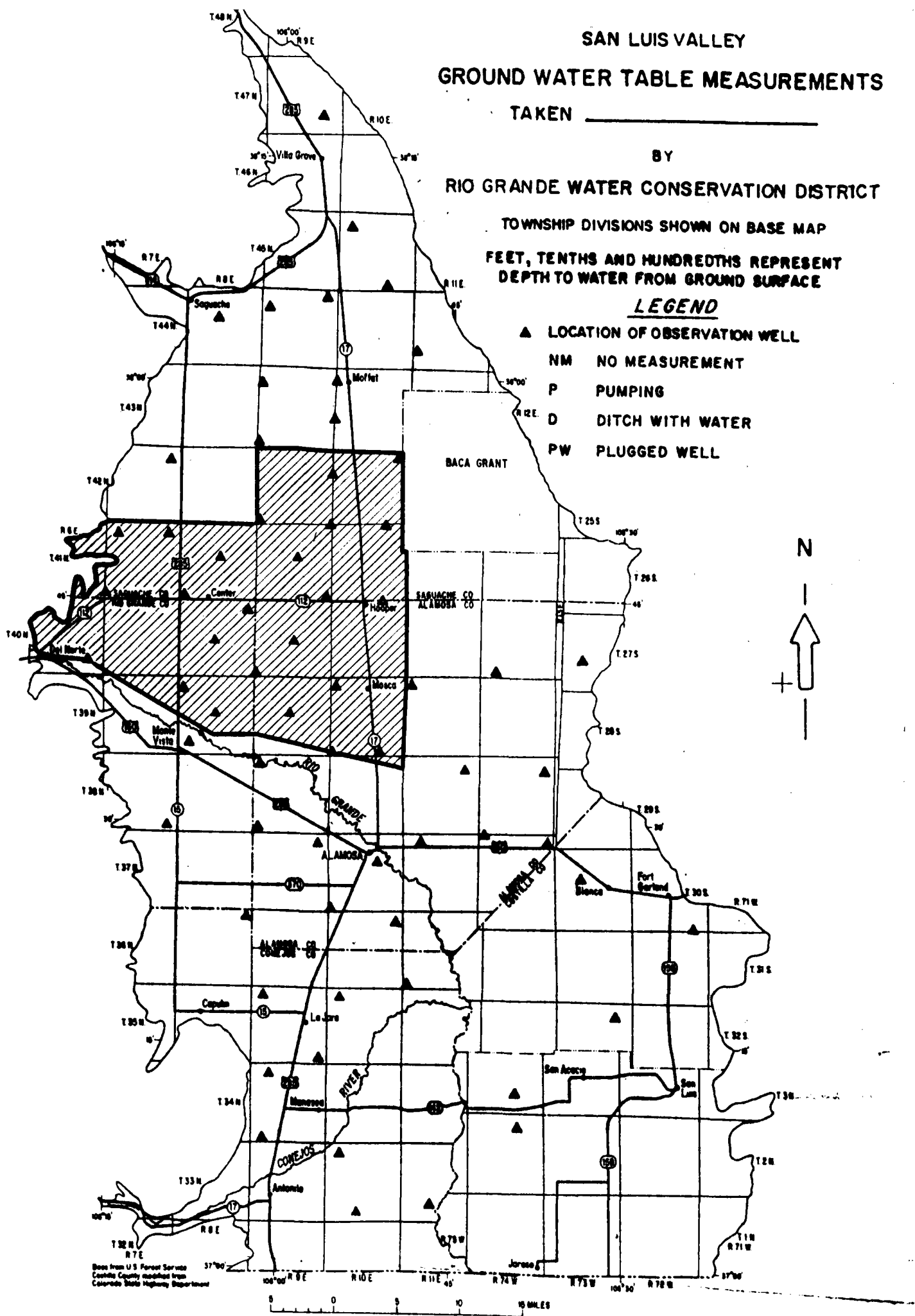
RIO GRANDE WATER CONSERVATION DISTRICT

TOWNSHIP DIVISIONS SHOWN ON BASE MAP

FEET, TENTHS AND HUNDREDTHS REPRESENT
DEPTH TO WATER FROM GROUND SURFACE

LEGEND

- ▲ LOCATION OF OBSERVATION WELL
- NM NO MEASUREMENT
- P PUMPING
- D DITCH WITH WATER
- PW PLUGGED WELL

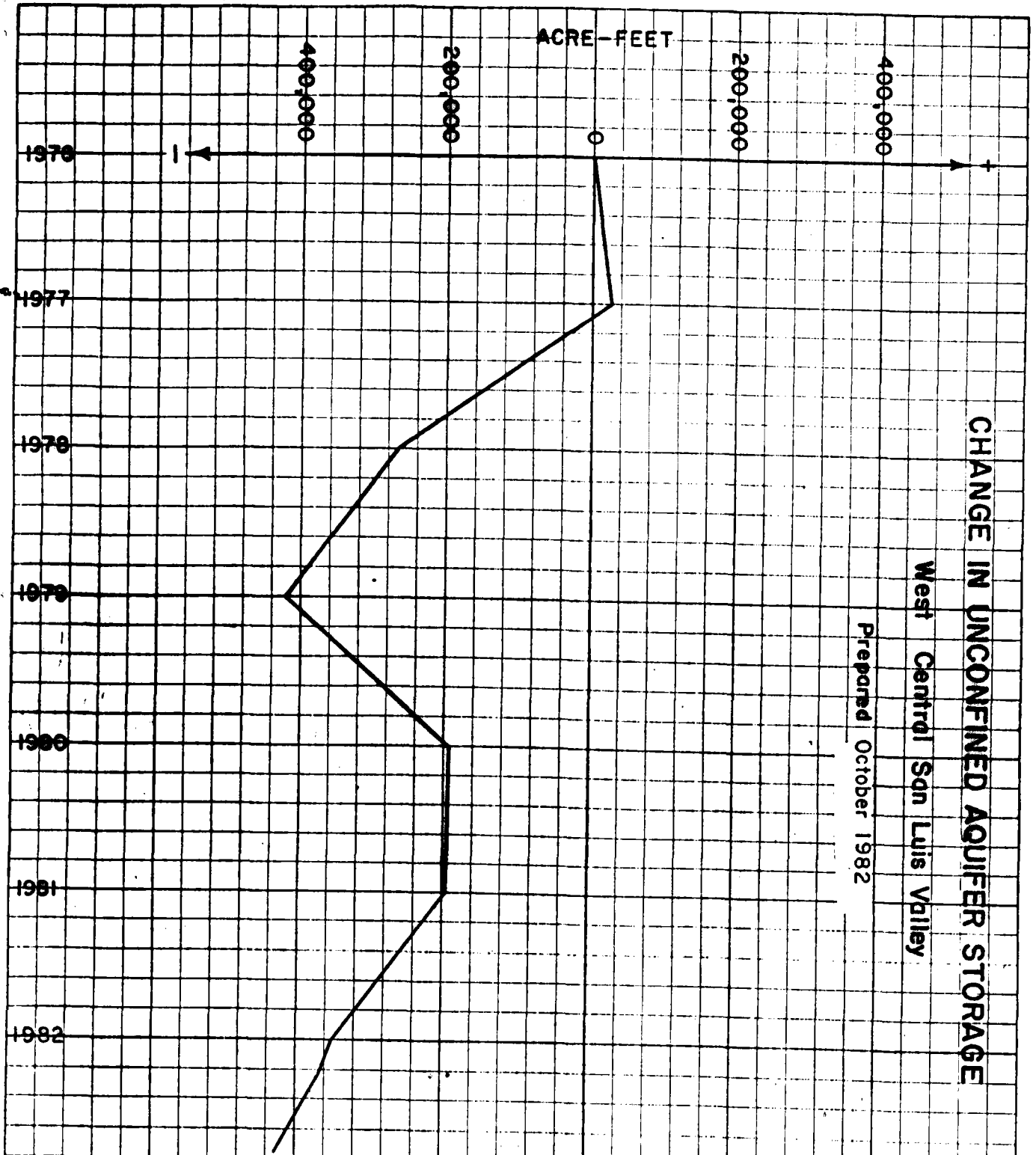


Based from U.S. Forest Service
Conejos County modified from
Colorado State Highway Department

CHANGE IN UNCONFINED AQUIFER STORAGE

West Central San Luis Valley

Prepared October 1982



Year	Change (ac. ft.)
1976 → 1977	+ 29,693
1977 → 1978	-297,522
1978 → 1979	-152,803
1979 → 1980	+228,366
1980 → 1981	- 3,417
1981 → 1982	-157,038
1982 → Mar. 82	-15,801
Mar. 82 → Sept. 82	-57,971

SAN LUIS VALLEY GROUND WATER TABLE MEASUREMENT

TAKEN March 1982 - Sept. 1982

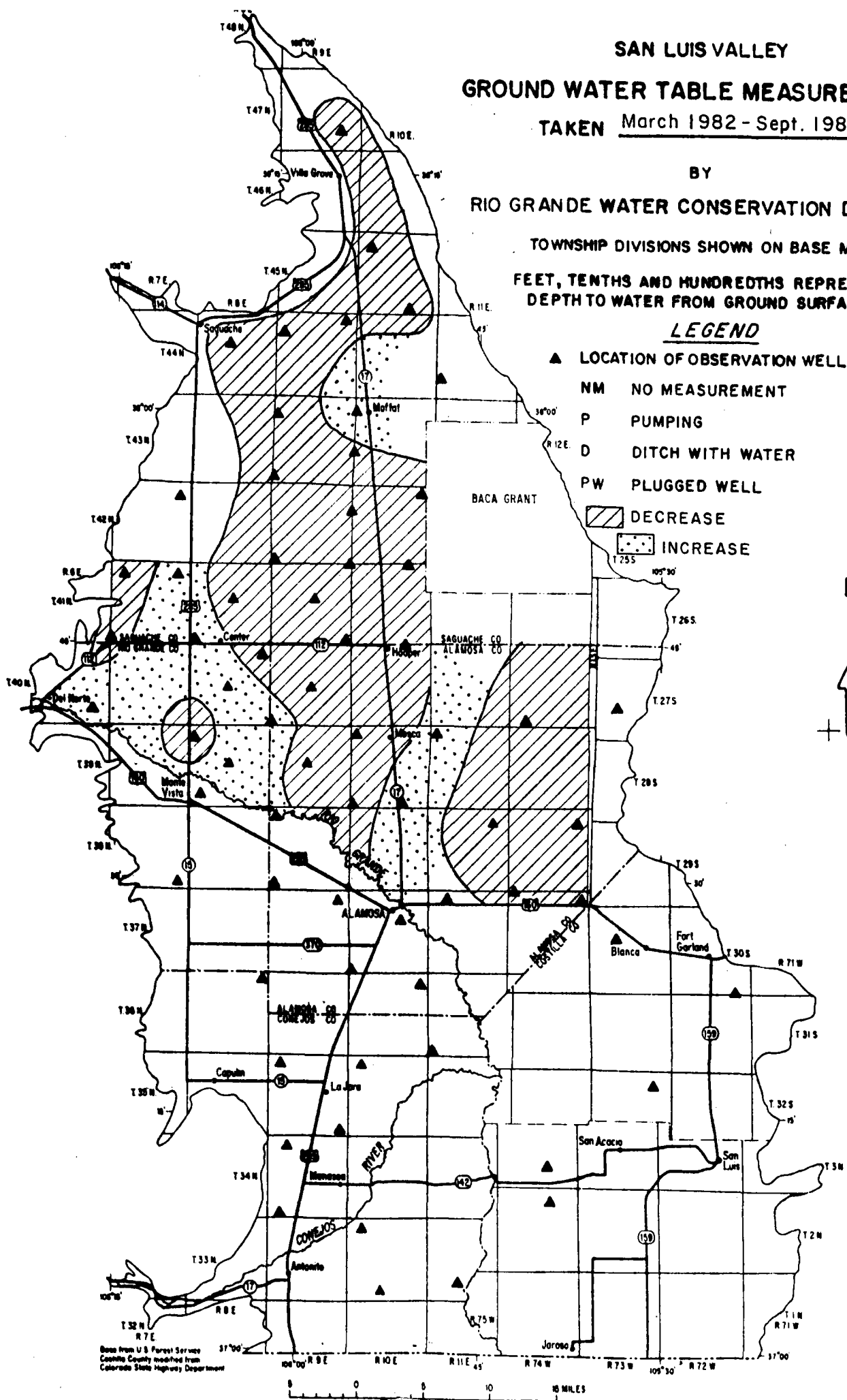
BY
RIO GRANDE WATER CONSERVATION DISTRICT

TOWNSHIP DIVISIONS SHOWN ON BASE MAP

FEET, TENTHS AND HUNDREDTHS REPRESENT
DEPTH TO WATER FROM GROUND SURFACE

LEGEND

- ▲ LOCATION OF OBSERVATION WELL
- NM NO MEASUREMENT
- P PUMPING
- D DITCH WITH WATER
- PW PLUGGED WELL
- DECREASE
- INCREASE



Base from U.S. Forest Service
Conejos County modified from
Colorado State Highway Department



SAN LUIS VALLEY
GROUND WATER TABLE MEASUREMENT
 TAKEN Sept. 1981-82

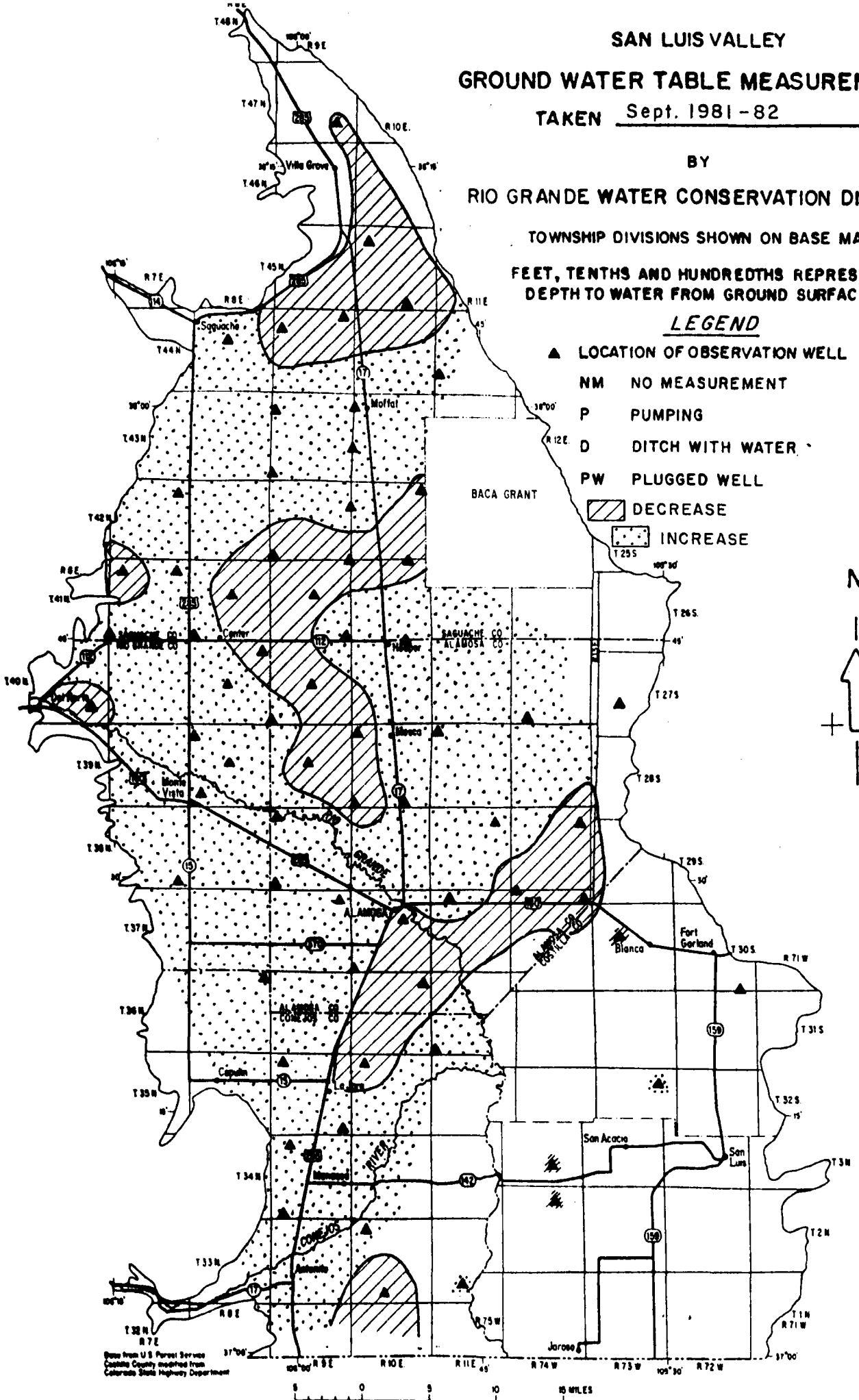
BY
RIO GRANDE WATER CONSERVATION DISTRICT

TOWNSHIP DIVISIONS SHOWN ON BASE MAP

FEET, TENTHS AND HUNDREDTHS REPRESENT
 DEPTH TO WATER FROM GROUND SURFACE

LEGEND

- ▲ LOCATION OF OBSERVATION WELL
- NM NO MEASUREMENT
- P PUMPING
- D DITCH WITH WATER
- PW PLUGGED WELL
-  DECREASE
-  INCREASE



Base from U.S. Forest Service
 Custer County acquired from
 Colorado State Highway Department



2. Several Problems Occurred on Small Streams

During the last week of August and most all of September LaGarita Creek, LaJara Creek, and Alamosa Creek presented serious problems. LaGarita Creek flowed more than 100 cfs for many days during August and September and caused many problems. Because of the rain on the valley floor most ditches shut off on LaGarita which sent the water straight to the Rio Grande Canal and the syphon underneath it. As a result of no channel maintenance below the canal, it could not run near what the syphon would run and several landowners below the canal plugged the syphon. This caused the water to wash out the canal bank and cause the canal company several headaches. The canal couldn't really use the water at the time and unplugged the syphon. After much haggling the canal company intercepted much of the water and prevented flooding considerable cropland below the canal. This is just another area that needs channel rectification.

Alamosa Creek also had similar problems. The rainfall over the valley and mountains caused no demand and excess water which resulted in Terrace Reservoir to fill the reservoir to allow downstream farmers to put up their hay. Again, this had to be done because of a lack of any channel on the Alamosa below Highway 285.

Once Terrace filled, it was drawn down in early November to prevent icing problems during the winter. The reservoir gates were closed November 19 and before December 22 was within 9-10 feet of spilling and the toe drain had begun to carry water which was not normal. We then decided to try to release at least the inflow and possibly some other water as the ice and river channel would allow. At this writing, the reservoir has been drawn down approximately 600 a.f. and we are still releasing approximately twice the inflow.

Lower LaJara Creek also experienced several weeks during the summer in which the channel was able to handle only a small portion of the water available to it. The natural flow, imported water, and excess Empire Canal water spread over a wide area and it was difficult to administer the decreed water rights properly.

These three examples tend to point out the tremendous need for channel rectification on many streams throughout the San Luis Valley.

3. PROJECTS OF DIVISION III OFFICE

Several projects were proposed and contemplated this year and a considerable amount of time was spent completing them. Each project was worthwhile in that the information can be used either by our Denver Office, the Joint Budget Committee, or by us to provide information as to what we really do in Division III. The main projects are listed below.

A. Goals and Objectives for Division III

This was an exercise to pinpoint, define, and prioritize our goals for 1982-83.

B. Budget Proposals and Justification

This was something new for us in that we had never been through the process before.

C. Professional Development Plan for Hydrographic Engineers

This plan was formulated by Steve Witte and Steve Vandiver for the Division of Water Resources to provide a means and plan for getting hydrographic engineers qualified to be registered as Professional Engineers. Much time was spent on this project, and it was very worthwhile as it was adopted by the State Engineer and approved by the Board of Registration.

D. Zero Base Budget

This exercise was asked for by the Joint Budget Committee and it turned into a very time consuming project. It was interesting in that we had to prioritize

operating budgets, personnel, and travel and really made us take a hard look at the most important things we do.

E. Division III Plans of Augmentations

The State Engineer requested that we tabulate and explain the decreed plans in Division III. This was very necessary in that this has never been kept track of before and it was important that we put these together to enable us to know what we have to work with and which plans need to be administered and how.

F. TRANS-MOUNTAIN DIVERSIONS (November 1, 1981-October 31, 1982)

<u>Ditch</u>		<u>Source</u>	<u>District</u>		<u>Preliminary</u> <u>Acre Feet</u>
			<u>From</u>	<u>To</u>	
Don La Font No. 1	<u>1/</u>	Piedra R.	78	20	79
Don La Font No. 2	<u>2/</u>	Piedra R.	78	20	65
Pine River Weminuche Pass	<u>3/</u>	Pine R.	31	20	613
Tabor Diversion	<u>4/</u>	Spring Cr.	62	20	1,684
Treasure Pass Diversion	<u>5/</u>	San Juan R.	29	20	388
Weminuche Pass	<u>6/</u>	Pine R.	31	20	1,580
Williams Squaw Pass	<u>7/</u>	Williams Cr.	29	20	144
Tarbell	<u>8/</u>	Cochetopa Cr.	28	26	716
Medano & Jackson Ditches	<u>9/</u>	Medano	35	16 Est.	826 <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>WD</u>	<u>Name</u>	Total Capacity (a.f.)	(Capacity (a.f.))		
			<u>Nov. 1</u> <u>1981</u>	<u>April 1</u> <u>1982</u>	<u>Nov. 1</u> <u>1982</u>
20	Alberta Park	598			
20	Beaver Park	10,951	3,680	3,976	3,295
20	Big Meadows	2,437			
20	Big Ruby	94			
20	Bristol Head No. 1	121			
20	Bristol Head No. 2	804			
20	Continental	12,270	7,112	4,960	198
22	Cove Lake (Failed 4/74)	6,380			
20	Downing	30			
24	Eastdale No. 1	3,519			
24	Eastdale No. 2	3,041			
20	Fuchs	238			
20	Goose Lake	232			
20	Grace	-0-			
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			
21	La Jara	14,056			
20	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			
35	Mountain Home	18,595	2,092	3,202	6,991
22	Platoro	60,000	19,800	19,700	19,700
20	Poage	261			
20	Regan's Lake	823			
20	Rio Grande	46,323	16,650	28,273	1,400
20	Rito Hondo	561			
20	Road Canyon No. 1	1,367			
20	Road Canyon No. 2	84			
26	Saguache	294			
24	Salazar No. 1	234			

WD	Name	Total Capacity (a.f.)	(Capacity (a.f.))		
			Nov. 1 1981	April 1 1982	Nov. 1 1982
24	Salazar No. 2	135			
24	Sanchez	103,155	9,300	19,700	21,429
20	Santa Maria	32,056	248	5,993	25,815
20	Shaw Lake	681			
20	S. Lazy U. Dude Ranch	106			
20	S. Lazy U. Dude Ranch 2	42			
35	Smith	5,651	2,589	3,076	5,061
20	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			
24	Stabilization (Head)	260			
20	Streams Lake	41			
21	Terrace	15,182	2,000	6,900	10,800
20	Trout	198			
20	Troutvale No. 1	201			
20	Troutvale No. 2	257			
22	Trujillo Meadows	913			
20	Wee Ruby	186			
24	Willow Creek	-0-			

IV. AGRICULTURAL SUMMARY FOR THE SAN LUIS VALLEY - 1982

The growing season was characterized by rather good surface water supplies and a 113 day frost-free growing season. This was measured from the last day at 32 F. or below, June 7th to the first day at 32 F. which occurred September 29th. This was the latest freeze on record for Alamosa. Then after September 29th, we continued to have nighttime temperatures above 32 F. for several days. An excessively long period of abnormally low spring temperatures occurred during the early part of the growing season. This resulted in a delayed growing season, which caused the grain to "stool" and some of the highest yield on record. Then the rains came from middle August to October and caused a considerable amount of difficulty in harvesting crops. Yields of some crops were damaged by this late precipitation. Some grain and potatoes weren't harvested until early November.

Despite the unusual rain the total precipitation at Alamosa was 5.99 inches, which is .95 inch below normal. The average annual temperature was 37.2 which is 4.4 degrees below normal. The highest temperature was 89 degrees on July 21 and the coldest was 25 degrees below zero on February 6. The year's highest reported wind gust was 71 mph on March 18.

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

1981 Preliminary

Barley

Alamosa	25,000 A.	1,986,000 bu.
Conejos	17,000 A.	1,380,000 bu.
Costilla	7,000 A.	600,000 bu.
Mineral	-0-	-0-
Rio Grande	34,000 A.	2,835,000 bu.
Saguache	32,000 A.	2,715,000 bu.

Oats

Alamosa	3,200 A.	232,000 bu.
Conejos	2,200 A.	150,000 bu.
Costilla	600 A.	32,000 bu.
Mineral	-0-	-0-
Rio Grande	1,400 A.	74,000 bu.
Saguache	2,600 A.	140,000 bu.

Spring Wheat

Alamosa	4,700 A.	353,000 bu.
Conejos	2,300 A.	178,000 bu.
Costilla	5,000 A.	410,000 bu.
Mineral	-0-	-0-
Rio Grande	11,000 A.	1,010,000 bu.
Saguache	12,000 A.	1,145,000 bu.

Alfalfa

Alamosa	23,000 A.
Conejos	46,000 A.
Costilla	19,000 A.
Mineral	100 A.
Rio Grande	16,500
Saguache	13,400 A.

Native Hay

8,000 A.	13,500 T.
29,000 A.	26,200 T.
4,000 A.	5,600 T.
500 A.	500 T.
18,500 A.	26,700 T.
30,000 A.	25,500 T.

Potatoes

Alamosa	7,000 A.	2,115,000 cwt.
Conejos	1,900 A.	530,000 cwt.
Costilla	1,600 A.	740,000 cwt.
Mineral	-0-	-0-
Rio Grande	23,000 A.	7,000,000 cwt.
Saguache	6,500 A.	1,884,000 cwt.

Cattle and Calves

Alamosa	13,000
Conejos	37,000
Costilla	6,500
Mineral	500
Rio Grande	15,000
Saguache	34,000

Sheep

10,000
28,000
4,000
-0-
12,000
10,000

Hogs

1,000
10,500
400
-0-
3,300
2,200

SAN LUIS VALLEY STATISTICAL INFORMATION

<u>County</u>	<u>No. of Farms</u>	<u>Irrig. Farms</u>	<u>Farmland</u>	<u>Cropland</u>	<u>Harvested Cropland</u>	<u>Irrigated Land</u>	<u>Total Value Crops/Livestock</u>
Alamosa	321	267	256,000	95,000	65,000	82,000	\$24.3 million
Conejos	458	398	357,000	131,000	88,000	120,000	32.2 million
Costilla	204	184	367,000	50,000	31,000	41,000	13.9 million
Mineral	12	9	13,000	1,400	545	2,500	\$245,000
Rio Grande	356	324	211,000	134,000	98,000	120,000	\$43.5 million
Saguache	266	228	482,000	127,000	88,000	130,000	41.6 million
TOTALS	1,617	1,410	1,686,000	538,400	370,545	495,500	\$155.7 million

SPRINKLER COUNT

End of Year	Atamosa County	Conejos County	Costilla County	Rio Grande County	Saguache County	Total	Increase
1973	82	5	53	82	40	262	
1974	109	20	84	132	85	430	168
1975	148	24	75	210	116	573	143
1976	226	29	86	276	204	821	248
1977	276	45	110	331	267	1029	208
1978	339	61	121	389	325	1235	206
1979	387	79	133	420	381	1400	165
1980	424	92	139	457	429	1541	141
1981	460	111	144	504	505	1724	183
1982	461	111	146	512	529	1759	35
CORNER SYSTEMS AS OF JANUARY, 1983							
	27	-0-	-0-	52	47	126	22

Miscellaneous Information About the San Luis Valley

Assessed Valuation

<u>County</u>	<u>1982</u>	<u>1981</u>
Alamosa	\$50,170,370	\$47,361,580
Conejos	16,564,000	16,623,610
Costilla	33,967,130	32,434,670
Mineral	9,318,610	17,872,880
Rio Grande	45,706,170	44,346,790
Saguache	23,093,280	21,463,190
	<u>\$178,819,560</u>	<u>\$180,102,720</u>

BACKGROUND: San Luis Valley
Alamosa, Conejos,
Costilla, Mineral,
Rio Grande, and
Saguache Counties

NUMBER OF FARMS:	1,617
NUMBER IRRIGATED FARMS:	1,410
FARMLAND:	1,686,000 acres
CROPLAND:	538,400 acres
HARVESTED CROPLAND:	370,545 acres
IRRIGATED LAND:	495,500 acres
TOTAL VALUE AGRICULTURAL PRODUCTION:	\$155.7 million

Agriculture has long been the primary source of income in the high southern Colorado valley called the San Luis Valley.

Unique in world topography, the elevation of the Valley floor varies from approximately 7,400 feet to over 8,000 feet above sea level. The Valley proper is almost perfectly level and stretches roughly 75 miles east and west by 125 miles north and south. A table-top valley floor is completely surrounded by mountain peaks, many of which exceed 14,000 elevation.

Geologists say the valley was a prehistoric lake. It is the upper headwaters for the Rio Grande River. Deep drilling tests have shown the valley floor is a rich alluvial fill for as much as 4,000 feet down, almost identical to that found on the surface. While there are many soil types to be found in the Valley, most of the area would fall into the sandy loam classification. It is a soil ideally suited to the production of potatoes, vegetables, cereal grains and hay.

With agricultural production valued at an estimated \$155.7 million, the area contributes about five percent of the state's total agricultural receipts to the economy.

The normal growing season in the San Luis Valley is from 90 to 110 days. The length of the growing season, plus the absence of common pests, such as bugs, worms, and aphids, makes this area a "natural" for potato production. It is not necessary to use as many of the complicated pesticides and insecticides so necessary to potato production in other areas. San Luis Valley potatoes are nationally recognized as having outstanding quality and draw premium prices in most of their markets.

The average annual rainfall is from five to seven inches. This means that through the application of irrigation water all growing crops can be completely controlled. Yields of potatoes have been verified as high as 650 cwt. per acre. Irrigation water is available from two sources; surface water--rivers and creeks, and underground water--artesian and pump wells.

Ninety percent of the potatoes produced in Colorado come from the San Luis Valley. Well-known varieties include the Russet Burbank, Centennial Russet and the Sangre (red). San Luis Valley seed potatoes are in great demand among California growers.

The area is also a major malting barley producing region, more than 50 percent of the state's production coming from there; major breweries currently contract with San Luis Valley barley producers for barley supplies.

The Valley is also a major hay-producing area, cutting 13 percent of the state's total annually, is famous for its vegetables, primarily lettuce, carrots, and spinach, and has a thriving livestock industry, as well.

Conejos County is fifth in the state in sheep production, and the Valley cattle/calf production accounts for five percent of the state's total.

Lettuce production was valued at \$7.8 million in 1980, carrots at \$2 million, and spinach at \$2.4 million.

Soft white wheat is a commodity produced in the San Luis Valley, which is eager to find new markets. Marketed primarily in the Denver area now, growers are beginning to talk about the marketing order, and members of the Colorado Wheat Administrative Committee are expressing interest in including the San Luis Valley in the order.

Water is by far the most significant issue facing San Luis Valley growers. Prior to sprinklers, crops were irrigated by flooding or row-watering with Rio Grande river or reservoir water through extensive canal systems or from pump wells and artesian wells. Some of the advantages of sprinkler-type irrigation are better control and utilization of water, which includes time and rates of application, injection of agricultural chemicals into system, more even distribution and less spread of noxious weed seed.

V. COMPACTS

A. COSTILLA CREEK COMPACT

The 36th Annual (41st) meeting of the Costilla Creek Compact Commission was held on May 18, 1982, in San Luis, Colorado. Jeris Danielson, State Engineer; Hal Simpson, Assistant State Engineer; Steve Vandiver, Division Engineer; Steve Witte, Assistant Division Engineer; Gilbert O'Cana, Water Commissioner, District 24; and David Pacheco, Deputy Water Commissioner, District 24, were in attendance from the Colorado Division of Water Resources.

The Costilla Compact Engineers Advisors meeting was held in the Division III Water Resources office on May 17, 1982. Chuck Merritt, Eddy Trujillo, Carl Slingerland, Hal Simpson, and Steve Vandiver were in attendance.

The water supply available for users for 1981 was approximately one-half of the long term average. This made for a very lean year.

Following are the Engineer Advisor Report, the USGS Report, Treasurer's Report and a portion (pages 1-4) of the Watermaster Report for the 1981 calendar year.

REPORT OF THE ENGINEER ADVISORS
TO THE
COSTILLA CREEK COMPACT COMMISSION

For 1981 Season

REPORT OF DELIVERIES

The 1981 computations of allocations and deliveries of water under the Amended Costilla Creek Compact are summarized on the attached Form No. 7 and indicate the following:

Direct Flow

- 1) Via Costilla Creek below the Cerro Diversion Dam New Mexico received an over-delivery of 193 acre-feet and Colorado received an under-delivery of 24 acre-feet.
- 2) Via the Acequia Madre New Mexico received an under-delivery of 563 acre-feet and Colorado received an under-delivery of 42 acre-feet.
- 3) Via the Cerro Canal New Mexico received an over-delivery of 425 acre-feet and Colorado received their allocation.

The total flow at the Canyon Mouth, 14,932 a.f. (May-Sept.), was well below the long term average, 29,000 a.f.

Storage Water

The allocation of storage water was made on the maximum content of Costilla Reservoir, (7,821 a.f.) and was based on a usable capacity of 11,000 acre-feet; i.e., 63.5% to New Mexico and 36.5% to Colorado.

The allocation of storage in Costilla Reservoir on May 5 resulted in an allocation of 4,966 a.f. to New Mexico and 2,855 a.f. to Colorado. On August 3rd, 441 a.f. of gain in Costilla Reservoir was reallocated to the states bringing the total allocation to 5,246 for New Mexico and 3,016 to Colorado.

During the season 5,993 a.f. storage water arrived at the Canyon Mouth of this amount 3,908 acre-feet was released for New Mexico and 2,085 acre-feet was released for Colorado.

A comparison of the requested storage releases and the computed storage water that arrived at the Canyon Mouth indicate an under-delivery to New Mexico of 148 acre-feet and an over-delivery to Colorado of 148 acre-feet.

Delivery to Eastdale Reservoir No. 1

The total recorded delivery of water to Eastdale Reservoir No. 1 during calendar year 1981 was 1,040 acre-feet. The delivery was as follows: 984 acre-feet prior to the irrigation season and 56 acre-feet during the irrigation season.

Other

During the 1981 season, 440 acre-feet of New Mexico's allocation of storage water in Costilla Reservoir were diverted for use in the Amalia area.

On May 11, 1981, after preliminary estimates indicated more than 1,000 acre-feet had been delivered to Eastdale Reservoir No. 1, the direct flow originating below Costilla Dam was made available to the direct flow users in accordance with their priorities. Final records of the U.S.G.S. show that by May 11 only about 984 had

been delivered past the Eastdale intake Canal gage. Submergence of the flume at the gage was the reason for the disparity in the original estimate.

The Engineer Advisors recommend that the gage Costilla Creek near Amalia be discontinued since it is no longer used by the Watermaster or the Engineer Advisors. This will also result in a savings of \$1515 for the Commission's share of the gaging program for fiscal year 1983.

By letter dated April 15, 1982, the New Mexico State Engineer transmitted the 1982 forecasted runoff for Costilla Creek and the estimated safe-yield for the Costilla Reservoir System to the waterusers and Colorado officials. The forecasted natural flow at the Canyon mouth (May-September) is 17,600 acre-feet.

The forecasted safe-yield of the Costilla Reservoir System is 13,500 a.f. A safe-yield of 16,000 a.f. represents essentially a full supply. A copy of the forecast and estimated safe-yield is attached.

Attachments

COSTILLA CREEK FORECAST

1982 SEASON

<u>SNOW COURSE</u>	<u>DATE</u>	<u>DEPTH</u>	<u>WATER CONTENT</u>
Culebra #1	4/1/82	39 in.	10.8 in.
Red River	4/1/82	21 in.	<u>5.5 in.</u>
		Sum	<u>16.3 in.</u>
		Average	8.2 in.

Actual March 2 1982 Costilla Creek Reservoir
 Content 4745 a.f.
 Estimated April 30, content 5380 a.f.

Forecasted natural (May-Sept.) flow of Costilla Creek at
 Canyon Mouth - 17,600 a.f.

Forecasted Safe Yield of the Costilla Reservoir System is
 13,500 a.f. (A safe yield for the system of 16,000 a.f.
 represents essentially a full supply).

Rev 5/17/82

**COSTILLA CREEK COMPACT
SUMMARY OF WATER SUPPLY, ALLOCATIONS AND DELIVERIES
BELOW CANYON MOUTH
FORM NO. 7**

MAY 16 TO
SEPTEMBER 30
19 81

	VALUES IN ACRE FEET					
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
A. WATER SUPPLY AT CANYON MOUTH <i>(Gaging station on Costilla Creek near Costilla, New Mexico)</i>	1984	4011	3808	3560	1569	14,932
1. Total Direct Flow	1069	2390	1916	2130	1436	8,941
2. Surplus Water	0	0	0	0	0	0
3. Conveyance Losses on Direct Flow	95	179	184	184	157	799
4. Usable Direct Flow (1-2-3)	974	2211	1732	1946	1279	8,142
5. Reservoir Water	914	1624	1892	1430	133	5,993
6. Total Flow (1+5)	1983	4014	3808	3560	1569	14,934
B. ALLOCATIONS AND DELIVERIES OF DIRECT FLOW <i>(a) Via Creek below Cerro Headgate</i>						
1. New Mexico Allocation (Excl. Cerrito)	1	28	1	13	4	47
2. Channel Losses	72	140	9	60	78	359
3. Required at Gaging Station (1+2)	73	168	10	73	82	406
4. Actual Deliveries	44	103	2	44	47	240
5. Differences between Allocations and Deliveries (4-1)	43	75	1	31	43	193
6. Differences during surplus water period						
7. Colorado Allocation	0	103	0	9	3	115
8. Channel Losses to boundary	23	39	175	124	79	440
9. Channel Losses below Boundary						
10. Required at Gaging Station (7+8+9)	23	142	175	133	82	555
11. Required Delivery at Boundary (7+9)	0	103	0	9	3	115
12. Actual Delivery at Boundary	0	29	0	14	48	91
13. Differences (12-11)	0	- 74	0	5	45	- 24
14. Differences during surplus water period						

Rev 5/7/

1981

	VALUES IN ACRE FEET					
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL
(b) Via Acequia Madre						
1. New Mexico Allocation	391	726	748	742	532	3139
2. New Mexico Deliveries	297	703	705 711	599	272 356	2570 2666
3. Differences (2-1)	- 94	- 23	- 43 37	-143	- 260 176	- 56 473
4. Differences during surplus water period						
5. Colorado Allocation	33	62	64	63	45	267
6. Losses to Boundary	3	4	10	8	21	46
7. Required Delivery at Boundary (5-6)	21	58	54	55	24	221
8. Actual Delivery at Boundary	- 9	- 31	0	- 2	0	- 42
9. Differences (8-7)						
10. Differences during surplus water period						
(c) Via Cerro Canal						
1. New Mexico Allocation (Incl. Cerrito)	255	655	404	526	313	2153
2. New Mexico Deliveries	321	746	471	639	401	2578
3. Differences (2-1)	66	91	67	113	88	425
4. Differences during surplus water period						
5. Colorado Allocation	294	646	515	589	382	2426
6. Losses to Boundary	54	118	87	118	108	485
7. Required Delivery at Boundary (5-6)	240	528	428	471	274	1941
8. Actual Delivery at Boundary	240	528	428	471	274	1941
9. Differences (8-7)	0	0	0	0	0	0
10. Differences during surplus water period						



United States
Department of
Agriculture

Soil
Conservation
Service

Denver,
Colorado



COLORADO AND

NEW MEXICO

WATER SUPPLY OUTLOOK

AS OF
May 1, 1982



STREAMFI
Percent of



YOUR WATER SUPPLY

PRECIPITATION DURING APRIL WAS WELL BELOW NORMAL THROUGHOUT THE ENTIRE BASIN. IN THE RIO GRANDE IN NEW MEXICO PRECIPITATION AMOUNTED TO LESS THAN 1/3 OF AVERAGE FOR THE MONTH. SNOWPACK IN THE RIO GRANDE BASIN IN COLORADO IS 35% ABOVE NORMAL. MOST OF THE SNOW IS CONCENTRATED AT ELEVATIONS ABOVE 10,000 FEET WITH ELEVATIONS BELOW 9,500 FEET ALREADY BARE. A HEAVY SNOWPACK CONTINUES TO PERSIST IN THE RIO GRANDE IN NEW MEXICO AT ELEVATIONS ABOVE 10,000 FEET, PARTICULARLY IN THE HEADWATERS OF THE RIO CHAMA. ALONG THE MAIN STEM OF THE RIO GRANDE FORECASTS RANGE FROM 14% ABOVE NORMAL AT DEL NORTE TO 72% ABOVE NORMAL AT SAN MARCIAL. RUNOFF IS PROJECTED TO BE ESPECIALLY HEAVY IN THE CONEJOS AND RIO CHAMA WATERSHEDS WHICH ARE FORECAST TO FLOW 50% AND 72% ABOVE NORMAL, RESPECTIVELY. RESERVOIR STORAGE IN THE COLORADO PORTION OF THE BASIN IS 32% ABOVE NORMAL AND NEW MEXICO IS 63% ABOVE NORMAL.

RESERVOIR STORAGE (Thousand Ac. Ft.)

Basin or Stream and/or RESERVOIR	Usable Capacity	Usable Storage		
		This Year	Last Year	1963-77 Average
COLORADO				
Continental	27	5	9	5
Platoro	60	20	20	10
Rio Grande	51	25	26	19
Sanchez	103	12	17	11
Santa Maria	45	9	8	7
Terrace	18	7	2	7

WATER SUPPLY OUTLOOK

Expressed as "Poor, Fair, Average, Excellent" With Respect to Usual Supply

STREAM or AREA	Flow Period	
	Spring Season	Late Season
COLORADO		
Sangre de Cristo Cr	Exc	Avg
Trinchera Creek	Exc	Avg

SUMMARY of SNOW MEASUREMENTS
(COMPARISON WITH PREVIOUS YEARS)

RIVER BASIN and/or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF	
		Last Year	1963-77 Average
<u>COLORADO</u>			
Alamosa	1	-	50
Conejos	6	717	164
Culebra	4	671	70
Rio Grande, CO	13	342	125

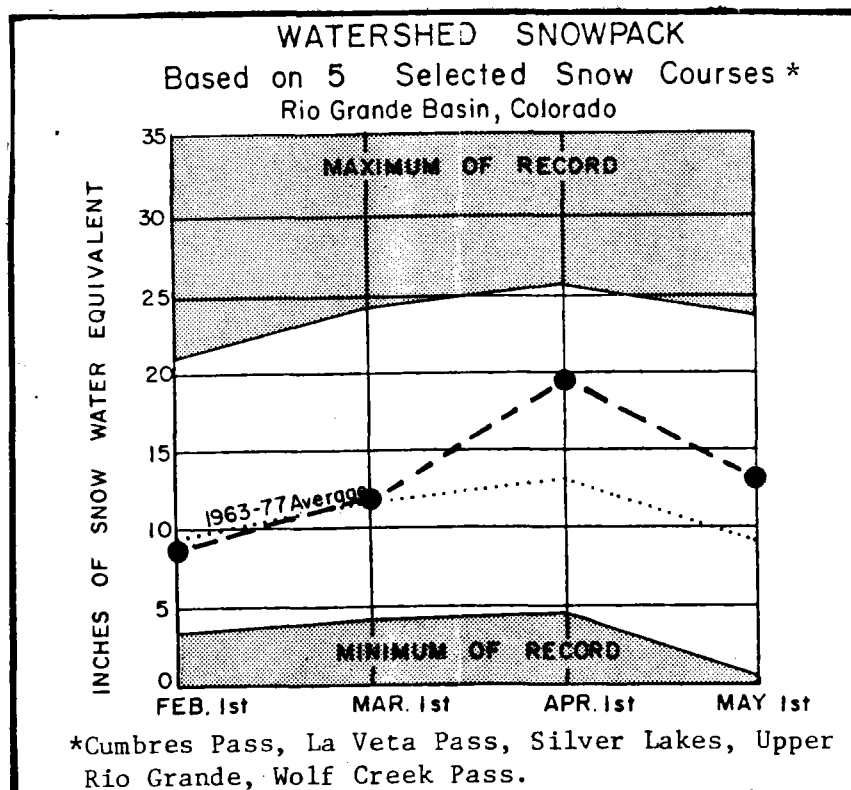
SNOW COURSE MEASUREMENTS

SNOW COURSE	CURRENT INFORMATION			PAST RECORD	
	DATE OF SURVEY	SNOW DEPTH (INCHES)	WATER CONTENT (INCHES)	WATER CONTENT (INCHES)	
				LAST YEAR	AVG. 63-77
<u>RIO GRANDE BASIN-COLO.</u>					
<u>Alamosa River</u>					
Lily Pond	4/29	51	22.0	0.0	--
Silver Lakes	4/29	2	0.8	0.0	1.6
<u>Conejos River</u>					
Cumbres Pass	4/28	55	26.3	3.1	14.7
Cumbres Trestle	4/28	72	33.9	6.4	17.7
La Manga	4/28	48	20.4	4.1	16.7
Pinos Mill	4/28	69	32.8	3.2	20.4
Platoro	4/29	47	20.4	2.0	11.8
River Springs	4/27	3	1.0	0.0	0.7
<u>Culebra River</u>					
Brown Cabin	4/28	0	0.0	0.0	1.9
Culebra	4/28	17	6.2	1.3	5.2
La Veta Pass (B)	4/28	0	0.0	0.0	3.2
Trinchera (B)	4/29	15	5.2	0.4	6.1
<u>Rio Grande</u>					
Big Meadows	4/30	22	9.7	0.0	10.0
Cochetopa Pass	4/27	16	5.4	0.0	4.0
Grayback	4/26	59	22.2	5.0	13.2
Hiway	4/28	83	34.8	14.6	26.0
Lake Humphrey	4/27	0	0.0	0.0	2.1
Love Lake	4/27	9	3.5	0.0	6.0
Middle Creek	4/27	65	24.2	9.9	--
Pass Creek	4/28	16	6.8	0.0	5.3
Pool Table	4/27	3	1.0	0.0	3.1
Porcupine	4/25	19	5.9	0.3	6.6
Santa Maria	4/25	0	0.0	0.0	1.4
Upper Rio Grande	4/28	3	1.2	1.1	3.5
Wolf Creek Pass	4/28	74	36.8	9.5	22.8
Wolf Cr. Summit (B)	4/28	100	41.8	19.0	30.8

STREAMFLOW FORECASTS (000 Ac. Ft.)

FORECAST POINT	Forecast	% of Average	1963-77 Average
COLORADO (April-September)			
Rio Grande at Wagon Wheel Gap (3)	320	110	292.0
Alamosa Creek above Terrace Reservoir	90	142	63.6
Conejos River near Mogote (1)	275	150	182.9
Culebra Creek at San Luis (2)	19	124	15.3
La Jara Creek near Capulin	11	145	7.6
Los Pinos River near Ortiz	100	163	61.3
Rio Grande at Thirty Mile Bridge (3)	135	113	118.9
Rio Grande near Del Norte (3)	525	114	461.8
Saguache Creek near Saguache	30	100	30.1
San Antonio River at Ortiz	25	205	12.2
South Fork of Rio Grande at South Fork	155	130	119.4
Trinchera Water Supply (April-July) (6)	26	119	21.9
NEW MEXICO (March-July)			
Gallinas Creek near Montezuma	8	133	6.0
Costilla Creek at Costilla (4)	20	130	15.4
Jemez River near Jemez	43	129	33.3
Pecos River at Pecos	46	120	38.1
Red River at Mouth	28	103	27.2
Rio Chama at El Vado	305	172	177.0
Rio Grande at Otowi (5)	750	151	497.0
Rio Hondo near Valdez	575	172	335.0
Rio Pueblo de Taos below Los Cordovas	14	109	12.8
Santa Cruz River at Cudiyo	25	132	19.0
Santa Fe near Santa Fe	15	129	11.6
Santa Fe near Santa Fe	4	138	2.9

(1)Observed flow plus change in storage in Platoro Reservoir. (2)Observed flow plus change in storage in Sanchez Reservoir. (3)Observed flow plus change in storage in Santa Maria, Rio Grande and Continental Reservoirs. (4)Observed flow plus change in storage in Costilla Reservoir. (5)Observed flow plus change in storage in El Vado and Abiquiu Reservoirs. (6)Sum of Trinchera Creek near Fort Garland, Uta Creek near Fort Garland, Sangre de Cristo Creek near Fort Garland, and Indian Creek diversion.



B. PRECIPITATION - SUMMER

During May, June, July and the first part of August the precipitation on the valley floor was almost nil. Much rangeland and land under junior surface rights suffered greatly. Because of this dry period the forecast on August 15 was reduced to 575,000 af on the Rio Grande and 410,000 af on the Conejos. During the middle part of August the "Great San Luis Valley Monsoon of 1982" began. The rain occurred generally over the entire Valley as well as the mountains. It made much of the area a virtual bog for several weeks. Springs and seeps in the mountains returned that haven't run for several years. This situation is contributing to a much higher than normal baseflow in all the rivers and streams. We have figured the rain added some 120,000 af to the annual flow of the Grande and 35,000 af to the flow of the Conejos resulting in an annual inflow of approximately 696,000 af on the Rio Grande and 449,000 af flow on the Conejos system. The rain had similar effects on all the streams in the Valley.

The period reported on the following page is from May 1 through September 30. Normal precipitation (1931-1960 average) for the period at NOAA reporting stations is 6.28 inches. The average annual precipitation is approximately seven inches on the Valley floor.

PRECIPITATION AND DEVIATION FROM NORMAL (FROM NOAA REPORTS)

(Inches of Precipitation)

Station	May 1/		June		July		August		Sept	
	1	2	1	2	1	2	1	2	1	2
Alamosa	0.57	-0.05	0.22	-0.30	0.51	-0.66	0.58	-0.57	1.85	1.14
Blanca	0.55	-0.32	0.17	-0.54	1.14	-0.27	3.58	1.92	2.94	2.21
Center	0.32	-0.39	0.06	-0.55	0.80	-0.20	2.03	0.77	1.90	1.21
Crestone	0.79	----	0.29	----	3.34	----	4.35	----	3.11	----
Del Norte	0.52	-0.24	.70	-0.04	0.67	-0.81	4.91	3.22	2.16	1.30
Great Sand Dunes	1.18	----	0.21	----	2.87	----	1.71	----	2.85	----
Hermit	1.35	0.23	0.10	-0.78	1.45	-0.68	4.05	1.86	3.50	2.14
Manassa	1.26	0.62	0.31	-0.33	0.48	-0.68	1.94	0.49	2.20	1.49
Monte Vista	0.76	0.21	0.11	-0.45	0.66	-0.52	2.94	1.61	1.84	1.09
Rio Grande Reservoir	1.55	----	0.60	----	1.89	----	3.71	----	3.55	----
Saguache	0.29	-0.46	0.49	-0.22	0.63	-0.90	3.38	1.85	2.15	1.31
San Luis	1.23	----	0.45	----	1.86	----	2.90	----	2.41	----
Wolf Creek	1.55	----	T	---	0.43	----	5.36	----	5.84	----
Average	0.92	.02	0.29	-0.48	1.29	-0.39	3.19	1.37	2.79	1.68

Column 1 - Precipitation.

Column 2 - Deviation from normal.

Data from the table indicate about 135% of normal precipitation for the period. Several major rainstorms occurred from the middle of August to October in and around the San Luis Valley. This unusual amount of rainfall was very helpful considering the very dry spring and summer in Division III.

C. FLOODS

The normal snowpack on the Rio Grande and the cold spring weather prevent any flooding in District 20. The high snowpack on the Conejos was basically controlled and extended by the cold weather in June and only minor flooding in low lying meadows occurred along the San Antonio, Los Pinos, and Conejos Rivers.

D. GROUNDWATER

Groundwater has again been the topic of the year in Division III. The restrictions placed on well drilling in February, 1981 and the continuing tightening of procedures for completing wells and finishing the paper work, the general water user public has squirmed to say the least. The new policies brought several court cases in 1982. These are mentioned later in the court case section.

The Division III staff has spent many hours trying to educate the public as to why the new policies were established. This includes subdivisions, exemptions, domestic wells, as well as irrigation wells. Some users do not agree with the decision but most have accepted the decision. There are, though, several court cases pending which involve the new groundwater policies.

Our inspection program of requests of replacement, alternate points or supplemental wells has worked well but added considerable mileage to several vehicles.

Rev 5/7/78

1981

	VALUES IN ACRE FEET						
	MAY	JUNE	JULY	AUGUST	SEPTEMBER	TOTAL	
C. ALLOCATIONS AND DELIVERIES OF RESERVOIR WATER							
(a) New Mexico							
1. Delivered to Creek	6	47	31	0	0	84	
2. Delivered to Acequia Madre	0	20	0	14	0	- 34 56	
3. Delivered to Cerro Canal	611	1100	933	953	45	3642	
4. Total at Canyon Mouth for Delivery (1+2+3)	617	1167	964 958	967	45 89	3760 3670	
5. Allocated						3908	
6. Difference (4-5)						178 - 238	
(b) Colorado							
1. At Canyon Mouth for Delivery at Boundary via Creek	14	0	40	77	0	131	
2. Losses to Boundary	0	0	0	0	0	0	
3. Delivered to Boundary via Creek (1-2)	14	0	40	77	0	131	
4. Diverted by Acequia Madre	0	0	8 14	0	0 84	8 98	
5. Losses to Boundary	0	0	0	0	0	0	
6. Delivered to Boundary (4-5)	0	0	8 14	0	0 84	8 98	
7. Diverted to Cerro Canal	283	457	880	386	88	2094	
8. Losses to Boundary	52	84	148	78	25	387	
9. Delivered to Boundary (7-8)	231	373	732	308	63	1707	
10. Total Delivered at Boundary (3+6+9)	245	373	780 786	385	63 147	1846 1936	
11. Total at Canyon Mouth for Delivery (1+4+7)	297	457	928 934	463	88 172	2233 2323	
12. Allocated						2085	
13. Differences (11-12)						+ 148 238	
COSTILLA RESERVOIR ALLOCATION (Acre Feet)	STORED (A.F.)		Total Releases		10% LOSS	AT CERRO HEADING	
	N. MEX. PORTION - 63.5%		4966 5246		4823	918 (1)	3908
	COLO. PORTION - 36.5%		2855 3016		2397	309	2085

FOOTNOTES Total 7821 8262 7220 5993

(1) includes 295 AF Amalia depletion

REPORT ON THE COOPERATIVE WORK OF THE NEW MEXICO DISTRICT,
U. S. GEOLOGICAL SURVEY, IN CONNECTION WITH
ADMINISTRATION OF THE COSTILLA CREEK COMPACT

WORK PERFORMED DURING CALENDAR YEAR 1981

The New Mexico District of the Geological Survey, Water Resources Division, continued the operation of 16 stream gaging stations and one reservoir gage in the Costilla Creek watershed for use in the administration of the Costilla Creek Compact. Two of these gages are located in Colorado; the remainder are in New Mexico. Stations are as follows:

Costilla Creek Compact Commission stations:

1. Costilla Creek above Costilla Dam
2. Casias Creek near Costilla
3. Santistevan Creek near Costilla
4. Costilla Reservoir near Costilla
5. Costilla Creek below Costilla Dam
6. Costilla Creek near Amalia
7. Costilla Creek near Costilla - Canyon mouth
8. Acequia Madre at Costilla
9. Mesa ditch near Garcia
10. Cordillera ditch at Garcia
11. Cerro Canal at Costilla
12. N. Mex. branch Cerro Canal near Jaroso
13. Cerro Canal at State line near Jaroso
14. Costilla Creek below diversion dam at Costilla
15. Costilla Creek at Garcia
16. Eastdale No. 1 intake canal near Jaroso

Interstate Stream Commission and State Engineer of
New Mexico station:

1. Cerro Canal below Association ditch at Costilla

During the year the Costilla Watermaster, Mr. Max A. Chavez, made 66 discharge measurements as a result of the "direct State expenditures" provision of the cooperative agreement.

RUNOFF AND STORAGE

Runoff in the Costilla Creek basin during calendar year 1981 as determined at the gage Costilla Creek near Costilla (at Canyon mouth) was 20,700 acre-feet. This is 79 percent of the 20-year average (1962-81), 26,300 acre-feet, and 60 percent of the average for the 40-year period of record (1942-81), 29,850 acre-feet.

Storage in Costilla Reservoir was as follows:

<u>Date</u>	<u>Storage in acre-feet</u>
December 31, 1980	5,500
April 30, 1981	7,600
September 30, 1981	1,400
December 31, 1981	3,000

MAINTENANCE

Only routine maintenance work is anticipated at this time. Repairs will be made to the concrete gage well at Casias Creek.

RECOMMENDATIONS FOR NEW WORK

No major maintenance work is anticipated at this time. Repairs will be made to the concrete gage well at Casias Creek.

The concrete control at Costilla Creek below Costilla Dam continues to deteriorate - routine patching will continue as long as possible.

The concrete control at Costilla Creek below diversion dam continues to be ineffective because of submergence from the Penasquito ditch heading. Consideration has been given to relocating this gage upstream closer to the Costilla Creek diversion structure but no suitable location is available. The control structure cannot

cannot be raised any higher because this would force high flows out of the channel. The discharge record at this gage will continue to be rated as poor until control conditions improve.

SUMMARY OF COSTS

July 1 to June 30

<u>Fiscal Year</u>	<u>Total</u>	<u>USGS</u>	<u>CCCC</u>	<u>Direct State Expenditures</u>
1980-81	\$41,300	\$20,650	\$20,650	\$3,820
1981-82	\$44,600	\$22,300	\$22,300	\$4,120
1982-83	\$49,140	\$24,570	\$24,570	\$4,500

Prepared by William K. Dein
for James F. Daniel, District Chief
U. S. Geological Survey, (WRD)
Albuquerque, N. Mex.
May 10, 1982

GENERAL

The Costilla Creek watershed received a below normal snow-pack; consequently, there was no significant runoff. The storage in Costilla Reservoir was also less than normal; however, the summer rains relieved some of the shortages and most of the system had a fair supply of water for the 1981 season.

Administration of the flow of Costilla Creek was made by daily inspections of the various measuring devices and points of delivery throughout the system. Daily distribution of flows were made in accordance with the Amended Costilla Creek Compact.

EASTDALE DELIVERY

On March 6 flows were first diverted into the Cerro Canal for delivery to Eastdale No. 1 Reservoir. Flow reached the Eastdale #1 Intake Canal gage on March 26. On May 11 the direct flow was turned over to the direct flow irrigators in accordance with commission action at the May 1, 1981 meeting. Final U. S. G. S. records indicate that only 984 af had been delivered by that date. A total of 1,040 af was delivered past the Eastdale #1 Intake gage during the season. During the latter part of 1979 sand, as a result of channel work on the Intake Canal, built up below the gage and caused severe backwater conditions. This made the delivery difficult to estimate.

COSTILLA DAM AND RESERVOIR

Frank Barela was again employed as the reservoir attendant. The timing and amount of storage water releases were such that the distribution of storage water went well in 1981.

The water users requested an early release of storage water which started on May 5. Storage releases were made while the Eastdale delivery was still in progress. The total amount of storage in Costilla Reservoir available for allocation on May 5th was 7,821 af. The allocation for Colorado was 2,855 af and the allocation for New Mexico 4,966 af. On August 3, a reallocation of storage water was made, which gave an additional 280 af to New Mexico and 161 af to Colorado. Both states last request for storage water was on September 4.

By-passing the inflow to the reservoir was stopped on September 15 since the demand for water could be met from the inflow below the dam. The amount of storage on September 4 was 842 af which was the last day storage water was released. The amount of storage on October 1 was 1,420 af.

AMALIA AREA

The Amalia area water users received no water under their direct flow entitlement, except for short periods in the latter part of the season during storm peaks. The storm peaks were usually of short duration. Most ditches received storage water under a lease agreement with Rio Costilla Cooperative Livestock Association. Some gate tampering was noted, mostly at night.

CERRO CANAL

Direct flow available to the Cerro Canal was below normal but the Canal had a good supply of storage water. There was no interruption of deliveries except for sluicing operations. Sediment was not a major problem during the 1981 season; however,

the amount of sediment that could not be removed at the diversion dam increased approximately 15% during the season.

Sediment was sluiced six times for a total of about 70 hours for the entire season.

CERRITOS NO. 1 AND NO. 2 DITCHES

Cerritos Ditches No. 1 and No. 2 had small quantities of flow under their direct flow entitlements for most of the season. In addition they received storage water under a lease agreement with the RCCLA. Some gate tampering was noted.

ASSOCIATION AREA

Ted Martinez was the ditch rider for the Association during the 1981 season. Association lands had a fair supply of water, mainly because of storage water available to them. No major problems were brought to my attention.

JAROSO AREA

Herb Quiller, again, was the ditch rider for the Jaroso Mutual Ditch Company. The Jaroso area also had a fair supply of water. Debris in the canal was the only significant problem noted.

ACEQUIA MADRE

The Acequia Madre had a full entitlement of the direct flow during most of the season. During periods of rain they did not want their full entitlement; also, in September they did not require their full entitlement.

Amalia Area	710	acres
Acquia Madre	800	acres
Costilla - Garcia Area	160	acres
Association Area	2,860	acres
Cerritos Ditch	356	acres
Jarosa	1,904	acres
Eastdale	350	acres

follows.

Lands irrigated from Costilla Creek during 1981 were as

OTHER

occasions.

The ditches along the creek in Costilla and Garcia received very little water under their direct flow entitlements. Some additional water was available as a result of sluicing at the Cerro heading. The sluice gates were tampered with on two occasions.

COSTILLA AND GARCIA AREAS

B. RIO GRANDE COMPACT

The Rio Grande Compact again offered a challenge to all involved. Thanks to the Division III hydrographic section, Suvarana Rao, and Hal Simpson, we were able to maintain a good balance between our forecast and the real numbers. To keep up with the very unusual fall rain storms was another challenge. Every forecast that was made between August 15 and November 15 was exceeded by thousands of acre feet. The valley-wide rain storms provided good return flows and contributions from the LaJara and Alamosa systems; this hasn't occurred since compact administration.

The year began with very unusual snow storm patterns. The Conejos and Alamosa River drainages received a much larger snowpack than did the Rio Grande. On May 1, 1982, the SCS Snow Survey Unit estimated from 107%-114% of normal stream flow on the Rio Grande and 145%-160% on the Conejos. As the runoff proceeded those numbers were backed off to 97% and 140% respectively. Using the SCS forecasts and making some "seat of the pants" observations the State's initial forecast for calendar year 1982 was a 607,000 a.f. Index on the Rio Grande and a 413,000 a.f. total Conejos Index. Using those numbers the initial compact curtailments were set at 18% and 45% respectively.

The spring in the San Luis Valley was almost like winter. The June temperatures above 10,000 feet were relatively cold and this resulted in a very flat and extended hydrograph of the runoff. Rather than having a normal hydrograph the Rio Grande ran between 3,000 and 4,000 c.f.s. for approximately 35 days and the Conejos ran between 1,500 and 2,300 c.f.s. for the same period. This, coupled with the curtailments on the two rivers, caused many junior priorities to run little, if any, water during the runoff period. June also brought rather severe winds with it and conservative estimates reflect we lost approximately 25,000-30,000 a.f. of water on the Grande and approximately 10,000 on the Conejos Index.

Because of several of the situations cited above, many inovative ideas surfaced to try to lessen the effect of the Compact on both river systems.

The Rio Grande Water Users Association formulated and signed an agreement with the State Engineer and the Colorado Water Conservation Board to use the three pre-compact reservoirs on the headwaters of the Rio Grande (Farmers Union, Continental, and Santa Maria) as storage vessels for Compact waters in order to try and help reduce the over-delivery in any given year. This agreement was part of a package deal for the San Luis Valley Irrigation District to obtain a loan and grant from the Conservation Board to repair the Farmers Union Reservoir in the amount

of \$1.1 million. This arrangement was then utilized and on May 17, 1982, 10% of the Del Norte Index was stored in the Farmers Union Reservoir and 8% of the Index was delivered to the State line. By June 24, 1982, 24,600 a.f. of Compact water had been stored. It was decided this was enough water to handle this year. Then, because of a need to empty the Farmers Union Reservoir for fall repairs, 5,776 a.f. of stored Compact water was delivered to the State line and 18,824 a.f. exchanged into Santa Maria Reservoir to be held there until year's end, subject to the State Engineer's call.

The Conejos users faced a much different problem this year. At the request of the Conejos Conservancy District, the State Engineer proposed a resolution to the Compact Commission to allow the Conejos users to store direct flow rights in Platoro Reservoir. The resolution passed and the apparatus to accomplish this was set up with the Army Corps of Engineers and the Bureau of Reclamation. The plan then fell through when the Conejos and the Bureau could not reach agreement on the payback contract terms. For the first time, the Bureau wanted to trigger the payback agreement and the Conejos District felt that the payment of operation and maintenance of approximately \$25,000 the first year and between \$2 and \$6 an acre foot was beyond their ability for payment and declined to store any water in Platoro. Being the large, wet year that it

was, it would have been a perfect opportunity to store direct flow rights. It goes without saying that the Conejos District will have to have an agreement with the Bureau before the resolution will be presented again to the Commission.

There was no flood storage in Platoro this year either because of the very controlled runoff caused by the cold June. Therefore, the designated level of storage remained at 9982.72 feet or approximately 19,691 a.f. for the entire year.

The runoff out of the LaJara-Alamosa systems also surprised us this year. The extended high runoff period eventually saturated the lands below Highway 285 and then contributed a considerable amount of water to the Rio Grande River. This inflow during July and early August was enough to meet the Grande's obligation (18%) to the Compact during that period. As a result, 100% of the Del Norte Index was delivered to the users. This was a considerable contribution at times, ranging up to from 300-500 c.f.s.- approximately 10,000 acre feet.

This water would have not been recognized nearly as quickly or accurately had it not been for the new Comsat sites which were installed on the Rio Grande Lobatos and Conejos near LaSausas stations. These devices monitor the gauge height every 15 minutes and send the data to a GOES satellite. That information

is then relayed to a ground station in Concord, Massachusetts every three hours. This information can then be converted to discharges, mean 24 hour gauge height, hydrographs, and other excellent information to help administer a stream. Because of these three sites, we had a much better handle on the Compact administration. We were able to make decisions, with the most recent data, about what we should or were delivering to the State line. This system is extremely valuable. We only hope the program is continued and expanded to other stations in the coming year. The platforms were put in service in May and we were able to use them during the remaining water year.

The extended flat runoff proceeded down in a normal pattern through July and the first 20 days of August. We felt on the 15th of August that the curtailments could soon be lifted for the remainder of the irrigation season. At that time we predicted a runoff of 413,000 a.f. on the Conejos and 578,000 a.f. on the Rio Grande. Then, during the last 10 days of August, the "Great San Luis Valley Monsoon of 1982" began and continued through the first half of October. Many areas of Division III received from 6 to 10 inches of rain during those two months and resulted in very unusual river flows for late summer and fall for all streams in the San Luis Valley.

This was a blessing on one hand and a real detriment on the other. The moisture recharged the groundwater throughout Division III and mountain streams and springs which haven't run for several years are now running again. This greatly increased the baseflow of all streams in the Valley this fall and winter. On the other hand, many crops were damaged or made impossible to harvest for several weeks. Much alfalfa and meadow hay molded in windrows, grain germinated in the head or in the windrow, and potatoes were impossible to harvest during September.

The third consideration was trying to meet the Compact with the great increase in Index experienced during the late fall. This was done by increasing the curtailments on both rivers during September. This was done with full agreement of the Conejos Conservancy District and the Rio Grande Water Users Association. The rain was spread over the Valley as well and there was little or no demand on either during part of September. Many days the Commissioners on both rivers could not find users to take the water and much water was delivered to the State line. Because of this, it was decided by all involved that the curtailments be increased during this time to meet the added obligation. The Conejos very nearly made 100% delivery during that time and coupled with the return flows, the Grande made approximately 45% delivery with just a 25% curtailment. Therefore, we were able to

"catch up" on our deliveries during this time and make a very comfortable late fall situation.

On November 3, 1982, it was decided that recharge on both rivers could be allowed and many ditches participated. On the Rio Grande the Farmers Union Canal, Rio Grande Canal, Prairie Ditch, Rio Grande Lariat Ditch, Chicago Ditch and the New Ditch all participated. Many others could have run recharge water but refused. On the Conejos many ditches received recharge water. On the San Antonio the river was split at the bifunction and the Senicero Ditch and Rincones Ditch ran some water, all for recharge. Several other ditches on the Conejos could have run recharge water but also refused.

This recharge was very beneficial to the groundwater table in those areas and it also reduced the over-delivery by an estimated 13,500 a.f. (See Groundwater Section.)

The following table shows how the rains affected our forecasts during the year. It is estimated the rains increased the Grande 120,000 a.f. and the Conejos 35,000 a.f.

	<u>Rio Grande</u>	<u>Conejos</u>
May 1, 1982	607,000 a.f.	413,000 a.f.
August 15, 1982	578,000 a.f.	413,000 a.f.
Dec. 1, 1982	694,000 a.f.	449,000 a.f.

The following table shows the preliminary computations on the system for 1982.

	Rio Grande	Conejos	Total
Index	696,800	449,400	1,146,200
Obligation	202,600	231,500	434,100
Actual Delivery	207,000	234,300	441,300
Credit	<u>4,700</u>	<u>5,300</u>	<u>10,000</u>
Over-delivery	9,100	8,100	17,200

This would show approximately a 1.66% over-delivery for the entire system. A 2.0% over-delivery on the Grande and a 1.2% over-delivery on the Conejos system.

CURTAILMENT SCHEDULE FOR 1982

<u>RIO GRANDE RIVER</u>	<u>CONEJOS RIVER</u>
1. 100% curtailment through April 4, 1982	1. 100% curtailment to April 11
2. 18% curtailment April 5	2. 45% curtailment starting April 12
3. $\frac{10\%}{18\%} = 55.6\%$ of 18% curtailment stored in Rio Grande Reservoir from May 17 to June 24	3. 20% curtailment starting August 20
4. 18% curtailment to State line June 24, 1982	4. 40% curtailment starting September 1
5. 5,776 a.f. of 24,600 delivered to State line August 1-15	5. 100% curtailment starting September 21
6. 25% curtailment starting September 20	6. 60% curtailment starting October 6
7. 0% curtailment starting September 20	7. 100% curtailment starting November 1
8. 100% curtailment starting November 1, 1982	8. Recharge available November 15
9. Recharge available November 15, 1982	9. 100% curtailment starting December 31
10. 100% curtailment December 31, 1982	

DELIVERIES BY COLORADO AT COLORADO STATE LINE FOR 1981

Accrued Debit January 1, 1981	a.f. 674,600
Scheduled Delivery in 1981	130,500
Actual Delivery in 1981	141,500
Annual Credit Before Adjustments	11,000
Reduction in Debit for Evaporation of Water Held in Reservoirs	100
Accrued Debit, December 31, 1981	663,500

The 43rd annual meeting of the Rio Grande Compact Commission was held at Alamosa, Colorado on March 25, 1982. No major change was made for the coming year except that the storage of direct flow rights in Platoro would be allowed in 1982.

The different Rio Grande Compact reports by the Federal agencies involved are too lengthy to include in this report and can be obtained at the Division III or the State Engineer's Office.

VI. DAMS

A. SEE ROSTER FOR LIST OF DAMS

B. INSPECTIONS, FAILURES, RESTRICTIONS, AND
STOP ORDERS

Yearly inspections of high and medium hazard dams proceeded normally this year. Most, if not all, high hazard dams had formal inspections this year and most all dams were at least observed by our water commissioners or hydros.

One change that has helped the dam safety unit is the training of our hydros to perform at least minimum level inspections on dams. This past summer and fall Bennie DeProspero and Wayne Schieldt inspected several low and medium hazard dams and wrote reports to go into the records of these dams. Training people in field offices for these types of programs is essential to provide for all dams being covered on a regular basis. This program also fits in with training our new engineers to show progressive engineering experience to insure they can qualify for registration.

Several dams were involved with construction and problems in 1982. The San Luis Valley Irrigation District started their first phase of rehabilitation on Rio Grande Reservoir this past fall. After releasing and exchanging the water out of the reservoir, construction started to replace the guides, seals, and lining of the

gates and downstream structures. The gates were removed and sent to Denver for repair. This construction occurred during the unusual rainfall last fall and many problems were encountered trying to work under high river conditions. The coffer dam that was built was in jeopardy many times and finally had to be partially breached to prevent overtopping and failure. The work was finally completed in early November and seems to be well done.

Continental Reservoir's gate structures were also repaired this fall. New seals and guides were installed. The work went very well without much interference from the weather and a good job was done.

Terrace Reservoir is also back in the news this year with continual problems plaguing the completion of repairs. After the new electric control system was designed and completed, it was found to be very unsatisfactory. After struggling with the gates and controls all summer, a new hydraulic system was put in and is operable at this time, though some modification is still in the works. Also, the pressure relief or air release valve on the new pipeline blew off during the late summer and the resulting fountain caused deterioration of the ceiling of the tunnel. A large volume of rock debris was deposited around the pipeline and partially blocked off the tunnel. At this time the repairs and cleanup are

underway and a new bypass and relief valve will be put in place. A further problem involved is that the Terrace was able to store during the fall as there were few calls on the river. The reservoir came within three feet of spilling and then was dropped back to 10,800 a.f. on the 19th of November, thinking that would be adequate to store the rest of the winter. But the inflow was enough that by December 22, 1982, the reservoir reached within nine feet of spilling and it was necessary to start a release of at least the inflow and more if possible. This can cause an icing problem in the Capulin area and at this time we are keeping our fingers crossed to keep the ice from jamming and prevent further releases. It was determined that we draw down the reservoir to insure adequate room to store while the final repairs are made.

Mountain Home Reservoir was involved with a restriction order this year. After many years (at least 30), a written storage level was issued. There is great concern for the spillway structure on Mountain Home and after much discussion a flood routing calculation was done and a reservoir level of 87.5 feet was established. This was not very well received by the Trinchera Irrigation Company and discussion will surely result.

The following information on inspections in Division III for the FY 1981-82 are as follows.

ANNUAL SAFETY INSPECTIONS BY HAZARD RATING

<u>High</u>	<u>Moderate</u>	<u>Low</u>
7	6	0

CONSTRUCTION INSPECTIONS BY HAZARD RATING

<u>High</u>	<u>Moderate</u>	<u>Low</u>
0	0	0

VII. WATER RIGHTS

A. Data Bank Entries

The tabulation is one of the areas that suffered with all the change in personnel. Because no one was situated in a position to do it and because of its complexities, nothing was done on the tabulation after Sandy Waddington left in April, 1981. Steve Witte finally tackled it in the fall of 1982 and is presently putting it together for the July 1, 1983, publication. Steve, with the help of four water commissioners, had quite a pile of decrees to deal with. My sincere thanks for their effort.

B. Referee Findings and Decrees

SUMMARY OF WATER COURT DECREES

Number of applications received from January 1, 1982, through December 31, 1982: 82CW1 thru 82CW245. Types of claims received from January 1, 1982 thru December 31, 1982:

1676 wells
715 reserved rights
141 springs
59 ditches
7 reservoirs
5 ponds
3 drains
single ditch with 3 priorities
1 arroya
23 creeks
<u>11</u> rivers
2644 TOTAL

Number of cases terminated from January 1, 1982,
through December 31, 1982: 125 cases.

Structures terminated from January 1, 1982, through
December 31, 1982:

1 hydro plant
159 wells
21 ditches
17 creeks
11 reservoirs
15 springs
1 drain
1 dam
6 livestock tanks
2 pipelines
a single ditch with 3 priorities
(this does not include any cases which were
re-opened and re-terminated)
237 total

Break down of types of cases filed on from January
1, 1982, through December 31, 1982:

Plan of Augmentation

82CW17-Conditional & chg. of Water Right
82CW78-(Chg. of use & exchange)
82CW97-(Including Chg. of Water Right; exchange)
82CW160 (Including Chg. of Use)
82CW176
5 TOTAL

Water Storage Rights

82CW 52- U.S. Case
82CW 55- U.S. Case
82CW205- Conditional direct flow & storage
3 TOTAL

Application to Make Conditional Water Right Absolute:

82CW 21 (W-3701)
82CW 32 (W-3788)
82CW 69 (W-3318)
82CW 71 (W-3771)
82CW 74 (W-3510)
82CW128 (79CW9)
82CW148 (W-895)
7 TOTAL

Complaint Cases:

82CW 16
82CW 20
82CW 35
82CW 77
82CW 82
82CW 83
82CW105
82CW107
82CW112
82CW121
82CW122
82CW141
82CW173
13 TOTAL

Application of Quadrennial Finding of Reasonable Diligence:

82CW127 (W-48)
1 TOTAL

Application for Water Rights to Protect the Natural Environment to a Reasonable Degree:

82CW206	82CW217	82CW228
82CW207	82CW218	82CW229
82CW208	82CW219	82CW230
82CW209	82CW220	82CW231
82CW210	82CW221	82CW232
82CW211	82CW222	82CW233
82CW212	82CW223	82CW234
82CW213	82CW224	82CW235
82CW214	82CW225	82CW236
82CW215	82CW226	82CW237
82CW216	82CW227	82CW238
<u>33 TOTAL (Colorado Water Conservation Board Cases)</u>		

Application for Reserved Water Rights:

82CW 4 - U. S. Case	82CW42 - U. S. Case
82CW 5 - U. S. Case	82CW44 - U. S. Case
82CW 6 - U. S. Case	82CW49 - U. S. Case
82CW13 - U. S. Case	82CW50 - U. S. Case
82CW26 - U. S. Case	82CW51 - U. S. Case
82CW27 - U. S. Case	82CW53 - U. S. Case
82CW39 - U. S. Case	82CW57 - U. S. Case
82CW40 - U. S. Case	82CW58 - U. S. Case
82CW41 - U. S. Case	
<u>17 TOTAL</u>	

Surface Water Rights:

82CW 14
82CW 25
82CW126
82CW129 (Cond)
82CW138 (Cond)
82CW144
82CW147 (Absolute & Conditional)
82CW171
82CW183
82CW191
82CW196
82CW239 - U. S. Case
82CW240 - U. S. Case
82CW241 - U. S. Case
82CW242 - U. S. Case
82CW243 - U. S. Case
82CW244 - U. S. Case
82CW245 - U. S. Case
18 TOTAL

Application for Water Rights:

82CW 43 - U. S. Case - springs/surface
82CW 45 - U. S. Case - springs/surface
82CW 46 - U. S. Case - springs/surface
82CW 54 - U. S. Case - springs/surface
82CW 56 - U. S. Case - springs/surface-cond.
82CW 62 - conditional (202 wells)
82CW 70 - (1 spring & 2 wells)
82CW 85 - (4 wells)
82CW110 - conditional (1 drain diversion)
82CW145 - (springs)
10 TOTAL

Underground Water Rights:

82CW 3	82CW139
82CW 7	82CW140
82CW 12	82CW146
82CW 15	82CW149 - U. S. Case
82CW 18	82CW150 - U. S. Case
82CW 22	82CW151 - U. S. Case
82CW 23	82CW152 - U. S. Case
82CW 24	82CW153 - U. S. Case
82CW 30 (& chg. of water right)	82CW154 - U. S. Case
82CW 33	82CW155
82CW 47 - U. S. Case	82CW156
82CW 48 - U. S. Case	82CW157
82CW 59 - U. S. Case	82CW158
82CW 60 - conditional	82CW159
82CW 63 - conditional	82CW161
82CW 79	82CW162
82CW 87	82CW163
82CW 90	82CW164
82CW 92	82CW165
82CW 99 (& chg. of water right)	82CW168
82CW102	82CW169
82CW103	82CW170
82CW104	82CW174 - conditional
82CW106	82CW175 - conditional
82CW108 - conditional	82CW177 (also 1 ditch)
82CW109	82CW178
82CW111	82CW181
82CW113	82CW182
82CW116	82CW184
82CW118	82CW186
82CW119	82CW187
82CW124	82CW188
82CW125	82CW201
82CW132	82CW203 - conditional from non-tributary and/or tributary sources
82CW133	82CW204 - conditional from non-tributary and/or tributary sources
82CW137	

71 TOTAL

Change of Water Rights:

82CW 1	82CW 96
82CW 2	82CW 98
82CW 8	82CW100
82CW 9	82CW101
82CW 10	82CW114
82CW 11 - conditional	82CW115
82CW 19	82CW117
82CW 28	82CW120
82CW 29	82CW123
82CW 31	82CW130
82CW 34 - conditional	82CW131
82CW 36	82CW134
82CW 37	82CW135
82CW 38	82CW136
82CW 61	82CW142
82CW 64 - conditional	82CW143 - conditional
82CW 65 - conditional	82CW166
82CW 66	82CW167
82CW 67	82CW172 - & underground water right
82CW 68	
82CW 70	82CW179
82CW 73	82CW180
82CW 75	82CW185
82CW 76	82CW189
82CW 80 - conditional	82CW190
82CW 81	82CW192
82CW 84	82CW193
82CW 86	82CW194
82CW 88	82CW195
82CW 89	82CW197
82CW 91	82CW198
82CW 93	82CW199
82CW 94	82CW200
82CW 95	82CW202
<u>67 TOTAL</u>	

The number of cases pending as of December 31, 1982, is 447.

C. LITIGATION

It seems that unresolved court litigation is the only kind we have. Several cases were heard in 1982, and many more are lined up for 1983. Most of these come as a result of the tightening of regulations on the use of wells and changes which may involve them.

A few of the more notable cases are listed below along with their current status.

W-3366 (80SA288) Proposed Rules and Regulations
for Division III

This case finally moved along somewhat this year. The case was heard in 1979, and the approximately 7,000 page transcript was completed and transmitted to the Colorado Supreme Court in the spring of 1982. Then three "volleys" of briefs were submitted to the court before the end of the year. At this writing it is probable the oral arguments will be heard in February, 1983, with the decision sometime in the latter part of the year.

W-3394 - Middlemist Well Owners Plan of Augmentation
and W-3560 - People vs Mogote-Northeastern Ditch are still waiting for the final decision on W-3466 (SA288).

W-3894 - People vs Reed

The case concluded in November, 1981, and the decision was rendered May 17, 1982. The decision

by Judge Ogburn was one we could administer although the Upper La Jara Creek Users were very unhappy. We used the decision through the summer to administer La Jara Creek and it worked fairly well. On January 5, 1983, the final judgment on W-3894 was deferred except to the claims against the state of Colorado, and will await the outcome of a new trial in the sister case W-3379.

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

A main point in the decision in W-3894 was to vacate the decree in W-3379 and, as a result, a motion for new trial was requested at that time. As a result of the subsequent hearing of the motion, a new trial will take place this year.

W-3665 - San Marco Pipeline

No action in 1982

W-3864 - Herr Hans Hardt Plan of Augmentation

A hearing is set January 27, 1983, before the water judge.

W-3596 - Town of Center Plan of Augmentation

Decreed in 1982

W-3959 - Valley Ranches

Still pending.

W-3961, 80CW128, 81CW135, 81CW149, 81CW168
Consolidated Cases of Ted Cook

The consolidated cases of Ted Cook turned out to be a monumental undertaking. After much legal maneuvering, the hearing started March 22, 1982, and the last hearing was May 6. The trial consumed approximately 22 days of actual argument and three or four days of legal argument. The State, Rio Grande Water Users, Rio Grande Water Conservation Board and several pro se Saguache water users entered statements of opposition. With everyone's attorneys and engineers and all the supporting documents it reminded us of the Jaws II trial. The decree was entered on June 14, 1982, and the judge gave Cook a limit of 4,160 acres. He has since asked to amend his applications and no proceedings have been held to hear that question.

80CW31 - Thales Smith

This case is one in which Thales Smith is trying to split off one-half of a confined well and move it to a new quarter two and one-half miles away. A hearing has been held and a stipulated decree is now in the process.

81CW31 - Warren Shawcroft

This is our first successful case in curtailing the use of flowing artesian wells during the winter. We will be able to use this case in others to get users to valve down their large, flowing wells and prevent waste during the winter using the excuse of stock watering and icing meadows for next year.

81CW53,54 - Robert Souza, 81CW70 Alan Beard,
81CW70,71 - Ray Slane

A referee hearing has been held and a ruling made in these cases that ask for conditional water rights on denied permits. A protest has been filed as the conditional rights were denied.

81CW137 - Mushroom Farm

This case came about in a change of water right proceeding in which a pump right was bought out of a gravel pit to provide the mushroom farm and the adjoining batch plant two wells. It was a very emotional case which the State wasn't heavily involved in. An agreement was finally reached with an acre foot limitation on both the wells and the gravel pit.

81CW138 - Travelers

This case has not come to a conclusion, but could be a pivotal case in that it addresses conditional underground water rights in relation to per-

mits and their expiration dates. It should be a very worthwhile case.

81CW176 - Robert Flickenger

This is a complaint case in which Mr. Flickenger drilled a 3,000 gpm well without a permit. A plug and abandon order was issued and resisted. A hearing was held and the judge ruled that removing the pump motor was sufficient to abandon a well. We need to continue to educate the judge.

81CW197 - Draco

This case is still in the negotiation stage with Draco mining trying to formulate a plan of augmentation using Transmountain diversion water to recharge for a well to operate their cyanide heap leach extraction process.

82CW16 - Carl Weiscamp

This was a complaint case in which we finally observed this unlicensed well driller on a well. He had been drilling shallow wells without permits for some time in the Alamosa area. The judge issued a permanent injunction against him.

82CW35 - Closed Basin Landowners Association

This suit asked that the conditional decree issued in 1972 in W-3038, Closed Basin Project, be voided because of deficiencies in the application. This case will be heard as the motion to dismiss by the Rio Grande Water Conservation Board was denied.

82CW107 - NBH K. C. Land & Cattle, Western
Farms vs Rio Grande Water Conservation
District, Jeris A. Danielson and C. J.
Kuiper

This suit was brought against the District and two state engineers asking for \$40,000,000 damages for denying well permits. The District was allowed to be dismissed and counsel for NBH has withdrawn. At present the case is pending.

VIII. ORGANIZATIONS

A. Water Conservation and Water Conservancy Districts

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

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

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

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

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

B. Water Users Associations

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

Association of Senior Water Rights
Clinton Off, President
Alamosa, CO 81101

Monte Vista Water Users Association
Alan Getz, President
LaJara, CO 81140

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

IX. CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS

The year of 1982 presented many challenges to the staff of Division III. Considering all the staffing changes in the past year, the Division has weathered very well and perhaps we are about to get our feet underneath us.

It was an especially trying year, especially as far as the changeover in personnel was concerned. In the past 13 months, every position in the Alamosa office has had a change in personnel. This presents many difficulties in that it takes so long to get people oriented as to what their job is and how to do it. We do now have a core of people whom I feel will make great strides in bringing Division III operations to a level they should be. I would especially like to recognize Steve Witte's performance and abilities. A Division Engineer could not ask for a more competent, industrious, thorough, and responsible assistant who is truly interested in doing the best job possible, no matter what the assignment. His aggressive, straight forward, and indepth work style is one of Division III's greatest assets.

The inadequate allocation of permanent part-time man month's was one of our greatest problems this year. Without a larger allocation it is impossible to properly administer the streams, complete and check the diversion

records, and still provide time for commissioners to take annual leave and holiday time. Much work needs to be done in this area by the State and Division Offices.

The hydro section remains one member short at year's end and this coupled with two new men has put a severe limitation on the quantity and quality of the stream flow data.

The overall water supply for the Division was more than adequate this year, although the precipitation on the valley floor in the early part of the irrigation season was very short. The slightly below normal snowpack on the Rio Grande and the high snowpack on the Conejos made us think in quite different terms in considering the administration and likelihood of problems on the two rivers this year. The fall rains, while increasing the annual streamflows to higher than expected levels, came too late to be used effectively for irrigation this year. The 1982 diversions, recharge, and rainfall will make a considerable difference in both the surface and underground water supply available in 1983. There was much useful recharge to the groundwater system throughout the year and the entire division is fairly well saturated going into 1983. A normal snowpack should result in a good runoff and groundwater supply.

The crop production in the San Luis Valley was good

although the yields were damaged somewhat by the intense rainfall event during the late summer and fall.

The increase of center pivot sprinklers finally dropped off this year, primarily because of the rather tight permit situation. From 1974 through 1981 the average number of new sprinklers per year was 183. In 1982 only 35 sprinklers were put in.

The Rio Grande Compact was quite a challenge this year because of the unusual late year rains. The possibility of this phenomena has been feared in that it was seen as something that could not be recognized and handled early enough to prevent underdelivery on the compact. But because of the general rainfall over the valley floor, a considerable return flow pattern developed and the Compact was met easily. The undesirable approximate 17,000 a.f. overdelivery was a result of the above normal base flows and the unusual return flows during the early winter months.

One of the ways we were able to keep up with the deliveries this year was a result of the COMSAT system. This continuous monitoring system, on our isolated lower index stations, was instrumental in proper administration of both the Conejos and the Rio Grande Rivers. We only hope that the program can be continued or even expanded. The reservoirs in Division III presented several problems this year, especially with three of them undergoing

construction during the fall. But each situation was worked out satisfactorily with the exception of a small amount of work remaining on Terrace Reservoir. The storage of Compact water and exchanges in the Farmers Union, Continental, and Santa Maria Reservoirs in 1982 was a tremendous help not only to the State, but to the reservoir owners and other Rio Grande users as a whole. This is one example of the many forms of water management that can be used to conserve and effectively utilize the waters in Division III.

No let up can be seen in the court and litigation problems that we have had over the past years. More cases and more structures were filed in the Division III water court than in any year since 1972. As a result of this, our involvement in the court system is bound to increase. This is not something we are looking forward to as it is extremely time consuming and keeps us away from our administrative duties.

Our involvement in litigation is already lining up for this year (1983) with several major cases set for trial. We feel that any reasonable stipulated agreement is preferred over a lengthy court trial.

Finally, one of the sharpest thorns in our side is the inability to do a proper job, because of the severe restraints on personnel, operating and travel budgets. Without a full staff, proper vehicles, and adequate operating and travel budgets, Division III has suffered in both the

quality and quantity of all its records (streamflow, snow course, and diversion) and the inspections and investigations that badly need to be done to do our job properly. While trying to understand the State's budget crunch, it is impossible to prepare and follow through with a budget plan when the bottom line is reduced mid-year. It makes the planning for the last half of the fiscal year ludicrous. The allocation of man months in Division III was reduced mid-year because two months to be used for completion of records and emergencies by all commissioners were not assigned to an individual. This kept us from calling in the commissioners to complete and check their diversion records. Perhaps some of these problems can be solved in the future by communicating better with our administrative officers.

The limited resources and personnel in the Dam Safety Branch in the Denver office in the last two years has prompted us to use our hydrographic engineers for dam inspections on low and moderate hazard dams. This worked out very well during 1982 and enabled these staff members to begin to acquaint themselves with several structures in the Division. This work usually fits in well with hydrographic work because of the dams relatively close proximity to our gaging stations. We plan to increase both the number and complexity of their inspections

this summer. We feel this is a very worthwhile program which must be used until such time that the Dam Safety Branch is expanded and fully funded.

We would like to thank all of the Denver personnel for their support and help throughout 1982 and only wish for the good working relationship to continue.

B. RECOMMENDATIONS

The past year in Division III presented many areas that we feel need to be addressed in this portion of this report. They are as follows.

1. We recommend that everything possible be done to fill vacant positions and that the earlier recommended promotions be effected as soon as possible. Every effort should be made to upgrade our water commissioners to a level that they are entitled to. There is not one water commissioner in a higher level than W.C. C in Division III. There is no equity in this situation; when the administration on the Rio Grande and the Conejos is among the toughest in the State and both Division I and II have a relatively high number of commissioners in the Senior and Principal levels.

Also of great need is at least one more full time commissioner that can be used to complete diversion records in the fall and winter and help us with the tabulations. Our recommendation is to combine the two permanent part-time commissioners in District 21 into one position at the first opportunity. This would give us two additional man months to fill in other holes in the

Division. We feel that one full time commissioner could be more effective than two part-time employees.

Along with the preceding suggestions, a firm policy statement on permanent part-time employee annual leave and holiday comp time is urgently needed, especially as to whether it can be taken outside the allotted man-months. If it can be taken outside allotted months, then Division III needs more man-months.

2. Adequate diversion structures, measuring devices, and good channel conditions prevent confrontations among water users and officials than any other factors. An accurate record goes a long way in solving any dispute. We have statutes to address structures; but we feel, because of the extremely poor shape of many San Luis Valley streams, the State Engineer should propose legislation to provide that landowners must maintain stream channels through their property to insure adequate delivery of decreed water rights below their lands.

3. We recommend that we attempt to minimize litigation by utilizing full statutory opportunities provided in conferring with referee. This would accomplish several things --1) Reduce

expenditures for preparation of statements of opposition. 2) Allow guiding referee without interference of applicants and their attorneys. 3) Protest ruling if necessary. 4) If ruling sought is obtained and applicant protests, we can enter our appearance. 5) Eliminate the two trial situations we are now in. 6) Still allows opposing applications if complex enough to need further clarification or we are unable to handle out of the division office.

Cases which we do enter should be selectively chosen to clarify specific issues and establish precedent setting principles.

4. We recommend that public and water user education be accomplished by any means possible. This would include the formation of an advisory board in Division III made up of at least four respected water users from throughout the valley. This informal board would be used as a means to acquaint the water user public of policies and problems in administration and to bring forward ideas and proposals from the users concerning water management, schemes, and water related problems.

5. We recommend the State Engineer use his familiarity of water problems and his influence

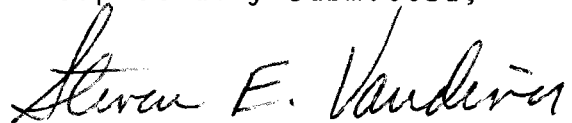
as a catalyst to promote water management programs. Because of the respect the State Engineer commands, we feel his prompting is as powerful a tool as is available.

6. We feel that Division III is a good place to try the waste statute on an applicable stream. We will, if a "clean" opportunity presents itself, pursue a waste case this year.
7. We recommend all available promotion of the COMSAT program be continued. This is the most valuable tool since the water commissioner. We would recommend that Division III obtain a remote data terminal with a printer if the program is continued. The ADM presently in the Division III office is not entirely adequate.
8. In 1983 it would prove cost effective and more expedient if Division III staff would take direct control of diversion data entry and processing, utilizing a remote terminal which accesses the Adams State College computer. Personnel savings will occur by utilizing our own staff or contract employees; however, additional equipment will be required.
9. As mentioned in the conclusions, many inspections and investigations have been delayed or not done because of inadequate funding and also

because of the shortage of personnel. Even with adequate funding, it is doubtful that all these investigations could have been done. It is our opinion that a Senior Water Resource Engineer with an expertise in groundwater be hired for the Alamosa office. This, of course, could only be done when the economy turns around, but it is something we do feel is greatly needed.

10. Also mentioned in the conclusions was the hydrographic staff being involved in dam inspections. We feel this fills a great need in light of the cutbacks in travel. We would recommend that each occasion a dam inspector is in the valley that one of our staff accompany him to provide as much on-the-job training as possible.
11. We would recommend that the midyear Division Engineer's meeting be held again this year. It proved very valuable to us and presume to the other Divisions also. We strongly suggest it become a biannual meeting.

Respectfully submitted,



Steven E. Vandiver, P.E.
Division III