

PETER FRENZEL

1963

# Surface Water Records of New Mexico



UNITED STATES DEPARTMENT OF THE INTERIOR-GEOLOGICAL SURVEY

Prepared in cooperation with the State of New Mexico  
and with other agencies

United States Department of the Interior  
Geological Survey - Water Resources Division

SURFACE WATER RECORDS  
OF NEW MEXICO

1963

Prepared in cooperation with

Office of the State Engineer  
Interstate Stream Commission  
State Department of Game and Fish  
Pecos River Commission  
State Highway Department  
Rio Grande Compact Commission  
Costilla Creek Compact Commission  
Bureau of Reclamation, U. S. Department of the Interior  
Corps of Engineers, U. S. Army  
Bureau of Indian Affairs, U. S. Department of the Interior  
Fish and Wildlife Service, U. S. Department of the Interior  
Soil Conservation Service, U. S. Department of Agriculture  
National Park Service, U. S. Department of the Interior  
Weather Bureau, U. S. Department of Commerce

Copies of this report may be obtained from  
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113 Washington Avenue  
P. O. Box 1750  
Santa Fe, N. Mex.

# CALENDAR FOR WATER YEAR 1963

## OCTOBER 1962

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

## NOVEMBER 1962

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

## DECEMBER 1962

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

## JANUARY 1963

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

## FEBRUARY 1963

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28		

## MARCH 1963

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

## APRIL 1963

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
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28	29	30				

## MAY 1963

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

## JUNE 1963

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
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23	24	25	26	27	28	29
30						

## JULY 1963

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

## AUGUST 1963

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

## SEPTEMBER 1963

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

# CONTENTS

	Page
Introduction . . . . .	1
Cooperation . . . . .	2
Definition of terms and abbreviations . . . . .	3
Downstream order and station numbers . . . . .	3
Explanation of data . . . . .	4
Accuracy of field data and computed results . . . . .	6
Supplemental data. . . . .	7
Gaging-station records . . . . .	8
Lower Mississippi River basin	
Mississippi River:	
<u>Arkansas River basin</u>	
Arkansas River:	
Cimarron River near Guy . . . . .	8
Cimarron River near Kenton, Okla. . . . .	9
Canadian River near Hebron . . . . .	10
Vermejo River near Dawson. . . . .	11
Moreno Creek (headwaters of Cimarron Creek)	
Cieneguilla Creek:	
Six Mile Creek near Eagle Nest . . . . .	12
Eagle Nest Reservoir near Eagle Nest . . . . .	13
Cimarron Creek below Eagle Nest Dam . . . . .	14
McEvoy Creek near Eagle Nest . . . . .	15
Tolby Creek near Eagle Nest . . . . .	16
Clear Creek near Ute Park . . . . .	17
Cimarron Creek near Cimarron . . . . .	18
Ponil Creek near Cimarron . . . . .	19
Rayado Creek at Sauble Ranch, near Cimarron . . . . .	20
Cimarron Creek at Springer . . . . .	21
Canadian River near Roy . . . . .	22
Rio Agua Negra (head of Mora River) near Holman . . . . .	23
Vigil Canyon near Holman. . . . .	24
Agua Fria Creek near Holman. . . . .	25
Rio de la Casa near Cleveland. . . . .	26
La Cueva Canal below la Cueva . . . . .	27
Mora River at La Cueva . . . . .	28
Cebolla River near Golondrinas . . . . .	29
Mora River near Golondrinas . . . . .	30
Coyote Creek below Black Lake . . . . .	31
Coyote Creek above Guadalupita . . . . .	32
Coyote Creek near Golondrinas . . . . .	33
Mora River near Watrous . . . . .	34
Sapello River:	
Sapello Canal at Sapello . . . . .	35
Manuelitas Creek near Rociada . . . . .	36
Sapello River at Sapello . . . . .	37
Lake Isabel feeder canal near Sapello . . . . .	38
Sapello River near Watrous . . . . .	39
Mora River near Shoemaker . . . . .	40
Canadian River near Sanchez . . . . .	41
Conchas River at Variadero . . . . .	42
Conchas Reservoir:	
Bell Ranch Canal near Conchas Dam . . . . .	43
Conchas Canal below Conchas Dam . . . . .	43
Conchas Reservoir near Conchas Dam . . . . .	44



	Page
Gaging-station records--Continued	
Lower Mississippi River basin--Continued	
Mississippi River--Continued	
Arkansas River basin--Continued	
Canadian River below Conchas Dam. . . . .	45
Ute Creek near Logan . . . . .	46
Ute Reservoir near Logan . . . . .	47
Canadian River at Logan. . . . .	48
Reuelto Creek near Logan . . . . .	49
Western Gulf of Mexico basin	
<u>Brazos River basin</u>	
Double Mountain fork Brazos River:	
Salt Fork Brazos River:	
Running Water Draw (head of White River) near Clovis . . . . .	50
<u>Rio Grande basin</u>	
Costilla Creek above Costilla Dam . . . . .	51
Casias Creek near Costilla . . . . .	52
Santistevan Creek near Costilla . . . . .	53
Costilla Lake near Costilla . . . . .	54
Costilla Creek below Costilla Dam. . . . .	54
Costilla Creek near Amalia . . . . .	55
Costilla Creek near Costilla . . . . .	56
Costilla Creek below diversion dam, at Costilla. . . . .	57
Costilla Creek at Garcia, Colo. . . . .	58
Principal diversions from Costilla Creek, New Mexico-Colorado. . . . .	59
Latir Creek near Cerro. . . . .	60
Rio Grande near Cerro . . . . .	61
Red River near Red River. . . . .	62-66
Red River below Zwergle damsite, near Red River . . . . .	67
Red River near Questa . . . . .	68
Cabresto Creek:	
Llano ditch near Questa . . . . .	69
Cabresto Creek near Questa . . . . .	70
Red River at mouth, near Questa . . . . .	71
Rio Hondo near Valdez . . . . .	72
Rio Hondo at damsite, at Valdez. . . . .	73
Rio Hondo at Arroyo Hondo . . . . .	74
Rio Grande near Arroyo Hondo. . . . .	75
Rio Pueblo de Taos near Taos . . . . .	76
Rio Lucero near Arroyo Seco. . . . .	77
Rio Fernando de Taos near Taos . . . . .	78
Rio Pueblo de Taos near Ranchito . . . . .	79
Rio Grande de Ranchos near Talpa . . . . .	80
Rio Chiquito near Talpa . . . . .	81
Rio Pueblo de Taos at Los Cordovas . . . . .	82
Rio Pueblo de Taos below Los Cordovas . . . . .	83
Rio Grande below Taos Junction Bridge, near Taos . . . . .	84
Embudo Creek at Dixon. . . . .	85
Rio Grande at Embudo. . . . .	86
San Juan lateral above San Juan Pueblo. . . . .	87
San Juan Pueblo ditch above San Juan Pueblo . . . . .	88
Guique ditch near San Juan Pueblo . . . . .	89
Rio Grande above San Juan Pueblo . . . . .	90
Rio Chama near La Puente . . . . .	91
Willow Creek above Heron Reservoir, near Park View . . . . .	92
Horse Lake Creek above Heron Reservoir, near Park View . . . . .	93
Willow Creek near Park View. . . . .	94

# CONTENTS

V

Page

Gaging-station records--Continued	
Western Gulf of Mexico basins--Continued	
Rio Grande basin--Continued	
Rio Chama below El Vado Dam . . . . .	95
Rio Chama above Abiquiu Reservoir . . . . .	96
Rio Chama below Abiquiu Dam . . . . .	97
Rio Chama near Abiquiu . . . . .	98
Rio Ojo Caliente at La Madera . . . . .	99
Hernandez ditch at Hernandez . . . . .	100
Chamita ditch near Chamita . . . . .	101
Rio Chama near Chamita . . . . .	102
Santa Cruz River at Cundiyo . . . . .	103
Rio Nambe at Nambe Falls, near Santa Fe (headwater of Pojoaque Creek, Pojoaque River) . . . . .	104
North Fork Tesuque Creek near Santa Fe (headwaters of Tesuque Creek) . . . . .	105
Middle Fork Tesuque Creek near Santa Fe . . . . .	106
South Fork Tesuque Creek near Santa Fe . . . . .	107
Little Tesuque Creek near Santa Fe . . . . .	108
Little Tesuque Creek tributary No. 2 near Santa Fe . . . . .	109
Rio Grande at Otowi Bridge, near San Ildefonso . . . . .	110
Rito de los Frijoles near Los Alamos . . . . .	111
Rito de los Frijoles in Bandelier National Monument . . . . .	112
Rio Grande at Cochiti . . . . .	113
Santa Fe River near Santa Fe . . . . .	114
Galisteo Creek at Domingo . . . . .	115
Rio Grande at San Felipe . . . . .	116
Jemez River below East Fork, near Jemez Springs . . . . .	117
Rio Guadalupe at Box Canyon, near Jemez . . . . .	118
Jemez River near Jemez . . . . .	119
Jemez River below Jemez Canyon Dam . . . . .	120
Bernalillo floodwater retarding reservoir No.1 (Piedra Lisa Arroyo) near Bernalillo . . . . .	121
Rio Grande near Bernalillo . . . . .	122
Rio Grande at Albuquerque . . . . .	123
Rio Grande near Bernardo . . . . .	124
Rio Puerco above Chico Arroyo, near Guadalupe . . . . .	125
Chico Arroyo near Guadalupe . . . . .	126
Bluewater Creek (head of Rio San Jose) below Bluewater Dam . . . . .	127
Bluewater Creek near Bluewater . . . . .	128
Bluewater Creek at Grants . . . . .	129
Grants Canyon at Grants . . . . .	130
Rio San Jose near Grants . . . . .	131
Rio San Jose at Correo . . . . .	132
Rio Puerco at Rio Puerco . . . . .	133
Rio Puerco near Bernardo . . . . .	134
Rio Salado near San Acacia . . . . .	135
Socorro main canal north at San Acacia . . . . .	136
Rio Grande at San Acacia . . . . .	137
Socorro Riverside drain:	
Socorro main canal south near San Antonio . . . . .	138
San Antonio Riverside drain near San Antonio . . . . .	138
Elmendorf interior drain near San Antonio . . . . .	139
San Antonio Riverside drain near San Marcial . . . . .	139
Rio Grande at San Marcial . . . . .	140
Alamosa River near Monticello . . . . .	141
Rio Grande below Elephant Butte Dam . . . . .	142

	Page
Gaging-station records--Continued	
Western Gulf of Mexico basins--Continued	
Rio Grande basin--Continued	
Rio Grande below Caballo Dam. . . . .	143
Las Cruces Arroyo near Las Cruces. . . . .	144
Tortugas Arroyo near Las Cruces. . . . .	144
McKelligon Canyon at El Paso, Tex. . . . .	145
Government ditch at El Paso, Tex. . . . .	145
Pecos River near Pecos. . . . .	146
Tecolote Creek near San Pablo. . . . .	147
Pecos River near Anton Chico. . . . .	148
Gallinas River near Montezuma. . . . .	149
Gallinas River at Montezuma. . . . .	150
Gallinas River near Lourdes. . . . .	151
Gallinas River near Colonias. . . . .	152
Pecos River at Santa Rosa. . . . .	153
Pecos River near Puerto de Luna. . . . .	154
Pecos River below Alamogordo Dam. . . . .	155
Fort Sumner main canal near Fort Sumner. . . . .	156
Pecos River near Acme. . . . .	157
Rio Ruidoso (head of Rio Hondo) at Hollywood. . . . .	158
Rio Hondo at Diamond A Ranch, near Roswell. . . . .	159
North Spring River at Roswell. . . . .	160
Rio Felix at old highway bridge, near Hagerman. . . . .	160
Pecos River near Lake Arthur. . . . .	161
Cottonwood Creek near Lake Arthur. . . . .	162
Pecos River near Artesia. . . . .	163
Rio Penasco at Dayton. . . . .	164
Pecos River (Kaiser Channel) near Lakewood. . . . .	165
Four Mile Draw near Lakewood. . . . .	166
Pecos River below McMillan Dam. . . . .	167
Pecos River at damsite 3, near Carlsbad. . . . .	168
Lake Avalon:	
Carlsbad main canal at head, near Carlsbad. . . . .	169
Pecos River below Avalon Dam. . . . .	169
Pecos River at Carlsbad. . . . .	170
Black River above Malaga. . . . .	171
Pecos River near Malaga. . . . .	172
Pecos River at Pierce Canyon Crossing, near Malaga. . . . .	173
Pecos River at Red Bluff. . . . .	174
Delaware River near Red Bluff. . . . .	175
Reservoirs in Rio Grande basin. . . . .	176-180
<u>Mimbres River basin</u>	
Mimbres River near Mimbres. . . . .	181
San Vicente Arroyo at Silver City. . . . .	182
<u>Tularosa Valley</u>	
Rio Tularosa near Bent. . . . .	183
Colorado River basin	
San Juan River basin	
San Juan River near Carracas, Colo. . . . .	184
Piedra River near Arboles, Colo. . . . .	185
San Juan River at Rosa. . . . .	186
Los Pinos River at La Boca, Colo. . . . .	187
Spring Creek at La Boca, Colo. . . . .	188
Navajo Reservoir near Archuleta. . . . .	189
San Juan River near Archuleta. . . . .	190

# CONTENTS

VII

Page

Gaging-station records--Continued	
Colorado River basin--Continued	
San Juan River basin--Continued	
San Juan River at Bloomfield . . . . .	191
Animas River near Cedar Hill . . . . .	192
Animas River at Farmington . . . . .	193
San Juan River at Farmington . . . . .	194
La Plata River near Farmington . . . . .	195
San Juan River at Shiprock . . . . .	196
<u>Little Colorado River basin</u>	
Largo Creek near Mangas . . . . .	197
<u>Gila River basin</u>	
Gila River near Gila . . . . .	198
Gila River near Redrock . . . . .	199
Gila River below Blue Creek, near Virden . . . . .	200
Sunset Canal near Virden . . . . .	201
New Model Canal near Virden . . . . .	202
San Francisco River near Reserve . . . . .	203
San Francisco River near Glenwood . . . . .	204
Discharge at partial-record stations and miscellaneous sites . . . . .	205
Low-flow partial-record stations . . . . .	205
Crest-stage partial-record stations . . . . .	206-214
Measurements at miscellaneous sites . . . . .	215-219
Rio Grande seepage investigation . . . . .	220-221
Pecos River seepage investigations . . . . .	222-225
Index . . . . .	226-228



## SURFACE WATER RECORDS OF NEW MEXICO, 1963

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### INTRODUCTION

The surface-water records for the 1963 water year for gaging stations, partial-record stations, and miscellaneous sites within the State of New Mexico are given in this report. For convenience there are also included records for a few pertinent gaging stations in bordering States. The records were collected and computed by the Water Resources Division of the U. S. Geological Survey, under the direction of W. L. Heckler, district engineer, Surface Water Branch.

This report is the third in a series presenting, annually, basic data on surface-water records by States. Through September 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U. S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in New Mexico were contained in Parts 7, 8, and 9 of that series.

Beginning with the 1961 water year, streamflow records and related data will be released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these basic-data reports will be limited and primarily for local needs. The records later will be published in Geological Survey water-supply papers at 5-year intervals. These 5-year water-supply papers will show daily discharge and will be compiled on the same geographical areas previously used for the annual series; however, some of the 14 parts of conterminous United States will be further subdivided.

The records for New Mexico will be published in water-supply papers covering Part 7 for stations in the Lower Mississippi River drainage, Part 8 for Western Gulf of Mexico drainage, and Part 9 for Colorado River drainage. For 1960 water year, the WSP Numbers for these parts were 1711, 1712, 1713 respectively. A compilation of records for these parts through 1950 water year is contained in WSP Nos. 1311, 1312, 1313 respectively; a 1951-60 compilation series will have WSP Nos. 1731, 1732, 1733.

## COOPERATION

The first gaging station established by the Geological Survey in the United States was on the Rio Grande at Embudo Jan. 1, 1889. Cooperation with the Territory of New Mexico began about 1907, and Territory or State cooperation in varying amounts continued until 1915, the work being directed from the Denver office. From 1916 to 1930 the State conducted its own stream-gaging program. In 1931 a new State cooperative program was begun and a Geological Survey district office established in Santa Fe. Agreements have also existed with county, municipal, and private organizations, and with other Federal agencies. Organizations that supplied data are acknowledged in station descriptions.

Organizations that assisted in collecting data through cooperative agreements with the Survey in 1963 are:

Office of the State Engineer, S. E. Reynolds  
Interstate Stream Commission, S. E. Reynolds, Secretary  
State Department of Game and Fish  
Pecos River Commission, Berkeley Johnson, Federal Representative  
and Chairman, David P. Hale, Commissioner for New Mexico, J. C. Wilson,  
Commissioner for Texas.  
State Highway Department, T. B. White, State Highway Engineer  
Rio Grande Compact Commission, Berkeley Johnson, Federal Representative and Chairman, J. E. Whitten, Commissioner for Colorado, S. E. Reynolds, Commissioner for New Mexico, L. A. Scott, Commissioner for Texas.  
Costilla Creek Compact Commission, S. E. Reynolds, Commissioner for New Mexico, J. E. Whitten, Commissioner for Colorado.

Assistance in the form of funds or services was furnished by the following Federal Agencies.

Corps of Engineers, U. S. Army in the operation of 21 gaging stations.  
Bureau of Reclamation, U. S. Department of the Interior in the operation of 23 gaging stations.  
Bureau of Indian Affairs, U. S. Department of the Interior in the operation of 4 gaging stations.  
Fish and Wildlife Service, U. S. Department of the Interior in the operation of 4 gaging stations.  
Soil Conservation Service, U. S. Department of Agriculture in the operation of 2 gaging stations.  
National Park Service, U. S. Department of the Interior in the operation of 1 gaging station.

Assistance in the form of funds or services was also given by the following organizations:

Forest Service, U. S. Department of Agriculture; Weather Bureau, U. S. Department of Commerce; the Cities of Ruidoso and Silver City; Carlsbad irrigation District; Public Service Company of New Mexico; Middle Rio Grande Conservancy District.

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

Partial-record station is a particular site where limited streamflow data are collected systematically over a period of years for use in hydrologic analyses.

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, a long reach of the channel, or an artificial structure.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Capacity, as applied to reservoirs, expresses space available for contents below a specific elevation or gage height; hence, capacity table.

The drainage area of a stream at a specified location is that area, measured in a horizontal plane, which is so enclosed by a topographic divide that direct surface runoff from precipitation normally would drain by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports, or pending reports.

#### DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indentation in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indentation shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.



As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been assigned in the same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete number for each station, such as 09-3545.00, includes the part number "9" and a six digit station number. In this report, the part number and only the essential digits of the station number are shown. For example, the complete number 09-3545.00 would appear as 9-3545, just to the left of the station name. In this report, the records are listed in downstream order by parts. All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

#### EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. Records of stage are obtained from a water-stage recorder that gives a continuous record of fluctuations or from direct readings on a non-recording gage. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge. Low-flow measurements may also be made by volumetric methods or by use of portable flumes or weirs of rated capacity.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is in effect the shifting-control method.

At some gaging stations the stage-discharge relation is affected by ice during the winter, and it becomes impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed on the basis of the gage-height record and occasional winter discharge measurements, consideration being given to the available information on temperature and precipitation, notes by gage observers and engineers, and comparable records of discharge for other stations in the same or nearby basins.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute the daily discharge. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins.

The data in this report generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the water year which begins on October 1 and ends on September 30. A calendar for the 1962 water year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U. S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height; the minimum daily discharge, and/or the minimum discharge if it is meaningful. In the first paragraph, the data given are for the complete current water year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record are given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder, a crest-stage indicator, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

Skeleton rating tables are published for all stations except those for which the daily discharge for the greater part of the open-water period was determined by the shifting-control method, the slope method, or other special methods involving an equivalent adjustment to the gage height of more than one-tenth foot. Skeleton rating tables generally are not published for canals, ditches, drains, or springs.

The daily table gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharges for several parts of a day.

In the table of daily discharge, the figures for the maximum day and the minimum day for each month are underlined. If the figure is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month. The line headed "Mean" gives the average flow in cubic feet per second during the month. Total discharge, or runoff for the month is in acre-feet.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man, unless they are meaningful. Time of day is expressed in 24-hour time, for example 12:30 a.m. is 0030, 1:30 p.m. is 1330.

Footnotes to the table of daily discharge indicate periods for which discharge was computed or estimated by unusual or special methods because of no gage-height record, ice effect, or other conditions that reduce the degree of accuracy of the records. The footnotes are either reference footnotes, with corresponding symbols used in the table of daily discharge to indicate the days included, or general footnotes, introduced by the word "Note," in which the days included are stated.

#### ACCURACY OF FIELD DATA AND COMPUTED RESULTS

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. A skeleton table of capacity at given stages is not published for reservoirs for which only monthly data are given.

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at

those stations where adjustments are made, large errors in computed runoff may occur when relatively large negative adjustments are made or when evaporation is large in comparison with the observed discharge.

#### SUPPLEMENTAL DATA

Data collected at partial-record stations and at miscellaneous sites are given at the end of each report. Data for partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in a third table.

Seepage investigations are presented following measurements at miscellaneous sites. These consist of text and tabulations summarizing data derived primarily from associated series of discharge measurements and observations made within a short time period along a given reach of channel, preferably during a period of relatively stable conditions. The objectives may vary, but usually include the study of seepage gains or losses, surface inflow, diversions (including pumps), areas of springs, water temperatures, low-flow characteristics of the area, and chemical quality (not published herein). These investigations may be repeated periodically or at random intervals for some reaches of certain channels. Indicated gains and/or losses as shown may be substantially affected by small inaccuracies of open channel measurements. Small differences between large measurements will have a lower degree of accuracy than the same differences between smaller measurements.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office. About half the gaging-station records in the state (through 1954 for Part 9, 1958 for Parts 7 and 8) have been analyzed by electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year. This information is now available in printed form under title, "Flow Characteristics of New Mexico Streams," an unnumbered special Report, from New Mexico State Engineer, Capitol Building, Santa Fe, N. Mex.

#### HYDROLOGIC CONDITIONS

Wide variations in hydrologic conditions and runoff are characteristic in the State. The year began with low ground-water tables; precipitation was generally below average except for August. During August Albuquerque had two flash floods causing damage, highways were damaged below Carlsbad, and some arroyo-type streams peaked high.

Streams in Parts 7 and 8 were at or below median (using standard period 1931-60) all months except November, March and September, with annuals grouping around 55 percent. Adjusted July flow at Otowi bridge on Rio Grande was lowest since at least 1895. Rayado Creek in upper Canadian drainage had the highest September discharge since 1913, but its annual was only 58 percent of median. Flow was near median in upper Pecos River, but had decreased to 79 percent at Santa Rosa and less than 20 percent at Carlsbad. Carlsbad Springs went dry for the first time. Animas River at Farmington dropped to 55 percent of long-term average and San Juan River at Shiprock to 50 percent. Gila River near Gila was at or above median all months except March, June, July, and its annual was 145 percent of median.

Runoff for 1963, taking the State as a whole, was only 40 to 80 percent of median, and even less with respect to long-term averages. Heavy withdrawals of stored irrigation water brought major reservoir contents well below average.

## ARKANSAS RIVER BASIN

7-1535. Cimarron River near Guy, N. Mex.

Location.--Lat 36°59'15", long 103°25'25", in SE¼ sec.21, T.32 N., R.33 E., on right bank 1.5 miles upstream from Baker dam-site, 1.7 miles northwest of Valley filling station, 12 miles north of Guy, and 27 miles northwest of Kenton, Okla.

Drainage area.--545 sq mi.

Records available.--April 1942 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 4,900 ft (from topographic map). Prior to Oct. 1, 1943, at datum 0.44 ft higher.

Average discharge.--21 years, 10.9 cfs (7,890 acre-ft per year).

Extremes.--Maximum discharge during year, 3,930 cfs Sept. 21 (gage height, 12.06 ft); no flow many days.

1942-63: Maximum discharge, 8,500 cfs Oct. 5, 1954 (gage height, 20.5 ft), from rating curve extended above 3,000 cfs on basis of velocity-area study and logarithmic plotting; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 6,500 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 22-30)

0.1	0	0.5	2.5	1.2	29	3.0	325
.2	.2	.6	4.2	1.6	62	4.0	610
.3	.6	.8	9.5	2.0	110	5.0	950
.4	1.3	1.0	18	2.5	200	5.4	1,110

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.9	1.5	1.3	2.3	1.2	0.2	0.2	2.5	0	0	2.4
2	.6	.9	1.5	1.3	2.1	1.3	.2	.2	2	0	0	.9
3	.7	.9	1.5	1.8	1.0	1.2	.2	.2	6.5	0	0	.5
4	.6	1.1	1.4	2.3	.8	1.2	.3	.1	5	0	0	.4
5	.6	1.1	1.3	1	.7	1.2	.4	.1	1	0	0	68
6	.6	1.1	1.3	.9	.7	1.4	.4	.1	1	0	0	4.2
7	.5	1.2	1.5	.8	.5	1.4	.2	.1	1	0	0	1.1
8	.5	1.2	1.5	.8	.4	1.4	.2	0	1	0	0	.6
9	.5	*1.2	1.4	.8	.4	1.4	.1	0	1	0	0	.5
10	.5	1.2	*1.7	.5	.6	1.4	.1	0	1	*19	7.1	22
11	*.5	1.2	1.8	.1	.5	*1.4	.2	0	1	30	3.9	5.4
12	.4	1.3	1.4	.1	.4	1.5	.3	0	1	12	31	.6
13	.4	1.2	1.7	.1	.3	1.8	.3	0	1	3.0	220	.4
14	.4	1.5	1.7	.4	.4	1.8	.2	*0	1	1.4	26	.5
15	.4	1.4	1.7	.4	*.7	1.4	.1	0	2	.5	5.4	56
16	.5	1.4	1.8	.5	.9	.9	.1	0	1	.3	2.1	8.8
17	.6	1	1.7	.6	.7	.5	.1	0	*.7	.1	1.2	1.2
18	.6	.5	1.8	*.6	.6	.5	.1	0	.4	.6	.8	.9
19	.7	.6	2.1	.2	.6	.7	*.1	0	.1	.5	.5	.8
20	.8	1	2.1	.2	.5	.9	.1	0	1	.1	.5	57
21	.8	1.8	1.8	.5	.5	1.0	.1	.6	0	.1	.6	1080
22	.7	1.5	1.5	.5	.4	.9	.1	2	0	0	.6	197
23	.8	1.4	.6	.2	.6	.5	.1	3.5	0	0	.9	24
24	.9	1.4	.5	.8	.8	.3	.1	3	0	29	142	7.9
25	.8	1.3	.7	.8	.9	.2	.2	2.5	0	3.4	377	4.9
26	.9	1.4	1.2	.5	.9	.2	.3	2	0	1.4	17	*3.7
27	.9	1.3	1.3	.4	1.1	.2	.2	1	0	4.9	*5.4	3.2
28	.8	1.3	1.5	.7	1.0	.2	.1	.4	0	.2	2.1	2.7
29	.9	1.4	1.5	.8	-	.2	.1	.4	0	.1	1.1	2.4
30	.9	1.7	1.5	.9	-	.2	.1	1	0	.1	6.7	2.3
31	.9	-----	1.5	1.2	-----	.2	-----	2	-----	0	2.5	-----
Total	20.3	36.4	46.0	22.0	21.3	28.6	5.3	19.4	30.3	106.7	876.9	1581.9
Mean	0.65	1.21	1.48	0.71	0.76	0.92	0.18	0.63	1.01	3.44	28.3	52.7
Ac-ft	40	72	91	44	42	57	11	38	60	212	1,740	3,140

Calendar year 1962: Max 150 Min 0 Mean 3.08 Ac-ft 2,230  
Water year 1962-63: Max 1,080 Min 0 Mean 7.66 Ac-ft 5,550

Peak discharge (base, 1,000 cfs).--Aug. 24 (2030) 1,450 cfs (6.25 ft); Sept. 21 (2020) 3,930 cfs (12.06 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-20, Dec. 23, 29-31, Jan. 5-27. No gage-height record May 15 to June 16.

## ARKANSAS RIVER BASIN

9

7-1545. Cimarron River near Kenton, Okla.

Location.--Lat 36°56', long 102°57', in SE¼ sec. 4, T.5 N., R.1 E., near right bank on downstream side of pier of highway bridge, 1.5 miles upstream from Carrizo Creek, 1.7 miles northeast of Kenton, 2.2 miles downstream from Carrizozo Creek, and at mile 594.0.

Drainage area.--1,106 sq mi, of which 68 sq mi is probably noncontributing.

Records available.--April 1904 to July 1905 (gage heights only), October 1950 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 4,267.08 ft above mean sea level, datum of 1929 (levels by State Highway Commission). April 1904 to July 1905 staff gage at site 0.9 mile upstream at different datum.

Average discharge.--13 years, 22.7 cfs (16,430 acre-ft per year).

Extremes.--Maximum discharge during year, 12,800 cfs Aug. 10 (gage height, 10.30 ft); no flow at times.

1950-63: Maximum discharge, 26,300 cfs July 6, 1958 (gage height, 13.67 ft), from rating curve extended above 6,000 cfs by logarithmic plotting; no flow at times in most years.

Remarks.--Records good below 200 cfs and fair above, except those for periods of no gage-height record or ice effect, which are poor. Diversions for irrigation of about 7,400 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Jan. 3, 4, Feb. 3-11, Feb. 17 to Mar. 4,  
Mar. 6-19, Apr. 8-11, June 16-18, Sept. 6, 9-17)

0.3	0	1.1	18
.4	.2	1.4	47
.5	1.0	1.9	117
.6	2.1	2.4	225
.7	3.5	3.3	550
.8	5.3	4.2	1,120
.9	8.0	5.4	2,280
1.0	12	7.1	4,810

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.4	0.9	2.2	3	1.8	208	0	0	0	0	236
2	0	.4	.8	2.4	3.4	1.9	55	0	.5	0	0	17
3	0	.4	.8	2.7	5.6	2.1	4.6	0	.7	0	0	5
4	0	.4	.8	2.1	4.2	1.9	2.4	0	.1	0	0	4
5	*0	.4	.7	2	3.9	1.6	2.0	0	0	0	0	106
6	0	.4	.7	2.2	2.9	1.6	1.6	*0	0	0	0	46
7	0	.6	.7	*2.4	2.8	1.6	1.3	0	0	0	0	8
8	0	.7	.7	2.4	2.7	1.6	*1.0	0	0	0	0	5
9	0	.8	.6	2.4	2.5	1.4	.8	0	0	0	0	*1.8
10	0	.8	.6	1	3.2	1.6	.9	0	0	0	2700	3.0
11	0	.8	.7	.5	*3.7	1.6	1.0	0	0	0	28	1.9
12	0	.8	.7	.4	2	1.4	.7	0	0	143	4.8	1.4
13	0	.8	*.7	}	1.6	1.4	.4	0	*0	576	2580	33
14	0	.8	.8		1.7	1.4	.4	0	0	14	1280	25
15	0	1.0	.8		2.0	1.3	.2	0	0	2	27	1.7
16	0	1.1	.8	}	1.8	1.0	.2	0	*43	.4	3	477
17	0	1.1	.8		1.8	1.0	.2	65	*23	0	2	42
18	0	1.1	1.1		1.8	*1.1	.1	9.6	182	*.8	2	7
19	*0	1.0	1.0	}	1.8	1.0	0	1	74	.4	2	4
20	0	*.9	.9		1.6	.9	0	*.7	8	.1	*1.6	*15
21	.1	.9	.9	*.4	1.8	.8	0	.4	3	0	1.2	1020
22	.1	.9	.9	}	1.8	.5	*0	.8	2	0	.8	4720
23	.3	.9	.8		1.8	.4	0	.8	1	0	.7	193
24	.3	.8	.7		1.8	.1	0	.5	.7	0	32	50
25	.2	.8	.6	.4	*1.8	.1	0	.3	.4	0	676	30
26	.4	.8	.5	}	1.8	.1	0	.3	3	0	86	23
27	.4	.8	.7		1.8	.2	0	.3	.2	0	6	15
28	.3	.8	1		1.8	.2	0	.2	.1	0	4	10
29	.3	.9	1.5	}	-	*.2	0	.4	0	0	2	9
30	.4	.9	2		.6	.4	0	.5	0	0	2	7
31	*.5	-----	2.2	1	-----	.1	-----	.3	-----	0	1	-----
Total	3.3	23.2	27.4	30.3	68.4	32.3	280.7	81.1	339.0	736.7	7442.1	7064.6
Mean	0.11	0.77	0.88	0.98	2.44	1.04	9.36	2.62	11.3	23.8	240	235
Ac-ft	6.5	46	54	60	136	64	557	161	672	1,460	14,760	14,010

Calendar year 1962: Max 515 Min 0 Mean 4.00 Ac-ft 2,900  
Water year 1962-63: Max 4,720 Min 0 Mean 44.2 Ac-ft 31,990

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-13	0500	6.24	3,480	8-13	1900	9.04	8,970
8-10	0700	10.30	12,800	9-22	1000	9.45	10,000

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Jan. 13-20, Jan. 22 to Feb. 1, Mar. 25-28, Apr. 3-7, May 19, June 20-28, July 14, 15, Aug. 16-19, 27-31, Sept. 3, 4, 7, 8, 18, 19, 24-30. Stage-discharge relation affected by ice Dec. 23-30, Jan. 1, 2, 5-12, 21, Feb. 2, 12-14, Mar. 5.

## ARKANSAS RIVER BASIN

7-1990. Canadian River near Hebron, N. Mex.

Location.--Lat 36°47'10", long 104°27'45", in Maxwell Grant, near right bank at downstream end of bridge pier on U. S. Highways 64 and 85, 3½ miles north of Hebron, 5 miles upstream from Chicorica Creek, and 8 miles south of Raton.

Drainage area.--229 sq mi.

Records available.--June 1946 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,250 ft (from topographic map). June 1, 1946, to Sept. 30, 1952, on bridge pier 150 ft upstream and Oct. 1, 1952, to July 13, 1955, on bridge pier 200 ft upstream, both at datum 1 ft higher.

Average discharge.--17 years, 5.23 cfs (3,790 acre-ft per year).

Extremes.--Maximum discharge during year, 2,360 cfs Sept. 4 (gage height, 6.40 ft), from rating curve extended above 116 cfs on basis of logarithmic plotting and shape of curves at former site 200 ft upstream; no flow for many days.

1946-63: Maximum discharge, 6,860 cfs May 19, 1955; maximum gage height, 11.6 ft Aug. 24, 1951 (backwater from temporary dam downstream); no flow at times.

Flood in 1942 reached a stage of about 26 ft, at site 150 ft upstream, datum 1 ft higher, from information by local residents.

Remarks.--Records poor. Diversions above station for irrigation of a few hundred acres. Part or all of low flow can be diverted to left bank a few hundred yards above station for stock water, off-channel storage and irrigation.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 2-26, Sept. 23)

2.0	0.0	2.5	45
2.1	.6	2.6	68
2.2	4.0	2.7	95
2.3	12	2.9	155

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.0	0	0.5	0.4	0.4	* 0.2	0.2	0.2	0.1	1.0	0	0
2	4.0	.1	.5	.3	.5	.2	.2	*.1	.1	*.0	0	0
3	4.0	.1	.5	.3	.4	.2	.2	.1	0	0	1.3	0
4	3.3	.1	.4	.3	.4	.2	.2	.1	0	0	0	1.45
5	3.0	*.1	.3	.2	.4	.2	*.2	.1	0	0	0	1.2
6	1.3	0	.3	.2	.3	.2	.2	.1	0	0	0	0
7	.2	0	.5	.2	*.3	.2	.2	.1	0	0	0	.1
8	.1	0	.3	.3	.2	.2	.2	.1	0	0	0	.3
9	0	.1	.5	.3	.3	.2	.2	0	0	0	2.2	0
10	0	.1	*.6	.1	.3	.2	.2	0	0	0	8.2	3.1
11	* 0	.1	1.0	.1	.3	.2	.2	0	0	0	.3	3.0
12	0	.5	.8	.1	.2	.2	.2	0	0	3.4	4.8	0
13	0	.6	.7	.1	.2	.2	.2	0	1.2	.1	7.0	*.3
14	0	.6	.6	.1	.3	*.2	.2	0	.3	5.2	0	7.3
15	0	.6	.5	.1	.3	.2	.2	0	.1	0	0	0
16	0	.9	.4	.1	.3	.2	.2	0	8.1	0	0	0
17	0	1.3	.4	*.1	.3	.2	.2	0	1.5	0	0	0
18	0	.9	.5	.1	.2	.2	.2	0	*.2	3.1	0	0
19	0	*.1.6	.5	.1	.2	.2	.1	0	.1	.1	0	0
20	0	*.1.3	.4	.1	.2	.2	.2	.1	0	3.9	0	5.5
21	0	.9	.3	.2	.2	.2	.1	.2	0	0	1.8	1.33
22	0	.9	.4	.2	.3	.2	.1	.2	0	0	.7	1.4
23	0	.6	.3	.1	.3	.2	*.1	.2	0	0	0	4.0
24	0	.6	.3	.2	.3	.2	.1	.1	0	0	0	a.1
25	0	.6	.2	.3	.2	.2	.1	0	0	3.5	6.5	a.5
26	0	.5	.1	.2	.2	.2	.1	0	.1	.9	1.2	a.3
27	0	.6	.2	.1	.2	.2	.1	0	0	0	.3	a.2
28	0	.5	.2	.2	.1	.2	.1	0	0	0	* 0	a.1
29	0	.5	.3	.3	.1	.2	.1	0	0	0	0	a.1
30	0	.5	.3	.3	.1	.2	.1	.6	0	0	0	a.0
31	0	-----	.4	.3	-----	.2	-----	1.0	-----	0	9.8	-----
Total	19.9	15.2	13.2	6.0	7.8	6.2	4.9	3.3	11.8	60.8	86.4	397.4
Mean	0.64	0.51	0.43	0.19	0.28	0.20	0.16	0.11	0.39	1.96	2.79	13.2
Ac-ft	39	30	26	12	15	12	9.7	6.5	23	121	171	788

Calendar year 1962: Max 173 Min 0 Mean 1.98 Ac-ft 1,430  
Water year 1962-63: Max 146 Min 0 Mean 1.73 Ac-ft 1,250

Peak discharge (base, 1,000 cfs).--Sept. 4 (1730) 2,360 cfs (6.40 ft).

\* Discharge measurement made on this day.

a No gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 17-21, Dec. 5-17, Dec. 21 to Jan. 4, Jan. 6 to Feb. 3, Feb. 10-20, Mar. 3-8.

# ARKANSAS RIVER BASIN

11

7-2030. Vermejo River near Dawson, N. Mex.

Location.--Lat 36°40'50", long 104°47'05", T.28 N., R.20 E., on left bank in Maxwell Grant, 1½ miles north of Dawson.

Drainage area.--301 sq mi.

Records available.--October 1915 to July 1918, April 1919 to May 1921, January 1927 to September 1963. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,540 ft (from topographic map). Prior to Sept. 17, 1921, staff gage and Sept. 17, 1921, to May 31, 1923, water-stage recorder, at sites 1 mile upstream at different datums. Feb. 25, 1927, to Sept. 23, 1953, water-stage recorder at several sites about three-quarters of a mile upstream at datums 8 to 12 ft higher.

Average discharge.--39 years (1915-17, 1919-20, 1927-63), 19.7 cfs (14,260 acre-ft per year).

Extremes.--Maximum discharge during year, 2,320 cfs Sept. 21 (gage height, 7.51 ft); minimum daily, 0.2 cfs Jan. 14.

1927-63: Maximum discharge, about 9,000 cfs Aug. 6, 1940 (gage height, 11.88 ft, site and datum then in use, from flood-mark in well), from rating curve extended above 360 cfs on basis of slope-area measurements of 3,250 and 5,000 cfs at later site; no flow at times.

A major flood occurred Aug. 2, 1921, when discharge probably exceeded 10,000 cfs.

Remarks.--Records good except those for periods of ice effect and doubtful gage-height record, which are fair, and those for periods of no gage-height record, which are poor. Diversions for irrigation of small acreage and mountain meadows above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	0.9	2.0	11.5	2.6	54	3.3	200
1.7	1.9	2.2	20	2.8	84	3.6	300
1.8	3.9	2.4	33	3.0	122	4.1	490

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	d 9.1	2.2	7.5	1.6	1.7	* 5.2	1.2	2.7	1.9	0.7	0.8	4.7
2	d 7.9	2.0	6.6	1.4	1.8	3.4	9.1	* 2.3	5.8	* .7	.7	1.7
3	d 7.9	1.9	5.5	1.5	1.1	4.5	4.8	2.3	3.6	.6	.6	1.4
4	d 5.5	2.0	5.2	1.8	1.0	2.9	4.2	2.0	2.3	.6	.7	8.2
5	d 5.2	* 2.4	3.1	2.2	7.9	2.7	* 3.6	2.4	2.2	.6	.6	2.5
6	d 4.5	2.9	2.7	2.0	5.2	2.0	3.1	2.4	1.9	.6	* .5	4.4
7	d 3.6	3.6	2.7	1.8	* 3.6	2.0	4.8	2.4	* 1.8	.6	.5	6.7
8	* 3.9	3.4	2.4	1.6	2.9	3.1	7.1	2.3	1.8	.6	.7	2.4
9	3.9	3.4	2.2	1.5	2.7	3.9	6.2	2.0	1.8	.6	1.4	7.4
10	3.9	3.9	2.4	2.4	3.6	5.5	3.4	2.0	1.8	.6	.9	6.8
11	3.9	3.9	* 2.2	1.0	2.0	4.8	3.1	1.9	1.9	.6	2.3	4.0
12	3.6	3.9	2.9	.7	2.2	4.2	3.6	1.8	1.8	.6	2.5	* 2.7
13	3.4	3.9	2.5	.5	1.9	4.2	3.1	1.7	1.8	.6	3.9	4.3
14	3.4	5.2	3.1	2	2.0	* 4.5	3.4	1.8	1.8	.6	4.5	4.5
15	3.6	6.6	3.9	.3	1.9	3.1	* 4.2	1.8	2.1	.6	1.4	1.5
16	3.4	6.2	5.5	.4	1.8	2.7	4.2	1.8	3.3	.6	8.0	1.6
17	3.6	7.9	5.5	* .4	2.3	3.6	4.2	1.6	3.8	.6	3.2	8.3
18	4.2	6.2	5.2	.4	2.4	4.2	4.5	1.5	* 3.7	.6	2.1	3.9
19	3.6	2.5	4.5	.3	4.5	4.8	4.5	1.5	2.9	.7	1.4	2.3
20	1.0	* 3.6	* 5.5	a .7	6.6	3.9	3.1	1.6	2.1	1.1	1.2	7.5
21	1.4	7.9	3.1	a 1.5	8.7	4.2	3.6	2.6	1.8	3.5	1.1	4.73
22	1.2	9.9	2.0	a 1.3	5.5	4.8	3.9	2.8	1.6	6.2	1.2	9.2
23	9.9	8.3	1.6	a 1.0	2.5	5.5	4.2	3.1	1.3	2.0	2.1	3.4
24	9.1	7.9	2.5	a 2	4.5	6.6	3.3	2.3	1.2	* 1.4	1.5	a 2.3
25	8.3	7.1	1.5	a 2.5	4.5	7.1	3.2	1.7	1.1	4.3	6.0	a 1.8
26	7.5	7.1	1.0	a 2.2	3.4	6.2	2.8	1.4	1.0	8.0	4.9	a 1.4
27	7.1	5.9	1.0	a 2.1	5.9	4.8	2.3	1.4	.8	2.9	a 1.6	a 1.1
28	6.6	4.8	1.0	a 3	5.2	3.4	2.6	1.4	.8	3.0	* a 9.9	a 8.3
29	6.6	4.2	1.1	a 4	-	3.6	2.8	1.7	.7	1.3	3.0	a 6.6
30	5.2	6.2	1.2	a 7	-----	7.5	2.6	2.1	.7	1.1	8.3	a 5.5
31	2.5	-----	1.3	1.0	-----	1.0	-----	2.3	-----	.9	5.1	-----
Total	186.9	146.9	98.4	59.3	149.7	138.9	127.5	62.6	61.1	57.3	453.4	1281.9
Mean	6.03	4.90	3.17	1.91	5.35	4.48	4.25	2.02	2.04	1.85	14.6	42.7
Ac-ft	371	291	195	118	297	276	253	124	121	114	899	2,540

Calendar year 1962: Max 106 Min 1.0 Mean 16.2 Ac-ft 11,740  
Water year 1962-63: Max 473 Min 0.2 Mean 7.74 Ac-ft 5,600

Peak discharge (base, 800 cfs).--Sept. 9 (1745) 820 cfs (4.79 ft); Sept. 21 (1930) 2,320 cfs (7.51 ft).

\* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

Note.--Stage-discharge relation affected by ice Nov. 17-20, 27-29, Dec. 3-17, Dec. 21 to Jan. 19, Feb. 3-19, 22, 23, 25, 26, 28, Mar. 4-9, 15-17, Apr. 2, 3.



## ARKANSAS RIVER BASIN

7-2050. Six Mile Creek near Eagle Nest, N. Mex.

Location.--Lat 36°31'10", long 105°16'15", on left upstream wingwall of concrete control, in Maxwell Grant, 600 ft downstream from highway bridge, a quarter of a mile upstream from high-water line of Eagle Nest Reservoir, and 3 miles southwest of Eagle Nest, Colfax County.

Drainage area.--11 sq mi.

Records available.--April 1928 to September 1955, July 1958 to September 1963. No winter records 1928-31, 1933-55. Prior to October 1930 monthly discharge only, published in WSP 1311. Records for December 1930 to March 1931 have been found to be unreliable and should not be used. Published as "near Therma" 1928-34.

Gage.--Water-stage recorder. Concrete control Sept. 11, 1931, to May 1933, and since Sept. 13, 1934. Datum of gage is 8,195.0 ft above mean sea level, datum of 1929. Prior to May 18, 1928, staff gage 88 ft upstream at datum 0.98 ft higher. May 18, 1928, to Sept. 11, 1938, water-stage recorder at site 88 ft upstream at datum 0.43 ft higher.

Average discharge.--6 years (1931-32, 1958-63), 2.44 cfs (1,770 acre-ft per year).

Extremes.--Maximum discharge during year, 17 cfs July 20 (gage height, 1.43 ft); maximum gage height, 2.19 ft Jan. 12 (ice backwater); minimum discharge, 0.1 cfs Dec. 31.

1930-55, 1958-63: Maximum discharge not determined, occurred Apr. 11, 1937 (discharge probably exceeded 125 cfs); maximum gage height recorded, 3.38 ft Apr. 2, 1937 (ice jam), site and datum then in use; no flow at times.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	0.2	0.9	3.2
.7	.7	1.0	5.1
.8	1.8	1.1	7.6

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.6	2.3	0.2	1.7	1.4	5.1	* 2.1	0.7	* 0.3	0.4	1.2
2	.8	.5	2.1	.6	1.8	1.4	4.1	2.3	1.0	.4	.4	1.1
3	.8	.4	2.0	1.0	1.8	1.3	3.7	2.0	.8	.6	.6	1.4
4	1.1	.4	2.2	1.5	1.9	1.3	3.7	1.9	.7	.5	.8	1.5
5	.7	.5	2.1	1.0	1.9	1.3	3.7	1.9	1.2	.8	.6	1.9
6	.5	.5	2.3	.2	1.8	1.3	3.9	2.0	1.4	.4	.4	1.5
7	.4	* .4	* 2.3	.2	1.6	1.3	4.2	2.0	1.3	.4	.4	1.8
8	.4	.4	2.5	.7	* 1.5	1.4	* 4.7	1.9	1.3	.4	* .4	1.4
9	* .4	.5	2.4	2.0	1.4	1.3	5.6	1.9	1.3	.8	* .7	1.2
10	.5	.4	2.4	* 2.3	1.3	1.4	6.1	1.6	1.3	.7	.7	* 1.2
11	.5	.4	2.3	1.8	1.2	1.4	5.6	1.6	1.2	.6	.4	1.2
12	.5	.4	2.0	1.0	1.2	1.4	5.4	1.5	.9	.6	.5	1.3
13	.5	.5	2.0	.5	1.3	1.4	4.9	1.3	* .7	.6	1.1	1.3
14	.4	.5	1.9	.6	1.4	1.4	4.7	.9	1.4	.6	.7	1.1
15	.4	.6	2.4	.7	1.5	* 1.6	5.4	* 1.3	.7	.6	.5	1.1
16	.5	.4	2.4	.8	1.5	1.6	5.4	1.4	1.2	.6	.4	1.2
17	.5	.5	2.4	.9	1.4	1.8	5.4	.8	1.3	.6	.4	1.2
18	.6	.6	2.1	1.0	1.5	1.8	5.1	.7	1.3	.7	.6	1.1
19	.8	* .6	* 2.1	1.1	1.5	1.8	4.9	.5	1.2	.5	2.3	1.1
20	.8	1.2	2.0	1.1	1.4	2.0	4.2	.5	.8	3.1	1.5	1.1
21	.8	2.5	2.1	1.2	1.4	2.8	3.7	.7	.6	.9	1.0	1.9
22	.7	2.2	2.3	1.3	1.4	4.2	* 3.3	.8	.7	* .6	1.0	1.4
23	.7	2.1	2.5	1.4	1.4	6.1	2.8	.7	.7	.4	1.0	1.3
24	.6	2.1	2.3	1.5	1.4	5.8	2.5	.6	.6	.4	1.1	1.1
25	.9	2.1	2.0	1.6	1.4	4.9	2.3	.6	.9	.5	1.2	.6
26	.7	2.1	1.5	1.7	1.4	* 5.4	2.3	.6	.6	.4	1.3	.9
27	.6	2.1	1.0	1.8	* 1.4	4.7	2.3	.6	.6	.8	1.1	.7
28	.6	2.3	.5	1.8	1.4	4.9	1.9	.6	.6	.6	1.2	.4
29	.6	2.2	.3	* 1.8	-	5.6	2.0	.7	.3	.6	1.4	.4
30	.6	2.1	.3	1.8	-----	5.1	2.0	.8	.3	.6	1.5	.9
31	.6	-----	.3	1.7	-----	5.4	-----	.6	-----	.6	1.3	-----
Total	19.2	32.1	59.3	36.8	41.8	84.5	120.9	37.4	27.6	20.2	26.9	35.5
Mean	0.62	1.07	1.91	1.19	1.49	2.73	4.03	1.21	0.92	0.65	0.87	1.18
Ac-ft	38	64	118	73	83	168	240	74	55	40	53	70

Calendar year 1962: Max 38 Min 0.2 Mean 3.53 Ac-ft 2,550  
 Water year 1962-63: Max 6.1 Min 0.2 Mean 1.49 Ac-ft 1,080

Peak discharge (base, 15 cfs).--July 20 (1500) 17 cfs (1.43 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 16-25, 27-29, Dec. 3-11, 16, 17, Dec. 20 to Feb. 7 (no gage-height record Jan. 12-29), Feb. 11-15, Mar. 4, 5, Apr. 3.

## 7-2055. Eagle Nest Reservoir near Eagle Nest, N. Mex.

Location.--Lat 36°32'05", long 105°14'00", about sec. 26, T.27 N., R.16 E. (projected), in Maxwell Grant; at upstream face of Eagle Nest Dam on Cimarron Creek, 2 miles southeast of Eagle Nest and 6½ miles west of Ute Park.

Drainage area.--167 sq mi.

Records available.--December 1927 to December 1944 (month-end contents only, published in WSP 1311), May 1950 to September 1963.

Gage.--Wire-weight gage since May 1950 read 1 to 4 times a month (at random intervals). Datum of gage is at mean sea level, datum of 1929. Prior to 1950, nonrecording gage (type unknown) at same site and datum.

Extremes.--Maximum contents observed during year, 32,030 acre-ft Apr. 9, 16 (elevation, 8,112.30 ft); minimum determined, 19,550 acre-ft Sept. 30 (elevation, 8,101.80 ft).  
1927-44, 1950-63: Maximum contents observed, 78,800 acre-ft May 31, 1942 (elevation, 8,136.9 ft); minimum observed, 635 acre-ft Dec. 14, 1954 (elevation, 8,061.33 ft).

Remarks.--Reservoir is formed by concrete dam with spillway cut in natural rock; completed June 30, 1918; storage began in June 1917. Capacity, 79,120 acre-ft between elevations 8,035.0 (sill of outlet gate) and 8,137.0 ft (crest of ungated spillway). Dead storage negligible. Records given herein represent usable contents. Water released is used for irrigation. Lake is recreational area. Diversions for irrigation of about 2,500 acres above reservoir.

Cooperation.--Elevation readings furnished by employee of Springer Land and Cattle Co. or by Cimarron Creek watermaster.

Month-end elevation and contents, water year October 1962 to September 1963

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	-	a29,300	-
Oct. 31 . . . . .	-	a28,120	-1,180
Nov. 30 . . . . .	-	a28,060	-60
Dec. 31 . . . . .	-	a28,380	+320
Calendar year 1962 . . . . .	-	-	+6,280
Jan. 31 . . . . .	-	a28,770	+390
Feb. 28 . . . . .	-	a29,430	+660
Mar. 31 . . . . .	-	a31,470	+2,040
Apr. 30 . . . . .	8,111.15	30,440	-1,030
May 31 . . . . .	-	a24,320	-6,120
June 30 . . . . .	-	a22,100	-2,220
July 31 . . . . .	-	a20,640	-1,460
Aug. 31 . . . . .	-	a19,740	-900
Sept. 30 . . . . .	-	a19,550	-190
Water year 1962-63 . . . . .	-	-	-9,750

a No gage-height record; contents estimated or interpolated from a total of 44 observations during the year and outflow records (Cimarron Creek below Eagle Nest Dam, see following page).

## ARKANSAS RIVER BASIN

7-2060. Cimarron Creek below Eagle Nest Dam, N. Mex.

Location.--Lat 36°32'05", long 105°13'55", about sec.28, T.27 N., R.16 E. (projected), in Maxwell Grant on left bank 300 ft downstream from Eagle Nest Dam, 2 miles southeast of Eagle Nest, and 6¼ miles west of Ute Park.

Drainage area.--167 sq mi.

Records available.--May 1950 to September 1963. Prior to October 1962, published as Cimarron River below Eagle Nest Dam.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,000 ft (from topographic map). Prior to May 15, 1951, at datum 0.81 ft higher.

Average discharge.--13 years, 12.9 cfs (9,340 acre-ft per year).

Extremes.--Maximum discharge during year, 190 cfs May 13 (gage height, 2.61 ft); no flow at times.  
1950-63: Maximum discharge, 205 cfs June 14, 1955 (gage height, 2.79 ft); no flow at times.

Remarks.--Records good. Flow regulated by Eagle Nest Reservoir (see preceding page). Diversions for irrigation of about 2,500 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.05	0.0	0.4	9.1	1.5	75	2.5	171
.1	.9	.7	22	2.0	119	2.7	193
.2	3.0	1.0	39				

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	10				0	2.8	* 36	17	21	33	1.7
2	21	5.4				0	2.8	36	43	* 21	33	1.7
3	21	5.4				0	2.1	36	57	13	17	1.9
4	21	6.9				0	.9	9.9	57	24	28	2.1
5	21	9.5				0	.9	36	56	29	33	1.9
6	21	* 9.5				0	.7	49	56	16	33	1.9
7	21	9.8				0	7.7	50	55	32	33	1.9
8	* 21	9.8				0	13	50	15	38	* 31	1.9
9	21	6.3				0	14	50	42	38	28	1.9
10	19	4.3				0	14	49	58	38	13	5.9
11	19	4.0				0	15	26	56	38	18	* 1.7
12	18	4.0				0	15	54	56	38	21	1.7
13	16	3.8				0	5.5	149	56	18	16	1.7
14	16	2.7				0	12	187	* 56	29	1.9	1.7
15	17	0				0	22	187	15	36	13	1.7
16	17	0				0	29	187	28	32	18	1.7
17	17	0				0	30	187	41	31	18	1.7
18	25	0				0	30	187	41	31	29	1.7
19	29	0				0	30	187	30	31	34	1.6
20	29	0				0	12	187	25	9.9	31	1.6
21	29	0				0	38	187	24	22	29	1.6
22	18	0				0	* 58	187	17	29	29	1.6
23	11	0				0	59	* 187	23	* 29	24	9.0
24	12	0				0	62	186	26	29	5.1	9.4
25	12	0				0	62	105	23	29	12	1.6
26	12	0				4.3	48	49	22	29	14	1.6
27	12	0				3.0	37	62	22	17	12	1.6
28	12	0				3.0	43	62	22	24	10	1.5
29	12	0			-	3.0	46	62	13	33	10	1.6
30	13	0				3.0	41	62	19	33	9.8	1.6
31	12					3.0		62		33	4.2	
Total	566	91.4	0	0	0	19.3	753.4	3,150.9	1,071	870.9	641.0	336.2
Mean	18.3	3.05	0	0	0	0.62	25.1	102	35.7	28.1	20.7	11.2
Ac-ft	1,120	181	0	0	0	38	1,490	6,250	2,120	1,730	1,270	667
Calendar year 1962:	Max	97	Min	0	Mean	14.4	Ac-ft	10,460				
Water year 1962-63:	Max	187	Min	0	Mean	20.5	Ac-ft	14,870				

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 15 to Mar. 24 (flow was probably less than 0.1 cfs).

# ARKANSAS RIVER BASIN

15

7-2062. McEvoy Creek near Eagle Nest, N. Mex.

Location.--Lat 36°33'00", long 105°13'30", in Maxwell Grant, on left bank 1.4 miles north of Eagle Nest Dam, and 2 miles east of Eagle Nest, Colfax County.

Drainage area.--1.95 sq mi.

Records available.--September 1961 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 8,600 ft (from topographic map).

Extremes.--Maximum discharge during year, 0.71 cfs Aug. 17 (gage height, 0.60 ft); minimum, 0.03 cfs July 23.

1962-63: Maximum discharge 1.37 cfs Apr. 30, 1962 (gage height, 0.82 ft); minimum, 0.003 cfs Nov. 3, 1962, result of freezeup.

Remarks.--Records good.

Rating table, (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.05	0.4	0.26
.3	.13	.5	.46

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.18	0.19	0.23	0.11	0.18	0.19	0.33	*0.20	0.14	*0.07	0.07	0.13
2	.18	.19	.22	.11	.19	.18	.31	.19	.16	.08	.07	.13
3	.18	.19	.20	.10	.19	.19	.26	.18	.13	.08	.12	.12
4	.16	.19	.18	.09	.19	.18	.33	.18	.13	.10	.11	.14
5	.16	.19	.15	.10	.19	.18	.31	.18	.12	.11	.08	.16
6	.16	.19	.15	.12	.19	.18	.30	.18	.12	.11	.08	.14
7	.18	*.17	*.19	.13	.19	.19	.31	.18	.11	.11	.08	.14
8	.18	.15	.22	.14	*.20	*.19	*.30	.16	.13	.14	*.09	.12
9	.18	.17	.19	.14	.20	.19	.26	.16	.12	.11	.21	.13
10	*.16	.19	.15	*.14	.20	.19	.26	.16	.11	.11	.19	*.14
11	.16	.19	.15	.13	.19	.19	.26	.16	.11	.10	.14	.13
12	.16	.16	.18	.13	.19	.19	.25	.16	.11	.09	.16	.14
13	.16	.16	.20	.14	.18	.19	.25	.16	*.12	.09	.15	.13
14	.16	.22	.20	.14	.19	.20	.26	.14	.11	.08	.16	.14
15	.16	.22	.19	.13	.19	.22	.25	*.14	.10	.08	.16	.14
16	.18	.20	.20	.13	.18	.22	.25	.13	.15	.08	.13	.13
17	.18	.13	.20	.13	.18	.23	.23	.13	.14	.08	.29	.12
18	*.18	.23	.18	.13	.18	.22	.22	.14	.14	.08	.24	.12
19	.18	*.14	*.14	.13	.18	.22	.19	.14	.15	.08	.22	.11
20	.18	.23	.15	.13	.18	.26	.22	.15	.14	.11	.19	.16
21	.18	.25	.15	.14	.18	.30	.22	.15	.12	.09	.18	.26
22	.16	.23	.14	.14	.18	.31	*.20	.14	.11	*.07	.16	.16
23	.16	.22	.16	.14	.18	.33	.18	.14	.11	.07	.16	.15
24	.16	.22	.20	.14	.18	.33	.19	.13	.10	.08	.17	.15
25	.16	.22	.20	.14	.18	.33	.19	.14	.10	.08	.16	.14
26	.16	.22	.16	.15	.18	.33	.19	.13	.08	.08	.15	.13
27	.18	.19	.14	.15	*.18	.33	.20	.14	.08	.08	.14	.13
28	.18	.18	.13	.15	.18	.33	.20	.13	.07	.08	.14	.14
29	.19	.19	.11	*.15	-	.31	.19	.13	.07	.07	.17	.14
30	.19	.23	.11	.15	-----	.31	.20	.13	.07	.07	.16	.13
31	.19	-----	.11	.16	-----	.33	-----	.13	-----	.07	.15	-----
Total	5.33	5.85	5.28	4.11	5.20	7.54	7.31	4.71	3.45	2.73	4.68	4.20
Mean	0.172	0.195	0.170	0.133	0.186	0.243	0.244	0.152	0.115	0.088	0.151	0.140
Ac-ft	11	12	10	8.2	10	15	14	9.3	6.8	5.4	9.3	8.3

Calendar year 1962†: Max 1.32 Min 0.09 Mean 0.283 Ac-ft 204  
Water year 1962-63: Max 0.33 Min 0.07 Mean 0.165 Ac-ft 119

\* Discharge measurement made on this day.

1962† Calendar-year figures reflect revisions of August and September 1962. These revisions are available in District office and will be published in WSP for 1965.

## ARKANSAS RIVER BASIN

7-2063. Tolby Creek near Eagle Nest, N. Mex.

Location.--Lat 36°31'20", long 105°13'30", on right bank in Maxwell Grant, 1 mile upstream from mouth and 2.5 miles southeast of Eagle Nest, Colfax County.

Drainage area.--8.5 sq mi.

Records available.--October 1961 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 8,400 ft (from topographic map).

Extremes.--Maximum discharge during year, 7.51 cfs Mar. 30 (gage height, 1.18 ft); minimum, 0.15 cfs Dec. 5. 1962-63: Maximum discharge, 27.3 cfs Apr. 20, 1962 (gage height, 2.04 ft); minimum, that of Dec. 5, 1962.

Remarks.--Records good except those for period of doubtful gage-height record, which are fair, and those for period of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.22	0.7	1.95
.4	.46	.8	2.76
.5	.82	.9	3.73
.6	1.31	1.1	6.27

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.91	0.82	0.96	0.56	0.86	0.82	4.90	1.49	0.75	0.36	0.39	0.87
2	.91	.82	.91	.56	.96	.82	4.06	* 1.43	.8	* .40	.36	.78
3	.91	.82	.84	.59	.91	.82	3.52	1.37	.7	.47	.59	.94
4	.86	.82	.76	.74	.91	.82	3.52	1.31	.7	.47	1.10	1.30
5	.86	.82	.74	.78	.96	.78	3.32	1.26	.7	.67	.56	1.47
6	.86	*.82	.76	.74	.91	.78	3.42	1.26	.7	.72	.49	1.46
7	.86	.74	*.82	.70	.86	.78	4.06	1.15	.65	.66	.46	1.40
8	.86	.72	.82	.62	*.86	.78	* 4.53	1.10	.7	.72	*.56	1.20
9	.82	.87	.78	.59	.86	.78	4.65	1.05	.65	.66	1.12	1.26
10	*.82	.82	.74	*.59	.86	.82	4.53	1.05	.6	.56	1.65	1.28
11	.86	.82	.74	.70	.86	.82	4.06	1.00	.6	.50	.83	* 1.07
12	.86	.64	.74	.74	.91	.82	3.73	.91	.6	.47	.73	.97
13	.86	.89	.70	.74	.91	.82	3.52	.86	*.62	.46	.70	.89
14	.86	.91	.70	.74	.91	.82	3.42	.86	.70	.46	.70	.85
15	.86	1.00	.66	.74	.86	*.91	3.32	*.86	.55	.43	.81	.81
16	.86	.91	.74	.74	.86	.96	3.03	.86	.66	.38	.71	.77
17	.96	.82	.78	.78	.86	.96	2.76	.86	.75	.41	.81	.73
18	.96	1.00	.82	.78	.86	.96	2.58	.82	.72	.40	.92	.69
19	1.05	*.86	*.86	.78	.86	.96	2.41	.86	.72	.39	.98	.66
20	.96	.91	.78	.78	.86	1.10	2.25	.91	.73	.91	.97	.91
21	.91	.96	.70	.78	.86	1.37	2.10	1.10	.60	.68	1.19	4.69
22	.86	.96	.62	.78	.82	1.68	* 1.95	.96	.52	*.45	1.08	2.77
23	.86	.96	.59	.78	.82	2.25	1.88	.91	.47	.40	.84	2.31
24	.86	.96	.66	.82	.82	2.67	1.81	.86	.44	.39	.84	1.90
25	.86	.96	.74	.82	.78	2.94	1.74	.78	.43	.43	1.74	1.59
26	.86	.96	.70	.78	.78	3.32	1.74	.8	.41	.49	1.73	1.40
27	.86	.85	.66	.78	*.78	3.73	1.74	.8	.40	.54	1.21	1.22
28	.86	.75	.66	.78	.82	3.84	1.61	.7	.39	.47	1.08	1.12
29	.82	.85	.62	*.78	-	4.18	1.55	.7	.36	.47	1.11	1.05
30	.82	.91	.62	.82	-----	4.53	1.49	.7	.35	.40	1.21	.99
31	.82	-----	.62	.86	-----	5.03	-----	.7	-----	.37	1.02	-----
Total	27.15	25.95	22.84	22.77	24.18	52.67	89.20	30.28	17.97	15.59	28.49	39.35
Mean	0.876	0.865	0.737	0.735	0.864	1.70	2.97	0.977	0.599	0.503	0.919	1.31
Ac-ft	54	51	45	45	48	104	177	60	36	31	57	78

Calendar year 1962: Max 24.5 Min 0.59 Mean 2.50 Ac-ft 1810  
 Water year 1962-63: Max 4.90 Min 0.35 Mean 1.09 Ac-ft 786

Peak discharge (base, ) --Mar. 30 (2100) 7.51 cfs (1.18 ft).

\* Discharge measurement made on this day.

Note.--No gage-height record May 26 to June 12; discharge estimated on basis of record for station on McEvoy Creek. Doubtful gage-height record May 15-25.

## ARKANSAS RIVER BASIN

17

7-2064. Clear Creek near Ute Park, N. Mex.

Location.--Lat 36°31'35", long 105°10'30", on right bank in Maxwell Grant, a quarter of a mile upstream from mouth, and 4 miles southwest of Ute Park, Colfax County.

Drainage area.--7.44 sq mi.

Records available.--September 1961 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 7,860 ft (from topographic map).

Extremes.--Maximum discharge during year, 9.79 cfs Sept. 21 (gage height, 1.29 ft); minimum, 0.09 cfs Dec. 5.  
1962-63: Maximum discharge, 28.3 cfs May 13, 1962 (gage height, 1.90 ft); minimum, that of Dec. 5, 1962.

Remarks.--Records good except those for periods of no gage-height record, which are fair.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

0.2	0.07	0.6	1.30
.3	.21	.7	1.95
.4	.44	.9	3.79
.5	.80	1.1	6.43

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.51	0.48	0.42	0.25	0.34	0.34	1.54	*1.03	1.40	0.38	0.19	0.93
2	.54	.48	.39	.23	.39	.34	1.36	.98	1.53	*.37	.18	.89
3	.54	.48	.39	.25	.36	.34	1.08	.98	1.20	.32	.43	.98
4	.51	.48	.31	.29	.36	.34	1.08	1.03	1.10	.49	.69	1.19
5	.51	.48	.39	.31	.36	.31	1.03	1.13	1.02	.45	.31	1.30
6	.48	*.42	.36	.34	.36	.31	1.03	1.19	.95	.39	*.26	1.13
7	.51	.42	*.34	.31	.34	.31	1.24	1.19	.89	.35	.25	1.13
8	.48	.38	.36	.29	*.31	*.29	1.48	1.24	.95	.63	.33	1.08
9	.48	.39	.31	.25	.34	.29	*1.54	1.41	.88	.46	.56	1.13
10	*.44	.39	.27	*.31	.36	.31	1.42	1.47	.79	.53	1.02	*1.13
11	.44	.36	.27	a.32	.39	.31	1.24	1.53	.75	.42	.55	1.12
12	.42	.34	.29	a.32	.36	.34	1.19	1.59	.71	.37	.47	1.10
13	.44	.38	.29	a.31	.36	.34	1.19	1.69	*.75	.35	.45	1.09
14	.42	.39	.29	a.31	.36	.34	1.24	1.78	.69	.32	.60	1.07
15	.42	.42	.31	a.31	.34	.39	1.30	*1.89	.63	.28	.92	1.04
16	.44	.42	.31	a.31	.34	.39	1.30	1.98	.78	.25	.76	.97
17	.54	.36	.34	a.32	.34	.42	1.30	2.04	.77	.25	.57	.92
18	.51	.44	.36	a.32	.34	.42	1.30	2.03	.72	.23	.74	.87
19	.61	*.39	*.34	a.32	.31	.39	1.30	1.99	a.70	.22	.84	.83
20	.54	.44	.31	a.32	.34	.44	1.24	2.01	.68	.29	.84	1.76
21	.54	.44	.29	a.32	*.34	.54	1.24	2.08	.61	.27	.76	5.47
22	*.51	.44	.25	a.32	.34	.64	*1.19	1.97	.52	.23	.68	3.18
23	.51	.42	.23	a.32	.34	.84	1.13	1.91	.51	*.21	.68	2.56
24	.51	.42	.25	a.33	.34	.89	1.08	1.82	.49	.27	.76	2.59
25	.51	.42	.29	a.33	.34	.89	1.03	1.74	.48	.27	1.09	3.12
26	.48	.42	.29	a.32	.34	*.93	1.08	1.67	.45	.29	1.08	3.78
27	.48	.39	.27	a.31	.34	1.13	1.08	1.64	.43	.28	.98	4.06
28	.48	.34	.27	a.31	.34	1.19	1.03	1.54	.41	.27	.98	3.91
29	.48	.36	.27	*.31	-	1.48	1.03	1.52	.38	.23	1.13	3.68
30	.51	.42	.25	.31	-	1.48	1.03	1.51	.37	.19	1.19	3.37
31	.48	-	.27	.34	-	1.54	-	1.39	-	.21	1.03	-
Total	15.27	12.41	9.58	9.51	9.72	18.51	36.32	48.97	22.54	10.07	21.32	57.38
Mean	0.493	0.414	0.309	0.307	0.347	0.597	1.21	1.58	0.751	0.325	0.688	1.91
Ac-ft	30	25	19	19	19	37	72	97	45	20	42	114

Calendar year 1962: Max 27.9 Min 0.23 Mean 2.89 Ac-ft 2,090  
Water year 1962-63: Max 5.47 Min 0.18 Mean 0.744 Ac-ft 539

Peak discharge (base, )--Sept. 21 (0100) 9.79 cfs (1.29 ft).

\* Discharge measurement made on this day.

a No gage-height record.

## ARKANSAS RIVER BASIN

7-2070. Cimarron Creek near Cimarron, N. Mex.

Location.--Lat 36°31'00", long 104°58'35", about sec.6, T.26 N., R.19 E. (projected), in Maxwell Grant, on right bank 3.8 miles west of Cimarron.

Drainage area.--294 sq mi.

Records available.--May 1950 to September 1963. Prior to October 1952, published as Cimarron River near Cimarron.

Gage.--Water-stage recorder. Datum of gage is 6,599.58 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 20.2 cfs (14,620 acre-ft per year).

Extremes.--Maximum discharge during year, 510 cfs Sept. 21 (gage height, 2.93 ft); minimum daily, 1.0 cfs Jan. 11.  
1950-63: Maximum discharge, 580 cfs June 6, 1958 (gage height, 3.10 ft); no flow Sept. 14-30, Oct. 1-10, 1956, Feb. 18, 1960.

Remarks.--Records good except those for periods of ice or no gage-height record, which are poor. Flow regulated by Eagle Nest Reservoir (capacity, 79,120 acre-ft). Diversions above station for irrigation of about 3,500 acres, part of which is below station. Cimarroncito ditch (locally known as Philmont ditch) diverts from left bank 1½ miles above station, flumes under creek ¾ mile above and bypasses station for off-channel storage and irrigation below. See table below for diversion by this ditch.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.4	2.6	0.9	23
.5	3.9	1.3	61
.6	6.0	1.7	122
.7	10	2.1	211

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	29	13	4.3	4.1	3.2	4.5	11	46	46	* 15	25	7.2
2	30	12	4.5	4.0	3.1	4.3	11	* 44	22	14	25	4.7
3	30	9.6	4.3	3.9	2.5	4.7	9.2	43	52	13	24	4.1
4	25	8.8	4.0	3.9	2.8	4.5	10	36	52	8.4	17	6.2
5	23	* 9.6	3.9	3.7	3.0	4.3	* 8.8	23	51	19	28	5.0
6	23	12	4.5	4.0	3.0	4.7	8.4	48	50	18	* 29	5.5
7	24	12	4.3	4.5	* 3.0	4.7	8.0	50	50	12	29	4.3
8	* 23	12	4.1	5.0	3.0	* 5.0	13	51	39	27	29	3.8
9	23	12	4.2	4.5	3.5	4.5	17	52	17	32	25	3.5
10	22	9.2	4.3	3.0	6.0	5.0	21	52	50	32	24	3.5
11	21	8.0	* 3.9	1.0	4.0	4.5	22	45	49	34	11	* 13
12	21	8.0	3.8	2.0	3.5	4.5	22	36	49	33	19	14
13	19	7.6	4.0	2.5	3.7	4.3	22	83	50	28	39	20
14	18	6.8	4.0	2.5	3.7	4.1	14	164	* 51	14	19	16
15	18	6.8	3.8	* 3.0	3.8	4.5	* 24	* 177	39	30	8.8	15
16	18	6.0	3.8	3.0	4.0	4.7	32	173	15	30	17	15
17	19	5.8	3.9	3.0	3.9	4.7	35	184	40	27	19	15
18	22	5.6	3.9	3.5	3.7	5.0	36	186	41	27	30	15
19	34	* 5.2	3.8	2.5	4.3	4.1	36	186	37	26	35	15
20	36	6.0	* 3.8	2.7	4.5	4.7	34	188	29	24	35	110
21	36	6.2	3.5	3.5	* 3.6	5.0	21	188	25	8.8	31	97
22	36	6.0	3.9	3.5	4.3	5.0	56	188	21	23	31	29
23	17	5.5	3.2	3.0	4.3	5.0	62	* 184	15	* 22	30	25
24	16	5.0	3.5	3.5	4.7	5.0	69	182	21	22	20	24
25	15	5.1	3.0	3.5	5.0	5.2	69	163	21	24	12	22
26	14	5.2	2.0	3.5	4.3	5.4	66	44	17	23	22	22
27	14	5.0	3.2	2.5	4.5	7.6	50	62	16	19	17	21
28	14	4.5	4.0	2.7	4.7	8.4	48	61	16	9.6	* 14	21
29	14	4.1	4.0	2.8	-	9.2	52	60	14	24	15	21
30	14	4.2	4.2	3.0	-----	10	52	62	8.0	24	15	21
31	14	-----	4.2	3.1	-----	10	-----	60	-----	24	12	-----
Total	682	226.8	119.8	100.9	107.6	167.1	939.4	3121	1003.0	686.8	706.8	598.8
Mean	22.0	7.56	3.86	3.25	3.84	5.39	31.3	101	33.4	22.2	22.8	20.0
Ac-ft	1,350	450	238	200	213	331	1,860	6,190	1,990	1,360	1,400	1,190
(†)	0	0	0	0	0	0	0	149	297	307	139	0

Calendar year 1962: Max 136 Min 2.0 Mean 26.2 Ac-ft 18,960  
Water year 1962-63: Max 188 Min 1.0 Mean 23.2 Ac-ft 16,770

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17 to Dec. 16 (no gage-height record Nov. 21-28, Nov. 30 to Dec. 4), Dec. 21 to Mar. 19 (no gage-height record Jan. 13 to Feb. 6).

† Diversion, in acre-feet, by Cimarroncito ditch which bypasses station.

# ARKANSAS RIVER BASIN

19

7-2075. Ponil Creek near Cimarron, N. Mex.

Location.--Lat 36°34'35", long 104°56'55", about sec.8, T.27 N., R.19 E. (projected), on left bank 1½ miles downstream from confluence of Middle and North Ponil Creeks and 5 miles northwest of Cimarron.

Drainage area.--171 sq mi.

Records available.--November 1915 to June 1919, August 1919 to July 1925, September 1925, September 1927 to July 1929, May 1950 to September 1963. Prior to May 1950 monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,870 ft (from topographic map). Prior to May 8, 1922, at site about an eighth of a mile downstream at different datum. May 8, 1922, to Aug. 8, 1929, at site about three-eighths of a mile upstream at different datum.

Average discharge.--24 years (1915-25, 1927-28, 1950-63), 12.9 cfs (9,340 acre-ft per year).

Extremes.--Maximum discharge during year, 498 cfs Sept. 20 (gage height, 4.25 ft), from rating curve extended above 150 cfs on basis of slope-area measurements at gage heights, 4.55, 5.80, and 7.15 ft; no flow for many days.

1915-29, 1950-63: Maximum discharge, about 5,200 cfs (estimate by State engineer) Aug. 8, 1929, when gage was washed out; no flow at times.

Flood in September 1948 reached a stage of about 7 ft, from floodmarks (discharge, about 1,900 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of 200 to 300 acres above station. Diversions 1,000 ft below station for irrigation of about 300 acres (about 1,200 acres total irrigated from Ponil Creek).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	0.02	0.8	0.8	1.0	3.5	1.4	13.5	1.8	38
.7	.2	.9	2.0	1.2	7.5	1.6	24	2.0	54

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	1.3	1.9	1.3	1.6	2.2	6.5	1.9	0.7	0	0	4.6
2	1.0	1.4	1.9	1.2	1.4	2.0	6.3	* 1.9	1.0	* 0	0	2.3
3	1.2	1.4	1.8	1.3	9	2.2	4.9	1.8	4	0	2	1.6
4	1.0	1.5	1.8	1.4	1.2	2.0	5.1	1.6	3	0	2	2.5
5	.8	* 1.5	1.8	1.4	1.2	2.0	* 4.9	1.6	2	.6	0	2.2
6	.8	1.4	1.9	1.5	1.3	2.0	4.5	1.8	.2	.2	0	3.5
7	.7	1.4	1.9	1.5	* 1.4	2.2	4.3	1.5	* 1	.1	0	1.2
8	* .8	1.3	1.8	1.6	1.5	* 2.4	4.7	1.3	.2	.1	0	7.3
9	.8	1.3	1.5	1.7	1.6	2.0	4.7	1.2	.2	.1	.6	5.1
10	.7	1.3	1.6	1.5	2.5	2.0	4.7	1.2	1	.1	.4	3.9
11	.7	1.3	* 1.5	1.0	1.8	2.0	4.3	1.0	.1	.1	.2	* 4.8
12	.6	1.3	1.5	4	1.4	2.0	3.9	.8	.1	.1	1.1	3.2
13	.6	1.4	2.0	.5	1.5	2.0	3.7	.7	.1	.1	4.1	3.2
14	.6	1.5	2.0	.7	1.6	1.9	3.7	.6	.1	0	4.5	2.9
15	.7	1.6	2.0	* .8	1.7	1.9	* 3.7	.6	.1	0	.9	2.6
16	.8	1.8	2.0	1.0	1.7	1.9	3.5	.5	.4	0	* .5	2.4
17	.9	2.0	1.8	1.2	1.8	1.9	3.4	.4	.3	0	.5	1.8
18	1.0	1.7	1.8	1.2	2.1	2.0	3.2	.4	.2	0	1.0	1.4
19	1.0	1.5	1.8	.8	2.5	1.9	3.2	.4	.2	0	1.2	1.2
20	1.2	* 1.9	* 1.6	.8	2.9	1.9	2.9	.5	.2	0	.5	4.1
21	1.2	2.0	1.5	1.0	* 2.4	2.3	2.8	.6	.1	0	.4	3.9
22	1.0	2.0	1.4	1.2	2.2	2.8	2.6	1.0	.1	0	.3	5.7
23	1.0	1.9	1.3	1.0	2.3	3.2	2.6	1.2	0	0	.3	3.7
24	1.2	1.9	1.3	1.2	2.4	3.5	2.3	.9	0	0	.3	2.6
25	1.0	1.9	1.0	1.4	2.2	3.9	2.3	.6	0	0	3.1	2.2
26	1.0	1.9	.6	1.2	2.3	4.3	2.2	.4	0	0	4.6	1.9
27	1.0	1.9	.7	1.0	2.2	5.1	2.0	.5	0	0	1.8	1.6
28	1.0	1.8	.8	1.1	2.3	5.7	2.0	.5	0	0	* 1.2	1.5
29	1.2	1.8	.9	1.2	-	6.7	1.9	.4	0	0	5.6	1.4
30	1.2	1.8	1.0	1.3	-----	6.5	1.9	1.7	0	0	1.0	1.3
31	1.2	-----	1.2	1.4	-----	6.3	-----	.6	-----	0	1.1	-----
Total	28.9	48.7	47.6	35.8	51.9	90.7	108.7	30.1	5.4	1.5	54.5	170.4
Mean	0.93	1.62	1.54	1.15	1.85	2.93	3.62	0.97	0.18	0.05	1.76	5.68
Ac-ft	57	97	94	71	103	180	216	60	11	3.0	108	338

Calendar year 1962: Max 154 Min 0.4 Mean 12.2 Ac-ft 8,820

Water year 1962-63: Max 41 Min 0 Mean 1.85 Ac-ft 1,340

Peak discharge (base, 200 cfs).--Sept. 20 (1400) 498 cfs (4.25 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 17-21, Dec. 11, Dec. 22 to Feb. 1, Feb. 9-19, Mar. 4-6.



## ARKANSAS RIVER BASIN

7-2085. Rayado Creek at Sauble Ranch, near Cimarron, N. Mex.

**Location.**--Lat 36°22', long 104°58', in sec.30, T.25 N., R.19 E. (projected), in Maxwell Grant, on left bank at Sauble Ranch, 10 miles southwest of Cimarron and 16 miles upstream from mouth.

**Drainage area.**--65 sq mi.

**Records available.**--June to October 1908 (discharge measurements only), January 1909 to January 1910, July and August 1910, May 1911 to May 1913, July 1913 to February 1915, October 1915 to September 1918, March 1919 to September 1920, June 1923 to September 1924, March to May 1927, August 1927 to September 1963. Monthly discharge only for some periods, published in WSP 1311. Records for April and May 1910, as published in WSP 287, are unreliable and should not be used. Published as "at," "near," or "above Abreu's Ranch near Cimarron" prior to October 1925 and as Rayado River at Sauble Ranch, near Cimarron, October 1925 to September 1952.

**Gage.**--Water-stage recorder. Altitude of gage is 6,880 ft (from topographic map). Prior to May 4, 1911, chain or staff gage at site about 2 miles downstream at different datum, May 4, 1911, to Sept. 8, 1925, water-stage recorder about 3 miles upstream at 2 sites within 100 ft at 3 different datums. Sept. 9, 1925, to July 16, 1934, water-stage recorder at site 700 ft upstream at different datum.

**Average discharge.**--44 years (1911-12, 1913-14, 1915-20, 1923-24, 1927-63), 14.2 cfs (10,280 acre-ft per year).

**Extremes.**--Maximum discharge during year, 810 cfs Sept. 20 (gage height, 5.10 ft); maximum gage height, 5.93 ft Sept. 20 (back-water from drift); minimum discharge, 0.8 cfs Dec. 12.

1909-12, 1913-63: Maximum discharge, about 850 cfs Apr. 23, 1942 (gage height, 4.94 ft), from rating curve extended above 190 cfs by logarithmic plotting; maximum gage height, that of Sept. 20, 1963; minimum daily discharge, 0.4 cfs Nov. 16, 1956.

The major flood of June 10, 1913, destroyed the gage (maximum stage or discharge not determined). Another major flood probably occurred Sept. 29 or 30, 1904.

**Remarks.**--Records good except those for periods of ice effect, which are fair.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Sept. 4

Sept. 5 - 30

1.6	0.6	2.1	13	1.7	2.9	2.8	74
1.7	1.6	2.2	18	1.8	4.5	3.2	144
1.8	3.4	2.3	24	1.9	6.7	3.6	238
1.9	6.0	2.4	31	2.1	13		
2.0	9.2			2.4	31		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.9	4.4	4.7	3.5	4.4	4.4	1.9	6.0	3.9	1.5	1.5	3.4
2	4.9	4.4	4.7	3	5.2	4.5	1.6	6.0	5.7	1.5	1.4	3.0
3	4.9	4.4	3.9	3.0	4.9	4.7	1.2	6.0	4.4	1.8	1.9	3.2
4	4.4	4.4	3.4	3.4	4.2	4.4	1.3	5.7	3.4	1.8	6.9	2.6
5	4.4	4.4	2.4	3	4.4	4.0	1.3	5.4	3.0	2.1	3.0	2.9
6	3.9	4.4	3	3	4.7	4.0	1.1	5.4	2.8	3.0	2.3	8.7
7	4.2	3.9	3.5	3	4.7	4.0	1.3	5.2	2.4	2.3	2.1	6.7
8	4.2	3.6	3.5	3.5	4.4	4.0	1.3	4.9	2.4	3.7	2.1	5.3
9	3.9	4.0	3.5	3.5	4.2	4.0	1.4	4.7	3.2	4.4	3.1	4.7
10	3.9	4.2	3.5	3	4.0	4.2	* 1.4	4.9	2.6	3.2	2.4	4.7
11	3.9	3.9	3.5	2.5	3.5	4.2	1.2	4.7	2.4	2.6	4.7	4.5
12	3.9	3.7	* 3.5	2	* 3	4.0	1.1	4.4	* 2.4	2.3	4.2	4.3
13	3.9	3.8	4	2.5	3.5	4.2	1.1	* 4.2	2.8	2.3	5.1	* 4.0
14	3.7	4.4	4	2.5	3.5	* 4.2	1.2	4.2	2.8	2.4	3.9	4.0
15	* 3.9	4.7	3.9	3	3.5	4.6	1.4	3.9	3.2	1.9	4.4	4.0
16	3.9	4.7	3.9	* 3	3.5	4.8	1.2	3.9	4.0	1.8	* 5.2	3.8
17	4.9	3.9	3.9	3	3.5	5.0	1.2	3.7	7.9	1.6	3.4	3.5
18	4.7	3.5	4.7	3	4	4.9	1.2	3.7	5.7	1.8	3.2	3.4
19	4.9	3.5	4.2	2.5	4.5	5.2	1.0	3.7	4.7	* 1.6	4.2	3.2
20	4.9	4.0	3.0	2.5	4.5	5.7	1.0	3.7	5.2	2.4	4.2	* 9.1
21	4.7	* 5.7	3.0	3	4.4	6.3	9.6	4.2	4.2	2.6	3.0	23.6
22	4.4	5.2	3	3.5	4.3	7.2	8.9	4.9	3.2	1.9	3.0	6.6
23	4.4	5.4	3	3	4.2	1.1	8.6	3.9	2.6	1.6	2.4	4.1
24	4.4	5.2	3	3	4.2	1.4	8.6	3.4	2.3	1.5	3.4	2.9
25	4.4	5.1	3	3.5	* 4.4	1.3	7.6	3.0	2.1	1.8	4.4	2.4
26	* 4.4	* 4.9	* 2.5	3.5	4.4	1.6	7.2	2.8	2.1	2.1	4.2	1.9
27	4.4	4.4	3	3	4.4	* 2.0	7.6	3.0	1.9	1.8	4.7	* 1.7
28	4.4	4.2	3	* 3.5	4.7	2.5	6.9	3.0	* 1.8	1.8	3.0	1.5
29	4.2	3.9	3	3.7	-	2.9	* 6.3	3.0	1.6	2.1	* 2.8	1.3
30	4.4	4.9	3	3.9	-----	2.2	6.3	3.2	1.5	1.6	6.0	1.2
31	4.4	-----	3.5	4.2	-----	2.3	-----	* 5.7	-----	* 1.5	4.7	-----
Total	134.7	131.1	107.7	96.2	117.1	275.5	331.6	134.4	98.2	66.3	117.8	692.4
Mean	4.35	4.37	3.47	3.10	4.18	8.89	11.1	4.34	3.27	2.14	3.80	23.1
Ac-ft	267	260	214	191	232	546	658	267	195	132	234	1,370

Calendar year 1962: Max 147 Min 2.4 Mean 16.9 Ac-ft 12,260

Water year 1962-63: Max 236 Min 1.4 Mean 6.31 Ac-ft 4,570

Peak discharge (base, 100 cfs).--Sept. 4 (2245) 472 cfs (4.27 ft); Sept. 20 (2230) 810 cfs (5.10 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice, Nov. 18-20, Dec. 6-14, Dec. 22 to Jan. 2, Jan. 5-29, Feb. 10-20, 22-23, 26, Mar. 1, 4-9, 11-13, 15-17, 19.

## ARKANSAS RIVER BASIN

21

7-2110. Cimarron Creek at Springer, N. Mex.

Location.--Lat 36°21'30", long 104°35'50", in southeast corner of Maxwell Grant, on left bank at Springer, Colfax County, 270 ft downstream from highway bridge, 6 miles downstream from Rayado Creek, and 6 miles upstream from mouth.

Drainage area.--1,032 sq mi.

Records available.--August 1907 to December 1909, January 1921 to February 1922, October 1924 to January 1926, September 1926 to September 1963. Prior to October 1952, published as Cimarron River at Springer.

Gage.--Water-stage recorder. Concrete control since Nov. 5, 1954. Altitude of gage is 5,770 ft (from nearby level line). July 13, 1907, to Dec. 31, 1909, staff gage and Dec. 20, 1919, to Feb. 8, 1930, chain gages at site 270 ft upstream at various datums to Nov. 19, 1924, and thereafter at datum 3.34 ft higher than present datum. Feb. 9, 1930, to July 12, 1934, water-stage recorder at site 270 ft upstream at datum 3.66 ft higher. July 13, 1934, to Apr. 13, 1942, water-stage recorder at site 30 ft downstream at different datum. May 8 to July 16, 1942, water-stage recorder at site 270 ft upstream at datum 3.33 ft lower.

Average discharge.--39 years (1920-21, 1924-25, 1926-63), 17.7 cfs (12,810 acre-ft per year).

Extremes.--Maximum discharge during year, 968 cfs Sept. 21 (gage height, 6.52 ft); minimum, 0.02 cfs July 24, 31, Aug. 1, 2, 8. 1930-63: Maximum discharge, 6,250 cfs June 6, 1958 (gage height, 10.55 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement of peak flow; no flow at times in 1954, 1956-57. Maximum stage known, about 22 ft Sept. 29, 1904 (backwater from debris on railroad bridge). Another major flood occurred June 11, 1913. Maximum discharge of these floods probably exceeded 10,000 cfs.

Remarks.--Records good except those for periods of uncertain stage-discharge relation, which are fair, and those for periods of ice effect, which are poor. Flow partly regulated by Eagle Nest Reservoir (see p 13). Diversions for irrigation of about 23,000 acres above station and a few hundred acres between station and mouth.

Rating table, except periods of ice effect or uncertain stage-discharge relation (gage height, in feet, and discharge, in cubic feet per second)

3.2	0.16	3.5	4.5	3.9	40	4.8	233
3.3	.56	3.6	9.7	4.2	90	5.1	320
3.4	1.7	3.7	17	4.5	157	5.4	420

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	c 3.4	3.1	5.4	4.1	5.8	4.9	2.8	2.1	5.2	1.3	0.2	1.1
2	c 3.4	3.4	5.4	4.1	4.5	4.9	2.8	2.2	6.0	2.3	.2	6.2
3	c 3.4	3.4	5.4	3.8	4.1	4.5	2.5	2.1	5.6	*1.7	1.8	3.8
4	c 3.4	3.4	4.9	3.8	4.1	4.1	* 2.5	2.3	4.0	1.2	.9	2.7
5	* c 3.1	3.8	4.5	4.1	4.1	4.1	2.8	2.4	2.8	.9	*.3	2.4
6	3.1	3.8	* 4.5	4.1	3.8	4.1	3.4	2.3	2.7	1.6	.4	3.3
7	c 3.1	3.8	4.1	3.8	* 3.8	* 4.1	2.8	2.0	3.1	2.1	.3	5.2
8	c 3.5	* c 4.1	4.1	4.5	3.8	3.8	3.1	2.2	3.3	1.4	.2	5.9
9	c 4.1	4.1	3.8	4.1	3.8	3.8	2.8	2.1	3.0	.9	.9	3.9
10	c 4.1	4.5	3.8	4.1	4.9	3.8	2.8	2.0	* 3.9	1.5	1.7	2.9
11	c 4.1	4.1	3.8	3.5	4.5	3.8	2.5	1.7	4.4	3.1	.9	2.5
12	c 4.1	4.1	3.8	2.5	3.5	3.8	2.8	1.6	2.7	2.0	8.0	* 2.6
13	c 4.1	4.1	3.8	3.0	3.5	3.8	2.5	1.5	2.5	1.8	6.1	2.7
14	c 4.1	4.5	3.8	3.2	3.6	3.8	2.8	1.5	8.1	1.6	1.8	2.4
15	c 4.1	5.4	3.8	3.3	3.8	3.8	2.8	1.6	9.8	1.0	8.0	2.2
16	c 4.5	5.8	3.8	* 3.4	3.8	2.8	2.5	1.6	3.1	.6	3.4	2.0
17	4.9	1.0	3.8	3.5	3.8	3.4	c 2.5	1.7	1.2	.4	3.1	2.0
18	3.8	8.0	4.1	3.7	4.1	3.4	c 2.5	2.2	1.0	.3	1.8	2.0
19	3.1	6.8	4.1	3.5	4.1	3.4	c 2.5	2.3	9.8	.3	1.4	2.0
20	3.1	6.3	4.1	3.7	4.9	3.4	c 2.5	2.6	8.9	.3	1.1	3.2
21	3.1	6.3	4.1	4.0	5.8	3.4	c 2.3	5.7	1.0	.4	1.1	4.19
22	c 3.1	6.8	4.1	3.6	5.4	3.4	c 2.3	8.0	7.7	.3	1.0	1.14
23	c 3.2	6.8	3.8	3.7	4.9	3.4	c 2.3	7.1	7.2	.3	.9	3.9
24	c 3.4	6.3	3.4	4.0	5.4	3.1	2.0	5.1	7.0	.2	.9	2.0
25	c 3.4	6.3	3.4	4.5	4.9	2.8	1.8	3.1	4.8	.3	1.8	1.1
26	c 3.4	6.3	3.0	4.3	4.9	3.1	2.1	2.6	2.6	.4	3.1	8.5
27	3.4	5.8	3.8	3.7	4.5	* 2.8	2.1	2.5	2.0	.3	5.8	7.1
28	3.4	5.4	3.8	4.0	4.5	3.4	2.3	2.4	2.0	.3	3.1	5.9
29	3.4	5.4	3.4	4.5	-	3.1	2.0	2.5	1.9	.3	4.1	5.7
30	3.4	5.4	3.4	5.0	-----	2.8	* 2.1	2.8	1.6	.3	6.1	4.6
31	3.1	-----	3.8	5.5	-----	2.8	-----	6.6	-----	.2	1.1	-----
Total	110.8	157.3	124.8	120.6	122.6	111.6	75.5	88.4	185.6	29.6	178.6	705.7
Mean	3.57	5.24	4.03	3.89	4.38	3.60	2.52	2.85	6.19	0.95	5.76	23.5
Ac-ft	220	312	248	239	243	221	150	175	368	59	354	1,400

Calendar year 1962: Max 299 Min 1.7 Mean 15.5 Ac-ft 11,210  
 Water year 1962-63: Max 419 Min 0.2 Mean 5.51 Ac-ft 3,990

Peak discharge (base, 500 cfs).--Sept. 21 (1900) 968 cfs (6.52 ft).

\* Discharge measurement made on this day.

c Uncertain stage-discharge relation caused by backwater from debris.

Note.--Stage-discharge relation affected by ice Nov. 20, Dec. 24-27, Jan. 5-31, Feb. 11-17.

## RIO GRANDE BASIN

7-2140. Canadian River near Roy, N. Mex.

Location.--Lat 35°55'10", long 104°21'10", in E½ sec.35, T.20 N., R.24 E., on right bank 1,080 ft upstream from bridge on State Highway 120 and 9 miles west of Roy.

Drainage area.--4,066 sq mi, of which 107 sq mi is probably noncontributing.

Records available.--April 1936 to September 1963. Monthly discharge only for April 1936, published in WSP 1311.

Gage.--Water-stage recorder. Datum of gage is 4,892.55 ft above mean sea level (levels by Corps of Engineers). Prior to Oct. 9, 1942, Jan. 5, 1943, to Jan. 20, 1945, and Aug. 6, 1945, to Apr. 30, 1946, at site 1,080 ft downstream at datum 0.39 ft higher. Oct. 10, 1942, to Jan. 4, 1943, Jan. 21 to Aug. 5, 1945, and May 1, 1946, to Sept. 30, 1958, at present site at datum 1.00 ft higher.

Average discharge.--27 years, 129 cfs (83,390 acre-ft per year).

Extremes.--Maximum discharge during year, 8,730 cfs Sept. 1 (gage height, 9.56 ft); no flow Apr. 27 to May 22.

1936-63: Maximum discharge, 63,800 cfs Apr. 23, 1942 (gage height, 14.22 ft, former site and datum); no flow at times.

Maximum flood known occurred Sept. 29 or 30, 1904, when peak near Taylor Springs was computed as 91,100 cfs (see WSP 842, 847).

Remarks.--Records good except those for periods of ice effect and those for May 22 to Sept. 30, which are poor. Diversions for irrigation of about 30,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 23 to June 1, June 16 to July 27)

0.4	0	0.7	1.5	1.0	8.0	1.5	45	3.0	383	5.0	1,540
.5	0.1	.8	3.0	1.1	12	2.0	119	3.5	590	6.1	2,550
.6	0.3	.9	5.0	1.2	18	2.5	233	4.0	850		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.7	6.2	1.7	1.0	2.0	1.6	c 4.5	0	9.3	4.4	a.5	2,380
2	1.0	6.2	1.7	1.0	7.7	1.4	c 4.2	0	9.0	4.0	a.3	233
3	* 9.6	6.8	1.7	* 1.2	6.4	1.3	4.0	0	5.1	3.6	a.2.3	103
4	7.4	7.1	1.7	1.6	4.2	1.3	4.2	0	3.3	3.2	a.1.4	*65
5	5.9	7.4	* 1.6	1.2	3.0	1.1	4.4	0	2.3	3.0	a.8	4.4
6	5.0	7.7	1.4	1.3	2.9	* 1.0	4.6	0	1.6	5.7	a.4	4.8
7	4.2	8.4	1.2	1.4	2.4	8.8	4.0	* 0	1.0	1.7	a.0	7.1
8	3.6	8.4	1.2	1.3	2.1	1.1	3.8	0	6.2	5.9	* 2.6	5.5
9	3.2	8.8	1.3	1.4	1.8	1.1	3.6	0	4.4	* 2.0	5.2	3.1
10	3.0	8.8	1.3	1.4	1.8	1.1	3.4	0	2.8	.6	5.0	2.4
11	2.7	8.8	1.3	8	1.6	1.2	3.4	0	2.2	2.2	2.66	9.9
12	2.4	9.6	1.3	5	1.2	1.1	3.2	0	* 1.4	2.2	1.970	3.0
13	2.2	1.1	1.2	3	1.0	1.1	3.2	0	.5	1.6	1.340	3.83
14	2.4	1.0	1.0	2	* 1.0	c 1.0	3.0	0	.1	1.1	3.53	1.10
15	2.6	* 1.0	1.2	2.5	1.0	c 1.0	2.7	0	.1	8.0	a.150	5.7
16	2.4	1.1	1.3	2.6	1.3	1.0	2.1	0	3.46	5.0	a.80	3.8
17	2.7	1.3	1.4	2.7	1.6	1.0	2.0	0	* 4.65	7.0	a.50	3.5
18	3.6	1.6	1.7	3	1.5	1.1	* 1.1	0	a.90	3.3	a.35	3.1
19	4.4	1.6	1.6	2.5	1.7	1.1	.6	0	a.50	2.6	a.24	2.9
20	5.9	1.6	2.0	3	2.3	* 6.2	.7	0	a.25	1.7	* 1.9	2.4
21	6.8	1.5	2.7	3.5	2.6	c 6.2	.9	0	a.15	6.8	1.3	3.84
22	5.9	1.5	2.4	4	2.5	c 6.2	.3	0	a.12	3.2	1.0	1.470
23	5.9	2.4	2.3	3.5	2.4	6.2	.2	3.8	a.9	3.0	1.0	4.26
24	5.6	2.8	1.3	* 3.8	2.1	6.2	.1	* 2.9	7.7	1.4	7.1	* 1.61
25	6.2	2.4	1.1	4.5	2.0	6.5	.1	1.4	7.1	1.1	3.36	8.8
26	5.9	2.0	1.0	4.5	2.0	c 6.0	.1	9.6	6.2	4.0	9.1	5.3
27	6.2	1.9	1.1	4	1.9	5.6	.1	4.8	5.6	6.3	3.11	3.9
28	5.6	1.7	1.0	4.5	1.9	5.3	0	3.2	5.0	4.9	1.43	3.0
29	5.6	1.7	7.7	6	-	5.0	0	2.0	4.8	1.12	3.08	2.3
30	5.9	1.7	9.6	7.4	-----	5.0	0	1.5	4.8	3.0	5.62	1.9
31	6.2	-----	1.0	1.1	-----	c 4.7	-----	1.0	-----	1.2	2.35	-----
Total	156.7	393.2	444.3	219.0	65.9	283.9	64.5	103.1	1386.9	631.5	6494.5	6.583
Mean	5.05	13.1	14.3	7.06	23.5	9.16	2.15	3.33	46.2	20.4	210	219
Ac-ft	311	780	881	434	1,310	583	128	204	2,760	1,250	12,880	13,080

Calendar year 1962: Max 1,040 Min 1.1 Mean 35.9 Ac-ft 25,970

Water year 1962-63: Max 2,380 Min 0 Mean 47.7 Ac-ft 34,550

Peak discharge (base, 4,000)--Aug. 12 (2100) 8,660 cfs (9.53 ft); Sept. 1 (0230) 8,730 cfs (9.56 ft).

\* Discharge measurement made on this day.

a No gage-height record.

c Backwater from wind.

Note.--Stage-discharge relation affected by ice Dec. 25, 26, Jan. 11-29, Feb. 12, 13.

ARKANSAS RIVER BASIN

23

7-2145. Rio Agua Negra near Holman, N. Mex.

Location.--Lat 36°07'00", long 105°22'35", on right bank 150 ft upstream from bridge, 2½ miles south of Chacon, 4½ miles downstream from confluence of Luna and Lujan Creeks, 5.0 miles north of Holman, and 8½ miles southwest of Guadalupita, Mora County.

Drainage area.--57 sq mi.

Records available.--January 1953 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 7,876 ft (by barometer).

Average discharge.--10 years, 13.2 cfs (9,560 acre-ft per year).

Extremes.--Maximum discharge during year, 142 cfs Aug. 12 (gage height, 2.23 ft); minimum, 0.3 cfs Jan. 9 (during freeze-up). 1953-63: Maximum discharge, 4,700 cfs July 22, 1954 (gage height, 6.10 ft), from rating curve extended above 300 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.1 cfs July 18, 1954, Sept. 21, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 1,600 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Nov. 18

Nov. 19 to Sept. 30

0.7	2.2	0.57	0.3	1.3	22
.8	4.4	.7	1.5	1.5	35
.9	7.0	.8	3.4		
1.0	10	1.0	9.6		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	4.2	6.0	b3.5	b4	b5	2.2	3.0	4.8	2.4	1.0	6.6
2	5.2	4.2	5.7	b3.5	b4	b5	*2.0	2.8	6.6	2.4	.7	5.7
3	*6.0	4.2	5.4	b3.5	4.0	6.3	1.7	2.6	*6.6	2.2	.8	5.4
4	4.9	4.2	5.1	b3.5	4.8	6.3	1.8	2.2	6.3	3.0	1.8	5.1
5	4.9	4.2	*b4.5	b3.5	*4.8	*b6	1.8	2.2	5.7	3.0	1.2	4.8
6	4.7	4.2	b4.5	b3.5	5.1	b5.5	1.7	2.4	5.1	2.2	1.1	4.8
7	4.7	4.0	b4.5	b3.5	5.1	b5.5	1.6	2.0	3.7	2.2	1.0	4.7
8	4.7	3.7	b4.5	b3.5	5.1	b6	1.7	*2.2	4.3	4.0	.7	4.0
9	4.4	4.0	b4.5	*b3.5	5.7	b6	2.0	2.8	4.3	4.0	5.2	3.4
10	4.4	4.0	b4.5	b3.5	5.1	5.7	2.2	2.4	4.0	2.8	2.8	4.0
11	4.2	4.0	b4.5	b3	b3.5	b6	2.2	3.2	3.7	2.4	3.4	4.0
12	4.2	4.0	b4.5	a2.5	b4	b6	2.2	3.2	3.0	2.4	2.1	10
13	4.7	3.7	b4	a2.5	b4.5	7.0	2.0	3.7	2.8	2.4	*1.5	6.6
14	4.7	4.2	b4	a2.5	b4.5	6.3	2.0	3.2	3.2	2.2	1.1	6.0
15	4.7	*4.7	b4	a2.5	b4.5	5.1	2.0	2.6	2.8	*2.2	1.2	5.7
16	4.7	4.7	b4	a2.5	b4.5	6.3	1.9	2.6	3.4	2.0	8.9	5.4
17	4.9	4.7	4.3	a2.5	b4.5	10	1.8	2.8	4.0	1.8	1.1	5.4
18	4.9	b4	*4.8	a2.5	b4.5	8.0	*1.7	3.0	3.7	1.5	1.8	5.4
19	5.4	b7	4.6	a2.5	*b5	*10	1.4	3.4	4.0	1.2	8.3	*4.6
20	5.4	b7	b4	a3	b5	9.6	1.2	3.4	4.3	1.5	8.0	8.1
21	5.4	6.3	b4	a3	b4.5	10	1.1	*3.2	4.3	1.6	7.6	2.2
22	4.7	6.0	b4	a3	b4	12	10	4.8	3.7	1.2	7.3	1.2
23	4.7	6.0	b4	*b3	b4	15	8.3	5.1	3.4	1.5	6.3	8.9
24	4.7	6.0	b4	b3.5	b4.5	17	7.3	4.8	3.0	1.1	8.0	8.3
25	*4.4	5.7	b4	b3.5	b5	17	6.0	5.7	2.4	1.4	9.3	8.3
26	4.4	6.0	b3.5	b3.5	b6	19	5.4	4.8	2.4	1.6	10	8.0
27	4.4	5.4	b3	b3.5	b6	19	5.4	4.6	2.4	1.6	8.0	7.6
28	4.2	5.1	b3	b3.5	b5.5	21	5.1	4.6	2.8	1.6	7.6	7.0
29	4.4	5.1	b3.5	b4	-	24	4.6	4.6	2.4	1.4	9.4	5.4
30	4.4	6.0	b3.5	b4	-----	21	3.4	4.3	2.4	.8	*10	4.8
31	4.4	-----	b3.5	b4	-----	22	-----	4.6	-----	1.0	8.3	-----
Total	149.0	146.5	131.9	99.5	131.7	328.6	437.5	106.8	115.5	62.6	222.7	202.0
Mean	4.81	4.88	4.25	3.21	4.70	10.6	14.6	3.45	3.85	2.02	7.18	6.73
Ac-ft	296	291	262	197	261	652	868	212	229	124	442	401

Calendar year 1962: Max 165 Min 3 Mean 18.1 Ac-ft 13,080  
Water year 1962-63: Max 24 Min 0.7 Mean 5.85 Ac-ft 4,240

Peak discharge (base, 150 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2146. Vigil Canyon near Holman, N. Mex.

Location.--Lat 36°02'50", long 105°24'10", in Mora Grant, on right bank 1½ miles northwest of Holman, Mora County.Drainage area.--2.8 sq mi.Records available.--May 1956 to September 1963 (discontinued).Gage.--Water-stage recorder. Concrete control since September 1956. Altitude of gage is 7,840 ft (by barometer).Average discharge.--7 years, 1.86 cfs (1,350 acre-ft per year).Extremes.--Maximum discharge during year, 9.2 cfs May 11 (gage height, 2.16 ft); maximum gage height, 2.17 July 9; no flow at times.

1956-63: Maximum discharge, 87 cfs June 6, 1958 (gage height, 3.43 ft), from rating curve extended above 13 cfs by logarithmic plotting; no flow at times.

Remarks.--Records good. Large percentage of flow is transmountain diversion from Rio Pueblo. Little natural flow except during local storms or snowmelt.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)  
(Shifting-control method used Sept. 20-30)

1.45	0.0	1.6	0.3	1.8	1.6	2.2	8.6
1.55	.1	1.7	.8	2.0	4.4		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.1	0.1			0	0.3	0.1	2.8	0.2	0	0.3
2	.3	.1	.1			0	*.3	.1	3.2	.3	0	.2
3	*.2	.1	.1			0	.2	.4	*3.7	.4	0	.2
4	.2	.1	.1			0	.2	2.6	2.8	.4	.3	.2
5	.2	.1	*0		(*)	*0	.2	3.0	2.5	.3	0	.3
6	.2	.1	.1			0	.2	2.8	1.9	.2	0	.2
7	.2	.1	0			0	.1	3.2	1.6	.3	0	.1
8	.2	0	.1			0	.1	*3.5	1.8	.5	0	.1
9	.2	0	0	(*)		0	.1	4.3	1.9	1.5	0	.1
10	.1	0	0			0	.1	4.3	1.6	.5	1.7	.1
11	.1	0	0			0	.1	6.0	1.3	.1	1.6	.1
12	.1	0	0			0	.1	7.5	1.0	.1	.1	.4
13	.1	0	0			0	.1	6.6	1.0	0	.1	.4
14	.1	0	0			0	.1	6.6	1.5	0	*.3	.3
15	.1	*.1	0			0	.1	6.6	1.1	*0	.2	.3
16	.1	.1	0			0	.1	7.0	1.1	0	0	.2
17	.1	0	0			0	.1	6.8	1.2	0	.1	.2
18	.1	.1	*0			0	*.1	6.8	.8	0	.3	*.1
19	.2	.1	.1		(*)	*0	.1	7.0	.9	0	.1	.1
20	.2	.2	0			0	.1	6.8	.9	.1	.1	.3
21	.2	.3	0			.1	.1	*7.7	.7	0	.1	1.3
22	.2	.1	0			.1	.1	7.3	.6	0	.1	.6
23	.2	.1	0	(*)		.2	.1	6.6	.5	0	.1	.4
24	.2	.1	0			.2	.1	6.6	.5	0	.9	.4
25	*.1	.1	.1			.2	0	5.4	.4	0	.6	.4
26	.2	.1	0			.2	0	4.4	.4	0	.5	.4
27	.2	.1	0			.3	.3	4.1	.5	0	.4	.4
28	.2	.1	0			.3	.5	3.7	.5	0	.4	.4
29	.1	.1	0		-	.4	.2	3.3	.4	0	.4	.4
30	.1	.1	0			.4	.1	3.3	.3	0	*.5	.3
31	.1	-----	0		-----	.3	-----	3.0	-----	0	.4	-----
Total	5.0	2.5	0.7	0	0	2.7	4.3	14.74	39.4	4.9	9.3	9.2
Mean	0.16	0.08	0.02	0	0	0.09	0.14	4.75	1.31	0.16	0.30	0.31
Ac-ft	9.9	5.0	1.4	0	0	5.4	8.5	292	78	9.7	18	18

Calendar year 1962: Max 22 Min 0 Mean 2.15 Ac-ft 1,560  
 Water year 1962-63: Max 7.7 Min 0 Mean 0.62 Ac-ft 446

Peak discharge (base, 25 cfs).--No peak above base.

\* Discharge measurement or field observation of no flow made on this day.

# ARKANSAS RIVER BASIN

25

7-2147. Agua Fria Creek near Holman, N. Mex.

Location.--Lat 36°01'25", long 105°24'35", in Mora Grant, on left bank 1 $\frac{3}{4}$  miles southwest of Holman, Mora County.

Drainage area.--9.2 sq mi.

Records available.--May 1956 to September 1963 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 7,850 ft (from topographic map).

Average discharge.--7 years, 5.76 cfs (4,170 acre-ft per year).

Extremes.--Maximum discharge during year, 22 cfs May 11 (gage height, 1.42 ft); minimum daily, 0.3 cfs Feb. 11; stream dry at times above transmountain diversion.

1956-63: Maximum discharge, 138 cfs Aug. 6, 1959; maximum gage height, 1.87 ft Aug. 18, 1961; minimum daily discharge, 0.1 cfs several days in 1956, 1959-60.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Natural flow is supplemented by transmountain diversion which may, at times, supply entire flow. This supplementary flow not otherwise gaged.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.5	0.2	0.8	1.8	1.1	7.0	1.4	19
.6	.5	.9	2.9	1.2	10	1.5	26
.7	1.0	1.0	4.7	1.3	14		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	1.7	1.0	0.8	b 0.6	b 0.4	1.6	5.6	9.1	1.8	0.8	2.6
2		1.7	1.0	1.1	b 0.6	b 0.6	*2.0	5.6	1.0	2.0	.7	2.3
3	*1.9	1.6	b 0.8	1.1	b 0.6	b 0.7	1.7	6.8	*8.2	2.3	2.3	2.1
4	1.9	1.6	*b 0.8	1.0	.6	b 0.7	1.7	8.5	7.3	2.9	4.4	2.1
5	1.8	1.7	b 0.8	b 0.7	*.6	*b 0.8	1.7	1.0	6.5	3.3	2.3	2.3
6	1.8	1.6	b 0.8	b 0.6	.6	b 0.7	1.7	1.1	6.1	2.7	1.8	2.2
7	1.9	1.4	b 0.8	b 0.6	.6	b 0.7	1.7	1.6	5.8	3.4	1.4	2.0
8	1.9	1.4	b 0.8	*b 0.6	.6	b 0.7	1.7	*1.7	5.6	3.3	1.2	1.8
9	1.7	1.1	b 0.8	b 0.6	b 0.5	b 0.6	1.7	1.9	5.6	5.2	3.1	1.8
10	1.7	1.1	b 0.8	b 0.5	b 0.4	b 0.5	2.2	1.9	4.9	3.6	6.1	1.9
11	1.6	1.0	b 0.8	b 0.5	b 0.3	b 0.5	2.3	2.0	4.7	2.8	5.6	2.1
12	1.6	1.1	b 0.8	a 0.5	b 0.4	b 0.5	2.2	1.9	4.7	2.4	3.8	2.8
13	1.6	1.0	b 0.8	a 0.5	b 0.4	b 0.7	2.8	1.6	4.7	2.2	3.6	2.1
14	1.6	1.0	b 0.8	a 0.5	b 0.4	b 0.5	4.9	1.6	4.7	2.0	*3.6	1.9
15	1.6	*1.4	b 0.8	a 0.5	b 0.4	b 0.5	6.3	1.6	4.0	*1.9	2.8	1.8
16	1.6	1.3	b 0.8	a 0.5	b 0.4	b 0.4	6.1	1.6	4.3	1.8	2.7	1.7
17	1.9	b 1.2	*.8	a 0.5	b 0.4	b 0.4	5.8	1.6	4.5	1.9	2.6	1.5
18	1.9	b 1.2	.8	a 0.5	b 0.4	b 0.4	*5.8	1.6	4.0	1.8	3.1	1.5
19	2.0	1.2	.8	a 0.4	*b 0.5	*b 0.5	4.5	1.6	4.0	1.6	2.4	*1.5
20	1.9	1.2	b 0.8	a 0.5	b 0.4	b 0.4	4.5	1.5	3.6	1.7	2.2	2.0
21	1.7	1.2	b 0.8	a 0.4	b 0.4	b 0.6	4.5	*1.6	*3.3	1.6	2.8	5.8
22	1.8	b 1.1	b 0.8	a 0.4	b 0.4	b 1.1	4.5	1.5	2.9	1.4	2.4	4.2
23	*1.7	1.0	b 0.8	*a 0.4	b 0.4	1.4	4.2	1.4	2.7	1.3	2.1	3.6
24	1.7	1.0	b 0.8	a 0.4	b 0.4	1.4	4.7	1.3	2.4	1.2	2.7	3.3
25	1.7	1.0	b 0.6	a 0.4	b 0.4	1.3	5.2	1.2	2.3	1.1	2.6	3.0
26	1.7	1.0	b 0.5	a 0.4	b 0.4	1.4	6.1	1.2	2.3	1.1	3.3	2.8
27	1.9	1.0	b 0.5	a 0.4	b 0.4	1.4	6.5	1.1	2.3	1.1	2.8	2.6
28	1.8	b 0.9	b 0.6	a 0.4	b 0.4	1.5	6.1	1.0	2.3	1.0	2.4	2.4
29	1.6	b 0.9	b 0.7	a 0.4	-	1.6	5.6	9.7	2.1	.9	2.4	2.2
30	1.7	1.0	b 0.7	a 0.5	-----	1.6	5.4	9.7	1.9	.9	3.3	2
31	1.8	-----	b 0.7	.6	-----	1.6	-----	9.7	-----	.8	3.1	-----
Total	55.0	36.5	23.9	17.2	12.8	26.0	115.7	416.6	136.8	63.0	86.4	71.9
Mean	1.77	1.22	0.77	0.55	0.46	0.84	3.86	13.4	4.56	2.03	2.79	2.40
Ac-ft	109	72	47	34	25	52	229	826	271	125	171	143

Calendar year 1962: Max 27 Min 0.5 Mean 4.71 Ac-ft 3,400  
Water year 1962-63: Max 20 Min 0.3 Mean 2.91 Ac-ft 2,100

Peak discharge (base, 20 cfs).--May 11 (2100) 22 cfs (1.42 ft).

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2148. Rio de la Casa near Cleveland, N. Mex.

Location.--Lat 35°58'30", long 105°23'10", in Mora Grant, on left bank  $1\frac{1}{2}$  miles southwest of Cleveland.Drainage area.--23 sq mi.Records available.--May 1956 to September 1963.Gage.--Water-stage recorder. Altitude of gage is 7,625 ft (by barometer).Average discharge.--7 years, 14.9 cfs (10,790 acre-ft per year).Extremes.--Maximum discharge during year, 31 cfs May 11 (gage height, 2.37 ft); minimum, 0.6 cfs Jan. 6 (result of freeze-up).  
1958-63: Maximum discharge, 2,260 cfs Aug. 6, 1959 (gage height, 6.0 ft), from rating curve extended above 200 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.2 cfs Sept. 21, 22, 1956.Remarks.--Records good except those for periods of ice effect, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 100 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.6	0.4	2.0	8.9
1.7	1.4	2.2	18
1.8	3.1	2.4	32
1.9	5.6		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	2.6	3.1	b 2.2	b 2.4	b 2.7	11	10	14	2.9	0.9	5.6
2	4.1	2.6	3.1	b 2.2	b 2.4	b 2.7	9.7	10	16	2.8	1.8	4.6
3	4.1	2.4	3.1	2.2	b 2.4	b 3.3	8.2	12	14	3.8	1.4	4.1
4	3.8	2.6	2.9	1.9	b 2.4	b 3.3	8.9	14	12	4.8	4.4	4.1
5	3.8	2.6	2.9	b 2	b 2.3	b 3.3	8.9	14	10	6.3	2.4	4.1
6	3.6	2.4	2.9	b 2	b 2.2	b 3.2	7.9	14	9.3	4.6	1.7	7.3
7	3.4	2.2	2.9	b 2	b 2.2	b 3.1	7.9	18	8.6	4.6	1.6	10
8	3.1	2.1	2.8	b 2	b 2.2	b 3.1	10	22	8.6	6.9	1.4	6.6
9	3.1	2.1	2.8	b 2	b 2.2	b 3.5	13	26	8.2	1.2	2.2	5.4
10	2.9	2.2	b 2.8	b 1.5	b 2.1	b 3.5	13	23	7.6	6.6	4.4	5.9
11	2.8	2.2	b 2.8	b 1.5	b 2	b 3.2	12	26	7.2	5.6	4.6	8.6
12	2.8	2.1	b 2.8	b 1.5	b 2.1	b 3.5	12	27	7.2	5.1	4.4	7.2
13	2.8	2.1	b 2.5	b 1.5	b 2.3	b 4	13	25	7.2	4.4	4.8	7.2
14	2.8	2.4	b 2.5	b 1.5	b 2.5	b 3.5	14	23	9.3	3.8	4.8	8.2
15	2.8	2.8	b 2.5	b 1.5	b 2.5	b 3.5	16	26	6.9	3.4	4.8	6.9
16	2.9	2.6	2.4	b 1.5	b 2.5	b 4	14	24	7.2	2.9	4.4	5.9
17	3.6	2.9	2.4	b 1.5	b 2.5	4.4	11	23	8.2	3.4	3.8	5.1
18	3.8	b 3	2.4	b 1.5	b 2.5	4.4	11	25	7.2	4.1	6.6	4.6
19	4.6	b 3.5	2.2	b 1.4	b 2.8	b 4.5	9.7	26	7.2	3.1	4.8	4.4
20	4.4	b 4.5	2.2	b 2	b 2.8	4.8	8.6	25	7.2	2.9	4.1	5.4
21	3.8	4.8	2.1	b 2.2	b 2.7	5.4	8.6	26	6.3	2.9	4.1	1.8
22	3.8	4.6	b 2	b 2.3	b 2.5	5.4	7.6	24	5.4	2.4	5.1	1.6
23	3.8	4.1	b 2	b 2.2	b 2.5	7.2	7.2	22	4.6	2.1	4.4	1.2
24	3.6	3.8	b 2	b 2	b 2.6	8.6	9.7	20	4.4	1.9	5.4	10
25	3.1	3.6	b 2	b 2	b 3	8.2	11	19	3.8	1.7	5.4	8.6
26	2.9	3.6	b 2	b 2	b 3	8.2	12	18	3.6	1.7	6.3	7.9
27	2.9	3.4	b 2	b 2.2	b 3	8.9	12	16	4.1	1.4	5.6	6.9
28	2.8	3.1	b 2	b 2.3	b 2.8	10	10	16	4.4	1.6	4.6	6.6
29	2.6	2.9	b 2	b 2.4	-	13	10	14	3.6	1.4	4.6	5.9
30	2.8	3.1	2.2	b 2.4	-----	11	10	14	2.9	1.2	7.9	5.6
31	2.8	-----	2.4	b 2.4	-----	12	-----	13	-----	9	7.9	-----
Total	104.2	88.9	76.7	59.8	69.4	169.4	317.9	615	226.2	113.2	129.6	218.7
Mean	3.36	2.96	2.47	1.93	2.48	5.46	10.6	19.8	7.54	3.85	4.18	7.29
Ac-ft	207	176	152	119	138	336	631	1,220	449	225	257	434

Calendar year 1962: Max 62 Min 2 Mean 10.3 Ac-ft 7,430  
Water year 1962-63: Max 27 Min 0.8 Mean 6.00 Ac-ft 4,340Peak discharge (base, 60 cfs).--No peak above base.

b Stage-discharge relation affected by ice.

# ARKANSAS RIVER BASIN

27

7-2151. La Cueva Canal below La Cueva, N. Mex.

Location.--Lat 35°56'20", long 105 15'05", in Mora Grant, on right bank 500 ft downstream from head and half a mile west of La Cueva, Mora County.

Records available.--June 1956 to September 1963.

Gage.--Water-stage recorder (concrete control removed by landowner). Altitude of gage is 7,015 ft (from topographic map).

Extremes.--1956-63: Maximum daily discharge, 32 cfs Aug. 21, 1957; no flow at times in each year.

Remarks.--Records poor. During 1963 a total of 43 discharge measurements were made on diversion and wasteway. Canal diverts water from left bank of Mora River for irrigation and off-channel storage below La Cueva. Published record represents flow below wasteway half a mile downstream from head of canal. Flow shown is total diversion less flow in wasteway.

Monthly discharge, in cubic feet per second, water year 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	7.7	4.9	6.12	376
November . . . . .	8.6	4.9	6.25	372
December . . . . .	7.3	5.8	6.36	391
Calendar year 1962 . . . . .	23	0	6.03	4,363
January . . . . .	6.9	3.6	4.85	298
February . . . . .	13	3.8	8.46	470
March . . . . .	12	1.0	5.41	333
April . . . . .	7.6	0	3.24	193
May . . . . .	6.6	0	3.30	203
June . . . . .	7.6	0.4	4.01	239
July . . . . .	6.4	1.1	3.52	216
August . . . . .	4.0	0	1.79	110
September . . . . .	11	0	2.98	177
Water year 1962-63 . . . . .	13	0	4.67	3,378

Note.--Composite (diversion less wasteway flow).



## ARKANSAS RIVER BASIN

7-2155. Mora River at La Cueva, N. Mex.

Location.--Lat 35°56'15", long 105°15'05", in Mora Grant, on right bank 300 ft downstream from Las Vegas-Mora highway bridge, a quarter of a mile southeast of La Cueva, half a mile downstream from La Cueva damsite, Mora County.

Drainage area.--173 sq mi.

Records available.--August 1903 to April 1905 (gage heights and discharge measurements only), May 1905 to July 1911, April 1931 to September 1963. Monthly discharge only for some periods, published in WSP 1311. Figures of daily discharge for February to April 1905 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 6,998.7 ft above mean sea level, datum of 1929. April 1931 to Apr. 18, 1962, at site 300 ft upstream at datum about 2 ft higher. Aug. 25, 1903, to Sept. 29, 1904, staff gage at different datum (destroyed by flood of Sept. 29, 1904). Feb. 22, 1905, to July 31, 1911, staff gages at different datums.

Average discharge.--36 years (1906-10, 1931-63), 28.6 cfs (20,700 acre-ft per year).

Extremes.--Maximum discharge during year, 991 cfs June 16 (gage height, 8.33 ft), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 8.33 ft; minimum, 1.9 cfs Apr. 20.

1931-63: Maximum discharge, 1,530 cfs Sept. 23, 1941, from rating curve extended above 400 cfs by logarithmic plotting; maximum gage height, 8.55 ft July 23, 1962, present site and datum; no flow at times.

Flood of Sept. 29, 1904, may have exceeded 20,000 cfs; another major flood occurred June 11, 1913, but is believed less than that of 1904.

Remarks.--Records good except those for periods of ice effect and June 17-19, which are poor. Diversions above station for irrigation of about 7,000 acres, part of which is below station. This record plus La Cueva Canal below La Cueva (see preceding page) equals total flow in valley cross section.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 20-30, July 3-7, Sept. 23-30)

Oct. 1 to 1900 hrs July 7

1901 hrs July 7 to Sept. 30

1.5	1.0	2.2	25	2.1	1.5	2.6	23
1.6	2.2	2.4	37	2.2	3.2	2.8	40
1.8	7.5	2.7	57	2.3	5.8	3.2	85
2.0	15	3.0	81	2.4	10		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	6.9	1.3	b 7	4.5	4.5	2.9	5.1	5.1	1.3	4.1	1.5
2	* 1.2	7.2	1.3	b 7	4.5	5.4	3.0	5.4	1.2	1.3	4.1	9.9
3	1.2	7.5	1.2	7.2	6.0	3.2	2.5	4.8	* 1.1	1.3	3.6	6.2
4	1.1	7.8	1.0	7.2	6.3	2.9	* 2.4	4.0	6.9	1.3	3.4	6.2
5	1.1	7.8	9.2	b 7	4.2	b 2.5	1.6	2.7	5.1	1.4	3.2	6.6
6	1.1	8.2	* 1.0	b 7	* 4.2	* b 3	1.5	4.2	4.8	1.6	3.2	7.0
7	1.0	8.9	1.1	b 7	4.2	* b 2.5	1.3	5.9	4.8	1.6	3.2	7.8
8	1.1	9.2	9.2	* b 7	4.2	2.1	1.1	* 3.4	4.5	1.1	3.4	7.4
9	1.0	1.0	9.2	b 7	4.5	3.3	1.1	3.2	5.7	7.8	4.1	7.8
10	9.6	1.0	9.2	b 7	5.7	8.2	1.1	2.9	3.7	6.2	5.5	9.6
11	1.0	1.0	8.9	b 6	b 5	1.1	8.6	2.9	4.5	5.5	5.2	1.2
12	1.0	8.9	8.9	b 4	b 5	1.4	8.9	4.0	5.4	6.2	5.8	1.3
13	7.8	8.6	8.2	b 4	b 5	1.2	8.2	4.2	5.4	5.5	* 8.4	1.4
14	9.2	9.6	7.8	b 5	b 8	1.0	9.6	4.2	5.7	4.9	1.1	1.5
15	7.5	1.0	7.8	b 6	b 1.0	1.0	7.5	5.7	5.1	3.9	1.3	1.3
16	7.5	* 1.2	7.8	b 7	9.6	9.6	4.0	6.0	* 7.6	* 3.0	1.3	1.4
17	9.2	1.4	* 7.5	b 7	b 9	9.6	* 4.5	6.3	3.5	3.0	1.1	1.2
18	8.6	1.4	8.9	b 8	b 7	9.6	2.9	6.3	2.0	3.0	1.1	1.1
19	1.1	b 1.3	8.2	b 7	b 5	1.1	2.1	9.6	1.5	2.9	9.6	* 1.2
20	9.2	b 1.2	7.8	b 6	* 4.5	* 1.3	3.7	8.2	* 1.3	3.8	9.1	1.7
21	8.9	b 1.8	7.8	b 8	5.7	1.4	1.0	* 8.9	1.5	4.9	8.7	8.0
22	9.2	1.8	7.2	b 1.2	b 5	1.4	4.2	1.1	1.6	3.6	7.8	1.8
23	* 9.2	1.6	7.5	b 1.0	b 5	1.5	2.9	1.3	1.6	2.6	7.4	1.2
24	9.6	1.3	8.2	b 9	b 5	1.5	3.7	1.1	1.5	2.6	1.1	1.1
25	9.6	1.3	9.2	* b 1.5	6.0	1.6	5.7	1.0	1.4	2.8	9.6	1.2
26	9.2	1.3	b 6	b 1.4	8.3	1.8	5.4	7.2	1.2	2.8	* 1.4	1.1
27	9.2	1.3	b 7	b 1.2	2.0	2.0	5.4	5.1	1.3	2.8	2.0	7.8
28	9.6	1.2	b 8	b 2.0	1.4	2.0	5.4	4.0	1.4	3.0	1.5	4.4
29	8.6	1.2	b 8	3.6	-	2.2	5.4	3.4	1.4	2.8	1.6	3.4
30	7.5	1.2	b 7	1.0	-----	3.4	5.4	3.2	1.3	2.6	1.9	3.2
31	6.6	-----	b 7	6.3	-----	3.1	-----	2.9	-----	3.4	2.0	-----
Total	295.8	335.6	270.5	282.7	185.4	366.4	298.5	178.7	390.7	198.6	283.4	379.3
Mean	9.54	11.2	8.73	9.12	6.62	11.8	9.95	5.76	13.0	6.41	9.14	12.6
Ac-ft	587	666	537	561	368	727	592	354	775	394	562	752

Calendar year 1962: Max 177 Min 5 Mean 26.7 Ac-ft 19,300  
Water year 1962-63: Max 80 Min 2.1 Mean 9.49 Ac-ft 6,880

Peak discharge (base, 300 cfs).--June 16 (1145) 991 cfs (8.33 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

29

7-2156. Cebolla River near Golondrinas, N. Mex.

Location.--Lat 35°53'15", long 105°13'45", in Mora Grant, on right bank about 50 ft downstream from ford on State Highway 160 and 2 $\frac{1}{4}$  miles west of Golondrinas, Mora County.

Drainage area.--64 sq mi.

Records available.--June 1956 to September 1963 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 6,690 ft (by barometer).

Average discharge.--7 years, 5.84 cfs (4,230 acre-ft per year).

Extremes.--Maximum discharge during year, 140 cfs July 8 (gage height, 3.96 ft); minimum daily, 0.1 cfs May 7, 8, 11-16, 18, Sept. 27.

1956-63: Maximum discharge, 1,390 cfs Oct. 19, 1957, from rating curve extended above 150 cfs on basis of contracted-opening measurement at gage height 5.30 ft; maximum gage height, 6.35 ft Aug. 18, 1961, minimum daily, that of May 7, 8, 11-16, 18, Sept. 27, 1963.

A major flood probably occurred in August 1952; discharge, about 9,300 cfs (gage height, about 11.8 ft, from old floodmark), by slope-area measurement of June 1956.

Remarks.--Records fair except those for periods of ice effect and those below 1 cfs, which are poor. Diversions for irrigation of about 3,200 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 17

June 18 to Sept. 30

1.5	0.1	1.8	3.1	1.6	0.04	1.9	3.0	2.7	28
1.6	.3	2.1	9.5	1.7	.2	2.1	9.0		
1.7	1.0	2.5	21	1.8	1.0	2.3	15		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	1.2	2.3	b1.8	3.1	2.5	2.5	1.2	2.7	0.3	0.3	1.2
2	*1.0	1.2	2.0	b1.8	2.5	b2.3	2.3	.9	1.2	.3	.2	1.0
3	.9	1.2	2.0	2.0	1.6	2.7	*2.0	.8	.6	.3	.2	1.0
4	.9	1.4	*2.0	2.3	1.8	2.9	2.0	.6	.4	.3	.2	1.0
5	1.0	1.4	1.8	2.0	1.6	b2.3	2.3	.4	*.4	*.3	.3	1.2
6	.9	1.4	1.8	b1.8	*1.8	*b2.0	2.3	.2	.4	.3	.3	1.2
7	1.0	1.4	1.8	b1.8	1.6	b1.8	1.0	*.1	.4	.3	.3	1.0
8	1.0	1.4	1.8	*b1.8	1.6	2.5	1.0	.1	.4	1.8	.6	1.0
9	1.0	1.4	1.6	1.6	1.8	2.9	1.0	.2	.4	1.3	.7	.8
10	.9	1.4	1.6	1.8	1.6	3.5	1.0	.2	.4	1.4	.7	.4
11	.9	1.2	1.8	b1.5	b1.2	3.1	1.0	.1	.4	1.0	.7	.4
12	.9	1.4	1.8	b1	b1.2	2.7	1.0	.1	.4	1.8	.6	.4
13	.9	1.4	1.8	b1	b1.2	2.9	1.2	.1	.4	1.0	1.2	.4
14	.9	*1.4	1.8	b1.2	b1.5	3.1	1.4	.1	.4	1.0	*1.0	.4
15	.9	1.4	1.6	b1.4	b1.5	2.7	1.2	.1	.4	1.0	.6	.3
16	.9	1.4	1.8	1.4	2.0	2.3	1.0	.1	1.6	.8	.3	.4
17	.9	1.6	1.8	1.6	b1.8	2.5	*1.2	.2	8.1	.7	.2	*.4
18	.9	1.8	*2.3	1.4	b1.8	2.9	1.6	.1	1.6	.7	.4	.5
19	1.0	b1.5	2.0	1.4	2.3	2.0	1.6	.2	.7	.6	.3	.5
20	.9	2.0	2.0	b1.2	*2.3	*2.7	1.6	.3	1.6	.6	.3	5.3
21	.9	2.5	1.8	1.6	2.5	2.7	1.6	.3	*.8	.5	.4	2.7
22	.9	2.3	1.6	1.8	b2.0	2.7	1.0	*.3	.5	.5	.6	5.1
23	1.0	1.8	1.6	1.8	b2.0	2.5	1.2	.2	.4	.5	.7	1.2
24	1.2	1.8	1.8	b1.5	2.3	2.5	1.2	.2	.3	.6	6.8	.2
25	1.2	1.8	1.8	*1.8	2.5	2.5	1.2	.2	.2	*.6	2.0	.2
26	1.2	1.8	b1.5	2.0	2.5	2.5	1.2	.2	.2	.5	1.6	.2
27	1.2	1.8	b1.5	b1.5	2.9	2.5	1.0	.2	.2	.5	1.4	.1
28	1.2	1.6	1.6	b2.0	2.9	2.5	1.0	.3	.3	.6	1.4	.2
29	1.2	1.8	b1.5	2.7	-	2.3	1.0	.4	.3	.4	5.2	.2
30	1.2	2.3	b1.5	2.9	-----	2.7	1.0	.4	.3	.2	2.0	.3
31	1.2	-----	1.8	3.3	-----	2.7	-----	.4	-----	.2	1.4	-----
Total	31.3	48.0	55.4	54.7	55.4	80.4	41.6	9.2	40.8	48.8	32.9	53.5
Mean	1.01	1.60	1.79	1.76	1.98	2.59	1.39	0.30	1.36	1.57	1.06	1.78
Ac-ft	62	95	110	108	110	159	83	18	81	97	65	106

Calendar year 1962: Max 37 Min 0.2 Mean 2.90 Ac-ft 2,100  
 Water year 1962-63: Max 27 Min 0.1 Mean 1.51 Ac-ft 1,090

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-16	1620	3.88	129	9-20	2330	3.78	116
7- 8	1940	3.96	140				

\* Discharge measurement made on this day.  
 b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2165. Mora River near Golondrinas, N. Mex.

Location.--Lat 35°53'40", long 105°09'30", in Mora Grant, at downstream end of left abutment of highway bridge, 1.2 miles upstream from Coyote Creek, 2 miles east of Golondrinas, Mora County, and 4 miles downstream from Cebolla River.

Drainage area.--267 sq mi.

Records available.--March 1915 to May 1921, October 1921 to March 1922, May, August to September 1922, July 1923 to July 1924, December 1924 to September 1963. Monthly discharge only 1915-30, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map). Mar. 10, 1915, to June 4, 1921, water-stage recorder at site  $3\frac{1}{2}$  miles upstream at different datum. July 6, 1921, to Jan. 5, 1929, staff gage or water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--46 years (1915-20, 1921-22, 1923-63), 35.5 cfs (25,700 acre-ft per year).

Extremes.--Maximum discharge during year, 558 cfs July 8 (gage height, 5.12 ft); minimum, 0.7 cfs May 11, Aug. 6-9.

1915-63: Maximum discharge, 14,000 cfs Aug. 22, 1952 (gage height, 14.4 ft), from rating curve extended above 700 cfs on basis of slope-area measurement of peak flow; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 25,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 12,000 acres above station.

Rating table, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 7 to Sept. 13)

1.3	0.4	1.5	2.1	1.8	9.1	2.4	40
1.4	1.0	1.6	3.9	2.1	21	2.8	75

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	8.2	16	10	9.8	9.8	29	1.8	3.6	1.2	0.8	12
2	*14	8.8	17	10	8.2	8.8	30	2.1	13	1.4	.8	7.6
3	15	8.8	16	10	7.9	8.2	*29	1.7	9.8	1.3	.9	5.7
4	14	9.4	*14	10	9.4	7.9	25	1.6	*7.9	1.2	.9	4.6
5	13	9.1	13	9	7.6	9.1	19	1.6	*5.7	*1.2	.9	5.1
6	12	9.1	14	9	*7.4	*8.2	16	1.5	5.7	1.2	.7	6.0
7	13	11	13	*9	6.8	7.6	15	*1.4	4.4	2.8	.7	7.4
8	13	11	12	9	6.5	7.4	13	1.3	3.7	5.6	.7	6.8
9	12	12	12	10	6.5	7.4	10	.9	3.5	2.9	*.7	6.8
10	12	12	12	10	7.4	10	8.8	.9	3.3	3.9	.9	7.4
11	10	12	11	9	8	12	6.2	.9	2.4	2.1	1.0	6.8
12	8.8	12	11	7	7	16	5.0	.9	2.1	3.6	1.0	7.4
13	8.8	11	12	6	6	18	4.8	.9	2.0	1.7	1.2	7.4
14	5.7	*10	10	7	12	14	4.6	1.1	1.7	1.5	3.1	9.4
15	6.5	11	10	8	13	13	4.6	1.1	1.6	1.4	3.1	9.1
16	6.8	9.8	10	9	10	11	3.3	1.2	6.3	1.3	3.9	9.8
17	7.1	14	9.8	9	10	13	*2.1	1.2	3.4	1.3	4.1	*10
18	6.8	15	*11	10	*10	*13	2.3	1.3	1.2	*1.3	5.7	8.5
19	7.9	15	11	10	10	13	1.7	1.5	7.9	1.3	5.5	8.5
20	9.8	18	10	9	10	17	1.3	*3.5	7.4	1.3	4.4	10
21	8.8	21	10	10	9.8	17	1.2	2.1	5.5	1.2	4.4	7.4
22	9.1	22	9.4	12	9.1	17	2.0	2.1	3.9	1.1	3.7	3.4
23	9.8	19	9.8	17	10	16	1.8	4.6	3.1	1.1	*4.1	18
24	10	17	11	14	9.1	17	1.4	5.7	3.3	1.1	8.4	15
25	11	16	11	30	8.8	17	1.6	4.8	2.9	1.2	9.8	13
26	11	16	9	32	9.4	17	1.4	3.9	2.6	1.1	8.2	13
27	11	16	9	31	12	18	1.2	2.9	2.0	1.1	10	12
28	11	15	10	34	26	19	1.0	2.0	2.4	1.0	9.4	8.5
29	10	15	10	30	-	20	1.7	1.7	2.0	.9	18	7.6
30	9.4	15	10	36	-	27	2.1	1.4	1.4	.9	13	6.2
31	8.8	-	10	18	-	33	-	1.6	-	.9	13	-
Total	318.1	399.2	354.0	464	267.7	442.4	246.1	61.2	223.8	127.6	143.0	357.6
Mean	10.3	13.3	11.4	15.0	9.56	14.3	8.20	1.97	7.46	4.12	4.61	11.9
Ac-ft	631	792	702	920	531	877	488	121	444	253	284	709

Calendar year 1962: Max 200 Min 4.7 Mean 26.8 Ac-ft 19,370  
Water year 1962-63: Max 74 Min 0.7 Mean 9.33 Ac-ft 6,750

Peak discharge (base, 400 cfs).--July 8 (2100) 558 cfs (5.12 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Nov. 19, 20, Dec. 25-Jan. 3, Jan. 5-25 (no gage-height record Jan. 12-21) Feb. 11-19.

ARKANSAS RIVER BASIN

31

7-2170. Coyote Creek below Black Lake, N. Mex.

Location.--Lat 36°16'20", long 105°14'50", in NW¼ sec.33, T.14 N., R.16 E., on right bank 150 ft downstream from road crossing, a quarter of a mile downstream from Black Lake, 2 miles south of Black Lake Village, and 12 miles south of Agua Fria.

Drainage area.--48 sq mi.

Records available.--December 1952 to September 1963 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 8,450 ft (from topographic map).

Average discharge.--10 years (1953-63), 4.62 cfs (3,340 acre-ft per year).

Extremes.--Maximum discharge during year, 30 cfs Mar. 24 (gage height, 2.28 ft); minimum, no flow at times July 8, 14.  
1953-63: Maximum discharge, 913 cfs June 8, 1958 (gage height, 4.70 ft), from rating curve extended above 110 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records good except those for periods of ice effect, which are fair. Small amount of regulation possible at open flume in outlet from Black Lake. Diversions for irrigation of several hundred acres above station. Surface waste from one small ditch may enter stream between station and Black Lake.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 18-21, Feb. 1-21, Apr. 4-14)

0.6	0.1	1.2	4.0
.7	.2	1.4	6.8
.8	.6	1.6	10
.9	1.1	2.0	21
1.0	1.9	2.4	35

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	1.0	3.5	1.8	7.3	1.9	8.1	*1.3	0.1	*0.1	0.1	1.2
2	2.5	1.0	3.8	1.8	5.5	1.9	6.8	.8	.2	.1	.1	.9
3	2.6	1.1	b 3.5	1.8	5.4	1.9	7	.3	.2	.1	.1	.6
4	2.6	1.3	b 3	1.9	7.7	1.9	7.0	.2	.1	.1	.2	.4
5	2.5	1.7	b 2.5	1.8	b 9	3.0	6.2	.4	.1	.2	.1	.4
6	2.5	2.0	2.8	1.7	b 7	2.2	6.2	1.1	.1	.1	.1	.3
7	2.4	* 2.1	* 2.7	1.7	b 6	1.9	6.2	.2	.1	.1	.1	.2
8	2.1	2.2	2.8	1.7	*b 6	1.8	6.2	.2	.1	.1	.1	.2
9	* 2.2	2.4	2.7	1.6	6.2	1.9	* 5.9	.1	.1	.1	.1	.2
10	2.0	2.5	2.7	* 1.6	b 6	b 2.5	5.5	.1	.1	.1	.1	*.2
11	2.0	2.5	2.6	b 2.0	b 5.5	b 2.5	4.1	.1	.1	.1	.1	.3
12	1.8	2.3	2.6	b 1.5	5.6	b 2.5	2.0	.1	.1	.1	.1	.3
13	1.7	2.3	2.7	b 1.5	5.1	b 2.5	1.7	.1	*.1	.1	.1	.3
14	1.7	2.3	2.6	1.5	4.5	b 2.5	1.7	.1	.1	.1	.1	.3
15	2.2	2.8	2.7	1.3	4.0	*b 2.5	1.4	.1	.1	.1	.2	.4
16	4.7	3.0	2.7	1.1	3.8	b 2.5	2.5	.1	.1	.1	.2	.4
17	6.8	3.4	2.8	1.1	3.4	b 2.5	3.5	.1	.1	.1	.2	.3
18	* 6.7	3.5	3.0	1.0	3.1	2.4	4.0	.1	.1	.1	1.4	.3
19	6.1	3.3	3.4	.9	2.8	2.4	4.5	.1	.1	.1	2.3	.2
20	5.4	3.4	3.3	.8	2.3	2.8	4.0	.1	.1	.1	1.4	.4
21	4.8	3.7	b 3	.8	2.1	6.1	4.0	.1	.1	.1	.8	8.8
22	4.5	3.9	b 3	.8	2.0	8.6	3.9	.1	.1	*.1	.7	16
23	3.5	4.0	b 2.5	.9	1.9	1.3	2.8	.1	.1	.1	.4	9.9
24	2.2	4.1	2.5	.8	1.9	2.8	2.3	.1	.1	.1	.4	6.7
25	1.7	4.0	3.0	.8	1.9	2.3	2.0	.1	.1	.1	.4	5.1
26	1.3	4.1	3.0	.8	2.0	2.0	1.7	.1	.1	.1	1.4	3.9
27	1.3	4.0	2.7	.7	2.3	1.6	1.8	.2	.1	.1	1.8	2.0
28	1.1	3.7	2.3	.6	2.1	1.4	2.0	.1	.1	.1	1.3	.4
29	1.0	3.4	2.1	.7	-	1.3	1.7	.1	.1	.1	.9	.2
30	1.0	3.4	2.1	1.0	-----	1.1	1.4	.2	.1	.1	.9	.2
31	1.0	-----	1.9	4.4	-----	9.4	-----	.2	-----	*.1	1.2	-----
Total	86.7	84.4	86.5	42.4	121.4	208.1	118.1	7.1	3.2	3.2	17.4	61.0
Mean	2.80	2.81	2.79	1.37	4.34	6.71	3.94	0.23	0.11	0.10	0.56	2.03
Ac-ft	172	167	172	84	241	413	234	14	6.3	6.3	35	121

Calendar year 1962: Max 83 Min 0.2 Mean 8.93 Ac-ft 6,470  
Water year 1962-63: Max 28 Min 0.1 Mean 2.30 Ac-ft 1,670

Peak discharge (base, 15 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1-31	1440	1.80	19	4-3	0730	2.16	28
3-24	1200	2.28	30	9-22	0530	1.97	18

\* Discharge measurement made on this day.  
b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2171. Coyote Creek above Guadalupita, N. Mex.

Location.--Lat 36°10'30", long 105°13'35", in Mora Grant, on right bank 1½ miles north of Guadalupita, Mora County.Drainage area.--71 sq mi.Records available.--May 1956 to September 1963.Gage.--Water-stage recorder. Altitude of gage is 7,700 ft (from topographic map).Average discharge.--7 years, 10.1 cfs (7,310 acre-ft per year).Extremes.--Maximum discharge during year, 54 cfs Sept. 20 (gage height, 2.39 ft); minimum, 0.04 cfs June 16.

1956-63: Maximum discharge, 1,390 cfs June 6, 1958 (gage height, 6.08 ft), from rating curve extended above 150 cfs by logarithmic plotting; minimum, that of June 16, 1963.

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.26	0.1	1.6	5.8
1.3	.3	1.7	9.4
1.4	1.0	1.9	19
1.5	2.8	2.1	32

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.6	2.6	4.9	b 2.5	b 1.0	3.4	1.5	3.1	1.2	* 0.4	0.6	3.4
2	4.0	2.4	2.1	b 2.5	b 9	b 3	1.4	2.6	1.5	.5	.5	2.4
3	* 4.0	2.6	1.5	2.6	b 7.5	b 3	* 1.2	2.3	1.4	.5	.5	2.1
4	4.0	2.6	3.7	2.8	b 8.5	b 3	1.1	1.9	1.0	.6	.6	2.1
5	4.0	2.8	* 3.1	b 2.5	* b 9	* b 3	9.8	1.7	* 1.0	.8	.6	1.7
6	4.0	3.1	3.7	b 2.5	b 8	b 3.5	8.7	1.9	1.0	1.4	.5	1.7
7	3.7	3.7	3.4	b 2.5	b 7.5	b 3.5	8.7	* 2.1	.9	1.2	.2	1.5
8	3.7	3.7	3.4	* b 2.5	b 7	b 4.5	8.0	1.7	.5	1.2	.6	1.2
9	3.4	4.0	3.4	b 2.5	b 6.5	b 4.5	8.0	1.5	.6	1.7	.6	1.2
10	3.4	4.0	3.1	b 2	b 6.5	b 4.5	7.2	1.5	.7	1.2	1.4	1.4
11	3.1	4.0	3.1	b 2.5	b 6	b 4.5	6.5	1.4	.7	.9	1.2	2.3
12	3.1	4.0	3.7	b 2	b 6	b 4.5	4.9	1.4	.8	.6	1.5	1.9
13	3.1	4.0	3.4	b 2	b 5.5	b 4.5	3.4	1.4	.8	.6	* 1.7	1.7
14	3.1	4.0	3.4	b 2	b 5	b 4.5	2.8	1.0	.6	.6	1.7	1.5
15	3.4	* 4.3	3.7	b 2	b 5	b 4.5	2.6	1.2	.1	.6	1.7	1.7
16	4.9	4.6	3.4	b 2	b 4.5	5.8	* 2.6	1.2	.3	.6	1.9	1.5
17	8.3	4.9	* 4.3	b 2	b 4.5	5.8	4.0	1.2	.6	.6	1.9	1.4
18	8.3	4.6	4.6	b 2	b 4.5	6.5	5.2	1.2	.7	.6	2.6	* 1.4
19	8.3	b 5.2	4.9	b 2	* b 4	* 5.8	5.8	1.2	.5	.6	3.7	1.4
20	7.6	5.5	4.3	b 2	b 3.5	6.5	6.2	* 1.2	.6	.5	3.1	6.5
21	6.9	5.8	3.7	b 2	b 3.5	7.6	5.8	1.2	.7	.5	2.6	1.8
22	6.5	5.8	3.1	b 2	b 3.5	9.8	5.8	1.5	.6	* .5	2.3	2.2
23	6.2	5.8	b 3	b 2	b 3	1.6	5.2	1.4	.6	.5	1.9	1.7
24	4.6	6.2	b 3	* b 2	b 3	2.9	4.3	1.2	.6	.5	2.7	1.3
25	3.7	5.8	b 3	b 2	b 3	3.0	4.0	1.0	.5	.6	6.9	1.1
26	3.1	5.8	b 3	b 2	b 3	2.6	3.7	1.0	.4	.7	4.9	8.7
27	2.8	5.8	b 2.5	b 2	4.0	2.3	3.4	.9	.4	.7	4.6	7.2
28	2.8	5.2	b 2.5	b 2	4.0	2.1	3.4	.9	.5	.7	4.0	4.6
29	2.6	4.6	b 3	2.3	-	2.0	3.7	.9	.5	.7	4.0	3.1
30	2.6	4.9	b 3	3.1	-----	1.8	3.4	1.0	.4	.7	4.3	2.4
31	2.6	-----	b 3	b 5.5	-----	1.7	-----	1.4	-----	.6	2.6	-----
Total	136.4	132.3	103.9	72.3	155.0	306.2	189.1	45.1	20.7	22.4	67.9	147.0
Mean	4.40	4.41	3.35	2.33	5.54	9.88	6.30	1.45	0.69	0.72	2.19	4.90
Ac-ft	271	262	206	143	307	607	375	89	41	44	135	292

Calendar year 1962: Max 101 Min 1.2 Mean 11.6 Ac-ft 8,420  
 Water year 1962-63: Max 30 Min 0.1 Mean 3.83 Ac-ft 2,770

Peak discharge (base, 100 cfs).--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

# ARKANSAS RIVER BASIN

33

7-2180. Coyote Creek near Golondrinas, N. Mex.

Location.--Lat 35°54'40", long 105°09'50", in Mora Grant, on left bank a third of a mile downstream from Coyote Creek damsite, 2 miles upstream from mouth, and 2 miles northeast of Golondrinas.

Drainage area.--215 sq mi.

Records available.--April 1928 to September 1963. Prior to October 1930 monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,820 ft (from topographic map). Prior to Apr. 26, 1938, at site 0.4 mile downstream at different datum (staff gage prior to Apr. 20, 1929). Apr. 26, 1938, to Sept. 25, 1946, at site 139 ft downstream at same datum.

Average discharge.--35 years, 12.0 cfs (8,690 acre-ft per year).

Extremes.--Maximum discharge during year, 99 cfs Aug. 13 (gage height, 3.24 ft); minimum, 0.3 cfs Aug. 12.

1928-63: Maximum discharge, 4,050 cfs Aug. 17, 1961 (gage height, 9.60 ft), from rating curve extended above 245 cfs on basis of slope-area measurements at gage heights 5.54, 7.74, and 9.60 ft; maximum gage height, 10.1 ft Aug. 30, 1936 (site and datum then in use); no flow Aug. 4, 1945, Apr. 10, May 9, 10, 1956.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions (including off-channel storage) for irrigation of about 4,000 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 17

Dec. 18 to Sept. 30

1.9	0.6	1.6	0.4	2.0	6.5
2.0	3.0	1.7	1.0	2.1	9.0
2.1	6.0	1.8	2.5	2.3	16
2.3	14	1.9	4.5	2.5	25

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	3.0	9.5	b 9.5	9.3	1.0	6.1	1.0	4.7	0.5	.8	3.9
2	* 3.6	3.0	8.4	b 9	1.0	b 1.0	4.5	1.3	7.4	.6	.6	2.0
3	3.6	3.3	7.0	b 9	1.0	1.0	* 4.3	1.4	2.0	.5	.7	1.4
4	4.2	3.0	* 6.0	9.0	9.9	1.0	4.3	1.4	* 1.0	.5	.8	1.3
5	3.9	3.3	7.0	b 1.0	1.0	b 9	4.5	1.4	.9	*.5	.7	1.2
6	3.6	3.6	b 7	b 1.0	* 1.1	* b 8.5	4.5	1.3	.8	.6	*.7	1.4
7	3.3	3.6	5.4	b 1.1	1.1	b 8	5.1	*.8	.8	.6	.6	1.6
8	3.3	3.9	5.1	* b 1.0	1.0	8.2	3.7	.7	.8	1.4	.6	1.8
9	3.0	3.9	a 5	b 1.0	9.6	8.2	2.7	.7	.7	1.9	*.5	1.6
10	2.8	4.2	a 4.5	b 1.0	1.2	8.5	2.4	.6	.7	.8	.4	1.4
11	2.5	3.9	a 4.5	b 1.1	b 9	8.5	1.6	.5	.7	.7	.4	1.6
12	2.5	3.9	a 5.5	b 9	b 8	9.0	1.0	.5	.7	.7	5.2	1.3
13	2.5	4.2	a 5	b 7	b 8	8.8	.8	.7	.7	.7	1.8	1.2
14	2.5	* 4.2	a 5	b 7	b 8.5	8.0	.7	.7	.7	.7	1.9	8.6
15	2.8	4.2	a 6	b 8	b 9	7.8	.6	.5	.7	.7	2.0	2.7
16	2.3	5.1	a 5.5	b 8	b 9	7.5	*.7	.4	1.6	.6	1.2	2.0
17	2.3	b 6	a 7	b 8.5	b 1.0	7.0	.6	.4	1.4	.7	.5	* 1.8
18	2.3	7.0	* 8.8	b 8.5	* b 1.1	* 6.3	.7	.5	1.2	*.8	.5	1.6
19	2.3	b 6	8.2	a 8	b 1.1	b 6	.7	.5	2.4	.8	.5	1.3
20	2.0	b 7	7.5	a 8	1.0	5.7	.7	*.8	1.2	.9	.4	2.7
21	1.8	1.0	7.8	a 8	1.1	6.1	.8	.8	1.2	.9	.4	2.1
22	2.0	9.9	7.5	* b 8.5	b 1.0	6.3	.8	.9	1.0	.9	.5	9.6
23	2.0	8.8	b 7.5	b 7.5	b 1.0	6.5	.8	.8	.8	.9	*.5	9.3
24	2.3	7.8	b 7.5	a 8	1.0	9.9	.7	.8	.8	.9	8.9	6.8
25	2.8	7.0	8.0	a 7.5	1.0	1.8	.7	.6	.8	1.0	8.0	5.5
26	5.4	7.4	b 7	a 7.5	1.0	1.6	.7	.6	.8	1.2	5.9	4.3
27	3.9	7.0	b 7	a 8	9.6	1.2	.7	.8	.8	1.2	4.1	3.5
28	3.3	8.4	b 7.5	a 8.5	b 1.0	9.6	.7	.8	.9	.9	2.7	2.9
29	3.6	8.4	b 8.5	a 8.5	-	8.5	.7	.7	.5	.9	5.2	2.9
30	3.3	8.4	b 9.5	a 8.5	-----	7.0	.8	.7	.5	.8	3.5	2.9
31	3.0	-----	b 9.5	a 9	-----	5.7	-----	.7	-----	.8	3.3	-----
Total	92.6	169.4	215.2	270.0	276.9	270.6	57.6	24.3	39.1	25.6	97.1	111.1
Mean	2.99	5.65	6.94	8.71	9.89	8.73	1.92	0.78	1.30	0.83	3.13	3.70
Ac-ft	184	336	427	536	549	537	114	48	78	51	193	220

Calendar year 1962: Max 188 Min 0.6 Mean 14.0 Ac-ft 10,170  
Water year 1962-63: Max 21 Min 0.4 Mean 4.52 Ac-ft 3,270

Peak discharge (base, 180 cfs). --No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2181. Mora River near Watrous, N. Mex.

**Location.**--Lat 35°50'05", long 105°02'22", in Mora Grant, on right bank  $4\frac{1}{2}$  miles northwest of Watrous, Mora County, 5 miles upstream from Sapello River.

**Drainage area.**--521 sq mi.

**Records available.**--August 1956 to September 1963 (discontinued).

**Gage.**--Water-stage recorder. Altitude of gage is 6,480 ft (from topographic map).

**Average discharge.**--7 years, 54.2 cfs (39,240 acre-ft per year).

**Extremes.**--Maximum discharge during year, 805 cfs July 8 (gage height, 4.37 ft); minimum daily, 0.3 cfs Aug. 7-8.

1956-63: Maximum discharge, 7,050 cfs July 8, 1962, from rating curve extended above 700 cfs on basis of slope-area measurements at gage heights 6.10, 7.36 and 9.98 ft; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 25,000 cfs.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 17,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	0.3	2.2	31
1.5	.8	2.5	78
1.6	1.7	2.8	147
1.7	3.4	3.1	240
1.9	9.6		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	11	24	b 15	a 20	26	* 34	1.4	1.3	1.1	0.4	16
2	17	11	24	b 15	a 19	18	31	1.4	20	a 1.3	.4	11
3	16	11	* 23	b 17	a 18	21	30	1.2	13	a 1.3	.4	7.8
4	* 16	12	21	b 17	* 18	* 20	28	.9	* 8.5	a 1.3	.4	4.9
5	15	13	19	b 17	19	b 15	27	1.9	5.6	* 1.4	.4	3.9
6	14	13	19	b 17	16	b 15	22	* 1.6	3.9	1.1	.4	3.6
7	14	14	18	* b 17	18	b 15	21	1.4	3.2	.8	.3	5.1
8	14	15	18	b 17	17	17	19	.8	2.9	5.9	.3	7.0
9	13	16	b 15	a 17	16	15	16	.8	2.5	16.2	*.4	5.6
10	11	17	b 15	a 17	18	16	13	.6	2.2	9.9	.4	5.4
11	10	17	b 15	a 10	b 15	21	11	.6	2.2	4.4	2.3	5.9
12	10	17	b 15	a 5	b 10	23	7.4	.5	1.4	9.6	2.9	5.6
13	8.9	* 16	b 15	a 5	b 10	26	6.3	.6	1.1	8.4	5.6	5.4
14	10	16	b 15	a 6	b 12	23	5.9	.6	1.0	2.7	6.3	10
15	7.8	16	b 15	a 7	b 15	22	* 5.9	.6	1.0	2.1	9.2	10
16	8.9	16	b 15	a 9	b 15	18	4.9	.8	7.5	1.6	8.1	9.2
17	8.9	20	b 15	a 10	b 15	19	3.9	.7	7.7	1.2	7.0	* 8.9
18	8.9	21	17	a 10	* b 20	* 19	2.0	.6	1.8	*.9	6.3	8.1
19	9.2	b 19	18	a 10	b 20	17	.6	.6	6.2	.8	5.6	6.6
20	11	b 20	17	a 10	b 17	19	.6	*.6	1.3	2.2	* 5.1	6.3
21	11	28	16	a 12	b 15	21	1.2	1.5	7.8	1.7	4.9	20.1
22	9.2	35	b 15	a 15	b 15	22	.6	4.6	5.1	1.1	3.9	8.3
23	11	28	b 15	a 15	b 15	22	.6	2.6	4.1	.7	2.4	3.4
24	11	26	b 15	a 12	b 15	24	.7	2.8	3.2	.6	2.5	2.4
25	11	24	b 12	a 15	b 15	31	.8	3.0	2.4	.7	2.1	2.0
26	13	23	b 10	a 15	b 15	35	.7	3.0	1.6	.7	9.2	17
27	14	22	b 15	a 12	21	31	.8	2.4	1.2	.7	1.3	14
28	13	22	b 15	a 12	36	29	.6	1.6	1.2	.6	1.0	13
29	13	22	b 15	a 15	-	28	.8	1.5	.9	.6	7.1	9.6
30	12	23	b 15	a 17	-----	30	.9	1.6	1.1	.5	3.0	8.9
31	11	-----	b 15	a 19	-----	36	-----	1.6	-----	.5	1.8	-----
Total	368.8	564	511	407	475	694	297.2	57.9	343.4	281.5	248.1	570.8
Mean	11.9	18.8	16.5	13.1	17.0	22.4	9.91	1.87	11.4	9.08	8.00	19.0
Ac-ft	732	1,120	1,010	807	942	1,380	589	115	681	558	492	1,130

Calendar year 1962: Max 634 Min 5.1 Mean 46.0 Ac-ft 33,290  
 Water year 1962-63: Max 201 Min 0.3 Mean 13.2 Ac-ft 9,560

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-16	1415	4.00	620	9-21	0115	4.12	680
7-8	2220	4.37	805				

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

ARKANSAS RIVER BASIN

35

7-2186. Sapello Canal at Sapello, N. Mex.

Location.--Lat 35°46'10", long 105°15'00", in Las Vegas Grant, on right bank 20 ft downstream from highway crossing in Sapello, San Miguel County.

Records available. --June 1956 to September 1963.

Gage.--Water-stage recorder and Parshall flume Altitude of gage is 7,010 ft (from topographic map).

Extremes. --1956-63: Maximum daily discharge, 2.8 cfs June 1, 1957; no flow for long periods each year.

Remarks.--Records good. Canal diverts water from right bank of Sapello River for irrigation of land downstream from Sapello River gage (see p 37).

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	0.1	0	0.02	1.0
November . . . . .	0	0	0	0
December . . . . .	.1	0	.01	.6
Calendar year 1962 . . . . .	0.7	0	0.09	64.0
January . . . . .	0	0	0	0
February . . . . .	0	0	0	0
March . . . . .	0	0	0	0
April . . . . .	.3	0	.08	5.0
May . . . . .	.2	0	.10	6.3
June . . . . .	.6	0	.26	15
July . . . . .	.4	.1	.23	14
August . . . . .	.3	.1	.15	9.1
September . . . . .	.2	0	.13	7.5
Water year 1962-63 . . . . .	0.6	0	0.08	58.5



## ARKANSAS RIVER BASIN

7-2187. Manuelitas Creek near Rociada, N. Mex.

Location--Lat 35°49'30", long 105°23'55", in Mora Grant, on right bank about 300 ft downstream from road crossing and 1½ miles southeast of Rociada, San Miguel County.

Drainage area--52 sq mi.

Records available--June 1956 to September 1963 (discontinued).

Gage--Water-stage recorder. Altitude of gage is 7,350 ft (from topographic map).

Average discharge--7 years, 12.0 cfs (8,690 acre-ft per year).

Extremes--Maximum discharge during year, 451 cfs Sept. 20 (gage height, 4.27 ft); no flow June 29, July 1, Aug. 6-7.  
1956-63: Maximum discharge, 1,410 cfs Aug. 23, 1957 (gage height, 7.48 ft), from rating curve extended above 250 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 2,300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.93	0.04	1.2	1.6	1.5	6.0	2.2	43
1.0	.03	1.3	2.6	1.7	12	2.4	63
1.1	.9	1.4	4.0	2.0	28		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	1.3	2.7	b 2	b 3	b 4	8.9	0.5	0.5	0	0.1	1.6
2	2.2	1.2	2.5	b 2	2.4	b 4	* 6.0	.6	1.5	.1	.1	1.3
3	2.2	1.2	2.1	b 2	2.2	b 4	4.8	.4	1.1	.1	.1	1.1
4	2.0	1.1	1.8	b 2	2.4	b 4.5	5.2	.4	1.1	.1	.1	1.1
5	2.1	1.1	b 1.6	b 2	2.0	b 4.5	6.5	.4	1.0	.1	.1	1.1
6	1.9	1.0	b 1.5	b 2	* 1.9	b 4	6.5	.5	.7	.1	0	1.0
7	1.8	.8	b 1.5	b 2	1.8	b 4	5.8	.4	.5	.1	0	1.0
8	1.5	.9	b 1.5	b 2	1.7	b 4	5.8	.4	.4	.2	.1	.9
9	1.1	1.0	b 1.5	* b 1.5	1.9	b 5	4.6	.9	.2	.4	.1	.9
10	* 1.1	1.0	b 1.5	b 1.5	b 1.5	6.8	4.8	*.9	.1	.2	.1	1.0
11	1.0	.9	b 1.5	b 1	b 1	7.3	2.9	.4	.1	.2	.1	1.4
12	.9	.9	b 1.4	b 7	b 1	6.8	2.0	.3	.1	.2	.4	1.2
13	1.1	1.0	b 1.4	b .5	b 1	* 7.3	1.6	.3	.1	.3	1.0	4.6
14	1.1	.9	b 1.4	b .5	b 1.5	8	2.0	.3	*.1	.2	1.0	3.2
15	1.0	1.1	b 1.6	b 1	b 2	b 9	3.0	.4	.1	.2	.7	2.2
16	1.1	1.2	b 1.6	b 1	b 2.7	b 8	2.3	.3	.4	*.1	.5	2.0
17	1.4	1.3	b 1.6	b 1	b 2.7	8.9	1.7	.3	.4	.1	.6	1.6
18	1.7	1.7	b 3	b 1.5	b 2.7	6.5	1.4	.3	.3	.1	.7	1.4
19	1.9	2.1	3.0	b 1	b 3	7	1.2	.4	.3	.1	.8	1.3
20	1.8	b 2	* 2.6	b 1	b 3	6	.9	.6	.3	.1	.9	5.6
21	1.5	b 3	2.5	b 1.5	b 2.5	6.5	.8	.9	.3	.1	*.7	1.5
22	1.4	b 4	b 2	b 1.5	b 2.5	7.0	.7	.9	.3	.1	.5	5.0
23	1.4	b 3	b 2	b 1	b 2.5	7.8	.6	.7	.2	.1	.4	3.7
24	1.5	3.0	b 1.5	* b 1.5	b 3	8.1	.4	.7	.1	.1	.4	3.2
25	1.5	2.6	b 1.5	b 1.5	b 3	7.3	*.4	.7	.1	.1	.7	* 3.2
26	1.5	2.5	b 1.5	b 2	b 3.5	6.5	.4	.4	*.1	.1	1.4	3.0
27	1.7	2.3	b 1	b 3	* b 4	7.0	.4	.4	.1	.1	1.3	2.9
28	1.7	* 1.9	b 1	b 3.3	b 4	7.8	.4	*.4	.1	.1	.9	2.6
29	1.8	1.9	b 1.5	b 3.5	-	9.6	.4	.4	0	.1	1.0	2.5
30	1.9	2.3	b 1.5	b 3.5	-----	9.3	.4	.5	.1	.1	1.5	2.4
31	* 1.4	-----	b 2	b 3.2	-----	8.9	-----	.4	-----	*.1	1.9	-----
Total	48.3	50.2	55.3	53.7	66.4	205.4	82.8	15.4	10.7	4.1	18.2	129.4
Mean	1.56	1.67	1.78	1.73	2.37	6.63	2.76	0.50	0.36	0.13	0.59	4.31
Ac-ft	96	100	110	107	132	407	164	31	21	8.1	36	257
Calendar year 1962: Max 26 Min 0.8 Mean 4.92 Ac-ft 3,560												
Water year 1962-63: Max 56 Min 0 Mean 2.03 Ac-ft 1,470												

Peak discharge (base, 120 cfs).--Sept. 20 (2030) 451 cfs (4.27 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

37

7-2200. Sapello River at Sapello, N. Mex.

Location.--Lat 35°46'10", long 105°15'05", in Las Vegas Grant, on downstream end of bridge pier nearest left bank, on State Highway 3, in town of Sapello, half a mile downstream from Manuelitas Creek, San Miguel County.

Drainage area.--132 sq mi.

Records available.--May to October 1915, January 1916 to November 1918, February 1919 to May 1921, July to September 1921, July 1956 to September 1963. Monthly discharge only for some periods, published in WSP 1311. Gage heights and discharge measurements published under same name for August 1903 to March 1904 are for a site above Manuelitas Creek, and are not equivalent. Records for November to December 1915, December 1918, January 1919, and October 1921 to December 1928 have been found unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 6,910 ft (by barometer). May 1915 to September 1921, staff gage at site 300 ft upstream at different datum.

Average discharge.--12 years (1915-20, 1956-63), 27.3 cfs (19,760 acre-ft per year).

Extremes.--Maximum discharge during year, 1,020 cfs Aug. 24 (gage height, 3.70 ft); minimum, 0.09 cfs Aug. 23. 1915-20, 1956-63: Maximum discharge determined, 6,160 cfs Aug. 4, 1957 (gage height, 7.40 ft), from rating curve extended above 1,500 cfs on basis of computation of peak flow over dam; no flow at times.

Remarks.--Records good except those for periods of ice effect or doubtful gage-height record, which are fair. Diversions above station for irrigation of about 4,200 acres. Station is bypassed by Sapello Canal (see p 35).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.65	0.1	0.9	3.1	1.3	20
.7	.3	1.0	6.3	1.5	32
.8	1.0	1.1	10	1.8	61

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	3.7	4.3	b 3.5	b 3	b 5	1.4	2.4	4.8	0.4	0.2	1.2
2	3.4	3.4	4.6	b 4	b 3	b 6	*1.3	2.1	7.8	.2	.2	.7
3	3.4	3.1	4.0	4.9	b 3	7.0	1.1	2.4	2.8	.2	.2	.5
4	3.4	3.1	3.4	4.9	3.4	8.2	1.0	2.9	2.4	.2	.2	.4
5	3.4	2.8	3.1	b 4.5	3.1	b 7	1.1	2.6	1.7	.2	.2	.4
6	3.4	2.8	3.1	b 4	* 3.4	b 6	1.1	1.9	1.5	.2	.2	.5
7	3.4	2.8	3.1	b 4	4.0	b 5	1.0	2.1	1.5	3.6	.2	.5
8	3.1	2.8	3.1	b 4	3.4	b 5	8.9	2.4	1.5	8.6	.2	.5
9	3.1	2.8	b 3	* b 4	3.4	b 7	8.5	1.9	1.5	3.3	.2	.8
10	* 3.4	2.6	b 3	b 4	b 3	8.5	8.5	* 2.1	1.5	.4	.3	4.3
11	3.1	2.6	b 3	b 3	b 2	9.3	8.5	1.7	1.3	.4	.3	.6
12	3.1	2.6	b 2.5	b 2	b 2	1.0	7.4	1.5	1.3	3.5	.3	.5
13	3.1	2.6	b 2.5	b 1	b 2	* 9.3	6.3	1.5	1.3	.6	3.7	1.6
14	3.1	2.6	b 2.5	b 1.5	b 2	1.0	5.9	1.7	* 1.2	.4	1.7	3.7
15	3.1	2.6	b 3	b 2	b 3	1.1	5.6	1.7	1.0	.4	.3	1.3
16	3.1	3.1	3.1	b 2	b 3	b 9	5.9	1.5	1.7	* .3	.2	.6
17	3.1	3.4	3.1	b 2	b 3	1.1	5.2	1.5	1.5	.3	.2	.3
18	3.1	2.6	3.7	b 4	b 3	1.3	4.6	1.5	1.3	.3	.2	.3
19	3.4	3.1	4.0	b 3	b 4	8.5	3.7	1.9	1.1	.3	.1	.6
20	3.4	3.1	* 4.0	b 2	b 5	1.0	3.7	1.7	1.0	.3	.1	.6
21	3.4	3.1	4.0	b 2.5	b 4	1.0	4.0	4.8	.9	.3	* .1	6.0
22	3.7	3.7	b 3.5	b 3	b 3	1.1	3.4	2.6	.9	.3	.2	5.0
23	3.7	4.3	3.7	b 2.5	b 3	1.2	3.4	2.1	.9	.3	.1	2.3
24	3.7	4.3	4.0	* b 2.5	b 3	1.2	3.7	1.5	.8	.3	4.9	1.6
25	3.4	4.0	b 3.5	b 2	b 4	1.1	* 2.8	1.5	.8	.3	1.1	* 1.2
26	3.1	4.0	b 2.5	b 3	b 5	1.1	2.8	1.3	* .9	.3	3.4	1.0
27	3.7	3.7	b 2	b 3.5	* b 5	1.1	2.8	1.5	.9	.3	.5	7.4
28	3.7	* 4.0	b 2	b 4	b 5	1.2	2.8	* 1.5	.8	.3	.5	5.6
29	3.7	3.7	b 2.5	b 4.5	-	1.2	2.4	5.9	.7	.2	9.6	5.2
30	3.7	4.0	b 3	b 4	-----	1.5	2.1	2.6	.6	.2	3.4	4.6
31	* 3.7	-----	b 3	b 3.5	-----	1.4	-----	2.1	-----	* .2	1.2	-----
Total	104.5	97.0	99.8	99.3	93.7	296.8	192.9	66.4	47.9	27.1	121.5	213.9
Mean	3.37	3.23	3.22	3.20	3.35	9.57	6.43	2.14	1.60	0.87	3.92	7.13
Ac-ft	207	192	198	197	186	589	383	132	95	54	241	424

Calendar year 1962: Max 59 Min 1.5 Mean 8.53 Ac-ft 6,180  
 Water year 1962-63: Max 60 Min 0.1 Mean 4.00 Ac-ft 2,900

Peak discharge (base, 800 cfs).--Aug. 13 (1700) 971 cfs (3.68 ft); Aug. 24 (1445) 1,020 cfs (3.70 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2201. Lake Isabel feeder canal near Sapello, N. Mex.

Location.--Lat 35°44'40", long 105°09'30", in Mora Grant, 1 mile northwest of the site of Los Alamos and 5 miles southeast of Sapello.

Records available.--September 1956 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,700 ft (from topographic map).

Extremes.--1956-63: Maximum daily discharge, 190 cfs Oct. 20, 1957; no flow at times.

Remarks.--Records good except those for December to February, which are poor. Canal diverts water from left bank of Sapello River to fill Lake Isabel which stores water for irrigation.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	0.4	0	0.03	1.8
November . . . . .	0	0	0	0
December . . . . .	4	0	1.82	112
Calendar year 1962 . . . . .	66	0	3.42	2,480
January . . . . .	3	.5	1.81	111
February . . . . .	6.5	2	3.52	198
March . . . . .	10	2.1	6.57	404
April . . . . .	4.3	0	.27	18
May . . . . .	.1	0	.003	.2
June . . . . .	.4	0	.02	1.0
July . . . . .	3.9	0	.14	8.3
August . . . . .	17	0	1.41	86
September . . . . .	149	0	11.3	672
Water year 1962-63 . . . . .	149	0	2.22	1,610

# ARKANSAS RIVER BASIN

39

7-2206. Sapello River near Watrous, N. Mex.

Location.--Lat 35°46'05", long 105°02'28", on line between Mora and Las Vegas Grant, on right bank 4 miles southwest of Watrous and about 6 miles upstream from mouth.

Drainage area.--213 sq mi.

Records available.--September 1956 to September 1963 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 6,500 ft (from topographic map).

Average discharge.--7 years, 17.3 cfs (12,520 acre-ft per year).

Extremes.--Maximum discharge during year, 238 cfs Aug. 29 (gage height, 3.38 ft); no flow at times.

1956-63: Maximum discharge, 5,860 cfs Aug. 5, 1957 (gage height, 13.02 ft, from floodmark), from rating curve extended above 500 cfs on basis of slope-area measurement at gage height 13.02 ft; no flow at times.

A major flood occurred Sept. 29, 1904 (see WSP 131), and a discharge of about 11,400 cfs occurred June 11, 1913, at a site about 6 miles upstream from Los Alamos (see WSP 357).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 5,500 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	2.4	5.9	b3	2.3	2.0	*6.2	1.4	1.0	0.1	0	2.1
2	1.3	2.4	5.9	b3	1.8	1.6	6.6	1.6	2.9	.1	0	1.3
3	.8	2.6	*5.9	b2.5	1.4	1.6	7.7	1.4	3.8	.1	.1	.9
4	*.7	2.6	5.9	b2.5	*1.3	*1.7	7.7	1.3	*2.0	.1	.2	.8
5	.8	2.9	b4	b2.7	1.3	1.8	7.7	1.4	1.3	.1	.1	.7
6	.8	2.9	b3	b2.7	1.1	1.7	7.7	*1.7	1.0	.1	.1	.7
7	.8	2.9	b3	*b2.7	1.1	2.0	7.3	1.6	.9	4.1	.1	.7
8	.8	2.9	b2.5	b2.7	1.1	1.4	7.0	1.4	.9	.9	.1	.9
9	.8	3.1	b2.5	b2.7	1.3	1.3	6.2	1.4	.8	3.7	*.1	.7
10	.8	3.1	b2.5	b2	1.8	1.3	5.9	1.3	.6	2.3	.2	.6
11	.8	2.9	b2.2	b1.5	b1	1.1	5.9	1.3	.4	.8	.2	2.2
12	.7	2.9	b2.2	a1	b1	1.1	5.9	1.1	.3	.6	2.1	1.7
13	.6	*2.9	b2.2	a1	b1	1.3	4.8	1.0	.2	.4	2.7	.8
14	.7	3.1	b2	a2	b1.5	1.3	2.9	1.0	.1	.6	2.2	.6
15	.8	2.6	b2	a2	b1.5	.9	2.0	1.0	0	.4	5.3	1.3
16	.8	2.6	2.0	a2	b1.5	.9	*1.8	.9	1.9	.2	1.0	*1.0
17	.9	3.4	1.7	a3	b1.5	.9	1.6	.9	6.4	*.2	.8	.8
18	1.0	3.4	2.1	a7	*b1.5	.9	1.4	1.0	2.6	.1	.8	.7
19	1.1	3.1	2.0	a6	b2	.8	1.3	1.1	*1.6	.1	.6	.5
20	1.1	2.9	1.8	a6	b1.5	.9	1.3	*1.4	1.1	1.0	.4	.4
21	1.0	3.6	1.8	a9	b1.5	.9	1.1	2.0	.9	.4	.4	6.5
22	.9	3.4	2.1	b9	b1.5	1.3	1.0	3.6	.7	.2	.3	3.6
23	.9	3.1	b2	9.4	b1.5	2.6	1.0	2.3	.6	.1	*.3	4.8
24	1.3	3.1	b1.5	8.4	2.1	2.6	1.0	1.7	.4	.1	.4	2.6
25	1.3	3.1	b1.5	7.0	2.0	2.4	1.0	1.0	.4	0	1.0	1.8
26	1.4	3.1	b1	4.1	1.8	2.4	1.3	.9	.3	0	7.3	1.4
27	1.4	3.4	b1	3.6	1.8	2.1	1.3	.9	.2	0	2.9	1.3
28	1.4	3.8	b2	3.6	2.0	3.1	1.1	.9	.2	0	1.4	.9
29	1.7	5.2	b2.2	3.1	-	4.3	1.3	.9	.2	0	2.6	.9
30	2.4	5.2	b2.5	2.9	-----	5.2	1.4	1.4	.1	.1	1.4	.8
31	2.4	-----	b3	2.6	-----	6.2	-----	1.7	-----	0	4.3	-----
Total	33.6	94.6	81.9	120.7	42.7	59.6	110.4	42.5	50.9	16.9	123.1	134.9
Mean	1.08	3.15	2.64	3.89	1.52	1.92	3.68	1.37	1.70	0.55	3.97	4.50
Ac-ft	87	188	182	239	85	118	219	84	101	34	244	288

Calendar year 1962: Max 346 Min 0.1 Mean 5.83 Ac-ft 4,070  
 Water year 1962-63: Max 65 Min 0 Mean 2.50 Ac-ft 1,810

Peak discharge (base, 500 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

7-2210. Mora River near Shoemaker, N. Mex.

Location.--Lat 35°48', long 104°47', on left bank  $4\frac{1}{2}$  miles east of Shoemaker, Mora County, and 23 miles upstream from mouth.

Drainage area.--1,104 sq mi, of which 71 sq mi is probably noncontributing.

Records available.--October 1914 to July 1915, October 1915 to August 1918, May 1919 to July 1924, September to November 1924, March to July 1925, June 1927 to September 1963. Prior to October 1930, monthly discharge only, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 6,170 ft (from topographic map). Prior to Oct. 10, 1934, at site 2,000 ft upstream at different datum.

Average discharge.--45 years (1914-18, 1919-24, 1927-63), 60.7 cfs (43,940 acre-ft per year).

Extremes.--Maximum discharge during year, 3,010 cfs May 21 (gage height, 6.20 ft), from rating curve extended above 2,800 cfs as explained below; minimum daily, 0.3 cfs Aug. 1-3, 7-8.

1914-63: Maximum discharge, 15,200 cfs June 3, 1948 (gage height, 12.79 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurements at gage heights 10.09 and 12.79 ft; no flow at times.

Floods of Sept. 29, 1904, and June 11, 1913, probably exceeded 30,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 26,000 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

0.4	2.6	0.2	0.3	0.8	16
.5	5.3	.3	1.0	1.0	29
.7	14	.4	2.3	1.5	87
.9	26	.5	4.5	2.0	195
1.1	47	.6	7.5	2.5	355

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.3	5.0	29	b25	37	32	*9.4	1.9	3.8	0.9	0.3	2.7
2	5.3	5.7	29	b25	33	25	8.3	2.3	6.3	1.0	.3	2.0
3	5.3	6.1	*30	b25	27	18	11	1.9	4.3	1.8	.3	1.5
4	*5.0	5.7	29	b25	*23	*20	11	2.2	4.1	1.8	.5	1.6
5	5.0	6.1	26	b25	20	20	11	2.0	3.8	1.9	*.6	1.6
6	4.8	6.8	24	b20	19	14	9.0	*3.2	*3.4	1.8	.4	1.5
7	4.8	7.2	24	*b20	20	14	6.9	1.8	2.5	1.2	.3	1.4
8	4.5	6.1	23	b20	18	13	4.5	1.4	2.3	1.0	.3	1.1
9	4.5	6.8	24	b20	16	15	4.1	1.6	1.9	4.7	.5	.9
10	4.5	7.2	24	b20	18	16	3.2	1.6	1.5	8.0	.7	.8
11	4.0	13	22	b15	b17	16	3.2	2.0	1.2	3.0	.5	.8
12	4.2	16	22	b10	b15	18	3.4	1.4	1.2	1.8	200	.9
13	4.2	*15	22	a10	b15	20	3.8	1.4	1.6	1.1	69	.8
14	4.2	15	22	a12	b20	24	4.1	1.2	1.5	.9	6.9	.7
15	4.0	16	22	a15	b20	22	3.4	1.2	1.2	1.0	19	.5
16	4.5	18	22	a20	b20	19	2.7	1.2	1.4	1.1	6.3	*.6
17	4.8	16	22	a20	b20	18	2.7	1.1	1.9	*.8	3.4	.8
18	5.0	18	24	a20	b20	19	2.3	1.0	6.6	.8	2.7	.8
19	5.7	22	25	a20	24	16	1.8	.9	*20	.8	2.3	.8
20	6.4	22	25	a20	24	8.7	2.5	1.6	2.9	.8	*2.0	.7
21	6.8	26	25	a25	24	8.3	3.8	3.48	4.5	1.0	1.2	67
22	6.1	35	25	a25	24	8.7	4.3	4.8	2.7	.7	1.2	69
23	5.7	37	24	a25	22	12	2.3	14	2.2	.5	1.0	27
24	5.3	32	18	a20	21	6.1	1.4	9.0	2.0	.5	1.0	7.9
25	5.3	27	b15	a25	23	5.7	1.4	7.5	2.0	.8	1.8	3.8
26	5.0	25	b15	b25	22	12	1.8	6.3	1.9	.8	1.8	2.2
27	5.0	25	b17	b20	21	19	1.4	5.1	1.6	.8	1.4	2.0
28	5.0	25	b20	b25	23	15	1.6	4.8	1.2	.6	1.5	1.9
29	5.3	24	b22	b30	-	11	1.6	4.3	1.0	.6	1.8	1.8
30	6.1	25	b22	34	-----	9.1	1.5	4.5	1.0	.7	1.6	1.6
31	6.1	-----	b25	36	-----	9.1	-----	3.8	-----	.5	5.8	-----
Total	157.7	514.7	718	677	606	483.7	129.4	488.2	136.7	86.0	350.8	206.7
Mean	5.09	17.2	23.2	21.8	21.6	15.6	4.31	15.7	4.56	2.77	11.3	6.89
Ac-ft	313	1,020	1,420	1,340	1,200	959	257	968	271	171	696	410

Calendar year 1962: Max 1,520 Min 2.0 Mean 42.1 Ac-ft 30,510  
 Water year 1962-63: Max 348 Min 0.3 Mean 12.5 Ac-ft 9,020

Peak discharge (base, 800 cfs).--May 21 (1915) 3,010 cfs (6.20 ft); Aug. 12 (1930) 1,890 cfs (5.12 ft).

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

# ARKANSAS RIVER BASIN

41

7-2215. Canadian River near Sanchez, N. Mex.

Location.--Lat 35°39'15", long 104°22'30", in S½ sec.34, T.17 N., R.24 E., at downstream end of bridge pier on State Highway 65, 1 mile upstream from Lagartija Creek, 3 miles northeast of Sanchez, 10 miles downstream from Mora River and 24 miles southwest of Mosquero.

Drainage area.--6,015 sq mi, of which 303 sq mi is probably noncontributing.

Records available.--April 1912 to December 1914, October 1935 to September 1963. Monthly discharge only for some periods, published in WSP 1311.

Gage.--Water-stage recorder. Altitude of gage is 4,500 ft (from topographic map). Apr. 12, 1912, to Dec. 31, 1914, at two sites within 100 ft about 3 miles upstream at different datums.

Average discharge.--30 years (1912-14, 1935-63), 234 cfs (169,400 acre-ft per year).

Extremes.--Maximum discharge during year, 9,810 cfs Aug. 13 (gage height, 6.53 ft); no flow, May 9-20.  
1912-14, 1935-63: Maximum discharge, 87,800 cfs Sept. 2, 1942 (gage height, 19.3 ft, from floodmarks), from rating curve extended above 48,000 cfs on basis of slope-area measurement of peak flow; no flow at times.  
Maximum flood known occurred Sept. 29 or 30, 1904 (discharge probably exceeded 100,000 cfs).

Remarks.--Records good except those for periods of ice effect, which are poor. Diversions for irrigation of about 56,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

-0.30	0.0	0.00	6	0.3	35	1.0	260	3.0	2,020
-0.20	1	.1	12	.4	55	1.4	520	4.0	3,340
-0.10	3	.2	20	.6	107	2.0	1,040	4.3	3,880

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	10	51	20	57	51	16	2	8	4	19	2,720
2	16	10	49	20	60	47	13	2	7	3	11	568
3	* 14	10	47	* 25	93	49	10	2	50	2	6	224
4	12	11	47	35	110	49	8	1	43	2	4	133
5	14	12	* 47	30	99	43	9	1	26	1	2	90
6	11	12	45	30	72							
7	10	12	43	30	60	* 37	13	1	19	1	1	65
8	8	12	39	35	53	30	14	* 1	15	6	1	47
9	7	12	33	40	49	31	13	1	12	4	1	74
10	7	12	31	30	51	25	12	0	8	3	1	79
							10	0	6	5	2	69
11	6	12	31	20	49	24	7	0	5	* 2	7	47
12	5	12	31	15	30	24	7	0	* 4	1	1,170	85
13	5	13	31	10	25	24	6	0	3	15	3,670	135
14	5	13	31	10	* 30	25	5	0	3	41	800	256
15	5	* 17	31	15	41	26	4	0	2	15	316	120
16	4	22	30	15	35	25	3	0	1	10	228	69
17	5	23	31	15	31	26	2	0	* 291	5	136	45
18	6	25	33	20	33	28	* 2	0	256	11	104	30
19	6	26	39	20	37	25	1	0	157	12	72	23
20	5	28	43	25	43	23	1	0	161	7	* 53	19
21	5	30	53	30	49	* 20	2	6	431	6	39	17
22	6	31	53	30	55	20	1	30	148	6	30	1,170
23	6	35	53	* 25	55	19	1	* 101	65	4	23	869
24	8	43	47	30	51	15	1	57	37	3	17	* 340
25	9	65	45	35	49	12	1	31	24	2	121	191
26	10	62	20	30	47	12	1	26	17	2	884	123
27	10	53	20	25	45	11	1	20	11	4	616	82
28	9	47	25	35	51	12	1	17	8	3	242	57
29	9	45	25	49	-	10	1	13	6	26	362	45
30	9	45	20	47	-----	10	1	11	5	62	705	33
31	9	-----	20	51	-----	18	-----	10	-----	33	290	-----
Total	258	760	1,144	847	1,460	796	167	333	1,829	301	9,933	7,825
Mean	8.32	25.3	36.9	27.3	52.1	25.7	5.57	10.7	61.0	9.71	320	281
Ac-ft	512	1,510	2,270	1,680	2,900	1,580	331	660	3,630	597	19,700	15,520

Calendar year 1962: Max 1,990 Min 1 Mean 92.8 Ac-ft 67,200  
Water year 1962-63: Max 3,670 Min 0 Mean 70.3 Ac-ft 50,890

Peak discharge (base, 5,000 cfs). --Aug. 13 (0330) 9,810 cfs (6.53 ft); Sept. 1 (0700) 9,180 cfs (6.34 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 26 to Jan. 28, Feb. 12-14.

## ARKANSAS RIVER BASIN

7-2225. Conchas River at Variadero, N. Mex.

**Location.**--Lat 35°24'10", long 104°26'35", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec.36, T.14 N., R.23 E., on left bank 1.5 miles northeast of Variadero and 15 miles west of Conchas Dam.

**Drainage area.**--523 sq mi, of which 130 sq mi is probably noncontributing.

**Records available.**--October 1936 to September 1963.

**Gage.**--Water-stage recorder. Altitude of gage is 4,430 ft (from topographic map). Prior to Mar. 30, 1942, at site  $1\frac{1}{2}$  miles upstream at different datum. Mar. 30, 1942, to May 18, 1950, at present site at datum 0.5 ft higher.

**Average discharge.**--27 years, 18.9 cfs (13,680 acre-ft per year).

**Extremes.**--Maximum discharge during year, 1,280 cfs Sept. 22 (gage height, 4.16 ft), from rating extended above 760 cfs on basis of slope-area measurements at gage heights 10.0 and 19.5 ft; no flow at times.

1936-63: Maximum discharge, 44,000 cfs Sept. 1, 1942 (gage height, 19.96 ft, present datum), from slope-area measurement of peak flow; no flow at times.

**Remarks.**--Records fair except those for periods of ice effect, doubtful or no gage-height record, which are poor. Diversions for irrigation of about 300 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

(Shifting-control method used Nov. 15-30, Dec. 31 to Jan. 10, Aug. 18-30, Sept. 27-30)

0.22	0.0	0.5	0.5	0.8	2.6	1.4	16	2.0	102
.3	.03	.6	1.0	1.0	5.2	1.6	31	2.5	266
.4	.17	.7	1.6	1.2	9.2	1.8	57	3.0	515

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	0.5	2.5	1.6	1.5	1.5	0.4	0.4	0.1	0	0	8.8
2	1.4	.6	2.1	1.5	2.5	1.3	.4	.3	.2	0	0	2.2
3	1.2	.6	1.8	* 1.6	2	1.2	.3	.3	.1	0	0	6.7
4	1.0	.7	1.7	1.6	1.5	1.0	.4	.2	.1	0	0	* 4.0
5	1.0	.7	* 1.6	1.4	1.5	1.1	.8	.3	.1	0	0	1.8
6	.8	.7	1.6	1.4	1.5	* 1.1	1.1	.4	0	0	0	8.8
7	.7	.7	1.6	1.4	1.5	1.0	.6	* .3	0	0	0	6.6
8	* .7	.7	1.4	1.4	1.5	1.0	.3	.1	.1	* 0	0	5.0
9	.7	.7	1.4	1.3	1.5	.8	.3	.1	.1	0	0	4.5
10	.6	.7	1.4	1.2	1.5	.8	.3	.1	.1	0	.5	4.1
11	.5	.6	1.3	.6	1	.8	.3	.1	.1	0	15.7	3.9
12	.5	.6	1.3	2	1	.8	.4	.1	* .1	0	2.2	3.9
13	.5	.6	1.2	2	2	.8	.3	.1	.1	0	7.1	3.1
14	.5	.6	1.3	3	* 2.1	.8	.3	.1	.1	0	1.3	2.5
15	.4	* .6	1.3	.4	2.1	.7	.3	.1	.2	0	3.7	2.2
16	.4	.7	1.3	.4	2.0	.5	.2	.1	.1	0	1.5	3.7
17	.5	1.2	1.2	.4	1.9	.4	.2	.1	.2	0	.7	3.8
18	.8	1.2	1.5	.6	1.9	.4	* .1	.1	.2	0	.4	2.6
19	.8	1.0	1.5	.4	1.8	.4	.2	.1	.2	0	.2	2.1
20	.7	.9	1.4	.4	1.7	.4	.2	.1	.9	0	* .1	2.1
21	.6	.8	1.5	.5	1.8	.4	.1	1.0	.4	0	.1	2.5
22	.5	.8	1.5	.6	1.9	.4	.1	.3	.1	0	.1	4.7.1
23	.5	.8	1.4	* .4	1.9	.4	.2	* .1	0	0	0	.75
24	.6	.8	1.4	.3	1.7	.4	.3	.1	0	0	.4	* 2.1
25	.6	.8	b 1	.3	1.6	.4	.2	0	0	0	.2	1.0
26	.6	1.0	b .6	.3	1.6	.4	.3	0	0	0	.1	7.4
27	.6	1.0	b .6	.6	1.5	.4	.2	0	0	0	.1	5.6
28	.5	1.0	b .6	1	1.9	.4	.2	.1	0	0	.1	4.2
29	.5	1.0	b .6	1	-	.3	.2	.1	0	.1	.1	3.3
30	.6	1.4	b .7	.8	-----	.4	.3	.1	0	0	.2	2.7
31	.6	-----	1.6	1	-----	.4	-----	.1	-----	0	1.7	-----
Total	21.3	24.0	41.9	25.1	47.9	21.1	9.5	5.4	3.6	0.1	288.5	797.6
Mean	0.69	0.80	1.35	0.81	1.71	0.68	0.32	0.17	0.12	0.003	9.31	28.6
Ac-ft	42	48	83	50	95	42	19	11	7.1	0.2	572	1,580

Calendar year 1962: Max 1,070 Min 0 Mean 15.8 Ac-ft 11,460  
 Water year 1962-63: Max 471 Min 0 Mean 3.52 Ac-ft 2,550

**Peak discharge (base, 1,500 cfs).**--No peak above base.

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

**Note.**--Doubtful or no gage-height record Jan. 11 to Feb. 13.

## ARKANSAS RIVER BASIN

43

## 7-2230. Bell Ranch Canal near Conchas Dam, N. Mex.

Location.--Lat 35°24'00", long 104°11'05", in Pablo Montoya Grant, on left bank 1,270 ft downstream from Conchas Dam and 1 $\frac{3}{4}$  miles north of Conchas Dam Post Office, San Miguel County.

Records available.--October 1942 to September 1963.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,150 ft (from headgate elevations).

Extremes.--1942-63: Maximum daily discharge, 21 cfs July 10-13, Sept. 7-10, 1948, June 27, Aug. 7, 1951; no flow at times each year.

Remarks.--Records good. Canal diverts from Conchas Reservoir for irrigation of about 700 acres on Bell Ranch.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October .....	8.0	0	3.08	189
November .....	2.8	0	0.66	39
December .....	0	0	0	0
Calendar year 1962 .....	13	0	3.75	2,720
January .....	0	0	0	0
February .....	0	0	0	0
March .....	13	0	1.99	122
April .....	13	0	10.8	643
May .....	7.5	0	2.75	169
June .....	7.0	0	3.42	203
July .....	12	0	6.38	393
August .....	10	0	3.24	199
September .....	1.8	0	0.21	13
Water year 1962-63 .....	13	0	2.72	1,970

## 7-2233. Conchas Canal below Conchas Dam, N. Mex.

Location.--Lat 35°21'45", long 104°10'15", in S $\frac{1}{2}$  sec. 3, T. 13 N., R. 26 E., on left bank at upstream end of tunnel transition section, about 1 mile downstream from headgates in Conchas Dam and 22 miles north of Newkirk.

Records available.--September 1945 to June 1949, April 1954 to June 1955, September 1961 to September 1963.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,156.9 ft above mean sea level (from Bureau of Reclamation elevation of concrete structure). Prior to Nov. 19, 1948, at site three-quarters of a mile upstream at different datum.

Extremes.--1945-49, 1954-55, 1961-63: Maximum daily discharge, 751 cfs Aug. 31, 1961; no flow during most of each winter period.

Remarks.--Records good above 100 cfs and poor below. No diversion or wasteway between canal headworks and gage.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October .....	301	0	105	6,480
November .....	0	0	0	0
December .....	0	0	0	0
Calendar year 1962 .....	622	0	173	125,261.9
January .....	0	0	0	0
February .....	4	0	0.8	44
March .....	471	0	76.1	4,680
April .....	649	262	408	24,280
May .....	511	55	349	21,470
June .....	384	4	184	10,950
July .....	507	244	379	23,280
August .....	570	79	338	20,810
September .....	300	4	154	9,170
Water year 1962-63 .....	649	0	167	121,164



## ARKANSAS RIVER BASIN

7-2235. Conchas Reservoir near Conchas Dam, N. Mex.

Location.--Lat 35° 24' 10", long 104° 11' 25", in Pablo Montoya Grant, stilling well within concrete portion of Conchas Dam on Canadian River, 1 $\frac{1}{4}$  miles northwest of Conchas Dam Post Office and about 24 miles north of Newkirk.

Drainage area.--7,409 sq mi, of which 433 sq mi is probably noncontributing.

Records available.--December 1938 to September 1963.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents during year, 299,500 acre-ft Oct. 1 (elevation, 4,193.01 ft); minimum, 184,300 acre-ft Aug. 11 (elevation, 4,176.16 ft).

1938-63: Maximum contents, 479,600 acre-ft Apr. 24, 1942 (elevation, 4,208.41 ft); minimum after initial filling, 93,460 acre-ft Sept. 24, 1954 (elevation, 4,155.80 ft).

Remarks.--Reservoir is formed by dam consisting of concrete main section and earthfill wings, completed Sept. 15, 1939; storage began Dec. 29, 1938. Capacity, 370,200 acre-ft between elevations 4,073.5 and 4,201.0 ft (crest of 300-foot ungated service spillway); dead storage, 90,800 acre-ft at elevation 4,155 ft. Reservoir usually not drawn below elevation, 4,157.35 ft (sill of irrigation outlet), capacity, 98,810 acre-ft, except for minor sluicing and operation of small powerplant; during 1954-55 there was some pumping into Conchas Canal. Capacity of 196,000 acre-ft between elevations 4,201.0 (crest of 300-foot ungated service spillway) and 4,218.0 ft (crest of 3,000-foot ungated emergency spillway) acts as detention storage in the control of floods. Figures given herein represent total contents. Reservoir is used for irrigation, flood control, and recreation. Diversion above station for irrigation of about 57,000 acres. Direct diversions through Conchas Dam to Conchas Canal and Bell Ranch Canal (see preceding page) irrigate about 36,000 acres near Tucumcari and on Bell Ranch.

Cooperation.--Records furnished by Corps of Engineers.

Month-end elevation and contents, water year October 1962 to September 1963

Date	Elevation (feet) †	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	4,193.02	299,500	-
Oct. 31 . . . . .	4,191.71	289,000	-10,500
Nov. 30 . . . . .	4,191.59	288,000	-1,000
Dec. 31 . . . . .	4,191.76	289,400	+1,400
Calendar year 1962 . .	-	-	-78,700
Jan. 31 . . . . .	4,191.77	289,500	+100
Feb. 28 . . . . .	4,192.18	292,700	+3,200
Mar. 31 . . . . .	4,191.43	286,800	-5,900
Apr. 30 . . . . .	4,187.53	257,200	-29,600
May 31 . . . . .	4,184.37	235,000	-22,200
June 30 . . . . .	4,182.36	221,700	-13,300
July 31 . . . . .	4,177.99	194,800	-26,900
Aug. 31 . . . . .	4,177.74	193,400	-1,400
Sept. 30 . . . . .	4,178.60	198,500	+5,100
Water year 1962-63	-	-	-101,000

† Elevation at 2400.

## ARKANSAS RIVER BASIN

45

7-2245. Canadian River below Conchas Dam, N. Mex.

Location.--Lat 35°24'30", long 104°10'10", in sec.27, T.14 N., R.26 E. (projected), in Pablo Montoya Grant, on right bank 2.4 miles north of Conchas Dam Post Office (1960 location) and 2.8 miles downstream from Conchas Dam.

Drainage area.--7,417 sq mi, of which 433 sq mi is probably noncontributing.

Records available.--May 1936 to December 1938, January 1942 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 4,021.90 ft above mean sea level, datum of 1929. Prior to Dec. 13, 1941, at site 0.7 mile downstream at datum 6.2 ft higher.

Average discharge.--22 years (1941-63), 98 cfs (70,950 acre-ft per year).

Extremes.--Maximum discharge during year, 45 cfs May 21 (gage height, 4.26 ft); maximum gage height, 4.82 ft Aug. 9; minimum daily, 1 cfs Oct. 12-16.

1936-63: Maximum discharge, 73,000 cfs June 3, 1937; maximum gage height, 20.34 ft May 30, 1938, present datum (back-water from temporary construction dam); no flow at times.

Remarks.--Records poor. Flow regulated by Conchas Reservoir (see preceding page). Diversions above station for irrigation of about 90,000 acres, 36,000 of which are below station. Bell Ranch Canal (see p 43) diverts directly from Conchas Dam and flumes from right to left bank just above River gage for irrigation of about 700 acres on Bell Ranch. Conchas Canal diverts directly from Conchas Dam and bypasses gage for irrigation of about 35,000 acres around Tucumcari.

Discharge, in cubic feet per second, water year October to September												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2	4	4	3	3	* 3	3	3	4	3	6	5
2	2	4	4	3	3	3	3	3	4	3	6	5
3	2	4	4	3	3	3	3	* 3	4	3	6	5
4	* 2	4	4	3	3	3	3	3	4	3	6	5
5	2	4	4	3	3	3	3	3	3	3	6	5
6	2	4	4	3	3	3	3	3	3	3	6	5
7	2	4	4	3	3	3	3	3	3	3	5	5
8	2	4	4	3	3	3	3	3	3	* 3	6	5
9	2	4	4	3	3	3	3	3	3	3	9	5
10	2	4	4	3	3	3	3	3	* 3	3	17	5
11	2	4	4	3	3	3	3	3	3	3	6	5
12	1	4	4	a 3	3	3	3	3	3	3	6	5
13	1	4	4	a 3	3	3	3	3	3	3	6	5
14	1	4	4	a 3	3	3	3	3	3	3	4	5
15	1	4	4	a 3	3	3	* 3	3	3	3	4	5
16	1	4	4	3	3	3	3	3	3	6	5	5
17	2	4	4	* 3	3	3	3	3	3	5	5	5
18	2	4	4	3	3	3	3	3	3	5	5	5
19	2	3	4	3	3	3	2	3	3	5	5	5
20	2	4	4	3	3	3	3	3	3	5	5	5
21	2	4	3	3	3	3	3	* 14	3	5	5	5
22	2	4	3	3	3	3	3	8	3	5	5	5
23	2	3	3	3	3	3	3	3	3	5	5	4
24	2	3	3	3	3	3	2	3	3	5	5	4
25	* 2	3	3	3	* 3	4	3	4	3	5	5	4
26	2	3	3	3	3	4	3	4	3	* 6	5	4
27	3	3	* 3	3	3	4	3	4	3	6	5	4
28	3	3	3	3	3	4	2	5	3	6	6	4
29	3	3	3	3	-	3	3	4	3	7	* 5	4
30	3	* 3	3	3	-----	3	3	4	3	7	5	4
31	3	-----	3	3	-----	3	-----	4	-----	6	5	-----
Total	62	111	113	93	84	97	86	117	94	134	180	142
Mean	2.0	3.7	3.6	3.0	3.0	3.1	2.9	3.8	3.1	4.3	5.8	4.7
Ac-ft	123	220	224	184	167	192	171	232	186	266	357	282

Calendar year 1962: Max 107 Min 1 Mean 6.5 Ac-ft 4,730  
 Water year 1962-63: Max 17 Min 1 Mean 3.6 Ac-ft 2,600

\* Discharge measurement made on this day.  
 a No gage-height record.

## ARKANSAS RIVER BASIN

7-2265. Ute Creek near Logan, N. Mex.

Location.--Lat 35°24', long 103°30', in NE¼ sec.35, T.14 N., R.32 E., on right bank a quarter a mile downstream from Logan-Trigg Ranch road crossing, 5½ miles upstream from mouth, and 6 miles northwest of Logan.

Drainage area.--2,073 sq mi, of which 617 sq mi is probably noncontributing.

Records available.--August 1904 to June 1906 and April 1909 to May 1914 (gage heights and discharge measurements only), January 1942 to September 1963. Records of discharge for August 1904 to June 1906, April 1909 to December 1911, published in WSP 307, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 3,757.50 ft above mean sea level, datum of 1929. Prior to Aug. 1, 1911, staff gage at site 1½ miles downstream at different datum. Aug. 1, 1911, to May 23, 1914, water-stage recorder at site 1½ miles downstream at different datum. January 1942 to December 1955, water-stage recorder at present site at datum 1.00 ft higher.

Average discharge.--21 years, 29.8 cfs (21,570 acre-ft per year).

Extremes.--Maximum discharge during year, 3,750 cfs Aug. 29 (gage height, 4.50 ft); no flow at times.

1942-63: Maximum discharge, 24,500 cfs May 28, 1946, July 12, 1951 (gage height, 9.4 ft, present datum), from rating curve extended above 7,700 cfs on basis of slope-area measurements at gage heights 6.2 and 8.2 ft (present datum); no flow at times.

Flood of May 1, 1914, reached a stage of 22.95 ft, site and datum then in use. Another major flood reached a stage of 17.0 ft (present datum) sometime in 1941, from information furnished by Bureau of Reclamation (discharge, about 70,000 cfs).

Remarks.--Records poor. Discharge measurements generally made 2 or 3 times a month. Diversions for irrigation of a few hundred acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 5-30, June 2-16, Aug. 11-13)

1.3	0.0	1.6	5.0	1.9	70	2.4	380
1.4	.3	1.7	15	2.0	115	2.7	680
1.5	1.4	1.8	35	2.2	235		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2			0	b 2	0		0	20	0	0	154
2	0			0	b 2	0		0	220	0	0	106
3	0			0	b 1	0		0	115	0	0	33
4	0			0	1	0		0	35	0	0	15
5	0			0	1	0		182	10	9	0	14
6	0			0	1	0		46	5	4	0	9
7	0			0	1	0		2	3	1	0	4
8	0			0	1	0		3	2	0	0	2
9	0			0	1	1		0	1	28	34	1
10	0			0	1	1		0	0	2	60	1
11	0			0	2	0		0	0	0	129	0
12	0			0	1	0		0	0	0	4	0
13	0			0	1	0		0	0	0	4	0
14	0			0	1	0		0	0	0	31	0
15	0			0	1	0		0	0	0	9	0
16	0			1	1	0		0	40	0	3	0
17	0			1	0	0		0	4	0	0	15
18	0			1	0	0		0	54	0	0	5
19	0			1	0	0		0	21	0	0	1
20	0			1	0	0		0	1	0	0	0
21	0			1	0	0		0	1	0	0	0
22	0			1	0	0		0	0	0	0	1
23	0			1	0	0		0	0	0	0	31
24	0			1	0	0		0	0	0	0	84
25	0			1	0	0		0	0	0	0	33
26	0			1	0	0		0	0	0	0	20
27	0			1	0	0		0	0	0	56	10
28	0			1	1	0		0	0	0	70	6
29	0			1	-	0		0	0	0	489	2
30	0			1	-----	0		111	0	0	625	1
31	0			b 1	-----	0		256	-----	0	202	-----
Total	2	0	0	16	20	2	0	600	532	44	1,716	548
Mean	0.1	0	0	0.5	0.7	0.1	0	19.4	17.7	1.4	55.4	18.3
Ac-ft	4	0	0	32	40	4	0	1,190	1,060	87	3,400	1,090

Calendar year 1962: Max 699 Min 0 Mean 8.0 Ac-ft 5,800

Water year 1962-63: Max 625 Min 0 Mean 9.5 Ac-ft 6,910

Peak discharge (base 6,000 cfs).--No peak above base.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Jan. 10-30.

## ARKANSAS RIVER BASIN

47

7-2268. Ute Reservoir near Logan, N. Mex.

Location.--Lat 35°21', long 103°26', in NW¼ sec.21, T.13 N., R.33 E., 2½ miles southwest of Logan and 3½ miles downstream from Ute Creek.

Drainage area.--11,140 sq mi, of which 1,110 sq mi is probably noncontributing.

Records available.--May to September 1963.

Gage.--Inclined cable gage. Datum of gage is at mean sea level, (levels by Interstate Stream Commission).

Extremes.--Maximum contents during period, 25,650 acre-ft Sept. 26-29 (elevation, 3,728.7 ft); minimum during period, 3,340 acre-ft May 28 (elevation, 3,701.6 ft, reservoir filling).

Remarks.--Reservoir is formed by a 5,750-foot earthfill dam, 121 ft high above streambed, completed in May 1963, storage began Dec. 13, 1962. Capacity, 109,600 acre-ft at elevation 3,760.0 ft (crest of 800-ft ungated service spillway; gates included in future plans). Maximum-design capacity, 307,000 acre-ft at elevation 3,791.0 ft (maximum safe water level, first-stage of construction); the 197,400 acre-ft of capacity above service spillway is for use in detention of floods and for protection of structure. Dead storage, 20,710 acre-ft at elevation 3,725.0 ft (crest of outlet tower); inactive or conservation pool below 3,741.6 ft (capacity, 49,870 acre-ft). Figures given herein represent total contents and are based on once-daily gage readings. Reservoir is planned for flood control, industrial and municipal use, and recreation. Diversions above station for irrigation of about 90,200 acres.

Cooperation.--Interstate Stream Commission furnishes daily elevation record and capacity table.

Month-end elevations and contents, water year October 1962 to September 1963

Date	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre-feet)
Sept. 30. . . . .	-	-	-
Oct. 31. . . . .	-	-	-
Nov. 30. . . . .	-	-	-
Dec. 31. . . . .	-	-	-
Calendar year 1962	-	-	-
Jan. 31. . . . .	-	-	-
Feb. 28. . . . .	-	-	-
Mar. 31. . . . .	-	-	-
Apr. 30. . . . .	-	-	-
May 31. . . . .	3,710.3	7,530	-
June 30. . . . .	3,714.3	10,250	+2,720
July 31. . . . .	3,716.2	11,750	+1,500
Aug. 31. . . . .	3,726.9	23,150	+11,400
Sept. 30. . . . .	3,728.6	25,500	+2,350
Water year 1962-63	-	-	+25,500

Note.--No records available prior to May 28 except that storage began Dec. 13; the total change of 25,500 acre-ft is based on no storage prior to Dec. 13. Daily records available in District office.

## ARKANSAS RIVER BASIN

## 7-2270. Canadian River at Logan, N. Mex.

Location.--Lat 35°21'20", long 103°25'20", in NE¼ sec.15, T.13 N., R.33 E., on left bank 1,100 ft upstream from bridge on U. S. Highway 54, half a mile south of Logan, 1½ miles upstream from Chicago, Rock Island & Pacific Railroad Co. bridge, 2 miles downstream from Ute Dam, 4½ miles upstream from Revuelto Creek (formerly Tucumcari Creek), and 5½ miles downstream from Ute Creek.

Drainage area.--11,141 sq mi, of which 1,110 sq mi is probably noncontributing.

Records available.--June 1904 to November 1905 (gage heights and discharge measurements only), December 1908 to September 1909, February 1910, April to July 1910, August 1910 to September 1911 (gage heights and discharge measurements only), October 1911 to May 1914, January to May 1924, September 1924 to July 1925, January 1927 to April 1934, August 1934 to September 1963. Monthly discharge only for some periods, published in WSP 1311. Records for December 1909, January 1910, and May to July 1934, published in WSP 267, 287, and 762 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder at present site since Aug. 5, 1910; at different datums prior to Oct. 21, 1928, and at datum 1.54 ft lower Oct. 21, 1928, to Sept. 30, 1934. Altitude of present gage is 3,670 ft (from river-profile study). Prior to Aug. 5, 1910, staff gages 1½ miles downstream at different datums (datum of gage, 3,651 ft above mean sea level Dec. 22, 1908, to Aug. 4, 1910).

Average discharge.--15 years (1908-9, 1911-13, 1926-38), 392 cfs (283,800 acre-ft per year), prior to completion of Conchas Dam; 24 years (1938-62), 257 cfs (186,100 acre-ft per year), prior to completion of Ute Dam.

Extremes.--Maximum discharge during year, 238 cfs Sept. 6 (gage height, 5.16 ft); minimum daily, 0.1 cfs many days.

1930-63: Maximum discharge, 219,000 cfs Sept. 22, 1941 (gage height, 29.3 ft, from floodmarks), from rating curve extended above 75,000 cfs by logarithmic plotting; no flow at times.

Maximum discharge known, 278,000 cfs Sept. 30, 1904 (gage height, about 36.5 ft, site and datum used in 1909), from rating curve extended above 14,000 cfs, from Ninth Biennial Report of State engineer.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Conchas Reservoir, 45 miles upstream (see p 44) and Ute Dam, 2 miles upstream (see p 47). Diversions for irrigation of about 90,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	4.8	9.8	3.7	0.4	1.8	0.5	*0.5	1.0	0.4	0.3	2.4
2	*8.6	5.2	1.2	*3.7	.3	1.8	.2	.4	3.7	.6	.3	1.6
3	7.6	5.6	*1.3	3.7	.2	1.4	.2	.2	.9	.6	.3	*2.2
4	6.4	5.6	1.2	2.5	*.4	1.2	.4	.2	.8	.6	.3	2.0
5	6.0	6.0	9.2	1.8	1.4	*1.6	.8	.2	.5	2.1	.3	1.8
6	5.2	5.2	9.2	.3	1.4	1.2	.8	.2	.2	1.2	.3	*5.6
7	3.2	6.0	8.6	.3	.8	1.2	.5	.2	.2	1.4	*.2	6.8
8	3.5	6.0	9.2	.4	3.0	1.1	*.3	.1	.4	1.0	.3	4.4
9	2.5	5.2	9.2	.5	3.2	1.2	.2	.1	.4	*.9	1.2	3.7
10	3.0	5.6	9.2	.2	1.4	.9	.2	.1	.4	.5	1.6	3.0
11	6.0	5.2	8.0	a .2	1.4	.4	.3	.1	*.4	.5	.5	2.7
12	7.6	5.2	8.6	a .1	3.7	.2	.4	.1	.4	.8	2.5	2.2
13	7.6	5.2	3.7	a .1	4.4	.2	.3	.1	.8	.8	1.6	2.2
14	7.6	*5.6	.9	a .1	3.7	.3	.3	.1	.8	.8	.9	2.0
15	6.0	5.6	.6	a .1	*1.8	.4	.2	.1	.6	.6	.9	2.4
16	3.5	5.6	.8	*b .2	1.8	.2	.1	.2	.6	.5	.9	1.6
17	6.0	7.6	*.8	b .2	1.2	.2	.1	*.2	1.2	.6	.9	1.8
18	9.2	1.2	1.6	b .2	1.2	.2	.1	.2	1.8	.6	.9	1.8
19	2.5	1.4	2.4	b .2	1.6	.2	.1	.2	.8	.4	*1.2	1.4
20	2.9	1.2	1.6	b .3	1.8	*.3	.1	.4	.4	.5	1.2	*1.2
21	1.8	1.2	1.6	b .4	3.0	.3	.1	1.2	.3	.5	1.2	1.2
22	1.3	1.0	1.0	b .6	2.5	.3	.1	.9	.2	.4	1.2	1.2
23	1.3	9.8	1.0	b .8	2.2	.3	.2	.8	.2	*.5	1.2	1.0
24	*1.6	9.2	1.2	b .8	2.0	.2	.2	.5	.2	.5	1.4	.9
25	1.6	8.6	1.6	b .8	1.4	.2	.2	.4	.2	.5	1.6	.9
26	1.1	8.6	1.6	b .8	1.2	.3	.3	.3	.2	.4	1.2	1.2
27	8.0	8.6	3.2	.8	1.2	.4	.2	2.3	.2	.4	1.2	1.2
28	6.0	8.6	4.0	.8	2.7	.3	.1	.8	.3	.4	a 1	1.2
29	5.6	8.6	4.4	.9	-	.3	.2	1.9	.3	.4	a 1.5	1.4
30	5.2	8.6	4.0	.8	-----	.4	.2	4.6	.3	.4	*4.8	1.4
31	4.8	-----	3.7	.5	-----	.4	-----	*2.2	-----	.3	4.0	-----
Total	281.1	225.8	157.7	26.8	51.3	19.4	7.9	19.8	18.7	20.1	36.9	114.8
Mean	9.07	7.53	5.09	0.86	1.83	0.63	0.26	0.64	0.62	0.65	1.19	3.83
Ac-ft	558	448	313	53	102	38	16	39	37	40	73	228
Calendar year 1962: Max 4,340 Min 0.6 Mean 61.3 Ac-ft 44,400												
Water year 1962-63: Max 56 Min 0.1 Mean 2.69 Ac-ft 1,940												

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## ARKANSAS RIVER BASIN

49

7-2271. Revuelto Creek near Logan, N. Mex.

Location.--Lat 35°20'30", long 103°23'30", in NE¼NW¼ sec.24, T.13 N., R.33 E., on right bank a quarter of a mile upstream from bridge on State Highway 39, 2 miles upstream from mouth, and 2 miles southeast of Logan.

Drainage area.--786 sq mi.

Records available.--August 1959 to September 1963. Unpublished records collected by Bureau of Reclamation for the period October 1941 to July 1947 are for a site 500 ft downstream at different datum. They are not equivalent because of major irrigation development; major peaks should be comparable.

Gage.--Water-stage recorder. Altitude of gage is 3,650 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,900 cfs Aug. 13 (gage height, 5.42 ft); no flow at times.

1959-63: Maximum discharge, 26,700 cfs July 9, 1960 (gage height, 14.3 ft), from rating curve extended above 13,000 cfs on basis of slope-area measurement of peak flow; no flow at times.

1941-47: Maximum discharge determined, about 13,400 cfs Sept. 18, 1946 (gage height, 9.04 ft, site and datum then in use), computed by Bureau of Reclamation.

A peak of 26,100 cfs (time and date unknown; gage height, 12.9 ft) was measured by slope-area method in May 1957.

Remarks.--Records poor. Discharge measurements generally made twice a month. Low flows supplemented by surface and ground water return from irrigation in vicinity of Tucumcari.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	2	10	6	6	52	50	62	72	20	26	345
2	14	2	8	4	2	22	25	76	498	25	26	90
3	8	1	6	4	2	8	10	68	204	25	194	75
4	4	1	6	4	1	6	10	67	47	35	55	37
5	2	1	4	4	1	2	10	53	15	62	43	37
6	1	1	3	2	1	1	20	383	4	75	42	67
7	0	1	2	1	1	0	35	78	2	46	55	28
8	0	1	2	1	1	0	60	60	0	53	52	15
9	0	0	2	1	1	0	60	53	0	56	54	17
10	1	0	2	1	2	0	60	52	0	80	333	17
11	10	0	2	0	4	0	50	46	0	53	110	11
12	12	0	3	0	4	0	50	34	0	48	225	7
13	12	0	2	0	4	0	50	34	20	89	1,050	4
14	22	0	2	0	6	0	50	37	35	53	115	10
15	16	0	3	1	13	0	50	29	145	146	67	39
16	13	0	3	2	21	0	40	19	80	63	49	58
17	29	0	3	2	25	0	40	23	12	50	35	34
18	47	0	3	2	17	0	40	31	23	143	24	53
19	53	2	4	2	9	0	40	34	189	39	19	25
20	46	5	4	2	7	0	40	35	71	26	18	19
21	46	5	4	2	6	0	45	63	36	22	14	35
22	50	7	5	2	11	0	45	382	46	25	9	78
23	43	7	4	2	40	0	45	82	20	22	14	140
24	46	7	3	2	15	0	45	45	15	20	57	32
25	34	7	2	2	6	0	45	20	10	27	308	46
26	22	7	3	2	2	0	45	15	10	28	152	38
27	17	7	4	2	1	0	50	254	10	75	173	35
28	11	7	4	3	18	0	55	227	15	116	76	28
29	6	8	5	4	-	13	60	60	15	54	58	26
30	5	10	6	4	-----	39	60	208	15	34	401	29
31	3	-----	6	5	-----	50	-----	834	-----	33	729	-----
Total	594	89	120	69	227	193	1,285	3,464	1,639	1,643	4,583	1,475
Mean	19.2	3.0	3.9	2.2	8.1	6.2	42.8	112	54.6	53.0	148	49.2
Ac-ft	1,180	177	238	137	450	383	2,550	6,870	3,250	3,260	9,090	2,930

Calendar year 1962: Max 1,590 Min 0 Mean 46.6 Ac-ft 33,720

Water year 1962-63: Max 1,050 Min 0 Mean 42.1 Ac-ft 30,520

Peak discharge (base, 4,500 cfs).--No peak above base.

Note.--Stage-discharge relation affected by ice Jan. 10, 11, 16-31. No gage-height record Nov. 16 to Dec. 2, Jan. 12-15, Mar. 31 to Apr. 7, Apr. 10-30, June 7-10, June 24 to July 4.

## BRAZOS RIVER BASIN

8-806. Running Water Draw near Clovis, N. Mex.

Location.--Lat 34°31'55", long 103°12'05", in W $\frac{1}{2}$ NE $\frac{1}{4}$  sec.31, T.4 N., R.36 E., on left bank a quarter of a mile upstream from State Highway 18 and 8 miles north of Clovis.

Drainage area.--109 sq mi, of which about 14 sq mi is probably noncontributing.

Records available.--October 1952 to September 1956 (annual maximum only), October 1956 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map). Prior to October 1956, crest-stage gage at site 900 ft downstream at datum 0.4 ft lower.

Average discharge.--7 years, 2.04 cfs (1,480 acre-ft per year).

Extremes.--Maximum discharge during year, 4,740 cfs June 18 (gage height, 8.02 ft); no flow for most of year.

1952-63: Maximum discharge, 7,090 cfs Sept. 6, 1957 (gage height, 9.95 ft, from floodmarks), from rating curve extended above 1,800 cfs on basis of indirect measurements of flow at gage heights 7.73, and 9.95 ft; no flow for most of time.

Remarks.--Records poor. Precipitation at Clovis (8 mi south) was 19.20 inches during year, and at Clovis 13 N (5 mi north), 21.00 inches. During the year there were 11 observations of no flow and 6 discharge measurements.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								0	4.6	0		
2								0	*997	0		
3								0	1.8	0		
4								0	0	0		
5								0	.1	0		
6								0	0	0		
7								0	0	0		
8								0	0	0		
9								0	0	0		
10								0	0	0		
11								0	0	0		
12								0	0	0		
13								0	0	0		
14								0	86	0		
15								0	6.6	0		
16								0	.1	0		
17								0	0	0		
18								0	639	0		
19								0	*99	0		
20								0	3.9	0		
21								176	5.9	0		
22								*17	.2	0		
23								.1	0	0		
24								0	0	0		
25								0	0	0		
26								0	0	0		
27								0	0	0		
28								0	0	21		
29								0	0	0		
30								0	0	0		
31								0	0	0		
Total	0	0	0	0	0	0	0	193.1	1844.2	21	0	0
Mean	0	0	0	0	0	0	0	6.23	61.5	0.68	0	0
Ac-ft	0	0	0	0	0	0	0	383	3,660	42	0	0

Calendar year 1962: Max 1.1 Min 0 Mean 0.003 Ac-ft 2.2  
 Water year 1962-63: Max 997 Min 0 Mean 5.64 Ac-ft 4,080

Peak discharge (base, 150 cfs)

\* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-21	1845	6.52	1,400	6-14	1920	5.68	566
6-2	0445	7.75	4,110	6-18	2120	8.02	4,740
				7-28	0345	5.29	345

# RIO GRANDE BASIN

51

8-2525. Costilla Creek above Costilla Dam, N. Mex.

Location.--Lat 36°53'50", long 105°15'20", in Sangre de Cristo Grant, on left bank 2 miles upstream from Costilla Dam and 17 miles southeast of Costilla, Taos County.

Drainage area.--26 sq mi, approximately.

Records available.--April 1937 to September 1963 (no winter records). Published as "above reservoir, near Costilla" 1937-51. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 9,280 ft (from topographic map). Prior to July 9, 1940, at wooden control 660 ft downstream at datum 9.53 ft lower. July 9, 1940, to July 22, 1954, at concrete control 600 ft downstream at datum 7.75 ft lower. July 23, 1954, to June 16, 1959, 200 ft upstream at datum 2.53 ft higher.

Extremes.--Maximum discharge during year, 12 cfs July 20 (gage height, 3.11 ft); minimum, no flow Apr. 29.

1937-63: Maximum discharge, 3,870 cfs July 22, 1954 (gage height, 7.0 ft, from floodmarks, at present site and datum), on basis of slope-area measurement of peak flow; minimum, that of Apr. 29, 1963.

The flood in 1954 is highest known since about 1909, from information by local range rider.

Remarks.--Records good.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Apr. 23 to May 9		May 10 to Sept. 30	
2.3	0.7	2.4	0.4
2.4	1.5	2.5	1.4
2.5	3.3	2.6	2.8
2.6	7.0	2.8	5.6

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7						-	2.1	3.0	1.9	*1.2	2.8
2	2.7						-	1.9	4.4	1.4	1.7	2.4
3	2.5						-	1.9	4.3	1.3	2.8	2.4
4	2.3						-	2.1	*3.1	2.1	2.8	2.7
5	2.5						-	2.7	2.7	2.4	3.6	3.0
6	2.5						-	2.7	2.3	1.9	3.0	3.5
7	2.5						-	3.3	2.0	1.6	2.6	3.1
8	2.3	(*)					-	4.1	2.3	*2.0	3.0	2.6
9	2.5						-	*4.9	2.6	2.0	3.2	2.4
10	2.3						-	*4.0	2.3	1.9	4.4	3.0
11	*2.3		(*)				-	5.0	1.7	1.4	3.5	*3.0
12	2.3						-	4.6	1.9	2.3	3.5	2.8
13	2.5						-	4.6	2.0	2.4	3.9	2.7
14	2.5						-	4.3	2.3	1.6	*5.1	3.1
15	2.5						-	4.8	1.4	1.4	3.9	2.8
16	2.5						-	4.6	2.8	1.9	3.4	2.6
17	3.1						-	4.4	3.5	1.9	3.4	2.3
18	3.1						-	4.0	3.4	1.7	3.4	2.1
19	3.1						-	3.9	3.2	1.3	3.2	2.1
20	3.3						-	4.3	3.2	3.7	3.6	2.4
21	2.5						-	5.3	2.3	3.9	4.0	4.0
22	2.3						-	*5.7	1.7	2.7	3.8	2.8
23	2.3						*2.5	4.0	1.3	2.0	3.4	2.4
24	2.3						1.3	*3.9	1.2	1.7	3.8	*2.3
25	*2.1						1.2	3.5	1.1	1.9	4.3	2.3
26	2						1.5	3.4	1.2	1.7	2.8	2.1
27	2	(*)					1.8	3.5	1.1	1.4	2.7	2.0
28	2						1.4	3.4	*1.1	1.4	*2.7	1.9
29	2					-	1.6	3.2	1.2	1.3	3.1	1.9
30	2						1.5	3.2	1.4	1.3	3.4	1.9
31	2							3.2		1.3	3.1	
Total	75.5	-	-	-	-	-	-	116.5	68.0	58.7	102.3	77.4
Mean	2.44	-	-	-	-	-	-	3.76	2.27	1.89	3.30	2.58
Ac-ft	150	-	-	-	-	-	-	231	135	116	203	154

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.



## RIO GRANDE BASIN

8-2530. Casias Creek near Costilla, N. Mex.

Location.--Lat 36°53'50", long 105°15'35", in Sangre de Cristo Grant, on left bank 200 ft downstream from road crossing, 2 miles upstream from Costilla Dam, and 17 miles southeast of Costilla, Taos County.

Drainage area.--19 sq mi, approximately.

Records available.--April 1937 to September 1963 (no winter records). Nov. 1-7, 1947, and Nov. 1-8, 13-16, 1948, discharge records have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 9,270 ft (from topographic map). Prior to July 18, 1940, water-stage recorder and wooden control 100 ft downstream at datum 1.56 ft lower.

Extremes.--Maximum discharge during year, 31 cfs June 7 (gage height, 1.11 ft); minimum recorded, 0.8 cfs June 29.

1937-63: Maximum discharge, 122 cfs June 11, 1957; maximum gage height recorded, 1.90 ft June 14, 1938 (backwater from Costilla Reservoir); minimum recorded, that of June 29, 1963.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions for irrigation of about 1,300 acres above station.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

0.5	1.0
.6	3.2
.7	6.2

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.3	4.6						a 3	1.6	1.0	* 1.6	2.0
2	4.3	4.6						a 3	3.2	1.2	1.8	2.8
3	4.3	4.3						a 3	3.0	1.4	3.0	3.8
4	4.0	4.6						a 3	* 2.0	2.2	2.5	4.0
5	4.0	4.3						a 3	1.8	2.0	2.2	4.6
6	3.8	4.3						a 3	1.6	1.6	1.8	5.5
7	3.8	3.8						a 3	3.3	1.4	1.6	4.6
8	3.8	* 4.6						a 3	1.8	* 1.6	1.8	4.0
9	3.5							* 3.0	2.2	1.6	2.5	3.8
10	3.5	-						3.5	1.6	1.4	2.8	4.0
11	* 3.8	-	(*)					2.8	1.4	1.2	1.8	* 4.0
12	3.8	-						2.0	1.4	1.4	2.0	3.8
13	3.8	-						1.8	1.6	1.6	2.5	3.8
14	4.0	-						1.4	1.8	1.6	* 3.2	4.0
15	4.0	-						1.2	1.6	1.4	2.0	3.8
16	4.0	-						1.6	2.2	1.4	1.8	3.8
17	4.6	-						1.6	2.5	1.8	1.8	3.5
18	4.3	-						1.6	2.2	1.6	1.8	3.5
19	4.6	-						1.8	2.2	1.4	1.8	3.5
20	4.9	-						2.0	2.0	2.0	2.0	3.5
21	4.6	-						3.0	1.8	2.2	4.1	4.9
22	4.3	-						* 3.0	1.6	1.8	3.0	3.8
23	4.6	-						2.2	1.4	1.6	2.2	4.0
24	4.6	-						2.0	1.4	1.4	3.2	* 3.5
25	* 4.6	-						2.0	1.4	1.4	3.0	3.5
26	4.6	-						1.8	1.4	1.4	2.5	3.5
27	4.6	(*)						1.8	* 1.2	1.4	2.2	3.5
28	4.3	-						1.8	1.2	1.4	* 2.2	3.0
29	4.3	-						1.8	1.2	1.6	2.5	3.0
30	4.6	-						1.8	1.2	1.6	2.5	3.2
31	4.3	-						1.8	-	1.6	2.2	-
Total	130.5	-	-	-	-	-	-	71.3	54.8	48.2	71.9	112.2
Mean	4.21	-	-	-	-	-	-	2.30	1.83	1.55	2.32	3.74
Ac-ft	259	-	-	-	-	-	-	141	109	96	143	223

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

Peak discharge (base 50 cfs). --No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

# RIO GRANDE BASIN

53

8-2535. Santistevan Creek near Costilla, N. Mex.

Location.--Lat 36°53'05", long 105°16'50", in Sangre de Cristo Grant, on left bank 200 ft upstream from road crossing, 0.9 mile upstream from Costilla Dam, and 16 miles southeast of Costilla, Taos County.

Drainage area.--2.5 sq mi, approximately.

Records available.--April 1937 to September 1963 (no winter records). Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 9,300 ft (from topographic map). Prior to June 27, 1940, water-stage recorder and wooden control at same site at datum 0.99 ft lower.

Extremes.--Maximum discharge during year, 4.0 cfs July 20 (gage height, 0.55 ft); minimum recorded, 0.1 cfs Apr. 29. 1937-63: Maximum discharge recorded, 18 cfs Aug. 11, 1941, July 12, 1957; maximum gage height recorded, 1.73 ft Aug. 11, 1941; minimum daily discharge recorded, 0.1 cfs Nov. 13-17, 1948.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above or below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.3
.2	.8
.4	2.4

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 1	b 0.7					-	0.7	1.4	0.7	* 0.4	1.1
2	a 1	b .7					-	.7	1.7	.7	.4	1.1
3	a 1	b .7					-	.8	1.5	.8	.9	1.1
4	a 1	b .7					-	.8	* 1.4	.9	.6	1.1
5	a 1	b .7					-	.8	1.4	.8	.6	1.1
6	a 1	b .7					-	.8	1.3	.7	.5	1.2
7	a 1	b .6					-	.8	1.2	.7	.5	1.0
8	a 1	(*)					-	1.0	1.3	* .7	.5	.9
9	a 1						-	* 1.1	1.3	.8	.7	.9
10	1.0	-					-	1.1	1.2	.8	a .7	* .9
11	* 1.0	-	(*)				-	1.1	1.2	.7	a .8	1.0
12	1.0	-					-	1.1	1.2	.8	a 1.0	.9
13	1.0	-					-	1.1	1.2	.7	a 1.0	.9
14	1.0	-					-	1.1	1.2	.7	* 1.2	.9
15	1.0	-					-	1.2	1.0	.7	1.2	1.0
16	1.1	-					-	1.2	1.3	.7	1.1	.9
17	1.2	-					-	1.2	1.2	.7	1.2	.8
18	1.1	-					-	1.2	1.2	.7	1.1	.8
19	1.2	-					-	1.3	1.2	.6	1.4	.8
20	1.1	-					-	1.4	1.1	1.0	1.4	.8
21	1.1	-					-	1.4	.9	.5	1.2	1.3
22	1.0	-					-	* 1.4	.8	.4	1.1	.9
23	.9	-					-	1.4	.8	.4	1.2	* .8
24	.9	-					* 0.7	1.4	.8	.4	1.4	.8
25	* .8	-					.7	1.4	.8	.4	1.3	.8
26	.8	-					.7	1.4	.8	.4	1.2	.8
27	.8	(*)					.7	1.4	* .8	.4	1.2	.8
28	.8	-					.6	1.4	.8	.4	* 1.2	.8
29	b .7	-			-		.7	1.4	.7	.4	1.2	.8
30	b .7	-			-----		.7	1.4	.7	.4	1.2	.8
31	b .7	-----			-----		-----	1.4	-----	.4	1.2	-----
Total	29.9	-	-	-	-	-	-	35.9	33.4	19.4	30.6	27.8
Mean	0.96	-	-	-	-	-	-	1.16	1.11	0.63	0.99	0.93
Ac-ft	59	-	-	-	-	-	-	71	66	38	61	55

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

Peak discharge (base, 6 cfs)--No peak above base.

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-2540. Costilla Creek below Costilla Dam, N. Mex.

Location.--Lat 36°52'35", long 105°16'45", in Sangre de Cristo Grant, on left bank 125 ft downstream from outlet of reservoir and 16 miles southeast of Costilla, Taos County.

Drainage area.--55 sq mi, approximately.

Records available.--April 1937 to September 1963 (no winter records 1937-44, 1948-49). Prior to October 1951, published as "below reservoir near Costilla." Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 9,180 ft (from topographic map).

Average discharge.--17 years (1944-47, 1949-63), 17.0 cfs (12,310 acre-ft per year).

Extremes.--Maximum discharge during year, 118 cfs May 31 (gage height, 1.87 ft); no flow May 3-5.  
1937-63: Maximum discharge, 286 cfs May 9, 10, 1942 (gage height, 2.65 ft); no flow at times.

Remarks.--Records good. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 1,300 acres above Reservoir.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.1	0.5	4.4	1.1	33
.2	.5	.6	7.1	1.3	50
.3	1.2	.7	11	1.6	83
.4	2.4	.9	20	1.9	122

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	a.0.1	0.1	0.1	0.1	0.1	0.1	0.1	5.5	10.6	* 0.8	6.3
2	.1	a.1	.1	.1	.1	.1	.1	.1	31	10.6	2.4	6.0
3	.1	a.1	.1	.1	.1	.1	*.1	0	81	6.9	2.4	1.4
4	.1	a.1	.1	.1	.1	.1	.1	0	* 6.9	3.8	2.6	2.1
5	.1	a.1	.1	.1	.1	.1	.1	0	4.9	1.3	2.6	6.6
6	.1	a.2	.1	.1	.1	.1	.1	.1	3.9	.7	2.9	6.6
7	.1	a.2	.1	.1	.1	.1	.1	.1	1.8	2.7	4.8	6.6
8	.1	*.2	.1	.1	.1	.1	.1	.1	5.2	8.8	2.4	6.6
9	.1	.2	.1	.1	.1	.1	.1	*.1	2.2	* 8.8	2.4	6.6
10	.1	.2	.1	.1	.1	.1	.1	.1	6.2	7.9	2.4	*1.5
11	*.1	.2	*.1	.1	.1	.1	.1	.1	6.2	7.3	2.4	2.1
12	.1	.2	.1	.1	.1	.1	.1	3.6	6.6	2.8	2.6	8.8
13	.1	.1	.1	.1	.1	.1	.1	7.7	7.9	5.5	1.3	8.8
14	.1	.1	.1	.1	.1	.1	.1	7.8	3.1	2.3	* 2.0	8.8
15	.1	.1	.1	.1	.1	.1	.1	7.7	4.7	5.8	4.7	8.8
16	.1	.1	.1	.1	.1	.1	.1	7.8	3.0	5.8	5.5	8.8
17	.1	.1	.1	.1	.1	.1	.1	2.8	9.5	5.8	5.5	8.5
18	.1	.1	.1	.1	.1	.1	.1	6.6	8.5	5.8	5.5	6.6
19	.1	.1	.1	.1	.1	.1	.1	3.3	6.8	2.0	5.5	6.6
20	.1	.1	.1	.1	.1	.1	.1	7.7	6.8	3.0	1.4	6.6
21	.1	.1	.1	.1	.1	.1	.1	7.8	2.6	2.3	1.8	6.6
22	.1	.1	.1	.1	.1	.1	.1	* 7.8	4.7	6.0	6.3	6.3
23	.1	.1	.1	.1	.1	.1	.1	7.7	2.5	5.0	6.3	6.3
24	.1	.1	.1	.1	.1	.1	*.1	2.9	7.0	4.9	6.3	* 6.3
25	*.1	.1	.1	.1	.1	.1	.1	5.8	7.3	4.9	6.3	6.3
26	a.1	.1	.1	.1	.1	.1	.1	2.5	7.3	1.7	6.3	6.3
27	a.1	*.1	.1	.1	.1	.1	.1	8.3	* 7.2	1.8	1.5	6.3
28	a.1	.1	.1	.1	.1	.1	.1	8.3	2.5	2.0	* 2.1	6.3
29	a.1	.1	.1	.1	-	.1	.1	8.3	2.0	5.5	6.3	6.3
30	a.1	.1	.1	-	-	.1	.1	8.3	3.5	6.4	6.3	6.3
31	a.1	-	.1	.1	-	.1	-	3.5	-	4.2	6.3	-
Total	3.1	3.7	3.1	3.1	2.8	3.1	3.0	1.151.2	1.376.1	1.430.0	278.1	251.9
Mean	0.10	0.12	0.10	0.10	0.10	0.10	0.10	37.1	45.9	48.1	8.97	8.40
Ac-ft	6.1	7.3	6.1	6.1	5.8	6.1	6.0	2,280	2,730	2,840	552	500
(†)	4,600	5,050	5,590	6,020	6,850	7,060	7,570	5,760	3,370	558	508	490
Calendar year 1962: Max	121	Min	0.1	Mean	22.9	Ac-ft	16,610					
Water year 1962-63: Max	106	Min	0	Mean	12.4	Ac-ft	8,950					

\* Discharge measurement made on this day.

a No gage-height record.

† Contents, in acre-feet, at end of month, in reservoir above station.

RIO GRANDE BASIN

55

8-2545. Costilla Creek near Amalia, N. Mex.

Location.--Lat 36°52'15", long 105°23'10", in Sangre de Cristo Grant, on right bank 50 ft downstream from third bridge upstream from Amalia, 1.5 miles downstream from Latir Creek, 6½ miles southeast of Amalia, and 12 miles southeast of Costilla.

Drainage area.--140 sq mi, approximately.

Records available.--May 1949 to September 1959, April 1961 to September 1963 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 8,500 ft (from topographic map). Prior to May 3, 1956, at site 50 ft upstream at datum 1.0 ft higher.

Extremes.--Maximum discharge during year, 114 cfs May 31 (gage height, 3.54 ft); minimum discharge recorded, 1.4 cfs June 23. 1949-59, 1960-63: Maximum discharge recorded, 689 cfs Apr. 25, 1958, from rating curve extended above 400 cfs; maximum gage height recorded, 3.85 ft May 14, 1958; minimum daily discharge recorded, 5.4 cfs July 22, 1958.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 1,300 acres above Costilla Lake.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 - 31

Apr. to Sept. 30

Large shifts used  
during October

2.6	4.0	3.1	37
2.7	9.0	3.3	64
2.9	21	3.6	130

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8						-	a 13	*16	107	*9.4	13
2	7.5						-	a 12	23	112	5.5	12
3	8.2						-	a 10	87	82	7.5	13
4	7.8						-	a 10	69	47	11	31
5	8.2						-	a 10	56	29	7.0	17
6	8.2						-	a 11	41	a 5.5	15	16
7	7.8						-	a 12	*31	*12	6.2	16
8	8.2	(*)					-	a 13	13	86	11	13
9	7.4						-	*13	17	*91	10	11
10	*6.1						-	12	64	84	16	*15
11	8.5		(*)				-	13	64	77	11	30
12	12						-	28	66	48	15	16
13	12						-	84	82	*13	16	14
14	9.3						-	*86	51	13	33	14
15	8.6						-	86	a 11	58	*13	16
16	7.5						-	86	a 16	60	11	14
17	9.3						-	52	93	61	11	14
18	8.9						-	*18	88	60	10	12
19	9.8						-	29	*68	40	9.6	11
20	8.6						-	*80	68	11	12	13
21	7.5						-	84	43	13	26	18
22	7.2						-	84	11	62	14	14
23	7.2						-	82	14	54	12	13
24	7.2						*14	*52	66	50	18	13
25	*7.2						13	*17	75	50	18	12
26	b 7						14	19	77	36	16	*12
27	b 7		(*)				14	82	*75	6.5	16	11
28	b 6						13	84	45	64	*31	11
29	b 6						13	86	a 12	56	15	11
30	b 5						a 13	86	a 21	64	16	11
31	b 5							58		66	14	
Total	244.0	-	-	-	-	-	-	1412	1463	1560.4	492.0	437
Mean	7.87	-	-	-	-	-	-	45.5	48.8	50.3	15.9	14.8
Ac-ft	484	-	-	-	-	-	-	2,800	2,900	3,100	976	887
Calendar year	: Max	Min	Mean	Ac-ft								
Water year	: Max	Min	Mean	Ac-ft								

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-2555. Costilla Creek near Costilla, N. Mex.

**Location.**--Lat 36°57'55", long 105°30'10", in Sangre de Cristo Grant, on left bank 1 mile upstream from diversion dam and 2 miles southeast of Costilla, Taos County.

**Drainage area.**--195 sq mi.

**Records available.**--March 1936 to September 1963 (no winter records 1936-41). Monthly discharge only for some periods, published in WSP 1312.

**Gage.**--Water-stage recorder. Concrete control since Oct. 13, 1952. Altitude of gage is 7,810 ft (from topographic map). Prior to June 18, 1944, at site half a mile downstream at different datum.

**Average discharge.**--22 years (1941-63), 45.2 cfs (32,720 acre-ft per year).

**Extremes.**--Maximum discharge during year, 401 cfs July 20 (gage height, 3.87 ft); minimum daily, 3 cfs Jan. 13-16.  
1936-63: Maximum discharge, 1,150 cfs May 11, 1942 (gage height, 5.37 ft, site and datum then in use); minimum daily recorded, 2 cfs Dec. 30, 1946.  
The greatest flood known occurred in 1886, from information by local residents.

**Remarks.**--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor. Regulation by Costilla Reservoir 20 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions for irrigation of about 2,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	2.8	1.6	14	2.0	38	2.5	93
1.4	7.0	1.8	24	2.3	67		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	8.8	9.4	d6	d8.5	b11	34	13	a25	69	21	13
2	a12	9.1	a9.4	d5	d9	b10	26	12	a25	90	11	13
3	a11	a9	a9	d5	d8	b9	17	11	*a69	97	26	12
4	a10	a8.5	a8.5	d5.5	b9	b8	23	10	a68	53	14	27
5	a10	8.2	a8.5	d6	b9	b8.5	24	10	a61	44	12	21
6	a9	8.5	a8	d6	b10	b8.5	20	11	a45	20	12	26
7	a9	*7.6	b8	d5	b10	b9	24	10	a40	15	58	23
8	a9	6.8	b6.5	*d4.5	b9	b9	29	*10	a24	58	18	16
9	*9.4	6.8	b6	d4	b9	b7	*29	10	a22	*76	a10	14
10	9.4	8.2	*b5.5	a4	b8	b6.5	29	10	a47	79	17	14
11	9.1	7.3	b5.5	a4	b7	b5	25	10	a59	70	14	*34
12	8.8	6.5	b5.5	d3.5	a6	b5	24	10	a61	63	17	21
13	9.1	6.0	b5.5	a3	*b8	*6.5	24	54	a72	23	*19	16
14	9.1	8.8	b5.5	d3	a7.6	b6.5	24	67	a66	16	38	16
15	8.8	9.7	b6	a3	7.3	b7	24	70	a21	41	20	16
16	8.5	9.7	b6	a3	6.8	b6	22	74	a17	52	16	16
17	9.7	8.5	b6	a3.5	b5.5	b6.5	20	60	a68	52	17	15
18	12	7.6	b7	a4	b5	7.3	19	20	*8.5	53	16	14
19	13	a7.5	b7	a4	b5	7.6	14	17	72	43	16	12
20	12	a7	a7	a4	b6	10	17	*a57	75	48	16	11
21	11	a7	a7	*a4	b6	14	16	74	63	24	28	19
22	11	a7	a8	a4	b5	22	*15	80	24	65	d15	17
23	10	a8	a8	a4	b4.5	57	14	80	16	65	d12	14
24	*10	a8	a7	a4.5	b6	69	14	67	46	60	19	12
25	10	a8.5	a6	a5	a8	54	13	25	64	62	21	12
26	9.7	*9.4	a5	a5	*a10	*49	13	20	*64	52	*18	*12
27	9.7	b8.5	*b5	a5.5	b11	49	14	a59	64	16	14	13
28	9.4	b8.5	d5	a6	b11	50	14	a76	55	11	27	12
29	9.1	b9	d5.5	a7	-	51	13	a79	18	44	23	12
30	8.8	9.4	d6	a8	-----	34	12	a81	13	*58	16	13
31	8.8	-----	d6	d8	-----	37	-----	a69	-----	67	14	-----
Total	309.4	243.4	208.3	147.0	215.2	639.9	606	1256	1449	1576	595	486
Mean	9.98	8.11	6.72	4.74	7.69	20.6	20.2	40.5	48.3	50.8	19.2	16.2
Ac-ft	614	483	413	292	427	1,270	1,200	2,490	2,870	3,130	1,180	964

Calendar year 1962: Max 253 Min 3.5 Mean 46.5 Ac-ft 33,650  
Water year 1962-63: Max 90 Min 3 Mean 21.2 Ac-ft 15,330

Peak discharge (base, 250 cfs). --July 20 (1930) 401 cfs (3.87 ft); Aug. 3 (1330) 278 cfs (3.44 ft).

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.

## RIO GRANDE BASIN

57

8-2605. Costilla Creek below diversion dam, at Costilla, N. Mex.

Location.--Lat 36°58'00", long 105°30'55", in Sangre de Cristo Grant, on right bank 650 ft downstream from diversion dam and 1.5 miles southeast of Costilla, Taos County.

Drainage area.--197 sq mi.

Records available.--April 1952 to September 1963 (no winter records).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,790 ft (from topographic map).

Extremes.--Maximum discharge recorded during year, 400 cfs July 20 (gage height, 3.30 ft); minimum daily recorded, 0.1 cfs Oct. 4, 5, Aug. 2.

1952-63: Maximum discharge recorded, 525 cfs July 22, 1954; maximum gage height, 5.05 ft July 24, 1957; minimum daily discharge recorded, 0.1 cfs Sept. 28-30, 1953, Sept. 12-28, 1956, Oct. 4, 5, 1962, Aug. 2, 1963.

Remarks.--Records good. Flow partly regulated by Costilla Reservoir about 21 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions above station for irrigation of about 5,000 acres, 3,000 of which lies below station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1-30		Mar. 27 to Sept. 30			
0.55	0.1	0.57	0.1	1.0	9.5
.6	.3	.6	.4	1.2	20
.7	1.1	.7	1.3	1.4	34
.8	2.8	.8	3.0	1.6	49
.9	5.8	.9	5.7		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8					-	2.5	2.0	9.6	2.1	0.3	3.0
2	1.7					-	1.7	1.8	2.7	1.3	.1	2.8
3	.6					-	6.5	1.6	3.3	4.8	8.2	2.8
4	.1					-	1.3	1.6	1.5	2.6	.7	2.7
5	.1					-	1.6	1.6	*1.3	1.1	.5	3.5
6	.2					-	9.5	1.6	1.3	8.5	.4	1.1
7	.2	(*)				-	1.4	1.6	3.2	2.8	.9	7.6
8	.2					-	1.7	1.6	2.3	*2.8	.4	1
9	.4					-	1.7	1.6	2.3	2.5	.4	1
10	*.7					-	*1.7	1.6	2.5	3.0	.4	1
11	.7					-	1.4	2.3	2.7	1.8	.4	*5
12	.7					-	1.3	2.5	2.5	6.9	.8	1.2
13	.7					-	1.3	2.3	2.2	4.4	.4	1.1
14	.8					-	1.3	1.8	1.2	2.2	1.2	1.1
15	.8					-	4.6	*1.6	9.1	2.5	.4	1.1
16	1.8					-	1.6	1.8	2.0	1.8	.4	1.0
17	5.4					-	5.5	8.5	3.2	1.8	.4	1.0
18	4.2					-	5.5	7.8	*1.6	6.3	.4	1.0
19	1.7					-	1.5	2.7	1.3	1.3	.4	1.0
20	1.7					-	2.0	6.3	1.5	3.0	.4	.9
21	1.5					-	2.0	*2.3	5.0	1.9	.5	2.8
22	1.5					-	*1.8	2.3	2.2	4.9	.6	.9
23	1.4					-	2.8	2.7	2.2	1.2	.4	.8
24	*1.4					-	3.3	6.2	2.2	1.1	3.0	.9
25	1.2					-	3.3	3.0	2.0	1.0	3.5	*.6
26	1.2					-	3.3	2.2	*1.5	3.6	*1.8	.8
27	1.4					*4.0	5.8	1.8	1.5	1.5	.9	.8
28	2.4					4.2	7.5	1.8	1.5	.9	1.2	.8
29	4.4				-	4.0	2.0	1.6	1.8	.8	1.1	.8
30	2.2				-----	2.5	2.0	1.8	1.8	*.7	6.9	.8
31	2.0	-----			-----	2.6	-----	1.5	-----	.6	3.0	-----
Total	45.1	-	-	-	-	-	259.5	94.9	89.8	147.4	50.3	60.8
Mean	1.45	-	-	-	-	-	8.6	3.06	2.99	4.75	1.62	2.03
Ac-ft	89	-	-	-	-	-	515	188	178	292	100	121

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.

## RIO GRANDE BASIN

8-2610. Costilla Creek at Garcia, Colo.

Location.--Lat 36°59'30", long 105°32'00", in Sangre de Cristo Grant, on left bank 200 ft downstream from old highway bridge, a quarter of a mile upstream from New Mexico-Colorado State line, and 0.6 mile south of Garcia.

Drainage area.--200 sq mi, approximately.

Records available.--June 1944 to September 1963 (no winter records).

Gage.--Water-stage recorder. Altitude of gage is 7,750 ft (based on estimated relation to former station). Prior to Apr. 20, 1950, at site 1,000 ft downstream at datum 7,747.43 ft above mean sea level, datum of 1929.

Extremes.--Maximum discharge during year, 414 cfs July 20 (gage height, 4.53 ft); no flow for many days.

1944-63: Maximum discharge, 460 cfs July 24, 1957 (gage height, 4.76 ft); no flow at times in most years.

The greatest flood known occurred in 1886, information by local residents. Flood of May 11, 1942, probably reached a discharge of 1,000 cfs.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Flow partly regulated by Costilla Reservoir about 23 miles upstream (capacity, 15,700 acre-ft, original survey). Diversions above station for irrigation of about 5,500 acres, 2,000 of which lies below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.8	0	2.2	1.8	2.8	18
1.9	.2	2.4	4.6	3.0	28
2.0	.6	2.6	9.7	3.2	40

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0					-	2.4	0	5.9	*0	a0	1.5
2	0					-	1.7	0	0	0	a0	1.3
3	0					-	8.1	0	.7	.1	a5	1.1
4	0					-	1.3	0	0	.3	a0	1.1
5	0					-	1.3	0	*0	5.0	*0	2.3
6	0					-	8.4	0	0	6.4	0	8.9
7	0					-	1.2	0	.2	.3	.2	7.5
8	0					-	1.3	*0	.1	.1	.1	2.0
9	*0					-	1.5	0	0	.1	0	*.8
10	-					-	*1.4	0	0	0	0	.8
11	-					-	1.2	0	0	0	0	3.8
12	-					-	1.1	0	0	2.9	.1	1.6
13	-					-	1.2	0	0	1.6	*0	.9
14	-					-	1.0	0	5.0	0	a.5	.7
15	-					-	3.4	0	5.1	0	a0	.9
16	-					-	.2	0	0	0	a0	1.2
17	-					-	2.0	6.7	.3	0	a0	.8
18	-					-	4.0	1.2	*0	0	a0	.7
19	-					-	.3	0	0	9.0	a0	.6
20	-					-	.5	2.6	0	3.3	a0	.3
21	-					-	.3	*.6	1.5	a20	a0	2.1
22	-					-	*.2	0	.4	a3	a0	1.4
23	-					-	0	.2	0	a1	a0	*1.1
24	-					-	.5	1.6	0	a0	a1	1.1
25	-					-	.6	.8	0	a0	a2	1.1
26	-					-	.4	0	0	a2	a1	1.5
27	-					*2.9	1.6	0	0	a0	*0	1.5
28	-					3.7	6.0	0	0	a0	0	1.3
29	-				-	4.1	.2	0	0	*a0	8.5	.4
30	-				-----	2.3	0	0	0	a0	7.6	.3
31	-	-----			-----	2.5	-----	6.6	-----	a0	1.9	-----
Total	-	-	-	-	-	-	202.7	31.1	19.2	84.8	27.9	50.6
Mean	-	-	-	-	-	-	6.76	1.00	0.64	2.74	0.90	1.69
Ac-ft	-	-	-	-	-	-	402	62	38	168	55	100

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

Peak discharge (base, 200 cfs).--July 20 (2100) 414 cfs (4.53 ft).

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

## 59

Records of discharge are collected at 8 gaging stations on 4 diversions from Costilla Creek. Each of these stations is equipped with a water-stage recorder and a Parshall flume. Water diverted is used for irrigation in the Sangre de Cristo Grant in New Mexico and Colorado below the gaging station on Costilla Creek near Costilla, N. Mex. Records collected during irrigation seasons only except for No. 8-2620. Discharge measurements generally made twice a month except during winter period.

8-2620. Eastdale No.1 intake canal near Jaroso, Colo.--Lat 37°02'40", long 105°37'00", 750 ft downstream from headgate. Records available, June 1944 to September 1963. Canal diverts from right bank of Costilla Creek to Eastdale Reservoir No.1 for irrigation in Colorado.

[illegible]



## RIO GRANDE BASIN

8-2630. Latir Creek near Cerro, N. Mex.

Location.--Lat 36°49'45", long 105°32'45", in S $\frac{1}{2}$ SW $\frac{1}{4}$  sec. 15, T.30 N., R.13 E., on right bank at mouth of canyon, 100 ft upstream from heading of Cerro community ditch and 6 miles northeast of Cerro.

Drainage area.--10 sq mi, approximately.

Records available.--June 1937 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Records for April and May 1937, published in WSP 828, have been found to be unreliable (unknown portion of flow bypassing gage) and should not be used.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 8,250 ft (from topographic map).

Average discharge.--26 years, 6.37 cfs (4,610 acre-ft per year).

Extremes.--Maximum discharge during year, 22 cfs Sept. 6 (gage height, 1.00 ft); minimum daily, 1 cfs Jan. 12-15, Feb. 12. 1937-63: Maximum discharge determined, 121 cfs June 3, 1942, from rating curve extended above 56 cfs by logarithmic plotting; maximum gage height recorded, 4.2 ft July 19, 1945 (log jam; discharge not determined, but may have exceeded 121 cfs); minimum daily discharge, 0.2 cfs Jan. 20-21, 24, 1961.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.1	0.5	0.5	6.8
.2	1.6	.6	9.2
.3	3.0		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 4	a 3	a 3.5	a 1.5	d 2.5	1.9	4.5	3.4	4.1	2.6	* 1.9	2.8
2	a 4	a 3	a 3.5	a 1.5	d 2.5	1.9	3.1	3.6	4.9	* 2.8	2.2	2.6
3	a 4	a 3	a 3	a 2	d 2.5	1.9	3.3	4.3	4.5	2.6	2.5	2.5
4	a 4	a 3	a 3	a 2	d 3	1.9	3.4	5.3	4.1	3.1	3.0	2.5
5	a 4	a 3	a 3	a 2	d 3	1.9	3.6	4.7	3.8	3.3	2.6	2.8
6	a 3.5	a 3.5	a 3	a 2	d 3	1.8	3.1	4.9	3.6	2.8	2.8	5.3
7	a 3.5	a 3.5	a 3	a 2	d 3	1.8	5.3	6.1	3.6	2.6	2.6	5.7
8	a 3.5	a 3.5	a 3	* d 2	d 3	1.8	6.4	7.9	3.8	2.5	2.5	4.0
9	a 3.5	* 3.6	a 3	d 2	d 2.5	1.8	5.5	6.1	4.0	2.8	2.5	3.8
10	a 3.5	3.0	a 2.7	d 2	d 2.5	1.8	4.1	6.1	3.8	2.8	3.0	3.8
11	a 3	2.8	a 2.5	d 1.5	d 2	1.7	* 4.1	6.4	3.6	2.8	3.1	3.6
12	a 3	2.8	* 2.2	d 1	b 1	1.7	4.7	5.5	3.6	3.0	4.6	* 3.4
13	a 3	2.8	2.2	d 1	* b 1.5	1.7	5.5	4.9	3.4	3.0	4.0	3.4
14	a 3	3.1	1.9	d 1	b 1.5	1.7	5.3	5.1	3.4	2.6	5.1	3.3
15	a 3	3.3	1.9	d 1	d 1.5	1.7	4.5	5.3	3.4	* 2.6	* 3.8	3.3
16	* a 3	3.0	1.9	d 1.5	d 2	1.6	3.6	5.7	4.0	2.6	3.6	3.1
17	a 3	2.8	a 2	d 2	d 2	1.6	3.8	5.7	4.1	2.6	3.6	3.0
18	a 3	b 2.5	a 2	d 2	d 2	1.6	3.0	5.5	4.0	2.5	3.6	3.0
19	a 3	b 2.8	a 2	d 2	d 2	1.6	3.0	5.1	3.8	2.5	3.3	3.0
20	a 3	b 3	a 2	d 2	d 2	1.8	3.1	5.1	* 3.6	2.5	3.3	3.0
21	a 2.5	3.4	a 2	d 2	d 2	* 1.9	3.6	6.1	3.3	2.5	3.6	4.5
22	a 2.5	3.3	a 2	d 2	d 2	2.4	3.0	5.9	3.3	2.2	3.4	4.0
23	a 2.5	3.3	a 2	d 2	d 2	2.4	3.3	5.7	3.1	2.2	3.4	3.6
24	a 2.5	3.3	a 2	d 2	d 2	2.4	3.6	* 4.9	3.0	2.2	3.3	3.3
25	a 2.5	3.3	a 1.5	d 2	2.2	2.4	* 3.4	4.7	2.8	2.2	3.6	3.3
26	a 2.5	3.3	a 1.5	d 2	2.2	2.6	3.6	4.3	2.8	2.2	3.3	* 3.3
27	a 2.5	3.3	* b 1.5	d 2	* 1.9	3.3	3.4	4.3	2.8	1.9	3.3	3.3
28	a 2.5	* 3.4	b 1.5	d 2	1.9	* 3.8	3.0	4.0	2.8	1.9	3.1	3.0
29	a 2.5	a 3.5	a 1.5	d 2	-	4.0	3.1	4.0	2.8	1.9	* 2.8	3.0
30	a 2.7	a 3.5	a 1.5	d 2.2	-----	4.1	3.6	4.3	2.6	1.9	2.8	3.0
31	a 3	-----	a 1.5	d 2.5	-----	4.9	-----	4.1	-----	1.9	2.8	-----
Total	95.7	94.6	69.8	56.7	61.2	69.4	116.5	159.0	106.4	77.6	99.0	102.2
Mean	3.09	3.15	2.25	1.83	2.19	2.24	3.88	5.13	3.55	2.50	3.19	3.41
Ac-ft	190	188	138	112	121	138	231	315	211	154	196	203
Calendar year 1962:	Max 16	Min 1.3	Mean 4.69	Ac-ft 3,400								
Water year 1962-63:	Max 7.9	Min 1	Mean 3.04	Ac-ft 2,200								

Peak discharge (base, 40 cfs).--No peak above base.

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.

# RIO GRANDE BASIN

61

8-2635. Rio Grande near Cerro, N. Mex.

Location.--Lat 36°44'05", long 105°41'05", in N $\frac{1}{2}$  sec. 20, T. 29 N., R. 12 E., on left bank 4 miles southwest of Cerro, 5 $\frac{1}{2}$  miles northwest of Questa, and 7 miles upstream from Red River.

Drainage area.--8,440 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--May 1948 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 7,100 ft (from river-profile map).

Average discharge.--15 years, 344 cfs (249,000 acre-ft per year).

Extremes.--Maximum discharge during year, 720 cfs Nov. 10 (gage height, 5.30 ft); minimum, not determined (probably occurred during period of no gage-height record).

1948-63: Maximum discharge, 9,740 cfs June 22, 1949 (gage height, 15.78 ft); minimum daily, 44 cfs Sept. 20 to Oct. 2, 1956.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversions for irrigation of about 626,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.1	42	4.0	437
1.6	82	5.0	645
2.0	120	6.0	920
3.0	259		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	126	282	172	210	401	326	80	89	50	47	75
2	103	130	278	172	246	393	314	68	81	* 50	50	70
3	103	137	277	179	261	393	300	65	80	50	58	70
4	102	351	282	190	278	388	* 273	66	82	49	55	* 70
5	109	549	292	196	312	* 182	248	62	82	49	51	68
6	112	625	275	196	367	348	232	60	82	52	55	65
7	110	665	264	196	397	418	202	60	77	53	69	109
8	109	680	259	* 197	395	380	221	* 59	74	50	* 60	68
9	110	695	251	189	418	420	227	60	74	47	56	67
10	110	712	261	190	437	416	230	60	76	57	54	66
11	107	705	259	194	362	388	* 261	60	72	54	56	64
12	102	698	251	190	162	380	309	64	66	55	67	67
13	100	605	264	140	* 210	* 344	295	70	65	56	56	64
14	99	335	264	130	295	344	230	80	64	70	65	62
15	96	248	257	140	292	321	212	* 87	63	* 58	71	62
16	* 95	226	251	150	294	292	200	86	60	50	59	* 62
17	110	215	262	160	309	311	229	80	* 58	50	56	61
18	119	186	278	160	319	323	224	90	60	52	52	60
19	124	136	278	160	318	321	200	90	60	52	56	60
20	130	197	277	150	311	318	170	140	60	51	* 58	59
21	131	233	265	160	324	312	146	132	60	52	58	60
22	136	273	245	* 162	333	289	140	115	60	51	52	63
23	137	272	187	166	349	273	130	* 102	59	51	55	64
24	141	289	152	170	340	272	125	95	54	50	62	63
25	141	309	151	172	342	309	* 110	91	51	55	86	63
26	136	307	138	180	357	314	100	84	49	54	86	63
27	137	307	165	184	376	312	95	86	50	56	78	63
28	135	300	* 169	186	384	344	85	105	50	53	78	60
29	133	302	168	190	-	340	84	105	50	51	74	59
30	127	289	183	197	-----	323	82	105	50	49	216	* 55
31	124	-----	180	200	-----	362	-----	100	-----	46	80	-----
Total	3,629	11,102	7,365	5,418	8,998	10,531	6,000	2,607	1,958	1,623	2,076	1,962
Mean	117	370	238	175	321	340	200	84.1	65.3	52.4	67.0	65.4
Ac-ft	7,200	22,020	14,610	10,750	17,850	20,890	11,900	5,170	3,880	3,220	4,120	3,890

Calendar year 1962: Max 2,400 Min 90 Mean 461 Ac-ft 333,400  
 Water year 1962-63: Max 712 Min 46 Mean 173 Ac-ft 125,500

Peak discharge (base, 1,000 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--No gage-height record Jan. 13-21, Apr. 22 to May 20, and May 24 to Aug. 4.

## RIO GRANDE BASIN

8-2640. Red River near Red River, N. Mex.

Location--Lat 36°37'30", long 105°23'20", in NE¼ sec.36, T.28 N., R.14 E. (projected), on right bank 100 ft downstream from confluence of Middle and East Forks and 6 miles south of Red River.

Drainage area--19.1 sq mi (revised).

Records available--July 1940 to September 1963 (no winter records 1956 to 1962). Prior to October 1947, published as "Rio Colorado near Red River."

Gage--Water-stage recorder. Datum of gage is 9,394.2 ft above mean sea level (plane-table levels by Division of Water and Power).

Average discharge--16 years (1940-55, 1962-63), 17.9 cfs (12,960 acre-ft per year).

Extremes--Including supplemental peaks (base, 50 cfs):

Peak discharge				Minimum daily determined	
Date	Time	Gage height	Discharge	Date	Discharge
6- 2-56	0300	2.37	50	9-28, 29-56	4.1
6- 6-57	2300	2.96	178	10-25-56	3.2
7-15-57	1500	2.51	76		
8- 9-57	1745	2.39	52		
8-12-57	1950	2.42	56		
8-15-57	1600	2.47	65		
8-31-57	0200	2.39	56		
6- 2-58	1830	2.95	194	1-7, 9-58	3.9
8- 5-58	1500	2.62	56		
5-16-59	1800	2.40	53	10-11-58	3.6
6-19-59	1600	2.43	62		
6- 4-60	2000	2.65	86	11-26, 27, 30-59	4
6-10-60	2200	2.64	88		
6-18-60	0100	2.62	88		
6- -61	unknown	3.05	*188	11-9-60	4.0
5-12 or 13, 62	unknown	2.75	138	9-14-62	6.0
8- 9-63	1245	2.59	47	1-12, 13-63	2

\* Revised, supersedes figure published in 1961 State release.

1940-63: Maximum discharge recorded, 264 cfs June 12, 1952 (gage height, 3.16 ft); maximum gage height recorded, 4.19 ft during period Jan. 9 to May 11, 1960 (ice jam); minimum daily discharge determined, 2.0 cfs Mar. 6-9-1955, Jan. 12, 13, 1963.

Remarks--Records good for 1963 water year, others fair, except those for periods of ice effect or no gage-height record, which are poor.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 16 to Aug. 25, 1958,  
July 26 to Nov. 9, 1960, May 14 to July 8, 1962)

May 10 to June 12, 1956		June 13, 1956 to Aug. 13, 1959		Aug. 14, 1959 to Dec. 31, 1962		Jan. 1 to Sept. 30, 1963	
2.0	19	1.8	4.3	2.1	3.0	2.0	2.8
2.1	27	2.0	12	2.3	10	2.1	4.5
2.2	37	2.3	39	2.5	30	2.3	11
2.4	63	2.6	90	2.7	74	2.5	30
		3.0	200	2.9	135		

RIO GRANDE BASIN

63

8-2640. Red River near Red River, N. Mex.

Discharge, in cubic feet per second, water year October 1955 to September 1956

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11							-	48	11	21	6.3
2	11							-	53	11	16	6.0
3	11							-	49	10	12	5.6
4	10							-	45	9.0	10	5.6
5	-							-	44	9.0	10	5.6
6	-							-	42	9.0	9.0	5.6
7	-							-	37	8.6	8.6	5.6
8	-							-	33	8.1	8.6	5.6
9	-							-	31	9.0	7.6	5.3
10	-							* 25	30	8.6	7.6	5.3
11	-							24	30	8.1	7.3	5.0
12	-							24	28	8.1	7.3	5.0
13	-							24	26	10	8.1	4.6
14	-							23	* 25	8.1	8.6	4.6
15	-							20	24	8.1	7.6	4.3
16	-							19	22	10	7.6	4.3
17	-							20	20	11	8.1	4.6
18	-							24	20	9.5	11	4.6
19	-							29	18	9.5	13	4.3
20	-							33	18	10	13	4.3
21	-							35	18	9.0	* 11	4.3
22	-							39	16	8.6	9.5	4.3
23	-							44	15	8.6	8.6	4.3
24	-							43	14	8.1	8.1	4.3
25	-							44	14	* 8.1	7.6	4.3
26	-							42	13	8.1	7.6	4.3
27	-							39	13	7.6	7.3	4.3
28	-				-			38	12	7.6	7.3	4.1
29	-				-----			38	12	7.6	6.9	4.1
30	-				-----			39	11	9.0	6.3	4.3
31	-	-----			-----			42	-----	12	6.3	-----
Total	-	-	-	-	-	-	-	-	781	280.0	288.5	144.7
Mean	-	-	-	-	-	-	-	-	26.0	9.03	9.31	4.82
Ac-ft	-	-	-	-	-	-	-	-	1,550	555	572	287

Discharge, in cubic feet per second, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	5.0	b 4.1			3.6		-	63	134	32	42
2	5.0	b 4.1	b 4.1			3.6		-	60	121	32	36
3	* 4.6	b 4.6	b 4.1			3.4		-	68	111	33	33
4	4.6	4.6	3.9			3.4		-	92	106	34	30
5	4.3	5.3	3.9			3.4		-	113	95	38	39
6	4.3	5.0	3.9			3.6		-	139	90	38	27
7	4.3	5.0	3.6			3.6		-	154	84	34	25
8	4.3	4.6	b 3.9			3.9		-	159	78	* 31	23
9	4.3	4.3	-			3.9		-	154	* 78	39	22
10	4.3	4.3	-			3.9		-	148	67	35	22
11	4.3	4.6	-			4.1		-	131	62	33	* 20
12	4.3	4.3	-			4.1		-	108	58	36	20
13	4.3	4.3	-			3.9		-	104	53	33	19
14	4.3	* 4.3	-			3.9		-	131	49	30	18
15	4.1	b 3.9	-			4.1		-	139	52	39	16
16	4.1	b 3.9	-			4.3		-	145	49	44	16
17	4.7	b 4.1	-			4.3		-	134	46	42	15
18	4.3	4.1	-			-		-	* 129	42	37	14
19	4.1	4.1	-			-		-	139	42	33	14
20	4.1	b 4.3	-			-		* 27	154	35	31	14
21	3.9	b 4.6	-			-		25	142	33	28	13
22	4.1	4.3	-			-		20	131	33	26	13
23	4.1	4.3	-			-		19	129	31	30	12
24	4.9	4.1	-			-		19	131	29	31	12
25	3.2	3.9	-			-		21	139	29	26	12
26	4.3	3.9	-			-		24	139	29	23	11
27	5.3	b 4.1	-			-		30	139	28	22	11
28	5.3	b 4.1	-		-	-		38	139	28	22	11
29	5.3	b 4.1	-		-	-		50	139	29	26	11
30	4.6	b 4.1	-		-----	-		60	139	29	43	10
31	5.0	-----	-		-----	-		65	-----	31	47	-----
Total	137.6	130.2	-	-	-	-	-	-	3,631	1,781	1,028	581
Mean	4.44	4.34	-	-	-	-	-	-	128	57.5	33.2	19.4
Ac-ft	273	258	-	-	-	-	-	-	7,600	3,530	2,040	1,150

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

## 8-2640. Red River near Red River, N. Mex.--Continued

Discharge, in cubic feet per second, water year October 1957 to September 1958

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	9.0						-	165	43	10	9.0
2	10	8.6		4.1				-	174	42	10	8.6
3	10	8.6		4.1				-	178	38	10	8.6
4	10	8.6		4.1				-	181	36	10	9.0
5	9.5	8.6		4.1				-	181	36	18	9.0
6	10	7.6		4.1				-	178	39	14	9.0
7	10	7.3		3.9				-	168	33	12	9.0
8	9.0	7.6		5.0				-	156	32	11	8.6
9	9.0	7.6		3.9				-	126	30	11	8.1
10	9.0	7.6		4.3				-	108	29	10	8.1
11	9.0	7.6		5.0				-	95	28	10	8.1
12	10	7.6		-				-	84	27	12	7.6
13	10	7.3		-				-	80	27	11	16
14	10	7.6		-				-	76	25	11	15
15	10	7.6		-				-	78	23	14	12
16	9.5	7.3		-				* 68	74	21	12	10
17	9.5	6.9		-				67	72	* 20	12	9.5
18	9.0	6.6		-				74	70	21	12	9.0
19	9.5	6.9		-				80	70	19	12	9.0
20	11	7.3		-				80	70	16	11	8.1
21	11	* 7.3		-				88	70	15	12	8.1
22	10	-		-				90	67	14	15	7.6
23	9.0	-		-				102	63	14	13	7.6
24	10	-		-				126	62	14	12	7.6
25	9.5	-		-				142	58	14	11	7.3
26	9.5	-		-				139	* 55	14	* 11	6.9
27	7.6	-		-				154	53	12	10	7.6
28	8.6	-		-				151	50	12	10	8.6
29	8.6	-		-				162	47	11	10	7.3
30	8.6	-		-				171	46	11	10	7.3
31	8.6	-----		-	-----			165	-----	11	9.0	-----
Total	295.0	-	-	-	-	-	-	-	2,955	727	356.0	267.2
Mean	9.52	-	-	-	-	-	-	-	98.5	23.5	11.5	8.91
Ac-ft	585	-	-	-	-	-	-	-	5,860	1,440	706	530

Discharge, in cubic feet per second, water year October 1958 to September 1959

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.9	5.0	b 6				-	15	38	22	13	12
2	7.3	5.3	6.0				-	18	36	18	11	12
3	7.3	5.3	5.6				-	20	39	18	10	11
4	6.9	6.0	5.3				7.3	20	39	17	9.5	10
5	6.6	6.3	5.3				8.1	18	39	16	9.5	10
6	10	* 6.6	5.0				8.6	16	40	16	13	9.8
7	* 8.6	6.3	5.0				* 10	16	43	16	14	9.3
8	5.0	6.3	5.0				6.0	16	47	* 16	12	8.7
9	4.3	6.3	5.0				5.6	15	49	14	12	9.3
10	4.1	6.3	5.0				5.6	15	47	13	11	8.7
11	3.6	6.3	5.0				5.6	16	44	13	10	8.2
12	3.9	6.3	5.0				5.6	19	42	13	9.5	7.7
13	3.9	6.3	b 4				6.0	26	42	12	11	7.7
14	4.1	5.6	b 4				6.3	35	42	14	14	7.3
15	3.9	5.3	b 4				6.6	36	42	12	16	6.9
16	3.9	5.0	b 4				6.9	43	40	12	14	6.4
17	3.9	5.3	4.6				6.9	46	38	12	14	7.3
18	4.1	5.6	b 4				7.3	46	35	14	16	7.7
19	4.1	6.3	4.6				6.3	43	45	12	16	6.9
20	4.6	6.6	4.6				6.3	40	40	13	18	5.6
21	4.6	6.6	4.6				6.3	38	38	12	18	5.3
22	4.1	6.3	4.3				6.0	33	38	12	13	5.6
23	4.1	6.0	4.3				6.6	31	32	11	14	5.3
24	4.3	5.6	4.3				7.3	32	33	12	18	5.6
25	5.0	5.6	4.1				9.0	31	31	11	18	5.6
26	5.3	6.0	4.1				11	31	30	13	17	5.3
27	5.3	6.6	4.1				11	33	28	12	15	5.3
28	5.3	b 6	3.9				10	34	26	11	15	5.3
29	5.3	b 6	4.1				10	38	25	10	13	5.3
30	5.0	b 6	b 4				12	39	23	10	13	5.3
31	4.6	-----	b 4		-----		-----	38	-----	14	13	-----
Total	159.9	179.0	142.8	-	-	-	-	897	1,131	421	420.5	226.4
Mean	5.16	5.97	4.61	-	-	-	-	28.9	37.7	13.6	13.6	7.55
Ac-ft	317	355	283	-	-	-	-	1,780	2,240	835	834	449

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

65

8-2640. Red River near Red River, N. Mex. --Continued

Discharge, in cubic feet per second, water year October 1959 to September 1960

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	7.3						-	56	29	12	5.3
2	9.3	8.2						-	56	26	11	5.1
3	7.7	8.2						-	74	26	10	5.1
4	6.4	6.0						-	86	23	* 9.8	5.3
5	6.9	5.1						-	80	26	9.8	5.1
6	6.4	b 5						-	69	30	9.3	4.8
7	6.4	5.3						-	64	26	9.8	5.1
8	* 6.4	5.6						-	64	24	10	6.4
9	6.0	5.6						-	64	22	11	1.1
10	6.0	5.6						-	72	21	13	9.8
11	6.4	5.3						* 26	80	19	13	6.9
12	6.4	5.6						36	80	17	11	7.3
13	6.4	5.6						49	72	15	10	5.6
14	6.0	5.1						52	74	13	10	5.6
15	5.6	5.1						59	77	14	11	5.6
16	5.6	5.1						62	80	17	11	5.3
17	5.3	5.1						66	86	16	9.3	5.1
18	5.1	5.1						69	88	18	8.2	6.0
19	5.3	5.3						64	88	16	7.7	5.6
20	5.1	5.6						52	86	14	7.3	5.3
21	5.6	5.1						52	83	14	6.9	5.3
22	5.1	4.8						45	72	13	6.4	9.3
23	5.1	4.8						49	66	12	7.3	8.7
24	5.1	4.8						52	62	12	6.9	6.9
25	5.1	5.1						47	52	11	6.4	6.0
26	5.1	b 4						43	59	11	6.0	6.0
27	4.8	b 4						47	40	12	5.6	5.6
28	4.8	b 5			-			49	36	12	5.1	5.3
29	6.0	5.1			-----			52	32	12	5.1	5.1
30	6.0	b 4			-----			54	30	12	5.3	5.1
31	6.9	-----			-----			56	-----	12	5.1	-----
Total	184.3	161.5	-	-	-	-	-	-	2,028	545	270.3	184.6
Mean	5.95	5.38	-	-	-	-	-	-	67.6	17.6	8.72	6.15
Ac-ft	366	320	-	-	-	-	-	-	4,020	1,080	536	366

Discharge, in cubic feet per second, water year October 1960 to September 1961

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.1	6.0							119	23	13	12
2	5.1	6.0							109	21	14	12
3	5.1	6.0							97	21	22	15
4	5.3	* 5.6							91	26	22	15
5	5.1	6.0							83	24	22	15
6	4.8	5.3							* 77	26	19	16
7	5.1	5.6							72	38	17	13
8	5.1	4.3							69	32	17	13
9	6.0	4.0							69	27	15	13
10	6.4	-							74	23	14	16
11	6.4	-							72	23	16	15
12	6.0	-							72	22	19	14
13	6.4	-							74	22	17	13
14	6.0	-							74	21	16	13
15	5.1	-							69	20	15	12
16	6.0	-							64	20	14	12
17	7.7	-							64	17	* 13	12
18	7.7	-							62	17	18	15
19	7.7	-							56	17	26	41
20	7.3	-							54	17	21	32
21	7.3	-							52	17	19	23
22	7.3	-							49	17	19	20
23	7.3	-							47	17	20	19
24	7.7	-							41	16	13	16
25	7.3	-							38	16	13	15
26	7.3	-							36	16	14	15
27	7.3	-							32	15	15	15
28	6.9	-							30	15	14	14
29	6.9	-			-				27	14	13	13
30	5.3	-			-----				26	15	13	12
31	5.6	-----			-----				-----	13	12	-----
Total	195.6	-	-	-	-	-	-	-	1,899	628	515	481
Mean	6.31	-	-	-	-	-	-	-	63.3	20.3	16.6	16.0
Ac-ft	388	-	-	-	-	-	-	-	3,770	1,250	1,020	954

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

## 8-2640. Red River near Red River, N. Mex.--Continued

Discharge, in cubic feet per second, water year October 1961 to September 1962

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.2	9.3						-	3.4	3.6	1.7	6.9
2	1.1	8.7						-	3.2	3.4	1.7	7.3
3	1.1	7.3						-	3.2	2.9	* 1.5	7.7
4	1.0	8.2						-	3.4	2.4	d 1.4	7.7
5	1.0	9.3						-	4.0	2.3	d 1.4	7.7
6	9.8	8.7						-	4.5	2.0	d 1.4	8.7
7	9.8	* 8.7						-	5.2	2.2	d 1.3	9.8
8	9.3	8.7						-	5.4	d 2.0	d 1.3	10
9	1.1	9.3						-	5.4	d 1.9	d 1.2	9.3
10	1.3	9.3						-	5.6	d 1.9	d 1.2	8.2
11	* 1.0	8.7						-	5.9	d 1.8	d 1.1	7.7
12	1.0	8.7						-	5.9	d 1.8	d 1.1	7.3
13	9.8	8.2						-	6.2	d 1.8	d 1.0	6.9
14	9.8	8.7						* 9.1	6.2	d 1.7	d 1.0	* 6.0
15	9.3	9.3						8.6	6.9	1.7	* d 9	6.4
16	9.3	8.2						7.7	6.6	1.8	d 9	6.4
17	9.3	8.2						6.6	6.2	* 1.7	d 9	7.3
18	9.3	8.2						5.9	5.9	1.3	d 8	6.9
19	8.7	-						5.6	5.4	1.3	d 8	6.4
20	8.7	-						5.9	* 5.2	1.3	d 8	9.8
21	8.7	-						5.6	5.4	1.3	8.2	1.3
22	8.7	-						5.2	5.2	1.3	7.7	9.8
23	8.2	-						4.7	4.7	1.4	7.7	10
24	7.7	-						4.7	4.5	1.6	7.3	1.5
25	7.3	-						4.9	4.1	1.7	8.7	1.2
26	7.7	-						4.9	3.8	1.6	9.8	10
27	8.2	-						4.9	3.6	1.5	8.2	9.3
28	8.7	-						5.2	3.6	1.5	9.3	* 9.3
29	8.2	-			-			4.9	3.4	1.6	* 7.7	8.7
30	8.2	-			-----			4.7	4.0	1.5	6.9	8.2
31	9.8	-----			-----			4.0	-----	1.7	6.9	-----
Total	292.5	-	-	-	-	-	-	-	1,467	575	322.4	259.7
Mean	9.44	-	-	-	-	-	-	-	48.9	18.5	10.4	8.66
Ac-ft	580	-	-	-	-	-	-	-	2,910	1,140	639	515

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.7	6.4	4.6	a 3	4.3	a 4	8.0	1.1	1.8	6.4	* 4.7	6.4
2	7.7	6.9	4.6	a 3	3.8	a 4	7.3	1.1	1.9	* 7.3	4.9	6.4
3	7.7	6.9	4.3	a 3	3.6	a 4	b 7	1.2	1.7	8.0	6.4	6.1
4	7.7	6.9	4.3	a 3	3.8	a 3.7	7.0	1.4	1.5	8.2	7.0	* 7.0
5	8.2	7.3	4.0	a 3	4.0	a 3.5	7.0	1.6	1.4	8.3	6.1	7.6
6	7.7	* 6.9	4.0	a 2.5	4.0	a 4	6.7	1.6	* 1.4	7.6	5.8	8.0
7	7.7	5.6	4.3	a 2.5	4.0	a 4	7.6	* 2.1	1.3	7.3	5.6	8.3
8	7.7	6.0	4.0	a 2.5	4.0	a 4	8.7	2.4	1.4	7.3	5.6	7.0
9	7.7	6.4	4.0	* a 2.5	4.0	a 4	1.0	2.9	1.3	7.3	1.4	6.7
10	7.3	6.4	3.8	a 2.5	b 4	a 4	1.0	2.9	1.2	7.6	1.2	6.4
11	7.3	6.0	3.8	a 2.5	b 3	a 4	* 9.5	2.9	1.1	7.6	1.0	6.4
12	7.3	5.6	3.8	a 2	b 2.5	a 4	1.0	2.6	1.1	7.0	1.2	5.8
13	6.9	6.0	* 4.3	a 2.5	a 4	a 4	1.1	2.3	1.1	6.7	1.0	5.8
14	6.4	6.9	3.8	a 3	a 3	a 4	1.2	2.3	1.0	7.0	1.0	5.6
15	6.4	8.2	3.8	a 3	a 3.5	a 4	1.3	2.4	1.0	6.7	9.1	5.3
16	6.9	7.3	3.8	a 4	a 4	a 4	1.2	2.9	1.0	* 6.4	8.7	* 5.3
17	* 7.3	6.0	4.0	a 4	a 4	a 4	1.2	2.9	1.1	6.4	9.5	5.3
18	7.7	6.4	4.0	a 4	a 4	a 4	1.0	2.9	1.3	6.1	8.7	5.1
19	7.7	d 4	3.8	a 4	a 4	* 4.1	9.5	2.9	1.2	6.1	8.7	5.1
20	7.7	d 4	3.3	a 3.5	a 4	4.1	1.0	2.6	* 1.1	6.4	* 8.3	5.1
21	6.9	d 4.5	b 3.2	a 3	a 4	4.1	1.0	2.6	1.0	6.1	8.3	7.3
22	6.4	d 5	b 3	a 3.5	a 4	4.5	9.5	* 2.4	1.0	5.6	8.3	6.4
23	6.4	a 5.5	b 3	a 4	a 4	5.1	9.5	2.6	9.5	5.1	6.7	5.6
24	* 6.0	a 5.5	b 3	a 4	a 4	5.1	9.5	2.4	9.1	5.3	7.6	5.6
25	6.0	a 5.5	b 3	a 4	a 4	5.6	* 9.5	2.2	8.7	5.6	7.6	5.6
26	6.0	4.8	* b 2.5	a 4	a 4	6.4	1.0	2.1	8.7	5.6	7.3	5.3
27	6.0	4.3	b 2.5	a 3.5	a 4	6.4	1.0	2.0	8.3	5.1	6.7	5.3
28	6.0	* 4.3	a 2.5	a 4	a 4	* 7.3	9.5	1.8	8.3	5.1	6.4	5.3
29	5.6	4.3	a 3	a 4.5	-	8.0	9.5	1.8	7.6	4.9	7.3	5.1
30	6.0	4.6	a 3	a 4.5	-----	8.0	1.0	1.8	6.7	4.5	7.6	4.9
31	6.9	-----	a 3	b 4.5	-----	8.7	-----	1.8	-----	4.5	7.0	-----
Total	216.9	174.4	112.0	103.0	106.0	148.6	285.3	685	345.9	199.2	247.9	181.1
Mean	7.00	5.81	3.61	3.32	3.79	4.79	9.51	22.1	11.5	6.43	8.00	6.04
Ac-ft	430	346	222	204	210	295	566	1,360	686	395	492	359

Calendar year : Max Min Mean Ac-ft  
 Water year 1963: Max 29 Min 2 Mean 7.69 Ac-ft 5,560

Peak discharge (base, 50 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

RIO GRANDE BASIN

67

8-2645. Red River below Zwergle damsite, near Red River, N. Mex.

Location.--Lat 36°39'15", long 105°22'50", in NE¼NW¼SE¼ sec.7, T.28 N., R.15 E. (projected), on right bank half a mile downstream from Bear Canyon, 4 miles southeast of Red River.

Drainage area.--25.7 sq mi.

Records available.--April to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 9,100 ft (from topographic map).

Extremes.--Maximum discharge during period, 39 cfs May 10 (gage height, 1.32 ft); maximum gage height, 2.42 ft Aug. 9 (result of new control); minimum discharge, 6.1 cfs Aug. 1.

Remarks.--Records good. No diversion above station.

Rating tables (gage height, in feet, and discharge,  
in cubic feet per second)

Apr. 24 to July 17		July 23 to Sept. 30	
0.9	6.4	1.8	6.5
1.0	9.0	1.9	9.1
1.1	14	2.1	17
1.2	22		
1.3	35		

Discharge, in cubic feet per second, April to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	14	23	8.7	* 6.5	8.1
2							-	14	27	* 8.2	6.5	7.8
3							-	14	22	8.0	8.1	7.8
4							-	16	20	8.5	9.1	* 8.1
5							-	19	19	9.0	7.8	9.4
6							-	19	* 18	8.5	7.3	9.1
7							-	* 21	17	8.2	7.5	9.8
8							-	30	18	8.2	7.8	8.3
9							-	34	18	8.2	14	7.8
10							-	34	14	8.5	13	7.8
11							-	35	13	8.5	11	7.8
12							-	34	13	8.0	13	7.0
13							-	30	12	8.0	12	7.3
14							-	30	12	8.0	11	7.5
15							-	31	12	7.7	10	7.3
16							-	35	13	* 7.7	9.8	* 7.3
17							-	35	13	7.4	10	7.0
18							-	35	14	7	9.1	6.8
19							-	35	14	7	9.1	6.8
20							-	34	* 14	7.5	* 9.1	7.3
21							-	35	12	7.5	9.1	9.1
22							-	* 30	12	7	9.1	8.6
23							-	32	11	7.0	8.3	7.8
24							12	31	10	6.8	8.6	7.3
25							* 12	28	9.9	7.3	8.8	7.3
26							13	27	9.0	7.0	8.6	7.0
27							13	26	9.4	6.8	8.3	7.0
28							13	23	9.4	6.8	8.1	7.3
29						-	13	22	9.0	6.8	8.6	7.0
30							13	22	8.7	6.5	9.1	6.8
31							-----	22	-----	6.5	8.6	-----
Total							---	847	426.4	236.8	286.9	231.3
Mean							---	27.3	14.2	7.64	9.25	7.71
Ac-ft							---	1,680	848	470	589	459

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.



## RIO GRANDE BASIN

8-2650. Red River near Questa, N. Mex.

Location.--Lat 36°42'10", long 105°34'00", in NE¼SE¼ sec.32, T.29 N., R.13 E. (projected), on left bank 1¼ miles upstream from Cabresto Creek and 1.5 miles east of Questa.

Drainage area.--113 sq mi.

Records available.--April to October 1910 and January to September 1911 (gage heights and discharge measurements only), October 1912 to September 1925 (fragmentary prior to September 1915), January to March 1926, September 1926 to September 1963. Published as "above Questa" January 1926 to September 1930, and as Rio Colorado near Questa October 1930 to September 1947. Monthly discharge only for some periods, published in WSP 1312. Previously published figures of discharge for October to December 1925 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Wood or concrete control since Mar. 20, 1936. Datum of gage is 7,451.72 ft above mean sea level, datum of 1929. Apr. 5 to Oct. 14, 1910, and Jan. 27 to Sept. 4, 1911, staff gages at sites 1½ and 3½ miles upstream, respectively, each at different datum. Oct. 8, 1912, to Aug. 21, 1920, chain gage at site 200 ft upstream at various datums. Aug. 22, 1920, to June 16, 1921, staff gage at present site at datum 2.29 ft lower. June 17, 1921, to Apr. 30, 1934, water-stage recorder at present site at datum 2.55 ft lower and May 1, 1934, to Oct. 3, 1938, at datum 1.41 ft lower.

Average discharge.--50 years (1912-25, 1926-63), 56.4 cfs (40,830 acre-ft per year).

Extremes.--Maximum discharge during year, 92 cfs Mar. 28 (gage height, 1.57 ft); maximum gage height, 2.06 ft Dec. 27 (back-water from ice); minimum discharge, about 3.4 cfs Jan. 12.

1930-63: Maximum discharge, 886 cfs May 25, 1942 (gage height, 2.32 ft), from rating curve extended above 450 cfs by logarithmic plotting; minimum daily, 5 cfs Dec. 26, 1962, Jan. 12, 1963.

The peak of June 15, 1921, may have equaled or exceeded the peak of May 25, 1942.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of a few hundred acres above station. Discharge measurements generally made twice a month.

Rating tables, except periods of ice effect (gage height, in feet, and discharge in cubic feet per second)

Oct. 1 to Aug. 26

Aug. 27 to Sept. 30

0.9 8.8 1.2 30 2.0 10 2.3 25  
1.0 14 1.4 57 2.1 14

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	19	18	13	18	15	41	27	37	13	8.5	a13
2	24	19	18	13	18	b12	32	28	41	13	8.5	a13
3	24	18	18	14	17	15	22	28	37	13	9.3	a12
4	24	18	18	13	17	12	28	28	35	15	12	a13
5	24	18	17	12	17	b11	30	29	31	15	10	a14
6	24	17	16	11	17	b11	28	31	30	15	9.8	15
7	24	15	17	12	17	b11	30	32	28	15	9.3	18
8	23	17	17	11	16	14	36	35	28	15	10	20
9	22	17	17	11	17	14	41	41	29	15	15	20
10	21	16	15	12	18	15	44	42	26	15	22	19
11	20	16	14	10	b10	15	41	46	25	15	18	18
12	20	15	15	b5	b9	14	32	46	25	15	21	19
13	20	14	15	b7	b9	14	31	42	23	14	23	18
14	19	16	17	b9	b10	13	34	41	23	14	19	18
15	19	18	16	b12	b12	16	35	41	22	12	15	18
16	18	18	16	b13	b15	14	36	45	23	12	14	18
17	19	18	16	b13	b13	14	35	46	26	12	17	18
18	19	17	17	b14	b13	15	35	48	24	12	15	17
19	21	11	17	b14	b14	14	28	48	24	11	14	16
20	21	12	16	b13	b15	15	29	46	23	11	14	14
21	21	17	14	b14	17	18	28	46	21	9.8	13	21
22	21	18	12	b14	b14	19	27	41	20	8.8	14	18
23	20	19	12	b14	b13	22	27	42	20	8.8	12	16
24	20	18	15	b15	b14	23	27	42	19	8.8	13	16
25	20	19	12	15	b14	25	28	41	18	8.5	14	15
26	20	18	b5	14	16	30	28	40	18	8.8	14	14
27	19	18	b8	b14	18	34	28	40	17	8.5	a13	14
28	19	17	b11	b14	17	45	28	38	16	8.1	a15	12
29	18	17	b12	15	-	46	27	37	15	8.5	a12	11
30	20	18	13	15	-	41	26	36	13	7.8	a14	12
31	20	-	13	16	-	41	-	37	-	8.1	a14	-
Total	648	508	457	392	415	618	942	1,210	737	366.5	432.4	480
Mean	20.9	16.9	14.7	12.6	14.8	19.9	31.4	39.0	24.6	11.8	13.9	16.0
Ac-ft	1,290	1,010	906	778	823	1,230	1,870	2,400	1,460	727	858	952
Calendar year 1962:	Max	245	Min	5	Mean	46.6	Ac-ft	33,720				
Water year 1962-63:	Max	48	Min	5	Mean	19.7	Ac-ft	14,300				

Peak discharge (base, 160 cfs).--No peak above base.

a No gage-height record.

b Stage-discharge relation affected by ice.

Note.--South ditch diverts from left bank and bypasses gage for irrigation below. Discharge measurements made in 1963 water year were; 5.12 cfs Aug. 2, 5.20 cfs Sept. 6, 0.81 cfs Sept. 17.

RIO GRANDE BASIN

69

8-2655. Llano ditch near Questa, N. Mex.

Location.--Lat 36°43'45", long 105°33'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.21, T.29 N., R.13 E., on left bank 150 ft downstream from heading,  $\frac{3}{4}$  miles northeast of Questa, and  $\frac{3}{4}$  miles upstream from mouth of Cabresto Creek.

Records available.--September 1943 to September 1963 (no winter records).

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,877 ft above mean sea level (river-profile survey).

Extremes.--1943-63: Maximum daily discharge recorded, 42 cfs June 6, 7, 1958; no flow at times.

Remarks.--Records good. Ditch diverts water from right bank of Cabresto Creek for irrigation of about 800 acres near Questa.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	-	-	-	-
November . . . . .	-	-	-	-
December . . . . .	-	-	-	-
Calendar year 1962 . . . . .	-	-	-	-
January . . . . .	-	-	-	-
February . . . . .	-	-	-	-
March . . . . .	-	-	-	-
April . . . . .	-	-	-	-
May . . . . .	0.9	0	0.04	2.4
June . . . . .	0	0	0	0
July . . . . .	0	0	0	0
August . . . . .	0	0	0	0
September . . . . .	0	0	0	0
Water year 1962-63 . . . . .	-	-	-	-

## RIO GRANDE BASIN

8-2660. Cabresto Creek near Questa, N. Mex.

Location.--Lat 36°43'45", long 105°33'10", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec. 21, T.29 N., R.13 E., on right bank a quarter of a mile downstream from Llano ditch heading, 2 $\frac{1}{2}$  miles downstream from Lake Fork, 3 miles northeast of Questa, and 3 $\frac{1}{2}$  miles upstream from mouth.

Drainage area.--36.7 sq mi.

Records available.--September 1943 to September 1963.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 7,845 ft above mean sea level (river-profile survey).

Average discharge.--20 years, 9.96 cfs (7,210 acre-ft per year).

Extremes.--Maximum discharge during year, 27 cfs Apr. 9 (gage height, 2.35 ft); minimum daily, 2 cfs Jan. 12.  
1943-63: Maximum discharge, 176 cfs June 8, 1957 (gage height, 4.44 ft); minimum daily, 1 cfs Jan. 19, 1960.  
The high water of May 25, 1942, reached a stage of 4.18 ft (discharge probably exceeded 200 cfs).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Llano ditch (the only diversion above station) diverts from right bank a quarter of a mile above gage for irrigation of about 800 acres below. Flow regulated by Cabresto Reservoir (capacity, 732 acre-ft) on Lake Fork 1 mile above its mouth.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Jan. 24-29)

Oct. 1 to Jan. 23

Jan. 24 to Sept. 30

0.2 2.0 0.5 5.9 1.2 2.8 1.8 9.6  
.3 3.2 .6 7.4 1.5 5.4 2.1 16

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.9	3.3	a 3.5	a 3	a 6	4.3	1.6	8.6	6.9	5.1	* 3.3	5.2
2	5.9	3.3	a 3.5	a 3	a 6	4.0	1.3	8.5	7.5	* 6.3	3.4	5.1
3	6.4	3.4	a 3.6	a 3.5	a 6	4.1	9.6	8.3	7.1	6.2	3.6	5.0
4	6.4	3.4	3.7	a 4	a 7	3.9	1.1	8.0	6.8	7.1	4.3	5.1
5	6.2	3.4	3.6	a 4	a 7	4.1	1.2	8.2	6.5	6.8	4.0	5.4
6	6.2	3.4	3.4	a 3.5	a 7	3.9	1.1	8.3	* 6.4	6.5	4.0	5.3
7	6.2	3.4	3.4	a 3.5	a 7	4.0	1.4	* 8.3	6.2	6.2	3.8	5.4
8	6.0	* 3.2	3.7	a 3.5	a 7	4.4	1.4	8.3	6.3	5.9	4.1	5.1
9	6.0	3.0	3.6	a 3.5	a 6	4.3	1.5	8.6	6.4	5.7	4.6	5.0
10	5.9	3.2	b 3	a 3.5	a 6	4.5	1.4	8.5	6.0	6.7	5.1	5.1
11	5.9	3.2	b 2.7	* a 3.5	a 5	4.5	* 1.2	8.5	6.0	7.7	4.7	5.0
12	5.9	3.2	* b 2.5	a 2	a 4	4.4	1.2	8.3	5.9	7.6	4.8	6.4
13	5.8	3.3	b 2.7	a 2.5	a 3.5	4.2	1.2	8.2	6.6	7.6	5.4	7.9
14	6.0	3.6	b 3	a 3	* 4.4	* 4.0	1.2	8.0	8.5	7.2	5.6	7.7
15	5.9	4.0	b 3	a 3	4.5	4.5	1.2	8.0	7.2	6.8	* 4.9	7.3
16	5.9	4.0	b 3	a 3	4.4	4.2	1.1	7.9	5.9	* 6.5	4.6	7.5
17	6.4	3.8	b 3.5	a 3.5	4.1	4.5	1.1	7.9	6.0	6.3	4.9	* 5.7
18	* 6.0	3.6	b 3.5	a 4	4.4	4.6	1.0	7.9	5.9	6.2	5.1	4.7
19	6.2	3.0	b 3.5	a 4	4.4	4.3	9.4	7.9	5.9	5.9	5.1	4.3
20	6.0	3.0	b 3.5	a 3.5	4.3	4.6	1.0	7.9	* 5.8	5.7	5.4	4.9
21	5.1	3.7	b 2.5	a 3.5	4.3	5.2	9.8	8.0	5.4	5.4	5.4	5.2
22	3.6	4.0	b 2.5	a 4	4.3	5.6	9.3	8.0	5.3	5.3	5.4	a 5
23	3.2	4.0	b 3	a 5	4.2	6.3	9.0	* 7.7	5.2	5.1	5.2	a 4.5
24	3.3	4.0	b 3	5.4	4.2	6.9	9.1	7.6	5.0	4.9	5.4	a 4.5
25	3.3	4.1	b 3	* 5.4	4.2	7.5	* 9.0	7.6	5.0	4.9	5.7	a 4
26	3.3	4.2	b 2.5	5.4	4.0	8.3	9.1	7.5	4.9	4.6	5.4	a 4
27	3.3	4.1	a 2.5	5.8	* 4.2	8.3	9.3	7.5	4.8	4.3	5.4	a 4
28	3.3	* 3.8	* a 3	5.7	4.2	* 1.0	9.1	6.7	4.7	4.0	5.4	a 3.8
29	3.3	3.6	a 3	5.6	-	1.3	8.6	6.0	4.6	3.6	* 5.3	a 3.7
30	3.3	a 3.5	a 3	a 6	-----	1.2	8.5	6.8	4.5	3.4	5.4	* 3.7
31	3.3	-----	a 3	a 6	-----	1.5	-----	6.8	-----	3.4	5.4	-----
Total	159.4	106.7	96.9	124.8	141.6	183.4	331.8	244.3	179.2	178.9	150.1	155.5
Mean	5.14	3.56	3.13	4.03	5.08	5.92	11.1	7.88	5.97	5.77	4.84	5.18
Ac-ft	316	212	192	248	281	364	658	485	355	355	298	308

Calendar year 1962: Max 45 Min 2 Mean 8.18 Ac-ft 5,820  
Water year 1962-63: Max 16 Min 2 Mean 5.62 Ac-ft 4,070

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

71

8-2870. Red River at mouth, near Questa, N. Mex.

Location.--Lat 36°39'00", long 105°41'30", in NW¼ sec.20 T.28 N., R. 12 E., on left bank 800 ft upstream from Rio Grande and 6.5 miles southwest of Questa.

Drainage area.--180 sq mi.

Records available.--December 1950 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,600 ft (from topographic map).

Average discharge.--12 years (1951-63), 82.4 cfs (59,660 acre-ft per year).

Extremes.--Maximum discharge during year, 138 cfs Sept. 4 (gage height, 2.85 ft); minimum, 35 cfs Feb. 13.

1950-63: Maximum discharge, 647 cfs Jan. 18, 1952, from rating curve extended above 500 cfs on basis of slope-area measurement at gage height 5.71 ft; maximum gage height, 5.75 ft June 14, 1959; minimum daily discharge, 38 cfs Feb. 2, 1951, Jan. 6, 23, Feb. 20, 22, 1955.

Remarks.--Records good except those for period of uncertain stage-discharge relation, which are fair. Diversions for irrigation of about 3,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.7 36  
2.0 59  
2.5 103

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	57	58	45	52	53	87	662	70	50	*44	54
2	65	55	59	45	54	53	82	663	81	50	45	53
3	65	57	59	49	52	55	70	664	80	*49	48	53
4	64	58	59	49	52	54	70	664	76	50	51	56
5	65	57	57	49	51	53	*71	665	70	51	49	*54
6	58	57	57	48	51	*53	70	666	*67	50	49	55
7	57	57	57	49	50	54	71	667	61	51	51	57
8	57	*55	57	48	50	57	75	670	60	51	*49	57
9	55	55	57	48	52	55	84	674	62	53	51	58
10	53	53	55	*49	53	57	87	676	61	57	57	53
11	54	53	54	49	48	57	83	678	57	58	57	52
12	54	53	*54	48	44	55	*73	677	57	57	63	50
13	55	52	54	42	43	54	69	77	56	55	63	49
14	55	52	55	44	45	53	71	73	54	53	65	48
15	55	57	55	45	*49	*57	73	76	53	52	58	49
16	56	57	54	45	53	55	73	81	54	*51	49	49
17	*58	57	53	49	49	56	72	83	57	51	53	*49
18	56	56	54	49	49	57	73	83	58	52	56	48
19	58	50	54	50	53	54	69	83	61	51	51	47
20	57	49	53	49	52	56	67	82	*61	49	53	45
21	61	54	51	50	53	59	67	84	59	48	*57	50
22	61	55	49	*51	52	60	66	*80	56	48	56	56
23	60	57	49	51	52	63	65	81	56	48	54	53
24	59	57	52	51	53	65	65	80	53	49	52	53
25	59	58	49	52	53	65	*66	79	51	48	54	51
26	60	57	45	50	53	69	69	77	50	48	55	48
27	59	56	*40	49	54	73	70	75	49	46	56	45
28	57	54	41	49	54	86	70	71	50	46	53	45
29	57	54	42	51	-	98	66	69	49	45	53	45
30	59	57	44	51	-----	86	61	69	49	45	56	46
31	58	-----	45	51	-----	88	-----	71	-----	45	55	-----
Total	1,812	1,656	1,622	1,505	1,426	1,910	2,155	2,300	1,778	1,557	1,663	1,528
Mean	58.5	55.2	52.3	48.5	50.9	61.8	71.8	74.2	59.3	50.2	53.8	50.9
Ac-ft	3,590	3,280	3,220	2,990	2,830	3,790	4,270	4,560	3,530	3,090	3,900	3,030

Calendar year 1962: Max 298 Min 39 Mean 88.4 Ac-ft 62,520  
Water year 1962-63: Max 98 Min 40 Mean 57.3 Ac-ft 41,480

Peak discharge (base, 220 cfs).--No peak above base.

\* Discharge measurement made on this day.  
e Stage-discharge relation indefinite.

## RIO GRANDE BASIN

8-2675. Rio Hondo near Valdez, N. Mex.

**Location.**--Lat 36°32'30", long 105°33'20", in SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.28, T.27 N., R.13 E., on right bank 500 ft upstream from first diversion, a quarter of a mile upstream from Forest Service gate,  $\frac{1}{2}$  miles east of Valdez, 4 miles downstream from South Fork, and 9 miles upstream from mouth.

**Drainage area.**--36.2 sq mi.

**Records available.**--August 1934 to September 1963.

**Gage.**--Water-stage recorder. Concrete control since Oct. 28, 1938. Altitude of gage is 7,700 ft (from topographic map). Prior to Oct. 28, 1938, at datum 1.92 ft lower.

**Average discharge.**--29 years, 36.5 cfs (26,420 acre-ft per year).

**Extremes.**--Maximum discharge during year, 63 cfs May 17 (gage height, 1.88 ft); maximum gage height, 3.24 ft Jan. 2 (ice jam); minimum daily discharge determined, 6 cfs Jan. 14.

1934-63: Maximum discharge, 541 cfs May 13, 1941, from rating curve extended above 300 cfs by logarithmic plotting; maximum gage height, 4.05 ft Dec. 15, 1953 (ice jam); minimum daily discharge, 3 cfs Jan. 21, 1935.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Aug. 20

Aug. 21 to Sept. 30

0.80	7.0	1.3	21	1.8	9.3
.9	8.8	1.6	38	1.9	13
1.0	11	1.9	65	2.1	25

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	12	11	a12	b12	10	28	26	42	*17	14	13
2	15	12	11	a13	b12	10	26	26	46	17	14	12
3	14	12	11	a13	b12	9.9	22	28	38	17	16	12
4	14	12	11	a13	b12	9.2	22	31	37	20	15	14
5	15	12	10	a12	b12	b9	21	35	*34	21	14	*15
6	15	12	10	a11	b12	b9	20	*37	34	18	14	13
7	15	*11	10	a12	b11	b10	22	43	32	17	13	13
8	15	11	10	a12	b10	10	26	50	32	17	14	12
9	15	11	10	*b12	b10	10	28	57	31	18	16	12
10	15	11	9.7	b13	b10	9.9	30	58	29	19	17	12
11	15	11	b10	b11	b8	b9.5	29	60	28	20	16	a12
12	15	11	*b11	a9	b8	b9.5	28	57	26	18	a15	a12
13	15	11	b11	a8	b7	b9	28	54	26	17	a13	a12
14	14	11	b10	a6	*b9	b9	30	54	24	16	a13	a12
15	15	14	b10	a6.5	b11	*b10	30	58	24	16	a13	a11
16	15	13	b10	a7	b11	b10	30	60	24	16	a13	a11
17	15	12	b10	a7.5	b10	b10	31	60	24	*16	a13	a11
18	*15	12	b10	a8	b10	b10	30	59	26	16	a13	*11
19	18	11	b10	a8	b10	10	28	57	24	16	a13	12
20	15	b12	b10	a8	b10	11	27	56	22	17	a13	12
21	14	13	b10	a8	b10	12	25	56	22	18	13	19
22	14	12	b10	a9	b9	14	24	53	21	16	*14	15
23	*13	12	b10	a9	b8	16	24	54	20	16	13	13
24	13	12	b10	a9	b8	16	24	*55	19	15	13	13
25	13	12	b9	a8	b8	17	24	52	19	16	14	12
26	13	12	b8	a8	b9	18	*26	51	19	15	15	12
27	13	12	b8	a8	8.6	20	26	48	18	15	14	12
28	13	*11	*b10	a8	*10	*22	26	46	17	15	14	12
29	12	11	b11	*b8	-	26	25	44	17	15	15	12
30	12	11	b11	b9	-----	25	25	44	17	14	15	12
31	12	-----	b12	b10	-----	28	-----	42	-----	*14	14	-----
Total	44.2	35.2	31.4	29.6	27.7	40.9	78.5	151.1	79.2	51.8	43.6	37.6
Mean	14.3	11.7	10.2	9.55	9.91	13.2	26.2	48.7	26.4	16.7	14.1	12.5
Ac-ft	877	698	624	587	551	811	1,560	3,000	1,570	1,030	865	746

Calendar year 1962: Max 122 Min 6 Mean 27.4 Ac-ft 19,850  
 Water year 1962-63: Max 60 Min 6 Mean 17.8 Ac-ft 12,920

**Peak discharge (base, 100 cfs).**--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

73

8-2682. Rio Hondo at damsite, at Valdez, N. Mex.

Location.--Lat 36°32'00", long 105°36'00", in T.27 N., R.13 E. (projected), on right bank one mile west of Valdez and nine miles north of Taos.

Drainage area.--40.3 sq mi.

Records available.--April to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 7,300 ft (from topographic map).

Extremes.--Maximum discharge during period, 33 cfs May 12 (gage height, 0.85 ft); minimum, 6.4 cfs Sept. 9, 10, 11.

Remarks.--Records good except those for periods of no gage-height record, which are fair.

Discharge, in cubic feet per second, April to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								19	a 23	* 8.7	7.1	7.8
2								20	a 23	8.7	7.1	7.8
3								* 22	a 22	9.1	8.1	7.4
4								21	a 21	10	7.8	9.4
5								15	* 19	9.8	7.4	* 7.8
6							a 17	16	20	9.4	7.1	7.8
7								17	19	9.4	7.1	7.4
8								21	18	9.8	6.8	7.1
9								24	19	11	7.4	6.8
10								26	17	9.8	8.1	6.8
11								28	16	10	8.1	6.8
12							18	28	16	9.8	7.8	7.1
13							18	26	15	9.4	7.8	7.8
14							20	26	15	9.1	7.8	8.1
15							21	28	15	8.4	7.4	7.8
16							21	30	15	8.4	7.1	7.8
17							20	30	14	8.7	8.1	7.4
18							20	30	15	* 8.7	7.8	* 7.8
19							18	30	* 14	8.4	7.8	7.4
20							16	29	11	9.8	7.8	8.1
21							16	29	10	9.4	* 7.4	11
22							15	28	9.8	8.7	7.8	9.8
23							13	28	9.4	8.4	7.8	9.4
24							11	* 28	9.4	8.1	8.1	8.7
25							11	a 28	8.7	8.4	8.1	8.4
26							14	a 26	8.4	8.7	8.4	8.1
27							11	a 25	8.4	8.4	8.1	8.1
28							12	a 24	10	8.4	7.8	7.8
29							15	a 23	8.4	8.1	7.8	7.8
30							19	a 22	* 8.4	7.8	8.4	7.8
31								a 23		* 7.8	8.1	
Total							496	770	437.9	278.6	239.3	239.1
Mean							16.5	24.8	14.6	8.99	7.72	7.97
Ac-ft							984	1,530	869	553	475	474

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

Peak discharge (base, 100 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

## RIO GRANDE BASIN

8-2685. Rio Hondo at Arroyo Hondo, N. Mex.

Location.--Lat 36°31'55", long 105°41'05", in sec.32, T.27 N., R.12 E. (projected), on right bank 1 mile downstream from Arroyo Hondo and 1¼ miles upstream from mouth.

Drainage area.--65.6 sq mi.

Records available.--April 1910 to June 1912, fragmentary (gage heights and discharge measurements only), July 1912 to December 1928, and January 1932 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Published as "near Arroyo Hondo" prior to 1928.

Gage.--Water-stage recorder. Concrete control since Aug. 12, 1938. Altitude of gage is 6,670 ft (from topographic map). Prior to Feb. 29, 1928, staff gage at site 1.1 miles downstream at different datums. Feb. 29 to Dec. 31, 1928, and Jan. 21, 1932, to Aug. 13, 1934, staff gage at present site at datum 0.4 ft lower. Aug. 13, 1934, to Aug. 11, 1938, water-stage recorder at site half a mile downstream at different datum. Aug. 12, 1938, to Sept. 10, 1963, water-stage recorder on left bank at present datum.

Average discharge.--47 years (1912-28, 1932-63) 29.2 cfs (21,140 acre-ft per year).

Extremes.--Maximum discharge during year, 32 cfs Aug. 21 (gage height, 2.92 ft); minimum, 3.8 cfs Aug. 1 and 6. 1938-63: Maximum discharge, 1,060 cfs July 19, 1948 (gage height, 3.75 ft), from rating curve extended above 200 cfs by logarithmic plotting; minimum daily, 4.8 cfs Apr. 15, 16, 1955. Maximum gage height observed, 5.45 ft (site and datum then in use) Aug. 23, 1935 (discharge uncertain, but probably exceeded 1,100 cfs). A minimum daily discharge of 3 cfs occurred Oct. 19, 1912 (statement in WSP 328 that there was no flow in January and much of February 1912 is believed erroneous). Discharge not determined for the major floods of Oct. 6, 1911, Sept. 1, 1932, and July 22, 1934.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Diversions above station for irrigation of about 2,500 acres, most of which is outside basin.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 30 to Aug. 5)

Oct. 1 to Aug. 5

Aug. 6 to Sept. 30

0.7	4.4	1.2	20	2.1	5.1
.8	6.0	1.4	34	2.3	11
1.0	11				

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.2	1.9	1.7	2.2	1.7	2.1	8.1	1.2	* 6.7	5.2	6.6
2	9.8	1.2	1.8	1.7	2.2	1.6	2.2	8.3	1.2	6.9	5.0	6.6
3	9.8	1.2	1.8	1.9	1.9	1.7	2.3	7.6	1.1	6.2	5.2	6.3
4	9.8	1.2	1.8	2.0	2.0	1.7	2.3	8.1	9.5	6.5	5.2	6.6
5	1.1	1.0	1.8	1.7	1.9	1.6	2.2	7.8	9.5	6.5	5.2	* 6.3
6	1.1	1.0	1.8	1.5	1.8	1.4	2.0	* 7.6	9.5	6.2	a 5.1	6.9
7	1.1	* 9.8	1.9	1.7	1.8	1.5	2.0	7.4	* 8.9	6.5	5.1	7.2
8	1.1	1.0	1.8	* 1.5	1.7	1.8	2.0	7.4	8.9	7.2	5.1	6.9
9	1.0	1.0	1.8	1.6	1.6	1.7	2.3	8.1	9.2	6.9	5.1	6.9
10	1.0	1.0	1.7	1.8	1.9	1.6	2.4	8.9	8.9	6.9	5.4	6.6
11	1.0	9.8	1.4	1.8	1.6	1.6	2.3	9.8	9.2	6.9	5.4	6.6
12	1.0	1.0	* 1.5	a 1.4	1.1	1.6	* 2.1	1.1	8.6	7.4	5.7	6.3
13	1.0	1.1	1.6	a 1.1	1.0	1.5	2.2	8.6	8.6	7.2	5.4	6.6
14	1.0	1.1	1.5	a 9	* b 1.2	* 1.4	2.2	8.3	9.2	6.7	6.0	6.6
15	1.0	1.6	1.4	a 9	1.9	1.8	2.3	8.3	8.6	6.7	5.4	6.9
16	1.0	1.6	1.4	a 1.0	2.0	1.7	2.3	8.3	8.6	6.5	5.1	6.9
17	1.0	1.7	1.4	a 1.2	1.8	1.7	2.1	8.3	8.6	* 6.7	5.4	6.6
18	* 1.0	1.7	1.4	a 1.4	1.5	1.7	2.1	9.2	8.9	a 6.7	5.4	* 6.9
19	1.2	1.6	1.4	a 1.5	1.7	1.6	2.0	8.6	* 8.6	a 6.6	5.1	6.9
20	1.1	1.6	1.3	a 1.5	1.7	1.7	1.5	9.0	8.6	a 6.8	6.0	6.9
21	1.0	2.2	1.3	1.6	1.8	1.8	7.6	9.5	8.1	a 6.8	8.4	8.4
22	9.5	2.3	1.2	1.7	1.7	2.0	7.4	9.2	7.8	a 6.6	* 6.3	7.8
23	9.5	1.9	1.3	1.7	1.6	1.9	7.2	* 1.0	7.6	a 6.4	6.0	6.9
24	9.5	1.7	1.4	1.6	1.8	1.4	6.5	9.5	7.6	a 6.2	6.8	6.9
25	9.2	1.6	1.4	1.6	1.8	1.7	6.7	9.2	7.4	a 6.3	7.7	7.2
26	9.2	1.9	1.0	1.6	1.7	1.7	* 6.7	8.9	7.2	a 6.4	7.8	6.9
27	9.5	2.0	1.0	1.4	1.8	1.8	6.5	8.9	6.7	a 6.3	7.2	6.6
28	9.8	* 1.9	* 1.3	1.4	* 1.7	* 1.9	6.5	8.9	6.7	a 6.2	6.6	6.6
29	1.2	1.8	1.3	1.5	-	2.0	6.9	8.6	6.5	a 6	6.9	6.6
30	1.3	1.8	1.5	* 1.6	-----	1.9	7.6	1.1	7.2	5.7	6.9	6.9
31	1.2	-----	1.5	1.9	-----	2.0	-----	1.1	-----	* 5.7	6.9	-----
Total	320.6	438.6	466	474	484	527	498.6	273.4	259.7	203.3	184.0	204.9
Mean	10.3	14.6	15.0	15.3	17.3	17.0	16.6	8.82	8.66	6.56	5.94	6.83
Ac-ft	636	870	924	940	960	1,050	989	542	515	403	365	406

Calendar year 1962: Max 68 Min 7.4 Mean 16.1 Ac-ft 11,640  
Water year 1962-63: Max 24 Min 5.0 Mean 11.9 Ac-ft 8,600

Peak discharge (base, 100 cfs).--No peak above base.

\* Discharge measurement made on this day.  
a No gage-height record.

# RIO GRANDE BASIN

75

8-2687. Rio Grande near Arroyo Hondo, N. Mex.

Location.--Lat 36°32'05", long 105°42'40", in NW¼ sec.31, T.27 N., R.12 E., on right bank 200 ft downstream from Rio Hondo, 400 ft downstream from State Road 111 bridge, 2¼ miles west of Arroyo Hondo and 1½ miles northwest of Taos.

Drainage area.--8,760 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--February to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,500 ft (from topographic map).

Extremes.--Maximum discharge during period, 655 cfs Mar. 6 (gage height, 2.15 ft); minimum, 136 cfs Aug. 2.

Remarks.--Records good.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.8	122
1.0	178
1.5	353
2.1	630

Discharge, in cubic feet per second, February to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					-	575	520	200	239	164	141	184
2					-	565	492	187	242	*161	138	178
3					-	570	478	181	235	161	144	175
4					-	575	460	184	232	158	152	178
5					-	594	433	181	222	155	152	184
6					-	411	416	178	219	155	149	175
7					-	600	390	*172	*212	158	172	184
8					-	550	398	172	209	161	*164	184
9					-	565	407	175	209	164	*164	178
10					-	595	407	178	209	164	166	169
11					-	555	468	194	203	172	169	166
12					-	545	468	197	200	169	197	164
13					-	525	478	194	197	169	184	172
14					-	496	416	197	190	178	181	166
15					-	492	386	216	187	175	181	164
16					-	468	369	222	184	161	166	164
17					-	468	378	216	190	*161	161	161
18					-	487	398	219	190	164	164	*161
19					-	482	374	235	*194	158	155	158
20					-	478	334	249	197	155	155	158
21					-	473	296	303	190	155	175	166
22					-	455	274	277	187	149	*164	175
23					-	437	256	*252	178	149	158	178
24					-	428	249	249	175	149	158	175
25					-	464	239	235	172	149	190	169
26					-	478	*226	226	169	152	203	166
27					-	473	219	222	166	152	*194	158
28					550	516	212	226	166	149	155	158
29					-	540	209	242	166	146	152	158
30					-----	501	203	242	164	144	215	155
31					-----	540	-----	242	-----	*141	216	-----
Total	-	-	-	-	-	15,701	10,853	6,663	5,893	4,898	5,335	5,081
Mean	-	-	-	-	-	506	362	215	196	158	172	169
Ac-ft	-	-	-	-	-	31,140	21,530	13,220	11,690	9,720	10,580	10,080

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

Peak discharge (base, 1,400 cfs).--No peak above base.

\* Discharge measurement made on this day.



## RIO GRANDE BASIN

8-2690. Rio Pueblo de Taos near Taos, N. Mex.

Location.--Lat 36°26'30", long 105°30'10", in sec.36, T.26 N., R.13 E., on right bank 2½ miles east of Taos Pueblo, 4½ miles north-east of Taos, and 5 miles upstream from Rio Lucero.

Drainage area.--66.6 sq mi (revised).

Records available.--March to December 1910, discharge measurements only. January 1911 to December 1951, May 1952 to November 1962 (annual maximum only), October 1962 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,400 ft (from topographic map). Prior to Dec. 19, 1910, staff gage, and Dec. 19, 1910, to Dec. 2, 1916, water-stage recorder (pressure type) at same site and different datums. Jan. 31, 1940, to Dec. 31, 1951, water-stage recorder and May 8, 1952 to Nov. 19, 1962, crest-stage gage 0.2 of a mile upstream at different datums.

Average discharge.--18 years (1910-16, 1940-51, 1962-63), 32.3 cfs (23,380 acre-ft per year).

Extremes.--Maximum discharge during year, 64 cfs Apr. 15 (gage height, 1.44 ft); minimum daily, 3.4 cfs July 31, Aug. 1-2. 1910-16, 1940-63: Maximum discharge, 970 cfs May 14, 1941 (gage height, 3.90 ft, from floodmark), from rating curve extended above 290 cfs by logarithmic plotting; minimum daily (except 1952-62), 2 cfs Dec. 3, 6, 1950.

Remarks.--Records good except those for periods of ice effect, or no gage-height record, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	2.2	1.2	32
.7	4.2	1.4	57
.8	7.3	1.5	74
1.0	16		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	8.0	b 5.5	7.0	6.7	4.7	3.3	1.3	5.8	3.4	6.4
2		-	7.7	b 5.5	8.4	6.1	4.1	3.2	1.5	* 6.4	3.4	5.8
3		-	7.3	b 6.5	7.3	7.0	3.1	3.2	1.4	* 6.4	5.5	5.4
4		-	7.0	b 7	7.0	6.4	2.9	3.5	1.4	6.1	9.2	6.8
5		-	5.8	b 6	7.0	6.4	2.8	3.5	* 1.4	6.7	6.1	9.5
6		-	5.8	b 6	7.3	5.8	2.5	3.5	1.4	7.0	5.1	7.7
7		-	6.7	a 6	7.3	* 5.4	3.0	* 3.6	1.3	6.7	4.5	9.5
8		-	6.4	a 6	7.3	7.3	4.2	3.9	1.2	6.1	4.5	8.0
9		-	6.4	* a 6	7.3	6.7	5.1	4.2	1.4	6.4	6.5	7.0
10		-	6.1	a 6.5	7.3	6.7	5.6	4.2	1.2	* 6.4	1.2	6.7
11		-	* 5.4	a 6	5.4	6.7	5.3	4.2	1.2	6.1	9.2	6.7
12		-	6.1	a 5	* b 4.5	* 6.7	* 4.9	3.9	1.2	5.4	8.0	6.7
13		-	6.7	a 4	b 4.5	a 6.5	5.0	3.6	1.1	5.4	1.1	6.4
14		-	6.4	a 4	b 5	a 6.5	5.4	3.2	1.1	5.1	9.5	6.7
15		-	6.7	a 4.5	b 6	a 7.5	6.0	3.1	1.0	5.1	9.5	6.1
16		-	7.0	a 5	b 6	a 7.5	6.0	3.1	9.9	4.8	8.0	6.1
17		-	7.0	a 5	b 6	a 7.5	5.4	3.0	1.2	4.8	8.8	5.4
18		-	7.3	a 5	b 6	a 7.5	5.0	2.8	* 1.2	5.4	1.0	5.1
19		-	7.7	a 5	b 6	a 7.5	4.6	2.8	1.1	4.8	9.5	* 4.8
20		8.0	6.7	a 5	b 6	a 9	4.1	2.8	1.0	5.4	8.4	4.8
21		8.8	b 5	a 6	b 7	a 1.1	3.6	2.8	9.9	7.0	7.7	9.5
22		8.4	b 4	a 6	b 6	a 1.3	3.5	2.7	8.8	4.8	7.0	8.0
23		8.8	b 5	a 6	b 6	a 1.7	3.3	2.4	8.4	4.2	6.4	6.4
24		8.0	b 6	a 6	b 6	a 2.2	3.3	* 2.4	8.0	3.8	6.1	5.8
25		8.4	b 5	a 6	b 6	a 2.8	3.3	2.2	7.3	4.0	6.4	5.4
26		8.8	* b 4.5	a 6	b 6	a 3.1	* 3.4	2.2	7.0	4.5	8.0	5.4
27		8.0	b 4.5	a 5.5	7.0	a 3.5	a 3.3	2.0	6.7	4.0	* 7.3	5.1
28		7.0	b 5	a 5	6.7	a 4.0	a 3.3	1.8	6.1	3.6	7.0	5.1
29		* 7.0	b 5	a 5	-----	* 4.3	a 3.2	1.7	5.8	3.6	7.0	4.8
30		8.4	b 5	a 5.5	-----	4.1	3.2	1.6	5.8	3.6	7.7	4.8
31		-----	b 5.5	* 6.1	-----	4.6	-----	1.5	-----	3.4	7.0	-----
Total	—	—	188.7	172.6	179.3	464.4	123.1	91.9	319.7	162.8	229.7	191.9
Mean	6.8	7.7	6.09	5.57	6.40	15.0	41.0	29.6	10.7	5.25	7.41	6.40
Ac-ft	418	458	374	342	356	921	2,440	1,820	634	323	456	381

Calendar year : Max Min Mean Ac-ft  
 Water year 1963: Max 60 Min 3.4 Mean 12.3 Ac-ft 8,920

Peak discharge (base, 70 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

Note.--Means and acre-feet for October and November estimated to complete water year; maximum and minimum for water year not affected.

RIO GRANDE BASIN

77

8-2710. Rio Lucero near Arroyo Seco, N. Mex.

Location--Lat 36°30'30", long 105°32'00", in NE¼ sec.10, T.26 N., R.13 E. (projected), on right bank in Antoine Lerous Grant, 200 ft upstream from diversion dam for Tenorio and Indian ditches, 2 miles southeast of Arroyo Seco, and 7½ miles northeast of Taos.

Drainage area--16.6 sq mi (revised).

Records available--April to December 1910 (discharge measurements and occasional gage heights), January 1911 to September 1915, March to December 1916 (fragmentary), October 1933 to December 1951, May 1952 to November 1962 (annual maximum only), October 1962 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Published as "near Taos", 1910-1915. Fragmentary records for October 1915 to February 1916, published in WSP 438, have been found to be unreliable and should not be used.

Gage--Water-stage recorder. Datum of gage is 8,048.96 ft above mean sea level, datum of 1929. Prior to Dec. 17, 1910, staff gage, Dec. 17, 1910, to Dec. 31, 1916, pressure type water-stage recorder at site 50 ft downstream at different datum. Nov. 14, 1933, to Jan. 1, 1952, water-stage recorder and wooden control after Mar. 17, 1936, at different datum. May 7, 1952, to Nov. 21, 1962, crest-stage gage at different datum.

Average discharge--24 years (1910-15, 1933-51, 1962-63), 23.7 cfs (17,160 acre-ft per year).

Extremes--Maximum discharge during year, 49 cfs May 8 (gage height, 1.38 ft); minimum, 3.5 cfs Dec. 21, result of freeze-up. 1911-15, 1933-63: Maximum discharge, 300 cfs May 13, 1941 (gage height, 3.12 ft); minimum daily (except 1952-62), 2.5 cfs Feb. 12, 1948, Feb. 1, 2, 1951.

Remarks--Records good March to September, others poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.7	5.2	1.2	29
.8	7.7	1.4	51
1.0	16		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	7.2	b 6	6.2	7.0	2.7	1.9	2.4	*1.1	8.1	9.5
2		-	7.2	b 6	6.2	7.2	2.3	*2.0	2.6	1.1	8.1	9.1
3		-	7.0	b 7	6.0	6.7	1.9	2.2	2.4	1.1	8.8	9.0
4		-	6.7	b 7	6.0	6.7	1.6	2.6	2.2	1.2	9.0	9.8
5		-	6.0	b 6	6.4	6.7	1.6	2.8	*2.1	1.1	8.3	9.9
6		-	6.2	a 5	b 6.5	*6.7	1.5	2.8	2.1	1.1	8.1	9.7
7		-	6.4	a 5	b 6.5	7.0	1.9	3.2	2.0	1.0	8.0	9.6
8		-	7.0	a 5	b 6.5	7.0	2.4	3.9	2.0	1.1	8.4	9.0
9		-	6.7	*a 5	b 6.5	7.0	2.8	4.4	1.9	1.1	1.1	8.8
10		-	6.4	a 5	b 6	6.7	2.9	4.4	1.8	1.1	1.0	8.8
11		-	*b 6.5	a 5	b 6	7.0	2.7	4.6	1.7	1.2	1.0	8.7
12		-	b 7	a 4.5	*b 5.5	*6.7	*2.6	4.3	1.7	1.1	1.1	8.9
13		-	b 7	a 4	5.5	6.7	2.7	3.8	1.6	1.1	1.2	9.2
14		-	b 6.5	a 4	a 6	6.7	2.9	3.6	1.6	1.0	1.2	9.2
15		-	b 6.5	a 4	a 6	7.7	3.0	3.7	1.5	1.0	1.1	8.7
16		-	b 6.5	a 4.5	a 6	8.0	2.9	3.9	1.5	1.0	1.1	8.5
17		-	b 6.5	a 4.5	a 6	8.0	2.6	3.9	1.5	*1.0	*1.2	8.3
18		-	b 6.5	a 4.5	a 6	8.0	2.5	3.8	1.5	9.8	1.1	8.2
19		-	6.4	a 5	a 6	7.7	2.2	3.8	*1.5	9.6	1.1	*8.0
20		-	6.2	a 5	a 6	8.4	2.0	3.7	1.4	1.1	1.1	8.3
21		8.4	5.4	a 5	a 6	1.0	1.9	3.6	1.4	1.0	1.1	1.2
22		8.0	b 5.5	a 5	a 6	1.2	1.9	3.5	1.3	9.5	1.0	9.5
23		7.7	b 5.5	a 5.5	a 6	1.6	1.8	3.5	1.3	9.2	1.0	9.0
24		7.7	b 5.5	a 5.5	a 6	1.7	1.9	*3.4	1.2	9.1	1.1	8.8
25		7.7	b 5.5	a 5.5	a 6	1.9	2.0	3.2	1.2	9.0	1.1	8.6
26		7.7	*b 5	a 5	a 7	2.1	2.0	3.0	1.2	9.0	1.1	8.5
27		7.2	b 5	a 5	a 7	2.5	2.0	2.8	1.1	8.6	1.0	8.3
28		6.7	b 5.5	a 5	a 7	2.6	2.0	2.6	1.1	8.5	1.0	8.2
29		7.4	b 5.5	a 5.5	-	*2.6	1.8	2.6	1.1	8.4	1.0	8.2
30		*7.2	b 5.5	a 5.5	-----	2.6	1.9	2.5	1.1	8.2	1.0	8.0
31		-----	b 5.5	*a 6	-----	2.8	-----	2.4	-----	*8.1	9.7	-----
Total			191.8	160.5	172.8	369.6	669	1,024	490	312.0	313.5	268.3
Mean	7	7.5	6.19	5.18	6.17	11.9	22.3	33.0	16.3	10.1	10.1	8.94
Ac-ft	430	446	380	318	343	733	1,330	2,030	972	619	622	532

Calendar year : Max Min Mean Ac-ft  
Water year 1963 : Max 46 Min 4 Mean 12.1 Ac-ft 8,760

Peak discharge (base, 70 cfs)--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

Note.--Means and acre-feet for October and November estimated to complete water year; maximum and minimum for water year not affected.

## RIO GRANDE BASIN

8-2750. Rio Fernando de Taos near Taos, N. Mex.

Location.--Lat 36°22'30", long 105°33'00", in NE¼ sec.28, T.25 N., R.13 E., on right bank 2 miles southeast of Taos.Drainage area.--71.7 sq mi (revised).Records available.--April to September 1910, gage heights and discharge measurements only. October 1910 to June 1911, discharge measurements only; October 1912 to September 1917; October 1927 to December 1929; October 1962 to September 1963. Previously published figures of discharge for October 1917 to September 1927 appear unreliable and should not be used.Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,100 ft (from topographic map). Prior to July 21, 1921, and Aug. 23, 1921, to Dec. 31, 1929, staff gages at sites 125 ft and 425 ft upstream, respectively, at various datums.Average discharge.--7 years (1912-17, 1927-28, 1962-63), 9.34 cfs (6,760 acre-ft per year).Extremes.--Maximum discharge during year, 55 cfs Mar. 26 (gage height, 1.35 ft); minimum, 0.06 cfs Aug. 23, 24. 1912-17, 1927-28, 1962-63: Maximum discharge determined, that of Mar. 26, 1963; minimum daily discharge, 0.1 cfs on many days during 1963. A flood of undetermined magnitude occurred July 21, 1921.Remarks.--Records good except those for periods of no gage-height record and October to December, which are poor. A few very small diversions above station for irrigation. Randall's ditch diverts from left bank 175 ft downstream from gage for irrigation below station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.1	0.6	2.6	0.9	12
.4	.5	.7	4.7	1.1	26
.5	1.3	.8	7.8		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			-	1.6	1.2	2.6	1.5	8.2	2.5	0.3	0.1	0.1
2			-	1.6	2.8	2.5	1.3	8.2	3.2	.3	.1	.1
3			-	1.6	3.6	2.6	9.9	* 7.2	3.2	* .3	1.3	.1
4			-	1.4	3.4	2.6	10	6.9	* 2.5	.2	.4	.1
5			-	1.3	3.2	2.3	9.9	6.9	2.3	.3	.2	.1
6			-	1.6	3.9	2.5	9.1	* 6.9	2.1	.2	.1	.1
7			-	1.7	4.1	2.2	9.9	6.2	1.8	.2	.1	.2
8			-	1.7	4.5	2.8	11	5.9	1.8	.2	.1	.2
9			-	1.7	3.9	2.5	12	5.6	2.2	.2	.1	.2
10			-	* 1.7	3.9	2.6	14	5.3	2.0	.3	.1	.2
11			-	1.4	* 2.1	2.6	* 1.3	4.7	1.7	.2	.1	.2
12			-	a 1.0	2.0	2.5	12	4.7	1.4	.2	.1	* .2
13			* -	a .8	2.0	2.5	12	4.5	1.3	.2	.1	.2
14			1.8	a .8	1.7	2.2	13	4.3	1.3	.2	.1	.2
15			1.7	a 1.0	3.0	* 3.0	14	4.1	1.2	.2	.1	.2
16			2.0	a 1.0	3.2	2.8	14	3.9	1.2	.2	* .1	.2
17			1.8	a 1.0	3.0	3.4	14	3.9	* 1.2	* .2	.1	.2
18			1.8	a 1.0	3.0	3.2	14	3.6	1.2	.2	.1	.2
19			1.8	a 1.0	3.0	2.6	13	3.6	1.2	.2	.1	.2
20			1.7	a 1.0	2.8	3.2	12	3.6	1.2	.2	.1	.2
21			1.7	a 1.0	3.0	4.5	11	3.6	1.0	.2	.1	1.5
22			1.8	a 1.2	3.0	5.9	10	3.9	.8	.2	.1	1.4
23			a 1.6	a 1.2	2.5	9.9	9.5	3.4	.6	.2	.1	.8
24			a 1.5	a 1.2	2.8	21	9.9	* 3.2	.9	.2	.1	.7
25			a 1.3	a 1.2	2.6	22	9.1	3.0	.9	.2	.1	.5
26			a 1.0	a 1.2	2.6	2.6	9.5	2.6	.4	.1	.1	* .5
27			a 1.2	a 1.0	2.8	2.6	9.9	2.6	.3	.1	* .1	.4
28			* 1.4	a .8	* 2.6	2.2	9.5	2.6	.3	.1	.1	.4
29			1.6	* a 1.0	-	* 2.2	9.1	2.5	.3	.1	.1	.4
30			1.6	a 1.0	-----	1.7	9.2	2.5	.3	.1	.1	* .4
31			1.7	a 1.0	-----	1.6	-----	2.5	-----	* .1	.1	-----
Total				37.7	82.2	245.5	340.5	140.6	42.3	6.1	4.7	10.4
Mean	3	2.5	1.8	1.22	2.94	7.92	11.4	4.54	1.41	0.20	0.15	0.35
Ac-ft	184	149	111	75	163	487	675	279	84	12	9.3	21

Calendar year : Max Min Mean Ac-ft  
 Water year 1963: Max 26 Min 0.1 Mean 3.11 Ac-ft 2,250

\* Discharge measurement made on this day.

a No gage-height record.

Note.--Means and acre-feet for October, November and December estimated to complete water year.

RIO GRANDE BASIN

79

8-2753. Rio Pueblo de Taos near Ranchito, N. Mex.

Location.--Lat 36°23'30", long 105°37'30", on left bank 300 ft downstream from Rio Fernando de Taos and 2 miles southwest of Ranchito, Taos County.

Drainage area.--199 sq mi.

Records available.--March 1957 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,730 ft (from topographic map).

Average discharge.--6 years, 31.6 cfs (22,880 acre-ft per year).

Extremes.--Maximum discharge during year, 96 cfs Feb. 1 (gage height, 2.05 ft); maximum gage height, 2.78 ft Jan. 14 (ice jam); minimum discharge recorded, 0.8 cfs July 6 (may have been less in August).  
1957-63: Maximum discharge, 600 cfs May 13, 1957 (gage height, 3.72 ft); minimum daily, 0.9 cfs July 6, Sept. 10, 11, 1963.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 9,000 acres above station. Anderson ditch diverts from right bank about 125 ft below gage.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-15, July 16 to Sept. 30)

0.9	0.75	1.4	17
1.0	2.0	1.6	33
1.1	4.2	1.8	56
1.2	7.4	2.1	105

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	15	22	b15	47	*23	66	12	3.3	1.2	a1	2.9
2	12	15	20	b15	38	23	61	*12	5.5	1.3	a1	2.7
3	12	16	20	15	28	23	44	13	4.5	*1.3	a1	2.7
4	12	16	20	15	27	21	*46	11	*4.4	1.2	a1	2.7
5	12	16	20	b15	28	b21	46	10	4.0	1.2	a1	2.7
6	12	15	20	b14	28	b20	42	9.6	3.5	.9	a1	2.9
7	13	*15	20	a14	28	b20	43	7.4	3.3	1.2	a1	2.9
8	13	16	20	a15	27	23	56	6.8	4.0	1.4	a1	1.3
9	13	15	20	a15	27	23	66	6.4	4.5	1.4	a1	1.3
10	13	16	*20	*a16	30	23	56	6.4	3.3	1.7	a2	.9
11	14	16	18	a16	22	23	56	6.1	2.9	1.7	a1	.9
12	14	15	18	a14	*b20	23	*51	5.8	2.7	1.6	a1	1.3
13	14	15	18	a12	b16	23	51	6.1	2.7	1.3	a1	1.6
14	14	16	19	a12	b16	a22	53	6.8	2.7	1.2	a1	1.9
15	14	19	19	a13	b18	a25	62	6.1	2.4	1.2	a1	2.0
16	13	18	19	a14	18	a24	61	5.8	2.4	1.3	a1	2.4
17	14	18	19	a16	17	a23	47	4.5	2.4	1.3	a1	2.4
18	15	18	19	a16	17	a22	43	4.5	*2.4	*1.6	a1	2.4
19	*15	18	19	a15	17	a22	39	4.5	2.7	1.9	*1.7	*2.7
20	15	18	19	a15	18	a22	37	4.2	3.1	1.9	2.0	3.1
21	14	19	18	a16	21	*23	34	5.2	2.7	2.2	2.0	5.8
22	13	18	16	a18	21	23	28	6.8	2.0	2.2	2.0	5.2
23	14	18	16	a18	b19	23	24	*5.8	1.4	1.7	2.0	4.2
24	14	19	18	a18	23	33	24	4.5	1.4	1.9	2.0	4.2
25	14	19	17	a18	25	39	23	4.8	1.4	1.9	2.4	3.8
26	15	20	b14	a18	23	40	20	4.2	1.4	1.7	3.1	3.8
27	15	20	b12	a18	23	42	20	3.5	1.4	1.9	2.9	3.3
28	15	20	b14	a14	23	41	16	3.5	1.7	1.6	2.9	3.3
29	15	20	b15	*b16	-	50	15	2.7	1.4	1.4	2.9	3.3
30	15	20	b16	18	-----	44	11	3.4	1.2	*1.3	*3.1	3.3
31	15	-----	*b16	24	-----	46	-----	3.3	-----	a1	3.3	-----
Total	425	519	561	488	665	853	1,241	1,967	827	466	513	839
Mean	13.7	17.3	18.1	15.7	23.8	27.5	41.4	6.35	2.76	1.50	1.65	2.80
Ac-ft	843	1,030	1,110	968	1,320	1,690	2,460	390	164	92	102	166

Calendar year 1962: Max 360 Min 1.9 Mean 33.3 Ac-ft 24,120  
Water year 1962-63: Max 66 Min 0.9 Mean 14.3 Ac-ft 10,340

Peak discharge (base, 130 cfs). --No peak above base.

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.

## RÍO GRANDE BASIN

8-2755. Rio Grande de Ranchos near Talpa, N. Mex.

Location.--Lat 36°17'55", long 105°34'55", in Rancho del Rio Grande Grant, on right bank 1 $\frac{3}{4}$  miles downstream from Rito de la Olla (locally known as Pot Creek), 3.0 miles south of Talpa, and 3.5 miles upstream from Rio Chiquito.

Drainage area.--83 sq mi, approximately.

Records available.--October 1952 to September 1963. Prior to October 1955, published as Rio Grande del Rancho near Ranchos de Taos.

Gage.--Water-stage recorder. Altitude of gage is 7,250 ft (from topographic map). Prior to Nov. 11, 1952, staff gage at site 35 ft downstream at datum 0.39 ft lower.

Average discharge.--11 years, 19.3 cfs (13,970 acre-ft per year).

Extremes.--Maximum discharge during year, 75 cfs Apr. 16 (gage height, 2.62 ft); maximum gage height, 2.87 ft Dec. 28 (backwater from ice); minimum discharge, 2.9 cfs Dec. 21.

1952-63: Maximum discharge, 342 cfs May 19, 1958 (gage height, 3.78 ft); minimum daily, 0.6 cfs Jan. 5, 1955.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Minor diversions upstream for operation of saw mill and for irrigation.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.5	3.2	2.0	21
1.6	5.2	2.3	42
1.8	11	2.6	72

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	6.8	7.6	b7	b7	6.6	4.6	4.0	2.1	6.8	3.8	7.1
2	8.2	7.1	7.6	b7	7.9	b6	4.0	3.9	2.2	7.4	3.8	6.3
3	8.2	6.8	7.4	a7	7.6	6.8	3.1	4.1	2.1	7.1	4.6	5.5
4	7.9	6.6	7.1	a7	7.4	6.0	3.1	4.5	1.9	8.7	6.7	6.3
5	7.9	6.3	b7	b6	6.3	b5	2.9	4.8	1.8	9.3	6.3	7.1
6	7.9	6.8	b7	b5	6.6	b5	2.6	5.2	1.7	7.9	5.2	6.6
7	7.9	6.8	b7	b5	6.8	b5	2.9	5.5	1.5	7.4	4.8	6.8
8	7.4	6.6	b6	b5	6.6	b5	3.4	5.9	1.6	7.1	4.8	6.3
9	7.4	6.3	b5	b7	6.6	b6	4.6	6.1	1.7	7.6	5.4	5.7
10	7.4	6.3	b5	b7	7.1	6.6	5.1	6.3	1.5	8.2	1.1	5.5
11	7.4	6.6	b5	6.6	7.1	6.3	5.3	6.4	1.4	8.9	9.6	6.0
12	6.8	6.8	b5	a5	b5	b5	5.4	6.4	1.4	7.9	8.2	5.5
13	7.1	6.3	b5	a4	b5	b5	5.6	6.0	1.3	7.4	10	6.8
14	7.1	6.3	b5	a4	b6	b6	6.1	5.7	1.4	6.8	9.3	7.6
15	6.8	8.6	b5	a4	b6	b6.5	6.8	5.2	1.2	6.3	7.9	6.8
16	6.8	9.0	b5	a5	6.8	b6.8	7.3	4.9	1.2	6.0	7.9	6.0
17	7.4	8.6	b5	a5	b7	b6.3	6.6	4.7	1.2	6.3	8.6	5.2
18	7.6	7.9	5.7	a5	b7	6.8	6.4	4.4	1.3	5.5	10	5.0
19	10	b7.5	5.7	a5	b7	6.6	5.1	4.1	1.2	5.2	9.0	4.8
20	9.3	b7.5	b5	a5	b7	7.4	5.6	4.0	1.2	5.7	8.6	4.8
21	9.0	7.6	b5	a5	6.6	8.2	4.9	4.0	1.0	5.7	7.6	1.2
22	7.9	7.6	b4	a6	b5	10	4.6	3.7	9.6	4.6	7.1	1.3
23	7.9	7.6	b4	a6	b6	15	4.3	3.4	9.0	4.2	6.8	1.1
24	7.6	7.9	b4	a6	b6	19	4.3	3.2	7.9	3.8	6.8	9.6
25	7.4	7.9	b4	a6	b7	19	4.4	2.9	7.9	4.0	7.1	9.6
26	7.1	8.2	b3	a6	b7	2.2	4.4	2.6	7.9	5.0	8.6	10
27	7.1	7.9	b4	a5	7.4	2.8	4.7	2.5	7.6	4.8	7.9	9.6
28	7.1	7.1	b4	a6	7.4	3.5	4.6	2.5	7.4	4.4	7.4	9.3
29	7.1	7.4	b4	a7	-	3.7	4.2	2.3	7.1	4.0	7.1	9.0
30	6.8	7.6	b6	a7	-----	4.0	4.0	2.3	6.8	3.6	8.2	8.6
31	7.1	-----	b7	a7	-----	4.6	-----	2.3	-----	3.8	7.6	-----
Total	237.6	218.3	167.1	179.6	186.2	399.9	140.9	133.8	390.2	191.4	227.7	223.4
Mean	7.66	7.28	5.39	5.79	6.65	12.9	47.0	43.2	13.0	6.17	7.35	7.45
Ac-ft	471	433	331	356	369	793	2,790	2,650	774	380	452	443

Calendar year 1962: Max 195 Min 3 Mean 26.7 Ac-ft 19,330  
 Water year 1962-63: Max 73 Min 3 Mean 14.2 Ac-ft 10,240

Peak discharge (base, 75 cfs).--Apr. 16 (0400) 75 cfs (2.62 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

81

8-2756. Rio Chiquito near Talpa, N. Mex.

Location.--Lat 36°19'50", long 105°34'50", on right bank in Rancho del Rio Grande Grant, 1 mile southeast of Talpa, Taos County, and 1¼ miles upstream from mouth.

Drainage area.--37.0 sq mi.

Records available.--March 1957 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 7,230 ft (from topographic map).

Average discharge.--6 years, 8.74 cfs (6,330 acre-ft per year).

Extremes.--Maximum discharge during year, 37 cfs Apr. 16 (gage height, 1.87 ft); minimum daily, 1.0 cfs Jan. 13, 14.  
1957-63: Maximum discharge, about 144 cfs May 13, 1958 (gage height, 2.24 ft), from rating curve extended above 50 cfs by logarithmic plotting; minimum daily, that of Jan. 13, 14, 1963 (momentary minimum not yet determined).

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	0.9	1.4	5.0	1.7	19
1.2	1.6	1.5	8.1	1.8	28
1.3	3.0	1.6	13	2.0	58

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.9	a 3	3.9	b 3	3.5	3.0	2.0	1.6	7.1	3.3	2.2	3.5
2	3.7	a 3	3.7	b 3	3.9	2.6	1.7	1.6	8.1	3.3	2.2	3.3
3	3.7	a 3	3.5	b 3	3.9	3.1	1.2	1.5	7.8	* 3.3	2.3	3.0
4	3.5	a 3	3.5	b 2.5	3.9	b 2.5	1.3	1.6	6.7	3.7	2.8	3.0
5	3.3	a 3	2.8	b 2.5	3.9	b 2	1.2	1.6	* 6.7	3.3	3.0	3.1
6	3.3	* 3.7	2.2	b 2	3.9	b 2	1.1	* 1.6	6.4	3.3	2.6	3.1
7	3.1	3.3	3.0	b 2	3.9	b 2.5	1.3	1.6	6.1	3.3	2.5	3.1
8	3.1	3.1	3.0	b 3	3.9	3.3	1.6	1.6	5.8	3.3	2.3	2.6
9	3.1	3.3	2.8	b 3	3.9	3.0	2.3	1.6	6.4	3.3	3.2	2.6
10	2.8	3.3	* 2.8	* b 3	3.9	3.1	* 2.5	1.6	5.8	3.7	5.5	2.5
11	2.6	3.5	2.6	b 2	* b 2.7	3.1	2.4	1.5	5.5	3.5	5.5	2.6
12	2.6	3.1	3.1	b 1.5	b 2	3.0	2.4	1.5	5.5	3.1	4.9	2.5
13	2.6	3.1	3.5	a 1	b 1.5	3.1	2.5	1.4	5.0	3.1	5.8	2.6
14	2.6	3.5	3.1	a 1	b 1.5	2.6	2.8	1.3	5.2	3.0	4.8	2.6
15	2.6	4.5	2.8	a 1.5	b 2	3.3	3.3	1.3	5.0	2.8	3.9	2.6
16	2.6	4.5	3.1	a 2	b 2	3.0	3.4	1.2	4.8	2.8	* 3.5	2.3
17	2.8	4.3	2.8	a 2	b 3	3.5	3.1	1.2	5.0	2.6	3.3	2.2
18	3.0	4.1	a 3	a 2	2.8	4.5	2.8	1.1	* 5.2	* 2.6	3.7	* 2.2
19	* 5	3.9	a 2	a 2	3.3	3.3	2.4	1.1	5.2	3.1	3.5	2.0
20	a 4	3.9	a 2.5	a 2	3.1	* 3.9	2.3	1.1	5.2	3.3	3.3	2.2
21	a 3	4.3	a 2	a 2	3.1	4.1	2.0	1.0	4.8	3.7	3.3	6.4
22	a 3	4.1	2.2	a 2	3.1	4.5	1.9	1.0	4.3	3.0	3.0	5.2
23	a 3	* 4.1	2.2	a 2	3.0	6.4	1.8	* 9.5	4.1	2.6	3.0	3.9
24	a 3	3.7	b 2	a 2	3.0	7.4	1.8	9.5	3.9	2.6	3.0	3.5
25	a 3	3.7	b 2	a 2	* 3.1	8.6	1.8	9.0	3.7	2.6	3.5	3.3
26	a 3	3.9	b 1.8	a 2	3.0	1.0	* 1.7	8.1	3.7	3.7	4.3	3.1
27	a 3	3.5	* b 2	a 2	3.1	1.1	1.8	8.1	3.5	2.8	* 3.7	3.0
28	a 3	3.1	b 2	a 2	3.0	1.5	1.8	7.8	3.5	2.5	3.3	2.8
29	a 3	3.1	b 3	* b 2.5	-	* 1.6	1.6	7.1	3.3	2.2	4.1	2.8
30	a 3	3.9	b 3	b 2.5	-----	1.7	1.6	7.1	3.3	* 2.2	4.1	2.6
31	a 3	-----	b 3	b 3	-----	1.9	-----	7.8	-----	2.0	3.9	-----
Total	96.9	107.5	85.9	68.0	86.9	179.4	61.4	380.0	156.6	93.6	110.0	90.2
Mean	3.13	3.58	2.77	2.19	3.10	5.79	20.5	12.3	5.22	3.02	3.55	3.01
Ac-ft	192	213	170	135	172	356	1,220	754	311	186	218	179

Calendar year 1962: Max 95 Min 2.0 Mean 11.2 Ac-ft 8,120  
Water year 1962-63: Max 34 Min 1 Mean 5.67 Ac-ft 4,110

Peak discharge (base, 35 cfs). - Apr. 16 (0100) 37 cfs (1.87 ft).

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-2760. Rio Pueblo de Taos at Los Cordovas, N. Mex.

Location.--Lat 36°23'20", long 105°38'00", in N $\frac{1}{2}$  sec.23, T.25 N., R.12 E. (projected), in Martinez Grant, on left bank 200 ft downstream from Rio Grande de Ranchos, 0.2 mile downstream from Arroyo Seco, half a mile northeast of Los Cordovas, and 3 $\frac{1}{2}$  miles west of Taos.

Drainage area.--359 sq mi.

Records available.--April 1910 to January 1926, September 1926 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1955, published as Rio Taos at Los Cordovas. All records include flow of Rio Grande de Ranchos.

Gage.--Water-stage recorder. Datum of gage is 6,709.59 ft above mean sea level, datum of 1929. Prior to Oct. 4, 1921, staff gages at nearby sites at different datums. Oct. 4, 1921, to Sept. 30, 1934, water-stage recorder at site 200 ft upstream at datum about 1.26 ft higher and Oct. 1, 1934, to Apr. 30, 1957, at site 200 ft upstream at datum 1.00 ft higher.

Average discharge.--52 years (1910-25, 1926-63), 59.0 cfs (42, 710 acre-ft per year).

Extremes.--Maximum discharge during year, 162 cfs Apr. 16 (gage height, 2.78 ft); minimum, 2.2 cfs July 30, Aug. 1.

1915, 1922, 1924-25, 1927, 1929-63: Maximum discharge, 1,830 cfs May 14, 1941 (gage height, 5.81 ft, site and datum then in use), from rating curve extended above 1,300 cfs by logarithmic plotting; minimum daily, 1.3 cfs July 17, Aug. 18, 1951.

Remarks.--Records fair. Diversions above station for irrigation of about 12,000 acres, a small part of which is below station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-21, July 31 to Sept. 30)

1.28	2.6	1.6	13	2.2	62
1.4	5.3	1.8	24	2.5	105
1.5	8.8	2.0	41	3.0	211

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.4	1.9	3.3	b 2.3	6.0	* 3.5	1.29	2.2	8.4	3.6	2.7	6.0
2	1.4	1.9	3.0	b 2.1	5.1	3.3	1.16	* 2.0	1.4	3.9	2.6	5.6
3	1.4	1.9	3.0	b 2.0	4.2	3.3	9.4	1.9	1.4	* 3.9	3.1	5.6
4	1.4	1.9	3.0	b 2.1	3.9	3.0	* 9.5	1.8	* 1.2	3.6	3.1	5.3
5	1.4	1.9	2.9	b 2.2	4.0	3.2	9.1	1.9	9.6	4.1	3.1	5.6
6	1.5	1.9	2.8	b 2.3	4.0	3.1	8.2	2.0	8.1	4.3	3.6	5.1
7	1.5	* 2.0	2.8	b 1.9	3.9	3.4	8.1	1.9	7.4	4.3	3.4	5.1
8	1.4	2.2	2.9	b 1.9	3.6	4.0	9.4	2.0	8.1	4.6	3.6	3.9
9	1.6	2.2	2.9	b 2.1	3.7	3.9	1.09	2.6	9.6	4.6	3.9	4.3
10	1.6	2.2	2.8	* b 2.2	b 4.0	3.9	1.19	3.0	8.8	4.6	6.6	4.1
11	1.6	2.2	* 2.7	b 2.2	b 3.0	3.8	1.18	2.8	7.8	4.8	6.0	4.1
12	1.7	2.0	2.7	a 2.0	* b 2.6	3.7	* 1.19	2.7	6.7	5.3	4.6	4.1
13	1.7	2.0	2.8	a 1.9	b 2.3	3.9	1.23	2.5	7.0	5.3	4.3	4.3
14	1.7	2.2	2.8	a 1.9	b 2.4	3.9	1.35	2.2	6.7	5.1	4.3	5.1
15	1.7	2.8	2.6	a 2.1	b 2.5	4.8	1.54	2.0	5.6	5.1	4.3	4.8
16	1.6	2.5	2.7	a 2.3	b 2.8	3.9	1.54	1.6	5.6	5.1	4.3	4.8
17	1.8	2.6	2.8	a 2.3	b 2.9	3.6	1.41	1.4	6.0	5.1	4.3	4.8
18	1.8	2.6	3.0	a 2.3	b 2.9	3.6	1.25	1.4	* 6.0	* 5.1	4.3	4.8
19	* 2.3	2.6	3.0	a 1.9	b 2.9	3.4	1.07	1.3	6.7	4.6	* 4.6	* 5.1
20	1.8	2.5	2.9	a 2.1	b 2.9	3.5	8.9	1.4	7.0	4.1	5.6	6.0
21	1.7	2.7	2.7	a 2.4	b 3.4	* 3.6	7.5	1.3	6.7	3.6	6.4	8.8
22	1.6	2.7	2.5	a 2.7	b 3.3	3.8	6.1	1.5	5.1	3.1	6.4	7.0
23	1.7	2.6	2.5	a 2.7	b 3.4	4.4	5.0	* 1.4	5.3	3.9	6.0	6.0
24	1.7	2.5	2.7	a 2.7	3.9	5.8	4.7	1.4	5.1	3.4	5.3	6.0
25	1.7	2.6	b 2.5	a 2.6	4.0	6.7	4.2	1.2	4.6	2.7	5.6	6.0
26	1.8	2.9	b 2.2	a 2.5	3.6	7.4	4.1	1.0	3.9	3.1	6.4	6.4
27	1.8	2.6	a 2.0	a 2.4	3.6	8.9	4.2	9.6	4.1	3.6	5.6	6.4
28	1.7	2.6	a 2.1	a 2.7	3.5	9.7	3.9	8.4	4.3	4.1	5.6	6.4
29	1.7	2.6	a 2.2	* 2.8	-	1.18	3.3	8.1	4.3	3.1	5.6	6.4
30	1.8	2.8	a 2.4	3.0	-----	1.10	2.4	8.4	3.4	* 2.6	* 6.4	6.7
31	1.8	-----	* b 2.4	4.4	-----	1.21	-----	7.8	-----	2.7	6.4	-----
Total	51.3	70.6	83.6	73.0	98.3	1.579	2.729	526.3	211.9	127.0	148.0	164.6
Mean	16.5	23.5	27.0	23.5	35.1	50.9	91.0	17.0	7.06	4.10	4.77	5.49
Ac-ft	1,020	1,400	1,660	1,450	1,950	3,130	5,410	1,040	420	252	294	326

Calendar year 1962: Max 604 Min 4.3 Mean 60.4 Ac-ft 43,740

Water year 1962-63: Max 154 Min 2.6 Mean 25.4 Ac-ft 18,350

Peak discharge (base, 200 cfs). --No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

83

8-2763. Rio Pueblo de Taos below Los Cordovas, N. Mex.

Location.--Lat 36°22'30", long 105°40'10", in Gijosa Grant, on left bank 2 miles southwest of Los Cordovas, 2½ miles downstream from Rio Grande de Ranchos, 4½ miles upstream from mouth, Taos County.

Drainage area.--380 sq mi.

Records available.--March 1957 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,630 ft (from topographic map).

Average discharge.--6 years, 55.1 cfs (39,890 acre-ft per year).

Extremes.--Maximum discharge during year, 173 cfs Apr. 16 (gage height, 2.39 ft); minimum, 3.0 cfs July 14, 17, 22, 23, 25.

1957-63: Maximum discharge, 2,380 cfs Aug. 24, 1957 (gage height, 5.80 ft), from rating curve extended above 900 cfs on basis of logarithmic plotting; minimum daily, 3.7 cfs July 22, 1963.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 12,000 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 11				July 12 to Sept. 30	
0.7	2.6	1.2	27	1.6	3.0
.8	4.9	1.5	56	1.7	4.7
.9	8.0	2.0	118	1.8	7.3
1.0	13	2.5	195	1.9	11

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	18	35	b 24	*a 60	* 35	134	31	8.6	4.8	4.3	7.9
2	14	19	32	b 22	58	34	121	* 26	14	5.1	4.2	7.1
3	14	18	32	21	46	35	91	21	14	* 5.3	5.0	6.9
4	14	18	32	22	43	33	* 90	20	* 12	5.5	5.3	* 7.0
5	14	19	30	b 23	43	35	84	21	11	5.5	5.1	7.2
6	15	18	29	b 24	41	b 30	74	24	9.9	5.6	5.2	7.3
7	15	20	30	b 20	38	b 30	73	21	8.6	5.8	5.1	7.3
8	14	21	30	b 20	36	42	89	23	8.7	5.6	6.1	6.3
9	15	* 22	30	b 21	35	41	104	30	9.9	a 5.2	6.3	6.4
10	15	22	29	* b 23	42	41	118	34	9.9	a 5.2	8.3	6.2
11	16	22	* 28	b 23	32	40	119	32	9.0	a 5.5	8.6	6.2
12	16	21	28	b 21	* b 28	38	* 115	32	7.3	6.3	6.9	5.6
13	16	21	29	b 20	b 23	40	124	30	7.7	5.8	6.8	5.9
14	16	22	29	b 20	b 24	40	136	25	7.9	5.1	6.6	6.3
15	16	32	29	a 22	b 26	50	160	23	6.9	5.0	6.6	6.4
16	16	28	30	a 24	b 29	41	165	19	6.8	4.9	6.5	6.2
17	17	29	32	a 24	30	37	150	16	7.7	4.7	6.5	6.1
18	18	29	34	a 24	30	37	137	15	* 7.9	* 4.8	6.8	6.1
19	* 23	28	34	b 20	30	34	119	14	9.3	4.6	* 6.1	* 5.8
20	18	28	32	b 22	30	* 34	98	15	9.0	4.3	6.7	6.2
21	18	30	30	b 25	35	38	78	14	8.5	4.2	7.2	11
22	18	30	b 27	b 28	34	39	62	17	7.4	3.7	6.9	8.8
23	18	27	b 27	b 28	33	42	49	* 15	6.9	4.1	6.7	8.1
24	18	26	b 28	b 28	39	57	50	16	6.8	4.0	6.4	8.0
25	18	26	b 25	b 27	40	69	49	14	6.3	3.9	6.7	7.7
26	18	30	b 23	b 26	35	75	49	12	5.2	4.3	7.9	7.8
27	18	28	b 21	b 25	37	90	50	11	5.5	4.7	7.1	7.6
28	18	26	b 22	b 29	35	100	51	9.4	5.3	5.0	7.1	7.2
29	18	26	b 23	b 35	-	125	45	8.6	5.2	4.6	7.4	6.9
30	18	30	b 25	a 45	-----	114	32	9.4	4.7	* 4.0	7.7	7.0
31	18	-----	* b 25	a 58	-----	126	-----	8.7	-----	4.1	7.9	-----
Total	514	734	890	794	1,012	1,622	2,816	6,071	2,479	151.2	202.0	210.5
Mean	16.6	24.5	28.7	25.6	36.1	52.3	93.9	19.6	8.26	4.88	6.52	7.02
Ac-ft	1,020	1,460	1,770	1,570	2,010	3,220	5,590	1,200	492	300	401	418

Calendar year 1962: Max 585 Min 4.9 Mean 62.1 Ac-ft 44,940  
Water year 1962-63: Max 165 Min 3.7 Mean 26.9 Ac-ft 19,450

Peak discharge (base, 230 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.



## RIO GRANDE BASIN

8-2765. Rio Grande below Taos Junction Bridge, near Taos, N. Mex.

Location.--Lat 36°19'00", long 105°45'30", in N½ sec.15, T.24 N., R.11 E., on left bank 2 miles downstream from Rio Pueblo de Taos and bridge on State Highway 96 and 12 miles southwest of Taos.

Drainage area.--9,730 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--July 1925 to September 1963. Monthly discharge only July 1925 to September 1930, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 6,050.3 ft above mean sea level (planetable survey). Prior to Apr. 14, 1934, at bridge 2 miles upstream at different datum.

Average discharge.--38 years, 749 cfs (542,300 acre-ft per year).

Extremes.--Maximum discharge during year, 867 cfs Nov.11 (gage height, 4.48 ft); minimum, 167 cfs Aug. 2.

1926-63: Maximum discharge, 9,730 cfs June 7, 1948, June 22, 1949; maximum gage height, 10.7 ft July 3, 1927 (site and datum then in use), from graph based on recorder record ending at a gage height of 10.5 ft, 6 hours prior to peak; minimum daily discharge, 159 cfs Oct. 8-11, 1956.

Maximum flood known since at least 1888, about 14,000 cfs June 19, 1903, from records for Rio Grande at Embudo and estimated inflow. Other floods exceeding 10,000 cfs occurred June 9, 1905, May 28, 1920, and June 16, 1921, from comparison of records for stations near Lobatos and at Embudo.

Remarks.--Records good except those for period of no gage-height record, which are poor. Diversions for irrigation of about 650,000 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

3.3	135	4.0	500
3.5	220	4.5	875

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	270	*280	474	342	435	584	670	*260	265	184	171	220
2	270	280	468	336	448	584	626	255	270	184	*171	206
3	270	285	461	342	461	570	584	a240	*270	184	*175	202
4	265	358	454	364	468	598	563	a245	255	184	175	202
5	270	612	474	364	*494	*494	535	a240	245	184	180	206
6	275	739	468	358	542	387	500	235	235	184	180	202
7	270	795	461	358	577	633	474	220	235	184	188	*198
8	270	811	454	370	584	598	*480	220	230	193	198	220
9	270	819	448	375	584	605	507	230	230	193	*188	198
10	270	859	435	*370	633	633	528	240	230	*193	193	198
11	*265	859	442	375	605	591	542	245	225	206	198	193
12	260	851	448	350	474	577	591	250	225	198	206	184
13	255	811	442	a320	*280	570	612	250	216	202	230	198
14	250	612	442	a300	442	528	577	245	220	202	202	193
15	250	454	442	a300	474	507	556	260	211	206	216	188
16	245	405	*429	*a340	474	507	542	*265	211	193	202	*188
17	250	405	435	a340	468	494	*535	260	*216	188	188	188
18	270	387	454	a330	487	521	556	260	216	188	188	188
19	285	336	*468	a320	500	521	514	265	220	188	184	188
20	285	*300	435	a310	494	521	*474	270	225	180	180	188
21	280	387	435	a320	507	521	411	336	220	180	198	202
22	285	435	417	331	507	507	364	315	216	175	*193	211
23	295	448	381	348	521	480	331	295	211	175	184	206
24	295	442	353	353	535	474	326	285	206	175	184	202
25	295	480	320	358	535	528	310	270	198	180	202	198
26	295	494	305	364	528	563	295	260	193	175	230	193
27	295	494	295	358	549	570	285	255	188	180	220	188
28	295	487	326	370	570	605	280	250	188	175	211	188
29	285	474	320	375	-	662	275	260	188	175	253	184
30	285	480	336	381	-----	626	a265	265	184	171	297	184
31	280	-----	348	399	-----	648	-----	270	-----	171	290	-----
Total	8,500	15,879	12,870	10,821	14,176	17,207	14,108	8,016	6,642	5,750	6,275	5,904
Mean	274	529	415	349	506	555	470	259	221	185	202	197
Ac-ft	16,860	31,500	25,530	21,460	28,120	34,130	27,980	15,900	13,170	11,400	12,450	11,710

Calendar year 1962: Max 3,290 Min 240 Mean 717 Ac-ft 519,400  
 Water year 1962-63: Max 859 Min 171 Mean 346 Ac-ft 250,200

Peak discharge (base, 1,600 cfs).--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

85

8-2790. Embudo Creek at Dixon, N. Mex.

Location.--Lat 36° 12' 40", long 105° 54' 55", in NW¼SE¼ sec. 19, T. 23 N., R. 10 E., at downstream end of bridge pier on U. S. Highway 64, 0.5 mile upstream from mouth, three-quarters of a mile east of Embudo Post Office, and 1.6 miles northwest of Dixon.

Drainage area.--305 sq mi.

Records available.--October 1923 to September 1955, April 1956 to September 1962 (annual maximum only). September 1962 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 5,849.54 ft above mean sea level, datum of 1929. Prior to Nov. 30, 1938 at site about 1 mile upstream at different datums. Nov. 30, 1938 to Aug. 1, 1941, at site about three-quarters of a mile upstream at datum about 69.0 ft higher. April 1956 to Sept. 21, 1962, crest-stage gage.

Average discharge.--32 years (1923-25, 1926-55, 1962-63), 81.7 cfs (59,150 acre-ft per year).

Extremes.--Maximum discharge during year, 923 cfs Sept. 24 (gage height, 4.93 ft); minimum, 3.4 cfs July 30, Aug. 6-8. 1923-63: Maximum discharge determined, 2,180 cfs Aug. 22, 1946 (gage height, 7.00 ft); minimum daily, except 1956-62, 0.2 cfs June 27, 1950, July 8, 22, Aug. 17, 1951.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation of about 6,500 acres, a small part of which is below gage.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 24-30)

1.0	3.0	1.2	7.9	1.5	24	2.0	76	3.0	269
1.1	5.0	1.3	12	1.7	41	2.5	158		

Daily discharges for period Sept. 21-30, 1962 were: 19, 16, 18, 30, 37, \*33, 29, 32, 35, 30.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	* 28	44	25	37	30	237	* 62	30	4.6	4.4	11
2	28	26	41	25	79	29	223	56	41	4.6	* 4.6	9.6
3	27	28	38	25	50	35	168	50	* 57	4.6	4.0	7.9
4	26	29	37	25	43	33	158	49	48	4.8	4.0	7.6
5	27	28	36	25	* 42	* 32	148	48	46	5.3	4.0	7.9
6	27	27	* 35	25	40	30	129	50	33	5.3	3.8	7.6
7	26	26	36	25	37	30	129	49	30	4.8	4.2	* 7.3
8	23	26	35	* 26	36	35	* 170	53	26	5.0	4.2	7.6
9	23	25	35	28	37	30	230	59	26	5.6	3.8	7.6
10	21	24	31	26	45	35	256	64	23	* 7.6	4.6	8.3
11	* 21	24	27	24	29	33	242	72	18	8.7	6.7	8.3
12	22	24	25	20	23	34	226	84	16	6.2	5.3	7.9
13	20	24	26	15	21	32	226	83	15	5.6	4.4	7.3
14	20	27	28	15	25	32	235	76	13	5.0	5.0	7.3
15	20	48	29	20	* 32	37	254	72	12	4.8	5.3	7.0
16	19	48	31	* 25	32	37	244	* 77	11	4.6	5.0	* 7.6
17	22	44	31	25	33	41	* 206	72	* 13	4.6	5.0	7.6
18	23	41	37	25	33	47	186	64	10	4.6	5.3	7.6
19	38	38	* 36	25	33	38	162	66	10	4.8	6.7	7.9
20	37	* 36	31	25	33	49	141	70	11	4.8	7.9	8.3
21	34	46	29	25	38	66	120	80	10	4.6	8.3	13
22	30	47	21	25	34	82	112	94	7.3	4.4	* 7.6	19
23	28	48	19	28	31	107	100	82	7.3	4.4	7.9	15
24	28	46	28	28	30	122	96	77	6.7	4.6	6.7	44
25	26	44	29	28	30	112	92	67	5.9	4.6	6.7	22
26	27	48	16	28	31	120	90	62	5.0	4.2	8.3	18
27	26	44	22	28	36	137	93	51	4.6	4.4	9.2	16
28	29	40	25	28	34	154	87	47	4.6	4.4	8.7	15
29	30	40	25	29		197	75	44	4.6	4.2	8.7	13
30	30	44	25	30	-----	186	66	41	4.6	3.8	10	12
31	30	-----	25	30	-----	221	-----	35	-----	4.0	12	-----
Total	818	1068	933	781	1004	2203	4901	1956	5496	1535	1923	3462
Mean	26.4	35.6	30.1	25.2	35.9	71.1	163	63.1	18.3	4.95	6.20	11.5
Ac-ft	1,620	2,120	1,850	1,550	1,990	4,370	9,720	3,880	1,090	304	381	687

Calendar year 1962: Max - Min - Mean - Ac-ft -  
Water year 1962-63: Max 256 Min 3.8 Mean 40.8 Ac-ft 29,560

Peak discharge (base, 800 cfs).--Sept. 24 (1810) 923 cfs (4.93 ft).

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 11-16, Dec. 26 to Jan. 28, Feb. 12-19, Feb. 24-25 (No gage-height record Dec. 26-29, Jan. 2-8).

## RIO GRANDE BASIN

8-2795. Rio Grande at Embudo, N. Mex.

**Location.**--Lat 36°12'20", long 105°57'50", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.23, T.23 N., R.9 E., on right bank a quarter of a mile downstream from bridge at Embudo and 2 $\frac{1}{2}$  miles downstream from Embudo Creek.

**Drainage area.**--10,400 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

**Records available.**--January 1889 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge published in WSP 358 for period Oct. 4 to Nov. 30, 1896, have been found to be unreliable and should not be used.

**Gage.**--Water-stage recorder. Datum of gage is 5,789.14 ft above mean sea level, datum of 1929. Jan. 1 to Feb. 28, 1889, staff gage 1 $\frac{1}{2}$  miles upstream at different datum. March 1889 to December 1903, staff gage 1,300 ft upstream at different datum. September 1912 to June 1914 on downstream end of bridge pier at site 200 ft upstream at present datum.

**Average discharge.**--74 years, 1,046 cfs (757,300 acre-ft per year).

**Extremes.**--Maximum discharge during year, 966 cfs Apr. 1 (gage height, 3.59 ft); minimum, 172 cfs Aug. 1.

1889-1903, 1912-63: Maximum discharge, 16,200 cfs June 19, 1903 (gage height, about 15.9 ft); minimum daily, 130 cfs June 30, 1902.

A flood of about 14,000 cfs occurred between May 20 and June 10, 1905, from a comparison of records for Lobatos and Otowi Bridge. Another major flood occurred Sept. 29 or 30, 1904.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 660,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	279	* 307	515	375	a465	626	932	*303	272	189	180	247
2	276	310	500	371	a480	636	875	293	286	188	* 180	229
3	276	314	490	384	a490	631	774	278	* 302	187	181	217
4	279	328	485	402	a500	670	745	273	283	185	185	217
5	282	592	500	402	*540	*592	697	276	269	188	192	226
6	286	754	* 500	398	555	388	653	278	256	186	192	220
7	282	814	480	388	609	620	622	270	250	186	192	* 217
8	279	832	470	* 388	626	653	* 663	269	243	191	212	229
9	279	862	465	402	626	642	745	284	238	193	* 204	216
10	279	880	460	398	670	680	795	302	238	* 197	202	215
11	* 279	880	460	402	642	664	792	312	235	200	211	210
12	276	874	456	359	a495	636	815	330	226	197	215	205
13	268	862	456	b330	* 314	614	848	331	226	197	237	205
14	265	702	465	b310	452	560	826	323	223	191	215	205
15	262	535	465	b320	540	609	815	326	223	205	218	202
16	259	470	456	b370	540	560	798	* 341	220	197	218	203
17	268	452	452	b360	540	525	* 739	334	* 226	190	203	* 202
18	276	434	475	b350	545	587	744	322	221	189	203	200
19	318	388	* 505	b340	565	560	687	323	229	188	199	200
20	321	* 335	480	b330	555	570	621	331	232	187	198	198
21	310	416	475	b340	582	592	531	394	230	186	204	210
22	314	470	452	b355	570	609	484	398	224	181	* 210	232
23	314	505	429	b370	570	614	434	360	222	178	202	220
24	321	490	380	375	587	626	419	347	217	180	198	260
25	321	510	359	a380	587	648	400	325	212	183	207	239
26	321	535	335	a385	587	703	381	307	206	182	244	233
27	321	535	304	a380	609	727	375	289	200	186	238	225
28	321	520	355	a390	620	777	360	278	198	184	228	221
29	318	515	b350	a400	-	886	338	280	194	181	226	216
30	314	525	359	a410	-----	847	313	287	191	178	281	212
31	314	-----	b370	a430	-----	876	-----	280	-----	177	376	-----
Total	9,078	16,946	13,703	11,594	15,461	19,928	19,221	9,644	6,992	5,827	6,651	6,531
Mean	293	565	442	374	552	643	641	311	233	188	215	218
Ac-ft	18,010	33,610	27,180	23,000	30,670	39,530	38,120	19,130	13,870	11,560	13,190	12,950
Calendar year 1962: Max 3,900 Min 241 Mean 797 Ac-ft 576,700												
Water year 1962-63: Max 932 Min 177 Mean 388 Ac-ft 280,800												

**Peak discharge (base, 2,000 cfs).**--No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

87

8-2801. San Juan lateral above San Juan Pueblo, N. Mex.

Location.--Lat 36°04'03", long 105°04'07", in SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec.11, T.21 N., R.8 E., on right bank upstream from second drop structure below division box, 0.9 mile north of San Juan Pueblo.

Records available.--April to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,660 ft (from topographic map).

Extremes.--Maximum daily discharge during period, 20 cfs June 9; no flow at times.

Remarks.--Records fair. This is 1 of 3 ditch stations operated to gage flow bypassing "Rio Grande above San Juan Pueblo, N. Mex." Takeouts between division box and gage irrigate a few acres, but percentage of total acreage is small.

Monthly discharge during period April to September 1963

	Discharge, in cubic feet per second			Diversion in acre-feet
	Maximum	Minimum	Mean	
October . . . . .	-	-	-	-
November . . . . .	-	-	-	-
December . . . . .	-	-	-	-
Calendar year 1962 . . . . .	-	-	-	-
January . . . . .	-	-	-	-
February . . . . .	-	-	-	-
March . . . . .	-	-	-	-
April . . . . .	4.3	0	1.21	72
May . . . . .	15	0.3	4.80	295
June . . . . .	20	0	4.20	250
July . . . . .	13	0	3.95	243
August . . . . .	10	0.2	3.50	215
September . . . . .	6.3	0.2	3.68	219
Water year 1962-63 . . . . .	-	-	-	-

## 8-2802. San Juan Pueblo ditch above San Juan Pueblo, N. Mex.

Location.--Lat 36°03'55", long 106°04'10", in NW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.11, T.21 N., R.8 E., on right bank 1,000 ft downstream from Arroyo Chinguague, 0.7 mile north of San Juan Pueblo, and 5 miles north of Espanola.

Records available.--March to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,660 ft (from topographic map).

Extremes.--Maximum daily discharge during period, 23 cfs June 30; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. This is 1 of 3 ditch stations operated to gage flow bypassing "Rio Grande above San Juan Pueblo, N. Mex." Takeouts for irrigation above and below gage.

Monthly discharge during period March to September 1963

Month	Discharge, in cubic feet per second			Diversion in acre-feet
	Maximum	Minimum	Mean	
October . . . . .	-	-	-	-
November . . . . .	-	-	-	-
December . . . . .	-	-	-	-
Calendar year 1962 . . . . .	-	-	-	-
January . . . . .	-	-	-	-
February . . . . .	-	-	-	-
March . . . . .	-	-	-	-
April . . . . .	15	0	4.72	281
May . . . . .	19	1.5	9.72	597
June . . . . .	23	0	6.71	399
July . . . . .	18	.4	9.91	609
August . . . . .	21	.1	11.7	722
September . . . . .	17	0	8.26	491
Water year 1962-63 . . . . .	-	-	-	-

Note.--No gage-height record June 15-22.

RIO GRANDE BASIN

89

8-2807. Guique ditch near San Juan Pueblo, N. Mex.

Location.--Lat 36°04'07", long 106°04'50", in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.10, T.21 N., R.8 E., on right bank above road culvert, 1.1 miles northwest of San Juan Pueblo.

Records available.--April to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,660 ft (from topographic map).

Extremes.--Maximum daily discharge recorded, 12 cfs May 23; no flow at times.

Remarks.--Records good. This is one of three ditches gaged to determine flow bypassing station "Rio Grande above San Juan Pueblo, N. Mex. Takeouts from ditch irrigate land above and below gage, or waste back to Rio Grande.

Monthly discharge during period April to September 1963				
Month	Discharge, in cubic feet per second			Diversion in acre-feet
	Maximum	Minimum	Mean	
October . . . . .	-	-	-	-
November . . . . .	-	-	-	-
December . . . . .	-	-	-	-
Calendar year 1962 . . . . .	-	-	-	-
January . . . . .	-	-	-	-
February . . . . .	-	-	-	-
March . . . . .	-	-	-	-
April . . . . .	-	-	-	-
May. . . . .	12	0	3.46	213
June. . . . .	7.0	0	1.87	111
July. . . . .	8.3	0	1.88	116
August. . . . .	9.6	0	4.67	287
September . . . . .	9.6	0	2.33	139
Water year 1962-63. . . . .	-	-	-	-

## RIO GRANDE BASIN

8-2811. Rio Grande above San Juan Pueblo, N. Mex.

Location.--Lat 36°04'00", long 106°04'30", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.10, T.21 N., R.8 E., three quarters of a mile upstream from bridge on State road 74, three quarters of a mile north of San Juan Pueblo, 1.8 miles upstream from Rio Chama, and 5 miles north of Espanola.

Drainage area.--10,530 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--March to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 5,630 ft (from topographic map).

Extremes.--Maximum discharge during period, 940 cfs Apr. 1 (gage height, 1.96 ft); minimum, 96 cfs Aug. 1.  
For years of outstanding floods see records for station at Embudo.

Remarks.--Records good. Diversions above station for irrigation of about 619,000 acres in Colorado and 42,000 in New Mexico; bypass canals irrigate a few hundred acres below station. (see p. 87-89).

## Discharge, in cubic feet per second, March to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						-	* 910	250	220	115	103	225
2						-	* 862	* 250	265	118	*103	194
3						-	774	220	285	124	115	182
4						-	742	210	260	130	121	178
5						-	694	225	240	136	118	178
6						-	654	225	225	136	130	182
7						-	622	220	* 220	136	112	170
8						-	638	210	210	136	124	178
9						-	718	206	235	153	127	182
10						-	766	230	210	160	133	178
11						-	766	235	194	*163	139	167
12						-	790	270	194	156	139	*160
13						-	817	290	202	146	182	160
14						-	826	290	194	143	178	163
15						-	782	270	* 178	139	170	163
16						-	758	280	174	133	163	156
17						-	710	* 295	174	130	150	170
18						-	694	270	170	127	153	163
19						-	638	270	174	130	*156	160
20						-	566	285	174	136	143	156
21						-	494	325	156	139	136	189
22						-	432	350	* 143	130	153	235
23						-	384	330	153	118	153	225
24						-	355	310	* 143	*118	150	235
25						-	* 340	290	130	118	150	224
26						-	330	285	124	121	202	210
27						-	330	260	121	121	206	198
28						-	315	245	133	124	210	*190
29					-	-	285	230	* 127	124	206	190
30					-----	844	250	230	115	112	245	182
31		-----			-----	844	-----	225	-----	106	313	-----
Total							18,242	8,081	5,543	4,078	4,883	5,543
Mean							608	261	185	132	158	185
Ac-ft							36,180	16,030	10,990	8,090	9,690	10,990

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.

RIO GRANDE BASIN

91

8-2841. Rio Chama near La Puente, N. Mex.

Location.--Lat 36°39'45", long 106°38'00", on right bank in Tierra Amarilla Grant, 0.7 mile downstream from Rito de Tierra Amarilla, 3 miles southwest of La Puente, and 6.7 miles upstream from flow line of El Vado Reservoir, Rio Arriba County.

Drainage area.--480 sq mi, approximately.

Records available.--October 1955 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 7,083 ft (from river-profile map).

Average discharge.--8 years, 323 cfs (233,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,030 cfs Apr. 14 (gage height, 4.40 ft); minimum daily, 7 cfs Jan. 12-14.

1955-63: Maximum discharge, 8,040 cfs June 7, 1957 (gage height, 6.07 ft), from rating curve extended above 3,300 cfs on basis of logarithmic plotting and an inflow-outflow study of El Vado Reservoir; minimum daily, 4.4 cfs Sept. 19, 1956.

A discharge of about 9,000 cfs occurred Apr. 16, 1937, based on flow of Rio Chama at Park View with allowance for tributary inflow. A peak on May 21 or 22, 1926, may have exceeded 10,000 cfs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 10,300 acres above station (1962 determination).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.0	7	1.5	36	2.3	168	3.4	765
1.1	10	1.7	56	2.6	270	3.8	1,160
1.3	20	2.0	102	3.0	461	4.1	1,550

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	* 50	75	16	50	45	* 812	698	129	13	9.1	62
2	70	50	69	* 16	150	45	646	689	138	12	9.4	54
3	65	49	65	20	200	50	440	850	151	10	15	43
4	55	49	60	20	180	45	457	974	136	13	19	42
5	60	49	55	20	150	45	521	984	121	16	16	43
6	65	49	48	18	130	45	498	936	97	14	32	48
7	55	48	50	16	120	45	785	898	91	16	31	53
8	50	44	52	15	110	45	1,220	898	86	23	21	47
9	48	42	50	15	100	45	1,250	898	88	24	20	39
10	45	44	45	15	70	50	984	784	81	23	26	36
11	43	44	43	10	50	40	860	784	64	20	72	30
12	42	43	45	7	40	40	1,040	689	57	18	66	28
13	41	41	48	7	45	40	1,320	598	50	18	72	26
14	40	52	48	7	* 50	50	1,530	556	48	18	69	32
15	40	* 111	48	10	50	* 68	1,490	542	47	* 16	* 64	33
16	45	84	50	15	45	65	1,070	* 542	46	12	61	29
17	80	75	51	15	45	70	* 1,000	509	43	11	55	28
18	90	69	* 62	* 15	45	84	928	450	* 39	9.7	53	* 25
19	* 95	62	64	15	45	70	680	385	39	8.5	56	24
20	91	60	57	15	45	100	646	367	38	12	61	28
21	78	65	40	20	45	204	698	353	32	12	56	38
22	69	66	30	20	45	292	756	344	26	12	48	40
23	64	70	30	20	45	398	727	325	24	14	52	36
24	60	75	35	20	45	384	879	284	23	14	56	32
25	56	68	25	20	45	364	870	254	18	12	48	29
26	55	70	15	20	45	419	1,010	235	16	10	61	27
27	54	65	15	15	45	485	986	217	* 14	9.7	80	26
28	52	* 62	15	15	* 45	542	794	* 194	* 14	10	* 100	24
29	50	60	16	15	-	812	698	171	14	10	66	23
30	49	72	16	15	-----	691	* 708	151	14	9.7	61	* 19
31	49	-----	16	* 23	-----	794	-----	144	-----	* 8.8	62	-----
Total	1,836	1,788	1,338	490	2,080	6,472	26,313	16,703	1,784	429.4	1,517.5	1,044
Mean	59.2	59.6	43.2	15.8	74.3	209	877	539	59.5	13.9	49.0	34.8
Ac-ft	3,640	3,550	2,650	972	4,130	12,840	52,190	33,130	3,540	852	3,010	2,070

Calendar year 1962: Max 3,460 Min 18 Mean 407 Ac-ft 295,000  
Water year 1962-63: Max 1,530 Min 7 Mean 169 Ac-ft 122,600

Peak discharge (base, 2,700 cfs).--No peak above base.

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 5-17, Dec. 21 to Mar. 17 (no gage-height record Jan. 14-29, Feb. 11, Feb. 22-27).

No gage-height record Oct. 1-18.



8-2842. Willow Creek above Heron Reservoir, near Park View, N. Mex.

Location.--Lat 36°44'30", long 106°37'35", on right bank in Tierra Amarilla Grant, 7½ miles upstream from Horse Lake Creek, and 3.6 miles west of Park View.

Drainage area.--112 sq mi.

Records available.-- October 1962 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,210 ft (from topographic map). Prior to June 6, 1963, at datum 2.74 ft lower, and natural control.

Extremes.--Maximum discharge during year, 1,300 cfs about Mar. 22 (gage height, 6.48 ft, from floodmarks, former datum), from rating curve extended above 60 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records good June 6 to September 30, others poor.

Discharge, in cubic feet per second October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			2		1	6	40	* 1	3	0.2	0	0.7
2			2		100	6	28	1	3	.5	0	.5
3			2	(*)	129	6	22	0	4	.5	0	.5
4			2		106	6	20	0	5	.8	0	.4
5			1		82	5	18	0	3.6	1.6	0	.2
6			* 1		51	4	19	0	2.4	1.6	1.5	.2
7			1		32	5	17	0	1.5	1.6	4.9	.2
8			0		24	5	16	0	1.1	2.2	3.8	1.0
9			0		14	5	14	0	.9	3.3	3.5	.7
10			0		13	6	12	0	2.0	3.8	7.2	.7
11			0		7	5	10	0	4.1	3.8	14	7.0
12			0		4	3	8	0	3.5	2.9	8.1	4.7
13			0		4	4	6	0	2.6	2.7	1.0	1.5
14			0		3	8	5	0	4.3	2.2	.5	1.0
15			0		2	12	5	0	4.3	2.0	.4	.7
16			0		2	18	4	0	3.8	* 1.2	* .4	1.0
17			* 0	(*)	2	35	* 3	0	3.3	.5	.2	1.0
18			0		2	25	2	0	3.3	.2	.2	* .7
19			0		2	30	2	0	* 2.7	.1	.6	.7
20			0		2	50	1	1	2.4	.1	.2	1.4
21			0		3	150	1	1	2.7	.1	.2	2.2
22			0		5	300	1	1	2.4	0	1.7	2.0
23			0		7	230	0	0	1.6	0	1.8	1.5
24			0		6	190	0	0	2.4	0	.7	1.1
25			0		6	130	0	2	2.7	0	.6	.7
26			0		6	* 98	2	2	2.6	0	.9	.7
27			0		* 6	67	3	3	* 2.2	0	1.2	.7
28			0		6	63	4	4	.9	0	1.8	.6
29			0	(*)	-	100	4	* 3	.5	0	1.4	.5
30			0		-	70	2	2	.2	0	.5	.3
31			0		-	53	-	2	-	* 0	.6	-
Total	-	-	11	0	627	1,695	269	23	79.0	31.9	57.9	35.1
Mean	1	2	0.35	0	22.4	54.7	9.0	0.7	2.63	1.03	1.87	1.17
Ac-ft	61	119	22	0	1,240	3,360	534	46	157	63	115	70
Calendar year	: Max		Min	Mean		Ac-ft						
Water year 1962-63:	Max 300		Min 0	Mean 8.00		Ac-ft 5,790						

\* Discharge measurement made on this day (January measurements were 0.08, 0.24, and 0.22 cfs respectively).

Note.--Stage-discharge relation affected by ice Dec. 17 to Jan. 30 and Feb. 11 to 26 (no gage-height record Dec. 21 to Jan. 2 and Feb. 20 to 26); no gage-height record Mar. 1 to Mar. 26. Discharge was estimated by hydrographic comparison for period Oct. 1 to Dec. 5 to complete water year.

RIO GRANDE BASIN

93

8-2843. Horse Lake Creek above Heron Reservoir, near Park View, N. Mex.

Location.--Lat 36°42'30", long 106°44'50", on left bank in Tierra Amarilla Grant 300 ft downstream from pond with open spillway, 5½ miles upstream from mouth, 8 miles downstream from Horse Lake, and 13 miles west of Park View.

Drainage area.--45 sq mi.

Records available.--October 1962 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,220 ft (from topographic map). Prior to June 10, 1963, at datum 1.77 ft higher.

Extremes.--Maximum discharge during year, 86 cfs Feb. 2 (gage height, 4.49 ft, datum then in use), from rating curve extended above 2.5 cfs on basis of velocity-area studies; no flow for long periods.

Remarks.--Records poor. Diversions above station for irrigation of meadows and for off-channel stock tanks.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0.3	b 0.4	e 1.4	*			0	
2					3.1	b.3	e 1.0				0	
3					a 6	b.3	e .8				e 1.3	
4					a 3	b.2	e .6				e .5	
5					a 2	b.2	e .2				e 0	
6					a 1.5	a .2	e .3				e .1	
7					.9	a .3	e .3				e .2	
8					.5	a .3	e .2				e 0	
9					.3	b .4	e .1				0	
10					.4	b .4	e .1				0	
11					b .3	b .4	e .1				0	
12					b .2	b .3	e .1				0	
13					a .2	b .2	e 0				0	
14					a .2	b .4	e 0				0	
15					* .3	1.8	e 0				0	
16					.3	4.8	* 0				0	
17			(*)		b .2	e 1.8	0				0	
18					b .2	e 9.5	0				0	
19					b .2	e 10	0				0	
20					b .2	e 19	0				0	
21					b .2	e 2.2	0				0	
22					b .3	e 2.3	0				0	
23					b .3	e 2.1	0				0	
24					b .4	e 10	0				0	
25					b .4	e 5.6	0				0	
26					b .4	e 3.2	.1				0	
27					b .4	* e 2.8	.1				0	
28					b .4	e 2.7	.1				0	
29					-	e 5.3	.1				0	
30						e 2.8	0				0	
31						e 1.8					0	
Total			0	0	51.0	167.6	5.6	0	0	0	2.1	0
Mean	0.1	0.1	0	0	1.82	5.41	0.19	0	0	0	0.07	0
Ac-ft	6.1	6.0	0	0	101	332	11	0	0	0	4.2	0
Calendar year	: Max		Min	Mean	Ac-ft							
Water year 1962-63	: Max		31	Min	0	Mean	0.64	Ac-ft		460		

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

e Uncertain stage-discharge relation.

Note.--Mean and acre-feet for October and November estimated to complete water year.

## RIO GRANDE BASIN

8-2845. Willow Creek near Park View, N. Mex.

Location.--Lat 36°40'20", long 106°42'10", in Tierra Amarilla Grant, on right bank 400 ft upstream from Willow Creek damsite, 0.3 mile downstream from Horse Lake Creek, and 8½ miles southwest of Park View, Rio Arriba County.

Drainage area.--193 sq mi.

Records available.--May 1936 to September 1963 (no winter records prior to 1943). Monthly or yearly discharges only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 6,944.99 ft (Bureau of Reclamation datum). Prior to Oct. 1, 1937, at datum 0.79 ft higher. Apr. 19, 1949, to Aug. 8, 1951, at different datums. Aug. 9, 1951, to Sept. 30, 1960 at datum 0.41 ft higher.

Average discharge.--26 years (1936-38, 1939-63), 21.9 cfs (15,850 acre-ft per year).

Extremes.--Maximum discharge during year, about 1,400 cfs Mar. 22; no flow at times.

1936-63: Maximum discharge, 4,500 cfs Apr. 23, 1942 (gage height, 10.45 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurement of peak flow; no flow at times.

Remarks.--Records poor. Diversions for irrigation of about 300 acres above station.

Rating tables, except period of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

0.6	0	1.1	6.5	0.3	0	0.8	2.0	1.6	31
.7	.3	1.3	13	.4	.1	.9	3.2	2.0	65
.8	.9	1.6	28	.5	.3	1.0	5.1	2.5	129
.9	2.0			.6	.6	1.1	7.5	3.0	220
				.7	1.1	1.3	15		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5	3	4	0	1	8	48	*3	6	0	0	1
2	4	3	4	0	185	8	31	2	8	0	0	1
3	3	3	3	*0	205	8	20	1	10	0	17	1
4	3	3	2	0	180	8	21	1	10	1	4	1
5	3	3	2	0	155	7	18	1	8	2	0	1
6	3	3	1	1	59	6	18	2	6	2	0	0
7	2	2	1	1	29	8	16	2	5	3	1	0
8	2	2	1	1	14	9	14	2	5	3	7	0
9	1	2	1	0	12	8	13	3	5	7	6	0
10	1	1	1	0	14	10	12	3	4	7	7	0
11	1	1	1	0	12	8	10	3	4	6	10	1
12	1	1	1	0	11	7	8	4	3	6	18	12
13	1	1	0	0	9	5	7	4	4	5	8	8
14	0	1	0	0	8	10	6	5	4	4	4	8
15	0	26	0	0	*7	*16	6	*5	5	*2	3	6
16	3	13	0	0	6	22	5	5	5	1	*3	7
17	4	11	0	*0	d7	40	*4	5	5	1	3	*7
18	6	8	*0	0	d7	85	4	5	*5	0	3	6
19	*6	6	1	0	d6	70	3	5	4	0	3	4
20	9	4	1	0	d6	130	3	5	4	0	3	4
21	6	4	1	0	9	350	2	5	3	0	3	7
22	5	4	1	0	10	350	2	5	4	0	2	8
23	4	3	1	0	11	280	2	5	3	0	3	9
24	4	3	1	0	9	200	1	4	3	0	3	7
25	4	3	0	0	8	*150	1	3	3	0	3	5
26	3	3	0	0	8	103	2	4	3	0	3	5
27	3	3	0	0	*7	86	3	5	*3	0	3	5
28	3	*3	0	0	9	73	5	*6	*2	0	*3	4
29	3	2	0	*0	-	129	5	6	1	0	3	*3
30	3	2	0	0	-----	83	4	5	1	0	2	3
31	*3	-----	0	0	-----	70	-----	5	-----	0	-----	-----
Total	99	127	28	3	1,004	2,347	294	119	136	50	128	124
Mean	3.2	4.2	0.9	0.1	35.9	75.7	9.8	3.8	4.5	1.6	4.1	4.1
Ac-ft	196	252	56	6.0	1,990	4,660	583	236	270	99	254	246

Calendar year 1962: Max 591 Min 0 Mean 26.6 Ac-ft 19,230  
 Water year 1962-63: Max 350 Min 0 Mean 12.2 Ac-ft 8,850

Peak discharge (base, 800 cfs).--Mar. 22 (time unknown) about 1,400 cfs.

\* Discharge measurement made on this day.

d Doubtful gage-height record.

Note.--No gage-height record Jan. 15 to Feb. 1, Feb. 12-14, Feb. 28 to Mar. 25, May 11-14; stage-discharge relation affected by ice Nov. 18-20, Dec. 25 to Jan. 14, Feb. 3-5.

RIO GRANDE BASIN

95

8-2855. Rio Chama below El Vado Dam, N. Mex.

Location--Lat 36°34'50", long 106°43'30", in Tierra Amarilla Grant, on left bank 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla.

Drainage area--877 sq mi, of which about 100 sq mi is probably noncontributing.

Records available--October 1913 to November 1915, April to November 1916, March, April 1920, September 1920 to August 1924, October 1935 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Published as "Chama River" prior to 1935, as near Tierra Amarilla 1913-14, 1935-47, as "near El Vado" 1915-17, and as "at El Vado" 1920-24.

Gage--Water-stage recorder. Datum of gage is 6,696.12 ft above mean sea level, datum of 1929. Prior to October 1935, at site 1.5 miles upstream at different datum. October 1935 to September 1938 at site 1.1 miles upstream at datum 30.34 ft higher.

Average discharge--5 years (1913-15, 1920-23), 448 cfs (324,300 acre-ft per year), prior to completion of El Vado Dam; 28 years (1935-63), 384 cfs (278,000 acre-ft per year), subsequent to completion of El Vado Dam.

Extremes--Maximum discharge during year, 1,090 cfs Nov. 13 (gage height, 3.53 ft); minimum daily, 11 cfs July 22-28, Aug. 4-6. 1913-16, 1920-22, 1923-24, 1935-63: Maximum discharge observed, 9,000 cfs May 22, 1920 (gage height, 12 ft, site and datum then in use); no flow Mar. 25, 26, 31, 1955.

Flood of Oct. 4 or 5, 1911, exceeded floods of September 1904 and May 1920, from information by local residents.

Remarks--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor. Flow regulated since 1935 by El Vado Reservoir (see p.176). Diversions for irrigation of about 10,600 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.1	5.7	1.5	52	2.5	410
1.2	12	1.7	97	3.0	700
1.3	22	2.0	191	3.5	1,070

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	*74	990	798	42	a87	770	174	163	30	400	90
2	47	440	990	*784	54	a87	742	174	163	28	400	80
3	47	881	982	749	311	a75	613	174	138	28	158	75
4	47	1,010	975	721	355	a78	478	174	119	22	11	73
5	47	998	975	632	330	a78	478	177	117	20	11	62
6	47	998	960	209	282	a65	526	180	119	20	11	38
7	47	990	952	108	207	a75	550	184	119	20	15	38
8	47	990	945	90	170	a75	721	195	72	20	23	38
9	47	990	945	80	150	a82	805	210	60	21	23	38
10	47	982	897	b70	144	a82	819	207	69	20	23	42
11	45	998	855	b65	108	a82	798	203	67	20	23	44
12	38	990	855	a60	73	a82	700	207	65	20	40	42
13	38	1,030	848	a55	71	a69	714	385	62	19	52	44
14	35	1,050	904	*a55	*80	a75	865	604	60	18	78	42
15	28	*975	945	a55	78	*a100	922	*586	60	*152	*97	42
16	25	982	938	a55	92	a170	922	532	58	905	72	42
17	22	975	930	a55	85	a160	*922	510	56	420	25	42
18	22	968	*915	*54	73	a210	922	455	*52	420	35	*42
19	36	990	967	54	78	a150	801	405	45	415	60	42
20	*49	1,010	990	b52	80	a180	646	370	44	218	60	42
21	49	1,010	975	b52	90	a455	646	370	42	12	62	38
22	71	998	968	b52	87	a784	646	370	37	11	62	35
23	90	998	952	52	85	a824	646	370	34	11	51	35
24	90	990	938	b50	80	a840	646	298	186	11	32	37
25	90	982	922	b50	85	a812	762	238	867	11	35	37
26	90	975	900	49	85	a742	d870	238	415	11	37	37
27	90	987	892	b49	*95	*604	d890	238	*400	11	65	37
28	90	*1,010	870	b49	a97	604	d890	*238	395	11	80	37
29	64	1,010	862	47	-	694	d536	196	185	149	*80	34
30	49	990	840	*47	-----	749	*184	163	32	904	80	*25
31	49	-----	819	45	-----	756	-----	163	-----	*405	80	-----
Total	1,630	28,271	28,696	5,343	3,567	9,926	21,430	8,988	4,301	4,383	2,281	1,340
Mean	52.6	942	926	172	127	320	714	290	143	141	73.6	44.7
Ac-ft	3,230	56,070	56,920	10,600	7,080	19,690	42,510	17,830	8,530	8,690	4,520	2,660

Calendar year 1962: Max 1,160 Min 16 Mean 437 Ac-ft 316,100  
Water year 1962-63: Max 1,050 Min 11 Mean 329 Ac-ft 238,300

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

## RIO GRANDE BASIN

8-2865. Rio Chama above Abiquiu Reservoir, N. Mex.

Location.--Lat 36°19'05", long 106°35'50", in NW¼ sec.14, t.24 N., R.3 E. (projected), on left bank 7.7 miles downstream from Rio Gallina, 10 miles northwest of Youngsville, 16 miles upstream from Abiquiu Dam and 30 miles downstream from El Vado Dam.

Drainage area.--1,600 sq mi, of which about 100 sq mi is probably noncontributing.

Records available.--August 1961 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,280 ft (from river-profile map).

Extremes.--Maximum discharge during year, 1,800 cfs Aug. 3 (gage height, 5.33 ft); minimum, 11 cfs July 30.  
1961-63: Maximum discharge, that of Aug. 3, 1963; minimum, that of July 30, 1963.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by El Vado Reservoir (see p.176). Diversions for irrigation of about 15,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Sept. 7-30)

0.6	9.0	1.6	97	3.5	660
.8	18	2.0	166	4.0	920
1.0	31	2.5	285	4.5	1,220
1.3	60	3.0	445		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	49	980	780	b 50	94	830	196	155	a 35	356	81
2	51	*134	974	755	b 70	86	825	191	156	a 30	353	78
3	48	725	968	735	139	82	740	189	153	a 30	416	78
4	*46	968	956	700	338	86	578	189	120	a 30	68	77
5	46	968	944	655	310	83	483	191	114	a 25	27	75
6	47	968	*944	368	272	76	540	*194	112	a 24	*20	69
7	46	962	938	143	*226	75	536	198	110	a 23	19	70
8	44	962	932	b 95	185	77	700	207	110	*22	18	50
9	43	*956	926	77	160	82	845	221	63	46	54	39
10	43	950	902	*73	160	89	878	223	61	72	62	*37
11	43	968	840	b 65	142	91	872	219	67	45	28	37
12	42	968	835	a 60	a 90	87	780	216	64	37	25	36
13	40	968	835	b 50	a 80	78	770	234	63	31	*38	49
14	37	1,090	850	b 55	a 80	a 90	835	*601	62	28	58	134
15	36	1,060	926	b 55	a 80	*108	968	620	59	28	82	54
16	32	980	926	*b 55	89	189	*986	557	58	594	89	46
17	29	980	914	b 55	93	176	974	548	*56	524	70	44
18	*26	980	*920	b 55	82	223	974	472	54	399	35	42
19	54	968	926	b 55	82	172	908	420	53	385	47	41
20	83	*992	980	b 55	*91	164	695	369	51	364	187	43
21	56	986	968	b 52	100	334	660	365	51	75	*137	42
22	50	986	950	b 52	103	675	655	362	50	23	63	59
23	73	980	944	b 52	117	855	660	356	50	*18	60	39
24	82	974	932	b 52	115	926	665	340	49	18	53	*36
25	83	974	914	b 52	115	884	712	231	634	16	38	36
26	82	992	902	b 50	104	790	890	223	*533	14	105	36
27	83	962	872	b 50	109	665	902	223	389	14	155	36
28	83	980	855	b 50	104	710	902	223	389	12	87	34
29	82	980	840	b 50	-	*720	793	*216	363	12	83	34
30	57	992	825	b 50	-----	835	226	160	70	606	83	33
31	*50	-----	800	b 50	-----	830	-----	155	-----	498	93	-----
Total	1,689	27,402	28,218	5,501	3,686	10,432	22,782	9,109	4,319	4,078	3,009	1,565
Mean	54.5	913	910	177	132	337	759	294	144	132	97.1	52.2
Ac-ft	3,350	54,350	55,970	10,910	7,310	20,690	45,190	18,070	8,570	8,090	5,970	3,100
Calendar year 1962:	Max 1,320	Min 17	Mean 460	Ac-ft 333,200								
Water year 1962-63:	Max 1,090	Min 12	Mean 334	Ac-ft 241,600								

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

# RIO GRANDE BASIN

97

8-2870. Rio Chama below Abiquiu Dam, N. Mex.

Location.--Lat 36°14'10", long 106°25'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.8, T.23 N., R.5 E., on right bank half a mile downstream from Abiquiu Dam and 6 miles northwest of Abiquiu.

Drainage area.--2, 147 sq mi, of which about 100 sq mi is probably noncontributing.

Records available.--November 1961 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 6,040 ft (from river-profile map and topographic map).

Extremes.--Maximum discharge during year, 1,140 cfs Mar. 31 (gage height, 5.08 ft); minimum, 5.6 cfs July 23.

1961-63: Maximum discharge, 1,960 cfs Apr. 20, 1962 (gage height, 5.56 ft); maximum gage height, 6.30 ft Jan. 7, 1962 (backwater from ice); minimum discharge, that of July 23, 1963.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Flow largely controlled by El Vado Reservoir about 46 miles upstream, and Abiquiu flood control Reservoir  $\frac{1}{2}$  mile upstream (gates of Abiquiu Dam will remain open except when Rio Grande is at flood stage in Middle Rio Grande Valley). Diversions for irrigation of about 17,600 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	70	964	a800	56	107	933	350	163	52	384	95
2	59	97	958	a780	143	101	916	212	161	27	356	79
3	54	606	946	a750	126	101	841	*217	161	36	366	72
4	*54	958	940	a720	242	101	509	220	144	33	278	71
5	54	994	934	a660	302	99	377	214	*116	27	47	74
6	57	970	*922	a580	316	92	568	292	114	27	*33	74
7	59	970	916	a200	*274	94	543	235	112	27	25	57
8	58	958	916	a140	211	98	590	214	112	*19	22	67
9	52	*946	922	a100	190	101	*852	220	109	12	24	41
10	51	958	910	*a80	167	99	967	240	52	84	80	*41
11	50	970	838	a70	151	105	955	248	56	42	47	46
12	47	970	826	b60	94	111	894	245	61	27	36	43
13	45	970	826	b50	94	98	841	212	55	17	*35	43
14	43	1,070	832	b55	72	*105	835	*281	60	17	57	88
15	40	1,070	916	b55	96	138	862	489	59	16	74	79
16	38	*1,010	916	*b55	96	164	973	577	55	149	90	53
17	36	988	910	910	84	184	1,010	551	*55	751	88	52
18	42	976	*910	910	80	223	1,000	535	55	390	71	48
19	51	952	910	910	84	205	990	518	53	373	95	46
20	*111	964	970	970	96	190	961	412	39	370	97	47
21	89	964	958	958	107	351	894	398	43	186	*210	47
22	79	964	940	940	109	614	648	366	45	74	140	56
23	82	958	928	928	101	850	573	366	42	*21	75	54
24	94	958	916	b55	116	952	631	363	30	15	74	*38
25	90	952	916	916	120	874	701	334	97	16	57	36
26	96	994	910	910	109	832	674	311	*533	13	90	36
27	94	952	904	904	114	796	862	227	459	12	150	36
28	96	964	892	892	*122	*784	867	202	645	12	150	36
29	92	970	880	880	-	955	961	225	321	8.8	118	37
30	89	970	874	874	-----	939	719	220	178	166	114	34
31	*80	-----	832	832	-----	927	-----	176	-----	693	107	-----
Total	2,066	2,711.3	2,813.2	5,980	3,872	11,390	23,947	9,670	4,185	3,712.8	3,590	1,626
Mean	66.6	904	907	193	138	367	798	312	140	120	116	54.2
Ac-ft	4,100	53,780	55,800	11,860	7,680	22,590	47,500	19,180	8,300	7,360	7,120	3,230

Calendar year 1962: Max 1,870 Min 18 Mean 508 Ac-ft 367,400  
 Water year 1962-63: Max 1,070 Min 8.8 Mean 343 Ac-ft 248,500

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-2875. Rio Chama near Abiquiu, N. Mex.

Location.--Lat 36°13'00", long 106°15'00", in Juan Jose Lobato Grant, at downstream end of bridge pier on State Highway 96, 1 $\frac{3}{4}$  miles upstream from El Rito, 5 miles downstream from Abiquiu, Rio Arriba County, and 13.5 miles downstream from Abiquiu Dam.

Drainage area.--2,284 sq mi, of which about 100 sq mi is probably noncontributing.

Records available.--October 1941 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 5,873.17 ft above mean sea level, datum of 1929.

Average discharge.--22 years, 405 cfs (293,200 acre-ft per year).

Extremes.--Maximum discharge during year, 1,340 cfs Mar. 31 (gage height, 4.26 ft); minimum, about 1 cfs July 30.

1941-63: Maximum discharge, 7,870 cfs July 28, 1952, from rating curve extended above 2,900 cfs; maximum gage height, 6.38 ft Aug. 5, 1959; minimum daily discharge, 1 cfs June 11, 1947.

Remarks.--Records good except those for periods of ice effect, which are poor. Flow regulated by El Vado Reservoir (see p.176) and Abiquiu (flood-control and silt detention) Reservoir (see p. 176). Diversions for irrigation of about 19,100 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 31

June 1 to Sept. 30

2.0	23	3.0	245	1.65	0.6	2.0	16
2.2	43	3.5	540	1.7	1.5	2.2	38
2.4	71	4.0	1,000	1.8	4.1	2.5	88
2.7	137	4.5	1,740	1.9	8.6	Same as other table above 2.5 ft.	

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	101	59	956	781	101	118	1110	416	137	67	376	88
2	70	59	945	754	213	108	1020	198	140	19	330	74
3	59	454	934	745	240	101	870	*194	140	11	352	62
4	55	901	934	727	301	106	634	201	137	15	364	56
5	56	967	923	684	428	108	310	198	101	11	68	59
6	58	967	923	550	400	101	572	253	92	7.6	*32	56
7	58	978	*912	237	340	92	540	233	92	7.6	17	54
8	53	978	912	b140	258	92	580	194	88	*7.6	11	56
9	*52	978	912	b106	217	95	*807	188	88	7.0	7.6	37
10	53	978	912	b92	213	103	1000	198	64	60	36	*24
11	51	978	870	b80	201	108	989	209	37	23	38	29
12	51	978	850	*b50	121	115	945	205	51	17	29	30
13	47	967	850	b50	b100	103	870	184	41	7.6	*21	27
14	44	1060	850	b50	b95	*108	870	*209	38	8.1	24	66
15	41	1070	934	b70	b100	129	901	397	43	7.0	40	129
16	40	*1020	923	b70	b105	172	1010	556	41	6.0	81	48
17	36	989	912	*b70	b100	205	1070	540	*41	778	86	34
18	39	978	*901	b70	b95	221	1070	519	40	364	65	30
19	43	956	901	b70	b100	237	1070	505	36	335	109	30
20	96	*967	956	b70	*103	188	1050	424	33	340	63	29
21	80	978	956	b70	118	274	945	352	24	264	*157	37
22	65	978	934	b80	126	649	755	340	25	58	178	41
23	65	967	923	b80	129	934	596	325	25	*27	68	62
24	85	956	923	b80	137	1050	620	325	21	8.6	62	*43
25	*90	945	912	b80	132	1000	718	300	12	6.5	60	33
26	90	967	880	b80	126	956	676	290	420	5.6	54	32
27	90	934	880	b80	124	840	912	*208	*442	4.1	118	27
28	88	956	870	b80	126	830	912	170	560	4.1	129	24
29	88	956	850	b80	-	1040	1000	201	370	3.5	106	29
30	86	967	840	b90	-----	1080	820	198	215	1.2	79	25
31	64	-----	810	b95	-----	1130	-----	167	-----	680	84	-----
Total	1,994	26,886	27,988	6,381	4,849	12,393	25,242	8,897	3,594	31,611	32,446	1,371
Mean	64.3	896	903	206	173	400	841	287	120	102	105	45.7
Ac-ft	3,960	53,330	55,510	12,660	9,620	24,580	50,070	17,650	7,130	6,270	6,440	2,720

Calendar year 1962: Max 2,010 Min 10 Mean 510 Ac-ft 369,200  
 Water year 1962-63: Max 1,130 Min 1.2 Mean 345 Ac-ft 249,900

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

# RIO GRANDE BASIN

99

8-2890. Rio Ojo Caliente at La Madera, N. Mex.

Location.--Lat 36°20'59", long 106°02'38", in NW¼ NE¼ sec. 1, T.24 N., R.8 E., on left bank 400 ft upstream from bridge on State Highway 111, 2¼ miles south of La Madera, 2¼ miles downstream from confluence of Rio Vallecitos and Rio Tusas, and 3¼ miles north of Ojo Caliente.

Drainage area.--419 sq mi.

Records available.--April 1932 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 6,358.84 ft above mean sea level, datum of 1929. Prior to Apr. 23, 1934, at site about 2¼ miles upstream at different datum. Apr. 23, 1934, to June 22, 1936, at datum 12.58 ft lower and June 23, 1936, to Oct. 27, 1956, at datum 13.84 ft lower, both at site 1,400 ft downstream.

Average discharge.--31 years, 73.6 cfs (53,280 acre-ft per year).

Extremes.--Maximum discharge during year, 632 cfs Apr. 8 (gage height, 4.84 ft); minimum, 2.2 cfs Aug. 3. 1932-63: Maximum discharge, 3,140 cfs Apr. 21, 1958, from rating curve extended above 1,300 cfs by logarithmic plotting; maximum gage height, 7.60 ft July 15, 1933, site and datum then in use; minimum daily discharge, 0.6 cfs Aug. 18, Sept. 17, 1956.

A flood which occurred in May 1920 may have exceeded 3,200 cfs from information by local resident.

Remarks.--Records good except those for periods of ice effect or doubtful gage-height record, which are poor. Diversions above station for irrigation of about 3,500 acres (1962 determination).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-25, Nov. 29 to Jan. 10, Jan. 15-19, Jan. 21 to Feb. 2)

2.4	1.8	2.6	5.7	19	3.4	72	4.2	280	
2.5	3.3	2.7	9.1	3.1	35	3.8	152	4.6	470

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.1	9.5	1.8	1.2	2.4	2.3	306	50	6.8	3.8	2.5	8.7
2	7.1	9.5	1.6	1.1	4.0	20	219	45	6.3	4.7	2.5	7.1
3	6.7	9.5	1.5	1.3	3.1	2.4	*141	*42	7.1	4.0	2.2	6.0
4	6.7	9.5	1.5	1.3	2.9	2.3	162	41	8.3	4.0	2.3	5.1
5	7.1	9.5	1.4	1.2	*32	2.2	197	40	7.4	3.9	3	5.0
6	7.1	9	1.3	1.2	3.4	*20	195	39	*6.3	4.0	3.5	7.4
7	7.4	9	1.3	1.3	3.0	2.1	310	35	6.6	4.2	3	8.6
8	7.4	8.5	1.4	1.2	3.0	2.4	4.31	32	6.6	4.3	3	6.9
9	*7.1	8.5	1.4	1.2	2.8	2.4	370	31	6.3	5.4	3	6.7
10	7.4	8	1.3	1.3	3.1	2.5	262	29	7.3	*5.9	*3	6.7
11	7.4	8	1.2	b 1.1	1.8	2.5	208	30	6.6	5.5	3	*6.1
12	7.1	8	*1.2	b 9	1.5	2.4	*228	29	5.8	5.2	3.5	5.8
13	8.1	7	1.3	b 8	1.7	2.3	267	26	5.9	4.9	4.5	5.6
14	8.1	*7	1.4	b 8.5	2.4	2.2	281	*24	5.4	4.8	4	5.7
15	8.1	8	1.4	9.6	2.4	2.6	264	21	5.1	4.5	3	5.8
16	8.8	9	1.4	1.0	2.5	2.7	162	18	5.2	4.4	3	5.9
17	10	10	1.4	1.1	2.1	2.6	129	17	4.9	4.3	2.5	6.0
18	10	9.5	1.5	1.1	2.0	3.0	122	16	6.0	4.2	4	6.0
19	11	8	1.5	1.2	2.0	2.6	82	15	5.0	4.1	3.5	5.6
20	12	9	1.5	b 1.1	*20	3.3	82	15	5.2	4	4.2	5.7
21	1.3	9.5	1.4	*1.2	2.3	50	74	13	5.0	4	4.0	2.1
22	1.3	10	1.2	1.2	2.2	1.12	74	13	4.9	3.5	4.1	1.2
23	1.3	10	1.1	1.3	1.9	2.34	65	13	4.7	3.5	*3.9	9.2
24	1.3	1.1	1.4	1.3	2.1	2.80	67	12	4.6	3.5	3.7	1.1
25	*1.3	1.2	1.3	1.3	2.2	2.00	61	10	4.4	*3	4.2	8.9
26	1.2	1.2	*1.1	1.3	1.9	1.86	62	9.2	4.4	3	4.7	*8.1
27	1.2	1.3	1.1	1.3	2.4	1.99	*66	7.8	4.3	3	4.7	7.9
28	1.1	1.3	1.3	1.3	2.2	2.10	65	8.5	4.2	3	5.4	7.4
29	1.1	*1.4	1.2	1.4	-	3.19	57	7.4	4.0	2.5	5.8	6.9
30	1.0	1.6	1.3	1.6	-----	2.48	54	7.2	3.9	2.5	5.7	6.4
31	1.0	-----	1.2	1.9	-----	2.96	-----	6.6	-----	2.5	6.9	-----
Total	292.7	294.5	41.9	375.1	685	2822	5063	702.7	168.5	124.1	116.3	225.2
Mean	9.44	9.82	13.5	12.1	24.5	91.0	169	22.7	5.62	4.00	3.75	7.51
Ac-ft	581	584	831	744	1,360	5,600	10,040	1,390	334	246	231	447

Calendar year 1962: Max 1,360 Min 3.6 Mean 76.7 Ac-ft 55,530  
Water year 1962-63: Max 431 Min 2.2 Mean 30.9 Ac-ft 22,390

Peak discharge (base, 600 cfs)--Apr. 8 (0045) 632 cfs (4.84 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--Doubtful gage-height record Oct. 26 to Nov. 28; July 20 to Aug. 19.



## RIO GRANDE BASIN

8-2895. Chamita ditch near Chamita, N. Mex.

Location.--Lat 36°04'45", long 106°06'40", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.5, T.21 N., R.8 E., on left bank at head of flume over Arroyo de la Presa, 1 mile downstream from heading from Rio Chama, 1 mile northwest of Chamita, 1 1/8 miles northeast of Hernandez, and 6 $\frac{1}{2}$  miles north of Espanola.

Records available.--February to September 1963. Prior to March 1941 at site  $\frac{1}{2}$  mile upstream at different datum.

Gage.--Water-stage recorder at head of half round metal flume control. Altitude of gage is 5,690 ft (from topographic map).

Extremes.--Maximum daily discharge during period 18 cfs Aug. 3-4; no flow at times.

1936-1941, 1963: Maximum daily discharge, 40 cfs Aug. 3, 1938; no flow at times.

Remarks.--Records fair. This is one of two ditches gaged to determine flow bypassing station "Rio Chama near Chamita, N. Mex." Turnouts from ditch irrigate land above and below gage or wastes back to Rio Chama.

Monthly discharge during period February to September 1963

Month	Discharge, in cubic feet per second			Diversion in acre-feet
	Maximum	Minimum	Mean	
October .....	-	-	-	-
November .....	-	-	-	-
December .....	-	-	-	-
Calendar year 1962 .....	-	-	-	-
January .....	-	-	-	-
February .....	0	0	0	0
March .....	0	0	0	0
April .....	17	4.1	7.65	455
May .....	16	4.6	11.0	676
June .....	15	1.3	8.28	493
July .....	15	1.9	6.51	400
August .....	18	0.1	8.30	510
September .....	12	0.3	7.77	462
Water year 1962-63 .....	-	-	-	-

RIO GRANDE BASIN

101

8-2898. Hernandez ditch near Hernandez, N. Mex.

Location.--Lat 36°04'20", long 106°07'10", in NE $\frac{1}{4}$ NW $\frac{1}{4}$  sec.8, T.21 N., R.8 E., on right bank 75 feet upstream from culvert under U.S. Highway 285, 0.6 mile north of Hernandez, 1 mile downstream from heading on Rio Chama, 3 miles northwest of San Juan Pueblo and 6 miles northwest of Espanola.

Records available.--March to September 1963.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 5,670 ft (from topographic map).

Extremes.--Maximum daily discharge during period 44 cfs June 10; no flow at times.

Remarks.--Records poor. This is one of two ditches gaged to determine flow bypassing station "Rio Chama near Chamita, N. Mex." Takeouts from ditch irrigate land above and below gage, or waste back to Rio Chama.

Monthly discharge during period March to September 1963

Month	Discharge, in cubic feet per second			Diversion in acre-feet
	Maximum	Minimum	Mean	
October .....	-	-	-	-
November .....	-	-	-	-
December .....	-	-	-	-
Calendar year 1962 .....	-	-	-	-
January .....	-	-	-	-
February .....	-	-	-	-
March .....	-	-	-	-
April .....	34	0.5	20.3	1,210
May .....	37	7.7	23.8	1,460
June .....	44	1.5	19.1	1,130
July .....	25	0	9.09	559
August .....	31	1	12.0	739
September .....	27	0	9.71	578
Water year 1962-63 .....	-	-	-	-

## 8-2900. Rio Chama near Chamita, N. Mex.

Location--Lat 36°04'25", long 106°06'39", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 8, T. 21 N., R. 8 E., on left bank 200 ft downstream from bridge on U. S. Highway 285, half a mile west of Chamita, 2 $\frac{1}{2}$  miles northwest of San Juan Pueblo, and 3 miles upstream from mouth.

Drainage area--3,144 sq mi, of which at least 100 sq mi is probably noncontributing.

Records available--October 1912 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder. Datum of gage is 5,653.61 ft above mean sea level, datum of 1929. Prior to Oct. 4, 1933, at railroad bridge 2 miles downstream at different datums. Oct. 4, 1933, to Mar. 1, 1942, at site 150 ft upstream at datum 0.22 ft higher.

Average discharge--51 years, 558 cfs (404,000 acre-ft per year).

Extremes--Maximum discharge during year, 1,830 cfs Mar. 31 (gage height, 4.52 ft); minimum, about 2 cfs Aug. 12, 13.

1912-63: Maximum discharge, 15,000 cfs May 22, 1920; maximum gage height, 10.45 ft Aug. 22, 1961; no flow at times.

The floods of Sept. 29, 1904, and Oct. 4 or 5, 1911, probably exceeded 15,000 cfs. Another major flood occurred in 1884, from newspaper accounts.

Remarks--Records good except for periods of ice effect or no gage-height record, and those for Aug. 1-5, which are poor. Discharge measurements generally made 2 or 3 times a month. Diversions above station for irrigation of about 27,600 acres, a few hundred of which is below station. Flow partly regulated by El Vado Reservoir (see p 176), and Abiquiu (flood-control and desilting) Reservoir (see p 176), 75 and 29 miles upstream respectively.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	135	73	1110	904	108	141	1500	540	133	93	328	74
2	112	68	1100	892	173	129	1320	234	155	22	250	67
3	86	304	1100	880	302	123	1040	186	152	5.4	259	a 50
4	73	995	1070	868	273	129	868	176	a 125	4.4	308	a 50
5	64	982	1070	820	455	138	436	186	a 91	4.1	95	a 50
6	60	904	1040	740	458	126	710	202	68	3.9	9.6	a 45
7	60	904	1020	362	408	112	770	234	59	3.7	5.1	a 45
8	57	940	1020	238	310	115	928	176	59	3.9	d 4	a 40
9	52	982	1020	b 170	258	115	1110	164	67	4.8	d 3	a 25
10	52	968	1020	b 140	258	123	1250	164	47	8.3	d 10	a 20
11	51	968	954	b 110	254	129	1150	167	25	2.4	d 20	7.6
12	47	968	916	a 80	b 140	138	1150	170	17	4.4	d 20	7.3
13	47	968	892	b 58	b 90	132	1080	164	16	3.7	17	7.3
14	47	1010	892	b 60	b 85	129	1080	158	11	3.5	20	7.0
15	45	1080	940	b 70	b 110	129	1110	284	11	3.5	4.8	50
16	48	1070	996	b 80	b 130	182	1130	500	11	3.5	19	39
17	55	1010	982	b 80	b 120	246	1130	520	11	50.3	32	15
18	55	1020	996	b 80	147	246	1100	500	8.8	337	30	7.9
19	73	996	996	b 80	141	295	1050	494	8.8	290	63	6.0
20	84	1020	1010	b 80	135	238	1020	448	7.9	299	45	7.6
21	118	1040	1020	b 80	150	275	944	342	6.4	299	81	24
22	88	1040	1010	b 90	166	679	802	368	4.8	59	170	44
23	88	1040	982	b 90	162	1250	593	358	4.1	24	60	47
24	105	1040	968	b 90	178	1470	593	328	4.4	9.6	40	32
25	115	1020	954	b 90	166	a 1390	678	304	3.7	4.1	53	26
26	129	1080	940	b 90	162	a 1290	681	299	173	3.5	43	21
27	126	1050	954	b 90	144	a 1150	822	250	374	3.5	81	16
28	108	1070	954	b 90	150	a 1050	871	164	357	3.0	113	15
29	100	1080	928	b 90	-	a 1320	913	d 175	408	2.6	89	12
30	98	1100	916	b 100	-----	a 1480	870	d 170	178	2.6	70	10
31	86	-----	904	b 100	-----	1540	-----	d 155	-----	382	67	-----
Total	2,464	27,790	30,674	7,792	5,633	16,009	23,699	8,580	25,969	24,180	24,095	867.7
Mean	79.5	926	989	251	201	516	957	277	86.6	78.0	77.7	28.9
Ac-ft	4,890	55,120	60,840	15,460	11,170	31,750	56,920	17,020	5,150	4,800	4,780	1,720

Calendar year 1962: Max 3,540 Min 4.0 Mean 603 Ac-ft 436,600  
 Water year 1962-63: Max 1,540 Min 2.6 Mean 372 Ac-ft 269,600

a No gage-height record.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record.

RIO GRANDE BASIN

103

8-2910. Santa Cruz River at Cundiyo, N. Mex.

Location.--Lat 35°57'40", long 105°54'10", in SE¼NW¼ sec.17, T.20 N., R.10 E., on left bank 135 ft downstream from highway bridge at confluence of Rio Medio and Rio Frijoles and 0.6 mile northwest of Cundiyo.

Drainage area.--86 sq mi, approximately.

Records available.--October 1930 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Concrete control since Jan. 3, 1954. Altitude of gage is 6,460 ft (from topographic map). Sept. 1, 1930, to Aug. 12, 1932, water-stage recorder at site about 1 mile downstream at different datum. Aug. 13, 1932, to Oct. 29, 1934, water-stage recorder at site 35 ft upstream at datum 0.42 ft higher. Oct. 30, 1934, to Jan. 2, 1954, water-stage recorder at present site at datum 0.64 ft lower.

Average discharge.--33 years, 29.8 cfs (21,570 acre-ft per year).

Extremes.--Maximum discharge during year, 270 cfs July 10 (gage height, 3.00 ft); minimum, 2.7 cfs July 27. 1930-63: Maximum discharge, 2,420 cfs Sept. 24, 1931 (gage height, 7.8 ft), from rating curve extended above 170 cfs by logarithmic plotting; minimum daily, 1.1 cfs Dec. 3, 1950.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 1,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.4	2.7	2.0	36
1.5	5.1	2.2	60
1.6	8.5	2.4	94
1.8	19		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	8.5	9.8	a 8.5	9.4	a 11	7.6	40	33	7.6	6.0	20
2	9.0	8.5	9.8	a 8.5	9.8	a 11	6.8	40	39	9.0	6.3	15
3	9.0	8.0	9.0	* b 8.0	8.5	a 11	5.4	43	38	10	7.0	13
4	8.5	8.0	8.0	b 8.2	8.5	a 10	* 5.1	46	31	18	8.0	13
5	1.1	8.0	6.0	b 8.5	8.5	a 11	4.7	47	* 29	12	4.5	14
6	9.8	8.0	b 7.0	b 8.7	9.8	* a 11	39	48	25	11	4.5	15
7	8.5	7.3	8.5	b 8.9	* 9.0	10	45	52	22	11	4.1	14
8	8.0	6.3	9.0	b 9.1	9.4	11	57	55	22	11	4.1	12
9	8.0	7.3	8.0	b 9.3	9.4	9.8	65	60	25	15	5.1	11
10	8.0	7.6	7.6	b 9.0	9.4	11	66	62	19	* 22	* 7.6	13
11	8.0	8.0	b 7.6	b 8.0	7.3	11	63	65	18	16	12	14
12	7.6	6.3	b 7.6	a 6.0	b 7.0	10	* 5.9	63	18	12	9.0	12
13	7.6	* 7.0	* b 9.0	a 5.0	a 7.3	11	59	60	17	9.8	12	* 14
14	7.3	9.0	b 10	a 6.0	a 8.0	13	63	56	18	9.0	13	25
15	* 7.6	1.4	b 9.0	a 7.0	a 8.5	15	66	57	17	7.3	8.5	15
16	8.0	12	b 9.5	a 7.5	a 8.0	17	66	* 56	17	6.0	11	12
17	9.4	7.0	b 10	a 8.0	a 7.8	19	55	55	16	6.0	9.7	11
18	10	5.7	9.8	a 8.5	a 7.6	20	52	54	17	7.3	2.9	11
19	17	9.4	9.0	a 8.5	a 7.8	18	45	52	16	7.3	20	11
20	14	11	8.5	a 7.0	* 8.0	21	42	54	15	7.6	19	12
21	12	13	6.6	a 7.5	7.6	30	40	55	* 13	10	16	38
22	11	11	b 5.3	* 7.6	11	38	39	54	11	8.0	* 13	42
23	9.8	9.8	b 7.3	7.3	13	50	35	48	11	7.0	13	29
24	9.8	9.8	b 8.5	7.3	13	62	37	47	9.8	5.1	11	25
25	9.8	9.8	b 7.5	7.3	12	59	38	44	10	* 4.7	14	20
26	* 9.0	11	b 7.0	7.3	12	56	39	43	9.4	5.4	20	* 19
27	9.4	9.8	* b 6.0	7.3	13	60	* 42	38	9.0	4.5	17	18
28	9.0	8.5	b 6.5	7.6	a 12	65	40	35	9.0	4.7	14	17
29	8.5	* 11	b 7.0	7.6	-	80	39	34	8.5	5.1	14	16
30	8.5	11	b 7.5	7.6	-----	76	38	33	9.0	5.4	15	15
31	8.5	-----	a 8.0	8.0	-----	80	-----	33	-----	6.0	18	-----
Total	290.1	271.6	250.9	240.6	262.6	917.8	1,525	1,529	551.7	280.8	365.4	516
Mean	9.36	9.05	8.09	7.76	9.38	29.6	50.8	49.3	18.4	9.06	11.8	17.2
Ac-ft	575	539	498	477	521	1,820	3,020	3,030	1,090	557	725	1,020

Calendar year 1962: Max 130 Min 5.4 Mean 24.3 Ac-ft 17,560  
Water year 1962-63: Max 80 Min 4.1 Mean 19.2 Ac-ft 13,870

Peak discharge (base, 200 cfs).--July 10 (2100) 270 cfs (3.00 ft).

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-2943. Rio Nambe at Nambe Falls, near Nambe, N. Mex.

Location.--Lat 35°51'15", long 105°54'30", in SW $\frac{1}{4}$  sec.29, T.19 N., R.10 E., on left bank at Nambe Falls, 4.4 miles southeast of Nambe Pueblo, 5.1 miles southeast of Nambe, and 8.4 miles upstream from Rio Tesuque.

Drainage area.--25.1 sq mi.

Records available.--May to December 1911, miscellaneous discharge measurements only. March to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 6,550 ft (from topographic map).

Extremes.--Maximum discharge during period, 46 cfs July 6 (gage height, 1.07 ft); minimum, 2.6 cfs Aug. 7.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor.

Rating table, (gage height, in feet, and discharge,  
in cubic feet per second)

0.4	1.7	0.7	10
.5	3.4	.8	17
.6	6.2	.9	26

Discharge, in cubic feet per second, March to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						a 6	20	14	15	5.9	3.2	d 12
2						a 5.5	19	14	15	6.2	2.9	d 11
3						a 5.5	14	14	14	6.6	3.2	10
4						a 5	d*13	16	14	7.5	3.4	10
5						a 5	d 12	*16	*13	6.6	3.2	d 11
6						*5.6	d 11	16	13	7.1	3.1	d 12
7						5.6	14	17	a 13	5.6	2.9	d 11
8						4.5	20	18	a 12	5.4	3.2	d 10
9						4.5	22	18	a 12	8.8	3.7	d 9
10						4.0	21	17	a 11	*6.2	*3.4	10
11						4.2	21	19	a 10	5.6	7.9	8.8
12						4.0	22	20	a 9.5	4.5	6.2	7.9
13						4.0	22	19	a 9	4.2	7.9	*8.4
14						4.2	22	*18	a 8.5	4.0	6.6	8.8
15						4.0	21	19	a 8.5	3.4	6.2	7.9
16						4.5	20	21	a 8	3.7	6.6	7.5
17						4.5	19	21	a 8	3.7	6.2	7.1
18						4.8	17	21	a 7.5	4.0	7.9	6.2
19						4.8	15	20	a 7.5	4.2	10	6.2
20						*5.6	14	20	a 7.5	5.1	12	6.2
21						6.2	14	21	*a 7.5	6.6	12	12
22						7.1	13	21	a 8	4.8	*11	a 15
23						9.8	12	22	a 8	4.0	10	a 12
24						10	13	21	7.9	3.7	d 9	a 20
25						11	*13	19	7.5	*3.4	d 9	a 13
26						12	14	17	6.6	4.0	10	*10
27						12	14	16	6.6	3.4	d 12	9.6
28						14	14	16	6.2	3.4	d 11	9.6
29						16	13	15	6.2	3.2	d 11	9.2
30						16	13	15	5.9	3.1	d 12	9.6
31						18		15		3.2	d 14	
Total						226.9	492	556	286.4	151.1	230.7	301.0
Mean						7.32	16.4	17.9	9.55	4.87	7.44	10.0
Ac-ft						450	976	1,100	568	300	458	597

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

RIO GRANDE BASIN

105

8-3022. North Fork Tesuque Creek near Santa Fe, N. Mex.

Location.--Lat 35°46'12", long 105°48'31", on left bank in Santa Fe National Forest, 75 ft upstream from culvert on State Highway No.475, 250 ft upstream from Middle Fork Tesuque Creek, and 13 miles northeast of Santa Fe.

Drainage area.--1.60 sq mi.

Records available.--October 1962 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 9,670 ft (from topographic map).

Extremes.--Maximum discharge during year, 7.72 cfs Aug. 25 (gage height, 1.26 ft); minimum recorded, 0.09 cfs Nov. 16.

Remarks.--Records excellent except those for periods of ice effect or doubtful or no gage-height record, which are fair.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.3	0.21	0.7	1.78
.4	.44	.9	3.33
.5	.77	1.2	6.83
.6	1.21		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a0.55	0.50	a0.45	0.44	0.47	0.50	2.72	3.42	2.94	0.98	0.54	1.70
2	a.55	.50	a.45	.44	.50	.50	2.48	3.42	3.06	1.02	.58	1.61
3	.56	.50	a.45	.44	.50	.50	b 2.33	3.52	2.79	1.08	.61	1.83
4	.57	.50	a.45	.41	.52	b.47	2.25	3.71	2.63	1.15	.59	2.00
5	.67	.47	a.45	.41	.59	b.45	* 2.18	4.01	2.49	.99	.56	1.99
6	.56	.47	a.45	.41	*.59	b.45	2.11	4.22	2.37	.92	.52	1.87
7	.56	.47	a.45	.41	.59	b.45	2.25	4.55	2.26	.91	*.52	1.80
8	.52	b.44	a.45	.41	.59	.47	2.72	4.89	2.21	1.01	.55	1.78
9	.52	b.42	a.45	.41	.59	.47	3.15	5.13	2.12	1.00	.62	1.76
10	.52	.44	a.45	.41	.52	b.47	3.33	5.42	2.04	.91	.94	1.77
11	.52	.44	a.45	b.40	b.5	.47	3.33	5.57	1.97	*.84	.81	1.68
12	.52	b.40	a.45	b.35	b.5	*.44	3.33	5.54	1.89	.83	.86	1.64
13	.52	b.40	*.44	a.35	b.5	.44	3.52	5.42	1.81	.79	1.17	1.66
14	.52	*.47	.41	a.35	.50	.47	3.81	5.21	1.74	.77	.83	*1.58
15	.52	.50	.41	a.40	.50	.50	4.22	5.06	1.67	.74	.82	1.51
16	.52	.44	.41	a.40	.50	.50	4.33	4.89	1.84	.75	.77	1.45
17	*.56	.40	.41	a.40	.47	.50	4.12	4.72	1.65	.75	.87	1.39
18	.56	.45	.44	*.41	.47	.50	* 3.91	4.60	1.57	.73	.88	1.34
19	.69	.50	.44	.41	.44	.52	3.91	4.48	1.52	.73	.88	1.29
20	.59	.56	.41	b.40	.44	.62	3.52	4.40	1.47	.94	.84	1.56
21	.56	.59	.38	b.40	*.44	.80	3.33	4.31	1.44	.74	.85	1.78
22	.52	.56	.41	b.40	.44	.93	3.15	4.20	1.41	.68	.89	1.90
23	.52	.59	.38	b.40	.44	1.21	3.06	4.10	1.29	.65	*.89	1.78
24	.52	.62	a.36	b.40	.44	1.48	2.97	4.02	*1.26	.63	.93	1.84
25	*.50	.59	a.35	b.40	.44	d1.53	3.06	3.94	1.20	.64	1.41	1.89
26	.50	.59	a.35	b.40	.47	d1.71	3.15	3.80	1.15	.61	1.29	1.89
27	.50	*.56	a.35	b.40	.47	d1.84	3.15	* 3.65	1.12	.59	1.20	1.89
28	.50	a.56	a.38	b.40	.50	d2.04	3.15	3.49	1.07	.58	1.23	1.94
29	.50	a.52	a.40	b.40	-	d2.33	3.15	3.37	1.03	.57	1.69	1.95
30	.50	a.48	a.42	.42	-----	d2.48	* 3.24	3.26	1.00	.54	1.58	1.95
31	.50	-----	*.44	.44	-----	2.80	-----	3.03	-----	.54	1.58	-----
Total	16.72	14.93	12.99	12.52	13.92	28.84	94.93	133.35	54.01	24.61	28.30	52.02
Mean	0.539	0.498	0.419	0.404	0.497	0.930	3.16	4.30	1.80	0.794	0.913	1.73
Ac-ft	33.2	29.6	25.8	24.8	27.6	57.2	188.3	264.5	107.1	48.8	56.1	103.2

Calendar year : Max Min Mean Ac-ft  
Water year 1962-63: Max 5.57 Min 0.35 Mean 1.33 Ac-ft 966.2

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.

## RIO GRANDE BASIN

8-3023. Middle Fork Tesuque Creek near Santa Fe, N. Mex,

Location.--Lat 35°46'03", long 105°48'26", on right bank in Santa Fe National Forest, 1,000 ft upstream from road culvert on State Highway No. 475, 1,100 ft upstream from mouth, 13 miles northeast of Santa Fe.

Drainage area.--0.44 sq mi.

Records available.--November 1961 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 9,800 ft (from topographic map).

Extremes.--Maximum discharge during year, 2.84 cfs Aug. 13 (gage-height, 1.04 ft); minimum daily, 0.07 cfs several days. 1961-63: Maximum discharge and minimum daily, those of 1963.

Remarks.--Records excellent except those for periods of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.05	0.5	0.48
.3	.13	.7	1.04
.4	.26	.9	1.94

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.13	0.11	0.11	a 0.08	0.08	0.08	0.33	0.50	0.96	0.27	0.16	0.25
2	.13	.11	.11	.08	.08	.08	.30	.50	.96	.28	.17	.20
3	.13	.11	.11	.07	.07	.08	.26	.52	.89	.29	.19	.22
4	.14	.11	.11	.07	.07	.08	.25	.55	.82	.30	.17	.29
5	.15	.11	.10	.08	.08	.08	*.25	.58	.78	.27	.17	.26
6	.14	.11	.10	.08	*.08	.08	.25	.60	.75	.25	*.15	.23
7	.13	.10	*.10	.08	.08	.08	.31	.66	.70	.25	*.15	.23
8	.13	.11	.10	.08	.08	.08	.43	.71	.68	.29	.15	.23
9	.13	.11	.10	.08	.08	.08	.48	.74	.64	.29	.16	.23
10	.13	.11	.10	.08	.08	.08	.43	.78	.61	.26	.27	.26
11	.13	.10	.10	.08	.08	*.08	.41	.83	.59	*.24	.24	.26
12	.13	.10	.10	a .07	.08	*.08	.41	.87	.56	.23	.29	.26
13	.13	.10	.10	a .07	.08	.08	.46	.87	.53	.22	.44	.29
14	.13	*.10	.10	a .07	.08	.08	.52	.88	.51	.21	.24	*.29
15	.13	.11	.10	a .07	.08	.09	.55	.87	.48	.21	.22	.28
16	.13	.11	.10	a .08	.08	.09	.52	.87	.53	.21	.19	.28
17	.14	.12	.10	a .08	.08	.09	.48	.84	.47	.21	.20	.28
18	.14	.11	.10	*.08	.08	.09	*.43	.87	.44	.21	.20	.27
19	.18	.11	.09	.08	.08	.09	.41	.90	.42	.20	.18	.26
20	.15	.12	.09	.08	.08	.10	.39	.94	.40	.25	.16	.38
21	.14	.12	.09	.08	.08	.12	.41	.94	.38	.21	.16	.45
22	.13	.12	.09	.08	.08	.13	.39	.97	.36	.19	.16	.48
23	.13	.11	.09	.07	.08	.16	.39	1.01	.35	.19	*.15	.36
24	.13	.11	.09	.07	.08	.19	.41	1.04	*.33	.18	.15	.33
25	*.13	.11	a .08	.07	.08	.20	.41	1.08	.32	.18	.29	.32
26	.13	.11	a .07	.07	.08	.22	.46	1.08	.31	.18	.24	.32
27	.13	*.11	a .08	.07	.08	.23	.46	1.12	.30	.17	.19	.34
28	.12	.11	a .08	.08	.08	.26	.46	*.112	.30	.17	.18	.37
29	.12	.11	a .08	.08	-	.28	.46	1.10	.28	.17	.28	.39
30	.12	.11	a .08	.08	-----	.30	.48	1.07	.28	.16	.23	.40
31	.12	-----	a .08	.08	-----	.33	-----	1.00	-----	.16	.21	-----
Total	4.13	3.29	2.93	2.37	2.22	4.09	12.20	26.41	15.93	6.89	6.34	9.00
Mean	0.133	0.110	0.095	0.078	0.079	0.132	0.407	0.852	0.531	0.222	0.205	0.300
Ac-ft	8.19	6.53	6.81	4.70	4.40	8.11	24.2	52.4	31.6	13.7	12.6	17.8
Calendar year 1962: Max	1.64	Min	0.07	Mean	0.290	Ac-ft	209.7					
Water year 1962-63: Max	1.12	Min	0.07	Mean	0.262	Ac-ft	190.0					

\* Discharge measurement made on this day.

a No gage-height record.

RIO GRANDE BASIN

107

8-3024. South Fork Tesuque Creek near Santa Fe, N. Mex.

Location.--Lat 35°45'37", long 105°48'40", on left bank in Santa Fe National Forest, 150 ft upstream from road culvert on State Highway No. 475, 2,700 ft upstream from mouth, and 12 miles northeast of Santa Fe.

Drainage area.--0.47 sq mi.

Records available.--October 1962 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 9,740 ft (from topographic map).

Extremes.--Maximum discharge during year, 1.32 cfs Aug. 13 (gage height, 0.77 ft); minimum, 0.07 cfs Nov. 16.

Remarks.--Records excellent except those for periods of ice effect or no gage-height record, which are fair.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.2	0.05	0.6	0.71
.3	.13	.7	1.04
.4	.26	.8	1.45
.5	.46		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 0.13	0.13	0.12	a 0.11	0.11	0.10	0.28	0.23	0.67	0.25	0.19	0.20
2	a 1.13	.13	.12	a 1.11	.11	.10	.26	.25	.66	.25	.20	.17
3	.13	.13	a .12	b .11	.11	.10	.25	.26	.59	.26	.21	.17
4	.13	.13	a .12	b .11	.11	.10	.23	.28	.54	.27	.19	.18
5	.15	.13	a .12	.11	.11	.10	* .23	.30	.51	.22	.15	.18
6	.13	.13	a .12	.11	* .11	.10	.22	.33	.47	.21	.15	.17
7	.13	.12	a .12	.11	.11	.10	.25	.37	.45	.20	* .15	.16
8	.13	.12	a .12	.11	.11	.10	.30	.39	.43	.22	.15	.16
9	.14	.12	a .12	.11	.11	.10	.31	.43	.40	.22	.15	.15
10	.13	.12	a .12	.11	.12	.10	.31	.46	.38	.21	.20	.16
11	.13	.12	a .12	b .11	.11	.10	.30	.51	.37	* .19	.17	.16
12	.13	.12	a .12	b .10	b .10	.10	.30	.56	.36	.19	.18	.15
13	.13	.12	* .12	b .09	b .10	* .10	.30	.58	.34	.19	.32	.17
14	.13	* .12	.12	a .10	.11	.10	.33	.58	.32	.19	.21	* .17
15	.13	.14	.12	a .11	.11	.10	.33	.59	.31	.24	.18	.16
16	.13	.12	.12	a .11	.11	.10	.31	.69	.34	.21	.16	.16
17	* .14	.13	.12	a .11	.11	.10	.30	.84	.31	.18	.16	.18
18	.14	.13	.12	* .11	.11	.10	* .28	.97	.30	.17	.16	.18
19	.16	.13	.12	.11	.11	.11	.25	1.07	.29	* .18	.15	.19
20	.15	.13	.11	.11	.11	.11	.25	1.15	.28	.19	.15	.25
21	.14	.13	.11	.11	.11	.11	.25	1.16	.27	.18	.14	.32
22	.14	.12	.11	b .11	.11	.12	.23	1.16	.26	.17	.14	.33
23	.13	.12	.11	.11	.11	.13	.22	1.14	.25	.17	* .15	.28
24	* .13	.12	.11	.11	.11	.15	.22	1.10	* .25	.16	.14	.27
25	* .13	.13	.11	.11	.11	.18	.22	1.06	.24	.16	.19	.26
26	.13	.12	a .10	.11	.11	.19	.23	1.00	.23	.16	.19	.25
27	.13	* .12	a .10	.11	.11	.20	.23	.95	.23	.15	.17	.24
28	.13	.12	* .11	.11	.11	.23	.23	* .89	.22	.16	.16	.23
29	.13	.12	.11	.11	-	.25	.22	.84	.22	.18	.16	.23
30	.13	.12	.11	.11	-----	.26	* .23	.79	.23	.19	.17	.23
31	.13	-----	a .11	.11	-----	.28	-----	.73	-----	.19	.16	-----
Total	4.15	3.74	3.58	3.37	3.07	4.12	7.87	21.66	10.72	6.11	5.35	6.11
Mean	0.134	0.125	0.115	0.109	0.110	0.133	0.262	0.699	0.357	0.197	0.173	0.204
Ac-ft	8.23	7.42	7.10	6.68	6.09	8.17	15.6	43.0	21.3	12.1	10.6	12.1

Calendar year : Max Min Mean Ac-ft  
 Water year 1962-63: Max 1.16 Min 0.09 Mean 0.219 Ac-ft 158.4

- \* Discharge measurement made on this day.
- a No gage-height record.
- b Stage-discharge relation affected by ice.



8-3041. Little Tesuque Creek near Santa Fe, N. Mex.

Location.--Lat 35°44'42", long 105°49'39", in SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.36, T.18 N., R.10 E., on right bank in Santa Fe National Forest, 1,200 ft upstream from East Boundary line of Hyde State park, 0.25 mile (by access road) east of State Highway 475, 9 miles northeast of Santa Fe.

Drainage area.--0.37 sq mi.

Records available.--June 1962 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 9,220 ft (from topographic map).

Extremes.--Maximum discharge during year, 0.87 cfs Apr. 9 and Aug. 13 (gage height, 0.65 ft); minimum, 0.04 cfs Aug. 1. 1962-63: Maximum discharge, that of Apr. 9 and Aug. 13, 1963; minimum, 0.03 cfs Aug. 29, 1962.

Remarks.--Records good.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second).

0.2	0.05	0.5	0.46
.3	.13	.6	.71
.4	.26		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.07	0.07	0.09	0.07	0.07	0.12	0.68	*0.28	0.28	0.09	0.06	0.26
2	.07	.07	.09	.07	.07	.11	.68	.26	.33	.10	.11	.18
3	.07	.07	.08	.07	.07	.11	.60	.28	.28	.11	.10	.14
4	.07	.07	.08	.07	.07	.11	.52	.30	.25	.20	.10	.15
5	.11	.07	.08	.07	.08	.11	.48	.30	.23	.14	.08	.15
6	.08	.07	.08	.07	*.09	.10	*.46	.30	.22	.10	.06	.13
7	.07	.07	.08	.07	.10	.10	.52	.31	.20	.10	*.06	.12
8	.07	.06	.08	.07	.10	.10	.66	.33	.20	.13	.07	.10
9	.07	.07	.07	.07	.10	.10	.84	.33	.20	.15	.07	.09
10	.07	.07	.07	.07	.10	.09	.80	.33	.18	.12	.13	.11
11	.07	.07	.07	a.06	.09	.09	.68	.33	.18	*.10	.15	.10
12	.07	.06	.07	a.06	.08	a.09	.60	.33	.16	.09	.11	.10
13	.06	.07	*.07	a.05	.08	*.09	.58	.33	.16	.08	.35	.11
14	.06	*.07	.07	a.06	.09	.09	.66	.33	.15	.08	.23	*.12
15	.07	.13	.07	a.06	.09	.10	.68	.35	.15	.07	.15	.10
16	.07	.08	.07	a.06	.09	.11	.60	.37	.18	.08	.12	.09
17	*.07	.08	.07	*d.06	.09	.13	.52	.37	.15	.09	.12	.09
18	.07	.09	.08	d.06	.09	.14	*.46	.37	.14	.07	.16	.09
19	.12	.09	.07	d.06	.08	.14	.41	.37	.14	*.08	.14	.08
20	.09	.10	.07	d.06	.08	.15	.37	.41	.13	.10	.11	.14
21	.07	.11	.07	d.07	.09	.18	.35	.43	.13	.09	.09	.37
22	.07	.11	.07	d.07	.09	.20	.31	.46	.12	.08	.10	.49
23	.07	.10	.06	d.07	.09	.25	.30	.46	.12	.08	*.09	.30
24	.07	.10	.07	d.07	.09	.30	.28	.46	*.11	.07	.08	.22
25	*.07	.11	.07	d.07	.10	.35	.30	.43	.11	.07	.13	.18
26	.07	.10	.06	d.06	.11	.37	.31	.41	.10	.07	.16	.15
27	.07	*.10	.07	d.06	.12	.41	.31	.39	.10	.06	.18	.14
28	.07	.09	*.07	d.06	.12	.46	.28	*.35	.10	.06	.15	.13
29	.07	.09	.07	d.06	-	.55	.26	.33	.09	.06	.15	.13
30	.07	.09	.07	d.06	-	.58	.26	.33	.09	.06	.18	.12
31	.07	-----	.07	d.06	-----	.66	-----	.30	-----	.06	.19	-----
Total	2.27	2.53	2.26	2.00	2.52	6.49	14.76	10.93	4.98	2.84	3.98	4.68
Mean	0.073	0.084	0.073	0.065	0.080	0.209	0.492	0.353	0.166	0.092	0.128	0.156
Ac-ft	4.50	5.02	4.48	3.97	5.00	12.9	29.3	21.7	9.88	5.63	7.89	9.28

Calendar year 1962: Max Min Mean Ac-ft  
 Water year 1962-63: Max 0.84 Min 0.05 Mean 0.165 Ac-ft 119.5

- \* Discharge measurement made on this day.  
 a No gage-height record.  
 d Doubtful gage-height record.

RIO GRANDE BASIN

109

8-3044. Little Tesuque Creek Tributary No.2 near Santa Fe, N. Mex.

Location.--Lat 35°43'34", long 105°51'02", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.2, T.17 N., R.10 E., on right bank in Santa Fe National Forest, 300 ft upstream from mouth and State Highway No. 475, 6 $\frac{1}{2}$  miles northeast of Santa Fe, N. Mex.

Drainage area.--0.45 sq mi.

Records available.--June 1962 to September 1963.

Gage.--Water-stage recorder and V-notch sharp-crested weir. Altitude of gage is 7,960 ft (from topographic map).

Extremes.--Maximum discharge during year, 0.166 cfs Apr. 1-2 (gage height, 0.33 ft); no flow for many days.  
1962-63: Maximum discharge, that of Apr. 1-2, 1963, no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.03	0.0	0.3	0.125
.1	0.007	.4	0.262
.2	0.041		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.002	0.006	0.006	0.009	0.016	0.152	*0.041	0.007	0	0	0.006
2	0	.002	.006	.006	.014	.014	.152	.036	.009	0	0	.006
3	0	.001	.007	.006	.014	.014	.125	.036	.009	0	0	.004
4	0	.002	.007	.006	.014	.014	*.108	a.030	.009	0	0	.006
5	0	.002	.007	.006	.011	.014	.108	a.030	.009	0	0	.016
6	0	.002	.006	.006	*.011	.014	.100	a.030	.007	0	0	.011
7	0	.001	a.006	.006	a.011	.011	.100	a.030	.007	0	*0	.009
8	0	.002	a.006	.006	a.011	.011	.108	a.027	.009	0	0	.007
9	0	.002	a.006	.006	a.011	.011	.108	.024	.007	0	0	.006
10	0	.002	a.006	.006	a.011	.011	.117	.024	.007	0	0	.004
11	0	.002	a.005	.006	a.010	.011	.108	.020	.007	*0	0	.004
12	0	.003	a.005	.006	a.009	.011	.100	.016	.007	0	0	.004
13	0	.003	*.006	.006	a.009	*.011	a.090	.016	.007	0	0	.003
14	0	*.002	.006	.006	a.009	.014	a.080	.016	.007	0	0	*.003
15	0	.004	.006	.006	a.010	.016	a.100	.020	.007	0	0	.003
16	0	.004	.006	.006	a.010	.020	a.090	.016	.007	0	0	.002
17	*0	.003	.004	.006	a.010	.020	a.080	.016	.007	0	0	.002
18	0	.003	.006	*.006	a.011	.020	*a.080	.016	.003	0	0	.002
19	.001	.003	.006	.006	a.013	.020	a.070	.014	0	*0	0	.002
20	.001	.003	.006	.006	a.015	.020	a.060	.014	0	0	0	.002
21	.001	.004	.006	.006	a.015	.024	a.050	.014	0	.001	0	.006
22	.001	.006	a.005	.006	a.012	.024	a.050	.014	0	.001	0	.066
23	.001	.006	a.004	.006	a.012	.032	a.050	.014	0	0	*0	.032
24	.001	.006	a.004	.006	a.015	.032	a.045	.014	*0	0	0	.020
25	.001	.006	a.004	.007	.020	.036	a.045	.011	0	0	0	.016
26	.001	.006	a.004	.007	.020	.036	a.050	.009	0	0	0	.011
27	.001	*.006	*.006	.007	.020	.041	a.060	*.009	0	0	.001	.009
28	.001	.006	.006	.007	.016	.066	a.060	.007	0	0	.001	.009
29	.001	.006	.006	.007	-	.100	a.050	.007	0	0	.008	.007
30	.001	.006	.006	.007	-----	.108	a.045	.007	0	0	.014	.007
31	.002	-----	.006	.007	-----	.125	-----	.007	-----	0	.007	-----
Total	0.014	0.106	0.176	0.193	0.353	0.917	2.541	0.585	0.132	0.002	0.031	0.285
Mean	0.0005	0.004	0.006	0.006	0.013	0.030	0.085	0.019	0.004	0.0001	0.001	0.010
Ac-ft	0.03	0.21	0.35	0.38	0.70	1.82	5.04	1.16	0.26	0.004	0.06	0.57

Calendar year : Max Min Mean Ac-ft  
Water year 1962-63: Max 0.152 Min 0 Mean 0.015 Ac-ft 10.6

\* Discharge measurement or observation of no flow made on this day.  
a No gage-height record.

## RIO GRANDE BASIN

8-3130. Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.

**Location.**--Lat 35°52'30", long 106°08'30", near right bank on downstream side of pier of former railway bridge, 400 ft downstream from bridge on State Highway 4, 1½ miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Pojoaque River, and 7 miles west of Pojoaque.

**Drainage area.**--14,300 sq mi, approximately (includes, 2,940 sq mi in closed basin in San Luis Valley, Colo.).

**Records available.**--February 1895 to December 1905, June 1909 to September 1963. Monthly discharge only for some periods, published in WSP 1312. In early reports this record was published as Rio Grande at water tank, as "at Rio Grande", and as "near Buckman."

**Gage.**--Water-stage recorder. Datum of gage is 5,488.48 ft above mean sea level, datum of 1929. Prior to May 19, 1904 and July 25 to Oct. 1, 1904, staff gage at site 180 ft upstream at datum 2.02 ft lower. May 19 to July 24, 1904, Oct. 2, 1904, to Dec. 31, 1905, and June 23, 1909, to May 31, 1910, staff gage or chain gage at same site and datum.

**Average discharge.**--64 years (1895-1905, 1909-63), 1,570 cfs (1,137,000 acre-ft per year).

**Extremes.**--Maximum discharge during year, 2,670 cfs Apr. 1 (gage height, 4.67 ft); minimum, 90 cfs July 31.

1895-1905, 1909-63: Maximum discharge, 24,400 cfs May 23, 1920; maximum gage height, 14.5 ft Sept. 29, 1904 (present site and datum); minimum daily discharge, 60 cfs July 4, 5, 1902.

The 1920 flood is greatest since at least 1884 and probably since 1741; information from H. W. Yeo's file on floods.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made two or more times a month. Flow partly regulated by El Vado and Abiquiu Reservoirs (see p. 176) on Rio Chama which contributes about 40 percent of total flow. Diversions above station for irrigation of about 619,000 acres in Colorado and 75,000 acres in New Mexico.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	431	403	1,670	1,280	627	830	2,420	878	374	243	456	359
2	395	395	1,650	1,270	714	844	2,250	719	435	168	320	300
3	361	493	1,620	1,270	893	837	1,960	d600	469	133	337	261
4	358	1,190	1,620	1,310	792	878	1,780	d500	418	144	378	281
5	358	1,450	1,610	1,290	974	871	1,380	d470	382	151	284	244
6	358	1,690	1,640	1,240	997	648	1,560	d460	341	146	168	252
7	358	1,740	1,600	893	1,010	719	1,600	d490	306	154	144	239
8	354	1,780	1,580	a700	974	857	1,690	440	a270	157	134	232
9	351	1,830	1,540	a600	907	830	1,840	391	a260	186	135	234
10	344	1,830	1,500	b550	959	878	2,040	399	a300	190	140	234
11	331	1,880	1,440	b500	982	893	2,000	419	a250	264	173	214
12	324	1,910	1,400	a470	773	878	2,000	431	a220	196	186	190
13	318	1,920	1,390	a400	537	830	2,000	465	232	177	220	175
14	297	1,900	1,390	a400	492	785	2,000	448	224	170	250	186
15	309	1,800	1,420	b400	703	779	1,950	496	201	161	192	208
16	294	1,690	1,470	b470	779	811	1,910	756	219	146	201	236
17	300	1,600	1,450	b514	737	850	1,910	818	222	430	217	205
18	306	1,570	1,470	b496	737	871	1,860	779	210	577	205	181
19	484	1,520	1,480	b496	749	914	1,790	767	192	427	236	173
20	452	1,420	1,520	b452	749	864	1,690	773	208	418	252	166
21	448	1,460	1,500	b474	792	886	1,540	642	192	427	210	294
22	423	1,510	1,470	b492	804	1,190	a1,410	785	162	267	334	330
23	399	1,560	1,410	b492	785	1,750	a1,180	719	166	149	300	306
24	411	1,570	1,410	b478	818	2,000	a1,020	708	159	133	242	415
25	431	1,570	1,380	b496	830	1,950	1,050	658	143	125	239	363
26	448	1,630	1,320	506	818	1,930	1,140	611	138	123	310	291
27	448	1,620	1,290	483	818	1,910	1,160	566	509	117	303	272
28	448	1,610	1,320	501	837	1,880	1,270	452	427	115	356	258
29	440	1,630	1,320	538	-	2,180	1,300	427	650	113	367	250
30	431	1,660	1,320	547	-----	2,330	1,330	435	367	106	344	242
31	427	-----	1,310	591	-----	2,350	-----	431	-----	257	422	-----
Total	11,837	45,831	45,510	20,599	22,587	37,023	50,030	17,933	8,646	6,570	8,055	7,591
Mean	382	1,528	1,468	664	807	1,194	1,668	578	288	212	260	253
Ac-ft	23,480	90,900	90,270	40,860	44,800	73,430	99,230	35,570	17,150	13,030	15,980	15,060

Calendar year 1962: Max 7,170 Min 210 Mean 1,441 Ac-ft 1,044,000  
 Water year 1962-63: Max 2,420 Min 106 Mean 773 Ac-ft 559,800

**Peak discharge (base, 5,200 cfs).**--No peak above base.

- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.

## 8-3133. Rito de los Frijoles near Los Alamos, N. Mex.

Location.--Lat 35°48'55", long 106°21'35", on right bank at upper Frijoles crossing, 5½ miles southwest of Los Alamos, 5½ miles upstream from Bandelier National Monument Headquarters, and 7½ miles upstream from the mouth.

Drainage area.--8.9 sq mi.

Records available.--August 1959 to October 1963 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,000 ft (from topographic map).

Extremes.--Maximum discharge during period October 1962 to October 1963, about 10 cfs Feb. 2 (during period of no gage-height record); maximum gage height, 1.58 ft Jan. 12 (ice backwater); minimum discharge, 0.67 cfs June 29.

1959-63: Maximum discharge, 13 cfs Apr. 7, 1960; maximum gage height, that of Jan. 12, 1963; minimum discharge, 0.67 cfs June 29, 1963.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. No diversions above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 20 to Apr. 1)

0.7	0.3
.8	1.0
.9	2.4
1.0	4.6

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	1.3	1.4	1.4	3.2	1.8	* 2.9	1.6	0.8	0.8	1.2	1.3
2	1.3	1.3	1.4	1.4	3.5	1.8	2.8	1.6	1.0	.8	1.2	1.2
3	1.0	1.3	1.4	1.4	3.5	2.0	2.8	1.6	.9	.8	1.3	1.2
4	1.0	1.3	1.4	1.4	3.3	2.0	2.8	* 1.6	.9	.8	1.2	1.2
5	1.0	1.3	1.3	1.4	3.2	2.0	2.8	1.5	.8	.8	.9	1.2
6	1.0	1.3	1.3	1.4	* 3.2	2.0	2.6	1.4	.8	.8	.9	1.0
7	.9	1.3	* 1.3	1.4	3.2	2.0	2.2	1.3	.8	.8	.9	1.0
8	.9	1.3	1.3	1.4	3.2	2.0	2.2	1.3	.8	.9	1.2	1.0
9	.9	1.3	1.3	1.4	3.2	2.0	2.2	1.3	.8	1.2	1.4	.9
10	.9	1.3	1.3	1.4	3.2	2.0	2.2	1.3	.8	.9	1.3	* 1.0
11	.8	1.3	1.3	* 1.2	2.5	2.0	* 2.2	1.3	.8	* .8	1.4	1.3
12	.8	1.3	1.3	1.0	2.0	2.1	2.2	1.3	.8	.8	1.5	1.2
13	.8	1.3	1.3	.7	1.0	2.0	2.2	1.3	.8	.8	* 1.4	1.2
14	.9	1.3	1.3	.8	1.0	2.0	2.2	1.3	.8	.8	1.3	1.5
15	* 1.0	* 1.6	1.3	.9	1.2	2.0	2.2	1.3	.8	.8	1.3	1.6
16	1.3	1.4	1.4	1.0	1.8	2.0	2.2	1.3	.8	.8	1.2	1.5
17	1.4	1.4	1.8	1.0	1.8	2.0	2.1	* 1.1	.9	.8	1.2	1.4
18	1.4	1.4	1.6	1.0	1.8	2.0	2.1	.9	.8	.9	1.0	1.2
19	1.6	1.3	1.4	1.0	1.8	2.0	2.1	.8	.8	.9	1.0	1.0
20	1.6	1.3	1.4	1.0	1.8	2.1	2.1	.8	.9	.9	1.0	.9
21	1.5	1.4	1.4	1.0	1.8	2.1	2.1	.8	* .9	.9	1.2	.9
22	1.5	1.4	1.2	1.0	1.8	2.1	2.1	.8	.9	.9	1.3	.9
23	1.5	1.3	1.0	1.0	1.8	2.1	2.1	.8	.9	.9	1.2	.8
24	1.5	1.3	.9	1.2	1.8	2.2	2.0	.8	.8	.9	1.3	.8
25	1.5	1.3	.9	1.4	1.8	2.2	1.6	.8	.8	1.3	1.4	.8
26	1.5	1.3	.9	1.4	1.8	2.4	2.0	.8	.8	* 1.0	1.6	.8
27	1.5	1.3	.9	1.4	1.8	2.4	2.0	.8	.8	.9	1.4	.8
28	1.5	1.3	.9	1.4	1.8	2.8	2.0	.8	.8	1.3	1.2	1.0
29	1.5	1.3	1.0	2.0	-	3.0	2.0	.8	.8	1.3	1.3	1.2
30	1.5	1.4	1.2	2.5	-----	3.0	1.8	.8	.8	1.2	1.4	1.2
31	1.3	-----	1.4	3.0	-----	3.0	-----	.8	-----	1.2	1.3	-----
Total	38.3	39.9	39.2	40.9	63.8	67.1	67.0	34.7	24.9	28.7	38.6	33.0
Mean	1.24	1.33	1.26	1.32	2.28	2.16	2.23	1.12	0.83	0.93	1.25	1.10
Ac-ft	76	79	78	81	127	133	133	69	49	57	77	65

Calendar year 1962: Max 6.6 Min 0.8 Mean 1.68 Ac-ft 1,220  
Water year 1962-63: Max 3.5 Min 0.7 Mean 1.41 Ac-ft 1,020

\* Discharge measurement made on this day.

Note.--Stage-discharge relation affected by ice Dec. 16 to Feb. 19 (no gage-height record Jan. 12 to Feb. 5).

Discharge, in cubic feet per second, October 1963

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
1	1.3	6	1.3	11	1.5	16	1.3	21	1.4	26	1.3
2	1.3	* 7	1.3	12	1.5	17	1.3	22	1.3	27	1.3
3	1.3	8	1.5	13	1.5	18	1.3	* 23	1.3	28	1.3
4	1.3	9	1.5	14	1.5	19	2.0	24	1.3	29	1.3
5	1.3	10	1.4	15	1.3	20	1.4	25	1.3	30	1.3
										31	1.3
Total											42.5
Mean											1.37
Runoff in acre-feet											84

\* Discharge measurement made on this day.

## RIO GRANDE BASIN

8-3133.5 Rito de los Frijoles in Bandelier National Monument, N. Mex.

Location.--Lat 47°29'08", long 106°16'50", in Bandelier National Monument, 2,000 ft southeast of Ceremonial Cave, 3,600 ft upstream from Monument headquarters, 6 miles south of Los Alamos and 19 miles northwest of Santa Fe.

Drainage area.-- 17.5 sq mi.

Records available.--July to September 1963.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 6,140 ft (from topographic map).

Extremes.--Maximum discharge during period, 1.6 cfs Aug. 26 (gage height, 0.31 ft); maximum gage height, 0.33 ft July 10; minimum discharge determined, 0.1 cfs July 27.

Remarks.--Records good except those for periods of doubtful or no gage-height record, which are poor. Pipe line diversion upstream not presently in use.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

Aug. 26 to Sept. 30

0.0	0	0.2	0.81
.1	.28	.3	1.53

## Discharge, in cubic feet per second, July to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										-	d 0.3	1.0
2										-	d .3	.8
3										-	d .6	.8
4										-	d .4	.8
5										-	d .2	.8
6										-	d .2	.8
7										-	d .2	.8
8										-	d .4	.7
9										-	d .6	.6
10										* 1.0	d .5	* .6
11										.5	d .6	.8
12										.4	d .9	.6
13										.3	* .7	.5
14										.3	.6	.6
15										.2	.5	.7
16										d .2	.4	.6
17										d .2	.4	.5
18										d .3	.4	.5
19										d .3	.4	.5
20										d .3	.3	.5
21										a .3	.3	.6
22										a .3	.5	.9
23										a .3	.4	.5
24										a .3	.4	.5
25										a .6	.6	.5
26										* .3	1.3	.5
27										.2	1.0	.4
28										.2	.8	a .5
29										.4	.8	a .7
30										.3	1.0	a .7
31										.3	.9	
Total										-	16.9	19.3
Mean										-	0.55	0.64
Ac-ft										-	34	38

Calendar year : Max Min Mean Ac-ft  
Water year : Max Min Mean Ac-ft

\* Discharge measurement made on this day.

a No gage-height record.

d Doubtful gage-height record.

## 8-3145. Rio Grande at Cochiti, N. Mex.

**Location.**--Lat 35°37'10", long 106°19'20", in SE¼NE¼ sec.17, T.16 N., R.6 E., on downstream end of concrete pier near left end of highway bridge, 1½ miles northeast of Cochiti, 3¼ miles north of Pena Blanca, and 8 miles upstream from Galisteo Creek.

**Drainage area.**--14,600 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

**Records available.**--October 1924 to September 1963. Published as "near Cochiti" prior to 1928. Monthly discharge only for some periods, published in WSP 1312.

**Gage.**--Water-stage recorder since July 16, 1925. Datum of gage is 5,224.70 ft above mean sea level, datum of 1929. Prior to July 16, 1925, staff gage 1 mile upstream at different datum. July 16, 1925, to Jan. 28, 1947, at or near right abutment of bridge at same datum. Jan. 28 to May 15, 1947, 600 ft upstream at same datum.

**Average discharge.**--39 years, 1,338 cfs (968,700 acre-ft per year).

**Extremes.**--Maximum discharge during year, 2,710 cfs Mar. 31 (gage height, 5.78 ft); minimum, 32 cfs July 16, Aug. 8.

1924-63: Maximum discharge, 23,400 cfs May 15, 1941 (gage height, 10.93 ft); minimum daily, 1 cfs Aug. 10-12, 1934.

The flood of May 23, 1920, probably exceeded 23,400 cfs, and is likely the highest since 1905.

**Remarks.**--Records good except those for periods of ice effect, which are fair. Discharge measurements generally made twice a month. Diversions above station for irrigation of about 700,000 acres, 6,000 of which are irrigated below by Cochiti eastside and Sili main canals which bypass station. Possible regulation by two reservoirs on Rio Chama.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Dec. 30 to Jan. 6, Mar. 9-21)

Oct. 1 to Jan. 6				Jan. 7 to Sept. 30			
3.9	198	4.5	910	2.9	20	4.0	520
4.1	345	4.8	1,420	3.1	70	4.5	920
4.3	600	5.1	2,000	3.5	195	5.0	1,420
				3.7	295	5.6	2,350

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	380	391	1,720	1,350	632	856	2,300	896	290	142	355	454
2	286	426	1,650	1,290	720	840	2,140	672	408	74	256	315
3	260	391	1,650	1,280	864	824	1,840	472	363	44	330	199
4	248	976	1,630	1,290	832	832	1,560	464	273	42	408	148
5	260	1,370	1,590	1,280	888	840	1,220	480	236	44	424	187
6	311	1,630	1,590	1,170	912	768	1,180	392	200	74	231	157
7	391	1,700	1,550	832	936	672	1,270	360	174	157	94	179
8	320	1,720	1,550	688	928	808	1,400	347	179	100	34	268
9	260	1,720	1,550	664	888	816	1,620	295	273	65	37	179
10	248	1,800	1,550	640	896	816	1,980	273	227	65	75	130
11	229	1,820	1,550	620	936	840	1,980	337	133	107	170	127
12	204	1,840	1,420	600	800	800	1,940	464	112	91	114	109
13	204	1,860	1,400	400	600	768	1,870	432	109	92	103	88
14	302	1,840	1,370	400	520	712	1,840	400	109	188	158	117
15	254	1,820	1,420	420	688	680	1,840	416	130	110	130	226
16	241	1,700	1,530	450	760	696	1,800	600	208	42	106	204
17	235	1,590	1,500	500	808	712	1,750	704	181	39	174	124
18	254	1,570	1,520	550	776	728	1,700	704	109	473	256	103
19	356	1,530	1,520	500	792	784	1,660	744	100	290	214	85
20	474	1,500	1,570	450	784	776	1,550	672	103	315	164	92
21	516	1,530	1,610	470	784	760	1,400	528	106	424	115	383
22	391	1,630	1,550	500	808	905	1,270	592	124	307	155	334
23	294	1,700	1,480	520	792	1,430	968	576	188	94	268	276
24	277	1,700	1,440	500	832	1,860	864	536	144	54	207	219
25	277	1,700	1,420	470	848	1,860	864	544	103	54	278	365
26	294	1,690	1,350	500	824	1,800	904	592	73	54	268	178
27	368	1,720	1,240	470	816	1,800	928	464	202	76	200	160
28	460	1,650	1,330	500	832	1,720	1,050	334	302	136	231	180
29	368	1,700	1,460	520	-	1,950	1,070	268	406	88	320	181
30	328	1,720	1,380	584	-----	2,300	1,140	262	222	54	308	157
31	336	-----	1,370	592	-----	2,330	-----	268	-----	52	339	-----
Total	9,626	45,934	46,410	21,000	22,496	34,283	44,898	15,088	5,787	3,947	6,522	5,924
Mean	311	1,531	1,497	677	803	1,106	1,497	487	193	127	210	197
Ac-ft	19,090	91,110	92,050	41,650	44,620	68,000	89,050	29,930	11,480	7,830	12,940	11,750
(†)	5,220	111	0	0	0	4,180	7,710	6,710	6,210	5,580	5,020	5,130

Calendar year 1962: Max 7,050 Min 85 Mean 1,362 Ac-ft 986,200  
Water year 1962-63: Max 2,330 Min 34 Mean 718 Ac-ft 519,500

Peak discharge (base, 4,500 cfs)--No peak above base.

† Combined monthly diversion, in acre-ft, of Sili main and Cochiti eastside canals; records of this flow are furnished by Bureau of Reclamation.

Note.--Stage-discharge relation affected by ice Jan. 11-29, Feb. 12-14.

## RIO GRANDE BASIN

8-3160. Santa Fe River near Santa Fe, N. Mex.

Location.--Lat 35°41'10", long 105°50'35", in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.23, T.17 N., R.10 E., on left bank 0.4 mile downstream from McClure Dam and 5 $\frac{1}{2}$  miles east of Santa Fe.

Drainage area.--18.2 sq mi.

Records available.--January 1913 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1953, published as Santa Fe Creek near Santa Fe.

Gage.--Water-stage recorder and concrete control. Datum of gage is 7,718 ft above mean sea level, datum of 1929. Prior to Nov. 4, 1930, at site 1.5 miles downstream and Apr. 11, 1931, to September 1947 at site 0.3 mile upstream, each at different datum.

Average discharge.--50 years, 8.34 cfs (6,040 acre-ft per year).

Extremes.--Maximum discharge during year, 92 cfs May 17 (gage height, 2.87 ft); minimum, 0.6 cfs Dec. 1-8, 13-18.

1913-63: Maximum discharge, 1,500 cfs Aug. 14, 1921 (gage height, 5.17 ft, site and datum then in use), from rating curve extended above 150 cfs by logarithmic plotting; minimum daily, 0.1 cfs Feb. 7-10, 20, 1927, Aug. 1-4, 1951.

Peaks which probably exceeded 1,000 cfs occurred Aug. 19, 1872, and Sept. 29 or 30, 1904. Without regulation the flood of Sept. 23, 1929, might have exceeded 1,500 cfs.

Remarks.--Records good. Flow regulated by McClure Reservoir (see p 176), completed in 1926, raised in 1935, and again in 1947.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.4	0.4	1.8	5.6
1.5	1.0	1.9	8.4
1.6	1.9	2.1	16
1.7	3.4	2.3	27

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.6	0.8	0.6	0.7	1.5	1.2	1.2	1.4	6.3	1.9	9.8	3.1
2	3.6	*.9	.6	.7	1.4	1.3	1.1	*1.3	3.4	1.8	1.3	3.1
3	*3.4	.9	.6	.9	1.2	1.3	5.5	1.3	10	1.7	1.5	*3.1
4	3.4	.9	*.6	.9	1.1	1.3	10	1.2	1.3	1.7	1.4	3.1
5	3.6	.9	.6	.9	1.0	*1.2	10	1.2	9.4	1.7	1.4	3.1
6	3.6	.9	.6	.9	1.0	1.2	10	9.4	9.1	1.6	1.4	3.1
7	3.4	.9	.6	*.9	1.0	1.3	1.1	1.6	8.8	*1.6	1.2	3.1
8	3.4	.9	.6	1.0	*1.0	1.4	*1.4	2.2	*8.8	1.6	9.8	3.1
9	3.4	.9	.7	1.1	.9	1.4	1.7	2.1	8.4	1.6	9.8	3.1
10	3.4	.9	.7	1.1	.9	1.3	1.8	2.0	8.1	1.6	9.8	3.1
11	3.4	.9	.7	1.1	.9	1.3	1.9	2.0	7.8	1.6	9.8	3.1
12	3.4	.9	.7	1.1	.9	1.2	1.9	2.0	7.6	1.6	*9.8	3.1
13	3.4	.9	.6	1.1	.9	1.2	1.9	1.7	7.3	1.3	*9.8	4.2
14	3.4	.9	.6	1.1	1.0	1.2	1.9	1.4	7.3	10	6.9	5.6
15	3.4	.9	.6	1.1	1.0	1.2	1.9	1.4	7.0	9.8	3.1	5.9
16	3.4	.9	.6	1.1	1.1	1.2	1.9	1.4	7.0	9.8	3.1	5.9
17	3.4	.9	.6	1.1	1.0	1.2	1.9	1.3	7.0	9.8	3.1	5.9
18	3.4	.9	.6	1.1	1.0	1.2	1.9	5.4	7.0	9.8	3.1	5.9
19	3.4	.9	.7	1.1	1.1	1.2	1.9	5.2	6.7	9.8	3.1	5.9
20	3.4	.9	.7	1.1	1.1	1.3	1.9	4.5	6.7	9.8	3.1	5.9
21	3.4	.8	.7	1.2	1.2	1.2	1.9	4.5	6.7	9.8	3.1	6.2
22	3.4	.8	.7	1.2	1.1	1.3	1.8	6.8	6.4	9.8	3.1	6.2
23	3.4	.8	.7	1.2	1.1	1.3	10	9.1	6.4	9.8	3.1	6.2
24	2.2	.8	.7	1.3	1.1	1.3	3.3	1.3	10	9.8	3.1	6.2
25	.8	.8	.7	1.3	1.1	1.3	3.3	1.7	1.7	9.8	3.1	6.2
26	.8	.8	.7	1.3	1.2	1.3	3.4	1.7	1.9	9.8	3.1	6.2
27	.7	.8	.7	1.3	1.3	1.3	3.4	1.2	1.6	9.8	3.3	6.2
28	.7	.8	.7	1.3	1.3	1.3	3.6	8.1	1.7	9.8	3.3	6.2
29	.8	.8	.7	1.3	-	1.3	1.1	7.8	2.0	9.8	3.3	6.2
30	.8	.7	.7	1.4	-----	1.3	1.5	7.6	1.9	9.8	3.3	6.2
31	.8	-----	.7	1.4	-----	1.2	-----	7.3	-----	9.8	3.1	-----
Total	86.6	25.8	20.3	34.3	30.4	39.2	377.8	389.7	294.2	389.6	211.0	144.4
Mean	2.79	0.86	0.65	1.11	1.09	1.26	12.6	12.6	9.81	12.6	6.81	4.81
Ac-ft	172	51	40	68	60	78	749	773	584	773	419	286

Calendar year 1962: Max 46 Min 0.6 Mean 7.09 Ac-ft 5,140  
 Water year 1962-63: Max 22 Min 0.6 Mean 5.60 Ac-ft 4,050

\* Discharge measurement made on this day.

8-3180. Galisteo Creek at Domingo, N. Mex.

Location.--Lat 35°30'45", long 106°19'00", in SW $\frac{1}{4}$  sec.21, T.15 N., R.6 E., in Santo Domingo Pueblo Grant, 160 ft downstream from highway bridge, 0.3 mile northeast of Domingo,  $2\frac{3}{4}$  miles east of Santo Domingo Pueblo, and 4 miles upstream from mouth.

Drainage area.--640 sq mi, approximately.

Records available.--October 1941 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 5,255.50 ft above mean sea level, datum of 1929 (levels by Corps of Engineers). Prior to July 20, 1956, at site 160 ft upstream at same datum.

Average discharge.--22 years, 9.99 cfs (7,230 acre-ft per year).

Extremes.--Maximum discharge during year, 6,100 cfs Aug. 26 (gage height, 5.20 ft); no flow on many days.

1941-63: Maximum discharge, 19,600 cfs Sept. 25, 1955 (gage height, 12.1 ft, from floodmark), from rating curve extended above 11,000 cfs on basis of slope-area measurement of peak flow; no flow at times.

The floods of Sept. 23, 1929, and Aug. 20, 1935, probably exceeded 20,000 cfs. Discharge for the flood of Aug. 20, 1935, was estimated as 24,300 cfs by H. W. Yeo.

Remarks.--Records fair above 10 cfs, and poor below. Discharge measurements or observations of no flow generally made twice a month. Diversions for irrigation of about 50 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.2	1.2	a 0.1	a 0.2	0			0	0	0	0
2	.5	.2	.5	.4	a .1	0			42.4	0	0	0
3	.4	.2	.3	.7	a 0	0			28	0	23	0
4	.2	.2	.2	1.3	a 0	0			1.5	9.5	38	9.2
5	1.7	.3	.2	.4	a 0	.1			.2	6.7	7.0	28
6	.4	.3	.2	.2	a 0	.1			0	0	2.6	72
7	.7	.2	.2	.2	a 0	0			0	6.4	2.1	1.5
8	.4	.1	.2	.2	a 0	0			0	3.6	1.2	0
9	.3	.2	.2	.3	a 0	0			0	52	50	0
10	.2	.3	.2	.2	a .2	0			0	2.1	70	0
11	.1	.2	.2	a 0	a .1	0			0	.2	90	0
12	.2	.2	.2	a 0	a 0	0			0	0	22	10
13	.1	.2	.2	a .1	a .3	0			0	0	196	4.0
14	.1	.2	.1	a .1	a .2	0			5.5	0	49	1.7
15	.1	1.0	.3	a .1	a .2	0			3.2	0	15	1.5
16	0	.6	.2	a .1	a .2	0			2.7	0	4.4	0
17	.3	1.4	.2	a .2	a .1	0			3.5	0	3.5	0
18	.4	.6	1.0	a .2	a .1	0			.7	0	1.4	0
19	1.4	.7	.6	a 0	a .1	0			.3	0	250	0
20	1.7	.3	.2	a 0	a 0	0			0	.1	.9	0
21	.8	.2	.2	a .1	a 0	0			0	1.8	0	1,790
22	.6	.1	.2	a .3	a .1	0			0	.4	0	286
23	.5	.1	.3	a .2	a 0	0			0	0	0	26
24	.4	.9	a .2	a 0	a 0	0			0	0	94	2.6
25	.3	.1	.8	a .2	a 0	0			0	0	123	.7
26	.4	.5	.6	a .3	a 0	0			0	0	876	0
27	.4	.3	a .2	a .2	0	0			0	0	7.0	0
28	.4	.2	a .1	a .2	0	0			0	0	2.8	0
29	.4	.2	a .3	a .2	0	0			0	1.0	108	0
30	.4	.9	a .2	a .3	0	0			0	0	236	0
31	.3		a .1	a .4	0	0			0	0	.8	
Total	14.8	10.2	10.5	7.3	1.9	0.2	0	0	469.6	169.3	2,273.7	2,233.2
Mean	0.48	0.34	0.34	0.24	0.07	0.006	0	0	15.7	5.46	73.3	74.4
Ac-ft	29	20	21	14	3.8	0.4	0	0	931	336	4,510	4,430

Calendar year 1962: Max 425 Min 0 Mean 6.93 Ac-ft 5,020  
 Water year 1962-63: Max 1,790 Min 0 Mean 14.2 Ac-ft 10,300

Peak discharge (base, 3,000 cfs)

a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	0420	4.71	4,520	9-21	2100	4.20	4,300
8-26	0130	5.20	6,100				



## 8-3190. Rio Grande at San Felipe, N. Mex.

**Location.**--Lat 35°26'40", long 106°26'20", in SW 1/4 sec. 17, T.14 N., R.5 E., in San Felipe Grant, on right bank 200 ft below mouth of Tonque Arroyo, 1,800 ft upstream from steel highway bridge, three-quarters of a mile upstream from San Felipe Pueblo, and 11 miles northeast of Bernalillo.

**Drainage area.**--16,100 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

**Records available.**--October 1925 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

**Gage.**--Water-stage recorder. Datum of gage is 5,115.73 ft above mean sea level, datum of 1929, adjustment of 1951. Prior to Sept. 27, 1957, at site 1,800 ft downstream at datum 5.35 ft lower, except period May 16, 1945 to Sept. 30, 1946 when it was 5.94 ft lower than present datum.

**Average discharge.**--38 years, 1,426 cfs (1,032,000 acre-ft per year).

**Extremes.**--Maximum discharge during year, 3,730 cfs Aug. 26 (gage height, 5.11 ft); maximum gage height, 5.20 ft Sept. 21; minimum discharge, 49 cfs July 31.

1927-63: Maximum discharge, 27,300 cfs June 26, 1937 (gage height, 11.13 ft site and datum then in use), from rating curve extended above 15,000 cfs by logarithmic plotting; minimum daily, 34 cfs July 7, 1934.

Other major floods occurred in 1874, 1884 and 1904.

**Remarks.**--Records good except those for period of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions for irrigation of about 705,000 acres above station, some of which are irrigated below by Cochiti eastside main canal and San Felipe eastside acequia, which bypass station. Possible regulation by two reservoirs on Rio Chama.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Nov. 6 to Dec. 4, Dec. 29 to Jan. 3, Aug. 20 to Sept. 25)

Oct. 1 to Mar. 22				Mar. 23 to Sept. 30			
2.9	215	4.0	1,500	2.2	47	3.0	425
3.1	340	4.5	2,400	2.4	102	3.5	950
3.5	780			2.7	228	4.0	1,830

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	462	430	1.630	1.380	684	806	2,230	1,030	330	223	172	468
2	390	462	1.640	1.380	660	793	2,250	779	680	167	285	320
3	360	430	1.660	1.340	845	806	1,990	548	493	124	268	274
4	333	778	1.610	1.230	845	832	1,710	484	402	135	372	262
5	340	1,260	1.530	1.280	897	884	1,490	493	365	109	380	298
6	333	1,560	1.530	1.170	1,010	780	1,290	459	330	96	285	274
7	390	1,640	1.550	994	1,020	550	1,390	388	298	155	180	218
8	350	1,680	1.550	768	1,020	780	1,470	402	262	176	93	251
9	291	1,730	1.520	672	952	806	1,710	350	318	109	74	214
10	291	1,800	1.520	605	966	806	1,990	324	292	151	102	190
11	284	1,810	1.500	605	1,040	858	1,990	337	239	127	176	194
12	270	1,830	1.460	605	952	793	1,890	434	209	172	180	180
13	265	1,810	1.420	390	684	744	1,810	442	190	131	151	155
14	333	1,800	1.420	b 350	440	696	1,870	380	185	167	257	142
15	284	1,780	1.440	b 400	549	649	1,870	365	176	163	214	209
16	254	1,760	1.470	b 450	696	696	1,870	434	218	86	163	209
17	248	1,600	1.470	b 500	732	720	1,870	678	234	80	180	185
18	259	1,600	1.500	b 530	696	756	1,790	678	176	303	251	155
19	319	1,600	1.500	b 500	720	806	1,730	733	155	350	528	134
20	495	1,520	1.520	a 470	756	806	1,590	700	138	318	262	131
21	517	1,520	1.550	a 450	744	768	1,570	605	134	395	234	1,380
22	451	1,530	1.530	b 500	768	871	1,470	548	134	372	209	830
23	390	1,600	1.500	a 500	780	1,590	1,170	616	180	205	304	a 400
24	380	1,630	1.470	a 500	780	1,810	962	576	176	116	274	a 300
25	390	1,630	1.440	a 500	819	1,780	924	548	120	99	365	459
26	420	1,660	1.410	b 500	819	1,750	1,030	605	106	86	238	a 300
27	451	1,730	1.360	b 500	819	1,710	1,020	548	86	74	256	a 250
28	495	1,640	1.350	528	793	1,670	1,190	434	318	120	251	a 220
29	462	1,550	1.400	561	-	1,790	1,170	350	330	124	631	a 200
30	420	1,600	1.400	627	-----	2,050	1,200	337	388	71	580	a 180
31	420	-----	1.380	684	-----	2,070	-----	350	-----	54	372	-----
Total	11,347	44,970	46,230	21,469	22,486	33,226	47,576	15,955	7,662	5,058	8,987	8,982
Mean	366	1,499	1,491	693	803	1,072	1,586	515	255	163	290	299
Ac-ft	22,510	89,200	91,700	42,580	44,600	65,900	94,370	31,650	15,200	10,030	17,830	17,820

Calendar year 1962: Max 7,200 Min 149 Mean 1,400 Ac-Ft 1,009,000  
Water year 1962-63: Max 2,250 Min 54 Mean 751 Ac-Ft 543,400

Peak discharge (base, 5,000 cfs)--No peak above base.

- a No gage-height record.
- b Stage-discharge relation affected by ice.

8-3215. Jemez River below East Fork, near Jemez Springs, N. Mex.

Location.--Lat 35°49'39", long 106°38'51", in NW¼ sec. 5, T. 18 N., R. 3 E., on left bank 0.4 mile downstream from East Fork and boundary of Santa Fe National Forest and 5.3 miles northeast of Jemez Springs.

Drainage area.--173 sq mi.

Records available.--July 1949 to October 1950 (gaged separately above East Fork), May 1951 to September 1957 (irrigation seasons only), March 1958 to September 1963. Records for 1949-50 published as "near Jemez Springs" and "East Fork Jemez River near Jemez Springs".

Gage.--Water-stage recorder. Datum of gage is 6,702.7 ft above mean sea level (planetable survey). Prior to May 1951, at sites 3,000 ft upstream, at different datums and on separate channels.

Average discharge.--6 years (1949-50, 1958-63) 27.1 cfs (19,600 acre-ft per year).

Extremes.--Maximum discharge during year, 945 cfs Mar. 23 (gage height, 4.33 ft); minimum, 8.6 cfs June 30. 1949-50, 1951-63: Maximum discharge recorded, 2,520 cfs Apr. 31, 1958 (gage height, 7.35 ft), from rating curve extended above 1,100 cfs on basis of slope-area and contracted-opening measurements of peak flow; minimum daily recorded, 6 cfs Jan. 5, 1960.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. No diversion above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	7.4	2.0	130
.9	10	2.5	231
1.0	15	3.1	405
1.2	28	3.3	480
1.5	58		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	14	19	12	21	16	41	15	11	9.2	9.2	29
2	13	14	18	12	b 130	* 14	32	15	13	9.5	* 9.2	21
3	13	14	17	13	143	17	25	* 14	14	9.8	10	17
4	13	14	16	14	72	16	27	14	12	* 12	10	16
5	* 15	14	14	14	* 60	15	25	14	11	12	9.8	17
6	14	14	14	b 12	48	15	24	14	10	11	9.8	18
7	13	13	15	b 12	35	b 14	* 24	14	10	11	9.5	19
8	13	13	15	b 12	* 30	15	24	13	9.8	13	9.5	15
9	13	14	14	b 12	27	14	24	13	10	25	11	14
10	13	14	14	13	24	17	23	13	* 10	20	12	15
11	12	14	12	b 12	b 18	14	22	13	10	14	18	14
12	13	13	12	b 11	b 10	11	20	13	10	12	23	13
13	12	13	14	10	b 10	12	20	12	10	11	25	* 12
14	13	* 15	14	10	b 14	18	20	12	11	10	25	13
15	13	30	13	* b 10	18	20	20	12	11	10	26	13
16	13	26	15	11	18	17	19	12	11	9.8	* 21	12
17	14	20	14	11	b 15	20	18	12	12	9.8	17	11
18	17	18	18	12	b 14	22	17	12	11	* 10	16	11
19	25	13	18	12	16	17	17	12	11	13	19	11
20	* 23	14	16	12	15	23	17	12	10	12	20	12
21	17	18	14	13	17	34	16	12	11	11	16	13
22	14	18	12	13	14	* 100	16	12	10	10	16	13
23	14	18	12	13	14	360	15	12	9.8	10	14	12
24	14	16	16	13	16	454	* 16	* 12	9.8	9.8	13	12
25	14	16	12	14	16	291	16	11	9.8	10	22	11
26	14	18	b 10	14	16	* 222	19	11	9.8	10	59	11
27	14	18	b 12	13	17	144	19	11	9.5	9.5	36	11
28	14	18	13	13	16	95	17	11	9.5	9.2	* 24	10
29	14	17	b 12	13	-	94	16	11	9.5	9.5	21	10
30	14	17	b 12	14	-----	55	15	11	9.2	9.5	24	10
31	14	-----	b 12	14	-----	48	-----	11	-----	9.2	22	-----
Total	4 46	4 88	4 39	3 84	8 64	2 224	6 24	3 86	3 15.7	3 51.8	5 77.0	4 16
Mean	14.4	16.3	14.2	12.4	30.9	71.7	20.8	12.5	10.5	11.3	18.6	13.9
Ac-ft	885	968	871	762	1,710	4,410	1,240	766	626	698	1,140	825

Calendar year 1962: Max 390 Min 9.8 Mean 33.1 Ac-ft 23,990  
Water year 1962-63: Max 454 Min 9.2 Mean 20.6 Ac-ft 14,900

Peak discharge (base, 500 cfs).--Mar. 23 (2400) 945 cfs (4.33 ft).

\* Discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Nov. 19-28, Jan. 13, 14.

8-3230. Rio Guadalupe at Box Canyon near Jemez, N. Mex.

Location.--Lat 35°43'55", long 106°45'45", in E½ sec. 6, T. 17 N., R. 2 E. (projected), in Canon de San Diego Grant, on left bank at downstream end of Guadalupe Box Canyon, 4.8 miles upstream from mouth, 5 miles southwest of Jemez Springs, and 7 miles north of Jemez.

Drainage area.--235 sq mi.

Records available.--May 1951 to September 1957 (irrigation seasons only), May 1958 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 6,015.5 ft above mean sea level, datum of 1929 (planetable survey).

Average discharge.--5 years (1959-63), 33.1 cfs (23,960 acre-ft per year).

Extremes.--Maximum discharge during year, 464 cfs Aug. 25 (gage height, 5.43 ft); minimum, 3.4 cfs Aug. 8.

1951-63: Maximum discharge determined, 1,440 cfs Apr. 21, 1958 (gage height, 7.6 ft, from floodmarks), from rating curve extended above 750 cfs on basis of slope-area measurements of peak flow; minimum, 2 cfs Feb. 28, 1962.

Maximum discharge known probably occurred on May 13 or 14, 1941, when a discharge of 3,190 cfs was computed for a downstream station (drainage area, 239 sq mi) called Rio Guadalupe near Jemez Springs.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Some regulation by San Gregorio Reservoir on Clear Creek, tributary to Rio de Las Vacas, to Rio Guadalupe (constructed July to October 1958, capacity, 345 acre-ft), and by transpountain diversion into Rio Puerco Basin for irrigation of 200 to 300 acres in vicinity of Cuba.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.9	3.1	3.7	42
3.0	4.7	4.0	81
3.2	10	4.5	183
3.4	19	5.0	316

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1												
2	12	8.2	13	b 7	17	12	109	45	10	a 4	3.9	21
3	9.7	8.2	13	b 7	15	12	95	46	10	a 4	3.7	16
4	9.1	7.9	11	b 7	26	a 10	70	44	10	a 4	4.9	12
5	8.5	7.9	10	7.9	21	a 12	72	50	10	4.4	4.9	9.4
6	9.4	7.6	9.4	8.2	21	a 12	69	48	9.4	4.5	4.9	8.8
7												
8	9.1	7.3	8.8	b 7	21	a 10	63	46	8.5	4.4	4.1	12
9	8.8	7.3	8.8	b 7	19	a 10	78	48	7.9	7.0	3.7	10
10	8.5	7.0	9.1	b 7	16	a 12	109	49	7.6	6.3	3.6	8.8
11	7.9	6.8	8.8	b 7	16	a 12	156	49	7.6	12	11	7.9
12	7.6	6.8	8.8	8.2	19	a 13	151	48	7.3	21	7.3	8.5
13												
14	7.3	6.8	8.4	b 8	15	a 13	130	41	7.3	16	8.2	7.9
15	7.3	6.8	8.2	a 7	b 10	a 12	128	38	a 7	10	8.8	7.9
16	7.3	7.0	8.2	a 8	b 10	a 8	153	32	a 6	7.9	8.2	7.9
17	7.0	7.3	8.2	a 8	b 13	a 7	178	28	a 6	6.8	8.8	7.9
18	7.0	13	7.9	a 8	b 13	a 9	191	25	a 6	6.1	8.2	7.9
19												
20	7.0	18	7.9	8.2	14	a 12	143	27	a 5	5.6	9.1	8.5
21	7.9	14	8.2	7.9	14	a 10	109	28	a 5	5.2	10	8.5
22	9.4	13	10	7.9	13	a 15	95	23	a 5	5.2	8.5	7.6
23	13	a 10	10	7.6	12	a 10	74	21	a 5	5.4	10	6.8
24	14	a 10	9.1	7.6	12	a 10	72	19	a 5	4.9	10	8.8
25												
26	14	a 14	8.8	7.9	13	a 15	68	18	a 5	4.7	12	10
27	12	a 13	8.2	7.9	12	37	63	18	a 5	4.5	10	12
28	13	a 13	8.2	7.9	12	57	57	16	a 4	4.2	8.8	11
29	12	a 13	9.4	7.9	12	66	56	16	a 4	4.2	8.2	9.4
30	10	a 12	8.5	8.2	12	66	51	14	a 4	4.4	31	8.5
31												
32	9.4	a 12	b 6	7.6	12	65	54	13	a 4	4.4	30	a 8
33	9.4	a 12	b 7	b 7	14	66	72	12	a 4	4.1	16	a 7
34	8.8	a 10	b 8	b 7	12	78	66	12	a 4	4.1	12	a 7
35	8.5	10	b 7	7.6	-	104	50	12	a 4	4.1	10	a 6
36	8.5	12	b 7	7.6	-----	88	45	12	a 4	3.9	24	a 6
37	8.2	-----	b 7	9.1	-----	102	-----	12	-----	3.9	19	-----
Total	291.6	301.9	271.9	237.2	436	965	2827	910	187.6	191.2	322.8	279.0
Mean	9.41	10.1	8.77	7.65	15.6	31.1	94.2	29.4	6.25	6.17	10.4	9.30
Ac-ft	578	599	539	470	865	1,910	5,610	1,800	372	379	640	553

Calendar year 1962: Max 472 Min 4.4 Mean 43.3 Ac-ft 31,340

Water year 1962-63: Max 191 Min 3.6 Mean 19.8 Ac-ft 14,320

Peak discharge (base, 400 cfs).--Aug. 25 (2330) 464 cfs (5.43 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

## 8-3240. Jemez River near Jemez, N. Mex.

Location.--Lat 35°39'45", long 106°44'30", in NW¼ sec. 33, T.17 N., R.2 E. (projected), in Canyon de San Diego Grant, on left bank 0.7 mile downstream from Rio Guadalupe and 3½ miles north of Jemez, Sandoval County.

Drainage area.--470 sq mi.

Records available.--June 1936 to May 1941 (published as Jemez Creek near Jemez), August 1949 to October 1950, May 1951 to September 1952 (irrigation seasons only), March 1953 to September 1954, May 1955 to September 1957 (irrigation seasons only), May 1958 to September 1963.

Gage.--Water-stage recorder (digital). Datum of gage is 5,622.3 ft above mean sea level, datum of 1929. June 22, 1936, to Mar. 11, 1937, at site 60 ft upstream at datum 0.50 ft higher. Mar. 12, 1937, to July 8, 1938, at present site at datum 0.70 ft higher. July 9, 1938, to May 6, 1941, at site 60 ft upstream at datum 0.70 ft higher.

Average discharge.--11 years (1936-40, 1949-50, 1953-54, 1958-63), 64.0 cfs (46,330 acre-ft per year).

Extremes.--Maximum discharge during year, 3,590 cfs Aug. 26 (gage height, 7.24 ft); minimum, 7.9 cfs Dec. 26. 1936-41, 1949-63: Maximum discharge recorded, 3,590 cfs May 6, 1941 and Aug. 26, 1963 (gage heights, 8.60 and 7.24 ft, respectively); minimum daily recorded, 5.8 cfs July 11, 12, 1951.

Maximum flood known since at least 1890 occurred between May 6 and 15, 1941, after gage was destroyed (discharge probably exceeded 6,000 cfs), from information by local residents. A peak of 5,900 cfs occurred Apr. 21, 1958 (gage height, 8.2 ft); from rating curve extended above 2,200 cfs on basis of contracted-opening measurement.

Remarks.--Records good except those for periods of ice effect, which are fair. Diversions for irrigation of about 300 acres above station.

Rating tables, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Aug. 18-31, Sept. 15-30)

Oct. 1 to Mar. 21				Mar. 22 to Sept. 30			
1.2	13	1.9	86	1.2	7.5	1.7	35
1.4	26	2.4	185	1.4	14	2.0	72
1.6	44			1.5	19	2.5	168

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	25	35	20	24	32	178	* 61	14	10	12	64
2	28	25	33	20	165	* 29	150	62	18	10	* 13	47
3	28	25	32	* 23	172	32	114	62	19	9.6	30	35
4	23	25	29	25	106	34	114	64	17	* 10	18	30
5	* 26	25	28	23	* 91	31	107	61	15	18	22	30
6	28	25	25	22	81	27	102	59	13	17	15	32
7	28	25	28	22	62	27	* 109	61	13	17	13	32
8	27	24	25	22	* 56	30	137	58	13	19	18	29
9	24	24	25	22	50	29	185	60	12	27	19	26
10	22	25	24	23	55	33	185	58	* 12	48	22	26
11	22	25	23	21	39	32	163	55	12	35	20	24
12	22	25	22	20	22	28	159	51	12	24	40	22
13	24	26	25	21	23	22	178	45	12	20	43	* 21
14	28	* 27	25	21	32	25	194	39	12	17	37	21
15	27	41	24	* b 21	34	34	207	36	12	15	37	21
16	22	51	26	b 21	35	34	161	36	12	14	* 43	20
17	23	41	25	b 22	30	34	130	39	13	15	34	20
18	32	38	32	b 22	29	43	116	33	14	* 15	30	18
19	85	27	31	b 22	31	31	91	31	14	18	45	18
20	* 44	28	28	b 22	30	37	93	30	13	18	31	19
21	36	35	25	b 22	34	51	88	29	13	17	35	23
22	31	34	22	b 23	30	* 96	83	27	14	15	31	24
23	29	34	19	b 23	28	285	74	28	12	14	27	20
24	28	33	29	19	30	602	* 72	* 26	12	14	24	19
25	27	32	24	23	31	414	69	25	11	14	58	18
26	26	34	15	22	31	338	68	24	11	14	192	18
27	27	33	21	21	34	259	86	23	11	14	72	18
28	26	31	21	22	32	212	80	21	10	13	* 66	18
29	26	* 30	22	23	-	248	66	18	10	13	46	17
30	26	33	22	23	-----	182	61	16	11	14	56	16
31	26	-----	22	24	-----	178	-----	16	-----	13	46	-----
Total	899	906	787	680	1,417	3,489	3,620	1,254	387	531.6	1,195	746
Mean	29.0	30.2	25.4	21.9	50.6	113	121	40.5	12.9	17.1	38.5	24.9
Ac-ft	1,780	1,800	1,560	1,350	2,810	6,920	7,180	2,490	768	1,050	2,370	1,480

Calendar year 1962: Max 676 Min 14 Mean 81.0 Ac-ft 58,620  
Water year 1962-63: Max 602 Min 9.6 Mean 43.6 Ac-ft 31,560

Peak discharge (base, 1,000 cfs).--Mar. 24 (0200) 1,070 cfs (4.79 ft); Aug. 26 (0100) 3,590 cfs (7.24 ft).

\* Discharge measurement made on this day.  
b Stage-discharge relation affected by ice.

8-3290. Jemez River below Jemez Canyon Dam, N. Mex.

Location.--Lat 35°23'10", long 106°31'45", in NE $\frac{1}{4}$  sec. 5, T.13 N., R.4 E., on right bank three-quarters of a mile downstream from Jemez Canyon Dam,  $\frac{1}{2}$  miles upstream from mouth, and 6 miles north of Bernalillo.

Drainage area.--1,040 sq mi.

Records available.--March 1936 to January 1938, March 1943 to September 1963. Published as "Jemez Creek" prior to 1948, and as "near Bernalillo" prior to 1954.

Gage.--Water-stage recorder. Datum of gage is 5,095.60 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark). Prior to Apr. 24, 1951, at site three-quarters of a mile upstream at datum 24.51 ft higher. Apr. 24, 1951, to June 25, 1958, at site 37 ft upstream at datum 4.40 ft above present datum. Supplementary water-stage recorder at gates on Jemez Canyon Dam at datum 5,125.00 ft above mean sea level, datum of 1929 (Corps of Engineers bench mark) used at times since January 1953.

Average discharge.--21 years (1936-37, 1943-63), 51.5 cfs (37,280 acre-ft per year).

Extremes.--Maximum discharge during year, 606 cfs Mar. 25 (gage height, 7.45 ft); no flow at times.

1936-38, 1943-63: Maximum discharge, 16,300 cfs Aug. 29, 1943 (gage height, 5.62 ft, site and datum then in use), from rating curve extended above 3,000 cfs by logarithmic plotting; no flow at times.

A flood in 1900 was probably less than 16,000, but highest known outside period of record.

Remarks.--Records fair for March to July, others poor. Discharge measurements generally made 2 to 6 times a month. Subsequent to October 1953, flow at this station can be completely regulated by Jemez Canyon Reservoir (see p. 176). However, reservoir is designed essentially for desilting and flood control rather than storage. Diversions for irrigation of about 3,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	16	31	20	70	30	a 85	26			0	100
2	5.4	16	a 30	23	46	18	280	27			0	45
3	5.8	17	a 27	34	219	20	100	29			0	a 20
4	5.4	18	a 25	38	145	26	a 60	27			0	17
5	11	18	a 22	42	112	31	92	24			0	9.0
6	8.7	18	20	b 27	94	26	88	20			0	6.0
7	9.4	18	17	b 23	93	25	85	19			0	2.7
8	11	17	18	b 20	68	31	93	16			0	1.4
9	9.8	19	20	b 15	56	36	164	9.6			0	1.5
10	7.5	19	14	b 17	71	32	257	9.0			0	.6
11	5.2	18	16	b 7	20	29	214	9.9			0	.6
12	5.7	18	15	b 5	a 5	30	124	9.3			0	.2
13	7.0	18	16	a 0	25	19	120	10			0	0
14	8.7	21	18	a 0	40	17	120	9.3			0	0
15	13	27	18	a 0	50	20	126	2.8			0	0
16	11	34	17	a 0	70	20	130	0			0	0
17	14	38	21	a 1	46	30	139	0			0	0
18	21	31	28	a 2	32	34	76	0			0	0
19	116	28	27	a 1	34	40	59	0			0	0
20	118	27	27	a 0	31	32	62	0			0	0
21	a 45	30	25	a 0	37	38	55	0			0	.6
22	a 35	30	24	b 2	38	43	48	0			8.5	0
23	a 31	32	24	b 5	31	166	42	0			4.6	0
24	29	32	26	b 2	32	237	31	0			3.8	2.5
25	22	31	24	b 40	29	406	27	0			3.4	4.3
26	20	32	b 10	28	34	435	31	0			114	1.4
27	18	28	b 12	25	29	370	34	0			54	0
28	17	30	b 12	22	31	166	32	0			11	0
29	18	29	15	46	-	95	31	0			34	0
30	17	30	17	56	-----	a 75	24	0			102	0
31	16	-----	20	79	-----	a 80	-----	0			27	-----
Total	666.6	740	637	580	1,588	2,677	2,829	2,479	0	0	362.3	212.8
Mean	21.5	24.7	20.5	18.7	56.7	86.4	94.3	8.00	0	0	11.7	7.09
Ac-ft	1,320	1,470	1,260	1,150	3,150	5,310	5,610	492	0	0	719	422

Calendar year 1962: Max 1,570 Min 0 Mean 60.2 Ac-ft 43,570  
 Water year 1962-63: Max 455 Min 0 Mean 28.9 Ac-ft 20,900

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3291. Bernalillo floodwater retarding reservoir No. 1 (Piedra Lisa Arroyo), near Bernalillo, N. Mex.

Location.--Lat 35°18'50", long 106°31'45", in NW¼ sec.33, T.13 N., R.4 E. (projected), in Bernalillo Grant, in reservoir 0.3 mile east of intersection of State Highways 44 and 422 and 1½ miles northeast of Bernalillo.

Drainage area.--4.1 sq mi, of which 2.0 sq mi has contouring, pitting and small dams to reduce runoff.

Records available.--September 1955 to September 1963.

Gage.--Water-stage recorder adjacent to outlet tower with fixed ports. Datum of gage is 5,169.98 ft above mean sea level (levels by Soil Conservation Service). Since July 21, 1958, supplementary outflow gage 390 ft below toe of dam, water-stage recorder and Parshall flume.

Average outflow.--8 years, 0.014 cfs (10.1 acre-ft per year).

Extremes.--Maximum outflow during year, 18.5 cfs Aug. 3; no inflow or outflow except that of Oct. 19, Aug. 3, 29.

1955-63: Maximum outflow, 55 cfs July 19, 1956 (gage height, 11.23 ft). Maximum inflow, 2,330 cfs, July 19, 1956 (average for 5-minute interval), computed from outflow and change in reservoir contents. No inflow or outflow for most of time.

Remarks.--Records fair since 1962, records obtained at supplementary gage below dam; those for prior years from reservoir gage. No adjustments made for evaporation or seepage.

Reservoir is formed by earth-fill dam, completed in 1955. Capacity, 300 acre-ft (original survey, no dead storage). Elevation of spillway crest is 27 ft, crest of dam is 35 ft. Outlet tower has an inside opening 3 ft square and outlet pipe through dam is 2 ft in diameter. A total of 9 port openings are spaced at 5-ft vertical intervals on upstream and sides of tower. They are 2 ft wide by 1 ft high; sill of lowest upstream port is at gage-height 4.8 ft (modified in 1963) and lowest side ports at gage-heights 6.3 ft.

Outflow during water year October 1962 to September 1963, supplementary gage

Flow event	Date	Outflow (hours)	Maximum (cfs)	Cfs-days	Runoff (acre-ft)
13	October 19	1	.4	0	0
14	August 3	8	18.5	3.0	6.0
15	August 29	7	3.5	.3	.6
Totals		16	-	3.3	6.6

## 8-3295. Rio Grande near Bernalillo, N. Mex.

**Location.**--Lat 35°17'05", long 106°35'45", in SE¼NW¼ sec.11, T.12 N., R.3 E. (projected), on right bank 2 miles northwest of Sandia Pueblo, 3 miles southwest of Bernalillo, 3.5 miles downstream from State Highway 44, and 8.5 miles downstream from Jemez River.

**Drainage area.**--17,300 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

**Records available.**--May 1941 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

**Gage.**--Water-stage recorder at a datum of 5,030.57 ft above mean sea level, datum of 1929, adjustment of 1951. Supplemental water-stage recorder at a site, 1,900 ft downstream used alternately 1953-58, 1961, at the same datum 1953-55, variable 1956-58 and 1.26 ft lower than primary gage in 1961.

**Average discharge.**--22 years, 1,106 cfs (800,700 acre-ft per year).

**Extremes.**--Maximum discharge during year, 3,460 cfs Aug. 26 (gage height, 4.25 ft); no flow at times.

1941-63: Maximum discharge, 25,400 cfs May 16, 1941; maximum gage height, 6.83 ft Sept. 20, 1941; no flow at times.

Other major floods occurred as follows (based primarily on records for station at San Felipe): Sept. 23, 1929, about 23,000 cfs; Aug. 21, 1935, about 22,000 cfs; June 26, 1937, about 27,000 cfs.

**Remarks.**--Records poor. Discharge measurements generally made 3 or 4 times a month. Diversions above station for irrigation of about 710,000 acres, some of which is below station. Possible regulation by operation of two reservoirs on Rio Chama and flood-and-silt detention reservoir on Jemez River (see p.176).

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	126	171	1640	1340	915	732	2110	832	0	0	0	135
2	82	290	1660	1320	829	707	2170	446	97	0	0	94
3	65	296	1660	1300	915	724	1890	235	22	0	0	a5
4	25	422	1610	1290	1000	588	1590	115	0	0	0	0
5	0	1060	1590	1340	925	602	1410	117	0	0	0	0
6	0	1450	1530	1190	988	550	1240	97	0	0	0	2
7	0	1640	1570	1030	1070	364	1390	45	0	0	0	0
8	a	1710	1590	820	1080	358	1470	42	0	0	0	0
9	19	1780	1590	707	1020	535	1640	0	0	0	0	0
10	0	1780	1550	514	1000	521	1910	0	0	0	0	0
11	3	1810	1550	493	1080	528	2000	0	0	0	0	0
12	0	1830	1550	b470	935	486	1810	0	0	0	0	0
13	0	a1800	1490	b300	732	420	1720	0	0	0	0	0
14	0	a1800	1490	b220	550	346	1640	0	0	0	a1	0
15	0	a1780	1510	b250	534	275	1660	0	0	0	0	0
16	0	1760	1510	b320	698	296	1690	0	0	0	0	0
17	0	1860	1510	b370	758	376	1640	16	0	0	0	0
18	0	1710	1530	b450	732	400	1530	68	0	0	0	0
19	69	1590	1550	b500	724	446	1370	109	0	0	66	0
20	199	1550	1590	b450	741	500	1210	115	0	0	a1	0
21	91	1510	1610	a350	750	446	1120	78	0	0	a0	254
22	54	1510	1570	b400	775	432	965	28	0	0	a0	410
23	31	1550	1550	b450	775	970	783	65	0	0	a5	12
24	32	1590	1510	b500	750	1590	542	31	0	0	a0	0
25	30	1640	1450	b600	707	1860	486	8	0	0	a10	100
26	44	1660	1410	b550	750	1830	603	9	0	0	453	9
27	54	1730	1390	b550	775	1730	650	8	0	0	64	0
28	68	1640	1340	b550	775	1700	783	1	0	0	14	0
29	65	1610	1390	b600	-	1710	820	0	0	0	168	0
30	26	1640	1360	b750	-----	2030	829	0	0	0	406	0
31	28	-----	1340	b1000	-----	2000	-----	0	-----	-----	10	-----
Total	1.113	44.169	47.190	20.974	23.283	26.052	40.671	2.465	1.19	0	1.198	1.021
Mean	35.9	1,472	1,522	677	832	840	1,355	79.5	3.97	0	38.6	34.0
Ac-ft	2,210	87,610	93,600	41,600	46,180	51,670	80,670	4,890	236	0	2,380	2,030

Calendar year 1962: Max 6,900 Min 0 Mean 1,190 Ac-ft 861,800

Water year 1962-63: Max 2,170 Min 0 Mean 571 Ac-ft 413,100

Peak discharge (base, 5,000 cfs).--No peak above base.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3300. Rio Grande at Albuquerque, N. Mex.

Location.--Lat 35°05'20", long 106°40'50", in SE $\frac{1}{4}$  sec.13, T.10 N., R.2 E. (projected), in Atrisco Grant at downstream side of Old Town bridge on U.S. Highway 66 at Albuquerque.

Drainage area.--17,440 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--October 1941 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Datum of gages is 4,946.16 ft above mean sea level, datum of 1929. Prior to Sept. 18, 1947, at various sites at datum about 2.00 ft higher; Sept. 18, 1947, to Apr. 12, 1959, at site 550 ft to the left of present site; Apr. 13, 1959, to June 29, 1960, at site 150 ft to the right of present site.

Average discharge.--22 years, 1,094 cfs (792,000 acre-ft per year).

Extremes.--Maximum discharge during year, 2,480 cfs Mar. 30 (gage height, 5.70 ft); no flow for many days.

1941-63: Maximum discharge, 25,000 cfs Apr. 24, 1942, from rating curve extended above 13,900 cfs by logarithmic plotting; maximum gage height, 7.0 ft July 18, 1953; no flow at times.

Remarks.--Records fair. Discharge measurements generally made twice a week. Possible regulation by operation of reservoirs on Rio Chama and by flood-and-silt detention reservoir on Jemez River (see p.176). Diversions above station for irrigation of about 718,000 acres, several hundred of which are below station.

Cooperation.--Records for Albuquerque Riverside drain and Arenal, Armijo, and Atrisco canals furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	231	321	1.510	1.330	1.030	814	2.070	886	28		0	59
2	195	305	1.690	1.310	782	798	2.160	565	32		0	166
3	136	267	1.630	1.310	854	830	1.940	360	58		0	58
4	73	257	1.650	1.250	1.050	774	1.520	225	40		0	47
5	55	786	1.630	1.100	946	798	1.360	172	30		0	46
			1.650									
6	59	1.040	1.650	1.130	982	782	1.160	203	27		0	14
7	66	1.380	1.600	1.110	1.120	593	1.390	121	25		0	20
8	60	1.620	1.620	852	1.120	390	1.420	49	20		0	13
9	50	1.690	1.540	761	1.020	670	1.550	62	12		0	9.4
10	34	1.630	1.600	645	973	686	1.820	64	15		0	12
11	32	1.660	1.570	621	1.080	670	1.950	53	24		0	4.4
12	29	1.770	1.500	614	955	726	1.780	53	11		0	8.7
13	26	1.790	1.570	300	686	656	1.740	51	6.4		0	7.2
14	120	1.810	1.520	188	530	572	1.800	45	5.0		0	6.4
15	57	1.880	1.520	210	565	558	1.780	42	4.4		0	1.8
16	62	1.790	1.600	300	710	551	1.780	40	5.7		0	3.3
17	79	1.930	1.540	350	774	600	1.780	36	2.9		0	.5
18	62	1.730	1.520	428	750	614	1.720	36	1.2		0	0
19	66	1.600	1.730	416	670	572	1.560	34	1.0		0	0
20	295	1.500	1.690	422	702	600	1.550	31	.4		.4	0
21	286	1.440	1.710	325	734	551	1.500	28	0		0	131
22	199	1.480	1.740	400	758	544	1.310	28	0		0	4.45
23	133	1.540	1.650	470	790	822	1.130	30	0		0	28
24	121	1.470	1.510	537	734	1.620	790	28	0		0	15
25	139	1.570	1.510	579	766	1.900	628	36	0		0	4.4
26	142	1.650	1.450	614	830	1.850	635	36	0		200	25
27	176	1.690	1.340	635	838	1.700	726	37	0		100	15
28	199	1.730	1.260	600	854	1.630	750	31	0		44	10
29	142	1.660	1.370	614	-	1.660	878	34	0		31	10
30	124	1.600	1.370	742	-----	2.020	822	31	0		505	10
31	160	-----	1.310	1.000	-----	2.000	-----	25	-----		115	-----
Total	3,608	42,586	48,100	21,163	25,603	29,551	42,999	3,472	3,490	0	995.4	1,207.7
Mean	1.16	1.420	1.552	683	843	953	1,433	1.12	1.16	0	32.1	40.3
Ac-ft	7,160	84,470	95,400	41,980	46,820	58,610	85,290	6,890	6,920	0	1,970	2,400
(†)	14,760	762	837	780	762	11,010	22,030	23,240	1,4720	7,620	1,1850	1,4150
Calendar year 1962: Max 6,460 Min 4.8 Mean 1,252 Ac-ft 906,700												
Water year 1962-63: Max 2,160 Min 0 Mean 596 Ac-ft 431,700												
Peak discharge (base, 4,000 cfs).--No peak above base.												

† Combined flow, in acre-feet, of Albuquerque Riverside drain and Arenal, Armijo, and Atrisco canals. This flow, which bypasses river gage, can be added to river records to get entire surface flow in valley cross section.



8-3320. Rio Grande near Bernardo, N. Mex.

Location.--Lat 34°25'00", long 106°48'00", in E<sup>1</sup>/<sub>2</sub>NE<sup>1</sup>/<sub>4</sub> sec. 11, T.2 N., R.1 E. (projected), in Sevilleta or Belen Grant, at bridge on U.S. Highway 60, 2 miles east of Bernardo and 4½ miles upstream from Rio Puerco.

Drainage area.--19,230 sq mi, approximately (includes 2,940 sq mi in closed basin San Luis Valley, Colo.).

Records available.--June 1936 to January 1939, October 1941 to September 1963. Monthly discharge only October 1942 to June 1943 published in WSP 1312. Prior to October 1951, flow of Bernardo Interior drain was included only when it carried river overflow; since that date entire flow is included.

Gage.--Water-stage recorders. There are 3 gages, 1 on a conveyance channel designed to carry 2,000 cfs, 5 miles downstream from heading, formerly San Francisco Riverside drain, 1 on the floodway (former river channel) which will now carry water when total flow exceeds about 1,700 cfs, and 1 on Bernardo Interior drain. Datum of conveyance channel gage is 4,719.23 ft above mean sea level, datum of 1929, leveling of 1951. Prior to October 1952, main gage was on river channel (the present floodway gage, present datum) at datum 4,722.55 ft above mean sea level, datum of 1929, leveling of 1951. Datum of Bernardo Interior drain supplementary recording gage is 4,713.99 ft above mean sea level, datum of 1929, leveling of 1951.

Average discharge.--24 years (1936-38, 1941-63), 1,050 cfs (760,200 acre-ft per year).

Extremes.--Maximum discharge during year, 2,360 cfs Apr. 23; minimum, 2.6 cfs Aug. 2.

1936-39, 1941-63: Maximum discharge, 21,100 cfs Apr. 25, 1942 (gage height, 6.90 ft); no flow at times.

Remarks.--Records fair. Records represent total discharge of the river and are a summation of discharge in river channel (now called floodway), conveyance channel, and Bernardo Interior drain. Flow in La Joya Eastside drain along left side of floodway is not included in the composite but monthly values shown below in table. Diversions for irrigation of about 740,000 acres above station.

Cooperation.--Records for La Joya Eastside drain are furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	239	227	1,690	1,310	889	783	1,850	489	39	16	4.9	33
2	237	207	1,640	1,290	953	724	1,670	575	39	13	4.3	21
3	244	208	1,580	1,310	718	747	1,980	467	39	12	6.0	19
4	230	231	1,580	1,300	758	712	1,550	298	36	15	12	28
5	200	225	1,560	1,270	915	660	1,190	185	33	15	6.0	19
6	205	387	1,560	1,280	867	700	1,130	170	32	13	4.9	15
7	194	665	1,560	1,210	1,070	625	780	112	31	13	4.7	12
8	204	954	1,540	1,100	1,160	580	906	91	36	14	4.9	15
9	190	1,200	1,500	880	1,080	469	734	82	36	12	4.0	14
10	177	1,380	1,500	745	1,240	482	739	73	33	12	4.0	13
11	171	1,330	1,490	710	1,050	528	1,030	72	32	12	4.9	13
12	150	1,380	1,490	609	1,260	531	1,430	70	31	12	4.9	13
13	146	1,480	1,430	449	1,120	510	1,190	67	30	12	4.4	10
14	128	1,460	1,410	248	854	521	1,200	59	29	10	3.9	9
15	134	1,620	1,350	311	657	475	1,250	58	28	8.6	3.9	8
16	130	1,650	1,340	363	515	483	1,160	61	24	8.6	3.5	8
17	114	1,580	1,450	403	755	510	1,220	61	26	8.3	3.5	7
18	114	1,660	1,470	447	799	565	1,210	59	25	8.0	3.7	6
19	127	1,600	1,510	484	738	539	1,330	66	21	7.0	3.4	5
20	136	1,510	1,530	408	739	440	1,120	70	20	8.3	3.2	6.0
21	120	1,360	1,560	315	784	421	1,010	60	23	8.0	3.1	28
22	199	1,360	1,570	515	810	415	1,060	60	24	6.5	3.2	13
23	192	1,420	1,550	464	841	393	836	57	23	7.0	3.7	18
24	142	1,460	1,490	509	841	453	657	62	21	5.8	4.7	32
25	144	1,470	1,520	623	806	1,460	498	63	20	6.5	5.1	23
26	138	1,520	1,480	668	781	1,360	386	63	19	5.6	6.7	17
27	219	1,600	1,400	623	836	1,430	351	70	18	6.0	9.7	11
28	242	1,610	1,350	633	811	1,400	386	56	16	6.5	8.9	11
29	214	1,580	1,240	613	-	1,250	500	50	16	6.7	11	8.7
30	195	1,570	1,330	623	-----	1,280	477	46	18	5.4	12	6.7
31	183	-----	1,300	678	-----	1,510	-----	41	-----	4.4	2.0	-----
Total	5,458	35,904	45,970	22,391	24,647	22,956	30,830	3,813	816	298.2	183.1	442.4
Mean	176	1,197	1,483	722	880	741	1,028	123	27.2	9.62	5.91	14.7
Ac-ft	10,830	71,210	91,180	44,410	48,890	45,530	61,150	7,560	1,620	591	363	877
(†)	3,740	2,570	2,970	2,810	2,840	5,190	6,280	4,600	1,620	281	145	664
Calendar year, 1962:	Max	6,350		Min	19	Mean	1,080	Ac-ft	782,100			
Water year 1962-63:	Max	1,980		Min	3.1	Mean	531	Ac-ft	384,200			

† Monthly discharge, in acre-feet, of La Joya Eastside drain.

8-3340. Rio Puerco above Chico Arroyo, near Guadalupe, N. Mex.

Location.--Lat 35°36'05", long 107°09'55", in SW $\frac{1}{4}$  sec.21, T.16 N., R.3 W., on right bank 1.6 miles upstream from Chico Arroyo and  $\frac{5}{2}$  miles northeast of village of Guadalupe, Sandoval County.

Drainage area.--420 sq mi, approximately.

Records available.--July 1951 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 5,950 ft above mean sea level, datum of 1929.

Average discharge.--12 years, 13.9 cfs (10,060 acre-ft per year).

Extremes.--Maximum discharge during year, 2,450 cfs Sept. 6 (gage height, 7.75 ft); no flow for many days.

1951-63: Maximum discharge, 4,540 cfs Aug. 18, 1961, from rating curve extended above 280 cfs on basis of slope-area measurements at gage heights 7.75 and 10.60 ft; maximum gage height, 13.2 ft Aug. 12, 1952; no flow for many days in each year.

Flood of June 29, 1943, probably exceeded 5,000 cfs (based on records for station above and below).

Remarks.--Records fair except those below 10 cfs and above 500 cfs, which are poor. Diversions for irrigation of about 3,700 acres above station in past years, but present diversion negligible.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 23, May 3-8, Aug. 9-12, Sept. 16-25)

0.18	0	0.6	4.5	1.4	59
.2	.02	.7	8.3	1.7	95
.3	.2	.8	13	2.0	137
.4	.7	1.0	25	2.4	205
.5	2.0	1.2	40	2.7	265

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a0.5	0	a0.1	a0	b0.5	1.0	21	a0.5		0	0	52
2	**0	0	a.1	a0	64	.5	18	a.2		0	0	a5
3	0	0	a.1	a.1	74	.4	16	*.1		**0	0	a.1
4	0	0	a.1	a.1	46	0	15	.7		0	0	a6
5	0	0	a.1	**b.1	*32	0	14	1.2		**0	0	*14
6	0	0	a.1	b.1	18	0	13	1.2		0	0	*247
7	0	0	a.1	b.1	a10	0	9.7	1.6	(*)	0	**0	a10
8	0	0	**1	b.1	a7	0	11	1.8		0	0	a2
9	0	0	0	b.1	a5	0	24	3.2		.7	.2	a.5
10	0	0	0	b.1	a8	0	36	6.0		**0	0	*51
11	0	.1	a0	a.1	a5	0	*31	6.4		0	.4	.8
12	0	12	a0	a0	a3	0	28	5.6		0	.4	.4
13	.1	24	a0	a0	a2	0	28	6.4		0	.4	.3
14	.1	a8	a0	a0	a1	0	39	a3		0	13	.3
15	.1	a5	a0	a0	a1	16	51	a2		0	a.5	23
16	.1	a4	a0	a0	a.5	14	49	a1		a0	**0	4.5
17	*.1	*5.3	a0	a0	a.3	5.6	31	*0		**0	0	a1
18	.1	6.0	a0	a0	a.2	a2	26	0		0	0	a.5
19	15	1.1	a0	a0	**a.1	a.3	*20	0		0	0	13
20	56	2.7	a0	a0	b.5	a3	12	0		0	22	6.4
21	9.6	.2	a0	a0	16	a2	11	.1		0	110	37
22	a3	.7	a0	a0	4.5	a2	16	0		0	26	53
23	a1	.3	a.1	a0	9.7	*3.0	14	0		0	26	a8
24	**1	a.2	a.1	a0	9	4.0	11	0		0	a5	*2.0
25	0	a.2	a.1	a0	a5	4.5	7.5	0		0	a2	.3
26	0	a.1	a.1	a0	a4	4.5	9	0		0	a1	.2
27	.1	a.1	a0	a0	a2	4.2	a7	0		0	*7	.1
28	.1	a.1	a0	a0	*1.6	*4.5	a8	0		0	.2	.1
29	.1	a.1	a0	b.1	-	9.7	a5	0		0	118	.1
30	.1	a.1	a0	**b.1	-----	15	a2	0		0	44	.1
31	0	-----	a0	b.2	-----	20	-----	0		**0	9.2	-----
Total	86.2	70.3	1.2	1.3	329.9	118.9	583.2	41.0	0	0.7	385.3	482.0
Mean	2.78	2.34	0.04	0.04	11.8	3.84	19.4	1.32	0	0.02	12.4	16.1
Ac-ft	171	139	2.4	2.6	654	236	1,160	81	0	14	764	956

Calendar year 1962: Max 290 Min 0 Mean 14.3 Ac-ft 10,350

Water year 1962-63: Max 247 Min 0 Mean 5.75 Ac-ft 4,170

Peak discharge (base, 1,800 cfs).--Sept. 6 (0320) 2,450 cfs (7.75 ft).

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3405. Chico Arroyo near Guadalupe, N. Mex.

Location.--Lat 35°35'40", long 107°11'20", in NE $\frac{1}{4}$  sec.30, T.16 N., R.3 W., on left bank a quarter of a mile upstream from mouth,  $4\frac{1}{2}$  miles northwest of Guadalupe, and  $5\frac{1}{2}$  miles southwest of Cabezón.

Drainage area.--1,390 sq mi, approximately.

Records available.--November 1943 to September 1963.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,923 ft above mean sea level, datum of 1929.

Average discharge.--20 years, 24.0 cfs (17,380 acre-ft per year).

Extremes.--Maximum discharge during year, 4,650 cfs Aug. 3 (gage height, 7.55 ft); no flow for many days.

1943-63: Maximum discharge, 12,200 cfs July 17, 1953 (gage height, 15.1 ft), from rating curve extended above 2,900 cfs on basis of slope-area measurements at gage heights 9.6 and 12.8 ft; no flow at times.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 100 acres above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to July 9				July 10 to Sept. 30			
1.9	0	2.7	14	1.8	0	3.3	180
2.0	.3	2.8	21	2.0	.7	3.6	360
2.1	.9	2.9	32	2.2	4.5	4.0	650
2.4	4.9	3.0	49	2.4	11	4.5	1,120
2.5	6.8	3.2	108	2.7	32	5.0	1,660
2.6	10	3.4	200	3.0	80		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 1	0	0.1	0	1.1	0		0		0	0	150
2	* 0	0	0	0	9.5	0		0		0	0	15
3	0	0	0	0	b 4	0		* 0		0	1,460	5
4	0	0	0	.1	3.0	0		0		0	1,130	2
5	0	0	0	*.2	2.2	0		0		0	875	84
6	0	0	0	.2	1	0		0		0	230	324
7	0	0	0	.1	.8	0		0	(*)	0	11	18
8	0	0	* 0	.1	.6	0		0		0	3.1	4
9	0	0	0	b 1	.4	0		0		0	.5	1
10	0	0	0	.1	.2	0		0		176	72	4.3
11	0	0	0	0	a .2	0	(*)	0		20	53	1.0
12	0	0	0	0	0	.1		0		26	11	0
13	0	0	0	0	0	.1		0		11	2	135
14	0	0	0	0	0	0		0		1	18	49
15	0	.2	0	0	0	0		0		0	8.5	31
16	0	1.6	0	0	0	0		0		0	8.0	6
17	* 0	* 4.2	0	0	0	0		* 0		0	20	1
18	.1	2.1	.1	0	0	0		0		0	20	0
19	10	.4	0	0	*.6	0	(*)	0		0	2	0
20	14	.2	0	0	b .5	0		0		0	1	0
21	2	0	0	0	b 5	0		.1		0	13	320
22	.5	0	0	0	b 2.5	0		.1		1.5	50	395
23	0	0	0	0	b 2	* 0		0		.1	40	648
24	* 0	0	0	0	b 4	0		0		4.4	8.0	68
25	0	0	.1	b 0	b 3	0		0		.3	17	13
26	0	0	0	b .2	b 1	0		0		0	450	6.7
27	0	0	0	0	.3	0		0		0	77	4.0
28	0	0	0	0	* 0	* 0		0		0	31	1.4
29	0	0	0	0	-	0		0		0	102	.1
30	0	.1	0	*.1	-----	0		0		0	584	1
31	0	-----	0	.1	-----	0		0		0	234	-----
Total	27.6	8.8	0.3	1.3	51.8	0.2	0	0.2	0	240.3	5,531.1	2,286.6
Mean	0.89	0.29	0.01	0.04	1.85	0.006	0	0.006	0	7.75	178	76.2
Ac-ft	55	17	0.6	2.6	103	0.4	0	0.4	0	477	10,970	4,540

Calendar year 1962: Max 180 Min 0 Mean 4.93 Ac-ft 3,560  
 Water year 1962-63: Max 1,460 Min 0 Mean 22.3 Ac-ft 16,170

Peak discharge (base, 2,900 cfs).--Aug. 3 (0830) 4,650 cfs (7.55 ft).

\* Discharge measurement or observation of no flow made on this day.

b Stage-discharge relation affected by ice.

Note.--No gage-height record Oct. 1, 21-23, Jan. 11-24, Feb. 6-18, June 16 to July 2, July 14-16, Aug. 13, 19, 20, Sept. 2-4, 8, 9, 16-20.

8-3415. Bluewater Creek below Bluewater Dam, N. Mex.

Location.--Lat 35°17'35", long 108°06'35", in SE $\frac{1}{4}$  sec.4, T.12 N., R.12 W., on left bank 350 ft downstream from Bluewater Dam and 9.3 miles west of Bluewater.

Drainage area.--201 sq mi.

Records available.--March 1951 to December 1963 (discontinued).

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,320 ft (by barometer).

Average discharge.--12 years, 2.15 cfs (1,560 acre-ft per year).

Extremes.--Maximum discharge during period October 1962 to December 1963, 28 cfs May 9-11 (gage height, 2.65 ft); minimum daily, 0.2 cfs for many days.

1951-63: Maximum discharge, 58 cfs July 1-3, 1952 (gage height, 2.75 ft); no flow at times in 1955, 1957.

Remarks.--Records good above 2 cfs and fair below. Flow regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft).

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)  
(Shifting-control method used May 27-31)

1.4	0.2	1.9	3.0
1.5	.4	2.0	4.5
1.6	.8	2.2	9.0
1.7	1.3	2.4	16
1.8	2.0	2.7	33

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.0	*0.4	*0.4	0.4	0.5	0.4	0.4	0.4	15	*16	*23	0.2
2	*2.7	.4	.4	*.4	.5	*.4	.4	.4	15	16	19	.2
3	.3	.4	.4	.4	.5	.4	.4	.4	15	16	14	.2
4	.3	.4	.4	.4	.5	.4	.4	.4	15	18	11	.2
5	.3	.4	.4	.4	.5	.4	.4	7.8	15	18	11	.2
6	.3	.4	.4	.4	.5	.4	.4	14	14	18	11	.2
7	.3	.4	.4	.4	.5	.4	.4	14	11	18	11	.2
8	.7	.4	.4	.4	.5	.4	.4	18	11	20	11	.2
9	3.6	.4	.4	.4	.5	.4	.4	25	11	20	12	.2
10	5.7	.4	.4	.4	.5	.4	.4	28	12	18	10	.2
11	4.4	.4	.4	.4	.4	.4	.4	27	15	16	10	.2
12	4.2	.4	.4	.4	.4	.4	.4	24	15	13	10	*.2
13	4.0	.4	.4	.4	.4	.4	.4	24	15	10	10	.2
14	3.9	.4	.4	.4	.4	.4	.4	*20	15	9.3	12	.2
15	3.9	.4	.4	.4	.4	.4	.4	18	15	9.9	*13	.2
16	*4.0	.4	.4	.4	.4	.4	.4	15	16	*12	16	.2
17	4.0	.4	.4	.4	.4	.4	.4	15	17	13	16	.2
18	2.7	.4	.4	.4	.4	.4	.4	15	*17	14	16	.2
19	1.4	.4	.4	.4	.4	.4	.4	15	18	15	15	.2
20	1.4	.4	.4	.4	.4	.4	.4	16	18	16	15	.2
21	1.0	.4	.4	.5	.4	.4	.4	17	18	17	15	.2
22	.4	.4	.4	.5	.4	.4	.4	17	16	20	15	.2
23	.4	.4	.4	.5	.4	.4	.4	18	14	21	15	.2
24	.4	.4	.4	.5	.4	.4	.4	18	14	22	15	.2
25	.4	.4	.4	.5	.4	.4	.4	18	14	25	14	.2
26	.4	.4	.4	.5	.4	.4	.4	17	14	23	11	.2
27	.4	.4	.4	.5	.4	.4	.4	14	15	23	7.2	.2
28	.4	.4	.4	.5	.4	.4	.4	11	15	23	6.5	.2
29	.5	.4	.4	.5	-	.4	*.4	9.0	15	23	*5.5	.2
30	.5	.4	.4	.5	-	*.4	.4	8.8	15	24	*2.0	.2
31	.5	-	.4	*.5	-	.4	-	*10	-	24	.8	-
Total	59.4	12.0	12.4	13.5	12.2	12.4	12.0	455.2	445	551.2	373.0	6.0
Mean	1.92	0.40	0.40	0.44	0.44	0.40	0.40	14.7	14.8	17.8	12.0	0.20
Ac-ft	118	24	25	27	24	25	24	903	883	1,090	740	12

Calendar year 1962: Max 32 Min 0.3 Mean 8.94 Ac-ft 6,470  
 Water year 1962-63: Max 28 Min 0.2 Mean 5.38 Ac-ft 3,900

\* Discharge measurement made on this day.

Daily discharge during period Oct. 1 to Dec. 31, 1963, 0.2 cfs (without variation).

Calendar year 1963: Mean, 5.20 cfs ; runoff, 3,760 acre-ft.

8-3420. Bluewater Creek near Bluewater, N. Mex.

**Location.**--Lat 35°17'50", long 108°01'40", in W $\frac{1}{2}$ S $\frac{1}{2}$  sec. 5, T.12 N., R.11 W., on left bank 3 $\frac{1}{2}$  miles northwest of Bluewater Village and 8 miles downstream from Bluewater Dam.

**Drainage area.**--209 sq mi.

**Records available.**--July 1912 to August 1915, April 1916 to June 1919, January 1927 to September 1963. Figures of daily discharge for July 20-23, 1912, published in WSP 358, have been found to be unreliable and should not be used. Monthly discharge only for some periods, published in WSP 1312.

**Gage.**--Water-stage recorder. Altitude of gage is 6,720 ft (by barometer). Prior to Mar. 4, 1918, at site 113 ft upstream at different datums. Mar. 4, 1918, to Mar. 17, 1939, at site 83 ft upstream; Mar. 4, 1918, to June 28, 1919 (destroyed by flood), at datum 1.92 ft higher; Apr. 6, 1921, to Mar. 17, 1939, at datum 1.57 ft higher.

**Average discharge.**--41 years (1912-15, 1916-18, 1927-63), 9.88 cfs (7,150 acre-ft per year).

**Extremes.**--Maximum discharge during year, 70 cfs Aug. 3 (gage height, 3.84 ft); minimum, 0.5 cfs Mar. 5.

1912-18, 1927-63: Maximum discharge observed, about 1,510 cfs Mar. 10, 1916 (gage height, 8.6 ft, site and datum then in use, from floodmarks), from rating curve extended above 4.4 ft by logarithmic plotting; no flow at times.

Maximum flood known occurred Sept. 6, 1909 when Bluewater Dam washed out; stage and discharge not determined. A major flood occurred during period July 12-19, 1919, discharge not determined (gage height, 13.5 ft, from floodmarks, site and datum in use Mar. 4, 1918 to June 28, 1919).

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft).

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.7	0.8	3.2	13
2.8	2.6	3.4	22
3.0	7.2	3.6	35

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 6.0	*2.2	*2.2	b 2	2.4	1.6	2.0	1.8	15	*15	*28	3.9
2	*5.3	2.2	2.0	*b 2	2.2	*1.6	2.0	2.0	16	16	25	2.2
3	3.7	2.0	1.8	b 2	1.8	1.6	2.0	2.0	16	17	27	1.8
4	2.4	2.0	1.8	b 2	1.6	1.8	2.0	1.8	16	18	16	1.6
5	2.4	2.0	1.6	b 2	1.6	1.4	2.0	1.8	16	19	14	1.6
6	2.2	2.0	1.6	b 2	1.4	1.4	1.8	7.9	15	18	14	1.8
7	2.2	2.0	1.6	b 2	1.3	1.4	2.0	13	11	18	19	1.4
8	2.0	1.8	1.6	b 2	1.2	1.3	1.8	16	11	20	14	1.4
9	3.0	1.8	1.4	b 2	1.2	1.3	1.8	23	11	20	14	1.6
10	5.8	1.8	1.4	b 2	1.2	1.4	1.8	27	11	19	13	1.4
11	5.5	1.8	1.6	b 2	b 1.2	1.4	1.8	27	14	17	12	1.3
12	5.3	2.2	1.6	b 2	b 1	1.6	2.0	24	15	15	12	*1.3
13	5.0	2.2	1.6	a 2	b 1	1.6	2.0	24	15	12	12	1.3
14	5.0	2.2	1.6	a 1.5	b 1	1.4	2.0	*20	15	10	13	1.4
15	5.0	2.4	1.6	a 1	b 1.2	1.6	2.0	18	15	9.7	*14	1.8
16	*5.0	2.4	1.6	a 1	b 1.4	1.6	2.0	15	15	*11	18	1.3
17	5.5	2.4	1.6	a 1.5	b 1.6	1.8	2.0	15	17	14	18	1.3
18	6.5	2.4	1.8	a 1.5	b 1.8	1.6	2.0	15	*17	15	18	1.3
19	4.1	2.4	1.6	a 1.5	2.0	1.6	2.0	15	18	15	a 17	1.6
20	3.5	2.0	1.4	a 1.5	2.2	1.6	2.0	15	19	17	a 17	2.8
21	3.3	2.0	1.3	a 1.5	2.0	1.8	2.0	17	19	17	a 17	5.9
22	2.8	2.2	1.3	a 1.8	2.0	1.8	2.0	17	19	21	a 17	2.8
23	2.2	2.2	1.4	a 1.8	1.8	1.8	2.0	19	14	23	a 17	1.6
24	2.2	2.2	1.4	a 1.8	1.6	1.8	2.0	19	13	24	a 17	1.6
25	2.2	2.2	b 1.4	a 1.8	1.6	2.0	2.0	19	13	26	a 17	1.3
26	2.2	2.0	b 1.5	a 1.6	1.6	1.8	2.0	19	13	25	a 15	1.3
27	2.2	2.0	b 1.5	a 1.6	1.8	1.8	2.0	17	15	25	a 10	1.3
28	2.2	2.0	1.6	a 1.6	1.6	2.0	2.0	15	16	25	a 9	1.3
29	2.0	1.8	1.8	a 1.8	-	2.0	*2.0	12	15	25	a 7	1.3
30	2.2	2.0	b 2	a 2.0	-----	*2.0	2.0	11	15	27	*5.8	1.3
31	2.2	-----	b 2	*2.8	-----	2.0	-----	*11	-----	28	4.4	-----
Total	111.1	62.8	50.2	55.6	44.3	51.4	59.0	460.3	450	581.7	471.2	53.8
Mean	3.58	2.09	1.62	1.79	1.58	1.66	1.97	14.8	15.0	18.8	15.2	1.79
Ac-ft	220	125	100	110	88	102	117	913	893	1,150	935	107

Calendar year 1962: Max 34  
Water year 1962-63: Max 28

Min 1.0  
Min 1

Mean 10.7  
Mean 6.72

Ac-ft 7,730  
Ac-ft 4,860

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## 8-3430. Bluewater Creek at Grants, N. Mex.

Location.--Lat 35°09'20", long 107°52'10", in SW 1/4 sec. 26, T.11 N., R.10 W., on right bank at bridge on State Highway 53 at Grants, 0.2 mile south of U.S. Highway 66.

Drainage area.--1,020 sq mi, approximately.

Records available.--October 1912 to February 1914, June 1914, October 1914 to February 1915, May 1915 to June 1921, September 1921 to June 1923, October 1923 to May 1926, September to December 1926, May 1949 to September 1963. Monthly discharge only for some periods published in WSP 1312.

Gage.--Water-stage recorder. Datum of gage is 6,468.34 ft above mean sea level (levels by Corps of Engineers). Oct. 30, 1912, to Apr. 23, 1915, staff gage, Apr. 24, 1915, to Dec. 5, 1917, chain gage, and Dec. 6, 1917, to Dec. 31, 1926, staff gage, at nearby sites at different datums.

Average discharge.--24 years (1912-13, 1914-20, 1921-22, 1923-25, 1949-63), 4.92 cfs (3,560 acre-ft per year).

Extremes.--Maximum discharge during year, 176 cfs Aug. 31 (gage height, 3.18 ft); no flow for most of year.

1949-63: Maximum discharge recorded, 1,760 cfs Aug. 28, 1952 (gage height, 5.35 ft), from rating curve extended above 300 cfs on basis of velocity-area studies; no flow for long periods.

Maximum flood known occurred Sept. 6 or 7, 1909, when Bluewater Dam washed out.

Remarks.--Records fair. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillway, 38,500 acre-ft). Diversions and ground-water withdrawals for irrigation of about 4,500 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	(*)		(*)	(*)		(*)				(*)	*0	14
2											*0	*4.1
3											*.6	.9
4											0	.2
5											0	0
6											0	0
7											0	0
8											0	0
9										(*)	0	0
10											*9.4	0
11											2.2	0
12											0	*0
13											0	0
14											0	0
15	(*)										*0	0
16										(*)	0	0
17											0	0
18											0	0
19	(*)										0	0
20											0	0
21											0	1.9
22											1.0	4.0
23											1.4	.7
24											.1	*.1
25											.1	0
26											0	0
27											3.2	0
28											5.7	0
29											1.1	0
30											*4.5	0
31	(*)	-----		(*)	-----	(*)	(*)	(*)	-----		7.5	-----
Total	0	0	0	0	0	0	0	0	0	0	142.1	25.9
Mean	0	0	0	0	0	0	0	0	0	0	4.58	0.86
Ac-ft	0	0	0	0	0	0	0	0	0	0	282	51

Calendar year 1962: Max 4.3 Min 0 Mean 0.04 Ac-ft 25.7  
 Water year 1962-63: Max 75 Min 0 Mean 0.46 Ac-ft 333

Peak discharge (base, 200 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Dec. 26 to Jan. 1, Jan. 8-30, Feb. 13 to Mar. 1.

## RIO GRANDE BASIN

8-3431. Grants Canyon at Grants, N. Mex.

Location.--Lat 35°09'40", long 107°50'15", in NE<sup>1</sup>/<sub>4</sub> sec. 25, T.11 N., R.10 W., at Roosevelt Avenue, in the town of Grants, 0.2 mile east of intersection of Roosevelt and First Avenue and 1.1 mile upstream from confluence with Bluewater Creek (to form Rio San Jose).

Drainage area.--13.0 sq mi.

Records available.--December 1961 to September 1963.

Gage.--Water-stage recorder and control formed by four culvert barrels. Altitude of gage is 6,450 ft (from topographic map).

Extremes.--1961-62: Maximum discharge during period December to September, 262 cfs July 5 (gage height 2.15 ft); no flow for most of time.

1962-63: Maximum discharge during water year, 1,550 cfs Aug. 26 (gage height 5.10 ft), from rating curve extended above 218 cfs on basis of slope-area measurements at gage heights 3.17 and 5.10 ft; no flow for most of time.

Remarks.--Records fair except those below 10 cfs, which are poor.

Discharge, in cubic feet per second, for period December 1961 to September 1963

July 5, 1962	6.4	Oct. 17	.3	June 13	3.6	Aug. 21	*9.3	Sept. 4	14
23	1.7	Jan. 4, 1963	.2	July 9	*3.6	22	.2	13	.1
25	3.8	22	.2	21	.1	25	18	20	3.5
Aug. 1	*.5	23	.5	Aug. 2	*.2	26	*56	21	.5
2	.1	24	.1	3	.3	27	1	22	8.8
Sept. 27	*.3	25	.1	9	7.9	30	*13	23	.2
28	*.1	29	.1	15	1.2	31	1		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 1962	11.9	6.4	0	0.38	24
August	.6	.5	0	.02	1.2
September	.4	.3	0	.01	.8
Water year 1961-62	-	-	-	-	-
October	.3	.3	0	.01	.6
Calendar year 1962	13.2	6.4	0	.04	26.6
January 1963	1.2	.5	0	.04	2.4
June	3.6	3.6	0	.12	7.1
July	3.7	3.6	0	.12	7.3
August	108.1	56	0	3.49	214
September	27.1	14	0	.90	54
Water Year 1962-63	144.0	56	0	0.39	285.4

Peak discharge (base, 100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-5-62	1620	2.15	262	8-21	1610	1.82	245
7-23	1440	1.47	103	8-26	2040	5.10	1,550
7-25	1600	1.72	155	8-30	1750	3.17	576
7-9-63	1710	1.72	108	9-4	1540	2.05	285
8-9	1940	1.59	168	9-22	0310	1.50	150

\* Discharge measurement or observation of no flow made on this day.

Note.--Flow occurred only on days listed above.

8-3435. Rio San Jose near Grants, N. Mex.

Location.--Lat 35°04'30", long 107°45'00", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.23, T.10 N., R.9 W., on right bank at west boundary of Acoma Pueblo Grant,  $\frac{1}{2}$  miles southeast of Grants.

Drainage area.--2,300 sq mi, approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

Records available.--June 1936 to September 1963. Prior to October 1955, published as San Jose River near Grants.

Gage.--Water-stage recorder and concrete control. Datum of gage is 6,269.47 ft above mean sea level, datum of 1929.

Average discharge.--27 years, 6.78 cfs (4,910 acre-ft per year).

Extremes.--Maximum discharge during year, 1,400 cfs Sept. 20 (gage height, 4.87 ft), from rating curve extended above 438 cfs on basis of slope-area measurements at gage heights 3.19 and 4.87 ft; minimum, 3.7 cfs July 31.

1936-63: Maximum discharge, that of Sept. 20, 1963; minimum daily, 3.7 cfs several times in 1943, 1946, 1958-59 and 1961.

Maximum flood known probably occurred Sept. 6 or 7, 1909, following destruction of Bluewater Dam. The peak of August 1947 may have been exceeded by those of August and September 1929, and August 1935.

Remarks.--Records good. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillway, 38,500 acre-ft). Diversions and ground-water withdrawal for irrigation of about 5,100 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.3	2.3	2.0	62
1.4	4.9	2.4	148
1.6	15	2.8	275
1.8	34		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	* 4.9	4.9	* 5.3	4.9	7.0	4.9	4.9	4.6	4.9	* 4.0	* 4.0	7.0
2	4.9	4.9	5.3	* 4.9	5.7	* 4.9	4.9	4.6	4.9	4.0	7.3	* 2.1
3	4.9	4.9	5.3	5.3	4.9	4.9	4.9	4.9	4.9	4.0	* 5.9	1.0
4	4.9	4.9	5.3	5.3	4.9	4.9	4.9	4.6	4.9	4.0	3.2	* 8.8
5	4.9	5.3	5.3	5.3	4.9	4.9	4.9	4.3	4.9	4.3	8.0	2.0
6	4.9	5.3	5.3	5.7	4.9	4.9	5.3	4.3	4.9	4.3	6.1	6.5
7	4.9	5.3	5.3	5.3	4.9	4.9	4.9	4.3	4.9	4.3	5.7	5.3
8	4.9	5.3	5.3	5.3	4.9	4.9	4.9	4.3	4.9	4.3	4.9	4.9
9	5.3	5.3	5.3	5.3	4.9	4.9	4.9	4.3	5.3	4.3	4.9	4.9
10	5.3	5.3	5.3	5.7	4.9	4.9	4.9	4.3	4.9	4.3	5.3	4.9
11	5.3	5.7	5.3	5.3	4.9	4.9	4.9	4.6	4.9	4.6	7.5	4.9
12	5.3	5.7	5.3	4.9	4.6	4.9	4.9	4.6	5.3	4.6	8.0	4.9
13	5.3	5.7	5.3	4.6	4.6	4.9	4.9	4.6	5.7	4.6	7.0	5.3
14	5.3	5.7	5.3	4.3	4.6	4.9	4.9	4.6	5.7	4.6	5.3	5.3
15	* 5.3	6.1	5.3	4.3	4.6	4.9	4.9	4.6	5.3	4.6	* 4.9	5.3
16	5.3	5.7	5.3	4.3	4.9	4.9	4.9	4.6	4.6	* 4.6	4.6	5.3
17	5.3	5.7	5.3	4.3	5.3	4.9	4.9	4.6	4.3	4.6	4.9	5.3
18	5.3	5.3	5.3	4.3	4.9	4.9	4.9	4.9	* 4.3	4.6	4.9	4.9
19	5.3	5.3	4.9	4.3	4.9	4.9	4.9	4.9	4.3	4.6	4.6	4.9
20	5.3	5.3	4.9	4.3	5.3	4.9	4.9	4.9	4.3	4.6	4.6	* 2.54
21	4.9	5.3	4.9	4.3	5.3	4.9	4.6	4.9	4.6	4.6	4.6	8.4
22	4.9	5.3	4.9	4.3	5.3	4.9	4.9	4.9	4.6	4.6	5.3	1.6
23	4.9	5.3	4.9	4.6	4.9	4.6	4.9	4.9	4.6	4.3	8.5	1.6
24	4.9	5.3	4.9	4.9	4.9	4.6	4.6	4.9	4.6	4.3	1.0	* 6.5
25	4.9	5.3	4.9	4.9	4.9	4.3	4.6	5.3	4.6	4.3	7.0	5.3
26	4.9	5.3	4.9	4.9	4.9	4.3	4.9	4.9	4.6	4.3	3.2	5.3
27	4.9	5.3	4.6	4.9	4.9	4.6	4.9	5.3	4.6	4.3	7.0	5.3
28	4.9	5.3	4.9	5.3	4.9	4.6	4.9	5.7	4.3	4.3	3.8	5.3
29	4.9	5.3	4.9	5.3	-	4.6	* 4.6	5.3	4.0	4.3	1.3	4.9
30	4.9	5.3	4.9	6.1	-----	* 4.6	4.6	4.9	4.0	4.0	* 9.0	4.9
31	* 4.9	-----	4.9	* 6.5	-----	4.6	-----	* 4.9	-----	4.0	5.4	-----
Total	156.7	160.6	158.8	153.9	140.5	148.6	145.9	147.3	142.6	135.1	444.9	609.9
Mean	5.05	5.35	5.12	4.96	5.02	4.79	4.86	4.75	4.75	4.36	14.4	20.3
Ac-ft	311	319	315	305	279	295	289	292	283	268	882	1,210

Calendar year 1962 : Max 11 Min 4.0 Mean 4.87 Ac-ft 3,530

Water year 1962-63 : Max 254 Min 4.0 Mean 6.97 Ac-ft 5,050

Peak discharge (base, 100 cfs)

\* Discharge measurement made on this day.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-3	1900	3.19	426	9-1	0010	2.42	153
8-26	2300	2.72	247	9-20	1900	4.87	1,400



## 8-3515. Rio San Jose at Correo, N. Mex.

**Location.**--Lat 34°58'05", long 107°11'15", in NE¼ sec.31, T.9 N., R.3 W., on right bank 0.7 mile upstream from State Highway 6, 0.8 mile northwest of Correo, and 14 miles upstream from mouth.

**Drainage area.**--3,660 sq mi, approximately, of which about 1,130 sq mi does not contribute directly to surface runoff.

**Records available.**--April 1943 to September 1963. Prior to October 1955, published as San Jose River at Correo.

**Gage.**--Water-stage recorder. Datum of gage is 5,492.43 ft above mean sea level, datum of 1929. Prior to Oct. 1, 1958, water-stage recorder and concrete control at site 1 mile downstream at datum 17.55 ft lower.

**Average discharge.**--20 years, 11.6 cfs (8,400 acre-ft per year).

**Extremes.**--Maximum discharge during year, 1,660 cfs Aug. 30 (gage height, 3.80 ft); no flow for many days.

1943-63: Maximum discharge, 7,150 cfs Aug. 11, 1955; maximum gage height, 20.7 ft Aug. 22, 1958, backwater from dam (site and datum then in use); no flow for long periods.

A flood which probably occurred Aug. 21, 1935, reached a stage of 15.4 ft, from floodmarks, former site and datum (discharge, about 11,000 cfs), but was probably exceeded by the flood of Sept. 23, 1929 (discharge not determined), based on study of records for Rio Puerco at Rio Puerco.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Flow partly regulated by Bluewater Lake (capacity at crest of uncontrolled siphon spillways, 38,500 acre-ft) and one small reservoir above station. Diversions and groundwater withdrawals for irrigation of about 7,800 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.2	0	1.8	31.5
1.3	.24	2.0	68.0
1.4	1.15	2.3	158
1.5	4.00	2.7	361
1.6	9.6	3.1	696

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4		0	a1	*8.0	4.4	1.5			0	0	365
2	a0		0	a1	7.4	3.6	.5			*0	0	102
3	*0		0	a2	6.8	4.4	0		(*)	0	0	*44
4	0		0	b5	5.7	4.8	0			0	0	22
5	0		0	b6	*4.8	*4.4	0			0	0	48
6	0		0	b4	4.8	4.4	0	(*)		0	0	63
7	0		0	b2	4.4	4.4	0			0	*0	265
8	0		0	b2	4.4	4.4	*0			0	0	47
9	0		0	a2	4.4	4.0	0			7.5	0	*13
10	0		*0	b8	4.8	4.0	0			.5	3.9	3.2
11	0		0	b5	1.3	4.0	0			0	0	.9
12	0		0	*.8	.4	4.8	0			0	0	0
13	0		0	a0	a0	*4.4	0			0	*.4	0
14	0		0	a0	*a1	4.4	0			0	6.8	0
15	0		0	a0	b2	4.0	0			0	0	0
16	*0		0	a0	b3	3.6	*0			0	0	0
17	0		0	a0	b5	4.0	0		(*)	*0	0	*0.3
18	1.35		0	a0	b8	4.0	0			0	0	0
19	3.74	(*)	0	a0	10	*1.2	0			0	0	0
20	70		0	a0	9.6	3.2	0			0	0	0
21	a10		0	a0	7.4	3.2	0			0	17	680
22	a5		1.1	a0	10	3.2	0			0	0	331
23	*2.5		3.0	a0	10	3.6	0			0	*16	*92
24	1.7		b.5	a3	6.8	2.8	0			0	13	32
25	.2		b3	*b6	5.7	*2.5	0			0	.8	26
26	0		b2	b4	*4.8	2.2	0			0	313	12
27	0		a1	a3	4.4	2.0	0			0	*70	6.2
28	0		a1	a7	4.0	1.7	0			0	26	3.2
29	0		a1	a10	-	1.7	0			0	40	2.2
30	0		a1	b12	-----	2.5	*0			0	548	1.5
31	0		*a1	b11	-----	2.2	-----			0	188	-----
Total	598.8	0	19.1	94.8	148.9	108.0	2.0	0	0	8.0	1,242.9	2,159.5
Mean	19.3	0	0.62	3.06	5.32	3.48	0.07	0	0	0.26	40.1	72.0
Ac-ft	1,190	0	38	188	295	214	4.0	0	0	16	2,470	4,280

Calendar year 1962: Max 374 Min 0 Mean 4.88 Ac-ft 3,530

Water year 1962-63: Max 680 Min 0 Mean 12.0 Ac-ft 8,700

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-18	2230	3.72	1,540	8-30	0440	3.80	1,660
8-26	0120	3.64	1,380	9-21	1400	3.60	1,340

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

## 8-3525. Rio Puerco at Rio Puerco, N. Mex.

Location.--Lat 34°47'35", long 106°59'20", in SW $\frac{1}{4}$  sec.31, T.7 N., R.1 W., in San Clemente Grant, on downstream end of pier nearest left abutment of The Atchinson, Topeka and Santa Fe, Railway Co. bridge, 7 miles downstream from Rio San Jose.

Drainage area.--6,590 sq mi, approximately, of which at least 1,130 sq mi does not contribute directly to surface runoff.

Records available.--June 1909 to December 1912 (records fragmentary, gage heights only), March 1934 to September 1963. Records for January 1913 to December 1914 published in WSP 358, 388, and 408 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,008.59 ft above mean sea level, datum of 1929.

Average discharge.--29 years (1934-63), 61.8 cfs (44,740 acre-ft per year).

Extremes.--Maximum discharge during year, 1,930 cfs Aug. 4 (gage height, 2.78 ft); no flow for many days.  
1934-63: Maximum discharge, 28,000 cfs Aug. 21, 1935 (gage height, 7.24 ft), by computation of peak flow over dam; no flow at times.

The damaging flood of Sept. 23, 1929, is the greatest since about 1880; it reached a stage of 18 ft (conditions prior to destruction of railroad bridge. Discharge, 37,700 cfs, by weir formula, from reports of State engineer). The flood of Aug. 12, 1929, reached a stage of about 16 ft (discharge, 31,300 cfs, by weir formula, from reports of State engineer). A flood on Oct. 4, 1913, reached a stage of 9.5 ft (discharge not determined) prior to construction of the concrete control.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Diversions for irrigation of about 11,500 acres above station (includes 3,700 acres irrigated wholly or partly from wells).

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 3.3	0	0.3	0	*8.1	4.2	0	0.2	0	0	0	7.40
2	a 6	0	1.2	0	4.9	3.1	0	2	0	0	0	3.35
3	* 2.0	0	.2	.2	4.0	2.0	0	1	(*)	0	2.0	*1.20
4	.8	0	0	3.7	1.3	2.0	0	0	0	0	6.46	2.9
5	.2	0	0	5.0	*4.3	*2.2	3.3	0	0	0	7.23	6.2
6	.2	0	0	5.0	2.4	2.2	4.3	0	0	0	5.78	*1.13
7	0	0	0	.9	1.8	2.2	2.0	0	0	0	*1.98	6.02
8	0	0	0	1.8	1.2	2.2	*1.5	0	4.6	4.1	1.40	1.40
9	0	0	0	1.8	9.0	2.5	1.4	0	0	*9.3	*3.0	*3.0
10	0	0	*0	3.9	5.8	2.5	.6	0	0	6.6	1.4	1.4
11	0	0	0	5.5	3.2	2.2	.3	0	0	2.5	8.1	8.1
12	0	0	0	*1.0	1.4	2.2	6.4	0	0	6.7	2.8	2.2
13	0	0	0	0	a 5	*2.2	1.7	0	11	*3.4	.9	.9
14	0	0	0	0	*.1	2.5	1.3	0	1.8	3.6	a.1	a.1
15	0	.1	0	0	.3	1.8	1.1	0	3.4	3.3	5.5	5.5
16	*0	.7	0	0	.5	1.2	*1.7	0	.8	a15	3.1	3.1
17	0	0	0	0	3	1.0	2.7	0	*.1	a5	*1.8	*1.8
18	0	0	0	0	5	1.2	2.5	0	0	a1	a10	a10
19	*3.44	*0	.3	0	8.1	*.9	1.3	0	0	5.7	a5	a5
20	3.76	0	0	0	9.7	1.0	9.1	0	0	a10	a2	a2
21	5.7	0	0	0	7.3	.2	8.6	0	0	1.10	3.58	3.58
22	a2.0	0	0	0	7.7	.6	*4.9	0	0	a6.0	6.07	6.07
23	*1.2	0	0	0	7.7	.8	2.8	0	0	*1.10	*6.53	*6.53
24	6.5	0	0	0	8.1	.6	1.4	0	0	6.9	4.10	4.10
25	2.5	0	0	*3	7.7	*.6	.8	0	0	4.3	a8.0	a8.0
26	1.2	0	0	2	*5.8	.5	2.9	0	0	3.04	*3.8	*3.8
27	5.8	0	0	4	6.5	.3	1.9	0	0	*4.00	1.9	1.9
28	.5	0	.2	6.0	6.5	.1	a1.0	0	0	2.40	9.7	9.7
29	0	0	.2	7.3	-	0	a.5	0	0	a10.0	5.2	5.2
30	0	0	0	1.1	-----	.6	*.2	0	0	8.23	2.5	2.5
31	0	-----	*0	1.3	-----	.2	-----	0	-----	7.25	-----	-----
Total	867.7	0.8	2.4	75.1	230.9	45.8	176.9	0.5	0	88.7	5.509.3	4.497.7
Mean	28.0	0.03	0.08	2.42	8.25	1.48	5.90	0.02	0	2.86	178	150
Ac-ft	1,720	1.6	4.8	149	458	91	351	1.0	0	176	10,930	8,920

Calendar year 1962: Max 590 Min 0 Mean 18.4 Ac-ft 13,350  
Water year 1962-63: Max 823 Min 0 Mean 31.5 Ac-ft 22,800

Peak discharge (base, 6,000 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.  
a No gage-height record.

8-3530. Rio Puerco near Bernardo, N. Mex.

Location.--Lat 34°24'30", long 106°51'10", in SE $\frac{1}{4}$  sec. 8, T. 2 N., R. 1 E., on bridge on former U.S. Highway 85 and  $\frac{1}{4}$  mile upstream from Interstate Highway 25, 1.2 miles southwest of Bernardo, 3 miles upstream from mouth, and 18 miles south of Belen.

Drainage area.--7,350 sq mi, approximately, of which at least 1,130 sq mi does not contribute directly to surface runoff.

Records available.--November 1939 to September 1963. Fragmentary gage-height record and footnotes concerning no flow for the period September 1910 to August 1914, published in WSP 358 and 388, have been found to be in error and should not be used.

Gage.--Water-stage recorder. Datum of gage is 4,725.44 ft above mean sea level, datum of 1929.

Average discharge.--23 years (1940-63), 52.2 cfs (37,790 acre-ft per year).

Extremes.--Maximum discharge during year, 1,210 cfs Aug. 5 (gage height, 7.22 ft); no flow for extended periods.

1939-63: Maximum discharge, 18,800 cfs Sept. 23, 1941, from rating curve extended above 7,800 cfs by logarithmic plotting; maximum gage height, 13.8 ft Aug. 12, 1955; no flow for extended periods.

The greatest flood known since about 1880 occurred Sept. 23, 1929, from information by local residents (discharge, about 35,000 cfs, estimated on basis of peak at Rio Puerco). Another flood occurred Aug. 12, 1929 (discharge 30,600 cfs, by slope-area method, from reports of State engineer).

Remarks.--Records fair. Diversions for irrigation of about 11,500 acres above station (includes 3,700 acres irrigated wholly or partly from wells).

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	* 6.1		5.7		0	* 0.1	0	(*)		0	0	8.80
2	1.8		0		0	0.2	0			0	0	4.88
3	7.4		0		0	0	0			0	0	* 2.22
4	3.2		0		0	0	0			0	3.2	5.8
5	1.2		0		0	0	0			* 0	* 9.00	3.4
6	0		0		1.7	0	0			0	* 6.27	6.6
7	0		* 0		* 1.3	0	0		(*)	0	* 2.94	3.76
8	0		0		9.5	0	0			0	* 1.08	3.40
9	0	(*)	0		7.0	0	0			7.4	3.0	* 7.9
10	0		0		6.0	0	0			* 3	3.1	3.2
11	0		0		2.1	0	0			9.6	3.2	1.1
12	* 0		0		0.2	0	0			1.3	* 1.7	4.6
13	0		0		0	0	0			3.9	1.3	* 1.5
14	0		* 0		0	0	0			3.3	2.6	0.6
15	0		0		0	0	3			0	2.2	2
16	0		0		0	0	* 5.6			* 1	* 1.9	2.1
17	* 0		0		0	0	6.1			0	4	3.0
18	0		0		0	0	* 1.8			0	1	* 1.4
19	6.8		0		0	0	1.9			0	13.3	1.1
20	* 3.50		0		.1	0	9.2			0	4.0	4.8
21	1.41		0		1.6	0	5.6			0	1.2	5.2
22	* 4.1		0		2.9	0	4.4			0	* 8.4	* 5.12
23	1.5		0		2.6	0	1.5			0	4.0	4.87
24	7.2		0		1.6	0	0			0	9.3	* 5.93
25	3.6		0	(*)	1.1	0	0			0	5.7	1.66
26	* 1.3		0		1.0	0	* 0			0	1.74	5.6
27	.6		0		1.0	0	0			0	2.62	* 2.0
28	.3		0		0	0	0			0	* 3.26	8.1
29	0		0		-	0	0	(*)		0	1.40	4.0
30	0		0		-----	0	0			0	3.80	1.6
31	0	-----	0		-----	0	-----	-----	-----	0	6.78	-----
Total	718.8	0	5.3	0	66.7	0.3	72.4	0	0	63.0	4,575.0	4,526.6
Mean	23.2	0	0.17	0	2.38	0.01	2.41	0	0	2.03	148	151
Ac-ft	1,430	0	11	0	132	0.6	144	0	0	125	9,080	8,980

Calendar year 1962: Max 430 Min 0 Mean 14.7 Ac-ft 10,630  
 Water year 1962-63: Max 900 Min 0 Mean 27.5 Ac-ft 19,900

Peak discharge (base, 3,000 cfs).--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Jan. 11-24, Apr. 15, Aug. 17, 18,

## RIO GRANDE BASIN

135

8-3540. Rio Salado near San Acacia, N. Mex.

Location.--Lat 34°16'55", long 106°52'50", in E½ sec.30, T.1 N., R.1 E., near right bank 1.0 mile downstream from bridge on U. S. Highway 85, 1.4 miles upstream from mouth, 2.0 miles northeast of San Acacia, and 15 miles north of Socorro.

Drainage area.--1,380 sq mi, approximately.

Records available.--October 1947 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 4,710.68 ft above mean sea level, datum of 1929.

Average discharge.--16 years, 13.4 cfs (9,700 acre-ft per year).

Extremes.--Maximum discharge during year, 15,300 cfs Aug. 29 (gage height, 12.58 ft); no flow for most of time.

1947-63: Maximum discharge, 16,600 cfs Sept. 25, 1954 (gage height, 12.80 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurements at gage heights 11.25 and 11.9 ft; no flow for most of time.

The greatest flood known occurred Aug. 12, 1929 (discharge, 27,400 cfs, by slope-area method), from reports of State engineer.

Remarks.--Records poor. Diversions for irrigation of about 100 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0		23					(*)			0	a20
2	0		a1								0	a5
3	0		a0								115	*20
4	0		0								*160	10
5	0		0							(*)	1	360
6	0	(*)	0								a1	*490
7	0		0								*a1	a20
8	0		0								0	a5
9	0		0	(*)							0	*0
10	0	(*)	0								70	0
11	0		0								*145	3
12	0		0								130	0
13	0		0								*170	0
14	0		0								8	0
15	0		0								1	0
16	0		0								a0	0
17	*0		0								a0	0
18	0		0								7	0
19	*88		0								785	250
20	10		0								a40	*80
21	0		0								780	*310
22	*0		0			(*)					*a60	1130
23	0		0							(*)	a10	a20
24	0		0								a50	*a3
25	0		0								a10	0
26	15		0						(*)		a150	0
27	*350		0		(*)			(*)			a20	0
28	a50		0								*100	0
29	a10		0								640	0
30	a0		0								*700	0
31	a0	-----	0		-----		-----		-----		890	-----
Total	523	0	24	0	0	0	0	0	0	0	5,044	2,726
Mean	16.9	0	0.8	0	0	0	0	0	0	0	163	90.9
Ac-ft	1,040	0	48	0	0	0	0	0	0	0	10,000	5,410

Calendar year 1962: Max 920 Min 0 Mean 12.3 Ac-ft 8,920  
 Water year 1962-63: Max 1,130 Min 0 Mean 22.8 Ac-ft 16,500

## Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-19	0600	11.90	5,300	9-19	1910	11.18	3,880
8-29	2130	12.58	15,300	9-22	0020	12.00	10,000
8-31	0600	11.23	4,300				

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

## RIO GRANDE BASIN

8-3545. Socorro main canal north at San Acacia, N. Mex.

Location.--Lat 34°15'15", long 106°53'45", in SE 1/4 sec. 1, T.1 S., R.1 W., on right bank at San Acacia, half a mile downstream from point of diversion.

Records available.--April 1936 to September 1963.

Gage.--Water-stage recorder (digital). Datum of gage is 4,660.16 ft above mean sea level, datum of 1929. Prior to Mar. 8, 1958, at site 300 ft upstream (in old channel) at datum 0.42 ft lower.

Extremes.--1936-63: Maximum daily discharge, 240 cfs June 29, 1960; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record, or uncertain stage-discharge relation, which are poor.

Discharge measurements generally made once a week during periods of flow. Canal diverts water from right bank of Rio Grande for irrigation of about 8,000 acres. Alamillo Acequia and 3 other smaller ditches divert water from canal above station for irrigation of about 400 acres.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	141	0	92.1	5,660
November . . . . .	5	0	1.4	83
December . . . . .	5	0	.8	52
Calendar year 1962 . . . . .	229	0	88.4	63,960
January . . . . .	6	0	.71	44
February . . . . .	28	0	3.80	211
March . . . . .	180	59	133	8,160
April . . . . .	213	149	186	11,040
May . . . . .	207	98	134	8,230
June . . . . .	104	4.8	33.7	2,000
July . . . . .	33	1.2	8.79	540
August . . . . .	191	.6	22.2	4,440
September . . . . .	134	2	54.0	3,210
Water year 1962-63 . . . . .	213	0	60.3	43,670

Note.--No gage-height record Oct. 20, 21, 27, 28, Dec. 25, Aug. 9-13, Sept. 10-16. Uncertain stage-discharge relation from dredging operations Nov. 1 to Feb. 18.

RIO GRANDE BASIN

137

8-3550. Rio Grande at San Acacia, N. Mex.

Location.--Lat 34°15'13", long 106°53'45", in NE 1/4 sec. 1, T.1 S., R.1 W., on right bank an eighth of a mile southeast of San Acacia, 0.7 mile downstream from San Acacia diversion dam, and 2 1/2 miles downstream from Rio Salado.

Drainage area.--26,770 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--April 1936 to September 1963.

Gage.--Water-stage recorders. There are two recorders here, one on the conveyance channel designed to carry 2,000 cfs, 0.8 mile below heading established February 1959 at elevation of 4,652.5 ft above mean sea level (from U.S.B.R. specifications). The other recorder is 0.7 mile downstream from heading on floodway or main channel at elevation of 4,658.10 ft above mean sea level, datum of 1929. Prior to Mar. 19, 1953 floodway gage at site 0.5 mile upstream, which from Apr. 16, 1936, to July 24, 1941, and Nov. 29 to Dec. 14, 1946, at datum 4.46 ft higher and July 25, 1941, to Nov. 28, 1946, and Dec. 15, 1946, to Mar. 18, 1953, was at datum 2.06 ft higher than present datum. Prior to about October 1958, all flow in floodway.

Average discharge.--27 years, 1,099 cfs (795,600 acre-ft per year).

Extremes.--Maximum discharge during year, about 11,000 cfs Aug. 29; no flow at times.

1936-63: Maximum discharge, 27,400 cfs Aug. 5, 1936 (gage height, 10.75 ft, site and datum then in use); no flow at times.

Remarks.--Records good except those below 5 cfs and Aug. 30, 31, which are poor. Record is composite of main stem and conveyance channel (constructed in 1958, headgates opened May 18, 1959). Discharge measurements generally made 1 to 3 times a week on each channel, less often during low flow periods. Diversions above station for irrigation of about 760,000 acres; this includes Socorro main canal north, which bypasses station and irrigates about 8,000 acres.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	278	262	1,708	1,322	824	704	1,752	341	5.8	1.9	1	746
2	117	246	1,703	1,312	1,087	614	1,526	329	5.8	1.8	0	544
3	101	228	1,622	1,302	818	638	1,780	381	4.8	1.7	0	269
4	102	241	1,611	1,312	784	644	1,586	246	2.6	2	43	67
5	86	236	1,601	1,302	964	599	1,123	122	1.6	2	536	145
6	110	255	1,571	1,282	933	629	1,041	79	1.8	1.8	508	241
7	95	626	1,572	1,232	1,000	614	743	61	1.8	1.8	202	186
8	93	860	1,551	1,171	1,121	539	776	21	2.8	1.8	36	348
9	85	1,183	1,531	937	1,120	485	636	19	2.8	1.7	4.1	34
10	82	1,362	1,521	805	1,111	424	623	18	2.6	1.7	12	10
11	88	1,371	1,521	778	1,101	499	792	16	2.4	1.6	116	8
12	78	1,391	1,511	745	1,240	493	1,329	12	2.2	1.6	29	7
13	51	1,501	1,451	497	1,190	504	1,145	11	2.1	1.6	80	8
14	47	1,541	1,431	293	949	463	1,080	10	1.1	.5	1.8	7
15	28	1,601	1,401	349	772	431	1,192	8.6	1.0	.4	1.1	6.5
16	11	1,661	1,401	442	637	416	1,053	8.5	1.0	1.5	0	6.2
17	11	1,621	1,462	433	715	408	1,076	6.5	1.0	1.4	0	6.1
18	9	1,621	1,492	487	794	474	1,093	7.5	1.0	1.3	0	6.7
19	128	1,591	1,522	514	794	501	1,191	6.4	.9	1.2	737	118
20	423	1,511	1,522	506	764	412	1,034	6.4	.8	1.0	12	60
21	401	1,411	1,562	358	794	294	880	6.5	.8	0	496	156
22	121	1,341	1,582	481	827	334	940	6.4	1.8	1	10	1,632
23	74	1,401	1,602	505	857	301	737	6.4	1.8	1	5.4	601
24	59	1,451	1,542	508	857	265	593	6.0	1.9	1	15	509
25	57	1,481	1,522	595	814	1,168	466	5.9	1.9	1	43	188
26	61	1,501	1,512	695	772	1,284	296	5.9	2.0	0	64	31
27	585	1,572	1,462	637	827	1,366	245	5.9	2.0	1	160	8
28	313	1,632	1,372	655	827	1,282	214	6.9	2.0	0	298	8
29	177	1,601	1,302	647	-	1,208	343	5.9	2.0	1	567	7.2
30	122	1,614	1,322	643	-----	1,180	344	5.9	1.9	1	1,319	8
31	116	-----	1,322	667	-----	1,213	-----	5.9	-----	1	1,484	-----
Total	4,109	35,914	46,807	23,412	25,293	20,386	27,629	1,777.5	64.0	38.3	6,780.4	5,971.7
Mean	133	1,197	1,510	755	903	658	921	57.3	2.1	1.2	21.9	199
Ac-ft	8,150	71,230	92,840	46,440	50,170	40,440	54,800	3,530	127	76	13,450	11,840
(†)	7,610	71,060	92,610	46,360	50,010	39,240	52,500	2,840	73	24	8,150	9,290

Calendar year 1962: Max 6,150

Min 0.4

Mean 1,038

Ac-ft 751,600

Water year 1962-63: Max 1,780

Min 0

Mean 543

Ac-ft 393,100

† Flow, in acre-feet, in conveyance channel only; this flow is included in above totals for composite flow.

8-3560. Socorro main canal south near San Antonio, N. Mex.

Location.--Lat 33°53'30", long 106°52'00", in NW $\frac{1}{4}$  sec.8, T.5 S., R.1 E., on right bank  $\frac{1}{2}$  miles upstream from Bosque del Apache Grant and  $\frac{1}{4}$  miles south of San Antonio.

Records available.--April 1937 to July 1938 (published as "at end near San Antonio"), March 1948 to September 1963.

Gage.--Water-stage recorder (digital). Wooden control since Mar. 27, 1954. Datum of gage is 4,526.41 ft above mean sea level, datum of 1929. April 1937 to July 1938 at two different sites about  $\frac{1}{2}$  miles downstream at different datums. March 1948 to November 1951 at site 30 ft upstream at datum 7.29 ft higher.

Extremes.--1937-38, 1948-63: Maximum daily discharge, 50 cfs Apr. 23, 1958, and Aug. 18, 1961; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Discharge measurements generally made 2 to 3 times a month during irrigation season. Diversions made at San Acacia into Socorro main canal north are the main source of water but may be supplemented by diversions from the conveyance channel at 3 points and from San Antonio Riverside drain, 2 miles upstream. Some diversions occur between gage and north boundary of U.S. Fish and Wildlife Refuge (Bosque del Apache Grant). This is 1 of 3 stations gaging flow into refuge.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	31	1.1	17.3	1,070
November . . . . .	21	0	.70	42
December . . . . .	0	0	0	0
Calendar year 1962 . . . . .	46	0	12.6	9,100
January . . . . .	0	0	0	0
February . . . . .	0	0	0	0
March . . . . .	38	0	15.2	936
April . . . . .	37	16	29.1	1,730
May . . . . .	42	4.8	19.3	1,190
June . . . . .	19	0	4.07	242
July . . . . .	9.3	0	1.52	93
August . . . . .	35	0	15.2	936
September . . . . .	24	0	7.45	443
Water year 1962-63 . . . . .	42	0	9.22	6,680

Note.--No gage-height record Oct. 1-3, Aug. 11-14, 22-28, Aug. 31 to Sept. 4, Sept. 24, 25.

8-3565. San Antonio Riverside drain near San Antonio, N. Mex.

Location.--Lat 33°53'00", long 106°51'05", in SW $\frac{1}{4}$  sec.9, T.5 S., R.1 E., on left bank 1 mile east of U.S. Highway 85, and 1.2 miles upstream from boundary of Bosque del Apache Grant (wildlife refuge), and 2 miles southeast of San Antonio.

Records available.--March 1948 to September 1963. May 1936 to February 1938, at site 50 ft downstream from Elmendorf Interior drain; records not equivalent.

Gage.--Water-stage recorder. Datum of gage is 4,524.33 ft above mean sea level (levels by Bureau of Reclamation). Mar. 15, 1948, to Mar. 31, 1949, site 1.2 miles downstream at datum 1.14 ft lower.

Extremes.--1948-63: Maximum daily discharge, 161 cfs May 31, 1957; no flow at times since 1959.

Remarks.--Records poor. Discharge measurements or observations of no flow generally made 3 to 4 times a month. Diversions from drain above station, canal wasteways and interior drains entering channel above station. Flow represents 1 of 3 channels entering north boundary of Bosque del Apache Grant. Reduction in flow occurred after conveyance channel was completed in about 1957.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	21	4.8	12.0	739
November . . . . .	19	6	10.3	613
December . . . . .	15	12	13.2	811
Calendar year 1962 . . . . .	48	.8	14.4	10,410
January . . . . .	13	8.5	10.6	652
February . . . . .	13	10	11.7	651
March . . . . .	30	11	14.3	881
April . . . . .	48	22	29.1	1,730
May . . . . .	28	2.9	21.4	1,310
June . . . . .	3.9	1.6	2.01	119
July . . . . .	1.9	0	.25	15
August . . . . .	50	0	7.55	464
September . . . . .	35	1	9.27	551
Water year 1962-63 . . . . .	50	0	11.8	8,540

Note.--No gage-height record, Nov. 2-14, Jan. 13-16, Feb. 6-13, Aug. 27-29, Sept. 1-18, 20-30.

8-3570. Elmendorf interior drain near San Antonio, N. Mex.

Location.--Lat 33°51'50", long 106°51'25", in NE $\frac{1}{4}$  sec.20, T.5 S., R.1 E. (projected), in Bosque del Apache Grant (wildlife refuge), on right bank 2,000 ft downstream from north boundary of refuge, 1.0 mile east of railroad, and 3.7 miles south of junction of U. S. Highways 85 and 380.

Records available.--July 1936 to January 1938 (Published as "at end", near San Antonio), March 1948 to September 1963.

Gage.--Water-stage recorder (digital) and metal control. Datum of gage is 4,518.9 ft above mean sea level, datum of 1929 (levels by Bureau of Reclamation). July 1936 to January 1938, staff gage at site half a mile upstream in former channel at datum of 4,519.24 ft, datum of 1929. Mar. 11, 1948, to Nov. 10, 1949, at site about 2,500 ft upstream (in old channel) at different datum. Nov. 11, 1949, to Feb. 7, 1956, at site 2,000 ft upstream (present channel) at datum about 0.26 ft lower than present datum.

Extremes.--1948-63: Maximum daily discharge, 51 cfs June 3, 1956, June 18, 1961, and July 24, 1962; no flow at times in February and March 1961.

Remarks.--Records fair. Discharge measurements generally made 2 to 4 times a month. Flow past station represents 1 of 3 channels of inflow to wildlife refuge.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	33	4.1	21.7	1,330
November . . . . .	26	1.4	2.59	154
December . . . . .	2.4	1.4	1.90	117
Calendar year 1962 . . . . .	51	.1	16.3	11,787
January . . . . .	3.0	2.0	2.37	146
February . . . . .	3.1	1.8	2.18	121
March . . . . .	50	1.9	19.6	1,210
April . . . . .	45	16	32.0	1,900
May . . . . .	42	5.0	27.8	1,710
June . . . . .	12	2.8	5.11	304
July . . . . .	3.3	1.6	2.34	144
August . . . . .	32	1.4	17.1	1,050
September . . . . .	46	.8	14.5	864
Water year 1962-63 . . . . .	50	.8	12.5	9,050

8-3575. San Antonio Riverside drain near San Marcial, N. Mex.

Location.--Lat 33°44'45", long 106°55'15", in Bosque del Apache Grant (wildlife refuge), on left bank 1.0 mile upstream from outlet to Rio Grande conveyance channel, 5 miles northeast of San Marcial, and 12 miles south of San Antonio.

Records available.--March 1948 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 4,489.12 ft above mean sea level, datum of 1929. Mar. 19, 1948 to July 28, 1960, water-stage recorder at present site and datum. July 28, 1960, to May 14, 1962, water-stage recorder 0.4 mile downstream end at datum 3.42 ft lower.

Extremes.--1948-63: Maximum daily discharge, 226 cfs May 22, 1957; no flow at times.

Remarks.--Records good except those for periods of doubtful gage-height record, which are poor. Discharge measurements generally made 2 to 4 times a month. Flow represents surface outflow from wildlife refuge. Diversion for irrigation of a few hundred acres above station.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	28	20	24.7	1,520
November . . . . .	20	3.2	9.35	556
December . . . . .	18	5.7	15.0	924
Calendar year 1962 . . . . .	107	.7	35.8	25,930
January . . . . .	18	8.8	13.5	828
February . . . . .	24	7.8	14.5	806
March . . . . .	66	5.7	31.8	1,960
April . . . . .	92	65	73.7	4,390
May . . . . .	72	40	54.9	3,380
June . . . . .	34	3.8	11.5	685
July . . . . .	17	1	6.13	377
August . . . . .	42	1	20.6	1,270
September . . . . .	46	2.1	18.9	1,130
Water year 1962-63 . . . . .	92	1	24.6	17,830

Note.--Doubtful gage-height record, July 24 to Aug. 2.



8-3585. Rio Grande at San Marcial, N. Mex.

Location.--Lat 33°40'50", long 106°59'30", in Pedro Armendaris Grant 33, on pier of the Atchison, Topeka and Santa Fe Railway Co. bridge, 1.1 miles downstream from former site of San Marcial, Socorro County, and 18½ miles southwest of San Antonio.

Drainage area.--27,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--January 1895 to September 1963.

Gage.--River channel (now called floodway): Water-stage recorder. Datum of gage is 4,455.19 ft above mean sea level, datum of 1929. Prior to June 25, 1943, floodway had water-stage recorder, inverted rod, inclined staff, and wire-weight gages at several sites within 2 miles of present site at various datums.

Conveyance channel: Water-stage recorder. Datum of gage is 4,454.00 ft above mean sea level (levels by Bureau of Reclamation). Prior to Apr. 29, 1958, at datum 4.19 ft higher. Apr. 14, 1950, to Feb. 28, 1954, bypass flow forming composite, measured at Tiffany Channel, 4 miles upstream; prior to 1950 all flow through floodway.

Average discharge.--67 years (1896-1963), 1,341 cfs (970,800 acre-ft per year).

Extremes.--Maximum discharge during year, 1,760 cfs Apr. 4; no flow at times.

1895-1963: Maximum discharge, about 50,000 cfs Oct. 11, 1904; no flow at times.

Remarks.--Records fair. Record is composite of floodway and conveyance channel (flows below 2,000 cfs generally routed through conveyance channel). Discharge measurements generally made once or twice a week on each channel. Diversions for irrigation of about 775,000 acres above station (includes about 13,800 acre-ft diverted from conveyance channel, as based on weekly measurements, data furnished by Bureau of Reclamation).

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	388	214	1,600	1,320	720	832	1,560	415	50	3.9	0	977
2	216	257	1,620	1,330	1,010	750	1,480	415	45	3.0	0	711
3	188	248	1,600	1,340	892	700	1,600	435	43	3.0	0	335
4	160	245	1,560	1,310	772	776	1,620	450	39	3.7	0	261
5	150	251	1,540	1,340	920	740	1,270	375	37	3.6	0	131
6	113	225	1,510	1,310	920	712	1,110	280	33	6.0	324	279
7	132	407	1,500	1,300	960	756	1,020	242	25	9.3	290	115
8	110	736	1,500	1,210	1,080	660	864	226	21	2.2	110	420
9	117	1,020	1,470	1,040	1,120	656	860	200	22	3.4	50	190
10	115	1,290	1,480	886	1,080	560	768	196	22	3.2	39	82
11	115	1,340	1,480	814	1,130	616	796	200	21	5.7	42	52
12	132	1,310	1,480	802	1,130	575	1,220	230	20	6.0	94	32
13	123	1,420	1,470	670	1,190	520	1,320	210	18	3.6	104	26
14	107	1,470	1,400	370	988	525	1,140	158	17	2.6	62	23
15	103	1,470	1,390	350	816	560	1,250	140	16	2.1	37	20
16	106	1,570	1,390	410	676	490	1,210	134	15	2.0	18	18
17	115	1,600	1,410	434	684	525	1,160	103	14	2.0	16	13
18	113	1,530	1,470	490	808	500	1,160	86	14	1.6	14	8.0
19	115	1,580	1,470	522	840	608	1,280	78	13	1.6	125	5.6
20	318	1,530	1,500	520	788	590	1,230	78	12	2.1	209	36
21	476	1,460	1,500	423	852	475	1,040	79	12	1.5	134	43
22	188	1,340	1,540	458	828	450	1,050	88	10	.9	98	425
23	172	1,350	1,580	500	884	425	972	86	9.3	.3	55	760
24	156	1,430	1,530	510	884	420	784	79	8.8	0	43	463
25	156	1,470	1,500	578	872	610	656	74	9.3	0	34	440
26	166	1,470	1,510	676	840	1,210	525	69	8.8	0	82	130
27	407	1,490	1,480	680	828	1,260	380	72	8.0	0	218	64
28	298	1,550	1,350	684	880	1,240	340	71	6.3	0	244	37
29	233	1,520	1,260	680	-	1,200	390	69	5.0	0	250	25
30	194	1,530	1,270	656	-----	1,070	480	64	4.4	0	540	18
31	178	-----	1,340	656	-----	1,210	-----	56	-----	0	874	-----
Total	5,660	34,323	45,700	24,269	25,392	22,221	30,535	5,458	578.9	73.3	4,106	6,139.6
Mean	183	1,144	1,474	783	907	717	1,018	176	19.3	2.36	133	205
Ac-ft	11,230	68,080	90,640	48,140	50,360	44,070	60,570	10,830	1,150	145	8,140	12,180
(†)	11,190	68,080	90,640	48,140	50,360	44,070	60,570	10,830	1,150	145	7,720	11,160
Calendar year 1962: Max 5,220 Min 8.0 Mean 1,030 Ac-ft 745,900												
Water year 1962-63: Max 1,620 Min 0 Mean 560 Ac-ft 405,500												

† Flow, in acre-feet, in conveyance channel only; this flow is included in above totals for composite flow.

8-3600. Alamosa River near Monticello, N. Mex.

Location.--Lat 33°34'10", long 107°36'20", in SW 1/4 sec. 31, T. 8 S., R. 7 W., on left bank at Alamosa damsite and below old Fort Ojo Caliente, just downstream from Wildhorse Creek, 15 miles northwest of Monticello.

Drainage area.--403 sq mi.

Records available.--October to December 1929, May 1931 to April 1942, July 1956 to June 1958 (annual maximum only), July 1958 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder and crest-stage gage. Datum of gage is 6,142.04 ft above mean sea level, datum of 1929. Prior to Aug. 17, 1930, at different datum. May 2, 1931, to Dec. 14, 1939, water-stage recorder at datum 0.20 ft lower and Dec. 15, 1939, to Apr. 17, 1942, at present datum. July 16, 1956, to July 27, 1958, crest-stage gage only at present site and datum.

Average discharge.--15 years (1931-41, 1958-63), 8.18 cfs (5,920 acre-ft per year).

Extremes.--Maximum discharge during year, 3,130 cfs Sept. 10 (gage height, 7.29 ft), from rating curve extended as explained below; minimum, 5.4 cfs June 24.

1931-42, 1956-63: Maximum discharge, 10,300 cfs Aug. 21, 1936 (gage height, 13.6 ft), from rating curve extended above 390 cfs on basis of slope-area measurements at gage heights 6.66 and 12.0 ft; minimum daily recorded, 5.6 cfs Jan. 9, 1932, Aug. 28-30, Sept. 3, 1936.

Maximum flood known probably occurred in 1895, from information by local residents. A flood in August 1943 was highest since 1917.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. No diversion above station. Entire normal flow diverted below station for irrigation.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	7.3	8.8	7.5	7.0	7.3	7.3	7.3	6.2	5.8	7.0	7
2	7.3	7.3	7.8	7.5	7.0	7.3	7.3	7.0	6.2	6.2	6.8	7
3	7.0	7.3	7.3	7.3	6.8	7.0	*7.3	7.0	6.2	6.2	6.8	7
4	7.3	7.3	*7.3	7.3	6.8	7.3	7.5	6.8	6.2	7.2	8	7
5	7.3	7.0	7.3	7.5	6.8	7.3	7.5	6.8	6.2	6.2	7	40
6	*7.3	7.0	7.3	7.5	6.8	7.3	7.3	6.8	6.0	5.8	7	8
7	7.5	7.0	7.3	7.5	*6.8	7.3	7.3	6.8	6.0	5.8	7	7
8	7.3	7.3	7.3	7.5	6.8	7.3	7.0	6.8	6.2	7.6	10	7
9	7.0	7.0	7.5	*7.8	7.0	7.3	7.3	6.8	6.2	36	12	7
10	7.0	7.0	7.5	7.8	7.3	7.3	7.0	6.6	6.2	44	8	*7.3
11	7.0	7.0	7.5	7.8	7.3	7.5	7.0	6.6	6.2	8	7	8.0
12	7.3	7.0	7.5	7.8	7.3	7.5	7.0	6.6	6.2	7	60	7.0
13	7.3	7.0	7.5	7.8	7.5	7.5	7.0	6.6	6.2	7	10	6.6
14	7.5	7.0	7.5	7.8	7.5	7.5	7.3	6.4	6.2	7	8	6.6
15	7.8	7.0	7.5	7.8	7.5	7.3	7.5	6.4	6.2	7	7	6.6
16	7.8	7.3	7.5	7.8	7.5	7.0	7.3	6.4	6.2	7	7	6.8
17	7.8	7.5	7.5	7.8	7.5	7.0	7.0	6.4	6.2	7	7	6.8
18	20	7.5	7.5	7.8	7.5	7.0	7.3	6.4	6.2	7	50	6.8
19	8.0	7.5	7.5	7.8	7.5	7.3	7.3	6.6	6.2	15	10	55
20	7.3	7.3	7.5	7.5	7.5	7.3	7.3	6.6	*6.2	8	15	15
21	7.3	7.0	7.5	7.5	7.8	7.3	7.3	6.6	6.8	7	30	44
22	7.3	7.3	7.5	7.5	8.0	7.5	7.3	6.6	6.8	7	10	10
23	7.3	7.3	7.5	7.5	8.0	7.5	7.3	6.6	6.4	10	8	7.3
24	7.3	7.3	7.5	7.5	7.8	7.5	7.3	6.4	5.8	7	7	7.0
25	7.5	7.3	7.5	7.3	7.8	7.3	7.3	6.4	6.2	*6.4	7	6.8
26	9.6	*7.3	7.5	7.3	7.5	7.3	7.3	6.4	6.4	6.4	7	7.0
27	7.5	7.0	7.5	7.3	7.5	7.3	7.3	6.4	6.0	6.2	7	7.0
28	7.5	7.0	7.5	7.3	7.5	7.3	7.0	6.4	6.4	6.0	7	7.0
29	7.5	7.5	7.5	7.3	-	7.5	7.3	6.4	6.2	7.2	7	7.0
30	7.3	10	7.5	7.3	-----	7.8	7.3	6.4	6.2	6.6	7	6.8
31	7.3	-----	7.3	7.0	-----	7.5	-----	6.2	-----	6.2	7	-----
Total	243.7	218.6	232.7	233.7	205.6	227.4	217.5	204.5	186.8	286.8	364.6	405.1
Mean	7.86	7.29	7.51	7.54	7.34	7.34	7.25	6.60	6.23	9.25	11.8	13.5
Ac-ft	483	434	462	464	408	451	431	406	371	569	723	804

Calendar year 1962: Max 56 Min 5.8 Mean 7.70 Ac-ft 5,580  
 Water year 1962-63: Max 73 Min 5.8 Mean 8.29 Ac-ft 6,010

Peak discharge (base, 1,000 cfs)

Note.--No gage-height record July 11-24, Aug. 4 to Sept. 9.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7-9	1550	5.47	1,280	8-21	unknown	5.45	1,260
8-12	unknown	5.68	1,430	9-5	unknown	5.58	1,360
8-18	unknown	5.88	1,590	9-10	1500	7.29	3,130

8-3610. Rio Grande below Elephant Butte Dam, N. Mex.

Location.--Lat 33°08'45", long 107°12'20", in SW $\frac{1}{4}$  sec.25, T.13 S., R.4 W. (projected), in Pedro Armendaris Grant, on left bank 1.0 mile downstream from dam and  $\frac{1}{2}$  miles upstream from Cuchillo Negro River.

Drainage area.--29,450 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--October 1916 to September 1963.

Gage.--Water-stage recorder (digital). Datum of gage is 4,242.09 ft above mean sea level, datum of 1929. Prior to Jan. 1, 1931, at one of three sites 0.1 to 1.0 mile upstream at different datums. Jan. 1, 1931 to Jan. 16, 1939, at site 400 ft downstream from dam at datum 12.80 ft higher than present datum. Jan. 17, 1939, to Dec. 31, 1940, at site 0.7 mile upstream at datums 0.06 ft lower and 1.36 ft lower Jan. 17 to Mar. 29, 1939, and Mar. 30, 1939, to Dec. 31, 1940, respectively. Jan. 1, 1941, to Apr. 23, 1942, at site 128 ft upstream from preceding gage at datum 0.91 ft lower than present gage.

Average discharge.--47 years, 1,048 cfs (758,700 acre-ft per year).

Extremes.--Maximum daily discharge during year, 2,070 cfs Feb. 12 (gage height, 6.02 ft); maximum gage height, 6.80 ft May 7; minimum daily, 2.8 cfs for many days.

1916-63: Maximum daily discharge, 8,220 cfs May 22, 1942; no flow at times prior to 1929.

Remarks.--Records good. Discharge measurements generally made 2 or 3 times a month. Flow regulated by Elephant Butte Reservoir (see p.177). Diversion for irrigation of about 800,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	8.6	4.3	3.1	1.150	1.080	1.790	1.150	756	1.390	1.430	565
2	9	9	5.2	3.5	1.100	1.080	1.790	1.150	754	1.380	1.420	562
3	9	9	4.3	3	668	660	1.790	1.170	758	1.390	1.420	265
4	9	8	3.9	3	1.190	1.170	1.790	1.170	756	1.380	1.400	10
5	9	8	2.8	3	1.220	1.160	1.780	1.180	770	1.390	1.400	7
6	9	8	4	4	1.360	1.150	1.780	1.190	754	1.390	1.410	5
7	9	8	4	4	1.180	1.150	1.780	1.180	765	1.390	1.410	5
8	8	8	3	4.1	1.170	1.150	1.780	1.180	762	1.400	1.410	4
9	8	8	3	4	1.080	1.050	1.780	1.170	763	1.390	1.420	4
10	8.0	8	3	4	646	634	1.780	1.170	767	1.400	1.420	4
11	8	7	3	5	1.180	1.140	1.770	1.170	750	1.410	1.420	4
12	8	7	3	5	1.230	1.160	1.790	1.180	750	1.400	1.420	3.1
13	8	7	2.8	5	1.170	1.160	1.780	1.180	748	1.390	1.430	3.9
14	8	7	3.1	5	1.160	1.150	1.790	1.180	752	1.380	1.430	3.9
15	8	7	2.8	5	1.160	1.150	1.800	1.180	752	1.380	1.420	3.9
16	9	7	2.8	5	1.060	1.050	1.800	1.170	748	1.380	1.420	3.9
17	8.7	7	2.8	5	633	635	1.800	1.170	753	1.370	1.430	3.5
18	9	6	2.8	5	1.150	1.150	1.790	1.160	750	1.380	1.440	3.5
19	8	6	3.1	5	1.150	1.150	1.800	1.160	752	1.380	1.450	3.5
20	8	6	3.1	5	1.140	1.150	1.780	1.160	755	1.390	1.480	3.5
21	8	6	3.1	5	1.120	1.150	1.790	1.150	712	1.390	813	3.9
22	8	6	3.1	10	1.060	1.150	1.790	1.140	762	1.330	810	3.5
23	7	6	3.1	13	1.060	1.040	1.790	1.140	758	1.400	812	3.5
24	7	6	3.1	10	630	625	1.790	1.140	772	1.410	790	3.5
25	7.3	5	2.8	10	1.150	1.130	1.810	1.140	746	1.410	812	3.1
26	7	5	3.1	10	1.180	1.130	1.790	1.140	774	1.430	826	3.1
27	7	5	3.1	10	1.160	1.140	1.790	1.150	776	1.430	562	3.1
28	8	5	3.1	10	1.170	1.140	1.780	1.150	771	1.430	562	3.1
29	8	5	3.1	10	-	1.130	1.780	1.160	749	1.430	562	3.1
30	8	4.7	3.1	10	-	1.120	1.760	1.160	786	1.370	562	3.1
31	8	-	2.8	10	-	760	-	1.170	-	1.460	562	-
Total	254.0	203.3	100.3	193.7	303.27	32.694	53.610	36.060	22.721	43.250	36.153	1.500.7
Mean	8.19	6.78	3.24	6.25	1,083	1,055	1,787	1,163	757	1,395	1,166	50.0
Ac-ft	504	403	199	384	60,150	64,850	106,300	71,520	45,070	85,790	71,710	2,980

Calendar year 1962 : Max 2,050 Min 2.6 Mean 956 Ac-ft 691,900  
 Water year 1962-63 : Max 1,810 Min 2.8 Mean 704 Ac-ft 509,900

Note.--Actual discharge measurement values used for daily figures on Oct. 10, 17, 25, Nov. 1, Jan. 8. No gage-height record Oct to Nov. 29, Dec. 6-12, Jan. 3-31, Sept. 4-11.

## RIO GRANDE BASIN

143

8-3625. Rio Grande below Caballo Dam, N. Mex.

Location.--Lat 32°53'05", long 107°17'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.30, T.16 S., R.4 W., on left bank 600 ft upstream from Bojarquez Bridge, 4,200 ft downstream from Caballo Dam, 1 $\frac{1}{2}$  miles downstream from Apache Canyon, 1 1/3 miles upstream from Percha diversion dam, 3 miles northeast of Arrey, and 5 miles south of Caballo.

Drainage area.--30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.).

Records available.--January 1938 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 4,140.9 ft above mean sea level, datum of 1929. Prior to Oct. 7, 1938, at datum 7.0 ft higher, Oct. 7-12, 1938, at datum 6.0 ft higher, and Oct. 13, 1938, to Dec. 31, 1945, at datum 5.0 ft higher than present datum.

Average discharge.--25 years, 933 cfs (675,500 acre-ft per year).

Extremes.--Maximum daily discharge during year, 3,050 cfs Mar. 16; minimum daily, 1.4 cfs Dec. 24 to Jan. 3, Feb. 13-16. 1938-63: Maximum daily discharge, 7,650 cfs May 20, 1942; minimum daily, 0.1 cfs Oct. 31 to Nov. 14, 1954, Nov. 7 to Dec. 31, 1955.

Remarks.--Records good. Flow regulated by Caballo Reservoir (capacity, 344,000 acre-ft, 1958 survey) and Elephant Butte Reservoir (capacity, 2,195,000 acre-ft, 1961 survey). Diversions for irrigation of about 800,000 acres above station. Figures of daily discharge do not include Bonita ditch which diverts from Caballo Dam and bypasses station for irrigation below. See monthly table below for record of ditch.

Cooperation.--Records furnished by Bureau of Reclamation.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	1.5	1.5	1.4	1.5	1.5	2,250	395	992	1,980	663	957
2	2.0	1.5	1.6	1.4	1.5	1.5	1,900	485	1,040	1,640	581	519
3	1.9	1.5	1.6	1.4	1.6	1.6	1,600	690	1,040	1,380	886	465
4	1.8	1.5	1.6	1.5	1.6	1.6	1,560	806	1,150	1,340	1,110	421
5	1.8	1.5	1.5	1.5	1.6	497	1,260	796	1,300	1,320	1,060	105
6	1.8	1.5	1.5	1.5	1.6	1,480	996	789	1,360	1,230	1,020	598
7	1.7	1.5	1.5	1.5	1.6	1,650	875	812	1,450	1,030	955	1,000
8	1.7	1.5	1.5	1.5	1.6	1,980	770	845	1,540	916	953	1,020
9	1.7	1.5	1.5	1.5	1.6	2,310	676	824	1,490	1,040	1,100	965
10	1.6	1.5	1.5	1.5	1.5	2,310	668	818	1,360	1,180	1,250	609
11	1.6	1.5	1.5	1.5	1.5	2,310	615	837	1,410	1,270	1,250	5.0
12	1.6	1.6	1.5	1.5	1.5	2,440	557	801	1,490	1,730	1,300	2.5
13	1.6	1.6	1.5	1.5	1.4	2,540	536	751	1,450	2,020	1,500	2.5
14	1.7	1.6	1.5	1.5	1.4	2,610	546	716	1,540	2,090	1,640	2.5
15	1.7	1.6	1.5	1.5	1.4	2,840	509	777	1,600	2,070	1,340	2.5
16	1.7	1.6	1.5	1.5	1.4	3,050	437	837	1,590	2,230	1,360	2.5
17	1.7	1.6	1.5	1.5	1.5	3,000	394	900	1,550	2,480	1,520	2.5
18	1.7	1.6	1.5	1.5	1.5	2,960	436	936	1,640	2,550	1,490	2.5
19	1.7	1.6	1.5	1.5	1.5	2,890	542	893	1,780	2,530	1,070	2.5
20	1.7	1.6	1.5	1.6	1.5	2,900	576	815	1,780	2,520	977	2.5
21	1.6	1.6	1.5	1.6	1.5	2,950	609	738	2,020	2,530	1,090	2.5
22	1.6	1.6	1.5	1.6	1.5	2,970	568	707	2,280	2,380	1,030	2.5
23	1.6	1.6	1.5	1.5	1.5	2,860	565	658	2,290	2,110	1,120	2.5
24	1.6	1.6	1.4	1.5	1.5	2,810	637	629	2,250	1,950	1,150	2.5
25	1.6	1.5	1.4	1.5	1.5	2,820	668	617	2,030	1,980	1,200	2.5
26	1.6	1.5	1.4	1.5	1.5	2,620	602	605	1,860	1,900	1,140	2.5
27	1.6	1.5	1.4	1.5	1.5	2,450	511	665	1,860	1,880	1,330	2.5
28	1.5	1.5	1.4	1.5	1.5	2,530	500	795	1,880	1,730	1,500	2.5
29	1.5	1.5	1.4	1.5	-	2,480	301	880	1,990	1,570	1,500	2.5
30	1.5	1.5	1.4	1.5	-----	2,320	311	941	1,980	1,280	1,280	2.5
31	1.5	-----	1.4	1.5	-----	2,330	-----	947	-----	1,010	980	-----
Total	52.0	46.3	46.0	46.5	42.3	66,913.2	22,975	23,705	48,992	54,866	36,345	6,710.5
Mean	1.68	1.54	1.48	1.50	1.51	2,158	766	765	1,633	1,770	1,172	224
Ac-ft	103	92	91	92	84	132,700	45,570	47,020	97,170	108,800	72,090	13,310
(†)	0	0	0	0	0	218	6	144	104	235	207	0
Calendar year 1962:	Max 2,910	Min 1.0	Mean 901	Ac-ft 651,900								
Water year 1962-63:	Max 3,050	Min 1.4	Mean 714	Ac-ft 517,100								

† Diversion, in acre-feet, by Bonita ditch. Bonita ditch diverts directly from Caballo Dam and this diversion is not included in the river records.

Location.--Lat 32°18'55", long 106°45'00", in SW 1/4 sec.9, T.23 S., R.2 E. (projected), on left bank in Dona Ana Bend Colony Grant, 1 1/2 miles northeast of Las Cruces City Hall, and 100 ft upstream from Interstate Highway 25.

Records available.--May 1958 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 4,035 ft (from topographic map). Prior to Aug. 17, 1960, at two sites about 670 ft upstream at datum 11.96 ft higher.

Extremes.--Maximum discharge during water year, 175 cfs Aug. 15 (gage height, 1.60 ft); no flow for most of time.  
1958-63: Maximum discharge, 1,060 cfs Aug. 23, 1959 (gage height, 4.05 ft, site and datum then in use), from rating curve extended above zero flow on basis of slope-area measurement at gage height 3.3 ft and logarithmic plotting; no flow for most of time.  
Greatest flood since about 1934 occurred Sept. 21, 1941 (discharge, 2,630 cfs, as determined by Corps of Engineers from newspaper accounts and rainfall-runoff studies). Another flood of about 1,900 cfs occurred Aug. 30, 1935.

Remarks.--Records poor.

Discharge, in cubic feet per second, water year October 1962 to September 1963

[illegible]

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
Calendar year 1962 . . . . .	17.7	11	0	0.048	35
July. . . . .	8.7	7.7	0	.28	17
August. . . . .	8.6	8.6	0	.28	17
Water year 1962-63 . . . . .	17.3	8.6	0	.047	34

Location.--Lat 32°17'20"U, long 106°43'45"W, in SE 1/4 sec.22, T.23 S., R.2 E. (projected), in Dona Ana Bend Colony Grant, 30 ft downstream from flood detention dam, 1.2 miles northeast of New Mexico State University and 3.3 miles southeast of Las Cruces Post Office, Dona Ana County.

Records available.--October 1962 to September 1963.

Gage.--Water-stage recorder and Parshall flume at downstream end of reservoir outlet pipe. Datum of gage is 4,071.62 ft above mean sea level (SCS bench mark).

Extremes.--Maximum discharge during year, 15 cfs July 29 (gage height, 0.87 ft); no flow for most of time.

Remarks.--Records good. Records represent outflow from Tortugas Reservoir, completed in 1962.

Reservoir is designed to retard flood flows and detain silt. Dam is earth-fill, L-shaped, 3,400 ft long at crest and 44 ft high. Original capacity, 1,325 acre-ft at spillway crest. No dead storage, though deposition of silt is expected to reduce storage capacity. Outlet drop tower is 9'-2" x 4'-2" inside and 18'-6" high. The tower has 9 rectangular outlet ports, each 8'x17", but 6 are presently closed. Tower is connected to downstream channel by a 30 inch diameter pipe. Records will be published in tabular form, as flow events.

Outflow during water year October 1962 to September 1963

Flow event	Date	Outflow (hours)	Maximum (cfs)	Cfs-days	Runoff (acre-ft)
1	July 3-4	18	13	3.2	6.4
2	July 29-30	31	15	4.7	9.3
3	Aug. 10-11	35	12	3.5	6.9
Totals		84	-	11.4	22.6

## 8-3656. McKelligon Canyon at El Paso, Tex.

Location.--Lat 31°49'20", long 106°28'15", on left bank 120 ft south of McKelligon Canyon Drive, 0.5 mile south of crest of Sugarloaf Mountain, 0.2 mile west of Alabama Avenue, 1.6 miles west of U.S. Highway 54 and 4.5 miles north of El Paso post office.

Drainage area.--2.3 sq mi, approximately.

Records available.--June 1958 to September 1963.

Gage.--Water-stage recorder and small earth-fill dam with uncontrolled concrete outlet tower. Altitude of gage is 4,257.33 ft above mean sea level (levels by City of El Paso).

Extremes.--No flow during year.

1958-63: Maximum discharge, 76 cfs Sept. 11, 1958 (on basis of culvert measurement of peak flow); no flow except Sept. 11, 12, 1958.

Remarks.--No flow since Sept. 12, 1958. Flood flow controlled by four small reservoirs upstream, with a total capacity of about 95 acre-feet.

## 8-3658. Government ditch at El Paso, Tex.

Location.--Lat 31°47'02", long 106°26'04", at intersection of Montana and Houston Streets, 2 miles northeast of the business center of El Paso.

Drainage area.--6.4 sq mi, approximately.

Records available.--June 1958 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,740 ft (from topographic map).

Average discharge.--5 years, 0.12 cfs (87 acre-ft per year).

Extremes.--Maximum discharge during year, 53 cfs Aug. 18 (gage height, 0.66 ft); no flow for most of time.

1958-63: Maximum discharge, 550 cfs Sept. 11, 1958 (gage height, 2.64 ft), from rating curve extended above 148 cfs on basis of slope-area measurement of peak flow; no flow for most of time.

Remarks.--Records good above 25 cfs and fair below.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Oct. 4. . . . .	1.1	Dec. 1. . . . .	0.3	Aug. 10. . . . .	0.1
5. . . . .	.2	Feb. 12. . . . .	.1	18. . . . .	2.8
26. . . . .	.1	May 23. . . . .	.9	30. . . . .	.1
Nov. 15. . . . .	.1	July 4. . . . .	.8	Sept. 5. . . . .	.4

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October . . . . .	1.4	1.1	0	0.05	2.8
November. . . . .	.1	.1	0	.003	.2
December. . . . .	.3	.3	0	.01	.6
Calendar year 1962 . . . . .	92.1	41	0	.25	182
February. . . . .	.1	.1	0	.003	.2
May . . . . .	.9	.9	0	.03	1.8
July. . . . .	.8	.8	0	.03	1.6
August. . . . .	3.0	2.8	0	.10	6.0
September . . . . .	.4	.4	0	.01	.8
Water year 1962-63 . . . . .	7.0	2.8	0	.019	14

Peak discharge (base, 100 cfs).--No peak above base.

Note.--Flow occurred only on days listed above.

## RIO GRANDE BASIN

8-3785. Pecos River near Pecos, N. Mex.

Location.--Lat 35°42'25", long 105°41'00", in NE¼NE¼ sec.17, T.17 N., R.12 E., on left bank at downstream side of bridge on private road, 600 ft upstream from Indian Creek, 2 miles downstream from Holy Ghost Creek, and 9 miles north of Pecos.

Drainage area.--189 sq mi (contributing area).

Records available.--August 1919 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Published as "near Cowles" 1919-25, "at Irvins Ranch" 1926-29, and as "at Irvins Ranch, near Pecos" 1930-39.

Gage.--Water-stage recorder. Datum of gage is 7,502.94 ft above mean sea level, datum of 1929.

Average discharge.--44 years, 100 cfs (72,400 acre-ft per year).

Extremes.--Maximum discharge during year, 225 cfs April 14 (gage height, 2.92 ft); minimum daily, 10 cfs Jan. 13.

1919-63: Maximum discharge, about 4,500 cfs Sept. 21 or 22, 1929 (gage height, 6.2 ft, from floodmark), from rating curve extended above 1,600 cfs by logarithmic plotting; minimum daily, 6 cfs Dec. 22, 23, 1956, Jan. 18, 22, 30, 1957.

Flood of Sept. 29, 1904, was greatest since 1886, from information by local residents.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 75 acres (1959 determination) above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

1.8	10	2.7	164
1.9	19	3.0	255
2.1	41		
2.4	92		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	23	27	b 22	b 37	b 27	148	119	90	28	21	67
2	26	23	25	b 22	b 35	b 28	124	116	110	29	21	58
3	* 26	23	b 23	a 22	b 36	b 23	96	121	101	31	25	55
4	25	22	b 22	a 21	b 37	b 23	96	136	88	49	30	64
5	35	24	b 21	a 20	34	b 26	99	146	80	52	* 26	78
6												
7	29	24	b 22	a 22	34	b 30	84	148	74	41	23	65
8	26	21	b 25	a 24	* b 28	b 24	107	167	70	35	21	57
9	25	20	b 25	a 25	b 27	b 24	154	184	* 69	37	22	51
10	24	21	b 25	a 26	b 24	b 23	186	201	70	* 58	33	49
11	24	* 22	b 25	a 25	b 23	24	192	201	64	47	48	49
12												
13	22	22	b 25	a 20	b 20	b 24	175	207	60	37	51	58
14	22	19	b 20	a 15	b 20	b 27	164	204	57	34	* 52	51
15	22	20	b 22	a 10	b 25	b 29	* 175	186	55	31	65	54
16	22	25	* b 24	a 15	b 26	b 27	186	175	58	30	* 55	82
17	22	36	b 25	a 20	b 24	b 29	204	* 172	51	28	49	64
18												
19	* 23	30	b 25	a 22	b 25	b 30	186	175	49	28	76	* 57
20	28	28	b 25	a 25	b 26	b 34	167	167	52	33	62	54
21	30	44	b 23	a 25	b 26	31	156	161	48	35	114	51
22	37	b 45	b 22	* b 23	* b 27	b 35	136	156	48	30	86	48
23	37	45	b 20	b 22	b 30	* b 33	128	151	45	36	78	48
24												
25	33	b 37	b 15	b 23	b 35	42	124	154	42	42	72	141
26	29	b 33	b 22	b 23	b 33	45	124	154	39	30	65	161
27	27	b 30	b 24	b 22	b 31	57	112	143	36	27	54	131
28	27	29	b 22	b 22	b 30	70	* 116	138	35	24	51	110
29	25	29	b 20	b 22	b 30	72	116	126	34	24	65	99
30												
31	24	29	b 22	b 22	b 30	82	126	119	31	25	92	90
32	24	26	b 18	b 22	b 30	90	131	112	30	23	80	82
33	24	* b 24	* b 21	b 25	* b 25	* 110	124	105	* 30	23	72	76
34	24	b 27	b 21	b 25	-	146	119	101	28	24	78	70
35	* 23	28	b 20	b 25	-----	131	112	101	27	23	80	67
36	23	-----	b 21	b 30	-----	151	-----	96	-----	21	74	-----
Total	814	829	697	687	808	1,547	4,167	4,642	1,671	1,015	1,741	2,187
Mean	26.3	27.6	22.5	22.2	28.9	49.9	139	150	55.7	32.7	56.2	72.9
Ac-ft	1,610	1,640	1,380	1,360	1,600	3,070	8,270	9,210	3,310	2,010	3,450	4,340

Calendar year 1962: Max 540 Min 10 Mean 82.9 Ac-ft 60,030  
 Water year 1962-63: Max 207 Min 10 Mean 57.0 Ac-ft 41,250

Peak discharge (base, 310 cfs). --No peak above base.

\* Discharge measurement made on this day.

a No gage-height record.

b Stage-discharge relation affected by ice.

8-3792. Tecolote Creek near San Pablo, N. Mex.

Location.--Lat 35°33'10", long 105°22'10", in Las Vegas Grant, on left bank half a mile downstream from San Pablo Creek and 1½ miles northeast of San Pablo.

Drainage area.--83 sq mi, approximately.

Records available.--June 1960 to September 1963.

Gage.--Water-stage recorder (digital subsequent to Apr. 23). Altitude of gage is 6,730 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,000 cfs June 1 (gage height, 7.93 ft), from rating curve extended above 320 cfs as explained below; minimum daily, 0.1 cfs Aug. 1, 5-7.

1960-63: Maximum discharge, 10,900 cfs Aug. 17, 1961 (gage height, 15.57 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 10.50 and 15.57 ft; minimum daily, that of Aug. 1, 5-7, 1963.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions for irrigation of about 250 acres (1960 determination) above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 1 Aug. 23 to Sept. 30				June 2 to Aug. 22			
0.3	0.3	0.8	12	0.3	0.1	0.8	7.7
.4	1.1	1.1	27	.4	.4	1.0	16
.5	2.9	1.5	57	.5	1.0	1.2	28
.6	5.3	2.1	132	.6	2.2	1.5	54
				.7	4.5		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.8	1.3	2.9	b 1.8	2.5	6.5	2.0	7.0	11.8	0.3	* 0.1	1.4
2	1.8	* 1.3	2.7	b 1.7	2.5	b 6.2	1.8	5.9	5.3	.3	.2	1.1
3	1.8	1.5	2.5	b 2.0	2.7	6.2	* 1.5	5.0	2.7	.9	.2	8.0
4	1.6	1.5	2.4	b 1.8	2.7	6.8	1.4	4.6	1.4	.8	.2	1.5
5	1.6	1.5	b 2.2	b 1.3	2.7	b 6.5	1.3	4.5	8.7	.5	.1	* 10
6	1.6	1.5	b 2.2	b 1.3	2.7	b 6.5	1.1	4.5	6.2	1.3	.1	6.4
7	1.5	1.5	2.0	b 1.3	* 2.7	b 6.5	1.1	4.5	4.7	7.4	.1	4.9
8	1.5	1.5	2.0	b 1.8	2.7	5.9	1.2	4.4	4.3	1.3	2.8	6.1
9	* 1.1	1.5	b 1.8	b 2.0	2.9	5.6	1.3	* 4.0	4.0	* 5.7	2.6	8.1
10	1.1	1.3	b 1.8	* b 1.6	b 3.1	6.2	1.3	3.8	3.4	2.9	1.0	7.3
11	1.0	1.3	b 1.8	b 6	b 2.5	5.9	1.3	3.7	2.6	1.5	.7	1.4
12	1.0	1.3	b 1.8	b 3	b 2.0	* 6.5	1.3	3.5	2.2	1.0	5.1	5.3
13	1.0	1.3	b 1.6	b 5	b 2.5	5.6	1.2	3.3	3.3	.9	1.1	3.9
14	1.0	1.3	b 1.5	b 1.0	b 3.0	6.2	1.2	2.8	2.4	.9	* 1.1	3.3
15	1.0	1.8	b 1.5	b 1.1	b 3.1	6.8	1.2	2.8	2.0	.9	1.4	6.5
16	1.1	2.7	b 1.5	b 1.2	b 3.1	8.1	1.1	2.7	1.9	.9	6.2	3.7
17	1.6	2.7	1.6	b 1.3	b 3.4	7.5	1.1	2.5	2.7	.8	4.6	2.6
18	2.2	b 2.0	2.0	b 1.4	b 3.4	8.1	9.1	2.3	2.0	.8	4.3	2.5
19	2.7	b 2.2	2.2	b 1.4	b 3.6	7.8	8.8	2.3	3.6	.7	9.8	2.5
20	2.9	b 2.4	2.0	b 1.0	b 3.6	8.1	7.8	2.3	1.7	.7	7.3	2.7
21	2.2	2.7	* 2.0	b 1.6	4.1	8.8	7.2	2.3	* 1.3	.7	1.0	10.7
22	2.0	2.7	b 1.6	b 2.0	5.1	9.5	6.5	2.4	.8	.7	* 6.1	8.9
23	1.8	2.7	b 1.6	b 1.4	b 4.3	1.1	5.6	2.4	.6	.6	4.1	3.1
24	1.8	2.5	b 1.5	b 2.0	b 4.6	1.3	5.4	2.2	.5	.5	3.0	2.1
25	1.8	2.5	b 1.4	b 1.8	4.8	1.4	5.2	1.9	.5	.5	4.4	1.5
26	1.8	2.5	b 1.0	b 2.4	b 4.6	1.3	* 5.6	1.8	.4	a.4	1.9	* 1.2
27	1.8	2.4	b 1.2	2.2	5.9	1.4	6.4	1.9	.4	a.4	1.2	9.3
28	1.8	* 2.4	b 1.6	2.4	6.8	1.5	5.2	1.7	.4	a.3	1.1	7.7
29	1.8	2.4	b 1.7	2.9	-	2.2	5.1	* 2.5	.4	a.3	1.1	6.8
30	1.6	2.5	b 1.8	3.4	-----	2.3	5.3	2.1	.4	a.2	2.5	6.0
31	1.5	-----	b 2.0	3.4	-----	2.2	-----	1.9	-----	a.2	1.8	-----
Total	50.8	58.7	57.4	51.9	97.6	298.8	307.2	99.5	290.5	58.7	290.5	466.9
Mean	1.64	1.96	1.85	1.67	3.49	9.64	10.2	3.21	9.68	1.89	9.37	15.6
Ac-ft	10.1	11.6	11.4	10.3	19.4	59.3	60.9	19.7	57.6	11.6	57.6	92.6

Calendar year 1962: Max 81 Min 0.3 Mean 7.56 Ac-ft 5,470  
 Water year 1962-63: Max 118 Min 0.1 Mean 5.83 Ac-ft 4,220

Peak discharge (base, 250 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6- 1	1915	7.93	2,000	8-25	1430	4.11	633
7- 6	1900	2.92	305	9-21	1515	5.38	1,010
8-12	1430	4.34	702				

\* Discharge measurement made on this day.  
 a No gage-height record.  
 b Stage-discharge relation affected by ice.



8-3795. Pecos River near Anton Chico, N. Mex.

Location.--Lat 35°10'45", long 105°06'30" (revised), in Anton Chico Grant, on right bank 2 miles upstream from Canyon Blanco, 2½ miles southeast of Anton Chico, and 10 miles downstream from Tecolote Creek.

Drainage area.--1,050 sq mi, approximately (contributing area).

Records available.--April 1910 to May 1916, October 1916 to September 1924, August to December 1925, January 1927 to September 1963.

Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder (digital subsequent to Apr. 21). Altitude of gage is 5,130 ft (from river-profile map). Prior to July 2, 1937, at five different sites from one-sixth mile to 8½ miles upstream at various datums. July 2, 1937, to June 21, 1951, at site 345 ft upstream at datum 2.42 ft higher.

Average discharge.--50 years (1910-15, 1916-24, 1926-63), 140 cfs (101,400 acre-ft per year).

Extremes.--Maximum discharge during year, 10,300 cfs Aug. 25 (gage height, 11.75 ft), from rating curve extended above 5,800 cfs on basis of slope-area measurement at gage height 16.62 ft; minimum daily, 1 cfs Jan. 11, 12, July 24, July 28 to Aug. 2, Aug. 5-9.

1911-63: Maximum discharge, 40,300 cfs June 1, 1937 (gage height, 20.34 ft, from floodmarks, at site and datum then in use), by slope-area measurement; no flow at times.

The greatest flood since 1879 occurred Sept. 29, 1904 (discharge, about 73,000 cfs), from information by a local resident.

Remarks.--Records fair except those for periods of ice effect or no gage-height record and those below 10 cfs, which are poor.

Diversions above station for irrigation of about 4,900 acres (1959 determination) above and below station. Bado de Juan Pais ditch (see table below) diverts water about 8 miles above gage and bypasses this station on left bank; ditch flow not included in record. Discharge measurements made at point opposite regular gage. A portion of this flow may be returned to the river about five miles downstream.

Discharge measurements, in cubic feet per second, of Bado de Juan Pais ditch,  
water year October 1962 to September 1963

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 12	3.77	Mar. 7	0	May 27	11.7
30	12.0	28	0	June 13	27.2
Nov. 27	22.4	Apr. 3	32.0	20	28.9
Dec. 19	13.3	11	35.9	July 30	0
Jan. 8	1.38	17	24.3	Aug. 23	31.3
Feb. 5	16.8	May 8	26.3	Sept. 27	16.9

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	a10	17	13	23	13	207	56	56	2	1	113
2	23	a10	16	13	27	11	199	60	a565	2	1	93
3	15	a10	16	6	24	20	*168	60	160	2	21	87
4	17	a10	14	11	23	32	130	56	127	2	20	65
5	13	a11	14	11	*21	36	143	52	87	6	1	178
6	12	a12	14	12	21	37	120	74	51	3	1	*100
7	14	a10	13	12	a20	*32	106	77	24	19	1	73
8	12	a9	12	*10	a20	34	99	*78	16	*31	1	58
9	10	a9	14	10	a20	34	132	88	10	*265	1	99
10	10	a10	13	8	a20	35	194	116	a5	66	4	90
11	13	a12	13	1	a15	32	*217	125	a4	24	231	15
12	*13	a10	13	b1	b14	34	199	132	a4	19	825	137
13	13	a8	14	b8	b20	34	175	138	*5	11	752	49
14	12	a7	13	b15	b22	32	177	121	6	13	*429	67
15	13	a12	13	b20	b23	31	189	103	9	8	191	37
16	12	a13	13	b25	b24	32	187	101	14	4	128	*53
17	13	a12	13	b25	b25	32	*177	99	115	2	74	34
18	14	a15	a13	b30	b27	37	152	104	16	2	61	22
19	15	a16	*14	b25	30	41	a130	104	14	3	137	23
20	13	a18	15	b20	31	46	a110	132	*37	4	99	33
21	13	a16	18	b25	27	42	a100	128	15	3	69	155
22	a11	a16	18	b30	27	49	90	164	14	2	48	2320
23	a10	a14	17	b20	24	64	85	131	12	2	*49	426
24	a12	a13	16	b25	23	76	72	115	3	1	22	282
25	a13	a12	18	b30	19	101	69	96	2	2	928	207
26	a15	a12	b14	b30	11	122	68	79	2	3	232	157
27	a12	*12	b16	b25	13	132	70	*75	2	2	101	*123
28	a12	13	b13	b30	14	*139	80	96	2	1	86	106
29	a11	8	b13	b35	-	152	70	60	2	1	213	93
30	*11	10	b12	b40	-	210	54	84	2	*1	299	80
31	a10	-----	12	34	-----	192	-----	68	-----	1	169	-----
Total	413	350	444	600	608	1914	3969	2972	1381	507	5195	5375
Mean	13.3	11.7	14.3	19.4	21.7	61.7	132	95.9	46.0	16.4	168	179
Ac-ft	819	694	881	1190	1210	3800	7870	5890	2740	1010	10300	10660

Calendar year 1962: Max 900 Min 0 Mean 89.9 Ac-ft 65,100  
Water year 1962-63: Max 2,320 Min 1 Mean 65.0 Ac-ft 47,060

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-12	2320	8.66	4,710	9-22	about 0145	9.92	6,980
8-25	about 1900	11.75	10,300				

\* Discharge measurement made on this day.  
a No gage-height record.  
b Stage-discharge relation affected by ice.

RIO GRANDE BASIN

149

8-3805. Gallinas River near Montezuma, N. Mex.

Location.--Lat 35°39'00", long 105°19'10", in Las Vegas Grant, on left bank 2 miles west of Montezuma, San Miguel County, and 6 miles northwest of Las Vegas.

Drainage area.--84 sq mi, approximately.

Records available.--March to September 1915, June 1916 to September 1963. Monthly discharge only for some periods, published WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 6,950 ft (from topographic map).

Average discharge.--47 years (1916-63), 20.4 cfs (14,770 acre-ft per year).

Extremes.--Maximum discharge during year, 460 cfs June 1 (gage height, 3.35 ft); minimum daily, 1.0 cfs Aug. 8.

1915-63: Maximum discharge, 5,400 cfs Aug. 4, 1957 (gage height, 8.25 ft), from rating curve extended above 530 cfs on basis of computation of peak flow over dam; minimum daily determined, 0.2 cfs Oct. 6-9, 1922, Sept. 21, Oct. 9-14, 1956.

The greatest flood since about 1900 occurred the night of Sept. 29, 1904 (discharge not determined), from information by local residents and G. B. Monk's report on floods.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions for irrigation of about 80 acres (1959 determination) above station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Jan. 25

Jan. 26 to Sept. 30

0.4	2.6	0.27	1.0	0.8	15
.5	4.8	.3	1.2	1.1	31
.6	8.1	.4	2.6	1.5	62
		.5	4.6	1.9	102
		.6	7.2		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	*3.5	6.0	b 5	6.7	5.6	2.6	9.6	2.7	2.1	1.4	3.2
2	4.0	4.0	5.4	b 5	5.6	5.9	2.0	9.9	1.1	2.1	1.3	2.4
3	4.2	3.7	5.1	b 5	4.4	6.4	1.6	8.9	8.6	2.2	1.3	1.9
4	4.0	3.7	5.1	b 5	4.2	6.7	1.8	8.9	8.2	2.6	1.3	1.8
5	4.2	3.5	4.8	b 5	4.4	b 5.5	1.6	9.2	6.7	3.6	1.2	1.8
6	4.0	3.5	b 4.8	b 5	* 4.4	b 6	1.4	9.6	6.4	3.6	1.2	1.4
7	4.2	3.7	5.1	b 5.5	4.4	b 5.5	1.5	9.2	5.3	3.6	1.1	1.2
8	* 4.0	3.7	4.8	b 5.5	4.4	6.4	1.9	9.6	5.1	5.1	1.0	9.9
9	4.2	3.3	b 4.5	* b 5.5	4.6	6.1	2.1	9.6	4.6	1.0	4.3	9.9
10	4.0	3.3	b 4.5	b 5.5	b 4	6.4	2.3	* 9.9	4.6	* 6.7	2.2	1.1
11	3.5	3.3	b 4.0	b 4	b 3	6.4	2.2	9.9	4.6	4.4	7.7	1.2
12	3.7	3.5	b 4.0	b 2.6	b 3	6.4	1.9	9.6	4.4	4.0	2.4	1.1
13	3.7	3.5	b 4.2	b 3	b 3.5	6.1	1.9	9.6	4.2	3.4	1.4	1.5
14	3.5	3.1	b 4.2	b 3.5	b 4	6.4	1.9	9.2	* 4.0	3.2	5.1	1.1
15	3.7	4.0	b 4.2	b 4	b 3.5	6.7	2.0	8.9	4.2	3.0	4.0	1.1
16	3.5	6.0	b 4.5	a 4.5	b 3.5	7.2	2.0	8.2	5.6	2.8	6.4	9.9
17	4.0	5.4	4.8	a 5	b 4	7.9	1.8	7.9	5.3	2.2	5.6	8.6
18	4.8	b 5.1	5.4	a 5.5	b 4.5	8.6	1.6	7.5	5.1	2.4	1.3	8.2
19	4.5	b 5.1	5.4	a 4	b 5	7.5	1.5	7.2	4.6	2.6	3.9	6.9
20	5.4	b 5.7	* 5.1	a 4.5	5.1	8.2	1.3	7.9	4.4	2.8	1.8	6.9
21	4.2	6.0	4.8	a 5	5.3	9.2	1.2	7.2	4.0	2.4	* 1.1	5.9
22	4.2	5.7	b 4.0	a 5.5	b 4.8	9.6	1.2	7.9	3.6	2.4	8.9	9.9
23	4.5	5.7	b 3.5	a 5	b 4.8	1.2	1.1	6.9	3.4	2.2	6.9	6.5
24	4.2	5.4	b 4.0	a 5	5.3	1.5	1.1	6.7	3.0	2.1	1.9	4.4
25	4.0	5.4	b 3.5	* a 6	5.1	1.5	* 1.0	6.1	2.6	2.2	7.1	* 3.4
26	3.7	5.1	b 3.0	b 5	5.3	1.6	1.1	5.3	2.4	2.1	9.0	2.6
27	3.5	5.1	b 3.0	b 5.5	5.6	1.5	1.2	5.3	* 2.4	2.1	5.2	2.2
28	4.0	* 5.1	b 3.5	b 5.5	* 6.1	1.8	9.9	* 5.1	2.2	2.1	3.2	1.8
29	4.0	4.8	b 4.0	b 6	-	* 2.9	9.6	5.1	2.1	2.1	3.9	1.6
30	4.0	5.1	b 4.5	b 6.5	-----	2.6	9.2	6.1	2.1	1.9	6.5	1.4
31	4.0	-----	b 5.0	b 7	-----	2.7	-----	6.1	-----	* 1.8	4.7	-----
Total	125.9	134.0	138.7	154.6	128.5	323.7	476.7	248.1	161.7	95.8	573.3	665.3
Mean	4.06	4.47	4.47	4.98	4.59	10.4	15.9	8.00	5.39	3.09	18.5	22.2
Ac-ft	250	266	275	307	255	642	946	492	321	190	1,140	1,320

Calendar year 1962: Max 138 Min 2.6 Mean 14.1 Ac-ft 10,240  
Water year 1962-63: Max 99 Min 1.0 Mean 8.84 Ac-ft 6,400

Peak discharge (base, 250 cfs).--June 1 (2030) 460 cfs (3.35 ft).

\* Discharge measurement made on this day.  
a No gage-height record.  
b Stage-discharge relation affected by ice.

8-3810. Gallinas River at Montezuma, N. Mex.

Location.--Lat 35°39'15", long 105°16'30", in Las Vegas Grant, at downstream end of middle pier of highway bridge, half a mile downstream from Montezuma, San Miguel County, and 5 miles northwest of Las Vegas.

Drainage area.--87 mi, approximately.

Records available.--August 1903 to September 1904 (gage heights only), October 1904 to May 1912, October 1912 to September 1963. Yearly estimate for water year 1912 (incomplete) and monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge for the periods Oct. 8-22, 1904, and Jan. 1 to Feb. 20, 1906, published in WSP 177 and 213, respectively, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Altitude of gage is 6,675 ft (from topographic map). Prior to Mar. 24, 1926, staff gage at site a quarter of a mile upstream. Gages at various datums prior to Sept. 3, 1942.

Average discharge.--59 years (1904-63), 19.6 cfs (14,190 acre-ft per year).

Extremes.--Maximum discharge during year, 434 cfs June 1 (gage height, 5.35 ft), from rating curve extended above 33 cfs by logarithmic plotting; no flow Aug. 4-8.

1904-63: Maximum discharge, 9,140 cfs Aug. 4, 1957 (gage height, 11.8 ft, from floodmark), from rating curve extended above 450 cfs on basis of slope-area measurement of peak flow; no flow Oct. 4-7, 1934, July 27, 28, 29, 1956, several days in 1957, Aug. 4-8, 1963.

Flood of Sept. 30, 1904, is the highest since about 1900 (discharge, 11,600 cfs by slope-area method), from G. B. Monk's report on floods and WSP 147.

Remarks.--Records fair. Flow partly regulated at low flows by reservoirs owned by Public Service Co. of New Mexico. Diversions above station for irrigation of about 180 acres (1959 determination) and for Las Vegas city water supply.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 24 to July 8, July 10 to Aug. 11)

Oct. 1 to June 1				June 1 to Sept. 30			
4.05	1.0	4.4	12	3.65	0	4.2	14
4.1	1.5	4.5	21	3.7	.1	4.3	22
4.2	3.4	4.6	35	3.8	.6	4.4	36
4.3	6.8			3.9	1.6	4.5	52
				4.0	3.8	4.6	74
				4.1	7.5	4.8	134

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.6	4.9	2.0	2.0	4.0	4.2	2.6	5.6	2.7	1.3	0.6	2.7
2	2.4	*5.2	2.2	2.0	3.7	4.0	1.9	5.6	1.6	1.3	.5	1.9
3	2.4	5.2	2.0	2.8	3.0	4.5	9.8	4.9	4.8	1.4	.2	1.3
4	2.2	4.5	2.0	2.6	2.4	4.9	1.1	4.9	2.7	1.6	0	1.2
5	2.4	3.4	2.2	2.2	2.4	3.7	1.2	4.5	2.5	1.3	0	1.2
6	2.2	1.0	2.0	2.0	*2.4	4.0	9.2	5.2	2.1	4.1	0	1.0
7	2.0	1.5	2.0	2.0	2.2	4.0	9.2	4.9	2.0	2.7	0	8.5
8	2.0	1.8	1.8	2.0	2.4	4.5	1.2	4.9	2.0	6.0	0	7.0
9	2.0	3.7	1.8	*2.2	2.6	4.2	1.4	5.2	2.0	8.0	.1	6.2
10	*2.0	4.2	1.6	2.0	3.2	4.5	1.6	*5.6	1.6	*4.4	.2	6.2
11	1.8	4.2	1.6	2.0	2.4	4.5	1.4	5.2	1.6	3.0	9.4	7.0
12	1.6	4.5	2.6	1.6	2.2	4.9	1.2	5.2	1.6	2.3	1.4	7.5
13	1.8	4.5	2.6	2.2	2.2	4.5	1.2	5.2	2.0	2.1	17	11
14	1.8	4.5	2.8	2.2	2.6	4.2	1.1	4.9	*2.0	2.1	3.7	8.5
15	1.8	4.5	2.6	2.4	3.4	4.9	1.2	4.2	1.8	2.0	1.6	6.2
16	1.8	6.4	2.6	2.0	3.4	4.9	1.2	4.0	3.4	2.1	2.0	5.8
17	2.0	6.0	2.6	1.8	2.4	5.6	1.1	3.7	5.4	1.8	2.3	5.0
18	2.2	4.9	3.4	2.2	2.8	6.0	9.2	3.4	2.7	1.8	4.6	4.4
19	2.4	4.2	3.2	2.2	3.2	5.6	8.2	3.4	3.0	1.6	3.6	3.5
20	2.8	4.9	*3.0	2.2	3.0	6.0	6.4	3.7	3.8	1.6	1.3	3.5
21	4.0	6.0	2.6	2.4	3.4	6.8	5.2	3.7	3.2	1.3	*6.2	5.2
22	5.2	6.0	2.2	2.6	2.8	7.6	4.9	4.0	2.7	1.0	4.0	1.27
23	5.6	5.2	2.0	2.4	3.2	9.2	5.2	4.0	2.3	.9	3.0	6.5
24	5.6	5.6	2.6	2.0	3.2	1.2	5.2	3.4	2.1	.9	9.8	4.0
25	5.2	5.6	2.6	*2.2	3.4	1.2	*5.2	3.2	2.0	1.0	7.9	*3.0
26	4.9	4.5	1.5	2.0	3.2	1.4	6.0	3.0	1.6	.9	11.4	2.0
27	4.9	*1.5	1.6	2.2	3.7	1.3	7.2	2.8	*1.4	.9	5.2	1.5
28	4.5	1.5	2.8	2.6	*4.5	1.5	6.0	*2.6	1.5	.8	3.0	1.1
29	4.9	1.8	1.8	2.6	-	*2.9	5.2	2.6	1.4	.8	3.2	9.6
30	4.9	1.8	2.0	2.8	-----	2.7	4.9	2.8	1.3	.7	7.0	8.0
31	4.9	-----	2.2	3.4	-----	2.7	-----	2.8	-----	*.6	4.4	-----
Total	96.8	123.5	70.5	69.8	83.3	266.2	301.0	129.1	109.5	62.3	536.6	560.9
Mean	3.12	4.12	2.27	2.25	2.98	8.59	10.0	4.16	3.65	2.01	17.3	18.7
Ac-ft	192	245	140	138	165	528	597	256	217	124	1060	1110

Calendar year 1962: Max 212 Min 1.0 Mean 12.6 Ac-ft 9,100  
Water year 1962-63: Max 127 Min 0 Mean 6.60 Ac-ft 4,770

Peak discharge (base, 200 cfs)--June 1 (2120) 434 cfs (5.35 ft).

\* Discharge measurement made on this day.

8-3820. Gallinas River near Lourdes, N. Mex.

Location.--Lat 35°28'15", long 105°09'35", in Las Vegas Grant, on right bank 0.8 mile upstream from ford on Lourdes-Romeroville road, 1.2 miles northwest of Lourdes, San Miguel County, 2.8 miles downstream from Pagosa Canyon, and 9 miles south of Las Vegas.

Drainage area.--313 sq mi.

Records available.--June 1951 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 5,928 ft above mean sea level (levels from planetable bench mark).

Average discharge.--12 years, 14.5 cfs (10,500 acre-ft per year).

Extremes.--Maximum discharge during year, 1,870 cfs Aug. 25 (gage height, 6.34 ft); minimum daily, 3.1 cfs Apr. 8-11.

1951-63: Maximum discharge, 6,680 cfs Aug. 17, 1961 (gage height 9.40 ft), from rating curve extended above 2,100 cfs on basis of slope-area measurement of peak flow; no flow June 17, July 2-10, 1957.

Flood of Sept. 30, 1904, is probably highest known. Other major floods occurred June 9, 1903 and June 1, 1937.

Remarks.--Records good except those above 25 cfs, which are fair. Diversions for irrigation of about 6,600 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 5 - 15)

1.5	2.0	2.5	46
1.6	3.6	3.0	98
1.7	5.6	3.5	179
1.9	12	4.0	292
2.2	25	4.5	455

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.5	*8.8	11	6.5	9.9	9.2	*4.8	12	5.9	3.8	*6.8	12
2	8.8	8.2	11	6.8	7.6	7.9	4.2	17	7.3	4.2	7.0	8.5
3	8.5	8.2	8.8	7.3	6.8	6.8	4.0	8.2	8.5	5.0	21	7.9
4	8.5	8.2	8.8	7.6	5.6	6.8	4.0	6.8	5.9	7.9	12	7.3
5	8.5	7.6	7.9	7.3	5.6	7.3	4.8	6.5	5.2	3.9	8.5	*11
6	7.3	7.9	8.8	7.3	5.4	7.6	5.2	6.8	4.6	23	7.6	9.6
7	7.3	7.6	7.9	6.8	*5.2	7.3	4.0	6.2	4.0	14	7.0	7.0
8	7.0	7.9	7.3	6.8	5.4	6.8	3.1	5.6	4.4	8.4	7.3	15
9	*6.8	8.2	7.0	6.8	5.4	6.5	3.1	*5.6	4.8	*3.5	7.9	7.4
10	7.3	8.2	7.0	*6.2	8.2	5.9	3.1	5.4	4.8	11	13	12
11	7.0	7.3	6.8	5.0	8.8	6.2	3.1	5.6	5.0	8.8	14	4.5
12	6.8	7.0	6.8	4.5	7.0	*6.5	3.8	5.0	5.6	7.3	24.9	21
13	7.0	7.0	7.0	5.5	6.8	7.0	4.0	4.8	*5.6	7.3	17.3	8.2
14	7.0	7.3	7.0	7.0	6.8	6.5	4.4	5.0	22	7.3	34	18
15	6.8	7.6	7.3	8.8	7.9	6.5	4.4	5.4	6.8	7.0	15	8.8
16	7.0	7.9	7.9	11	7.3	5.4	3.8	5.2	10.1	6.5	10	8.8
17	8.2	8.2	7.9	10	7.0	5.4	4.0	5.2	17	5.9	8.5	6.8
18	8.8	9.6	9.6	9.9	6.8	5.0	4.2	5.4	7.6	6.2	10	6.2
19	12	8.8	9.2	9.6	7.6	5.2	4.4	5.9	6.8	8.5	10	5.4
20	11	9.2	7.6	8.5	8.2	5.2	3.8	7.3	12	8.8	7.3	5.4
21	9.6	9.9	*7.3	7.9	9.2	5.2	3.6	6.8	*7.0	11	6.5	8.0
22	8.5	8.8	7.6	7.6	8.8	5.2	3.8	7.0	6.2	7.6	*6.5	4.00
23	9.6	8.8	7.9	8.5	8.8	5.0	3.6	7.0	5.6	7.0	5.9	32
24	9.9	8.5	6.8	7.6	8.8	4.8	4.0	5.4	5.0	6.8	7.3	15
25	9.2	8.2	6.5	7.9	8.5	4.6	4.4	4.8	4.6	7.0	28.6	11
26	8.5	9.9	6.0	8.5	7.9	4.8	*4.6	4.6	4.6	11	8.1	*8.8
27	8.5	7.6	7.0	7.9	8.5	4.8	5.2	*5.6	4.8	9.6	16	7.6
28	8.2	7.3	7.6	7.9	9.9	4.6	4.8	7.3	4.4	9.2	10	6.8
29	8.2	*7.6	7.0	8.5	-	4.4	4.4	6.5	4.2	8.5	27	6.5
30	8.5	8.2	7.0	9.9	-----	5.2	5.0	9.9	4.0	8.5	52	6.2
31	8.5	-----	6.5	11	-----	4.8	-----	7.3	-----	7.6	24	-----
Total	257.3	245.5	239.8	242.4	209.7	184.4	123.6	207.1	356.4	394.3	1151.1	871.8
Mean	8.30	8.18	7.74	7.82	7.49	5.95	4.12	6.68	11.9	12.7	37.1	29.1
Ac-ft	510	487	476	481	416	366	245	411	707	782	2280	1730

Calendar year 1962: Max 428 Min 3.1 Mean 12.9 Ac-ft 9,360  
Water year 1962-63: Max 400 Min 3.1 Mean 12.3 Ac-ft 8,890

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-16	1545	5.65	1,140	8-25	1810	6.34	1,870
7-8	2030	5.80	1,280	9-22	0220	5.69	1,180
8-12	1410	5.90	1,380				

\* Discharge measurement made on this day.

8-3825. Gallinas River near Colonias, N. Mex.

Location.--Lat 35°11'10", long 104°54'40", in Anton Chico Grant, on right bank 1½ miles upstream from mouth, 2 miles south of San Miguel - Guadalupe County line, and 6¼ miles northwest of Colonias, Guadalupe County.

Drainage area.--610 sq mi, approximately.

Records available.--January 1951 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 4,940 ft (from river-profile map).

Average discharge.--12 years, 18.4 cfs (13,320 acre-ft per year).

Extremes.--Maximum discharge during year, 9,360 cfs June 16 (gage height, 16.65 ft), from rating curve extended above 1,900 cfs on basis of slope-area measurements at gage heights 8.64, 12.74, 16.65, and 27.2 ft; no flow for many days.

1951-63: Maximum discharge, that of June 16, 1963; no flow for long periods.

Maximum flood known occurred about June 1, 1937, when a stage of about 27.2 ft was reached; discharge determined as 26,700 cfs by slope-area measurement made in 1951. A flood of about the same magnitude occurred Sept. 29-30, 1904.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Diversion for irrigation of about 7,000 acres (1959 determination) above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to June 15  
Aug. 29 to Sept. 30

June 16 to Aug. 28

1.5	0	3.0	98	1.6	0	3.0	86
1.6	1	3.5	160	1.7	1	3.5	145
1.7	2	4.0	233	1.8	3	4.0	218
1.8	5	4.5	319	1.9	6	4.5	314
1.9	8	5.0	455	2.0	10	5.0	452
2.1	19	5.5	620	2.3	24	5.5	620
2.5	49	6.6	1,140	2.6	48	6.5	1,080

Discharge, in cubic feet per second, water year October 1962 to September 1963.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4	0	2	0			(*)		0	0	a 0	47
2	3	0	3	0					0	0	* 0	27
3	3	0	3	0					0	0	0	15
4	2	0	3	1					0	0	0	17
5	2	0	2	1					0	0	0	8
6	2	0	2	0					0	0	0	* 3
7	1	0	2	0	(*)	(*)			0	1	0	2
8	1	0	2	0				(*)	0	* 18	0	3
9	1	0	1	0					0	* 40	0	28
10	0	0	1	* 0					0	41	0	61
11	* 0	0	1	0					0	12	1	39
12	0	0	1	0					0	4	38	12
13	0	0	1	0					0	0	215	30
14	0	0	0	0					0	0	140	12
15	0	0	0	0					0	0	43	4
16	0	0	0	0					* 1,050	0	18	10
17	0	0	0	0			(*)		250	0	10	a 5
18	0	0	0	0					41	0	13	a 3
19	0	0	* 0	0					* 14	0	20	a 1
20	0	0	0	0					20	0	5	a 25
21	0	1	0	0					* 28	0	3	a 200
22	0	1	0	0					8	0	0	1,130
23	0	1	1	0					1	0	* 0	174
24	0	1	1	0					0	0	0	59
25	0	1	1	0					0	0	185	30
26	0	1	0	0					0	0	524	17
27	0	* 1	0	0					0	0	88	* 10
28	0	1	0	0					0	0	* 99	5
29	0	1	0	0					0	40	116	3
30	0	1	0	0				(*)	0	44	94	2
31	0	-----	0	0	-----	-----	-----	-----	-----	2	113	-----
Total	19	10	27	2	0	0	0	0	1,412	202	1,725	1,982
Mean	0.6	0.3	0.9	0.1	0	0	0	0	47.1	6.5	55.6	66.1
Ac-ft	38	20	54	4.0	0	0	0	0	2,800	401	3,420	3,930

Calendar year 1962: Max 416 Min 0 Mean 9.6 Ac-ft 6,950  
Water year 1962-63: Max 1,130 Min 0 Mean 14.7 Ac-ft 10,670

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-16	1850	16.65	9,360	9-22	1130	10.36	3,530
8-25	about 2200	9.4	2,860				

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

8-3830. Pecos River at Santa Rosa, N. Mex.

Location.--Lat 34°56'30", long 104°41'40", in SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.3, T.8N., R.21 E., on right bank a quarter of a mile upstream from bridge on U. S. Highway 66 and 1.7 miles upstream from Rio Agua Negra Chiquita.

Drainage area.--2,650 sq mi, approximately (contributing area).

Records available.--May 1903 to December 1905 (gage heights only), January to December 1906, February 1910 to July 1911, September 1912 to December 1925, March to May 1927, July 1927, January 1928 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Figures of daily discharge for Apr. 5-20, May 4-7, 11, Aug. 13, 16-18, 24, Sept. 7-9, 11, 13, 19, 21, 23, 25, 27, Oct. 1-31, Nov. 3, 4, 9, 11, 20, 22, 1910, and Feb. 1 to Mar. 31, June 1 to July 31, 1911, published in WSP 358 have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 4,533.40 ft above mean sea level, datum of 1929. May 5, 1903, to Dec. 31, 1906, staff gage at site about 1,000 ft downstream at datum 2.52 ft lower. Feb. 2, 1910, to May 4, 1922, chain gage about a quarter of a mile downstream at different datum. May 5, 1922, to Sept. 30, 1936, water-stage recorder at present site at datum 0.60 ft higher. Oct. 1, 1936, to June 1, 1937, water-stage recorder at present site at datum 0.46 ft lower. June 2, 1937, to June 30, 1938, water-stage recorder at site about a quarter of a mile downstream at datum 3.63 ft lower.

Average discharge.--47 years (1912-24, 1928-63), 149 cfs (107,900 acre-ft per year).

Extremes.--Maximum discharge during year, 8,900 cfs Aug. 26 (gage height, 10.35 ft), from rating curve extended above 4,900 cfs by logarithmic plotting; minimum daily, 15 cfs Jan. 12, 13.

1930-63: Maximum discharge, 55,200 cfs June 2, 1937 (gage height, 25.7 ft), from rating curve extended above 32,000 cfs by logarithmic plotting; minimum daily, 3.8 cfs June 26, 1954.

The flood of June 2, 1937, is the greatest since about 1886. Flood of Sept. 30, 1904, reached a stage of 24.7 ft (site about 1,000 ft downstream, datum 2.52 ft lower), discharge, 45,500 cfs, by Kutter's formula. Flood of June 9, 1903, reached a stage of 21.1 ft (same site and datum as in 1904), discharge, 34,000 cfs, by comparison with 1904 flood.

Remarks.--Records fair. Discharge measurements generally made two or more times a month. Diversions for irrigation of about 12,000 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	28	34	27	26	25	106	23	30	23	20	240
2	36	30	31	27	25	23	103	23	223	23	21	106
3	35	30	27	28	24	23	113	19	282	23	22	64
4	34	30	26	27	24	24	99	19	106	22	90	52
5	34	28	27	26	24	24	82	19	86	23	24	59
6	32	30	28	27	23	24	77	19	63	25	21	51
7	32	30	28	28	24	25	69	19	46	23	20	67
8	32	30	28	27	24	25	55	19	37	22	19	42
9	32	28	28	26	24	25	45	19	33	57	20	55
10	31	28	28	27	26	25	38	19	22	218	35	107
11	30	28	28	a20	26	25	71	21	30	78	77	213
12	30	28	30	a15	26	26	92	22	36	36	522	53
13	31	28	28	a15	27	25	92	21	33	27	1530	33
14	30	28	28	a22	27	25	78	23	33	24	565	52
15	28	28	28	a25	27	24	69	25	36	23	311	28
16	30	28	28	a27	25	23	64	22	1370	23	113	28
17	31	33	28	a27	24	24	73	20	1620	23	77	28
18	33	33	28	28	23	23	78	23	214	23	40	28
19	33	32	27	a25	23	24	69	23	82	23	28	28
20	32	31	26	a27	22	25	63	22	46	23	25	28
21	31	30	27	31	23	17	48	23	37	23	38	109
22	30	28	27	35	24	21	27	26	33	22	27	2440
23	30	28	28	a24	24	27	22	48	31	23	20	926
24	30	28	28	31	23	24	21	46	28	23	20	342
25	28	28	28	35	23	21	20	32	27	23	47	218
26	28	28	26	32	23	21	20	23	27	23	2130	136
27	28	28	27	a28	23	21	20	23	25	49	450	95
28	28	28	36	30	28	25	21	23	24	26	151	59
29	28	28	27	38	-	35	20	21	23	22	136	42
30	28	31	28	35	-----	52	21	67	23	21	228	32
31	28	-----	27	30	-----	84	-----	223	-----	24	595	-----
Total	959	874	873	850	685	835	1776	975	4676	1041	7422	5761
Mean	30.5	29.1	28.2	27.4	24.5	26.9	59.2	31.5	156	33.6	23.9	192
Ac-ft	1.900	1.730	1.730	1.690	1.360	1.660	3.520	1.930	9.270	2.060	14.720	1430

Calendar year 1962: Max 929 Min 20 Mean 80.1 Ac-ft 58,000

Water year 1962-63: Max 2,440 Min 15 Mean 73.2 Ac-ft 53,000

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-17	0130	10.30	8,840	8-26	0500	10.35	8,900
8-13	0800	7.35	4,160	9-22	1800	9.10	7,290

a No gage-height record.

8-3835. Pecos River near Puerto de Luna, N. Mex.

Location.--Lat 34°44'00", long 104°31'30", in SE¼NW¼ sec.20, T.6N., R.23 E., on left bank 9 miles southeast of Puerto de Luna and 17½ miles upstream from Alamogordo Dam.

Drainage area.--3,970 sq mi, approximately (contributing area).

Records available.--April 1938 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,315 ft (from river-profile map). Prior to Apr. 15, 1954, at datum 1 ft higher.

Average discharge.--25 years, 230 cfs (166,500 acre-ft per year).

Extremes.--Maximum discharge during year, 9,640 cfs June 16 (gage height, 7.00 ft); minimum daily, 70 cfs Jan. 13.

1938-63: Maximum discharge, 48,600 cfs Sept. 1, 1942 (gage height, 17.00 ft), from rating curve extended above 7,400 cfs on basis of flow at Santa Rosa; minimum daily, 34 cfs July 9, 1951.

Maximum flood known since at least 1886 occurred June 2, 1937, when peak at Santa Rosa was 55,200 cfs. Flood of July 24, 1895, was reported as "highest in 10 years." Other major floods occurred on June 9, 1903, Sept. 30, 1904, and May 1, 1914.

Remarks.--Records good except those for period of no gage-height record, which are fair. Discharge measurements generally made two or more times a month. Diversions for irrigation of about 12,500 acres (1959 determination) above station. Discharge represents inflow to Alamogordo Reservoir (capacity, 122,100 acre-ft).

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

(Shifting-control method used June 17, Aug. 13, 26, Sept. 23)

1.1	57	2.5	709
1.4	118	3.0	1,240
1.7	215	3.9	2,660
2.0	356		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	104	99	132	108	101	111	175	96	132	88	86	419
2	104	99	126	106	101	101	178	106	108	88	88	232
3	104	96	116	106	99	101	185	96	395	86	86	172
4	104	101	108	108	96	104	178	92	215	82	120	140
5	101	101	111	106	106	106	175	92	172	82	113	132
6	94	101	111	108	106	106	156	88	140	90	84	126
7	92	96	108	113	104	108	149	82	111	78	72	135
8	101	96	111	108	99	108	135	80	92	78	71	132
9	94	104	108	104	101	104	121	78	92	80	74	113
10	90	99	108	101	101	99	113	71	86	211	96	121
11	84	104	106	85	106	96	104	74	76	219	181	243
12	82	108	106	a80	99	99	149	78	78	135	177	172
13	82	111	108	a70	101	101	182	80	92	104	L760	106
14	80	111	106	a100	106	101	168	82	88	88	744	111
15	78	113	106	a130	106	101	149	86	86	99	520	121
16	82	113	108	a110	106	101	143	94	1,870	88	276	96
17	88	124	111	a110	106	101	140	88	2,630	78	178	86
18	96	121	118	a110	104	106	152	84	373	84	159	80
19	106	121	116	a100	106	104	156	86	321	82	118	80
20	106	118	113	a110	106	101	146	86	168	80	99	78
21	104	118	111	a120	104	101	138	84	126	80	99	80
22	101	121	111	a120	111	96	126	88	113	78	106	1,380
23	108	116	104	a95	113	113	101	99	111	76	94	1,470
24	106	113	104	a95	108	106	99	124	104	74	88	465
25	101	113	112	101	106	101	96	121	99	78	104	309
26	101	111	105	108	106	101	106	99	101	84	1,910	223
27	99	108	100	104	106	96	104	99	104	106	693	175
28	104	108	113	121	113	92	94	118	92	146	385	140
29	101	108	121	113	-----	88	90	99	88	96	219	113
30	104	116	108	118	-----	111	90	96	86	92	393	101
31	96	-----	108	116	-----	124	-----	292	-----	86	786	-----
Total	2,997	3,268	3,434	3,284	2,927	3,188	4,098	3,038	3,349	3,016	9,979	7,351
Mean	96.7	109	111	106	105	103	137	98.0	278	97.3	322	245
Ac-ft	5,940	6,480	6,810	6,510	5,810	6,320	8,130	6,030	15,560	5,980	19,790	14,580

Calendar year 1962: Max 1,140 Min 78 Mean 157 Ac-ft 113,900  
 Water year 1962-63: Max 2,630 Min 70 Mean 150 Ac-ft 108,900

Peak discharge (base, 5,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-16	1650	7.00	9,640	8-26	1000	5.72	6,120

a No gage-height record.

8-3845. Pecos River below Alamogordo Dam, N. Mex.

Location.--Lat 34°36'20", long 104°23'10", in lot 1, sec.2, T.4 N., R.24 E., on left bank 1,200 ft downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe.

Drainage area.--4,390 sq mi, approximately (contributing area).

Records available.--October 1912 to April 1926, August 1926 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1944, published as "near Guadalupe."

Gage.--Water-stage recorder and Parshall flume, with concrete control above top of flume. Datum of gage is 4,142.67 ft above mean sea level (Bureau of Reclamation datum). Prior to Sept. 10, 1936, at site 1½ miles upstream at different datum. Sept. 14, 1936, to Mar. 8, 1941, and June 11 to Sept. 21, 1941, at site a quarter of a mile downstream at different datums.

Average discharge.--23 years (1912-25, 1926-36), 236 cfs (170,900 acre-ft per year), prior to completion of Alamogordo Dam; 27 years (1936-63), 227 cfs (164,300 acre-ft per year).

Extremes.--Maximum discharge during year, 1,360 cfs July 13 (gage height, 3.38 ft); minimum daily, 0.1 cfs Sept. 2, 3. 1912-63: Maximum discharge, 42,800 cfs Sept. 1, 1942, by computation of flow over spillway and through outlet gates of Alamogordo Dam by Bureau of Reclamation; maximum gage height, 15.5 ft May 1, 1914, site and datum then in use; no flow at times.

Remarks.--Records good. Diversion for irrigation of about 12,500 acres (1959 determination) above station. Flow regulated by Alamogordo Reservoir (see p. 177).

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 28 to May 18)

0.07	0.1	1.5	86
.1	.6	2.0	142
.2	3.0	2.4	215
.3	5.8	2.6	330
.4	9.3	2.9	620
.7	24	3.2	980
1.0	44	3.4	1,500

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.2	5.8	6.5	8.9	11	14	98	91	87	90	1,050	0.4
2	7.5	6.1	6.8	9.3	11	14	98	89	66	92	1,030	.1
3	22	6.8	6.8	9.3	11	15	98	87	3.5	88	1,030	.1
4	66	6.8	6.8	9.3	12	13	99	88	*3.5	92	1,030	40
5	61	6.5	7.2	9.7	13	14	99	87	3.8	94	1,050	60
6	57	6.5	6.8	10	13	14	99	87	39	90	1,050	40
7	58	5.8	6.8	10	14	706	100	87	75	88	1,050	3
8	58	5.8	7.2	*10	13	*1,090	102	87	101	88	1,050	3
9	59	5.5	7.2	9.3	13	1,120	103	85	101	85	916	49
10	54	5.8	7.2	9.3	12	1,110	91	77	101	753	748	79
11	47	5.8	7.2	9.7	11	1,110	93	73	101	*1,070	771	77
12	46	5.8	*7.2	9.3	11	1,110	96	73	101	1,050	955	77
13	46	5.8	7.2	9.3	11	1,110	90	73	101	998	721	77
14	47	5.8	7.2	9.3	11	*1,190	101	*73	101	1,030	78	89
15	62	5.5	7.5	10	11	1,160	*102	75	101	1,050	93	98
16	74	5.5	7.9	11	11	1,160	102	76	103	1,030	92	98
17	74	5.5	7.9	11	12	1,160	102	76	52	1,030	89	97
18	74	5.2	8.2	11	12	1,160	102	76	7.2	*1,050	91	97
19	75	*4.6	8.2	10	13	*417	96	76	6.3	1,050	87	99
20	75	4.6	8.2	11	12	65	93	83	3.2	1,030	85	*98
21	75	a5	8.2	11	12	66	94	92	3.2	1,020	86	96
22	75	a5	8.6	11	12	68	94	95	3.5	1,020	86	95
23	75	a5	8.6	11	13	82	94	90	3.6	1,030	86	97
24	75	a5	8.6	11	14	98	*94	90	35	*1,050	83	98
25	75	a5	8.6	11	14	103	94	87	*88	1,050	81	97
26	70	a5	8.6	11	*14	103	94	85	90	1,050	83	94
27	60	5.5	8.6	11	14	103	87	86	92	1,050	75	92
28	60	5.8	8.2	11	14	103	94	86	92	1,050	90	95
29	64	6.1	8.2	11	-	94	91	86	91	1,030	90	94
30	96	6.1	8.6	11	-----	93	90	86	88	1,050	91	89
31	79	-----	8.2	11	-----	97	-----	86	-----	1,050	34	-----
Total	1,573.7	169.0	239.7	317.7	345	1,476.2	2,890	2,588	4,844.0	23,398	13,971	212,32
Mean	60.4	5.63	7.73	10.2	12.3	476	96.3	83.5	61.5	755	451	70.8
Ac-ft	3,720	335	475	630	684	2,9280	5,730	5,130	3,660	46,410	27,710	42,210

Calendar year 1962: Max 1,970 Min 4.6 Mean 181 Ac-ft 130,900  
Water year 1962-63: Max 1,190 Min 0.1 Mean 177 Ac-ft 128,000

\* Discharge measurement made on this day.  
a No gage-height record.



8-3850. Fort Sumner main canal near Fort Sumner, N. Mex.

Location.--Lat 34°30'10", long 104°16'40", in NW¼ sec.12, T.3 N., R.25 E., on right bank 160 ft downstream from bridge, 0.45 mile downstream from diversion dam on Pecos River, and 2¼ miles northwest of Fort Sumner.

Records available.--July 1939 to December 1940 (published as Fort Sumner Irrigation District canal at Fort Sumner), April 1954 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 4,033 ft (from Bureau of Reclamation profile map of canal).

Extremes.--1939-40, 1954-63: Maximum daily discharge, 125 cfs Aug. 10, 1956; no flow at times.

Remarks.--Records fair. Discharge measurements generally made one or more times a month during periods of flow. Canal diverts water from Pecos River for irrigation of about 6,600 acres (1961 determination) by the Fort Sumner Irrigation District.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	88	0	58.3	3,590
November.....	25	0	.8	50
December.....	0	0	0	0
Calendar year 1962.....	106	0	46.7	33,800
January.....	0	0	0	0
February.....	0	0	0	0
March.....	100	0	32.9	2,030
April.....	103	76	89.8	5,340
May.....	93	67	78.3	4,820
June.....	99	0	51.3	3,050
July.....	97	84	90.9	5,590
August.....	103	41	92.0	5,660
September.....	96	0	68.4	4,070
Water year 1962-63.....	103	0	47.2	34,200

RIO GRANDE BASIN

157

8-3860. Pecos River near Acme, N. Mex.

Location.--Lat 33°32'10", long 104°22'40", in NW¼ sec.14, T.9 S., R.25 E., on right bank 1 mile southeast of Melena railroad station, 2½ miles south of U. S. Highway 70, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, and 13 miles northeast of Roswell.

Drainage area.--11,380 sq mi, approximately (contributing area).

Records available.--September 1921 to June 1923, July 1937 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (from river-profile map). Prior to Nov. 1, 1938, at site on highway bridge 2 miles upstream at various datums.

Average discharge.--26 years (1937-63), 218 cfs (157,800 acre-ft per year).

Extremes.--Maximum discharge during year, 13,000 cfs June 2 (gage height, 10.30 ft), from rating curve extended above 6,700 cfs by logarithmic plotting; no flow May 18-21.  
1937-63: Maximum discharge, 45,000 cfs Sept. 23, 1941 (gage height, 13.71 ft), from rating curve extended above 26,000 cfs by logarithmic plotting; no flow at times.

The flood of May 28, 1937, reached a discharge of 53,000 cfs (gage height, 14.82 ft, from floodmarks, site and datum then in use), by slope-area method, but may have been exceeded by the flood of Oct. 1, 1904. For other peaks prior to 1937, see Pecos River below Alamogordo Dam.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made two or more times a month. Flow regulated by Alamogordo Reservoir (see p. 177). Diversions for irrigation of about 20,000 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	12	22	20	44	17	37	18	1	18	830	1450
2	35	12	24	21	33	16	33	25	7,110	15	773	375
3	30	13	25	20	25	16	28	12	1,790	14	766	228
4	24	12	25	21	22	14	27	10	390	14	781	334
5	21	22	23	20	19	12	28	9	224	12	781	228
6	18	25	21	19	18	12	30	10	152	11	766	269
7	14	21	20	18	16	11	27	8	111	14	766	105
8	12	18	18	18	16	10	26	8	88	21	773	70
9	9	16	17	16	16	328	23	9	75	11	773	50
10	9	14	17	16	17	789	19	9	63	30	781	45
11	8	12	18	14	b 16	860	17	7	54	19	631	39
12	5	11	16	b 5	b 15	860	16	4	48	58	577	30
13	4	11	16	a 1	b 20	910	16	3	42	704	631	26
14	4	12	17	b 2	b 25	974	16	2	39	750	781	26
15	4	12	17	a 3	33	1,120	19	2	38	727	482	26
16	3	12	17	b 3	35	1,120	17	1	45	781	220	22
17	5	14	18	a 4	35	1,200	16	1	559	814	106	19
18	8	16	18	a 6	27	1,170	14	0	488	773	64	23
19	12	18	19	a 5	24	1,180	20	0	268	773	149	26
20	21	21	19	a 6	21	948	17	0	241	727	73	28
21	17	23	19	b 9	19	277	16	0	165	734	54	20
22	31	22	19	b 12	20	169	17	2	228	750	48	21
23	23	22	18	b 10	20	126	18	8	94	727	35	14
24	17	20	18	b 15	19	89	16	12	64	711	28	14
25	14	18	19	b 23	20	68	16	12	48	773	23	16
26	13	17	14	b 22	20	54	16	7	39	758	26	14
27	16	16	15	b 20	18	47	17	4	34	781	28	13
28	16	16	18	b 25	17	39	17	2	29	789	45	12
29	14	16	17	b 35	-	38	16	1	24	814	141	15
30	14	17	23	37	-----	38	16	4	21	750	98	14
31	13	-----	24	37	-----	37	-----	3	-----	766	1,060	-----
Total	483	491	591	483	630	12,549	611	193	12,572	14,639	13,090	3,572
Mean	15.6	16.4	19.1	15.6	22.5	405	20.4	6.2	419	472	422	119
Ac-ft	958	974	1,170	958	1,250	24,890	1,210	383	24,940	29,040	25,960	7,080

Calendar year 1962: Max 1,730 Min 0 Mean 150 Ac-ft 108,700  
Water year 1962-63: Max 7,110 Min 0 Mean 164 Ac-ft 118,800

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6- 2	1800	10.30	13,000	8-31	1945	6.24	2,610
6-17	1745	6.34	2,800	9- 1	0545	7.04	4,320

a No gage-height record.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

8-3870. Rio Ruidoso at Hollywood, N. Mex.

Location.--Lat 33°19'50", long 105°36'25", in NE¼ sec.30, T.11 S., R.14 E., on right upstream end of bridge on road leading to Ruidoso Downs, 0.9 mile east of Hollywood, 2½ miles downstream from Carrizo Creek, and 2½ miles east of Ruidoso.

Drainage area.--120 sq mi, approximately.

Records available.--March 1953 to September 1963.

Gage.--Water-stage recorder and concrete control. Datum of gage is 6,366.42 ft above mean sea level, datum of 1929. Prior to Oct. 14, 1961, at datum 0.70 ft lower. Oct. 14, 1961, to Mar. 8, 1962, at datum 0.40 ft lower.

Average discharge.--10 years, 10.6 cfs (7,670 acre-ft per year).

Extremes.--Maximum discharge during year, 126 cfs Sept. 7 (gage height, 2.22 ft); minimum daily, 0.9 cfs June 5.

1953-63: Maximum discharge, 1,070 cfs July 26, 1957 (gage height, 7.80 ft), from rating curve extended above 130 cfs on basis of slope-area measurement of peak flow; minimum daily, 0.5 cfs June 20, 1954.

The flood of Sept. 29, 1941, is probably the highest since at least 1904 (discharge not determined).

Remarks.--Records good. Figures of discharge do not include F. Herrera ditch-S, which diverts from right bank 1½ miles upstream and bypasses station for irrigation of 75 acres (1959 determination) below. See monthly table below for record of ditch. Village of Ruidoso diverts from right bank 7 miles upstream for municipal use and returns a portion of this to river as effluent from sewage disposal plant 1½ miles upstream from station.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 30

May 1 to Sept. 30

0.7	2.7	0.55	0.9	0.9	11
.9	10	.6	1.6	1.1	21
1.1	21	.7	3.6	1.4	43
1.4	43	.8	6.6	2.0	103

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.3	9.6	1.5	9.5	1.4	21	3.3	1.2	4.5	1.3	2.4	10
2	3.6	9.6	1.3	9.6	1.9	21	3.0	1.1	4.2	1.4	2.7	14
3	3.1	9.1	1.2	9.6	2.0	21	2.7	9.8	3.9	2.2	4.7	18
4	2.7	8.7	1.2	9.6	2.1	21	2.4	9.8	2.0	5.2	4.5	31
5	2.8	8.3	1.1	8.7	* 2.0	1.9	2.3	9.4	.9	6.2	3.4	61
6	2.2	8.3	1.1	7.9	2.1	1.9	2.1	1.0	* 1.1	3.9	2.9	101
7	2.1	7.9	1.0	b 7.5	2.0	1.8	1.9	* 1.1	1.3	6.0	3.4	78
8	1.9	7.9	1.0	* 9.1	2.0	* 1.7	1.9	1.1	1.6	8.5	* 5.4	50
9	1.7	7.5	1.0	8.7	1.9	1.5	1.9	1.1	1.9	7.3	5.1	44
10	1.6	7.5	9.6	9.1	2.3	1.5	2.1	1.2	1.9	5.7	1.6	* 37
11	1.5	7.0	9.1	9.1	1.7	1.5	* 2.3	1.1	2.1	4.8	1.1	32
12	1.4	* 7.0	8.7	6	b 1.5	1.5	2.3	9.8	2.4	4.5	5.7	26
13	1.3	6.6	8.7	5	b 1.7	1.4	2.2	9.8	1.9	4.5	1.2	22
14	1.2	6.2	9.1	6	b 1.9	1.4	2.1	9.8	1.9	3.4	1.2	21
15	1.1	1.4	8.7	* b 7	2.1	1.4	2.2	9.0	1.9	3.1	1.4	20
16	1.1	1.4	8.3	b 8	1.9	1.4	2.1	8.6	1.9	* 3.1	1.1	17
17	* 1.1	1.3	* 8.7	b 8	1.8	1.4	2.0	8.6	1.7	3.6	1.5	16
18	1.8	1.2	9.6	7.9	1.7	1.4	1.8	8.6	1.6	4.5	2.2	15
19	1.5	1.2	9.6	b 7.5	* 1.7	1.3	1.7	8.2	1.6	3.4	1.1	14
20	1.4	1.0	9.1	b 7	1.7	1.4	1.5	7.4	1.7	3.4	* 2.0	* 13
21	1.2	1.1	9.1	* b 8.5	1.7	* 1.4	1.5	8.6	1.6	3.1	1.4	16
22	1.1	1.2	8.7	8.7	1.8	1.4	1.5	* 8.2	1.6	2.4	1.2	14
23	1.2	1.3	8.7	8.7	1.8	1.4	* 1.4	7.4	1.6	2.4	1.2	12
24	1.1	1.3	9.1	b 7.9	1.8	1.5	1.3	7.0	1.4	2.4	1.1	11
25	1.1	1.3	9.6	8.7	1.8	1.6	1.1	6.6	* 1.4	2.2	1.1	11
26	1.1	1.4	b 7.9	1.0	1.9	1.7	1.7	6.6	1.4	2.7	1.0	9.8
27	1.2	1.3	9.1	b 9.6	2.1	1.8	1.9	6.3	1.3	2.9	1.0	9.4
28	1.1	* 1.3	9.6	1.0	2.2	2.0	2.0	6.0	1.3	3.6	8.6	9.0
29	1.0	1.3	b 8.7	1.0	-	2.3	1.8	5.4	1.3	3.4	9.4	8.6
30	1.0	1.4	b 8.3	1.0	-----	2.9	1.4	5.4	1.4	2.4	1.2	8.2
31	9.6	-----	b 8.3	1.1	-----	3.2	-----	4.8	-----	2.2	1.1	-----
Total	514.6	315.2	300.3	263.9	525	540	594	270.1	56.4	115.7	305.2	749.0
Mean	16.6	10.5	9.69	8.51	16.8	17.4	19.8	8.71	1.88	3.73	9.85	25.0
Ac-ft	1,020	625	596	523	1,040	1,070	1,180	536	112	229	605	1,490
(†)	74	70	84	36	6.7	4.4	28	217	121	59	78	45

Calendar year 1962: Max 118 Min 2.4 Mean 21.0 Ac-ft 15,200

Water year 1962-63: Max 101 Min 0.9 Mean 12.5 Ac-ft 9,030

Peak discharge (base, 100 cfs)--Sept. 7 (1963) 126 cfs (2.22 ft).

\* Discharge measurement made on this day.

† Diversion, in acre-feet, by F. Herrera ditch-S.

b Stage-discharge relation affected by ice.

8-3905. Rio Hondo at Diamond A Ranch, near Roswell, N. Mex.

Location--Lat 33°20'55", long 104°51'05", in NE¼NE¼ sec.20, T.11 S., R.21 E., on left bank on downstream side of road bridge at Diamond A Ranch, 18 miles upstream from Rocky Arroyo and 18 miles west of Roswell.

Drainage area--947 sq mi (contributing area).

Records available--May 1939 to September 1963.

Gage--Water-stage recorder. Altitude of gage is 4,185 ft (from topographic map).

Average discharge--24 years, 26.2 cfs (18,970 acre-ft per year).

Extremes--Maximum discharge during year, 911 cfs June 14 (gage height, 10.48 ft); no flow for most of year.

1939-63: Maximum discharge, 27,000 cfs Sept. 22, 1941 (gage height, 28.78 ft), from rating curve extended above 4,400 cfs on basis of slope-area measurement of peak flow; no flow at times in each year.

The flood in 1941 is greatest since about 1900. A flood on June 1, 1937, reached a discharge of 24,900 cfs at Riverside about 13 miles upstream. Other major floods occurred Oct. 31, 1901, Sept. 29, 30, 1904, and July 25, 1905.

Remarks--Records fair except those for periods of no gage-height record, which are poor. Diversions and ground-water withdrawals above station for irrigation of about 6,500 acres (1959 determination) above and below station.

Rating tables(gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to May 28		May 29 to Sept. 30	
3.3	0	4.1	0
3.4	1	4.3	2
3.6	2	4.5	6
3.8	6	4.7	16
4.0	13	5.1	47
4.3	26	5.7	116
4.6	43		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	* 4.2	3	8	2	0	0		0	18	0		0
2	2.6	4	9	1	0	0		0	12	0		0
3	1.9	3	7	1	0	0		0	0	0		0
4	1.3	4	7	1	0	2		0	* 0	0		0
5	* 1.3	4	7	0	* 0	1		0	0	0		* 1.1
6	4	3	6	0	0	1		0	0	0		4.4
7	1.1	2	5	1	0	* 0		0	0	0	(*)	6.4
8	1.1	2	5	* 1	0	0		0	0	0		5.3
9	1.3	2	6	1	0	0		* 0	0	* 0		4.2
10	1.4	2	6	1	2	0		0	0	0		3.5
11	* 1.2	3	5	a 1	6	0	(*)	0	0	0		2.2
12	1.0	3	3	a 1	1.5	1		0	0	2		* 1.3
13	6	* 3	4	a 0	1.7	0		0	0	0		9
14	6	2	2	a 0	1.7	0		0	* 1.1	0		6
15	6	1	1	* a 2	7	0		0	* 8	0		5
16	5	a 1	3	a 5	10	0		0	a 0	0		2
17	6	2	2	a 5	3	0		0	0	* 0		0
18	* 7	5	* 1	a 5	3	0		0	0	0		0
19	9	6	0	a 5	* 4	0		0	0	0	(*)	0
20	7	7	a 0	a 5	4	0		0	0	0	(*)	* 0
21	6	7	0	a 5	1	0		0	0	0		0
22	5	6	0	* 5	1	0	(*)	0	0	0		0
23	4	5	8	3	1	0		* 0	0	0		0
24	7	6	9	a 1	1	0		0	0	0		0
25	6	4	9	a 5	0	0		0	* 0	0		0
26	3	3	1.1	3	0	0		0	0	0		0
27	6	3	1.2	a 1	0	0		0	* 0	0	(*)	0
28	5	* 2	7	2	0	0		0	0	1.7		0
29	4	2	8	1	-	0		3	0	* 4		0
30	3	3	8	a 1	-----	0		0	0	0		0
31	3	-----	4	a 0	-----	0	-----	0	-----	0	(*)	-----
Total	292	103	163	65	92	5	0	3	149	23	0	306
Mean	9.4	3.4	5.3	2.1	3.3	0.2	0	0.1	5.0	0.7	0	10.2
Ac-ft	579	204	323	129	182	9.9	0	6.0	296	46	0	607

Calendar year 1962: Max 459 Min 0 Mean 14.3 Ac-ft 10,320  
 Water year 1962-63: Max 111 Min 0 Mean 3.3 Ac-ft 2,380

Peak discharge (base, 1,000 cfs)--No peak above base.

\* Discharge measurement or observation of no flow made on this day.

a No gage-height record.

8-3936. North Spring River at Roswell, N. Mex.

Location--Lat 33°23'45", long 104°32'55", in NW¼SE¼ sec.31, T.10 S., R.24 E., in Roswell Municipal Golf Course, on left bank 2,400 ft upstream from Montana Avenue, in Roswell.

Drainage area--19.5 sq mi.

Records available--May 1958 to September 1963.

Gage--Water-stage recorder. Altitude of gage is 3,570 ft (from topographic map).

Average discharge--5 years, 0.01 cfs (7.2 acre-ft per year).

Extremes--Maximum discharge during year, 101 cfs Aug. 31 (gage height, 3.09 ft), from rating curve extended above 9 cfs by logarithmic plotting; no flow for most of year.  
1958-63: Maximum discharge, that of Aug. 31, 1963; no flow for most of time.

Remarks--Records poor. No diversions above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Aug. 31..... 4.7

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1963.....	4.7	4.7	0	0.15	9.3
Calendar year 1962.....	-	1.4	0	.004	2.8
Water year 1962-63.....	-	4.7	0	.01	9.3

Note--Flow occurred only on day listed above. Observations of no flow generally made once a month.

8-3945. Rio Felix at old highway bridge, near Hagerman, N. Mex.

Location--Lat 33°07'30", long 104°20'40", in SW¼ sec.4, T.14 S., R.26 E., near left bank on downstream side of abandoned bridge pier, 0.6 mile upstream from U. S. Highway 285, 1½ miles northwest of Hagerman, and 2½ miles upstream from mouth.

Drainage area--932 sq mi (contributing area).

Records available--April 1939 to September 1963. March 1932 to April 1939 at site 1 mile downstream; records for periods of low flow not equivalent.

Gage--Water-stage recorder. Datum of gage is 3,403.40 ft above mean sea level, datum of 1929.

Average discharge--24 years, 17.3 cfs (12,520 acre-ft per year).

Extremes--Maximum discharge during year, 6,400 cfs May 30 (gage height, 16.27 ft); no flow for most of year.

1939-63: Maximum discharge, 74,000 cfs Oct. 7, 1954 (gage height, 27.5 ft, from floodmarks), from rating curve extended above 12,000 cfs on basis of slope-area measurement at point 5½ miles upstream from gage (adjusted for channel storage); no flow for many periods.

Flood in 1954 is the highest since 1894, from information by local residents. Flood of Oct. 1, 1904, is probably second highest. Another major flood occurred in April 1915.

Remarks--Records fair. Diversions for irrigation of about 350 acres (1959 determination) above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Oct. 1..... *21	Oct. 9..... 5	Oct. 25..... 1	May 31..... *144
2..... 22	10..... 5	26..... 1	June 1..... 50
3..... 15	11..... 1	27..... 1	2..... 1,670
4..... 6	12..... 2	Nov. 24..... 1	3..... 146
5..... 2	23..... 1	25..... 1	4..... 6
6..... 1	24..... 1	May 30..... 1,270	

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1962.....	85	22	0	2.7	169
November.....	2	1	0	.1	4
May 1963.....	1,414	1,270	0	45.6	2,800
June.....	1,872	1,670	0	62.4	3,710
Calendar year 1962.....	-	1,170	0	10.7	7,750
Water year 1962-63.....	-	1,670	0	9.2	6,680

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-30	0200	16.27	6,400	6-2	0930	14.74	4,530
5-31	0845	8.30	656				

\* Discharge measurement made on this day.

Note--Flow occurred only on days listed above. Observations of no flow generally made once a month.

RIO GRANDE BASIN

161

8-3955. Pecos River near Lake Arthur, N. Mex.

Location.--Lat 32°59'18", long 104°19'20", in SW¼NE¼ sec.27, T.15 S., R.26 E., on left bank 400 ft upstream from county bridge, 2½ miles east of Lake Arthur, 7 miles upstream from Cottonwood Creek, and 11 miles northeast of Artesia.

Drainage area.--14,760 sq mi, approximately (contributing area).

Records available.--August 1938 to September 1963.

Gage.--Water-stage recorder and rock control. Datum of gage is 3,327.07 ft above mean sea level, datum of 1929.

Average discharge.--25 years, 292 cfs (211,400 acre-ft per year).

Extremes.--Maximum discharge during year, 5,730 cfs June 3 (gage height, 9.58 ft); minimum daily, 2 cfs May 25.  
1938-63: Maximum discharge, 49,600 cfs Sept. 24, 1941 (gage height, 21.90 ft), from rating curve extended above 16,100 cfs on basis of slope-area measurement at gage height 21.77 ft and logarithmic plotting; no flow at times in 1947, 1953-4, 1962.  
Flood of May 30, 1937, reached a stage of 21.77 ft (discharge, 51,500 cfs, on basis of slope-area measurement of peak flow), but may have been exceeded by floods in 1904 and 1919.

Remarks.--Records good. Discharge measurements generally made two or more times a month. Flow partly regulated by Alamogordo Reservoir (see p. 177). Diversions and ground-water withdrawals for irrigation of about 124,000 acres (1959 determination) above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 14-16)

Oct. 1 to Apr. 4				Apr. 5 to July 14				July 15 to Sept. 30			
1.9	22	3.0	278	1.3	2	3.0	236	1.3	5	2.5	160
2.1	40	3.5	510	1.4	4	3.5	402	1.4	9	3.0	314
2.3	69	4.4	1,070	1.5	8	4.0	651	1.6	19	3.5	529
2.6	140			1.7	20	5.0	1,310	1.8	36	4.0	819
				2.0	52	8.6	4,650	2.1	79	4.8	1,470
				2.5	134						

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	103	58	71	67	67	58	35	24	112	7	653	1,400
2	96	52	73	71	71	52	25	30	1,100	4	682	878
3	91	50	77	79	73	39	32	24	4,620	4	682	375
4	79	49	75	73	73	41	39	27	1,140	5	706	249
5	75	49	75	73	66	41	39	24	460	7	671	310
6	63	52	75	79	63	44	41	25	259	10	677	300
7	56	44	77	83	59	41	37	20	186	7	694	269
8	52	45	75	81	63	39	38	14	153	8	712	148
9	48	45	71	77	59	35	32	11	121	9	718	103
10	45	41	69	73	53	251	27	8	105	7	718	60
11	61	40	67	69	63	706	27	7	63	6	749	48
12	56	44	66	50	63	790	20	3	52	7	555	34
13	55	50	59	35	64	846	19	10	88	8	466	28
14	49	50	56	50	67	895	29	5	74	391	534	30
15	48	55	55	65	73	916	36	4	86	550	839	26
16	35	56	55	66	73	993	26	7	65	571	514	24
17	45	55	55	73	73	1,010	20	3	60	671	246	15
18	45	52	56	81	77	993	18	3	531	700	155	8
19	46	58	61	59	75	993	12	3	369	625	106	5
20	49	59	61	66	66	1,010	24	3	249	677	103	9
21	49	61	59	71	64	706	25	3	211	682	118	7
22	52	64	61	69	64	270	30	4	155	688	69	28
23	58	66	61	66	67	173	21	7	162	642	53	28
24	59	64	61	50	67	140	20	5	129	614	34	13
25	54	63	63	52	66	99	20	2	78	620	28	18
26	61	69	64	50	59	66	27	5	47	636	20	17
27	61	66	64	55	52	53	29	10	33	671	11	18
28	67	66	64	63	61	44	30	4	24	712	6	16
29	64	66	64	56	-	37	21	8	20	743	6	14
30	63	67	64	55	-----	26	19	784	15	731	19	16
31	61	-----	69	59	-----	28	-----	145	-----	648	204	-----
Total	1,856	1,656	2,023	2,016	1,841	11,435	818	1,232	10,767	11,661	11,748	4,494
Mean	59.9	55.2	65.3	65.0	65.8	369	27.3	39.7	359	376	379	150
Ac-ft	3,680	3,280	4,010	4,000	3,650	22,680	1,620	2,440	21,360	23,130	23,300	3,910

Calendar year 1962: Max 1,700 Min 0 Mean 171 Ac-ft 124,100  
Water year 1962-63: Max 4,620 Min 2 Mean 169 Ac-ft 122,100

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-30	0900	6.77	2,820	6-3	1645	9.58	5,730
6-2	1515	6.85	2,900				

8-3960. Cottonwood Creek near Lake Arthur, N. Mex.

Location.--Lat 32°54'55", long 104°22'00", in SW¼SE¼ sec.15, T.16 S., R.26 E., on right bank 75 ft upstream from road bridge, 1½ miles upstream from mouth, and 6 miles south of town of Lake Arthur.

Drainage area.--199 sq mi (contributing area).

Records available.--March 1932 to September 1963. All figures of discharge above 150 cfs prior to June 1937 and daily discharges Sept. 24-30, 1932, June 13, 14, Sept. 5, 1935, and May 29, 1937, as published in previous Water Supply Papers have been found to be unreliable and should not be used.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,316.3 ft above mean sea level (river-profile survey). At site 75 ft downstream at different datum Mar. 7, 1932, to Mar. 28, 1935, and at datum 1.36 ft and 2.10 ft lower than present datum Mar. 29, 1935, to Sept. 30, 1936, and Oct. 1, 1936, to Aug. 29, 1938, respectively. Aug. 30, 1938, to May 22, 1948, at present site at datum 1.54 ft lower.

Average discharge.--29 years (1932-34, 1935-36, 1937-63), 5.77 cfs (4,180 acre-ft per year).

Extremes.--Maximum discharge during year, 3.8 cfs June 1 (gage height, 2.10 ft); no flow July 25, 26, Aug. 7, 13, Sept. 7. 1932-63: Maximum discharge not determined, occurred June 13, 1935; maximum gage height, 12.0 ft May 30, 1937, present datum, from floodmarks (backwater from Pecos River); no flow at times.

Remarks.--Records poor. Diversions and ground-water withdrawals for irrigation of about 4,500 acres (1959 determination) above station. Capacity of original excavated channel at and above gage has been progressively reduced by salt-cedar growth, blow sand, and bank erosion. Since 1957 a compacted earth plug in channel (forms pond for pump diversion) 1 mile above gage has reduced low-flow record to leakage through or under plug, ground-water inflow, and irrigation return entering channel in the 1-mile reach above gage. Higher sustained discharges originating above plug (moderate rises can originate below) will overflow banks and levees into swamps, farm areas, and Pecos River flood plain, most of over-bank flow remaining ponded or bypassing gage. Low-flow record represents contribution to Pecos River, based on comparative discharge measurements of March 1961.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	* 0.2	0.2	0.3	0.3	0.4	0.3	0.2	0.6	1.2	0.2	0.1	0.1
2		0.2	0.3	0.3	0.3	0.3	0.2	0.6	2.2	0.2	0.1	0.1
3		0.2	0.3	0.3	0.3	0.3	0.2	0.4	2.2	0.2	0.1	0.1
4		0.2	0.3	0.3	0.3	0.3	0.2	0.3	2.2	0.2	0.1	0.1
5		0.2	* 0.3	0.3	0.3	0.3	0.2	0.3	2.2	0.2	0.1	0.1
6		0.2	0.3	0.3	0.4	0.3	0.3	0.3	1.8	0.2	0.1	0.1
7		0.1	0.3	* 0.3	0.3	* 0.3	0.3	0.3	1.6	0.1	0.1	0.1
8		0.1	0.3	0.3	0.2	0.3	0.3	0.2	1.4	0.2	* 0.1	0.1
9		0.1	0.3	0.3	0.2	0.3	0.3	* 0.2	1.2	0.2	0.1	0.1
10		0.1	0.3	0.3	0.2	0.3	0.3	0.2	1.1	0.2	0.1	* 0.1
11		0.1	0.3	0.3	0.4	0.3	0.3	0.2	1.1	0.1	0.1	0.1
12		0.1	0.3	0.3	0.4	0.3	0.3	0.2	* 1.1	0.1	0.1	0.1
13		0.1	0.3	0.3	0.4	0.3	0.3	0.1	1.1	0.2	0.1	0.2
14		0.1	* 0.3	* 0.2	0.4	0.4	0.3	0.2	1.0	0.1	0.1	0.1
15		0.1	0.3	0.2	0.4	0.4	0.3	0.2	1.2	* 0.1	0.1	0.1
16		0.2	0.3	* 0.2	0.4	0.3	0.2	0.2	1.0	0.1	0.1	0.2
17		0.3	0.3	0.2	0.4	0.4	0.2	0.1	0.9	0.1	0.1	0.1
18		0.3	0.3	0.2	0.4	0.3	0.2	0.1	0.7	0.1	0.1	0.1
19	* 0.3	0.3	0.3	0.3	0.5	0.3	0.2	0.1	0.7	0.2	0.1	* 0.1
20		0.3	0.3	0.3	0.3	0.4	0.2	0.1	0.6	0.2	0.1	0.1
21		0.3	0.3	0.4	* 0.3	0.3	0.2	0.2	0.5	0.2	0.1	0.1
22		0.3	0.3	0.4	0.3	0.3	* 0.2	1.1	0.4	0.2	0.1	0.1
23		0.3	0.3	0.4	0.3	0.3	0.2	* 0.4	0.4	0.1	0.1	0.1
24		0.3	0.3	0.4	0.3	0.3	0.2	0.4	0.3	0.1	0.1	0.1
25		0.3	0.3	0.4	0.3	0.4	0.2	0.4	0.3	0.1	0.1	0.1
26		0.3	0.3	0.4	0.3	* 0.3	0.2	0.3	* 0.3	0.1	0.1	0.1
27		0.3	0.3	0.4	0.2	0.3	0.2	0.3	0.2	0.1	0.1	0.1
28		0.3	0.3	0.3	0.4	0.3	0.2	0.3	0.2	0.1	0.1	0.1
29		0.3	0.3	0.4	-	0.3	0.2	0.3	0.2	0.3	** 0.1	0.1
30		0.3	0.3	* 0.4	-----	0.3	0.2	0.3	0.2	0.2	0.1	0.1
31	* 0.2	-----	0.3	0.4	-----	0.2	-----	0.3	-----	0.1	0.1	-----
Total	5.5	6.2	9.1	9.7	9.3	9.5	7.0	9.2	28.7	4.6	2.9	3.1
Mean	0.18	0.21	0.29	0.31	0.33	0.31	0.23	0.30	0.96	0.15	0.09	0.10
Ac-ft	11	12	18	19	18	19	14	18	57	9.1	5.8	6.1

Calendar year 1962: Max 1.0 Min 0.1 Mean 0.28 Ac-ft 200  
 Water year 1962-63: Max 2 Min 0 Mean 0.29 Ac-ft 207

\* Discharge measurement made on this day.

\*\* Field estimate made on this day.

8-3965. Pecos River near Artesia, N. Mex.

Location.--Lat 32°50'25", long 104°19'25", in NW¼NW¼ sec.18, T.17 S., R.27 E., near left bank on downstream end of bridge pier on State Highway 83, 4.3 miles east of Artesia, 7.0 miles north of mouth of Rio Penasco, and 17 miles north of McMillan Dam.

Drainage area.--15,300 sq mi, approximately (contributing area).

Records available.--September 1905 to June 1909, August 1909 to September 1936, May 1937 to September 1963. Monthly discharge only for some periods, published in WSP 1312. Records for Aug. 22-31, 1934, and October 1936 to April 1937, published in WSP 763 and 828, respectively, have been found to be unreliable and monthly figures only should be used. Prior to February 1936, published as "near Dayton."

Gage.--Water-stage recorder. Datum of gage is 3,291.05 ft (Bureau of Reclamation bench mark). Prior to Aug. 27, 1914, staff gage and Aug. 27, 1914, to Feb. 20, 1936, water-stage recorder at site 6½ miles downstream at different datum. Feb. 21, 1936, to Apr. 4, 1941, water-stage recorder at site 600 ft downstream at different datum.

Average discharge.--30 years (1905-8, 1909-36), 365 cfs (264,200 acre-ft per year), prior to completion of Alamogordo Reservoir; 27 years (1936-63), 314 cfs (227,300 acre-ft per year).

Extremes.--Maximum discharge during year, 4,230 cfs June 3 (gage height, 12.14 ft); minimum daily discharge, 5 cfs May 27.

1905-63: Maximum discharge probably occurred May 30, 1937, when a discharge of 51,500 cfs was measured by slope-area method at a point 15 miles upstream (gage height, 14.7 ft, site and datum then in use); maximum gage height, 17.4 ft Sept. 30, 1932, site and datum then in use (discharge, 19,000 cfs); no flow at times in 1934, 1946-47, 1953-54, 1957.

Greatest flood known since at least 1893 occurred Oct. 2, 1904 (discharge not determined). The peak inflow to Lake McMillan, which includes Rio Penasco and Four Mile Draw, was estimated as 82,000 cfs. The second highest flood occurred July 25, 1905 (discharge below Rio Penasco, 50,300 cfs, based on gain in storage and spill from Lake McMillan). The floods in August 1893 and October 1904 damaged McMillan Dam and washed out Avalon Dam.

Remarks.--Records fair. Discharge measurements made two or more times a month. Flow partly regulated by Alamogordo Reservoir (see p. 177) since August 1937. Diversions and ground-water withdrawals for irrigation of about 154,000 acres (1959 determination) above station. Discharge represents inflow to Lake McMillan which is part of the storage system for the irrigation of about 25,000 acres of the Carlsbad project.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	117	63	77	69	69	62	26	27	108	8	645	921
2	102	60	80	69	76	58	29	35	781	8	677	1,330
3	98	56	80	76	74	50	17	30	3,470	8	674	520
4	94	53	81	76	80	40	27	24	2,020	6	680	265
5	85	50	78	73	76	42	36	25	600	8	695	230
6	77	50	78	74	69	43	39	24	321	8	648	385
7	64	51	77	80	67	46	37	24	222	10	662	250
8	58	43	76	81	65	45	40	20	156	6	671	183
9	54	48	74	78	64	44	38	16	128	16	701	106
10	51	48	70	77	60	52	34	13	106	11	674	77
11	52	46	69	74	62	552	26	11	95	9	713	53
12	62	45	67	50	65	749	26	9	69	8	635	46
13	58	51	62	40	65	812	19	6	69	8	445	34
14	57	57	57	45	68	860	18	8	78	106	500	29
15	56	58	54	60	73	893	34	17	95	512	755	33
16	48	64	54	75	76	941	36	11	70	538	628	33
17	48	63	56	76	72	956	29	8	65	622	295	28
18	51	59	57	78	73	965	24	7	263	701	165	20
19	49	62	59	76	72	965	21	6	505	598	120	15
20	51	68	63	68	69	971	15	6	314	628	80	10
21	52	68	64	73	64	854	12	7	236	638	108	10
22	52	69	64	78	62	409	20	53	198	645	84	10
23	54	70	65	69	67	211	29	12	120	602	69	33
24	60	72	65	62	67	146	23	12	155	590	50	33
25	65	69	65	56	67	117	20	10	97	595	37	17
26	67	72	65	56	64	74	21	7	64	625	29	20
27	64	73	65	57	57	57	27	5	38	653	24	19
28	67	73	67	63	56	49	28	9	29	677	18	19
29	68	72	65	69	-----	44	30	9	18	731	16	17
30	67	74	63	67	-----	39	24	689	12	737	15	14
31	64	-----	67	67	-----	29	-----	228	-----	668	57	-----
Total	2,012	1,807	2,084	2,112	1,899	11,175	805	1,368	10,502	10,982	11,570	4,760
Mean	64.9	60.2	67.2	68.1	67.8	360	26.8	44.1	350	354	373	159
Ac-ft	3,990	3,580	4,130	4,190	3,770	22,170	1,600	2,710	20,830	21,780	22,950	9,440

Calendar year 1962: Max 1,450 Min 1 Mean 171 Ac-ft 123,500  
 Water year 1962-63: Max 3,470 Min 5 Mean 167 Ac-ft 121,100

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	2100	10.32	2,490	9-2	0130	9.05	2,530
6-3	2200	12.14	4,230				



## RIO GRANDE BASIN

8-3985. Rio Penaasco at Dayton, N. Mex.

Location--Lat 32°44'30", long 104°22'30", in SW¼SW¼ sec.15, T.18 S., R.26 E., on right bank 3 ft upstream from crest of abandoned diversion dam, 1 mile northeast of old Dayton railway station, 3½ miles upstream from mouth, and 7 miles southeast of Artesia.

Drainage area--1,070 sq mi, approximately.

Records available--April 1951 to September 1963. Prior to October 1953, published as "near Dayton."

Gage--Water-stage recorder and concrete control. Datum of gage is 3,340.89 ft above mean sea level, datum of 1929.

Average discharge--12 years, 5.0 cfs (3,620 acre-ft per year).

Extremes--Maximum discharge during year, 1,280 cfs June 15 (gage height, 2.08 ft); no flow for most of year.

1951-63: Maximum discharge, 23,700 cfs Oct. 7, 1954 (gage height, 6.82 ft), from rating curve extended above 6,000 cfs on basis of slope-area measurement of peak flow; no flow for extended periods.

The greatest flood known occurred about Sept. 22, 1941, when a stage of about 9 ft (from old logs) was reached, and peak discharge for station near Dunken (about 50 miles upstream) was 70,000 cfs (as determined for that station in 1956, from floodmarks and rating curve extended above 36,300 cfs).

Remarks--Records good. Diversions and ground-water withdrawals for irrigation of about 3,200 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	0	0.8	58
.5	4	.9	91
.6	15	1.1	184
.7	33		

Discharge, in cubic feet per second, water year October 1962 to September 1963

June	15.....	*184
Aug.	14.....	17
	15.....	14

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
June 1963.....	184	184	0	6.1	365
August.....	31	17	0	1.0	61
Calendar year 1962.....	-	1,120	0	9.3	6,700
Water year 1962-63.....	-	184	0	.6	426

Peak discharge (base, 750 cfs)--June 15 (0330) 1,280 cfs (2.08 ft).

\* Discharge measurement made on this day.

Note--Flow occurred only on days listed above. Observation of no flow generally made once a month.

8-3995. Pecos River (Kaiser Channel) near Lakewood, N. Mex.

Location.--Lat 32°41'22", long 104°17'53", in NW¼SE¼ sec.5, T.19 S., R.27 E., on left bank 3 miles upstream from high-water line of Lake McMillan, 6 miles northeast of Lakewood, 7 miles northeast of gates in McMillan Dam, and 12 miles southeast of Artesia.

Records available.--May 1950 to September 1963. Prior to October 1954, published as Kaiser Lake-McMillan Channel near Lakewood.

Gage.--Water-stage recorder. Datum of gage is 3,270.53 ft above mean sea level (Bureau of Reclamation bench mark). Prior to Mar. 23, 1955, at site 3 miles downstream at datum 9.83 ft lower.

Average discharge.--13 years, 168 cfs (121,600 acre-ft per year).

Extremes.--Maximum daily discharge during year, 1,720 cfs June 3; minimum daily, 1 cfs May 20, 28.  
1950-63: Maximum daily discharge, 2,920 cfs July 12, 1960; no flow at times in most years.

Remarks.--Records good except those for periods of ice affect or no gage-height record, which are fair. Discharge measurements generally made two or more times a month. Flow partly regulated by Alamogordo Reservoir (see p. 177). Diversions and ground-water withdrawals for irrigation of about 170,000 acres (1959 determination) above station. Above about 1,500 cfs flow will begin bypassing station and, depending on the magnitude and duration of flow, may reach Lake McMillan.

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Mar. 12, May 30, June 2-7, 10, 11, 14-16, 18-20, 24, July 4-6, 8, July 11 to Sept. 20, Sept. 23-30)

-0.2	1	0.4	52
-.1	6	.8	126
0	12	1.5	298
.1	21	3.0	770
		5.3	1,720

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	120	58	72	72	64	61	26	19	a 145	9	623	631
2	99	56	74	69	74	62	33	33	432	7	644	1,310
3	91	50	76	78	76	52	24	28	1,720	7	657	529
4	85	50	80	83	76	44	24	24	1,520	6	654	274
5	80	47	78	78	78	41	33	24	810	6	685	225
6	67	46	76	80	69	45	37	26	484	6	647	353
7	56	46	78	83	64	42	40	23	350	7	661	253
8	50	42	76	82	62	47	37	23	a 260	6	678	215
9	46	40	76	85	61	44	38	18	a 215	7	696	126
10	45	42	71	87	58	42	37	13	164	9	678	87
11	40	42	69	83	58	480	29	11	135	6	706	52
12	52	41	69	71	60	727	28	8	a 95	5	678	45
13	50	42	67	a 40	61	781	27	5	a 85	5	472	34
14	50	48	61	a 50	62	817	23	2	97	11	494	28
15	46	51	56	b 55	69	850	26	8	99	436	674	27
16	46	56	56	b 65	74	908	35	19	101	491	724	27
17	40	56	56	b 70	72	940	30	4	a 85	567	364	27
18	45	55	56	80	72	960	25	7	174	654	188	19
19	48	55	58	78	72	956	24	3	626	580	133	16
20	44	60	61	b 50	71	960	19	1	328	600	91	12
21	45	61	60	b 70	64	904	12	2	a 260	627	97	a 8
22	45	64	58	89	62	436	17	40	a 225	633	87	a 8
23	47	66	61	74	64	210	24	19	a 145	607	76	11
24	51	67	61	64	67	157	25	7	164	587	51	29
25	54	67	62	56	66	126	21	8	a 110	587	39	19
26	61	66	62	55	64	93	21	5	a 80	600	32	10
27	60	71	64	54	61	67	24	2	a 50	644	28	15
28	58	67	64	55	55	55	26	1	a 40	650	20	14
29	66	66	64	67	-	47	28	6	a 25	702	15	13
30	62	69	64	64	-----	39	24	525	a 15	716	18	11
31	60	-----	64	62	-----	33	-----	366	-----	668	24	-----
Total	1,809	1,647	2,050	2,156	1,856	11,026	817	1,280	9,139	10,446	11,644	4,428
Mean	58.4	54.9	66.1	69.5	66.3	356	27.2	41.3	305	337	376	148
Ac-ft	3,590	3,270	4,070	4,280	3,680	21,870	1,620	2,540	18,130	20,720	23,100	8,780
Calendar year 1962: Max	1,570	Min	0	Mean	166	Ac-ft	120,000					
Water year 1962-63: Max	1,720	Min	1	Mean	160	Ac-ft	115,600					

a No gage-height record.

b Stage-discharge relation affected by ice.

8-4000. Four Mile Draw near Lakewood, N. Mex.

Location.--Lat 32°40'22", long 104°22'10" in SE $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.10, T.19 S., R.26 E., on right bank 50 ft upstream from ford on Lakewood-Dayton road, 1.8 miles downstream from U. S. Highway 285, 2.8 miles north of Lakewood,  $\frac{3}{4}$  miles upstream from mouth, and  $1\frac{1}{4}$  miles south of Artesia.

Drainage area.--265 sq mi, approximately.

Records available.--October 1951 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 3,305.22 ft above mean sea level, datum of 1929. Prior to June 19, 1962, at site 1.8 miles upstream at datum 24.53 ft higher.

Average discharge.--12 years, 1.4 cfs (1,010 acre-ft per year).

Extremes.--Maximum discharge during year, 6 cfs Aug. 30 (gage height, 1.88 ft); no flow for most of time.  
1951-63: Maximum discharge, 7,650 cfs Oct. 7, 1954 (gage height, 13.30 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurement of peak flow; no flow for most days.

Remarks.--Records fair. No known diversions above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Aug. 30..... 1

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1963.....	1	1	0	0.03	2.0
Calendar year 1962.....	-	354	0	2.5	1,820
Water year 1962-63.....	-	1	0	.003	2.0

Peak discharge (base, 200 cfs).--No peak above base.

Note.--Flow occurred only on day listed above. Observations of no flow generally made at least once a month.

8-4010. Pecos River below McMillan Dam, N. Mex.

Location.--Lat 32°35'40", long 104°21'00", in NE¼ sec.11, T.20 S., R.26 E., on left bank 700 ft downstream from gates in McMillan Dam and 3 miles southeast of Lakewood.

Drainage area.--16,990 sq mi, approximately (contributing area).

Records available.--January 1906 to March 1908, January 1909 to December 1911, August 1939 to December 1940, December 1946 to September 1963 (January 1906 and January 1910 to December 1911, gage heights and discharge measurements only). Published as "near Lakewood" 1906-11, and as "below McMillan Dam, near Lakewood" 1939-40.

Gage.--Water-stage recorder and rock control. Datum of gage is 3,238.21 ft above mean sea level, datum of 1929. January 1906 to December 1911 staff gage at three different sites within half a mile of present gage at different datums. August 1939 to December 1940 water-stage recorder at site 30 ft downstream at datum 0.10 ft higher; December 1946 to Mar. 11, 1957, at present site at datum 1.09 ft higher. Supplemental water-stage recorders on McMillan Dam spillways, Nos. 1 and 2, since July 9, 1960, and Apr. 6, 1960, respectively.

Average discharge.--18 years (1906-7, 1939-40, 1947-63), 107 cfs (77,460 acre-ft per year).

Extremes.--Maximum discharge during year, 2,840 cfs Apr.8 (gage height, 7.75 ft); no flow for many days.

1939-40, 1947-63: Maximum discharge, 16,100 cfs Oct. 11, 1954, includes flow of two spillways; no flow for many periods. Flood of Oct. 2, 1904, may have reached 60,000 cfs; figure of 82,000 cfs previously published has been found to be "inflow to McMillan Reservoir," and is considered too high. This station may have had a higher discharge in August 1893 when part of McMillan Dam was blasted to prevent total destruction of the dam (that flood was described as "highest in 50 years" and it also destroyed Avalon Dam).

Remarks.--Records good. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p.177). No flow over McMillan Dam spillways during year. Diversions and ground-water withdrawals for irrigation of about 171,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

1.4	0	2.0	24	3.5	340
1.5	1	2.3	56	4.0	540
1.6	2	2.6	104	5.3	1,180
1.8	11	3.0	190		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	(**)	0			* 0	* 4 22	143	0	* 296	154	0
2	**4 6		0	(*)		0	856	141	0	330	200	0
3	185		**0			0	892	141	0	313	230	0
4	188		0			0	0	137	0	309	132	0
5	154		0			0	0	36	68	230	98	0
6	293		0			0	0	0	107	139	165	0
7	105		0			0	0	0	109	139	256	0
8	31		0			0	* 1.1 30	0	111	139	365	0
9	290		0			0	0	62	111	139	403	0
10	0		0			0	0	152	73	111	238	193
11	0		6			0	0	185	58	95	109	403
12	0		0			0	186	185	58	95	111	284
13	0		0			0	287	* 180	72	95	113	* 213
14	0		0	(*)		0	195	180	113	95	1	250
15	0		0			1	145	108	111	143	0	213
16	0		0			0	178	0	93	193	0	213
17	0		0			0	219	0	60	259	0	180
18	0		0			0	262	0	60	262	0	163
19	0		0			0	326	0	60	262	0	227
20	0		0			0	203	0	60	265	0	253
21	0		0			0	139	0	60	268	0	253
22	0		0			0	139	0	80	268	0	253
23	0		0			0	* 141	0	159	* 351	0	244
24	0		0			0	141	0	253	387	0	300
25	0		0			* 0	115	0	293	387	0	300
26	0		0			0	64	37	287	330	0	* 268
27	0		0			* 202	0	139	287	300	0	67
28	0		0	(*)		344	0	139	287	201	49	162
29	0		0			434	* 0	113	280	152	309	0
30	0		0			430	82	100	280	154	69	0
31	1	-----	0		-----	426	-----	* 79	-----	* 154	0	-----
Total	1,293	0	6	0	0	1,837	6,172	2,257	3,590	5,861	3,002	4,439
Mean	41.7	0	0.2	0	0	59.3	206	72.8	120	221	96.8	148
Ac-ft	2,560	0	12	0	0	3,640	12,240	4,480	7,120	13,610	5,950	8,800

Calendar year 1962: Max 770 Min 0 Mean 97.4 Ac-ft 70,520  
 Water year 1962-63: Max 1,180 Min 0 Mean 80.7 Ac-ft 58,410

\* Discharge measurement or observation of no flow made on this day.  
 \*\* Field estimate made on this day.

8-4020. Pecos River at damsite 3, near Carlsbad, N. Mex.

Location.--Lat 32°30'40", long 104°20'00", in lot 14, sec. 6, T. 21 S., R. 26 E., on right bank at damsite 3 of Carlsbad project of Bureau of Reclamation, about 1 mile upstream from flow line of Lake Avalon, 1.3 miles downstream from Rocky Arroyo, and 8 miles northwest of Carlsbad.

Drainage area.--17,980 sq mi, approximately (contributing area).

Records available.--August 1939 to December 1940, August 1944 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 3,172.31 ft above mean sea level (Bureau of Reclamation datum). Prior to Aug. 10, 1944, at site 1,000 ft downstream at same datum.

Average discharge.--20 years, 182 cfs (131,800 acre-ft per year).

Extremes.--Maximum discharge during year, 9,160 cfs Aug. 13 (gage height, 9.60 ft); minimum daily, 34 cfs Jan. 10, May 26.

1939-40, 1944-63: Maximum discharge, 53,000 cfs Oct. 7, 1954 (gage height, 18.53 ft), from rating curve extended above 15,000 cfs on basis of slope-area measurement of peak flow; minimum daily, 4.8 cfs Aug. 1, 4, 7, 8, 1954.

Peaks which probably exceeded 40,000 cfs occurred in August 1893, Oct. 2, 1904, July 25, 1905, Apr. 17, 1915, Aug. 7, 1916, and May 30, 1937, based primarily on records for station at Carlsbad. Floods of 1893 and 1904 originated above McMillan Dam and contributed to the two failures of Avalon Dam. The flood of Oct. 2, 1904, probably did not exceed 60,000 cfs; the estimate of 82,000 cfs erroneously published as flow over McMillan Dam was actually inflow to Lake McMillan, and is thought to be high.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p. 177). Diversions and ground-water withdrawals for irrigation of about 173,000 acres (1959 determination) above station. Discharge represents inflow to Lake Avalon.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Apr. 2

Apr. 3 to Sept. 30

0.1	26	1.0	190	0.1	26	2.0	555
.4	60	1.5	360	.3	49	3.0	1,100
.7	113	2.0	580	.6	102	4.0	1,820
				1.0	200	5.7	3,480

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	49	45	45	43	42	43	434	186	60	311	190	60
2	* 49	45	44	* 43	44	43	548	186	37	* 356	* 217	75
3	170	45	* 43	43	44	42	1,240	184	36	339	262	* 61
4	252	45	43	43	* 44	44	68	184	36	* 336	203	56
5	159	45	43	44	44	43	62	134	48	301	136	60
6	a 330	45	43	44	44	43	61	54	136	186	170	125
7	a 180	45	43	44	43	42	58	49	141	178	253	56
8	a 50	44	42	43	43	42	* 1.1 10	48	143	178	353	52
9	a 350	44	43	42	42	41	88	58	143	178	405	* 52
10	95	43	43	34	42	39	61	168	129	163	332	131
11	a 54	44	43	36	45	38	60	220	98	136	153	390
12	a 52	43	43	37	44	38	143	217	100	134	150	353
13	a 52	44	* 44	38	43	41	322	* 217	100	131	928	253
14	a 50	44	44	39	44	* 41	265	220	146	131	* 3,470	285
15	a 50	43	44	39	44	41	195	189	215	150	* 321	262
16	a 50	43	44	a 41	44	39	209	70	150	209	54	256
17	a 50	44	45	a 42	44	41	253	45	109	272	283	* 238
18	a 50	44	45	* 43	45	41	275	48	104	281	185	214
19	a 50	45	44	44	45	41	346	44	106	281	49	247
20	a 50	44	44	44	44	41	291	40	106	285	50	298
21	a 48	44	45	44	44	42	192	40	104	285	50	294
22	a 46	44	44	43	44	43	189	40	106	288	50	294
23	a 48	43	44	44	44	44	189	39	173	328	52	281
24	a 48	43	44	44	43	44	186	37	259	* 382	52	332
25	a 48	43	45	42	43	45	170	35	315	386	54	336
26	a 46	43	44	44	43	45	a 130	34	315	356	54	318
27	a 46	43	44	43	43	113	a 60	140	315	318	55	196
28	a 44	43	44	44	* 44	322	a 50	170	315	262	55	184
29	a 44	44	43	43	-	425	a 50	160	315	a 190	305	80
30	a 44	45	43	43	-----	434	a 120	136	311	a 190	189	58
31	a 44	-----	43	42	-----	438	-----	* 141	-----	a 190	61	-----
Total	2,698	1,319	1,355	1,302	1,222	2,819	7,425	3,533	4,671	7,711	9,141	5,897
Mean	87.0	44.0	43.7	42.0	43.6	90.9	248	114	156	249	295	197
Ac-ft	5,350	2,620	2,690	2,580	2,420	5,590	14,730	7,010	9,260	15,290	18,130	11,700

Calendar year 1962: Max 1,440 Min 32 Mean 150 Ac-ft 108,800  
 Water year 1962-63: Max 3,470 Min 34 Mean 135 Ac-ft 97,370

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4- 3	1130	4.45	2,200	8-14	1450	9.35	8,710
4- 8	1630	5.02	2,750	8-17	2100	4.16	1,800
8-13	2230	9.60	9,160				

\* Discharge measurement made on this day.  
 a No gage-height record.

8-4035. Carlsbad main canal at head, near Carlsbad, N. Mex.

Location.--Lat 32°29'28", long 104°15'08", in N $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.12, T.21 S., R.26 E., on right bank 220 ft downstream from headgates in Avalon Dam and 5.0 miles north of Carlsbad.

Records available.--July 1939 to December 1940 (published as Carlsbad project main canal near Carlsbad), April 1951 to September 1963.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,156.50 ft above mean sea level (Bureau of Reclamation datum). July 1939 to December 1940 at site 20 ft upstream at datum 0.9 ft higher.

Extremes.--1939-40, 1951-63: Maximum daily discharge, 490 cfs July 13, 1940; no flow at times.

Remarks.--Records good. Discharge measurements made at least once a month during irrigation season. Carlsbad main canal diverts water from Lake Avalon for irrigation of about 25,000 acres of Carlsbad Irrigation District. About 1,600 acres is irrigated on left bank of the Pecos River, most of it above gaging station on Pecos River at Carlsbad. The remaining acreage is on right bank, most of it downstream from Pecos River at Carlsbad gage.

Monthly discharge, in cubic feet per second, water year October 1962 to September 1963

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	255	0	75.5	4,640
November.....	1	0	.03	2
December.....	0	0	0	0
Calendar year 1962	467	0	126	91,270
January.....	0	0	0	0
February.....	0	0	0	0
March.....	419	0	86.9	5,350
April.....	439	68	245	14,550
May.....	175	33	86.2	5,300
June.....	319	33	137	8,170
July.....	363	112	228	14,050
August.....	356	44	195	11,980
September.....	365	0	206	12,270
Water year 1962-63	439	0	105	76,310

8-4040. Pecos River below Avalon Dam, N. Mex.

Location.--Lat 32°28'53", long 104°15'43", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.14, T.21 S., R.26 E., on right bank 5,200 ft below Avalon Dam and 4.5 miles northwest of Carlsbad.

Drainage area.--18,080 sq mi, approximately (contributing area).

Records available.--January 1906 to March 1907 (published as "at Avalon"), June 1951 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 3,130 ft (from topographic map). January 1906 to March 1907 staff gage at site half a mile upstream at different datum.

Average discharge.--12 years (1951-63), 38.2 cfs (27,660 acre-ft per year).

Extremes.--Maximum discharge during year, 9,080 cfs Aug. 14 (gage height, 15.20 ft); no flow for most days.

1951-63: Maximum discharge, 41,000 cfs Oct. 7, 1954 (gage height, 23.3 ft, from floodmarks); no flow for many days.

Flood of Oct. 2, 1904, caused, in part, by failure of Avalon Dam, was described at that time as the greatest flood known. Flood in August 1893 is probably second highest, and was described as "greatest in 50 years"; it damaged McMillan Dam and washed out the original Avalon Dam.

Remarks.--Records fair. Flow regulated by Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p.177-8). Diversions and ground-water withdrawals above station for irrigation of about 198,000 acres (1959 determination). Station bypassed by Carlsbad main canal.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Aug. 14.....	*1,600	Aug. 18.....	9
15.....	*133	19.....	2
16.....	*10		

Month	Cfs-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 1963.....	1,754	1,600	0	56.6	3,480
Calendar year 1962.....	-	23	0	.07	48
Water year 1962-63.....	-	1,600	.0	4.8	3,480

\* Discharge measurement made on this day.

Note.--Flow occurred only on days listed above. Observations of no flow generally made once a month.

8-4050. Pecos River at Carlsbad, N. Mex.

Location.--Lat 32°25'05", long 104°13'25", in NW¼SE¼ sec.6, T.22 S., R.27 E., in downstream end of pier near center of Greene Street Bridge in Carlsbad, half a mile upstream from Dark Canyon.

Drainage area.--18,100 sq mi, approximately (contributing area).

Records available.--May 1903 to March 1908 (January 1907 to March 1908, gage heights and discharge measurements only), May 1914 to September 1915, and April 1920 to September 1963 in reports of Geological Survey. Monthly discharges only for some periods, published in WSP 1312. Records (except maximum discharges) for October 1915 to March 1920, published in WSP 438, 458, 478, and 508, have been found to be unreliable and should not be used.

Gage.--Water-stage recorder. Datum of gage is 3,080.28 ft above mean sea level, datum of 1929. Prior to June 1, 1920, staff gages in immediate vicinity of present site, and at different datums prior to Jan. 6, 1938.

Average discharge.--19 years (1903-4, 1905-6, 1914-15, 1920-36), 255 cfs (184,600 acre-feet per year), prior to completion of Alamogordo Dam; 27 years (1936-63), 196 cfs (141,900 acre-ft per year).

Extremes.--Maximum discharge during year, 7,670 cfs Aug. 14 (gage height, 10.10 ft); minimum daily, 0.9 cfs Aug. 2. 1903-6, 1914-15, 1920-63: Maximum discharge probably exceeded 90,000 cfs Oct. 2, 1904 (gage height, 23.44 ft, from floodmarks); minimum daily, 0.7 cfs Sept. 15, 1962. Flood of Oct. 2, 1904, caused in part by failure of Avalon Dam, was described at that time as "greatest flood known at Carlsbad." Flood in August 1893 is probably second highest, and was described as "greatest in 50 years"; it damaged McMillan Dam and washed out the original Avalon Dam.

Remarks.--Records good. Flow regulated by Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p.177-8), and at low stages by powerplant above station. Gage is bypassed on left bank by Carlsbad main canal east which irrigates several hundred acres adjacent to and below gage site, and on right bank by Carlsbad main canal south which with supplemental groundwater withdrawals irrigates about 23,000 acres below. This bypass flow is not presently gaged. Diversions and ground-water withdrawals above station for irrigation of about 198,000 acres (1959 determination).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Feb. 9 to Mar. 8)

Oct. 1 to Mar. 31			Apr. 1 to Aug. 14			Aug. 14 to Sept. 30			
0.59	2.8	0.46	0.9	0.8	9.8	0.5	1.8	2.0	143
.7	5.3	.5	1.3	1.0	21	.6	3.9	2.5	257
.8	8.5	.6	3.0	1.2	35	.7	7.3	3.0	409
.9	13	.7	5.9	1.5	65	.9	18	4.0	865
1.1	24					1.2	38	4.5	1,160
1.3	38					1.5	67		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	23	23	24	29	26	*34	*13	22	23	2.0	21
2	35	23	23	*24	29	27	33	33	27	*4.7	9	21
3	*13	19	*23	25	29	29	32	30	*23	9.4	1.2	22
4	33	20	22	30	*14	29	20	29	21	12	2.0	29
5	30	20	21	29	19	27	34	23	20	11	4.7	27
6	30	20	23	27	33	29	33	7.8	17	7.8	10	20
7	24	20	22	18	30	29	33	20	17	7.5	*9.4	13
8	17	19	22	27	30	30	32	22	17	20	8.5	28
9	28	20	22	27	30	28	31	26	17	*29	8.0	21
10	29	19	22	27	31	29	30	*21	15	2.2	2.4	23
11	25	19	23	26	34	27	17	20	*33	3.8	2.2	26
12	23	19	22	26	30	33	34	19	*25	26	3.9	*22
13	24	19	*23	26	31	34	33	18	4.5	2.2	*20	25
14	24	21	*24	27	15	*29	30	20	5.5	10	*1.10	27
15	32	*23	24	27	16	32	28	21	14	*14	*228	27
16	30	22	23	27	27	29	32	20	15	26	*54	26
17	30	23	23	*13	27	29	31	20	14	15	25	25
18	30	22	24	16	28	15	28	20	13	*18	3.6	*25
19	30	23	24	23	33	27	32	23	14	2.2	35	24
20	30	23	23	24	*24	22	31	*17	12	2.6	17	24
21	29	23	23	25	20	19	30	23	12	5.6	*17	22
22	29	23	24	25	25	24	20	40	12	27	19	20
23	30	23	22	23	26	25	29	30	12	*32	17	*24
24	37	22	23	23	27	25	29	5.9	11	*6.7	18	24
25	37	23	25	23	26	*23	26	14	*22	5.7	8.5	15
26	26	23	22	22	26	23	15	20	34	5.6	25	11
27	2.8	22	23	22	27	25	21	20	12	1.6	20	28
28	13	22	24	22	*25	27	25	18	1.1	1.7	19	22
29	22	22	22	29	-	29	58	21	6.3	14	23	18
30	23	23	23	27	-----	27	3.2	21	11	1.7	*17	18
31	23	-----	24	22	-----	36	-----	20	-----	*22	31	-----
Total	812.8	643	711	756	741	843	864.2	656.7	479.8	370.0	1762.3	678
Mean	26.2	21.4	22.9	24.4	26.5	27.2	28.8	21.2	16.0	11.9	56.8	22.6
Ac-ft	1.610	1.280	1.410	1.500	1.470	1.670	1.710	1.300	952	734	3.500	1.340

Calendar year 1962: Max 70 Min 0.7 Mean 24.4 Ac-ft 17,660  
Water year 1962-63: Max 1,110 Min 0.9 Mean 25.5 Ac-ft 18,480

\* Discharge measurement made on this day.

RIO GRANDE BASIN

171

8-4055. Black River above Malaga, N. Mex.

Location.--Lat 32°13'40", long 104°09'05", in SW¼ sec.12, T.24 S., R.27 E., on right bank 0.6 mile upstream from Black River diversion dam, 4.8 miles west of Malaga, and 7 miles upstream from mouth.

Drainage area.--343 sq mi.

Records available.--March to December 1940, December 1946 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 3,070 ft (from topographic map). March to December 1940 water-stage recorder and Cippoletti weir at site 0.3 mile downstream at different datum.

Average discharge.--16 years (1947-63), 12.5 cfs (9,050 acre-ft per year).

Extremes.--Maximum discharge during year, 14,000 cfs Aug. 31 (gage height, 12.35 ft), from rating curve extended above 5,900 cfs on basis of slope-area measurement at gage height 12.60 ft; minimum daily, 2.3 cfs Mar. 19.

1946-63: Maximum discharge, 20,500 cfs Sept. 23, 1955 (gage height, 14.70 ft), from rating curve extended above 1,400 cfs on basis of slope-area measurements at gage heights 8.41 and 12.60 ft; minimum daily, 2.1 cfs Mar. 29, 30, 1962.

Maximum flood known since 1908 (from information by local resident), 33,000 cfs Sept. 20 or 21, 1941 (gage height, 19.0 ft, determined in 1947 from well-defined floodmarks), from rating curve extended above 1,400 cfs as explained above. Flood of Apr. 17, 1915, reached a stage of 11 ft at bridge on Loving-Malaga road.

Remarks.--Records excellent, except those above 100 cfs, which are good. Diversions and ground-water withdrawals for irrigation of about 1,000 acres (1959 determination) above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Apr. 1, June 14)

Oct. 1 to Aug. 31				Aug. 31 to Sept. 30			
0.7	2.3	1.3	29	0.7	3.2	2.0	156
.8	4.8	1.5	45	.8	6.2	2.5	296
.9	8.1	1.8	80	.9	10	3.0	485
1.0	12			1.1	22	4.0	1,000
				1.4	51	4.8	1,540
				1.7	96		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	* 6.3	6.0	5.4	8.5	3.2	5.0	6.7	8.5	4.2	3.7	* 5.4
2	* 6.3	6.3	5.7	5.7	6.7	2.7	* 1.5	6.7	7.4	3.5	3.7	1.9
3	6.3	6.3	5.4	* 5.7	6.7	2.7	8.9	6.3	* 6.3	4.0	4.0	9.3
4	6.3	6.3	* 5.4	5.7	6.0	3.0	8.5	6.3	6.0	5.1	3.7	7.6
5	7.0	6.7	5.4	5.7	5.7	3.5	8.9	6.3	5.7	5.4	* 3.5	7.6
6	7.0	6.3	5.4	5.7	6.0	3.2	8.1	7.0	5.4	4.5	3.5	6.2
7	6.7	6.3	5.4	5.4	6.3	3.2	7.4	7.7	5.1	4.5	3.7	11.4
8	6.3	6.3	5.1	5.4	6.3	3.0	7.0	7.7	5.4	4.5	7.4	2.0
9	6.3	6.7	5.7	5.4	6.7	2.7	7.0	7.7	5.7	4.2	4.5	8.8
10	6.3	6.3	6.0	5.1	8.9	2.7	7.0	7.7	5.1	4.0	3.7	6.5
11	6.0	6.3	5.4	4.8	1.1	2.7	7.0	7.7	5.1	3.7	3.5	* 6.2
12	6.0	6.7	5.4	5.1	1.1	2.7	7.0	6.7	5.1	3.7	3.5	5.4
13	6.0	6.7	5.4	5.7	1.1	3.0	7.0	5.7	5.7	4.2	3.5	4.8
14	6.0	6.7	5.4	5.7	1.1	3.0	7.0	8.1	6.9	4.0	4.2	4.6
15	6.0	6.7	5.4	* 5.7	1.1	2.7	7.4	7.0	3.6	3.7	4.8	5.2
16	5.7	6.7	5.4	6.0	1.1	2.7	7.4	6.0	* 2.1	4.8	4.2	4.6
17	1.2	6.7	5.4	6.0	1.1	3.2	7.7	5.7	9.7	* 4.5	4.0	4.0
18	1.5	6.7	* 5.4	7.4	1.1	2.5	7.4	5.7	7.7	4.0	4.2	4.0
19	9.3	7.0	5.4	1.0	1.0	2.3	7.0	5.7	6.7	3.7	4.5	4.2
20	7.4	7.0	5.4	9.7	1.0	2.5	7.0	5.7	6.3	3.7	* 4.2	4.2
21	7.0	7.0	5.1	1.0	1.0	2.5	7.0	5.7	* 6.0	3.7	4.2	4.2
22	6.7	7.0	5.1	9.7	1.0	2.5	6.7	6.7	5.4	3.7	4.0	4.2
23	* 6.3	7.0	4.8	9.7	1.0	2.5	6.7	1.1	5.4	3.7	3.7	4.2
24	6.3	7.0	5.1	9.3	1.0	2.5	6.7	8.1	5.4	3.5	3.7	4.2
25	6.3	7.4	5.1	9.3	1.0	2.5	6.7	6.7	4.8	3.5	3.5	4.6
26	6.7	7.4	5.4	9.3	8.9	2.7	6.7	6.0	4.8	3.5	3.2	4.6
27	7.0	7.0	5.7	9.3	* 6.0	2.7	6.7	6.7	4.8	3.5	3.2	4.6
28	7.0	7.0	5.7	9.7	4.2	2.7	6.7	7.0	* 4.8	3.7	3.2	4.6
29	6.7	6.7	5.4	* 9.3	-	2.5	6.3	6.3	4.8	4.0	3.2	4.6
30	6.3	6.0	5.4	9.3	-----	2.7	* 6.3	7.0	4.5	4.0	* 5.7	4.6
31	6.3	-----	5.4	8.9	-----	4.8	-----	1.4	-----	3.7	* 1.540	-----
Total	216.8	200.5	167.7	225.1	244.9	87.8	266.2	219.3	283.6	124.4	171.0	344.6
Mean	6.99	6.63	5.41	7.26	8.75	2.83	8.87	7.07	9.43	4.01	5.52	11.5
Ac-ft	430	398	333	446	486	174	528	435	563	247	3390	684

Calendar year 1962: Max 435 Min 2.1 Mean 8.07 Ac-ft 5,850  
Water year 1962-63: Max 1,540 Min 2.3 Mean 11.2 Ac-ft 8,110

Peak discharge (base, 450 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
4-1	1545	3.27	547	9-7	0030	3.08	519
8-31	0630	12.35	14,000				

\* Discharge measurement made on this day.



8-4065. Pecos River near Malaga, N. Mex.

Location--Lat 32°12'30", long 104°01'20", in N $\frac{1}{2}$  sec. 19, T.24 S., R.29 E., on right bank 3 miles southeast of Malaga and 4 miles downstream from Black River.

Drainage area--19,190 sq mi, approximately (contributing area).

Records available--May 1920 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage--Water-stage recorder (digital subsequent to Apr. 30). Datum of gage is 2,895.64 ft above mean sea level, datum of 1929. Prior to Mar. 25, 1949, at datum 3 ft higher.

Average discharge--16 years (1920-36), 274 cfs (198,400 acre-ft per year), prior to completion of Alamogordo Reservoir; 27 years (1936-63), 241 cfs (174,500 acre-ft per year).

Extremes--Maximum discharge during year, 5,520 cfs Aug. 31 (gage height, 12.61 ft); minimum daily, 16 cfs June 23, 24, July 3, 19, 23, 26, 27, Aug. 5.

1920-63: Maximum discharge, 63,700 cfs Sept. 21, 1941, from rating curve extended above 22,500 cfs by logarithmic plotting; maximum gage height, 35.1 ft May 22, 1941, present datum, from floodmarks; minimum daily discharge, 5.6 cfs Aug. 18-20, 1954. Flood in 1941 is believed to be the highest since 1904 when a flood of about the same magnitude occurred. Flood of Aug. 7, 1916, was revised to 70,000 cfs at Carlsbad, 27 miles upstream. Flood in September 1919 reached a stage of 29.4 ft, present datum (discharge, 40,400 cfs).

Remarks--Records good. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p.177-8), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination). Harroun canal bypasses gage on left bank and irrigates approximately 1,000 acres adjacent to and below gage. This bypass is not gaged.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 28			Mar. 1 to Sept. 30		
1.8	15	1.7	14	4.0	317
2.0	28	2.0	32	5.0	589
2.2	45	2.5	80	6.0	945
2.5	78	3.0	141	7.3	1,540
		3.5	217		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	54	68	62	22	31	148	53	23	*18	18	*489
2	*30	55	70	*63	22	26	*223	45	32	17	21	101
3	29	63	66	63	21	23	72	33	*46	16	19	50
4	28	65	*66	63	21	23	44	25	47	19	17	30
5	31	65	63	64	21	*23	36	23	48	23	16	26
6	30	68	60	68	21	23	33	22	45	20	18	25
7	28	65	56	66	20	22	27	24	44	19	17	72
8	27	64	59	64	20	22	*26	21	40	46	*17	36
9	30	64	60	57	19	22	26	19	26	28	17	26
10	30	62	60	64	20	21	26	*19	22	24	19	23
11	29	63	62	67	22	23	28	19	20	21	19	22
12	29	60	60	51	21	25	28	19	20	19	18	*21
13	29	60	59	55	21	24	25	20	19	19	19	21
14	28	63	59	62	27	23	24	19	20	19	22	21
15	29	64	62	*64	30	23	23	20	63	18	*1040	22
16	29	65	63	64	30	27	21	56	31	*17	*140	25
17	40	63	63	65	30	24	21	34	24	17	66	28
18	56	63	*63	64	30	24	20	27	21	17	35	24
19	70	64	64	53	30	24	20	23	19	16	29	24
20	70	64	60	48	33	24	20	20	18	17	*24	22
21	67	65	60	58	58	24	22	20	*18	17	24	22
22	68	65	58	60	57	23	36	23	17	17	24	37
23	*68	64	58	60	56	23	31	23	16	16	23	51
24	68	63	59	58	59	22	27	29	16	17	23	47
25	68	63	60	55	*52	23	24	25	18	17	20	58
26	78	64	62	59	57	23	24	21	20	16	21	57
27	68	66	62	55	59	23	36	20	21	16	20	49
28	66	65	60	54	44	22	38	19	20	18	19	43
29	57	64	63	*40	-	*23	32	25	21	18	*23	57
30	54	64	62	26	-----	23	*33	30	19	18	*200	60
31	54	-----	62	23	-----	23	-----	27	-----	18	*1500	-----
Total	1,419	1,897	1,909	1,775	933	729	1,194	803	814	598	3,488	1,591
Mean	45.8	63.2	61.6	57.3	33.3	23.5	39.8	25.9	27.1	19.3	113	53.0
Ac-ft	2,810	3,760	3,790	3,520	1,850	1,450	2,370	1,590	1,610	1,190	6,920	3,160

Calendar year 1962: Max 433 Min 17 Mean 44.9 Ac-ft 32,530  
 Water year 1962-63: Max 1,500 Min 16 Mean 47.0 Ac-ft 34,020

Peak discharge (base, 1,800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-15	about 0700		about 3,300	8-31	1030	12.61	5,520

\* Discharge measurement made on this day.

8-4070. Pecos River at Pierce Canyon Crossing, near Malaga, N. Mex.

Location--Lat 32°11'20", long 103°58'45", in W $\frac{1}{2}$  sec. 27, T. 24 S., R. 29 E., on right bank a quarter of a mile upstream from Pierce Canyon Crossing and 6 miles southeast of Malaga.

Drainage area--19,260 sq mi, approximately (contributing area).

Records available--July 1938 to September 1941, August 1951 to September 1963.

Gage--Water-stage recorder. Altitude of gage is 2,890 ft (from river-profile map). July 1938 to September 1941 at datum 1.19 ft higher.

Average discharge--15 years, 208 cfs (150,600 acre-ft per year).

Extremes--Maximum discharge during year, 3,950 cfs Aug. 31 (gage height, 7.53 ft), from rating curve extended above 330 cfs by logarithmic plotting and correlation of peaks with associated stations; minimum daily, 12 cfs Aug. 9.  
1938-41, 1951-63: Maximum gage height, 24.8 ft May 22, 1941 (datum then in use), from floodmarks (discharge not determined); minimum daily discharge, 4.4 cfs Aug. 20, 1954.

Remarks--Records good except those above 400 cfs, which are fair. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan, and Lake Avalon (see p. 177-8), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination).

Rating tables (gage-height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Feb. 28

Mar. 1 to Sept. 30

0.9	16	0.7	8	1.6	136
1.0	26	.8	13	2.0	262
1.2	51	1.0	29	3.0	711
1.4	86	1.3	71	4.2	1,400

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	40	59	71	65	28	32	41	45	26	*21	17	651
2	*35	57	73	*65	25	24	352	53	29	20	16	152
3	34	62	71	67	25	24	90	39	*46	*19	24	59
4	32	65	*69	67	25	20	58	30	50	19	19	37
5	37	65	69	67	24	*24	43	26	49	22	19	29
6	36	71	67	69	24	27	38	24	43	24	22	27
7	34	67	64	71	24	25	34	24	40	25	22	57
8	31	67	65	67	24	25	26	24	39	52	*16	54
9	34	69	67	64	23	25	29	20	35	36	12	30
10	37	67	67	67	23	28	30	*18	24	27	13	27
11	35	65	65	71	25	28	32	19	17	23	19	21
12	35	65	65	64	25	30	35	21	15	21	19	*19
13	36	65	65	64	25	31	29	24	17	21	17	18
14	37	65	65	67	27	32	24	24	16	21	24	18
15	37	65	67	*67	34	35	24	24	51	18	918	19
16	38	65	67	67	35	40	20	37	43	*16	*200	19
17	44	67	69	67	35	39	22	61	32	15	94	24
18	64	65	*69	67	35	39	25	36	26	14	52	24
19	73	65	71	62	34	36	20	38	23	14	35	21
20	75	65	69	56	36	36	20	32	20	14	*27	19
21	71	67	67	62	52	32	22	26	*19	15	24	18
22	71	67	65	64	64	32	29	28	17	15	23	25
23	*71	67	64	62	61	28	30	32	14	18	20	49
24	73	65	64	61	62	29	28	36	13	18	19	46
25	71	65	65	61	*64	27	25	38	13	19	19	52
26	78	67	65	62	64	27	24	32	17	20	17	58
27	77	69	67	61	64	27	27	27	17	19	18	54
28	67	69	65	59	54	24	37	22	20	19	17	48
29	67	67	67	*56	-	*17	34	26	21	17	*17	58
30	61	67	67	37	-----	17	*28	49	24	16	199	63
31	61	-----	65	31	-----	19	-----	36	-----	17	1,380	-----
Total	1,592	1,971	2,076	1,937	1,041	879	1,276	971	816	635	3,338	1,796
Mean	51.4	65.7	67.0	62.5	37.2	28.4	42.5	31.3	27.2	20.5	108	59.9
Ac-ft	3,160	3,910	4,120	3,840	2,060	1,740	2,530	1,930	1,620	1,260	6,620	3,560

Calendar year 1962: Max 464 Min 17 Mean 49.6 Ac-ft 35,940  
Water year 1962-63: Max 1,380 Min 12 Mean 50.2 Ac-ft 36,350

\* Discharge measurement made on this day.

## RIO GRANDE BASIN

8-4075. Pecos River at Red Bluff, N. Mex.

Location.--Lat 32°04'30", long 104°02'20", in sec. 1, T.26 S., R.28 E., on right bank at Red Bluff, 0.2 mile downstream from Red Bluff Draw and 5.5 miles upstream from Delaware River.

Drainage area.--19,540 sq mi, approximately (contributing area).

Records available.--October 1937 to September 1963.

Gage.--Water-stage recorder. Datum of gage is 2,850.05 ft above mean sea level, datum of 1929.

Average discharge.--26 years (1937-63), 229 cfs (165,800 acre-ft per year).

Extremes.--Maximum discharge during year, 2,200 cfs Aug. 31 (gage height, 7.60 ft); minimum daily, 7 cfs June 25, 26.

1937-63: Maximum discharge, 52,600 cfs May 24, 1941 (gage height, 28.3 ft), from rating curve extended above 30,000 cfs on basis of slope-area measurement of peak flow; minimum, 1.4 cfs Aug. 21, 1954.

Maximum stage known, that of May 24, 1941. Flood in October 1904 reached a stage of 28.0 ft, from information by Panhandle and Santa Fe Railway Co.

Remarks.--Records good. Flow regulated by storage in Alamogordo Reservoir, Lake McMillan and Lake Avalon (see p.177-8), and by several small diversion dams that divert for power or irrigation. Diversions and ground-water withdrawals above station for irrigation of about 202,000 acres (1959 determination).

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used July 13-20)

Oct. 1 to July 31

Aug. 1 to Sept. 30

2.6	6	3.6	130	2.7	8	4.0	209
2.9	27	4.2	286	2.9	21	4.5	361
3.2	59			3.1	39	5.0	560
				3.5	98	6.0	1,080

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	59	73	72	34	44	19	30	30	*21	22	*1,080
2	*36	55	75	*72	33	31	*265	50	24	19	28	254
3	32	56	75	72	31	25	128	44	*30	18	47	98
4	31	64	*72	72	31	25	64	35	40	18	21	58
5	34	66	72	72	31	*21	49	29	41	18	18	38
6	34	70	70	73	30	25	37	25	38	22	*18	29
7	33	69	67	76	29	26	33	23	39	34	20	27
8	31	67	64	75	29	25	27	23	38	39	20	78
9	30	69	69	72	29	25	25	22	38	41	15	41
10	33	69	69	67	29	23	27	18	30	25	13	31
11	34	67	69	76	31	25	30	16	22	22	14	27
12	33	67	67	75	31	25	31	16	18	20	20	*23
13	31	66	67	66	30	28	31	19	14	18	20	21
14	33	67	67	70	30	28	26	21	15	17	19	21
15	33	69	67	*72	34	29	22	22	18	20	*574	50
16	33	69	69	72	38	31	22	22	54	*15	*391	28
17	36	70	70	72	38	34	20	50	*33	14	128	23
18	46	69	*70	70	38	33	22	33	25	10	70	26
19	66	69	72	70	38	33	24	29	22	10	47	23
20	75	69	73	60	37	32	20	29	19	12	*34	22
21	73	69	70	60	42	31	21	24	17	13	27	21
22	72	72	70	66	64	29	22	56	15	14	24	21
23	*73	70	66	69	63	28	31	25	13	14	22	35
24	72	69	67	67	63	25	28	26	10	14	21	50
25	72	69	70	67	*66	26	26	30	7	15	20	49
26	75	70	70	67	66	24	25	27	7	18	19	59
27	85	70	72	67	64	25	25	24	14	17	15	58
28	70	72	72	66	64	25	29	21	13	18	16	50
29	69	72	72	*63	-	*22	34	39	17	16	*15	49
30	62	72	73	49	-----	18	*30	54	19	14	112	64
31	59	-----	72	38	-----	18	-----	37	-----	14	*683	-----
Total	1,530	2,031	2,171	2,105	1,143	839	1,193	919	720	580	2,513	2,454
Mean	49.4	67.7	70.0	67.9	40.8	27.1	39.8	29.6	24.0	18.7	81.1	81.8
Ac-ft	3,030	4,030	4,310	4,180	2,270	1,660	2,370	1,820	1,430	1,150	4,980	4,870

Calendar year 1962: Max 385 Min 17 Mean 49.3 Ac-ft 35,680  
Water year 1962-63: Max 1,080 Min 7 Mean 49.9 Ac-ft 36,100

Peak discharge (base 1,800 cfs).--Aug. 31 (2240) 2,200 cfs (7.60 ft).

\* Discharge measurement made on this day.

8-4085. Delaware River near Red Bluff, N. Mex.

Location.--Lat 32°01'25", long 104°03'15", in SE¼ sec.23, T.26 S., R.28 E., near center of channel on downstream side of pier of bridge on U. S. Highway 285, 3.5 miles upstream from mouth, 4 miles south of Red Bluff, and 14 miles south of Malaga.

Drainage area.--689 sq mi.

Records available.--April 1912 to September 1913, May 1914 to June 1915, October 1937 to September 1963. Published as "near Malaga, N. Mex." 1912-13, and as "near Angeles, Tex." 1914-15.

Gage.--Water-stage recorder and concrete control. Datum of gage is 2,900.66 ft above mean sea level, datum of 1929. Prior to May 1914, at site 3 miles upstream at different datum. May 1914 to June 1915 at site 2½ miles downstream at different datum.

Average discharge.--26 years (1937-63), 14.3 cfs (10,350 acre-ft per year).

Extremes.--Maximum discharge during year, 10,100 cfs June 2 (gage height 10.17 ft), from rating curve extended above 1,500 cfs as explained below; no flow at times.

1912-13, 1914-15, 1937-63: Maximum discharge, 81,400 cfs Oct. 2, 1955 (gage height, 27.0 ft, from floodmark), from rating curve extended above 1,500 cfs on basis of slope-area measurements at gage heights 8.65, 12.84, 18.00, and 27.0 ft; no flow at times.

Maximum stage known since at least 1911, that of Oct. 2, 1955. Flood of June 27, 1938, reached a stage of 18.00 ft, from floodmark.

Remarks.--Records good prior to May 28, fair thereafter. No diversion above station.

Rating table (gage height, in feet, and discharge in cubic feet per second)  
(Shifting-control method used June 4 to July 8)

0.1	0	1.1	6.5	2.3	64
.3	.2	1.3	10	2.6	133
.5	.7	1.5	14	2.9	240
.7	1.8	1.8	23	3.3	455
.9	3.7	2.1	38	4.0	1,050
				5.7	3,040

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.8	1.7	1.4	1.5	1.1	2.1	0	4.16	*1.7	8.1	7.3
2	*.4	1.0	1.8	*1.4	1.4	1.2	2.1	0	2.990	1.7	9.3	5.0
3	.3	1.1	1.6	1.4	1.3	1.1	1.7	0	*.83	1.6	2.4	382
4	.2	1.1	*1.4	1.4	1.4	1.1	1.4	0	6.0	2.4	1.9	221
5	.4	.7	1.4	1.4	1.3	*1.1	1.5	0	5.0	3.7	1.1	28
6	.4	.8	1.4	1.4	1.4	1.3	1.4	0	3.4	2.0	*1.3	12
7	.3	.7	1.4	1.4	1.4	1.2	1.3	0	2.2	1.1	3.0	7.5
8	.3	.7	1.4	1.5	1.4	1.2	1.0	0	7.9	4.84	.9	6.5
9	.2	.8	1.3	1.6	1.4	1.2	.9	0	5.4	2.8	.4	5.0
10	.1	.8	1.3	1.5	1.4	1.2	.8	0	4.5	1.2	.3	4.7
11	.1	.9	1.4	1.5	1.7	1.1	.7	0	4.1	7.5	.2	4.2
12	.1	.9	1.4	a 1.4	1.6	.9	.6	0	3.7	5.3	.1	*2.8
13	.1	.9	1.5	a 1.5	1.7	.9	.4	0	3.4	4.4	3.9	2.8
14	.1	1.0	1.4	a 1.6	1.7	1.0	.4	0	*6.6	7.7	9.2	2.6
15	0	1.0	1.5	*1.7	1.7	1.0	.5	0	2.0	1.1	2.1	2.2
16	0	1.1	1.5	1.7	1.7	.9	2.2	0	1.2	4.6	1.4	2.1
17	0	1.1	1.4	1.8	1.7	.8	.9	0	*5.3	*2.2	.8	2.0
18	.2	1.1	*1.4	1.9	1.7	.9	.4	0	4.1	1.7	4.0	1.9
19	.6	1.2	1.5	1.8	1.5	.9	.2	0	6.6	1.5	4.4	1.8
20	.6	1.2	1.5	a 1.5	1.4	.9	.1	0	1.2	1.3	*1.8	1.7
21	.5	1.4	1.4	a 1.6	1.4	1.0	.1	0	*6.3	1.2	7.2	1.7
22	.4	1.4	1.2	1.7	1.4	1.0	.1	.4	1.1	1.0	3.3	1.6
23	*.3	1.4	1.2	1.6	1.2	1.1	.1	0	4.5	.8	5.2	a 1.5
24	.1	1.3	1.2	1.6	1.2	1.0	.1	0	3.1	.7	4.5	a 1.4
25	.2	1.4	1.4	1.6	*1.1	1.0	0	0	1.48	.6	1.8	a 1.5
26	.5	1.4	1.5	1.5	1.2	1.0	0	0	1.7	.5	1.0	a 1.4
27	1.8	1.4	1.5	1.6	1.3	1.1	0	0	6.0	.4	.6	a 1.3
28	1.0	1.4	1.6	1.6	1.2	1.0	0	0	3.5	.5	.4	a 1.3
29	.8	1.4	1.5	*1.5	---	.9	0	1.5	2.5	.7	*.8	a 1.2
30	.7	1.5	1.4	1.6	-----	.8	*0	2.41	2.1	.7	3.60	a 1.1
31	.7	-----	1.4	1.7	-----	.5	-----	3.0	-----	6.7	1.10	-----
Total	11.9	32.9	44.5	48.4	40.3	31.8	21.0	272.9	4070.7	630.7	642.3	827.8
Mean	0.38	1.10	1.44	1.56	1.44	1.03	0.70	8.80	136	20.3	20.7	27.6
Ac-ft	24	65	88	96	80	63	42	541	8070	1250	1270	1640

Calendar year 1962: Max 220 Min 0 Mean 3.03 Ac-ft 2,190  
Water year 1962-63: Max 2,990 Min 0 Mean 18.3 Ac-ft 13,230

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
6-2	0100	10.17	10,100	8-30	0140	5.21	2,450
7-8	0700	4.76	1,910				

\* Discharge measurement or observation of no flow made on this day.  
a No gage-height record.

## Reservoirs in Rio Grande basin

- 8-2539. Costilla Lake near Costilla, N. Mex.**--Lat 36°52'35", long 105°16'45", on face of Costilla Dam on Costilla Creek in Sangre de Cristo Grant, 16 miles southeast of Costilla, Taos County, N. Mex. Drainage area, 55 sq mi, approximately. Records available, May 1922 to September 1963. Inclined staff gage (taut cable, graduated). Datum of gage is at mean sea level (from original survey). Maximum contents observed during year, 7,850 acre-ft May 12 (elevation, 9,490.2 ft); minimum, 487 acre-ft Aug. 14 (elevation, 9,437.9 ft). Maximum contents during period 1922-63, 15,100 acre-ft June 30, 1940 (elevation, 9,511.4 ft); no contents October 1925 to February 1926, September 1956.
- Lake is formed by earth-fill dam. Storage began in 1920. Capacity, 15,700 acre-ft between elevation 9,405.0 ft (bottom of lower intake), and 9,513.0 ft (crest of ungated spillway cut in natural rock). By order of New Mexico State Engineer (first issued in 1942) storage was limited to 14,540 acre-ft maximum, and 10,880 for not to exceed 45 days (revised to 60 days in 1949). Diversions for irrigation of about 1,300 acres above Lake. Contents computed from intermittent gage readings and capacity table (based on original survey) furnished by New Mexico State Engineer.
- 8-2850. El Vado Reservoir.**--Lat 36°35'45", long 106°43'55", in Tierra Amarilla Grant, at left end of dam on Rio Chama, at Village of El Vado, 13 miles southwest of Tierra Amarilla, N. Mex. Drainage area, 873 sq mi. Records available, January 1935 to September 1963. Water-stage recorder (records stages above spillway floor only) and inclined staff gage. Datum of gage is 8.21 ft above mean sea level, datum of 1929, leveling of 1953. Maximum contents at 0800 during year, 112,800 acre-ft Oct. 1 to Nov. 1 (gage height, 6,872.1 ft); minimum, 2,430 acre-ft Jan. 9 to Mar. 20 (gage height, 6,775.0 ft). Maximum contents during period 1935-63, 204,900 acre-ft June 4, 5, 1948 (gage height, 6,904.2 ft); no contents at times.
- Reservoir is formed by rock-fill dam, steel faced. Storage began in January 1935. Capacity, 194,500 acre-ft between gage heights 6,758.5 (stoplog seat) and 6,902.0 ft (top of spillway gate). No dead storage. Prior to Jan. 1, 1947, figures represent usable contents computed from capacity table furnished by Middle Rio Grande Conservancy District in 1940; Jan. 1, 1947, to Sept. 30, 1954, figures represent usable contents, computed from capacity table based on survey of 1944 by Corps of Engineers; after Oct. 1, 1954, used revised table based on partial survey (below gage height, 6,770 ft) by Bureau of Reclamation. Water is used for irrigation by Middle Rio Grande Conservancy District. Gage readings and contents given herein are generally those at 0800. Continuous recorder registers gage heights above 6,879.3 ft (floor of spillway). Staff-gage readings furnished by Middle Rio Grande Conservancy District.
- 8-2869. Abiquiu Reservoir.**--Lat 36°14'15", long 106°25'35", in SW $\frac{1}{4}$  sec. 8, T. 23 N., R. 5 E., in Abiquiu Dam on Rio Chama,  $\frac{6}{12}$  miles northwest of Abiquiu. Drainage area, 2,146 sq mi, of which about 100 sq mi is probably noncontributing. Records available, February to September 1963. Datum of gage is at mean sea level, datum of 1929 (levels by Corps of Engineers). Maximum contents observed during period, 2,110 acre-ft Apr. 16 (elevation, 6,089.72 ft); no contents on several days.
- Reservoir is formed by earth-fill dam, completed Feb. 5, 1963. Capacity, 1,225,000 acre-ft (original table) between gage heights 6,060 (invert of outlet tunnel) and 6,350 ft (crest of spillway). No dead storage. Original plan for reservoir was to hold water for one day to desilt before releasing to Rio Grande, and for possible flood stage detention. All elevations and contents figures given above are based on original capacity table dated 14 April 1961. A new capacity table to be adopted Oct. 1, 1963, accounts for material borrowed from reservoir area during construction. If this table were applied to 1963 record, month-end contents figures (beginning with Feb. 28) would be 43, 335, 1138, 501, 420, 759, and 0 respectively.
- Records furnished by Corps of Engineers. Contents figures given here represent contents at 2400, from recorded elevations.
- 8-3155. McClure Reservoir.**--Lat 35°41'20", long 105°50'10", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 24, T. 17 N., R. 10 E., on outlet tower at McClure Dam on Santa Fe River,  $2\frac{1}{2}$  miles upstream from Nichols Reservoir, and 6 miles east of Santa Fe, N. Mex. Drainage area, 17.4 sq mi. Records available, October 1947 to September 1963. Water-stage recorder. Datum of gage is 7,768.12 ft above mean sea level, datum of 1929, and 165.9 ft above Public Service Co. of New Mexico assumed datum. Maximum contents at 2400 during year, 3,050 acre-ft June 23 (gage height, 102.5 ft); minimum, 1,680 acre-ft Oct. 23-28. Maximum contents during period 1947-63, 3,140 acre-ft June 25, 1960 (gage height, 103.7 ft); no contents Jan. 25 to May 8, 1951.
- Reservoir is formed by earth-fill dam, completed in 1926 (capacity, 503 acre-ft), raised 5 ft in 1935 (capacity, 650 acre-ft), raised 36.5 ft in 1947. Capacities and changes in height of dam are for effective height of spillway which includes 1 foot of flashboards above concrete crest 1926 to July 1935, 2 ft August 1935 to September 1947, and varying heights of sandbag bulkheads from October 1947 to May 1953 when spillway was equipped with radial gates which open automatically at gage height about 103.1 ft (some adjustment possible). Capacity, 3,090 acre-ft between gage heights -0.2 (bottom of lowest outlet tube), and 103.1 ft. No dead storage. Figures given here represent contents at 2400. Water is used for municipal consumption of city of Santa Fe. Capacity table computed from area-capacity table furnished by Public Service Co. of New Mexico.
- 8-3165. Nichols Reservoir.**--Lat 35°41'20", long 105°52'40", in E $\frac{1}{2}$ NE $\frac{1}{4}$  sec. 21, T. 17 N., R. 10 E., on outlet tower at dam on Santa Fe River, three-quarters of a mile upstream from Two Mile Reservoir,  $2\frac{1}{2}$  miles downstream from McClure Dam, and  $3\frac{1}{2}$  miles east of Santa Fe, N. Mex. Drainage area, 22.8 sq mi. Records available, December 1942 to September 1963. Water-stage recorder. Datum of gage is 7,313.2 ft above mean sea level, datum of 1929. Maximum contents at 2400 during year, 658 acre-ft May 16, 17 (gage height, 166.1 ft); minimum, 285 acre-ft Apr. 3 (gage height, 150.3 ft). Maximum contents during period 1943-63, 836 acre-ft June 8, 1952 (gage height, 171.8 ft); minimum, 16 acre-ft Feb. 11 to Mar. 10, 1944, Feb. 1-19, 1948.
- Reservoir is formed by earth-fill dam. Storage began Mar. 16, 1943. Capacity, 796 acre-ft between gage heights 121.2 (bottom of lower operational gate) and 171.0 ft (top of flashboards in spillway). Dead storage, 14 acre-ft. Figures given herein represent total contents at 2400. Water is used for municipal consumption of city of Santa Fe. Capacity table computed from survey furnished in 1943 by Public Service Co. of New Mexico.
- 8-3285. Jemez Canyon Reservoir.**--Lat 35°23'40", long 106°32'45", in SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 32, T. 14 N., R. 4 E., at corner of outlet works control tower of Jemez Canyon Dam, about  $2\frac{1}{2}$  miles upstream from mouth and 6 miles north of Bernalillo, N. Mex. Drainage area, 1,034 sq mi. Records available, October 1953 to September 1963. Water-stage recorder. Datum of gage is at mean sea level (levels by Corps of Engineers). Maximum contents during year, 1,300 acre-ft Mar. 26 (elevation, 5,147.4 ft); no contents for most of year. Maximum contents during period 1953-63, 71,220 acre-ft June 8, 1958 (elevation, 5,213.36 ft); no storage for most of time.

## Reservoirs in Rio Grande basin--Continued

8-3285. Jemez Canyon Reservoir.--Continued

Reservoir is formed by earth-fill dam, completed Oct. 19, 1953. Maximum capacity, 183,200 acre-ft (from capacity table adopted Oct. 1, 1962) between elevations 5,125.0 (sill of outlet gates) and 5,252.3 ft (operating deck of spillway). Maximum controllable capacity, 114,000 acre-ft (at crest of spillway) at elevation 5,232.3 ft; spillway is located about three-quarters of a mile south of dam and flows directly to Rio Grande. Original plan for reservoir operation was to desilt all flow above 30 cfs by storage for one day before releasing to Rio Grande, and for possible detention during flood stage on Rio Grande. Records furnished by Corps of Engineers.

8-3414. Bluewater Lake.--Lat 35°17'40", long 108°06'40", in SE $\frac{1}{4}$  sec.4, T.12 N., R.12 W., on left end of dam and 9.5 miles west of Bluewater, N. Mex. Drainage area, 201 sq mi. Records available, June 1927 to December 1950 in Water Bulletins (Nos. 10-20) of International Boundary and Water Commission. January 1951 to June 1958 in files of Bluewater-Toltec Irrigation Co. July 1958 to January 1961, inclined staff and supplemental vertical staff sections, and since January 1961, water-stage recorder. Datum of gage is 7,345.57 ft above mean sea level, datum of 1929. Gage heights have been reduced to elevations above mean sea level. Maximum contents observed during year, 8,640 acre-ft Apr. 27 (elevation, 7,376.8 ft); minimum observed, 3,750 acre-ft Aug. 30 (elevation, 7,366.6 ft). Maximum contents determined during period 1927-50, 1958-63, 47,100 acre-ft in April 1941 (date and elevation not available), from table then in use; no storage at times prior to 1947.

Reservoir is formed by concrete arch dam. Storage began in 1927. Capacity, 38,500 acre-ft at elevation 7,402.6 ft (crest of uncontrolled siphon spillway which is vented to avoid drawdown below crest), and 44,200 acre-ft at elevation 7,405.6 ft (crest of ungated spillway over dam). Dead storage, 3.4 acre-ft at elevation 7,345.4 ft (sill of lower outlet tube). Lake not usually drawn below conservation pool level (elevation, 7,365.36 ft), below which ownership is by State Game and Fish Department. Above this level, water is owned and used by Bluewater-Toltec Irrigation Co. Figures given herein represent total contents, based on table derived from 10-foot contour survey made in 1945 by Bureau of Reclamation. Contents figures are from daily staff gage readings at about 0800 prior to Jan. 27, 1961, and from recorded gage heights at 2400 thereafter.

8-3605. Elephant Butte Reservoir.--Lat 33°09'15", long 107°11'30", in NW $\frac{1}{4}$  sec.30, T.13 S., R.3 W (surveys by Bureau of Reclamation), at dam on Rio Grande, 1 mile west of Elephant Butte and 4 miles northeast of Truth or Consequences (Hot Springs), N. Mex. Drainage area, 29,445 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.). Records available, March 1915 to September 1963. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 432,800 acre-ft Jan. 31 (gage height, 4,327.52 ft); minimum daily, 66,500 acre-ft Aug. 31 (gage height, 4,282.07 ft). Maximum daily contents during period 1915-63, 2,302,800 acre-ft June 16-18, 1942 (gage height, 4,409.19 ft); minimum daily after initial filling, 9,900 acre-ft Aug. 6, 1954 (gage height, 4,258.03 ft).

Reservoir is formed by concrete dam. Storage began Jan. 6, 1915. Dam completed May 13, 1916. Capacity, 2,195,000 acre-ft (survey of 1961) between gage heights 4,231.5 (sill of outlet gate) and 4,407.0 ft (spillway crest). Capacity by original survey was 2,638,900 acre-ft. No dead storage, surveys of 1957 and 1961. No storage allocated to flood control. Figures given herein represent usable contents. Water is used for power development and irrigation on Rio Grande project of Bureau of Reclamation. Lake is major recreational area. Contents given herein are computed from mean daily gage heights. Records furnished by Bureau of Reclamation.

8-3620. Caballo Reservoir.--Lat 32°53'45", long 107°17'30", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.19, T.16 S., R.4 W., at dam on Rio Grande, 0.5 mile downstream from mouth of Apache Canyon, 0.9 mile upstream from Bojarquez Bridge, 2 miles upstream from Percha diversion dam, 3.5 miles northeast of Arrey, and 5 $\frac{1}{4}$  miles south of Caballo, N. Mex. Drainage area, 30,700 sq mi, approximately (includes 2,940 sq mi in closed basin in San Luis Valley, Colo.). Records available, February 1938 to September 1963. Water-stage recorder. Datum of gage is 43.3 ft above mean sea level, datum of 1929. Maximum daily contents during year, 103,800 acre-ft May 31 (gage height, 4,154.26 ft); minimum daily, 22,910 acre-ft Apr. 2 (gage height, 4,133.74 ft). Maximum daily contents during period 1938-63, 347,000 acre-ft Mar. 4, 1942 (gage height, 4,182.06 ft); minimum daily, 118 acre-ft Oct. 14, 1938 (gage height, 4,108.1 ft).

Reservoir is formed by earth-fill dam, completed Sept. 19, 1938. Storage began Feb. 8, 1938. Capacity (1958 survey), 344,000 acre-ft between gage heights 4,104 (bottom of tunnel entrance to gates) and 4,182 ft (gage height above which spillway gates operate automatically). No dead storage. Storage held for flood control, 100,000 acre-ft. Figures given herein represent usable contents. Water released from Elephant Butte Reservoir for power development is stored in Caballo Reservoir and released for irrigation on Rio Grande project of Bureau of Reclamation. Contents given herein are computed from mean daily gage heights. Records furnished by Bureau of Reclamation.

8-3840. Alamogordo Reservoir.--Lat 34°36'30", long 104°23'10", in SW $\frac{1}{4}$  sec.34, T.5 N., R.24 E., at dam on Pecos River, 5 miles northeast of Guadalupe and 12 miles northwest of Fort Sumner, N. Mex. Drainage area, 4,390 sq mi (contributing area). Records available, January 1939 to September 1963. Records published in New Mexico State Report for 1962 are a repetition of 1961 figures and should not be used. 1962 records will be included in this report as indicated. Staff gage. Datum of gage is at mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 during water year 1961-62, 115,000 acre-ft Mar. 6, 7 (elevation, 4,273.40 ft); minimum, 55,960 acre-ft Sept. 18, 19 (elevation, 4,256.50 ft). Maximum during water year 1962-63, 84,720 acre-ft Mar. 7 (elevation, 4,265.60 ft); minimum, 5,230 acre-ft Aug. 13 (elevation, 4,221.75 ft). Maximum contents observed during period 1939-63, 138,300 acre-ft May 23-30, June 1-10, July 21, Sept. 22, 23, 30, Oct. 12, Nov. 4, 5, 30, 1941 (elevation, 4,275.00 ft); maximum elevation, 4,276.10 ft June 3, Sept. 8, 1958; no storage July 28 to Aug. 2, 1951 (elevation, 4,200.70 ft).

Reservoir is formed by Alamogordo Dam; completed and storage began in August 1937. Total capacity, 122,100 acre-ft at elevation, 4,275.0 ft (top of spillway gates). No dead storage. No storage allocated for flood control. Figures given herein represent total contents and are computed from elevations at 0800. Elevation record furnished by Bureau of Reclamation and Carlsbad Irrigation District. Capacity table based on data furnished by Bureau of Reclamation, Corps of Engineers, and Carlsbad Irrigation District.

8-4005. Lake McMillan.--Lat 32°35'45", long 104°20'55", in SE $\frac{1}{4}$  sec.2, T.20 S., R.26 E., near gates at dam on Pecos River, 3 miles southeast of Lakewood, N. Mex. Drainage area, 16,990 sq mi (contributing area). Records available, January 1939 to September 1963. Gage heights since January 1918 published in reports of Pecos River Commission. Float-tape gage. Datum of gage is 3,241.6 above mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 during year, 34,220 acre-ft Mar. 23-27 (gage height, 25.15 ft); minimum, 5,640 acre-ft July 15 (gage height, 17.65 ft). Maximum contents observed during period 1939-63, 68,500 acre-ft September 26, 1941 (gage height, 29.95 ft); no storage at times in 1944-54, 1957.

## Reservoirs in Rio Grande basin--Continued

8-4005. Lake McMillan.--Continued

Lake is formed by McMillan Dam; completed and storage began in 1893. The dam was partially impaired by floods of October 1893 and Oct. 2, 1904. Capacity, 32,920 acre-ft between gage heights 0.0 (sill of outlet gate) and 24.9 ft (crest of spillway 2). Flashboards may increase this capacity. Maximum capacity without spill is 39,430 acre-ft at gage height 26.1 ft (crest of spillway 1). No dead storage. No storage allocated to flood control. Figures given herein represent usable contents and are computed from daily gage readings at 0800. Gage heights may be affected by variable drawdown due to flow through gates. Water is used for irrigation by Carlsbad Irrigation District. Gage-height record and capacity table furnished, respectively, by Carlsbad Irrigation District and Bureau of Reclamation.

8-4038. Lake Avalon.--Lat 32°29'25", long 104°15'00", in SW $\frac{1}{4}$  sec. 12, T.21 S., R.26 E., on headwall at outlet gate of dam on Pecos River, 5 miles north of Carlsbad, N. Mex. Drainage area, 18,070 sq mi (contributing area). Records available, January 1939 to September 1963. Gage heights since January 1919 published in reports of Pecos River Commission. Staff gage. Datum of gage is 3,157.0 ft above mean sea level, Bureau of Reclamation datum. Maximum contents at 0800 during year, 5,500 acre-ft Aug. 18 (gage height, 20.85 ft); minimum, 300 acre-ft Oct. 9 (gage height, 12.60 ft). Maximum contents during period 1939-63, 11,000 acre-ft May 22, 1941 (gage height, 25.0 ft); no storage at times when natural flow was passing through reservoir.

Lake is formed by Avalon Dam. The original Eddy (Avalon) dam was completed and storage began in 1893. The dam was destroyed by flood of October 1893 (date of reconstruction not available), was destroyed again by flood of Oct. 2, 1904; present dam rebuilt in 1905-6. Capacity, 5,080 acre-ft between gage heights 0.0 (sill of outlet gates) and 20.4 ft (crest of spillway 2). No dead storage. No storage allocated to flood control. Figures given herein represent usable contents and are computed from daily gage readings at 0800. Water is used for irrigation by Carlsbad Irrigation District. Capacity table furnished by Bureau of Reclamation.

8-4100. Red Bluff Reservoir.--Lat 31°54'05", long 103°54'40", at right end of Red Bluff Dam on Pecos River, 3 miles upstream from Salt (Screwbean) Draw, 4.5 miles north of Orla, Reeves County, Tex. Drainage area, 20,720 sq mi, approximately (contributing area). Records available, February 1937 to September 1963. Monthly contents only for some periods, published in WSP 1312. Staff gage read at irregular intervals. Datum of gage is 0.30 ft below mean sea level, datum of 1929. Maximum contents observed during year, 32,720 acre-ft June 3 (gage height, 2,797.2 ft); minimum observed, 15,420 acre-ft Nov. 17 (gage height, 2,786.1 ft). Maximum contents observed during period 1937-63, 352,000 acre-ft Sept. 27, 28, 1941 (gage height, 2,846.2 ft, observed on staff gage at service spillway, affected by variable drawdown due to flow through taintor gates); minimum observed, 11,080 acre-ft May 13, 1948 (gage height, 2,781.4 ft).

Reservoir is formed by earth-fill dam, rock-faced. Storage began in 1936. Dam completed early in 1937. Capacity, 307,000 acre-ft between gage heights 2,764.0 (penstock intake sill) and 2,842.0 ft (top of taintor gates). Dead storage, 3,000 acre-ft. Figures given herein represent total contents. Water is used for power development and for irrigation from Mentone to Grandfalls. Contents computed from intermittent gage readings. Red Bluff Water Power Control District furnished gage-height record and capacity curve, which was based on U. S. Geological Survey topographic map surveyed in 1925.

RIO GRANDE BASIN

179

Reservoirs in Rio Grande basin--Continued

Month-end elevations and contents, water year October 1962 to September 1963

Date	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
Costilla Lake			El Vado Reservoir			Abiquiu Reservoir			
Sept. 30 ....	-	a4,190	-	6,872.1	112,800	-	-	-	-
Oct. 31 ....	-	a4,600	+410	6,872.1	112,800	0	-	-	-
Nov. 30 ....	-	a5,050	+450	6,845.4	64,560	-48,240	-	-	-
Dec. 31 ....	-	a5,590	+540	6,794.7	11,810	-52,750	-	-	-
Calendar year 1962	-	-	-1,760	-	-	+9,380	-	-	-
Jan. 31 ....	-	a6,020	+430	6,775.0	2,430	-9,380	-	-	-
Feb. 28 ....	-	a6,850	+830	6,775.0	2,430	0	*6,063.58	19	-
Mar. 31 ....	-	a7,060	+210	6,781.0	4,550	+2,120	6,070.50	191	+172
Apr. 30 ....	-	a7,570	+510	6,801.3	16,270	+11,720	6,080.55	884	+693
May 31 ....	9,482.1	5,760	-1,810	6,820.6	33,070	+16,800	6,073.06	311	-573
June 30 ....	9,470.6	3,370	-2,390	6,815.5	28,040	-5,030	6,071.87	250	-61
July 31 ....	9,440.0	556	-2,814	6,806.9	20,550	-7,490	6,076.40	523	+273
Aug. 31 ....	-	a506	-50	6,803.7	18,040	-2,510	-	0	-523
Sept. 30 ....	-	a490	-16	6,803.7	18,040	0	-	0	0
Water year 1962-63	-	-	-3,700	-	-	-94,760	-	-	-
McClure Reservoir			Nichols Reservoir			Jemez Canyon Reservoir			
Sept. 30 ....	84.0	1,780	-	158.0	444	-	0	0	0
Oct. 31 ....	82.4	1,690	-90	151.8	313	-131	0	0	0
Nov. 30 ....	83.7	1,770	+80	150.7	292	-21	0	0	0
Dec. 31 ....	85.2	1,860	+90	152.4	325	+33	0	0	0
Calendar year 1962	-	-	-610	-	-	+12	-	-	-
Jan. 31 ....	85.6	1,880	+20	155.7	391	+66	0	0	0
Feb. 28 ....	88.0	2,030	+150	156.3	405	+14	0	0	0
Mar. 31 ....	95.3	2,520	+490	151.3	304	-101	5,145.35	900	+900
Apr. 30 ....	99.6	2,830	+310	162.1	547	+243	0	0	-900
May 31 ....	102.2	3,030	+200	164.2	603	+56	0	0	0
June 30 ....	98.1	2,720	-310	159.7	484	-119	0	0	0
July 31 ....	88.7	2,080	-640	161.5	531	+47	0	0	0
Aug. 31 ....	87.4	1,990	-90	159.2	472	-59	0	0	0
Sept. 30 ....	89.8	2,150	+160	158.2	449	-23	0	0	0
Water year 1962-63	-	-	+370	-	-	+5	-	-	-
Bluewater Lake			Elephant Butte Reservoir			Caballo Reservoir			
Sept. 30 ....	7,374.9	7,440	-	4,307.39	226,800	-	4,135.91	28,380	-
Oct. 31 ....	7,374.2	7,040	-400	4,308.67	237,700	+10,900	4,137.19	31,880	+3,500
Nov. 30 ....	7,373.8	6,810	-230	4,315.32	296,600	+60,900	4,137.97	34,100	+2,220
Dec. 31 ....	7,373.5	6,650	-160	4,323.92	390,300	+91,700	4,139.12	37,560	+3,460
Calendar year 1962	-	-	+720	-	-	+29,400	-	-	+18,000
Jan. 31 ....	7,373.3	6,540	-110	4,327.52	432,800	+42,500	4,139.70	39,370	+1,810
Feb. 28 ....	7,373.7	6,760	+220	4,326.49	420,500	-12,300	4,152.30	92,670	+53,300
Mar. 31 ....	7,376.5	8,440	+1,680	4,324.10	392,400	-28,100	4,135.04	26,110	-66,560
Apr. 30 ....	7,376.2	8,250	-190	4,319.24	338,600	-53,800	4,150.17	81,620	+55,510
May 31 ....	7,374.0	6,920	-1,330	4,312.14	268,400	-70,200	4,154.26	103,800	+22,180
June 30 ....	7,371.2	5,510	-1,410	4,306.24	217,200	-51,200	4,143.80	53,660	-50,140
July 31 ....	7,367.6	4,090	-1,420	4,294.23	130,200	-87,000	4,136.54	30,080	-23,580
Aug. 31 ....	7,367.0	3,880	-210	4,282.07	66,500	-63,700	4,137.62	33,110	+3,030
Sept. 30 ....	7,368.5	4,420	+540	4,284.80	78,800	+12,300	4,135.61	27,600	-5,510
Water year 1962-63	-	-	-3,020	-	-	-148,000	-	-	-780



## RIO GRANDE BASIN

## Reservoirs in Rio Grande basin--Continued

## Month-end elevations and contents, water year October 1962 to September 1963

Date	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents (acre- feet)
Lake McMillan			Lake Avalon			Red Bluff Reservoir			
Sept. 30. . . .	20.95	15,790	-	14.55	978	-	2,796.0	30,300	-
Oct. 31. . . .	20.30	13,490	-2,300	14.60	1,000	+22	2,794.0	26,600	-3,700
Nov. 30. . . .	20.45	14,020	+530	16.90	2,300	+1,300	2,788.4	18,320	-8,280
Dec. 31. . . .	20.85	15,430	+1,410	18.15	3,160	+860	2,792.0	23,300	+4,980
Calendar year 1962	-	-	0	-	-	+460	-	-	-33,900
Jan. 31. . . .	21.25	16,880	+1,450	19.00	3,840	+680	2,794.4	27,320	+4,020
Feb. 28. . . .	21.55	18,010	+1,130	19.10	3,920	+80	(a)	28,590	+1,270
Mar. 31. . . .	24.40	30,380	+12,370	16.50	2,040	-1,880	2,795.5	29,350	+760
Apr. 30. . . .	20.30	13,490	-16,890	15.30	1,340	-700	2,796.0	30,300	+950
May 31. . . .	18.20	7,060	-6,430	15.80	1,620	+280	2,794.5	27,500	-2,800
June 30. . . .	20.40	13,840	+6,780	14.90	1,140	-480	2,795.8	29,920	+2,420
July 31. . . .	21.00	15,970	+2,130	15.20	1,300	+160	2,793.2	25,240	-4,680
Aug. 31. . . .	23.75	27,240	+11,270	16.15	1,820	+520	2,793.0	24,900	-340
Sept. 30. . . .	21.95	19,560	-7,680	14.25	842	-978	2,796.4	31,100	+6,200
Water year 1962-63	-	-	+3,770	-	-	-136	-	-	-19,700
Alamogordo Reservoir †									
Sept. 30, 1961	4,269.35	98,480	-	* Feb. 5 is when the Dam officially began operation. a No gage-height record. † 1962 figures supersede figures published in 1962 report.					
Oct. 31. . . .	4,269.00	97,140	-1,340						
Nov. 30. . . .	4,270.05	101,200	+4,060						
Dec. 31. . . .	4,271.20	105,800	+4,600						
Calendar year 1961	-	-	-16,500						
Jan. 31. . . .	4,272.45	110,900	+5,100						
Feb. 28. . . .	4,273.25	114,300	+3,400						
Mar. 31. . . .	4,266.50	87,900	-26,400						
Apr. 30. . . .	4,268.55	95,430	+7,530						
May 31. . . .	4,266.85	89,160	-6,270						
June 30. . . .	4,259.30	64,120	-25,040						
July 31. . . .	4,263.80	78,520	+14,400						
Aug. 31. . . .	4,261.10	69,700	-8,820						
Sept. 30. . . .	4,258.05	60,400	-9,300						
Water year 1961-62	-	-	-38,080						
Sept. 30, 1962	4,258.05	60,400	-						
Oct. 31. . . .	4,258.45	61,580	+1,180						
Nov. 30. . . .	4,260.25	67,040	+5,460						
Dec. 31. . . .	4,262.25	73,400	+6,360						
Calendar year 1962	-	-	-32,400						
Jan. 31. . . .	4,263.90	78,860	+5,460						
Feb. 28. . . .	4,265.30	83,660	+4,800						
Mar. 31. . . .	4,257.20	57,940	-25,720						
Apr. 30. . . .	4,257.60	59,090	+1,150						
May 31. . . .	4,257.20	57,940	-1,150						
June 30. . . .	4,262.95	75,690	+17,750						
July 31. . . .	4,244.95	30,070	-45,620						
Aug. 31. . . .	4,239.45	21,400	-8,670						
Sept. 30. . . .	4,247.80	35,360	+13,960						
Water year 1962-63	-	-	-25,040						

8-4770. Mimbres River near Mimbres, N. Mex.

Location.--Lat 32°52'30", long 107°59'00", in NE 1/4 sec. 33, T.16 S., R.11 W., on left bank a quarter of a mile downstream from Bear Canyon and 1 1/2 miles northwest of Mimbres.

Drainage area.--152 sq mi.

Records available.--June 1921 to September 1930 (fragmentary), October 1930 to September 1963. Monthly discharge only for some periods, published in WSP 1312.

Gage.--Water-stage recorder. Concrete control since Mar. 26, 1938. Datum of gage is 5,972 ft above mean sea level, datum of 1929. Prior to Sept. 12, 1923, at site 10 ft downstream at datum 0.3 ft higher. Sept. 12, 1923, to Jan. 17, 1934, at datum of 0.1 ft lower.

Average discharge.--33 years, 9.89 cfs (7,160 acre-ft per year).

Extremes.--Maximum discharge during year, about 380 cfs Aug. 21 (gage height, 5.9 ft, outside gage, from floodmarks); minimum, 1.8 cfs Oct. 29, 30.

1930-63: Maximum discharge determined, 1,560 cfs Aug. 2, 1952 (gage height, 6.22 ft), from rating curve extended above 230 cfs by logarithmic plotting; minimum daily, 0.9 cfs July 22, 1947, Aug. 10, 1951.

Remarks.--Records fair except those below 10 cfs and above 30 cfs, which are poor. Discharge measurements generally made once or twice a month. Some regulation by Bear Canyon Reservoir (capacity, 700 acre-ft). Diversions for irrigation of about 300 acres above station.

Rating tables (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used May 31 to July 8, July 23 to Aug. 4, Aug. 20, 21, Sept. 10)

Oct. 1 to May 12				May 13 to Sept. 30			
2.1	1.8	2.7	7.3	2.3	2.5	3.0	12
2.3	3.0	2.8	11	2.6	4.2	3.2	36
2.5	4.6	2.9	18	2.8	6.4	3.5	90
				2.9	8.4	3.6	115

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	2.4	6.1	6.1	5.4	7.2	6.0	1.4	6.3	4.6	2.8	27
2	8.6	4.5	6.7	6.1	8.0	7.3	4.8	1.4	6.6	4.7	3.5	25
3	8.6	7.0	6.2	6.2	7.7	7.5	5.3	1.1	6.3	4.8	3.1	23
4	8.6	7.0	6.1	6.1	7.2	7.7	5.1	1.0	4.6	5.0	1.3	31
5	8.6	6.8	6.2	6.0	6.8	7.7	5.3	7.7	4.8	4.9	6.4	39
6	8.6	6.7	6.2	6.0	6.7	8.0	5.0	7.0	4.0	5.1	5.9	44
7	8.3	6.7	6.2	5.8	6.4	8.3	4.3	7.2	3.9	5.8	5.1	39
8	8.3	6.7	6.2	5.8	6.2	8.3	4.1	6.8	4.6	1.0	4.4	30
9	8.0	6.7	6.2	5.8	6.1	8.0	3.6	6.6	5.8	4.8	3.8	26
10	8.0	6.7	6.1	5.8	7.2	8.0	3.4	6.6	4.7	3.2	1.1	36
11	8.0	6.6	6.1	6.6	1.2	8.3	3.1	6.2	4.1	3.1	5.5	94
12	8.0	6.4	6.2	6.1	9.0	8.3	3.0	6.2	4.7	3.2	1.3	56
13	8.0	6.4	6.1	6.0	7.5	8.6	3.4	1.2	5.0	3.1	1.9	33
14	7.7	6.4	6.1	5.8	7.5	7.7	5.1	1.2	5.5	3.0	1.3	30
15	8.0	6.6	6.1	5.7	8.0	7.3	8.0	1.5	5.8	3.0	7.4	35
16	8.3	6.4	6.1	5.7	7.3	7.5	9.4	1.5	4.6	3.0	1.3	24
17	8.6	6.4	6.1	5.6	7.0	8.0	9.0	1.5	4.7	3.0	1.6	18
18	8.6	a 6.4	6.2	5.6	6.7	7.5	1.0	1.5	5.1	3.2	9.4	14
19	9.0	a 6.2	1.0	5.8	6.6	5.0	1.5	1.6	5.6	3.2	9.6	11
20	8.3	a 6.0	9.4	5.7	6.4	3.4	1.5	1.4	4.6	3.2	2.2	10
21	8.3	a 6.0	7.7	5.6	6.6	6.3	1.7	1.3	4.8	3.2	5.0	9.3
22	5.4	a 6.0	7.2	5.7	6.8	8.0	1.7	1.2	4.3	3.2	4.2	8.4
23	2.8	a 6.0	6.7	5.6	6.8	9.0	1.5	1.2	4.4	3.0	1.8	8.4
24	2.1	a 6.0	6.6	5.6	6.8	1.0	1.5	1.1	4.3	2.8	1.2	8.0
25	2.1	a 6.0	6.6	5.6	6.8	9.4	1.7	1.1	4.3	2.6	3.2	8.0
26	2.0	a 6.0	6.6	5.6	6.8	9.4	1.8	1.0	4.0	2.6	1.7	7.6
27	1.9	a 5.8	6.6	5.6	6.8	1.0	1.8	1.0	3.8	2.6	2.2	7.6
28	1.9	5.7	6.4	5.4	7.0	1.2	1.5	7.8	4.1	2.6	1.2	7.6
29	1.8	5.8	6.4	5.4	-	1.2	1.4	7.8	4.2	2.8	1.9	7.6
30	2.0	5.8	6.2	5.3	-	1.1	1.4	7.4	4.6	2.8	3.2	7.6
31	2.4	-----	6.1	5.3	-----	9.4	-----	6.4	-----	2.8	2.4	-----
Total	199.8	184.1	203.7	179.0	200.1	256.1	287.9	325.7	144.1	114.9	466.9	725.1
Mean	6.45	6.14	6.57	5.77	7.15	8.26	9.60	10.5	4.80	3.71	15.1	24.2
Ac-ft	396	365	404	355	397	508	571	646	286	228	926	1,440

Calendar year 1962: Max 110 Min 1.8 Mean 14.3 Ac-ft 10,360  
Water year 1962-63: Max 94 Min 1.8 Mean 9.01 Ac-ft 6,520

Peak discharge (base 290 cfs).--Aug. 21 (1800) about 380 cfs (5.9 ft).

a No gage-height record.

8-4776. San Vicente Arroyo at Silver City, N. Mex.

Location.--Lat 32°46'15", long 108°16'30", in NW 1/4 sec. 3, T.18 S., R.14 W. (projected), on left bank in Silver City, 800 ft upstream from bridge at Broadway Street and 1,300 ft downstream from confluence of Silva Creek and Pinos Altos Creek.

Drainage area.--26.5 sq mi.

Records available.--August 1953 to September 1963.

Gage.--Water-stage recorder and concrete control. Datum of gage is 5,862.58 ft above mean sea level, datum of 1929. Prior to May 25, 1958, at site 500 ft downstream at datum 17.99 ft lower.

Average discharge.--10 years, 0.82 cfs (594 acre-ft per year).

Extremes.--Maximum discharge during year, 4,680 cfs Aug. 16 (gage height, 8.30 ft in gage well, 10.0 ft from outside gage); minimum daily discharge determined, 0.1 cfs on many days.

1953-63: Maximum discharge, that of Aug. 16, 1963; no flow for many days in most years.

Maximum flood known occurred July 21, 1895 (discharge probably exceeded 10,000 cfs), from newspaper accounts. A peak of 6,800 cfs was measured by slope-area method from old floodmarks found in 1956 (probably occurred Sept. 9, 1938).

Remarks.--Records poor. Discharge measurements generally made once or twice a month.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	1.3	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2
2	a.1	a.1	a.2	1	2	1	1	1	1	1	2	4.8
3	1	a.1	a.1	1	2	1	1	1	1	2	2.6	2
4	1	a.1	a.1	1	2	1	1	1	1	1	4	2
5	1	a.1	a.1	1	2	1	1	2	1	1	2	2
6	1	a.1	a.1	1	2	1	1	1	1	3	2	2
7	1	a.1	a.1	1	2	1	1	2	1	2	1	a 15
8	1	a.1	a.1	1	2	1	1	2	1	3	1	a 1
9	1	a.1	a.1	1	2	1	1	1	1	3	2	2
10	1	a.1	a.1	1	3	1	1	1	1	4	2	a 50
11	1	a.1	a.1	1	a.2	1	1	1	1	a 3	2	a 1
12	1	a.1	a.1	1	4	1	1	1	1	3	2	a 2
13	1	a.1	a.1	1	a.2	1	1	1	1	3	13	a 2
14	1	a.1	a.1	1	a.1	1	1	1	1	3	3.2	a 2
15	1	a.5	a.1	1	a.1	1	1	1	1	2	a 2	a 2
16	2	a.1	a.1	1	a.1	1	1	1	1	2	11.9	a 2
17	2	a.1	a.1	1	a.1	1	1	1	1	2	2	a 2
18	9	a.1	a.1	1	a.1	1	1	1	1	3	6.4	a 2
19	5	a.1	a.1	1	a.1	1	1	1	1	2	1.2	20
20	a.1	a.1	a.1	1	a.1	1	1	1	1	2	2.6	1.6
21	a.1	a.1	a.1	2	a.1	1	1	1	1	2	21	2
22	a.1	a.1	a.1	2	a.1	1	1	1	1	2	2	2
23	a.1	a.1	a.1	2	a.1	1	2	1	1	2	2	2
24	a.1	a.1	a.1	2	a.1	1	1	1	1	2	2	2
25	a.2	a.1	a.1	2	a.1	1	1	1	1	7	2	2
26	a.1	a.1	a.1	2	1	1	2	1	1	1.0	2	2
27	a.1	a.1	a.1	2	1	1	1	1	1	4	2	2
28	a.1	1	a.1	2	1	1	1	1	1	3	2	2
29	a.1	1	a.1	2	-	1	1	1	1	4	2	2
30	a.1	1.1	a.1	2	-	1	1	1	1	3	2	2
31	a.1	-	a.1	2	-	1	-	1	-	2	2	-
Total	4.6	14.3	16.1	4.2	4.4	3.1	3.2	3.4	3.0	8.7	173.6	98.0
Mean	0.15	0.48	0.52	0.14	0.16	0.10	0.11	0.11	0.10	0.28	5.60	3.27
Ac-ft	9.1	28	32	8.3	8.7	6.1	6.3	6.7	6.0	17	344	194

Calendar year 1962: Max 57 Min 0 Mean 1.17 Ac-ft 850

Water year 1962-63: Max 119 Min 0.1 Mean 0.92 Ac-ft 670

Peak discharge (base, 500 cfs)

a No gage-height record.

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-13	1330	3.22	592	9-11	unknown	4.16	1,310
8-16	1150	8.30	4,680				

## TULAROSA VALLEY BASIN

183

8-4815. Rio Tularosa near Bent, N. Mex.

Location.--Lat 33°08'40", long 105°53'50", in SE¼NW¼ sec.32, T.13 S., R.11 E., on right bank 50 ft downstream from bridge on U. S. Highway 70, 2.6 miles west of Bent, and 8.5 miles northeast of Tularosa.

Drainage area.--120 sq mi, approximately.

Records available.--December 1947 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5,450 ft (from topographic map).

Average discharge.--15 years (1948-63), 9.67 cfs (7,000 acre-ft per year).

Extremes.--Maximum discharge during year, about 2,020 cfs Sept. 8 (gage height, 3.9 ft, from floodmark), from rating curve extended above 160 cfs on basis of slope-area measurement at gage height 3.74 ft; minimum daily, 2.1 cfs July 14, 15.  
1947-63: Maximum discharge, 2,360 cfs July 12, 1950 (gage height, 5.3 ft), from rating curve extended above 33 cfs on basis of logarithmic plotting and slope-area measurement at gage height 5.3 ft; minimum daily, 1.4 cfs Aug. 3, 1959.  
A major flood probably occurred Sept. 3, 1938, when a peak of 9,640 cfs was computed for station near Tularosa. Another high peak may have occurred July 2, 1914.

Remarks.--Records poor. Diversion for irrigation of about 1,000 acres (1959 determination) above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

2.24	2.1	2.5	30
2.3	4.4	2.6	60
2.4	13		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	10	10	10	7.3	10	9.1	6.5	4.4	3.3	6.5	13
2	10	9.1	9.1	10	7.3	10	10	7.3	3.1	3.3	6.5	d23
3	10	a 10	9.1	10	7.3	11	10	7.3	5.0	6.5	9.6	13
4	10	a 10	9.1	10	7.3	11	11	7.3	6.5	7.3	6.5	13
5	11	a 10	10	10	*7.3	12	12	6.2	*9.1	11	4.4	d22
6	9.1	a 10	10	10	7.3	13	9.1	*6.0	8.2	7.3	18	d18
7	11	a 10	9.1	10	7.3	12	5.7	6.0	8.2	5.7	8.2	13
8	10	a 10	9.1	*10	7.3	*11	5.0	10	8.2	5.0	*7.3	a60
9	8.2	a 10	9.1	10	7.3	10	5.7	9.1	6.5	4.4	d15	a15
10	8.2	a 10	9.1	10	10	8.2	*9.1	9.1	5.0	3.9	10	a15
11	7.3	a 10	9.1	10	10	7.3	9.1	9.1	4.4	3.5	6.5	*13
12	7.3	*10	9.1	11	a 8	8.2	9.1	9.1	3.9	3.5	11	12
13	7.3	11	9.1	a 8	a 7	8.2	9.1	7.3	4.4	2.8	11	12
14	7.3	11	9.1	a 9	a 10	7.3	9.1	7.3	3.1	2.1	d12	10
15	8.2	14	9.1	*11	a 10	7.3	6.5	7.3	3.9	*2.1	d9.1	11
16	9.1	11	9.1	11	a 10	10	5.7	7.3	3.2	2.8	d6.5	12
17	*9.1	8.2	*9.1	a 11	a 10	8.2	6.5	5.7	3.5	3.9	d5.0	12
18	13	10	9.1	a 11	*10	10	5.0	6.5	3.9	5.0	d4.4	10
19	18	9.1	9.1	a 10	9.1	9.1	5.7	4.6	6.5	5.0	d6.5	9.1
20	9.1	8.2	9.1	a 10	9.1	7.3	6.5	5.5	6.5	4.4	4.0	*9.1
21	9.1	8.2	9.1	a 10	9.1	*7.3	3.8	6.1	5.7	5.0	*13	10
22	9.1	8.2	9.1	*10	9.1	6.5	4.9	*10	5.7	3.5	12	30
23	9.1	8.2	9.1	9.1	9.1	7.3	*5.8	10	6.5	2.8	12	7.3
24	9.1	9.1	10	8.2	9.1	5.7	9.1	10	4.4	2.8	11	9.1
25	10	9.1	10	7.3	9.1	7.3	9.1	10	*3.9	3.1	21	7.3
26	11	10	10	5.7	9.1	7.3	10	9.1	4.4	3.1	12	9.1
27	11	10	9.1	5.7	10	6.5	10	5.9	3.9	3.5	12	9.1
28	10	*10	9.1	6.5	10	5.0	9.1	3.9	3.9	2.8	12	10
29	9.1	10	10	6.5	-	6.5	8.2	4.4	3.9	2.4	17	8.2
30	9.1	10	10	6.5	-----	11	6.5	5.0	3.0	2.8	16	7.3
31	10	-----	10	6.5	-----	11	-----	4.4	-----	5.0	11	-----
Total	299.8	294.4	290.2	284.0	243.5	272.5	235.5	223.3	152.8	129.6	353.0	422.6
Mean	9.67	9.81	9.36	9.16	8.70	8.79	7.85	7.20	5.09	4.18	11.4	14.1
Ac-ft	595	584	576	563	483	540	467	443	303	257	700	838

Calendar year 1962: Max 75 Min 3.1 Mean 9.12 Ac-ft 6,600  
Water year 1962-63: Max 60 Min 2.1 Mean 8.77 Ac-ft 6,350

Peak discharge (base, 125 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-6	1550	3.02	354	9-8	about	3.9	about
8-20	1515	3.38	930		1430		2,020
8-25	0400	2.82	209	9-22	1630	3.14	547
8-29	1445	2.79	174				

\* Discharge measurement made on this day.  
a No gage-height record.  
d Doubtful gage-height record.

9-3464. San Juan River near Carracas, Colo.

**Location.**--Lat 37°00'47", long 107°18'39", in SE 1/4 sec. 17, T.32 N., R.4 W., on right bank at river mile 178.8 just above flow line of Navajo Reservoir and 3 miles northwest of Carracas, Colo., 7.2 miles upstream from Piedra River.

**Drainage area.**--1,230 sq mi, approximately.

**Records available.**--October 1961 to September 1963.

**Gage.**--Water-stage recorder. Altitude of gage is 6,090 ft (from river-profile map).

**Extremes.**--Maximum discharge during year, 2,310 cfs May 9 (gage height 4.68 ft); minimum, about 15 cfs Dec. 26 (result of freezeup).  
 1961-63: Maximum discharge, 3,920 cfs Apr. 20, 1962 (gage height, 5.55 ft); maximum gage height, 6.58 ft Feb. 19, 1962 (ice jam); minimum discharge, about 5 cfs Dec. 10, 1961 (result of freezeup).  
 Maximum flood known occurred Oct. 5, 1911. Major floods occurred Sept. 5 or 6, 1909 and June 29, 1927.

**Remarks.**--Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 11,000 acres above station.

Rating tables, except periods of ice effect (gage height, in feet,  
 and discharge, in cubic feet per second)

(Shifting-control method used Apr. 4, 5, Apr. 16 to May 9, May 25 to June 5, July 13 to Aug. 15)

Oct. 1 to Feb. 2

Feb. 3 to Sept. 30

1.0	19	2.0	255
1.1	37	2.5	440
1.5	127	3.0	700

1.3	45	2.5	360
1.6	94	3.0	670
1.9	156	4.0	1,560
2.2	235		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	178	150	212	b 120	b 150	163	1310	788	1010	127	58	200
2	160	150	208	b 130	b 300	146	1020	780	964	122	58	179
3	148	145	190	b 130	d 650	150	780	884	916	116	89	150
4	134	141	178	b 140	d 670	143	740	1070	828	116	162	137
5	129	136	160	b 150	d 650	129	740	1320	804	120	195	193
6	180	132	138	b 140	d 600	120	780	1490	756	135	146	357
7	160	125	132	b 126	d 500	131	860	1710	698	141	172	252
8	143	116	141	b 130	d 420	146	1210	1980	656	139	124	197
9	134	109	145	b 120	b 350	150	1350	2050	677	168	120	152
10	132	111	127	b 120	b 550	163	1110	1680	600	238	118	133
11	129	109	116	b 110	a 350	150	908	1870	486	263	280	122
12	a 120	102	113	b 100	a 170	139	989	1830	450	290	174	129
13	a 115	97	127	b 50	a 200	131	1160	1740	468	438	189	129
14	a 110	125	138	b 50	a 130	148	1330	1750	504	249	154	141
15	a 110	186	138	b 70	a 150	211	1520	1710	540	192	127	143
16	a 110	316	141	b 80	a 200	211	1210	1860	492	161	152	129
17	476	279	143	b 90	a 150	200	1010	1980	456	148	139	114
18	a 670	261	152	b 100	a 140	235	852	2050	420	133	158	110
19	712	220	182	b 90	a 160	192	733	1960	402	122	148	98
20	545	195	182	b 85	156	a 400	663	1800	414	108	211	169
21	388	190	138	b 80	179	a 900	594	1800	366	98	165	836
22	332	210	92	b 90	182	a 1500	534	1750	315	112	174	509
23	296	218	88	b 95	170	a 1300	534	1800	274	112	184	278
24	a 260	215	136	b 103	179	a 1200	642	1560	256	106	168	229
25	a 240	215	122	b 100	187	a 1150	712	1460	232	100	152	195
26	a 220	205	b 40	b 100	172	a 1100	796	1290	202	92	150	174
27	a 200	202	b 30	b 95	202	1180	948	1210	170	92	298	158
28	a 180	188	b 50	b 90	182	1210	828	1100	158	80	242	143
29	a 166	178	b 80	b 90		1360	726	1060	139	73	174	129
30	160	188	b 100	b 95		1360	772	1070	131	62	200	124
31	158	-----	b 110	b 100	-----	1360	-----	1070	-----	60	182	-----
Total	7195	5414	4049	3179	8099	17078	27361	47472	14784	4513	5063	6009
Mean	232	180	131	103	289	551	912	1531	493	146	163	200
Ac-ft	14,270	10,740	8,030	6,310	16,060	33,870	54,270	94,160	29,320	8,950	10,040	11,920

Calendar year 1962: Max 3,510 Min 30 Mean 673 Ac-ft 487,000  
 Water year 1962-63: Max 2,050 Min 30 Mean 412 Ac-ft 297,900

Peak discharge (base 2,500 cfs)--No peak above base.

- a No gage-height record.
- b Stage-discharge relation affected by ice.
- d Doubtful gage-height record.

## SAN JUAN RIVER BASIN

185

9-3498. Piedra River near Arboles, Colo.

**Location.**--Lat 37°05'17", long 107°23'52", in NE 1/4 sec. 21, T.33 N., R.5 W., on left bank 3 miles downstream from Ignacio Creek, 5.2 miles northeast of Arboles Post Office, 8 miles upstream from mouth.

**Drainage area.**--629 sq mi.

**Records available.**--August 1962 to September 1963. Gage operated 1895-1899, 1910-1927 at a site 7½ miles downstream at altitude 6,000 ft. Low flow records probably not equivalent.

**Gage.**--Water-stage recorder. Datum of gage is 6,147.52 ft above mean sea level (from Colorado State Highway Department bench mark).

**Extremes.**--Maximum discharge during year, 1,640 cfs Mar. 29 (gage height, 4.05 ft); minimum daily, 28 cfs Aug. 1-3.

1962-63: Maximum discharge, that of Mar. 29, 1963; minimum daily, 26 cfs Sept. 4-6, 1962.

Major floods occurred Oct. 5, 1911, and Sept. 5 or 6, 1909.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 2,800 acres above station.

Rating tables, except periods of ice effect (gage-height, in feet, and discharge, in cubic feet per second)

Oct. 1 to Mar. 20

Mar. 21 to Sept. 30

1.4	18	1.4	18	2.8	540
1.6	49	1.6	49	3.3	920
2.0	157	1.9	120	3.7	1,270
2.3	280	2.3	260		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	88	99	99	b55	a70	76	1,010	404	345	46	28	210
2	86	99	99	b55	a90	69	808	422	325	46	28	178
3	79	91	91	b60	a120	74	575	458	320	46	28	147
4	74	88	86	b65	a110	74	568	575	296	44	34	126
5	71	86	74	b65	a120	67	582	696	278	51	57	126
6	110	83	69	b60	b130	65	589	800	248	51	59	212
7	93	79	69	b58	a140	65	610	888	224	46	51	216
8	81	71	69	b55	a150	71	752	992	216	55	49	178
9	74	67	69	b58	a130	69	824	1,020	196	74	49	147
10	69	67	61	b60	b110	71	712	896	196	162	49	126
11	67	65	57	b55	b90	74	596	936	182	154	92	132
12	63	63	55	b45	b80	79	596	896	171	138	74	126
13	61	61	63	b40	b80	65	680	856	168	210	79	115
14	57	69	63	b45	b75	69	768	856	164	147	65	147
15	55	102	63	b47	b90	76	872	736	160	120	59	168
16	57	99	63	b50	b85	74	728	816	144	104	57	141
17	144	99	63	b50	79	74	659	896	138	91	53	129
18	192	96	65	b50	79	79	540	872	132	81	65	123
19	266	79	79	b50	83	76	458	832	123	69	59	129
20	234	81	81	b50	79	123	416	776	126	61	57	200
21	188	81	b60	b50	81	199	394	792	123	59	55	434
22	171	81	b40	b50	81	302	340	720	112	69	61	345
23	160	86	b45	b52	76	526	335	696	98	74	91	274
24	150	91	b50	b55	76	731	366	631	83	59	93	232
25	140	91	b55	a55	81	742	404	596	74	55	88	202
26	136	88	b35	a55	76	870	428	491	61	47	96	182
27	129	91	b30	a53	88	1,010	491	446	51	46	265	164
28	116	86	b35	a50	79	950	440	399	49	39	248	150
29	108	81	b40	a50	-	1,200	399	388	47	34	192	132
30	102	93	b50	a52	-	1,170	410	388	46	31	196	123
31	99	-----	b55	a55	-----	1,090	-----	372	-----	31	157	-----
Total	3,520	2,513	1,933	1,650	2,628	10,280	17,350	21,542	4,896	2,340	2,634	5,314
Mean	114	83.8	62.4	53.2	93.4	332	578	695	163	75.5	85.0	177
Ac-ft	6,980	4,980	3,830	3,270	5,210	20,390	34,410	42,730	9,710	4,640	5,220	10,540

Calendar year 1962: Max - Min - Mean - Ac-ft -  
 Water year 1962-63: Max 1,200 Min 28 Mean 210 Ac-ft 151,900

Peak discharge (base, 1,500 cfs).--Mar. 29 (2300) 1,640 cfs (4.05 ft).

- a No gage-height record.  
 b Stage-discharge relation affected by ice.

SAN JUAN RIVER BASIN  
9-3505. San Juan River at Rosa, N. Mex.

Location.--Lat 37°00'20", long 107°24'10", in SW $\frac{1}{4}$  sec.21, T.32 N., R.5 W., on right bank 75 ft upstream from highway bridge, a quarter of a mile downstream from Piedra River, 0.9 mile upstream from Colorado-New Mexico State Line, and 1 mile north of Rosa.

Drainage area.--1,990 sq mi, approximately.

Records available.--July to November 1895, May 1896 to December 1897, April to December 1898, May to September 1899, September 1910 to September 1963. Monthly discharge only for some periods, published in WSP 1313. Prior to October 1920, published as two stations, Piedra and San Juan Rivers at Arboles, Colo., sum of which is equivalent.

Gage.--Water-stage recorder. Datum of gage is 5,972.38 ft above mean sea level (National Park Service bench mark). Prior to Oct. 1, 1920, at sites on Piedra and San Juan Rivers at Arboles, Colo. (see WSP 1313 for descriptions). Oct. 1, 1920, to Apr. 12, 1922, chain gage at site 75 ft downstream at different datum. Apr. 13, 1922, to Sept. 18, 1930, water-stage recorder at site 550 ft upstream at datum 0.7 ft higher. Sept. 19, 1930, to Aug. 31, 1938, water-stage recorder at sites 330 and 430 ft upstream at datum 1.0 ft higher. Sept. 1, 1938, to Dec. 19, 1949, water-stage recorder at present site at datum 1.0 ft higher.

Average discharge.--54 years (1896-97, 1910-63), 1,204 cfs (871,700 acre-ft per year).

Extremes.--Maximum discharge during year, 3,420 cfs May 9 (gage height, 5.34 ft); minimum daily, 55 cfs Dec. 27. 1920-63: Maximum discharge, about 25,000 cfs June 29, 1927 (gage height, 13.5 ft, from estimated graph, site and datum then in use), from rating curve extended above 8,000 cfs by logarithmic plotting; minimum daily, 39 cfs Oct. 8, 1956. Maximum flood known occurred Oct. 5, 1911. A major flood occurred Sept. 5 or 6, 1909.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are fair. Discharge measurements generally made twice a month. Diversions for irrigation of about 14,000 acres above station.

Rating tables, except for periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Dec. 19, 20, Mar. 15-18, 25-31, Apr. 9-17, May 11-23)

Oct. 1 to Feb. 2				Feb. 3 to Sept. 30			
0.95	55	3.0	780	0.8	55	2.0	290
1.3	104	4.0	1,690	1.0	78	2.5	470
1.8	222	5.0	3,130	1.5	165	3.0	710
2.5	489					5.0	1,500
						5.5	2,750
							3,600

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	314	252	335	b 180	a 220	248	a 2350	1220	1370	a 180	82	446
2	272	249	328	b 190	a 400	230	a 1850	1230	1310	a 170	82	378
3	240	237	285	187	b 800	230	a 1370	1380	1250	a 170	116	299
4	219	231	272	198	800	230	a 1320	1660	1140	a 165	191	255
5	217	225	243	214	782	210	a 1320	2040	1100	a 175	269	332
6	317	219	211	208	746	192	a 1350	2310	1030	a 190	205	585
7	268	214	200	198	645	212	a 1450	2620	949	a 190	228	520
8	225	192	217	b 190	575	225	a 1950	2980	900	a 195	172	414
9	214	176	219	b 180	490	242	2170	3040	900	242	176	302
10	200	182	195	b 180	665	248	1810	2620	818	424	176	263
11	190	176	176	b 170	458	242	1550	2810	705	458	340	260
12	179	168	168	a 150	269	220	1590	2750	655	473	235	258
13	176	158	208	a 95	281	192	1830	2600	670	680	287	248
14	168	190	208	a 100	218	215	2080	2600	685	430	232	296
15	166	493	203	b 120	252	305	2340	2480	700	329	189	326
16	171	419	206	b 130	296	326	1970	2680	a 650	266	210	272
17	696	381	206	b 140	245	299	1710	2900	a 610	238	196	240
18	630	361	219	b 150	230	341	1430	2930	a 560	215	232	225
19	1050	296	268	a 140	248	290	1230	2820	a 530	192	212	230
20	823	255	262	a 135	245	520	1130	2630	a 550	172	290	a 370
21	586	255	203	a 130	272	1120	1010	2630	a 500	159	228	a 1280
22	505	285	144	a 140	278	1820	907	2510	a 430	178	238	a 880
23	455	303	134	a 150	258	1830	900	2520	a 380	196	275	a 570
24	419	310	195	a 160	269	1940	1000	2230	a 340	167	260	a 480
25	389	317	179	a 160	290	1930	1130	2080	a 320	152	232	a 420
26	365	307	b 60	a 160	266	2000	1250	1820	a 270	140	235	a 370
27	346	303	b 55	a 150	305	2280	1400	1710	a 230	138	602	a 340
28	325	282	b 80	a 140	275	2230	1270	1520	a 210	118	555	a 300
29	299	255	b 120	a 140	-	2600	1150	1460	a 190	102	382	a 270
30	272	278	b 160	a 150	-----	2520	1190	1470	a 180	105	412	a 260
31	262	-----	b 170	a 160	-----	2480	-----	1460	-----	85	344	-----
Total	11.158	7.969	6.129	4.895	11.078	27.967	45.007	69.710	20.132	7.094	7.883	11.689
Mean	360	266	198	158	396	902	1500	2250	671	229	254	390
Ac-ft	22.130	15.810	12.160	9.710	21.970	55.470	89.270	138.300	39.930	14.070	15.640	23.180

Calendar year 1962: Max 5,700 Min 55 Mean 1,030 Ac-ft 746,100  
Water year 1962-63: Max 3,040 Min 55 Mean 632 Ac-ft 457,600

Peak discharge (base, 4,000 cfs).--No peak above base.

a No gage-height record.  
b Stage-discharge relation affected by ice.

## SAN JUAN RIVER BASIN

187

9-3545. Los Pinos River at La Boca, Colo.  
(Locally known as Pine River)

Location.--Lat 37°00'40", long 107°35'55", in S $\frac{1}{2}$  sec. 15, T. 32 N., R. 7 W., on downstream end of right abutment of The Denver & Rio Grande Western Railroad Co. bridge at southeast edge of La Boca, 0.1 mile upstream from Spring Creek and 13 miles upstream from mouth.

Drainage area.--510 sq mi, approximately.

Records available.--October 1950 to September 1963. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Datum of gage is 6,143.58 ft above mean sea level, datum of 1929.

Average discharge.--13 years, 190 cfs (137,600 acre-ft per year).

Extremes.--Maximum discharge during year, about 800 cfs Feb. 4 (gage height, 5.36 ft, backwater from ice); minimum, 32 cfs Apr. 23.  
1950-63: Maximum discharge, 6,400 cfs July 27, 1957 (gage height, 8.95 ft); minimum daily, 14 cfs Apr. 23, 24, 26, 1951.  
Maximum flood known occurred Oct. 5, 1911.

Remarks.--Records good except those for periods of ice effect or doubtful or no gage-height record, which are poor. Discharge measurements generally made twice a month. Flow regulated by Vallecito Reservoir (capacity, 126,280 acre-ft). Diversions for irrigation of about 33,000 acres above station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used, Oct. 1-18, Oct. 31 to Nov. 13, June 22 to July 14, July 22, 30, 31, Aug. 3 to Sept. 3, Sept. 14-25)

3.2	38	4.0	240
3.4	64	4.5	480
3.6	112	5.0	830

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	112	107	d 85	a 55	b 100	110	268	92	112	107	92	137
2	115	66	d 90	a 55	b 150	97	233	115	107	100	97	118
3	137	55	a 80	a 60	b 300	97	194	115	123	104	120	104
4	140	52	a 75	a 60	b 350	92	188	104	100	155	180	97
5	158	50	a 70	a 60	b 300	85	191	120	94	132	167	a 95
6	129	49	66	a 60	b 300	87	174	118	102	123	140	a 110
7	120	52	66	a 55	b 250	87	158	97	104	120	177	a 100
8	115	69	69	b 55	b 200	94	164	100	107	158	132	a 95
9	115	69	66	b 55	b 170	104	164	94	134	180	137	a 90
10	100	69	66	b 55	b 200	118	152	100	129	316	155	a 100
11	92	69	64	b 50	b 110	107	134	107	118	202	216	a 90
12	87	64	64	b 45	92	100	123	97	115	198	164	85
13	87	64	66	b 40	94	87	115	92	110	198	155	76
14	90	82	66	b 45	90	92	112	71	112	140	137	112
15	94	123	66	b 45	102	120	110	102	100	118	137	92
16	102	94	71	b 45	97	112	110	102	100	107	137	80
17	235	78	69	b 50	90	104	100	92	115	120	137	78
18	272	82	76	b 55	90	104	90	78	115	120	149	69
19	500	80	107	b 55	90	100	73	97	123	115	126	66
20	288	76	87	b 50	90	140	50	107	120	110	115	78
21	205	76	76	b 55	97	186	46	112	123	159	118	100
22	180	73	76	b 55	107	222	40	126	112	155	118	104
23	174	d 70	71	b 55	107	252	44	110	112	126	129	87
24	167	d 65	76	b 55	123	290	82	118	126	120	123	87
25	167	d 60	82	b 60	146	256	71	110	126	118	118	85
26	164	d 58	a 70	b 60	134	244	64	120	126	107	132	82
27	164	d 56	a 50	b 55	149	248	82	123	112	100	205	76
28	164	d 55	a 50	b 60	126	244	78	123	97	97	140	69
29	161	d 55	a 52	b 75	-	240	78	118	97	97	118	73
30	158	d 55	a 55	b 80	-----	276	73	123	102	82	123	76
31	115	-----	a 55	b 90	-----	276	-----	118	-----	82	129	-----
Total	4,907	2,073	2,182	1,750	4,254	4,771	3,561	3,301	3,373	4,166	4,323	2,711
Mean	158	69.1	70.4	56.5	152	154	119	106	112	134	139	90.4
Ac-ft	9,730	4,110	4,330	3,470	8,440	9,460	7,060	6,550	6,690	8,260	8,570	5,380

Calendar year 1962: Max 1,710 Min 40 Mean 203 Ac-ft 146,700  
Water year 1962-63: Max 500 Min 40 Mean 113 Ac-ft 82,050

- a No gage-height record.  
b Stage-discharge relation affected by ice.  
d Doubtful gage-height record.



## SAN JUAN RIVER BASIN

9-3550. Spring Creek at La Boca, Colo.

Location.--Lat 37°00'50", long 107°35'40", in S $\frac{1}{2}$  sec. 15, T.32 N., R.7 W., on right bank in an excavated channel, a quarter of a mile upstream from mouth and a quarter of a mile east of La Boca.

Drainage area.--58 sq mi, approximately.

Records available.--October 1950 to September 1963. Monthly discharge only for some periods, published in WSP 1733.

Gage.--Water-stage recorder. Altitude of gage is 6,160 ft (from topographic map).

Average discharge.--13 years, 28.1 cfs (20,340 acre-ft per year).

Extremes.--Maximum discharge during year, 258 cfs July 21 (gage height, 3.00 ft); maximum gage height, 3.22 ft Feb. 2 (backwater from ice); minimum discharge, 1 cfs Mar. 12.  
1951-63: Maximum discharge, 362 cfs July 19, 1957 (gage height, 3.97 ft), from rating curve extended above 100 cfs by logarithmic plotting; maximum gage height, 5.98 ft Mar. 9, 1960; minimum daily discharge determined, 1 cfs Feb. 25, 26, 1951, for several days during periods of ice effect in 1960-62.

Remarks.--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Part of flow is return waste from irrigation.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.6	1.3	1.2	22
.7	2.6	1.6	54
.8	4.6	2.0	98
1.0	12	2.5	170

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	41	a10	21	3.4	b30	6.1	8.4	20	41	43	38	a40
2	a40	9.9	10	b3.5	b100	b5	7.0	30	45	43	35	a35
3	a35	9.6	7.3	3.8	b50	4.9	5.8	28	48	47	39	a35
4	30	9.2	6.4	4.2	b60	4.6	4.2	31	44	59	60	a30
5	35	9.2	5.5	4.6	b50	4.6	5.8	31	43	54	68	a30
6	31	8.8	5.5	4.6	b20	4.6	5.2	29	43	47	59	a35
7	29	8.4	5.2	4.4	b10	b4	4.4	28	42	40	66	a30
8	29	7.0	5.8	3.8	b7	3.6	3.8	31	46	51	51	a30
9	29	5.2	b5.5	3.4	a6	3.2	3.6	29	53	68	50	a30
10	28	4.6	b5	4.0	a8	3.4	3.4	31	56	81	52	a35
11	28	4.2	b4.5	a3	a6	3.8	3.0	30	55	60	78	a30
12	28	3.8	b4.5	a2.5	a5	4.0	2.5	31	54	99	53	a30
13	26	4.0	b4	a2	a5	b3.5	2.3	32	47	84	49	32
14	24	8.4	b4	a2.5	a5	b4	2.1	32	53	64	45	44
15	25	26	b4	a3	a6	b4	2.1	36	46	52	45	36
16	26	12	b4.5	b3	a5	b4.5	1.8	35	47	40	44	37
17	87	12	b5	b3	a5	4.9	1.7	34	44	39	43	38
18	106	14	5.2	a3	a5	5.5	1.7	34	43	43	48	34
19	129	9.9	14	a3	a5	b4	1.8	34	49	44	40	32
20	44	8.8	7.6	a3	a6	4.4	24	42	42	43	43	43
21	20	8.4	b6	a3	12	8.8	8.8	44	40	75	42	52
22	16	7.6	b5	a3	19	13	8.8	40	36	87	40	49
23	14	6.4	b4	a3	23	15	9.9	35	36	59	56	46
24	13	5.8	b5	a3	26	17	12	45	35	53	39	46
25	12	5.2	b6	a3	20	12	12	42	35	46	a40	44
26	a12	4.9	b4	a3	13	9.7	19	44	36	46	a50	42
27	a11	4.4	b3	a3	12	10	23	45	38	41	a70	38
28	a11	4.0	b3	a3	7.9	9.2	20	43	37	41	a45	33
29	a11	4.2	b3	b3.5	-	11	23	43	39	42	a40	31
30	a10	5.2	b3	b4	-----	13	20	43	36	38	a40	30
31	a10	-----	b3	b5	-----	12	-----	44	-----	37	a40	-----
Total	990	241.1	179.5	104.2	526.9	217.3	251.1	1096	1309	1666	1508	1097
Mean	31.9	8.04	5.79	3.36	18.8	7.01	8.37	35.4	43.6	53.7	48.6	36.6
Ac-ft	1,960	478	356	207	1,050	431	498	2,170	2,600	3,300	2,990	2,180

Calendar year 1962: Max 129 Min 1 Mean 27.2 Ac-ft 19,700  
Water year 1962-63: Max 129 Min 1.7 Mean 25.2 Ac-ft 18,220

Peak discharge (base, 120 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-19	0800	2.73	206	7-21	1910	3.00	258
2-2	1800	3.22	250	8-4	2330	2.55	178
7-12	2000	2.66	191	8-11	0020	2.39	152

a No gage-height record.

b Stage-discharge relation affected by ice.

## 9-3551. Navajo Reservoir near Archuleta, N. Mex.

Location.--Lat 36°48'35", long 107°36'35", in SW 1/4 sec. 18, T.30 N., R.7 W., in gate shaft of outlet works structure near right abutment of Navajo Dam on San Juan River, 5 1/2 miles east of Archuleta and 33 miles east of Farmington.

Drainage area.--3,230 sq mi, approximately.

Records available.--June 1962 to September 1963.

Gage.--Water-stage recorder. Datum of gage is at mean sea level, datum of 1929.

Extremes.--Maximum contents during water year, 379,300 acre-ft Sept. 30 (elevation, 5,940.2); minimum, 38,400 acre-ft Oct. 1 (elevation, 5,806.4).

1962-63: Maximum contents, that of Sept. 30, 1963; minimum, 12,400 acre-ft June 30, 1962.

Remarks.--Reservoir is formed by earth-rock-fill dam, completed in June 1963; storage began June 27, 1962. Capacity, 1,709,000 acre-ft between elevations 5,720 ft (upstream toe of dam) and 6,085 ft (crest of spillway). Usable capacity, 1,036,000 acre-ft above elevation 5,990.0 ft (minimum operating level). Reservoir will not usually be drawn below elevation 5,882.5 ft (sill of intake structure), leaving a minimum pool or dead storage of 175,200 acre-feet. Figures given herein are total contents and are based on daily elevations at 0800. Reservoir is used for irrigation storage, river regulation, desilting, flood control, and recreation.

Cooperation.--Records furnished by Bureau of Reclamation.

Capacity table (elevation, in feet, and contents, in acre-feet)

5,805	36,900	5,850	101,600	5,900	226,200
5,810	42,300	5,860	121,400	5,910	259,300
5,820	54,500	5,870	143,700	5,920	295,400
5,830	68,400	5,880	168,000	5,930	334,900
5,840	84,000	5,890	196,000	5,941	382,700

Contents, in thousands of acre-feet, during water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38.4	55.8	62.9	69.6	76.5	102.3	155.8	218.8	337.6	362.2	364.6	370.6
2	38.8	56.0	63.3	69.6	77.4	102.5	160.3	220.8	339.6	362.1	364.0	371.0
3	39.0	56.2	63.7	69.7	79.6	102.7	163.4	222.9	341.6	362.1	363.7	371.4
4	39.4	56.4	64.0	70.0	81.6	103.1	165.7	225.2	343.5	362.1	363.5	371.6
5	39.6	56.7	64.5	70.5	83.4	103.3	168.3	228.3	345.0	362.1	363.6	371.7
6	39.9	56.8	64.9	70.6	85.3	103.5	170.7	232.2	346.6	362.1	363.7	372.1
7	40.1	56.8	65.2	71.1	87.4	103.5	173.0	236.4	348.1	362.1	363.7	372.8
8	40.6	57.0	65.3	71.4	88.7	103.5	175.4	241.4	349.4	362.1	363.8	373.3
9	40.7	57.0	65.5	71.7	90.1	104.2	180.5	246.9	350.7	362.4	363.8	373.5
10	40.9	57.0	65.9	72.0	91.5	104.4	184.3	252.4	351.9	362.8	363.9	373.7
11	41.0	57.1	66.2	72.0	93.2	104.4	187.2	257.1	353.1	363.8	364.0	373.7
12	41.1	57.1	66.5	72.1	93.6	104.6	189.5	262.1	353.9	364.5	364.4	373.8
13	41.1	57.1	66.6	72.3	93.7	105.0	190.6	266.7	354.7	365.6	364.6	373.8
14	41.1	57.1	66.8	72.4	94.3	105.2	192.0	271.1	355.6	366.6	364.8	373.8
15	41.1	57.4	66.9	72.6	94.8	105.4	193.8	275.4	356.5	367.1	365.0	374.0
16	41.1	58.5	67.1	72.9	95.3	105.6	196.0	279.6	357.3	367.3	365.0	374.2
17	41.4	59.0	67.5	73.2	95.9	105.8	197.4	284.2	358.0	367.3	365.1	374.2
18	43.5	59.6	67.7	73.4	96.1	105.9	198.1	289.5	358.8	367.4	365.1	374.2
19	46.1	59.8	67.9	73.4	96.1	107.3	198.4	294.4	359.4	367.4	365.3	374.2
20	47.8	60.4	68.2	73.5	96.8	107.9	199.7	299.0	360.0	367.4	365.4	374.3
21	49.5	60.5	68.4	73.5	97.1	109.2	201.3	303.4	360.6	367.4	365.6	375.0
22	51.3	60.7	68.7	73.8	98.6	112.0	202.7	307.7	360.8	367.7	365.7	375.8
23	51.9	60.9	68.8	74.0	98.8	115.8	203.9	312.0	361.1	367.8	365.7	376.7
24	52.5	61.1	69.0	74.4	99.3	119.7	205.1	316.0	361.3	367.8	365.8	377.3
25	53.2	61.4	69.1	74.7	100.1	123.7	206.7	319.8	361.7	367.7	366.0	377.7
26	53.8	61.8	69.3	75.2	100.6	127.6	208.7	322.8	362.0	367.2	366.1	378.1
27	53.9	62.1	69.4	75.2	101.2	132.0	210.9	325.7	362.1	366.7	367.8	378.4
28	54.2	62.3	69.4	75.7	101.6	136.3	213.3	328.5	362.2	366.3	368.8	378.7
29	54.5	62.5	69.4	75.8	-----	140.4	215.3	330.8	362.2	365.9	369.5	379.0
30	55.1	62.6	69.4	76.1	-----	145.4	217.0	332.5	362.2	365.5	369.8	379.3
31	55.5	-----	69.6	76.3	-----	150.6	-----	335.3	-----	365.0	370.2	-----
(+)	5,820.8	5,826.0	5,830.8	5,835.2	5,850.1	5,872.9	5,897.1	5,930.1	5,936.4	5,937.1	5,938.2	5,940.2
(#)	+17.6	+7.1	+7.0	+6.7	+25.3	+49.0	+66.4	+118.3	+26.9	+2.8	+5.2	+9.1

† Elevations, in feet, at 0800 on last day of month.

‡ Change in contents, in thousands of acre-feet.

9-3555. San Juan River near Archuleta, N. Mex.

**Location.**--Lat 36°48'30", long 107°42'00", 1n SW 1/4 sec. 17, T.30 N., R.8 W., on right bank half a mile upstream from Gobernador Canyon, 1 mile north of Archuleta, and 6.8 miles downstream from Navajo Dam. Prior to Dec. 29, 1959, at site 4.6 miles upstream.

**Drainage area.**--3,260 sq mi, approximately.

**Records available.**--December 1954 to September 1963.

**Gage.**--Water-stage recorder. Altitude of gage is 5,655 ft (from river-profile survey). Prior to Dec. 29, 1959, at site 4.6 miles upstream at datum 50 ft higher.

**Average discharge.**--8 years, 1,176 cfs (851,400 acre-ft per year).

**Extremes.**--Maximum discharge during year, 1,340 cfs Apr. 13 (gage height, 5.00 ft); minimum, about 8 cfs, Feb. 28. 1954-63: Maximum discharge, 18,900 cfs July 27, 1957 (gage height, 11.00 ft, site and datum then in use); minimum, that of Feb. 28, 1963.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made 2 to 4 times a month. Some regulation by Vallecito Reservoir (capacity, 126,280 acre-feet) on Los Pinos River and subsequent to June 1962 flow at this station can be completely regulated by Navajo Reservoir (capacity, 1,709,000 acre-feet) on San Juan River. Diversions above station for irrigation of about 47,000 acres. Archuleta ditch bypasses gage on left bank for irrigation below, but part or all of flow may be wasted back to River. Discharges, in cfs, for water year are as follows: May 15, 4.82 cfs; July 18, 2.83 cfs; Aug. 15, 1.74 cfs.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

2.2	16	3.5	420
2.5	55	4.0	750
2.8	122	5.0	1,730
3.1	226		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	283	265	248	156	112	230	a260	283	310	320	392	a330
2	283	239	248	152	119	239	a265	287	310	315	409	a330
3	283	235	206	146	119	239	a265	287	310	306	432	a330
4	283	235	156	108	119	239	a270	292	310	306	420	330
5	287	235	152	112	122	239	278	297	310	306	409	330
6	283	235	152	112	122	239	269	301	310	306	382	330
7	283	235	152	112	125	239	269	301	310	306	365	330
8	283	235	152	112	125	239	274	301	310	306	355	330
9	283	235	152	112	125	239	274	301	310	306	355	330
10	283	235	152	109	128	239	287	306	310	310	365	330
11	283	235	152	109	143	235	324	306	310	306	360	330
12	283	235	152	b105	170	235	690	310	310	310	355	335
13	283	235	152	b105	170	235	1,220	310	310	310	335	335
14	283	239	152	b110	170	235	1,260	310	310	306	330	340
15	287	243	152	b110	173	222	1,260	310	310	306	330	335
16	297	243	152	b110	173	226	1,270	306	310	306	330	335
17	335	243	152	b110	173	226	1,270	301	310	306	320	340
18	325	243	156	b110	173	235	1,260	301	310	306	325	340
19	355	239	156	b110	173	235	1,050	306	310	306	330	340
20	330	239	156	b112	170	235	297	306	330	310	330	350
21	330	239	156	b112	173	235	287	310	408	310	330	340
22	330	239	156	b112	173	235	287	320	355	310	330	345
23	330	239	156	b112	176	235	287	310	310	315	330	345
24	340	239	156	112	180	239	278	310	310	350	330	345
25	325	243	156	112	180	243	263	310	315	409	340	345
26	283	243	156	112	180	243	287	310	308	456	382	345
27	283	243	156	112	166	248	283	310	310	382	a340	345
28	283	243	156	112	33	252	283	310	310	365	a330	345
29	283	243	156	112	-	a250	283	310	320	376	a330	345
30	283	243	156	112	-----	a250	283	310	325	376	a330	345
31	278	-----	156	112	-----	a260	-----	310	-----	376	a330	-----
Total	9,243	7,192	5,018	3,554	4,165	7,390	15,503	9,442	9,491	10,184	10,931	10,125
Mean	298	240	162	115	149	238	517	305	316	329	353	338
Ac-ft	18,330	14,270	9,950	7,050	8,260	14,660	30,750	18,730	18,830	20,200	21,680	20,080

Calendar year 1962: Max 7,520 Min 152 Mean 1,204 Ac-ft 872,000  
 Water year 1962-63: Max 1,290 Min 33 Mean 280 Ac-ft 202,800

a No gage-height record.

b Stage-discharge relation affected by ice.

9-3570. San Juan River at Bloomfield, N. Mex.

**Location.**--Lat 36°42'00", long 107°59'10", in NW¼ sec. 27, T.29 N., R.11 W., on downstream end of bridge pier on State Highway 44 three-quarters of a mile south of Bloomfield, 3 miles upstream from Kutz Canyon, and 10 miles downstream from Canyon Largo.

**Drainage area.**--5,410 sq mi, approximately.

**Records available.**--January 1910 to September 1911, August 1927 to December 1931, November 1955 to September 1963. Monthly discharge only for some periods, published in WSP 1313.

**Gage.**--Water-stage recorder. Altitude of gage is 5,405 ft (from river-profile map). Prior to Apr. 3, 1910, staff gage and Apr. 3, 1910, to Oct. 3, 1911, water-stage recorder, at same site at different datum. July 27, 1927, to Dec. 19, 1931, water-stage recorder at same site at different datum.

**Average discharge.**--12 years (1910-11, 1927-31, 1956-63), 1,440 cfs (1,043,000 acre-ft per year).

**Extremes.**--Maximum discharge during year, 4,880 cfs Aug. 27 (gage height, 6.50 ft); minimum, 20 cfs Mar. 1.

1910-11, 1927-31, 1955-63: Maximum discharge determined, 20,500 cfs July 27, 1957; maximum gage height, 11.50 ft Aug. 11, 1929, site and datum then in use (discharge not determined); minimum daily discharge determined, 50 cfs Sept. 15, 1956.

Maximum flood known reached a stage of 12 ft Oct. 6, 1911, datum then in use (discharge, 80,000 cfs, estimated). Another major flood occurred Sept. 6, 1909.

**Remarks.**--Records fair except those for periods of ice effect or no gage-height record, which are poor. Since June 1962 flow can be substantially controlled by operation of Navajo Reservoir. Discharge measurements generally made 3 to 5 times a month. Diversions above station for irrigation of about 52,000 acres, 2,000 of which is below station. Citizens ditch bypasses gage on right bank and Hammond Main Canal bypasses gage on left bank; bypass flow not included in record. Land formerly irrigated by Kutz Canyon diversion is now irrigated by Hammond Main Canal.

Discharge measurements, in cubic feet per second, water year October 1962 to September 1963

Citizens ditch											
Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Sept. 18	0	Dec. 28	0	Mar. 29	0	May 3	36	June 7	41	July 18	*49.6
Nov. 26	34	Feb. 13	30	Apr. 5	0	9	42	19	46	24	49
14	34	26	0	10	0	15	*41.8	25	*43.1	Aug. 7	51
Dec. 5	*30.4	Mar. 13	0	16	*27.6	21	41	July 2	43	14	51
19	38	20	0	23	42	28	50	11	47	29	51
Hammond Canal											
Feb. 13	0	Mar. 29	0	Apr. 23	0	May 21	17	June 25	*18.4	July 23	17
26	0	Apr. 5	*6.08	May 3	19	28	19	July 2	30	Aug. 7	22
Mar. 13	0	10	*14.6	9	25	June 7	22	11	17	14	19
20	0	16	3	15	*8.49	19	15	18	*17.2	29	18

\* Result of discharge measurement.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	230	230	240	a 145	117	92	240	190	162	162	240	335
2	240	220	230	a 145	135	230	240	190	180	153	302	270
3	240	220	230	a 140	153	230	240	180	171	162	450	260
4	240	220	162	a 120	135	240	240	180	171	162	549	250
5	240	220	135	a 100	126	250	250	180	162	190	700	313
6	240	220	135	a 110	126	240	250	153	162	153	280	302
7	240	220	135	a 120	92	240	250	144	162	144	438	270
8	230	220	135	a 120	108	240	240	153	171	171	313	230
9	230	220	135	126	108	250	250	153	230	171	313	230
10	230	220	135	108	117	230	250	180	210	260	450	230
11	230	220	135	117	126	240	250	335	180	171	368	230
12	230	220	135	a 70	a 150	260	288	200	200	180	390	230
13	230	220	135	b 60	162	260	1,240	200	220	180	220	230
14	230	220	135	b 70	162	240	1,210	200	200	180	190	350
15	240	230	135	b 60	162	230	1,190	190	190	180	315	230
16	230	230	135	b 70	162	220	1,190	180	210	171	230	230
17	495	230	135	b 80	162	230	1,190	162	210	171	a 200	230
18	717	230	144	b 90	171	220	1,190	144	180	171	a 200	230
19	1,320	230	144	b 100	162	230	1,210	144	190	162	200	240
20	462	230	144	b 120	162	240	363	153	180	153	250	420
21	324	230	144	b 110	190	240	200	153	210	180	270	601
22	280	230	a 145	a 100	190	240	200	153	377	190	260	438
23	280	230	a 145	b 100	190	240	190	220	260	180	240	335
24	280	220	a 145	b 110	190	230	200	171	162	180	180	302
25	280	240	a 145	b 130	190	240	190	171	162	280	180	302
26	280	230	a 145	b 120	190	240	190	162	153	426	240	291
27	240	230	a 145	b 110	180	240	190	171	135	390	980	302
28	240	230	a 145	b 110	117	250	190	162	153	260	357	291
29	240	230	a 145	b 120	-	250	190	153	153	260	250	a 270
30	240	230	a 145	b 130	-	240	200	162	153	230	820	260
31	230	-	a 145	162	-	240	-	171	-	230	595	-
Total	9,658	6,770	4,643	3,373	4,242	7,262	13,711	5,460	5,659	6,253	10,970	8,702
Mean	312	226	150	109	152	234	457	176	189	202	354	290
Ac-ft	19,160	13,430	9,210	6,690	8,410	14,400	27,200	10,830	11,220	12,400	21,760	17,260

Calendar year 1962 : Max 7,070 Min 99 Mean 1,186 Ac-ft 858,800  
 Water year 1962-63 : Max 1,320 Min 60 Mean 238 Ac-ft 172,000

Peak discharge (base, 6,000 cfs).--Flow regulated since June 1962.

- a No gage-height record.
- b Stage-discharge relation affected by ice.

9-3635. Animas River near Cedar Hill, N. Mex.

Location.--Lat 37°02'15", long 107°52'25", in sec. 7, T. 32 N., R. 9 W., on right bank three-quarters of a mile downstream from Florida River, 2.5 miles upstream from Colorado-New Mexico State line, and 8.5 miles north of Cedar Hill.

Drainage area.--1,090 sq mi, approximately.

Records available.--October 1933 to September 1963. Monthly discharge only for October and November 1933, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 5,960 ft (from topographic map). Prior to Sept. 14, 1937, at datum between 1.52 and 1.36 ft higher. Sept. 15, 1937, to Sept. 30, 1946, at datum 1.36 ft higher.

Average discharge.--30 years, 902 cfs (653,000 acre-ft per year).

Extremes.--Maximum discharge during year, 4,140 cfs May 9 (gage height, 7.00 ft); minimum daily, 120 cfs Jan. 14.  
1933-63: Maximum discharge, 13,100 cfs June 19, 1949 (gage height, 11.45 ft); minimum daily, 90 cfs Jan. 21, 1935.  
Maximum flood known occurred Oct. 5 or 6, 1911.

Remarks.--Records fair except those for periods of ice effect or no gage-height record, which are poor. Discharge measurements generally made twice a month. Diversions for irrigation of about 20,000 acres above station. During water years 1944-49, Twin Rocks Canal diverted above station for irrigation below.

Rating tables, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 17, 18, Feb. 8 to Apr. 27, July 26 to Sept. 30)

Oct. 1 to Mar. 31

Apr. 1 to Sept. 30

3.4	106	4.2	415	3.3	210	4.8	1,160
3.6	150	4.6	720	3.5	285	5.5	1,900
3.8	213	5.0	1,100	3.9	490	6.6	3,460
				4.3	750		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	409	355	340	b240	b300	242	1.110	598	a1.800	544	238	998
2	379	345	310	b230	b320	234	1.030	631	a1.700	532	253	940
3	361	340	290	b240	b350	221	836	729	a1.400	484	277	778
4	350	361	290	b250	b330	242	736	1.110	1.150	484	365	666
5	340	355	290	b240	b350	230	694	1.630	1.140	526	415	659
6	361	350	280	b220	b400	221	673	2.160	1.150	478	400	750
7	340	340	280	b210	b380	226	778	2.770	1.120	442	448	924
8	320	320	285	b210	373	234	956	3.220	1.180	520	520	820
9	305	315	280	b220	350	247	989	3.440	1.160	598	478	680
10	305	320	265	b220	409	247	908	2.490	1.020	792	479	624
11	285	315	260	b200	345	251	813	2.280	884	743	580	645
12	270	305	251	a160	310	251	860	2.230	860	729	574	574
13	265	295	255	a130	300	238	1.020	2.270	1.080	736	550	532
14	260	320	260	a120	265	242	1.260	2.410	1.240	708	502	550
15	260	361	251	b130	265	255	1.520	1.860	1.430	610	448	574
16	285	345	247	a150	275	260	1.350	2.080	1.290	550	415	520
17	441	345	251	b170	265	242	1.140	2.700	1.070	496	415	490
18	543	345	260	b200	251	251	940	2.960	980	442	420	460
19	630	330	280	b230	260	242	836	2.780	972	436	425	460
20	508	305	265	a250	265	265	729	2.740	932	405	400	454
21	460	320	247	a230	285	330	659	2.610	956	380	425	568
22	434	325	230	a220	280	391	598	2.230	948	410	472	592
23	415	320	226	a220	265	460	532	2.150	908	420	520	514
24	403	320	226	a220	270	536	580	1.960	852	390	574	478
25	403	315	b220	b220	275	598	750	1.790	778	355	550	454
26	397	320	b200	b230	265	648	836	a1.650	736	308	568	436
27	397	310	b180	b220	265	819	806	a1.900	708	303	1.050	415
28	385	300	b190	b210	255	950	743	a1.900	659	294	1.160	400
29	373	295	b200	b220	-	990	652	a2.050	631	261	860	365
30	367	300	b210	b220	-----	1.020	598	a1.900	586	253	799	335
31	367	-----	b220	b230	-----	1.030	-----	a2.000	-----	253	884	-----
Total	11,618	9,792	7,839	6,460	8,523	12,613	25,932	65,228	31,320	14,889	16,464	17,655
Mean	375	326	253	208	304	407	864	2,104	1,044	480	531	588
Ac-ft	23,040	19,420	15,550	12,810	16,910	25,020	51,440	129,400	62,120	29,530	32,660	35,020

Calendar year 1962: Max 4,440 Min 150 Mean 901 Ac-ft 652,600

Water year 1962-63: Max 3,440 Min 120 Mean 626 Ac-ft 452,900

Peak discharge (base, 4,000 cfs).--May 9 (1000) 4,140 cfs (7.00 ft).

a No gage-height record.

b Stage-discharge relation affected by ice.

9-3645. Animas River at Farmington, N. Mex.

Location.--Lat 36°43'20", long 108°12'00", in SE $\frac{1}{4}$  sec. 16, T.29 N., R.13 W., on left bank at bridge on former State Highway 17, 0.6 mile southeast of Farmington and 1.3 miles upstream from mouth.

Drainage area.--1,360 sq mi, approximately.

Records available.--June 1904 to October 1905 (published as "near Farmington"). September 1912 to September 1963. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Altitude of gage is 5,278 ft (from bridge-profile plans). Prior to Nov. 1, 1905, chain gage at old bridge a quarter of a mile upstream at different datum. Sept. 17, 1912, to Oct. 4, 1938, water-stage recorder at site 0.6 mile downstream at lower datums (datum lowered 2.0 ft Aug. 15, 1927, and raised 0.2 ft Dec. 16, 1929).

Average discharge.--52 years, 951 cfs (688,500 acre-ft per year).

Extremes.--Maximum discharge during year, 3,520 cfs May 9 (gage heights, 5.10 ft); minimum, 26 cfs Aug. 1.

1904-5, 1912-63: Maximum discharge, about 25,000 cfs June 29, 1927 (gage height, 8.5 ft, site and datum then in use), from rating curve extended above 10,000 cfs by logarithmic plotting; minimum daily, 2.4 cfs Sept. 5, 1956.

Maximum flood known occurred Oct. 6, 1911, when a stage of about 16.5 ft was reached (present site and datum). Flood of Sept. 6, 1909, reached a stage of 11.1 ft, 1904-5 site and datum (discharge, about 19,000 cfs).

Remarks.--Records good except those for periods of ice effect and those for September, which are fair. Discharge measurements generally made 2 to 4 times a month. Diversions for irrigation of about 30,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	426	354	354	b 270	316	274	1.100	322	1.500	269	31	750
2	389	354	340	b 260	334	269	1.160	328	1.430	222	33	837
3	368	347	322	b 250	375	263	969	334	1.280	178	35	690
4	347	361	310	b 260	347	269	760	490	980	155	109	530
5	334	361	310	253	354	269	740	1.000	881	171	186	490
6	334	361	303	248	410	258	660	1.590	914	171	248	522
7	354	354	297	227	396	253	651	2.120	892	171	227	615
8	328	347	297	218	382	263	804	2.580	914	196	279	633
9	303	322	297	214	375	263	914	2.920	969	291	316	530
10	253	322	297	204	403	279	870	2.460	870	474	340	466
11	248	328	285	b 190	382	285	782	1.960	690	606	330	442
12	227	316	279	b 110	310	291	710	1.900	624	506	310	434
13	222	310	274	b 100	285	285	815	1.840	720	538	300	368
14	218	322	279	b 110	258	269	1.040	2.020	980	554	297	389
15	214	382	279	b 130	258	269	1.260	1.750	1.160	434	227	418
16	218	382	269	b 160	285	279	1.280	1.590	1.100	340	182	389
17	402	382	274	b 190	263	279	992	2.110	947	299	171	368
18	624	389	279	b 220	258	274	793	2.580	771	209	186	354
19	791	396	297	b 250	258	274	670	2.580	750	174	167	310
20	624	354	297	b 270	269	274	588	2.480	700	152	163	375
21	546	334	285	b 250	279	303	490	2.310	700	152	159	482
22	490	334	263	b 240	303	347	418	2.070	710	148	182	522
23	442	340	258	b 230	285	396	328	1.880	690	174	258	450
24	426	328	253	b 230	269	498	303	1.750	651	159	340	418
25	403	328	237	b 230	274	562	410	1.530	554	141	361	389
26	382	328	b 200	b 250	274	642	570	1.430	490	112	354	375
27	382	328	b 170	b 240	274	760	562	1.420	434	86	588	347
28	375	316	b 180	b 230	279	903	522	1.580	418	82	1,020	316
29	375	316	b 210	b 230	-	1,020	434	1.540	410	76	720	274
30	354	316	b 230	b 240	-	1,030	354	1.580	389	50	588	232
31	340	-	b 250	b 250	-	1,050	-	1.580	-	42	660	-
Total	11,739	10,312	8,475	6,754	8,755	12,950	21,949	53,694	24,518	7,312	9,367	13,715
Mean	379	344	273	218	313	418	732	1,732	817	236	302	457
Ac-ft	23,280	20,450	16,810	13,400	17,370	25,690	43,540	106,500	48,630	14,500	18,580	27,200

Calendar year 1962: Max 3,960 Min 50 Mean 773 Ac-ft 559,300  
 Water year 1962-63: Max 2,990 Min 31 Mean 519 Ac-ft 376,000

Peak discharge (base, 4,000 cfs).--No peak above base.

b Stage-discharge relation affected by ice.

## SAN JUAN RIVER BASIN

9-3650. San Juan River at Farmington, N. Mex.

**Location.**--Lat 36°43'25", long 108°13'30", in SE $\frac{1}{4}$  sec. 17, T. 29 N., R. 13 W., on left bank 360 ft downstream from highway bridge, 4,000 ft downstream from Animas River and 1 mile west of Farmington.

**Drainage area.**--7,240 sq mi, approximately.

**Records available.**--June to December 1904, January 1905 to September 1906 (gage heights and discharge measurements only; discharge records for January to December 1905, published in WSP 175, have been found to be unreliable and should not be used), September 1912 to September 1963. Monthly discharge only for some periods, published in WSP 1313.

**Gage.**--Water-stage recorder. Datum of gage is 5,230.37 ft above mean sea level, datum of 1929. June 19, 1904, to May 10, 1906, wire-weight gage at site  $\frac{1}{2}$  miles downstream at different datum. May 11 to Sept. 22, 1906, chain gage and Sept. 19, 1912, to July 2, 1918, staff gage, at site half a mile upstream at different datums. Nov. 1, 1921, to Nov. 18, 1933, water-stage recorder at site 360 ft upstream at datum 1.04 ft higher prior to October 1932, and 0.53 ft higher thereafter.

**Average discharge.**--51 years (1912-63), 2,527 cfs (1,829,000 acre-ft per year).

**Extremes.**--Maximum discharge during year, 5,000 cfs Oct. 19 (gage height, 4.60 ft); minimum 122 cfs Jan. 12.

1912-63: Maximum discharge, about 68,000 cfs June 29, 1927 (gage height, 10.2 ft, site and datum then in use), from rating curve extended above 37,000 cfs; minimum daily, 27 cfs Aug. 22, 1939.

Maximum flood known occurred Oct. 6, 1911. Flood of Sept. 6, 1909, reached a stage of about 12.3 ft, site and datum then in use.

**Remarks.**--Records good except those for periods of ice effect or no gage-height record, which are fair. Since June 1962 flow is partly controlled by operation of Navajo Reservoir. Discharge measurements generally made 2 to 3 times a month. Diversions above station for irrigation of about 86,000 acres, 4,000 of which is irrigated by Farmers Mutual ditch (see table below) which diverts from Animas River and bypasses this station; ditch flow not included in record. At times this ditch may be supplied partly or entirely by diversion from San Juan River below this station.

Rating table, except periods of ice effect (gage height, in feet, and discharge, in cubic feet per second)

0.8	135	1.5	430	2.5	1,250	4.0	3,500
1.0	200	2.0	790	3.0	1,840		

Discharge in cubic feet per second, of Farmers Mutual ditch, water year October 1962 to September 1963.

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Oct. 1	69	Dec. 10	* 66.3	Apr. 1	134	June 3	135	July 23	136
15	58	28	0	15	154	10	* 92.8	24	* 125
Nov. 19	64	Feb. 18	12	May 1	127	24	130	26	* 116
30	64	Mar. 1	133	10	127	July 1	130	Aug. 1	56
		28	* 136	20	134	17	* 122	12	153
								Sept. 3	141

\* Result of discharge measurement.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	638	630	581	b 440	b 490	282	1,220	442	1,610	369	282	1,070
2	609	602	560	424	b 500	374	1,290	396	1,520	295	286	1,120
3	595	567	532	436	b 530	448	1,090	402	1,400	265	395	942
4	574	574	484	385	b 500	518	897	525	1,100	257	525	766
5	560	581	413	308	b 500	532	906	1,080	1,000	282	958	766
6	553	574	408	348	b 540	518	814	1,700	1,040	261	742	758
7	574	567	402	353	539	511	766	2,200	1,000	257	560	862
8	539	560	402	338	518	518	897	2,690	1,030	286	478	854
9	504	546	402	327	511	511	1,090	3,140	1,110	391	478	710
10	460	546	402	313	546	525	1,130	2,700	1,030	591	609	616
11	472	546	442	338	539	525	915	2,190	846	718	581	581
12	460	532	424	b 210	436	560	798	2,160	734	553	630	595
13	448	511	380	b 150	b 440	560	1,590	2,100	830	595	525	539
14	442	511	385	b 170	b 430	511	2,040	2,230	1,090	595	442	662
15	442	672	385	b 200	448	511	2,290	1,940	1,270	497	430	630
16	419	630	385	b 230	490	518	2,350	1,840	1,220	413	348	616
17	1,030	654	385	b 270	460	518	2,100	2,370	1,080	364	313	602
18	1,810	623	396	b 300	454	511	1,960	2,780	862	318	338	567
19	2,930	609	436	b 350	442	504	1,760	2,720	846	273	322	525
20	1,210	567	424	b 400	442	a 520	1,050	2,640	790	257	343	850
21	960	532	408	b 360	460	a 550	623	2,530	814	257	374	1,010
22	846	546	380	b 340	454	a 600	581	2,230	897	261	413	987
23	782	546	369	b 330	413	a 650	472	2,100	806	261	442	822
24	766	539	374	b 330	380	a 750	430	1,920	726	269	466	766
25	734	532	358	b 370	380	a 800	504	1,680	630	304	472	734
26	686	539	b 340	b 360	374	830	726	1,550	567	374	497	654
27	654	546	b 300	b 350	374	924	702	1,560	511	391	1,280	602
28	662	532	b 320	b 350	385	1,080	670	1,680	478	304	1,240	546
29	662	532	b 340	b 360	-	1,180	588	1,710	484	295	996	497
30	654	525	b 370	b 370	1,170	460	1,680	1,680	454	286	1,130	448
31	630	-----	b 400	b 400	1,120	-----	1,700	1,700	-----	277	1,280	-----
Total	23,305	16,971	12,587	10,210	12,975	19,629	32,709	58,585	27,775	11,116	18,175	21,697
Mean	752	566	406	329	463	633	1,090	1,890	926	359	586	723
Ac-ft	4,6220	33,660	24,970	20,250	25,740	38,930	64,880	116,200	55,090	22,050	36,050	43,040

Calendar year 1962: Max 10,250 Min 220 Mean 1,937 Ac-ft 1,402,000  
 Water year 1962-63: Max 2,930 Min 150 Mean 728 Ac-ft 527,100

Peak discharge (base, 8,000 cfs).--No peak above base.

a No gage-height record.

b Stage-discharge relation affected by ice.

9-3675. La Plata River near Farmington, N. Mex.

Location.--Lat 36°44'30", long 108°14'45", in SW $\frac{1}{4}$  sec. 7, T.29 N., R.13 W., on right bank at downstream end of old bridge abutment, 40 ft upstream from former highway bridge, 1,300 ft upstream from bridge on U. S. Highway 550, 1,800 ft upstream from mouth, and 2 $\frac{1}{2}$  miles northwest of Farmington.

Drainage area.--583 sq mi.

Records available.--March 1938 to September 1963.

Gage.--Water-stage recorder. Altitude of gage is 5,215 ft (from river-profile map).

Average discharge.--25 years, 25.8 cfs (18,680 acre-ft per year).

Extremes.--Maximum discharge during year, about 1,000 cfs Aug. 26 (gage height 4.75 ft); no flow for many days.  
1938-63: Maximum gage height, 6.03 ft Sept. 10, 1939 (discharge not determined); no flow for long periods.  
Major floods occurred Sept. 5 or 6, 1909, and Oct. 5 or 6, 1911.

Remarks.--Records poor. Discharge measurements or field estimates generally made 2 to 3 times a month. Diversions for irrigation of about 24,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a 3	0.8	0.6	b 4	b 15	7.5	a 8	1.2	0.8	0.2	0.1	a 1
2	2.3	.6	.5	b 5	b 25	5.9	a 10	a 1	.8	.2	.1	a 1
3	1.6	.5	.5	b 6	a 20	5.6	a 7	1.2	.7	.2	20	a .8
4	1.5	.6	.5	b 7	a 15	5.0	a 5	1.2	.6	.1	54	a .7
5	1.4	.6	.5	b 5	a 15	2.1	a 4	1.3	.6	.1	1.7	a .7
6	1.3	.6	.5	b 5	a 15	1.6	a 3	1.3	.6	.1	.6	a .6
7	1.1	.6	.8	b 5	a 20	1.4	a 2	1.3	.6	.0	a .5	a .6
8	.9	.4	1.2	b 5	a 25	1.5	a 2	1.0	.6	.2	a .4	a .5
9	.8	.5	1.1	b 6	a 35	1.3	1.3	1.5	.6	23	15	a .5
10	.6	.4	1.1	b 6	a 30	1.6	1.3	1.7	.5	67	9	a .5
11	.6	.4	1.1	a 4	23	2.1	1.3	1.3	.4	a 2.5	a 2	a .5
12	.5	.4	1.7	a 3	22	4.3	1.2	1.2	.4	.8	a 1	a .5
13	.5	.7	1.7	a 3	22	6.5	1.5	1.4	.4	.3	a 5	a .5
14	.5	.9	1.7	b 3	22	6.5	1.6	1.3	.4	.2	a 2	a .5
15	.5	2.5	1.6	b 3	b 25	5.9	1.3	1.0	.4	.1	a 1	a .5
16	1.0	1.5	1.6	b 4	b 30	5.9	.9	.8	.4	.1	a 1	.5
17	66	a 1	1.7	b 4	a 20	5.9	1.1	1.0	.4	.1	a .5	a .4
18	154	a 1	1.6	b 6	a 15	5.9	1.1	1.1	.2	.1	a .5	a .4
19	220	.9	1.5	b 6	a 15	5.6	1.2	1.1	.1	.1	a .4	a .3
20	a 80	.7	1.2	a 5	a 15	5.3	1.1	1.3	0	.1	.4	7.5
21	a 40	.4	1.2	b 5	a 20	7.0	.8	1.1	0	.1	.3	a 4.5
22	a 20	.2	1.0	b 5	a 20	13	.8	1.0	0	0	1.0	a 10
23	a 10	a .1	a 1	b 5	a 15	19	1.1	.9	0	0	.2	a .5
24	a 5	a .1	a 1	b 5	a 13	32	1.3	1.0	0	2.1	.2	a .2
25	a 4	a .1	a 1	b 6	12	24	1.6	1.0	0	.3	.2	a 1
26	a 3	a .5	a 1	b 6	a 12	17	2.1	1.1	0	.1	95	a .5
27	a 2	a .5	b 1	b 7	a 12	33	1.4	1.0	0	.1	125	a .3
28	a 2	a .5	b 1	b 7	9.0	30	1.4	.8	0	.1	a 20	a .2
29	a 1	1.4	b 2	b 9	-	20	1.3	.9	0	.1	a 5	a .2
30	a 1	.6	b 3	b 10	-----	15	1.2	.9	0	0	a 2	a .2
31	a 1	-----	b 3	b 12	-----	10	-----	.9	-----	.1	a 2	-----
Total	627.1	20.0	38.9	17.2	537.0	307.4	68.9	34.8	9.5	98.5	366.1	150.4
Mean	20.2	0.67	1.3	5.5	19.2	9.9	2.3	1.1	0.32	3.2	11.8	5.0
Ac-ft	1,240	40	77	341	1,070	610	137	69	19	195	726	298

Calendar year 1962: Max 220 Min 0 Mean 9.79 Ac-ft 7,090

Water year 1962-63: Max 220 Min 0 Mean 6.66 Ac-ft 4,820

a No gage-height record.

b Stage-discharge relation affected by ice.



9-3680. San Juan River at Shiprock, N. Mex.

Location.--Lat 36°47'35", long 108°43'55", in SW $\frac{1}{4}$  sec.22, T.30 N., R.18 W., on left bank 3 miles west of Shiprock and 6 miles downstream from Chaco River.

Drainage area.--12,900 sq mi, approximately.

Records available.--January to October 1911, February 1927 to September 1963. Monthly or yearly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,846.68 ft above mean sea level (river-profile survey). Prior to Apr. 6, 1922, chain gage and Apr. 7, 1922, to Oct. 25, 1933, water-stage recorder, at site 3 miles upstream at different datum. Oct. 26, 1933, to Sept. 30, 1936, water-stage recorder at present site at datum 3.31 ft higher and Oct. 1, 1936, to Sept. 30, 1952, at datum 1.77 ft higher. Supplementary water-stage recorders all at gage datum, 400 ft downstream since Oct. 26, 1938 (at datum 1.00 ft higher prior to July 24, 1939); 400 ft upstream since Dec. 19, 1942 (at datum 1.77 ft higher prior to Dec. 30, 1953). Records compiled from any 1 or all 3 gages.

Average discharge.--37 years (1926-63) 2,325 cfs (1,683,000 acre-ft per year).

Extremes.--Maximum discharge during year, 9,500 cfs Oct. 19 (gage height, 6.07 ft); minimum, 47 cfs July 5, 6.

1927-63: Maximum discharge, about 80,000 cfs Aug. 11, 1929 (gage height, 5.7 ft, site and datum then in use); minimum daily, 8 cfs Aug. 25, 26, 1939.

Maximum flood known occurred Oct. 6, 1911, and reached a stage of 22 ft, site and datum then in use.

Remarks.--Records fair except those for periods of ice effect, which are poor. Discharge measurements generally made 4 to 8 times a month except during extreme winter period. Diversions for irrigation of about 118,000 acres above station. Canals bypass station on both right and left bank, though some of bypass flow is returned to River below gage.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	719	614	621	456	b550	420	1,210	240	1,440	155	62	1,590
2	628	628	649	504	b560	380	1,230	224	1,360	100	62	1,240
3	582	607	635	540	b600	492	1,130	164	1,300	83	74	1,050
4	534	594	594	552	b550	498	998	171	1,040	70	390	828
5	504	594	534	498	546	498	900	441	812	51	666	705
6	510	558	498	450	582	510	852	1,130	812	58	830	698
7	510	570	492	438	588	486	780	1,620	806	54	600	692
8	504	552	492	420	552	498	812	2,260	740	64	510	782
9	444	546	492	400	540	486	852	2,820	866	151	468	645
10	420	582	492	410	552	492	924	2,920	872	361	830	500
11	385	570	480	395	600	486	908	2,180	680	588	677	435
12	375	540	492	162	546	504	836	2,100	500	546	534	391
13	375	534	444	100	480	540	1,060	1,750	435	486	500	411
14	365	546	450	b120	468	522	1,820	1,770	616	486	391	415
15	360	635	462	b150	468	480	2,100	1,820	719	462	319	464
16	365	794	468	b200	504	504	2,420	1,470	980	364	284	480
17	796	812	462	b300	522	516	2,250	1,720	852	261	237	474
18	2,880	782	468	b400	498	498	1,910	2,400	663	180	240	456
19	6,190	752	498	b500	498	498	1,770	2,920	582	109	239	400
20	4,020	719	498	b470	498	480	1,390	2,680	540	87	206	1,290
21	1,360	684	468	b420	486	498	635	2,480	504	68	206	2,580
22	1,020	677	450	b400	516	558	478	2,260	558	66	244	1,190
23	796	670	420	b390	486	635	347	2,040	582	66	340	852
24	756	649	415	380	486	698	252	1,810	504	62	426	719
25	733	635	415	400	486	804	226	1,510	395	60	444	642
26	719	614	390	450	456	884	404	1,360	312	98	410	621
27	684	614	335	430	456	956	496	1,220	264	171	1,220	582
28	663	614	316	b420	456	1,130	496	1,330	216	193	1,420	516
29	663	600	330	b420	-	1,280	435	1,330	166	100	1,260	474
30	628	600	370	b440	-----	1,310	340	1,430	171	70	1,080	420
31	628	-----	400	b470	-----	1,220	-----	1,380	-----	64	1,510	-----
Total	30,116	18,886	14,530	12,085	14,530	19,761	30,261	50,950	20,287	5,734	16,679	22,542
Mean	971	630	469	390	519	637	1,009	1,644	676	185	538	751
Ac-Ft	59,730	37,460	28,820	23,970	28,820	39,200	60,020	101,100	40,240	11,370	33,080	44,710

Calendar year 1962: Max 9,460 Min 52 Mean 1,906 Ac-ft 1,380,000  
 Water year 1962-63: Max 6,190 Min 51 Mean 702 Ac-ft 508,500

Peak discharge (base, 8,500 cfs).--Oct. 19 (1200) 9,500 cfs (6.07 ft); Sept. 20 (2340) 8,700 cfs (5.90 ft).

b Stage-discharge relation affected by ice.

## LITTLE COLORADO RIVER BASIN

197

9-3860.5. Largo Creek near Mangas, N. Mex.

Location.--Lat 34°08'30", long 108°30'05", in SW $\frac{1}{4}$  sec. 10, T.2 S., R.16 W., on right bank at El Caso Ranch, half a mile upstream from Sawmill Canyon, 10 $\frac{1}{2}$  miles southwest of Mangas, and 14 miles south of Quemado.

Drainage area.--63 sq mi, approximately

Records available.--September 1959 to September 1963.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 7,600 ft (from topographic map).

Extremes.--Maximum discharge during year, 258 cfs Feb. 1 (gage height 2.65 ft); minimum, 0.03 cfs July 15.  
1959-63: Maximum discharge, that of Feb. 1, 1963; minimum daily, 0.02 cfs July 25-27, 1961.

Remarks.--Records fair except those for periods of no gage-height record, which are poor.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

0.1	0.01	0.7	8.2
.2	.2	.8	12
.3	.9	1.0	20
.4	2.0	1.3	40
.5	3.5	1.6	68
.6	5.5	1.7	79

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.07	0.09	0.3	0.1	7.9	0.6	0.2	0.2	0.09	0.07	0.05	0.1
2	.07	.09	.2	.1	4.0	.5	.2	.2	.09	.07	.6	.09
3	.07	.1	*.1	.2	9.2	.5	.2	.2	.09	.07	.09	a.2
4	.1	.1	.1	.2	2.7	.6	.2	.1	.09	.07	.09	a.1.5
5	.1	.1	.1	.2	*1.5	.6	.2	.1	.09	.07	.07	a.6
6	.09	.1	.1	.2	1.0	.5	.2	.1	.09	.07	.07	a.1.0
7	.07	.09	.1	.2	.6	.4	.2	.1	.09	.07	.07	a.4
8	.07	.09	.1	.2	.6	.4	.2	.1	.09	.07	.07	a.1
9	.07	.09	.1	.2	.5	.4	.2	.1	.09	.09	.09	a.6
10	.07	.1	.1	.2	.6	.4	.2	.2	.09	.1	.5	a.4
11	.07	.09	.1	.2	.6	.4	.2	.2	.09	.1	.4	a.2
12	.07	.09	.1	.2	.2	.4	.2	.1	.1	.09	.4	a.2
13	.07	.1	.1	.2	.4	.4	.2	.1	.1	.05	.1	a.2
14	.07	.1	.1	.2	.6	*.4	.2	.1	.1	.05	.09	a.2
15	.07	.4	.1	.2	.6	.3	.2	.1	.09	.05	.07	a.1.5
16	.07	.2	.1	.2	.8	.3	.2	.1	.09	.1	.07	a.5
17	.3	.2	.2	*.2	.7	.3	.2	.1	.09	.07	.09	a.2
18	.3	.2	.2	.2	.7	.4	.2	.1	.09	.07	.5	*.1
19	.4	.2	.2	.2	.8	a.4	.2	.1	.09	.05	.2	.07
20	.2	.1	.2	.2	.9	a.4	.2	.1	.09	.07	.1	.3
21	.1	.1	.2	.2	.8	a.3	.2	*.1	.09	.09	.4	.2
22	.09	.1	.1	.2	.6	a.3	.2	.1	.09	.07	1.5	.09
23	*.09	.1	.1	.2	.5	a.3	.2	.1	.09	.07	.5	.09
24	.09	.1	.1	.2	.4	a.3	.2	.1	.07	.05	.2	.09
25	.09	.1	.1	.2	.4	a.3	.2	.09	.07	.05	.2	.07
26	.1	.2	.1	.2	.4	.3	.3	.09	*.07	.05	4.3	.09
27	.1	.1	.1	.2	1.0	.3	.2	.09	.07	.09	.3	.07
28	.1	.1	.2	.2	.7	.3	.2	.09	.07	.07	1.4	.07
29	.1	.1	.2	.2	-	.3	.2	.09	.07	.05	.6	.07
30	.09	.2	.2	.2	-----	.3	.2	.09	.07	*.05	5.1	.07
31	.09	-----	.1	1.1	-----	.3	-----	.09	-----	.05	.7	-----
Total	3.44	3.83	4.2	16.8	146.9	11.9	6.1	3.53	2.59	2.14	18.92	22.87
Mean	0.11	0.13	0.14	0.54	5.25	0.38	0.20	0.11	0.09	0.07	0.61	0.76
Ac-ft	6.8	7.6	8.3	33	291	24	12	7.0	5.1	4.2	38	48

Calendar year 1962: Max 67 Min 0.07 Mean 1.91 Ac-ft 1,380  
Water year 1962-63: Max 79 Min 0.05 Mean 0.67 Ac-ft 482

Peak discharge (base, 30 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
2-1	1800	2.65	258	9-6	unknown	1.77	76
8-30	1300	1.31	38				

\* Discharge measurement made on this day.  
a No gage-height record.

## GILA RIVER BASIN

9-4305. Gila River near Gila, N. Mex.

Location.--Lat 33°03'45", long 108°32'20", in NW 1/4 sec. 30, T.14 S., R.16 W., on left bank at Hooker damsite, 1 mile upstream from Mogollon Creek, and 7 miles northeast of Gila.

Drainage area.--1,864 sq mi.

Records available.--April to December 1914, December 1927 to September 1963. Monthly discharge only December 1927 to September 1930, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,655.8 ft above mean sea level (river-profile survey). Prior to Dec. 31, 1928, at site 5 miles upstream at different datum. Dec. 31, 1928, to Jan. 7, 1942, at site 200 ft upstream at same datum.

Average discharge.--36 years (1927-63) 125 cfs (90,500 acre-ft per year).

Extremes.--Maximum discharge during year, 842 cfs Feb. 11 (gage height, 4.55 ft); minimum, 18 cfs June 30.

1929-63: Maximum discharge, 25,400 cfs Sept. 29, 1941 (gage height, 17.2 ft, from floodmark), from rating curve extended above 3,900 cfs on basis of velocity-area studies and logarithmic plotting; minimum daily, 17 cfs July 6, 7, 1956.

Remarks.--Records good. Discharge measurements generally made twice a month. Diversions for irrigation of about 500 acres above station.

Rating tables (gage height, in feet, and discharge,  
in cubic feet per second

Oct. 1 to Apr. 29				Apr. 30 to June 22				June 23 to Sept. 30			
2.4	65	4.5	860	2.1	14	2.3	18	3.5	315		
2.8	145			2.3	40	2.5	46	4.0	550		
3.5	370			2.9	157	3.0	153	4.3	700		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	209	86	138	140	152	212	245	133	43	19	31	210
2	168	84	197	140	338	203	245	125	42	21	31	210
3	140	82	182	150	459	188	236	116	42	22	36	216
4	127	80	158	176	430	182	218	112	42	34	51	324
5	120	79	143	165	406	179	194	110	40	36	74	333
6									40			
7	112	79	134	155	410	176	179	108	40	32	53	369
8	103	79	127	148	410	160	170	106	39	31	42	315
9	95	77	122	140	398	158	160	104	37	62	37	261
10	90	77	116	136	370	150	165	104	36	59	40	279
11	84	75	112	136	448	143	179	104	36	48	42	338
12												
13	82	75	107	160	806	136	188	104	37	50	95	303
14	79	75	105	170	660	134	182	102	37	43	86	291
15	77	75	101	148	513	131	173	98	39	36	70	258
16	75	74	101	127	446	127	162	98	39	32	62	291
17	72	88	97	120	438	124	152	96	34	30	76	240
18												
19	70	88	95	118	414	120	152	94	33	27	92	213
20	72	92	95	120	358	118	160	88	32	27	94	169
21	129	97	264	120	326	122	152	81	29	26	82	140
22	185	95	690	122	302	120	143	79	27	27	70	128
23	160	92	513	118	292	118	134	77	26	28	84	169
24												
25	131	88	386	112	298	112	127	73	26	32	88	480
26	116	86	309	116	306	114	120	70	25	42	253	655
27	107	84	254	116	302	112	114	66	23	31	195	405
28	101	82	224	118	292	109	109	63	24	27	138	315
29	97	79	215	120	274	109	103	59	24	26	153	261
30												
31	105	79	200	122	254	112	116	56	23	24	330	216
32	105	77	182	124	236	112	127	53	22	28	250	180
33	99	75	176	124	224	116	162	51	21	31	186	150
34	93	75	168	124	-	122	162	50	19	38	175	130
35	90	82	158	124	-----	143	145	46	19	40	201	116
36	86	-----	148	127	-----	212	-----	45	-----	34	213	-----
Total	3,379	2,456	6,017	4,136	10,562	4,374	4,874	2,671	956	1,043	3,430	7,965
Mean	109	81.9	194	133	377	141	162	86.2	31.9	33.6	111	266
Ac-ft	6,700	4,870	11,930	8,200	20,950	8,680	9,670	5,300	1,900	2,070	6,800	15,800

Calendar year 1962: Max 1,850 Min 36 Mean 214 Ac-ft 154,700  
 Water year 1962-63: Max 806 Min 19 Mean 142 Ac-ft 102,900

Peak discharge (base, 600 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
12-19	1000	4.32	740	8-26	0330	4.27	685
2-11	0800	4.55	842	9-21	1930	4.51	806

9-4315. Gila River near Redrock, N. Mex.

Location.--Lat 32°43'30", long 108°40'30", in W $\frac{1}{2}$  sec.23 T.18 S., R.18 W., on left bank 0.2 mile downstream from Copper Canyon, a quarter of a mile upstream from lower end of box canyon, 4.7 miles northeast of Redrock, and 14 miles downstream from Mangas Creek.

Drainage area.--2,829 sq mi.

Records available.--September 1904 to February 1905, gage heights only; May 1905 to December 1906, January to December 1907 and July to October 1908, gage heights only; November 1908 to December 1910, January 1911 to January 1912 and May to June 1912, gage heights only; August 1912 to June 1919, October to November 1919, February 1920 to January 1921, March to May, July 1921, October 1922 to July 1923, December 1925, January to March, May 1927, July 1927 to September 1955, October 1962 to September 1963. Monthly or annual discharge only for some periods, published in WSP 1313. Published as "near Cliff" 1904-7.

Gage.--Water-stage recorder. Altitude of gage is 4,090 ft (planetable survey). Prior to Dec. 31, 1907, staff gage at site  $1\frac{1}{2}$  miles upstream at different datum. May 14, 1908, to July 16, 1909, staff gage at site a quarter of a mile downstream at different datum.

Average discharge.--47 years (1905-6, 1908-10, 1912-55, 1962-63), 195 cfs (141,200 acre-ft per year).

Extremes.--Maximum discharge during year, 3,500 cfs Aug. 22 (gage height, 14.3 ft), on basis of slope-area measurement of peak flow; minimum, 10 cfs, June 25.

1905-55, 1962-63: Maximum discharge, 40,000 cfs Sept. 29, 1941 (gage height, 31 ft from floodmark), computed on basis of known peak flow for station below Blue Creek; minimum daily, 3 cfs Aug. 2-7, 1947.

Remarks.--Records fair except those for periods of no gage-height record, and those for August and September, which are poor. Discharge measurements generally made 1 to 3 times a month. Diversions for irrigation of about 5,000 acres above station.

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	300	110	193	215	210	292	250	147	42	12	60	a350
2	251	108	215	212	326	284	253	144	38	12	220	a300
3	221	106	208	210	580	268	242	141	37	15	560	415
4	a190	102	195	224	590	250	228	130	39	16	580	504
5	a170	102	185	227	565	236	216	112	42	16	a200	650
6	a160	100	180	224	565	228	207	115	38	18	a100	510
7	a150	97	175	221	595	219	195	106	36	17	a70	a400
8	a140	94	165	215	595	207	195	104	49	62	a60	475
9	a130	97	155	210	570	204	189	94	50	49	a50	570
10	a120	102	150	208	585	201	189	100	46	28	a50	480
11	a115	102	148	212	910	195	183	98	38	67	a70	400
12	a105	102	142	233	875	186	186	94	32	55	a100	a350
13	a100	97	140	218	735	177	186	102	34	46	a150	a360
14	a95	96	138	202	665	162	189	94	18	42	a200	a370
15	94	98	136	192	644	144	186	92	18	38	a150	a350
16	88	114	132	185	651	138	162	94	22	31	a120	a300
17	91	112	134	180	594	130	159	84	18	27	a110	a250
18	202	114	155	180	528	130	165	76	17	29	a100	195
19	265	116	669	180	480	128	159	74	13	28	a90	274
20	257	a110	638	175	450	120	150	80	13	27	a150	680
21	215	a105	520	170	450	110	144	78	13	24	400	480
22	190	a110	402	172	456	106	135	84	12	25	950	686
23	168	112	358	172	445	102	132	78	12	24	418	564
24	150	106	318	172	430	104	122	67	13	23	260	450
25	134	104	292	175	405	98	128	65	12	23	225	a300
26	126	102	278	178	395	98	130	67	12	24	376	a250
27	132	98	257	180	375	100	135	65	13	75	300	a200
28	136	97	248	182	325	100	153	58	13	19	225	a170
29	126	96	239	185	-	92	168	60	16	14	195	a150
30	118	97	233	188	-----	125	159	53	16	13	201	a130
31	114	-----	227	195	-----	174	-----	53	-----	103	745	-----
Total	4,853	3,106	7,625	6,092	14,994	5,108	5,295	2,809	772	1,002	7,485	11,563
Mean	157	104	246	197	536	165	176	90.6	25.7	32.3	241	385
Ac-ft	9,630	6,160	15,120	12,080	29,740	10,130	10,500	5,570	1,530	1,990	14,850	22,930

Calendar year 1962: Max - Min - Mean - Ac-ft -  
 Water year 1962-63: Max 950 Min 12 Mean 194 Ac-ft 140,200

a No gage-height record.

## GILA RIVER BASIN

9-4320. Gila River below Blue Creek, near Virden, N. Mex.

**Location.**--Lat 32°38'55", long 108°50'45", in SE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 18, T.19 S., R.19 W., on left bank at head of canyon, 1 $\frac{1}{4}$  miles downstream from Blue Creek, 10 miles east of Virden, and 16 miles upstream from New Mexico-Arizona State line.

**Drainage area.**--3,203 sq mi, excluding Animas River basin.

**Records available.**--May to November 1914, March to September 1915, July 1927 to September 1963. July 1927 to May 1931 monthly discharge only, published in WSP 1313, computed as sum of flow at Virden Bridge, 8 $\frac{1}{2}$  miles downstream, and in Sunset Canal. Published as Gila River near Duncan, Ariz., 1914-15 and as Gila River at Fuller's Ranch, near Duncan, Ariz. 1931-38.

**Gage.**--Water-stage recorder at present site and datum since July 8, 1931. Altitude of gage is 3,875 ft (from river-profile map). May 11, 1914, to Sept. 30, 1915, at site 6 miles downstream, 1,000 ft upstream from intake of Sunset Canal. June 1 to July 7, 1931, staff gage at present site and datum.

**Average discharge.**--36 years (1927-63), 164 cfs (118,700 acre-ft per year); median of yearly mean discharges, 130 cfs (94,100 acre-ft per year).

**Extremes.**--Maximum discharge during year, 7,320 cfs Aug. 31 (gage height, 14.46 ft); minimum, 3.9 cfs July 2.  
1927-63: Maximum discharge, 41,700 cfs Sept. 29, 1941 (gage height, 25.78 ft); minimum, 1 cfs July 14, 1934.

**Remarks.**--Records good except for those periods of no gage-height record which are poor. Station is above all Duncan Valley diversions. Diversions for irrigation of about 6,200 acres above station.

Rating table, water year 1962-63 (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used Oct. 1-18, Dec. 2 to Jan. 11, July 30 to Aug. 26, Sept. 1-30)

1.7	3.7	3.5	165	9.0	2,410
1.8	6.0	4.0	265	11.0	3,760
2.0	13	5.0	530	14.0	6,670
2.3	28	6.0	890	15.0	8,330
2.6	50	7.0	1,310		
3.0	90	8.0	1,810		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	278	118	201	218	194	325	224	145	40	4.8	a 160	356
2	230	*113	212	*208	256	303	261	*135	a 35	*4.4	a 250	276
3	196	110	*214	208	527	285	256	132	a 30	4.2	a 560	449
4	174	109	206	218	590	274	243	122	a 25	4.8	a 260	584
5	*156	106	187	237	572	254	224	106	*25	7.5	a 170	*648
6	143	100	181	226	554	235	212	102	24	7.2	a 120	642
7	135	98	176	222	579	222	198	93	21	7.2	*79	527
8	128	94	165	216	586	210	192	90	21	9.4	60	492
9	118	93	158	212	554	204	191	80	27	11	46	737
10	111	94	151	208	548	200	192	81	31	11	32	534
11	103	94	146	216	842	198	181	82	31	11	39	464
12	96	95	143	241	1,000	183	191	80	27	11	a 60	431
13	90	91	142	235	803	176	192	84	26	11	a 60	437
14	88	90	*137	210	698	162	192	82	19	11	a 80	434
15	84	93	135	*194	642	146	194	79	12	11	a 150	452
16	*83	*95	132	185	642	137	172	80	11	11	a 270	405
17	81	102	134	183	593	135	156	79	10	12	a 70	355
18	131	100	158	183	537	124	167	68	8.4	14	a 60	312
19	214	107	526	181	488	124	155	63	7.8	14	a 60	340
20	212	103	663	176	458	120	148	67	8.1	14	*140	740
21	204	99	509	170	458	110	138	64	7.5	14	210	335
22	179	102	431	162	473	107	135	65	6.9	14	1,570	618
23	169	104	372	169	473	106	126	65	7.2	14	*509	461
24	155	99	330	172	449	107	122	60	6.9	14	325	385
25	148	95	298	174	416	109	117	58	6.6	14	265	328
26	138	100	287	179	392	103	126	58	6.0	14	461	*263
27	137	93	267	183	*378	102	126	58	5.5	15	509	214
28	140	89	256	187	345	96	137	56	5.5	15	360	181
29	135	89	250	187	-	*94	160	51	5.3	13	310	162
30	124	92	241	*187	-----	111	151	48	5.1	34	312	135
31	123	-----	228	189	-----	150	-----	46	-----	a 230	1,650	-----
Total	4,503	2,967	7,636	6,143	15,047	5,212	5,279	2,479	501.8	582.5	9,207	12,697
Mean	145	98.9	246	198	537	168	176	80.0	16.7	18.8	297	423
Ac-ft	8,930	5,880	15,150	12,180	29,850	10,340	10,470	4,920	995	1,160	18,260	25,180

Calendar year 1962: Max 2,320 Min 4.4 Mean 291 Ac-ft 210,900  
Water year 1962-63: Max 1,650 Min 4.2 Mean 198 Ac-ft 143,300

Peak discharge (base, 1,900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	2400	+9.5	2,710	8-31	0300	14.46	7,320
8-22	0800	9.80	2,920	9-20	0730	8.20	1,930

\* Discharge measurement made on this day.

† About.

a No gage-height record.

9-4330. Sunset Canal near Virden, N. Mex.

Location.--Lat 32°39'20", long 108°56'00", in NW $\frac{1}{4}$  sec.17, T.19 S., R.20 W., on left bank 1.7 miles downstream from intake and 4.5 miles southeast of Virden.

Records available.--October 1914 to September 1915, July 1922 to September 1931, January 1936 to September 1963. Monthly discharge only January 1936 to December 1938, published in WSP 1313. Prior to 1939, published as "near Duncan, Ariz."

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 3,790 ft (from topographic map). Oct. 1, 1914, to Sept. 30, 1915, staff gage at site 0.4 mile upstream and July 15, 1922, to Sept. 30, 1931, staff gage at site 0.5 mile downstream at different datums. Mar. 9, 1936, to Feb. 20, 1942, water-stage recorder and submerged rectangular weir at site 300 ft downstream at different datum.

Extremes.--1914-15, 1922-31, 1936-63: Maximum daily discharge, 62 cfs Sept. 21, 22, 1929; no flow at times.

Remarks.--Records good. Canal diverts from right bank of Gila River in SW $\frac{1}{4}$  sec.21, T.19 S., R.20 W., for irrigation of about 2,750 acres in Virden-Duncan Valley. No diversion between intake and station.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

0.0	0.02	0.5	8.2
.1	.4	.8	18
.2	1.7	1.1	30
.3	3.5	1.4	43

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*12	16	20		0	20	24	*26	15	0.7	24	0
2	18	17	18		0	20	28	26	20	.4	27	0
3	18	20	13	(*)	0	15	26	27	22	.1	29	0
4	18	19	8.8		0	14	26	20	24	.2	30	0
5	22	19	8.2		0	g22	26	15	24	.9	23	0
6	28	18	7.6		0	g24	26	17	16	1.2	26	0
7	28	*18	7.4		0	g30	27	19	16	1.2	22	0
8	27	17	6.9		0	g33	27	15	16	2.9	19	0
9	27	16	6.6		0	g33	27	15	17	18	19	0
10	22	18	6.6		0	g38	27	15	*16	19	19	0
11	17	18	6.4		3.7	g39	26	15	16	17	20	0
12	16	18	6.4		5.2	g38	26	15	17	18	19	0
13	16	18	6.4		0	g36	27	16	16	17	19	0
14	16	17	6.4		0	g34	27	16	16	18	22	0
15	14	18	6.4		0	g33	24	14	9.7	17	22	0
16	14	18	6.2		0	g33	20	12	7.2	17	22	0
17	14	11	6.2		0	g34	23	12	6.2	16	24	0
18	16	14	6.6		0	g34	28	12	5.2	14	30	0
19	20	16	7.6		12	*g32	27	12	4.3	14	30	*0
20	18	16	5.7		18	28	26	13	4.3	17	30	5.3
21	17	15	5.0		19	27	28	13	3.7	12	30	0
22	17	14	3.1		20	26	28	12	3.1	9.1	31	0
23	17	16	3.1		20	19	27	12	3.3	7.4	33	0
24	17	15	2.7		20	20	24	*12	3.3	*5.2	32	0
25	16	14	2.4	(*)	19	19	16	12	*2.9	2.7	27	0
26	16	*16	3.1		19	17	16	12	2.4	2.2	25	3.8
27	14	18	2.2		19	16	16	12	1.8	9.3	26	16
28	15	17	1.8		20	16	16	12	1.8	18	24	19
29	16	17	1.8		-	16	16	12	1.5	14	31	19
30	16	17	2.0		-----	18	17	13	1.2	15	32	19
31	17	-----	.8		-----	18	-----	12	-----	18	3.7	
Total	559	501	195.4	0	194.9	802	722	466	312.9	322.5	770.7	82.1
Mean	18.0	16.7	6.30	0	6.96	25.9	24.1	15.0	10.4	10.4	24.9	2.74
Ac-ft	1,110	994	388	0	387	1,590	1,430	924	621	640	1,530	163

Calendar year 1962: Max 49 Min 0 Mean 17.7 Ac-ft 12,820  
Water year 1962-63: Max 39 Min 0 Mean 13.5 Ac-ft 9,780

\* Discharge measurement or observation of no flow made on this day.

g Computed from once-daily staff gage readings.

9-4360. New Model Canal near Virden, N. Mex.

Location.--Lat 32°40'30", long 108°59'30", in NE $\frac{1}{4}$  sec.10, T.19 S., R.21 W., 1 mile downstream from intake, 1 mile southeast of Virden, and  $\frac{3}{4}$  miles east of State line.

Records available.--October 1914 to September 1915, July 1922 to September 1931, January 1936 to September 1963. Monthly discharge only January 1936 to December 1938, published in WSP 1313. Published as Model Canal near Duncan, Ariz., 1914-15, as Moddle Canal near Duncan, Ariz., 1922-31, and as Moddle Canal near Virden, N. Mex., 1936-51.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 3,745 ft (from topographic map). Prior to Nov. 25, 1926, staff gage and Nov. 25, 1926, to Feb. 21, 1942, water-stage recorder, at several sites within half a mile upstream at different datums.

Extremes.--1914-15, 1922-31, 1936-63: Maximum daily discharge, 74 cfs Sept. 9, 1930; no flow at times.

Remarks.--Records good. Canal diverts from left bank of Gila River in NE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.11, T.19 S., R.21 W., for irrigation of about 2,450 acres in Virden-Duncan Valley. For additional history and gage data, see page 599 of WSP 1313.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

0.0	0.0	0.6	13
.1	.8	.8	20
.2	2.3	1.0	30
.4	6.6	1.2	40

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	*0	1.6			3.9	2.3	1.1	*1.8	0.8		7.8	3.4
2	0	1.3			9.3	2.7	2.2	2.4	6.1		9.5	a 3.5
3	0	8.5		(*)	1.4	2.5	2.4	2.4	5.2		2.4	a 7.4
4	0	8.2			8.5	2.5	2.6	7.5	3.2		1.9	a 1.5
5	0	8.2			5.9	2.4	2.5	2.3	1.3		1.2	a 1.6
6	1.1	7.9			5.4	2.5	2.6	1.6	1.2		2.6	a 1.6
7	5.9	*7.9			6.9	2.6	2.7	2.1	.8		1.7	a 1.4
8	4.5	7.9			8.2	a 2.4	2.5	2.1	0		0	a 9.5
9	2.3	7.7			7.1	a 2.5	2.6	1.3	0		0	a 1.4
10	2.6	8.2			9.1	a 2.4	2.5	0	*0		0	a 1.9
11	2.1	8.5			10	a 2.7	2.5	0	0		0	a 1.8
12	2.0	8.8			6.1	a 2.8	2.8	0	0		0	a 1.4
13	2.1	8.5			5.0	a 2.8	2.7	0	0		0	a 1.4
14	2.1	8.5			6.4	a 2.6	2.6	0	0		1.9	a 1.5
15	1.4	8.8			6.6	a 2.6	1.9	0	0		1.5	a 1.9
16	0	8.3			5.9	a 2.6	7.4	0	0		2.8	a 1.7
17	0	5.9			5.8	a 3.1	7.7	0	0		6.7	a 1.4
18	0	0			1.2	a 2.9	8.2	0	0		2.1	a 1.1
19	1.6	0			1.2	*2.7	8.5	0	0		2.5	*a 1.6
20	5.4	0			1.4	2.5	8.2	0	0		3.7	1.8
21	5.6	0			1.5	2.5	7.1	0	0		3.0	7.9
22	6.4	0			1.6	2.1	7.7	0	0		2.4	2.3
23	5.4	0			1.7	7.9	8.5	0	0		2.2	1.0
24	1.3	0			1.4	8.5	6.4	*0	0	(*)	2.1	2.1
25	1.7	0		(*)	1.8	5.7	3.4	0	*0		1.9	1.9
26	1.6	*0			2.2	2.3	3.0	0	0		2.1	1.4
27	1.7	0			2.2	2.0	3.4	0	0		2.8	9.4
28	1.9	0			2.2	1.2	3.4	0	0		1.8	7.7
29	1.8	0			-	3.9	4.0	0	0		1.8	6.6
30	1.6	0			-----	6.1	5.2	0	0		1.9	2.4
31	1.6	-----			-----	7.1	-----	0	-----		2.5	-----
Total	182.5	150.8	0	0	308.1	611.7	454.1	82.9	18.6	0	494.9	395.7
Mean	5.89	5.03	0	0	11.0	19.7	15.1	2.67	0.62	0	16.0	13.2
Ac-ft	362	299	0	0	611	1,210	901	164	37	0	982	785

Calendar year 1962: Max 32 Min 0 Mean 6.77 Ac-ft 4,900  
Water year 1962-63: Max 37 Min 0 Mean 7.40 Ac-ft 5,350

\* Discharge measurement or observation of no flow made on this day.

Note.--No gage-height record Mar. 8-18, Sept. 2-19. Discharge figures were furnished by Gila Water Commissioner.

## GILA RIVER BASIN

203

9-4426.8 San Francisco River near Reserve, N. Mex.

Location.--Lat 33°44'30", long 108°46'15", in SW 1/4 sec. 35, T.6 S., R.19 W., on left bank 500 ft upstream from mouth of Rainbow Bridge Canyon and 2 miles northwest of Reserve.

Drainage area.--350 sq mi, approximately.

Records available.--March 1959 to September 1963.

Gage.--Water-stage recorder (digital) and concrete control. Altitude of gage is 5,850 ft above mean sea level (from topographic map).

Extremes.--Maximum discharge during year, 806 cfs Sept. 9 (gage height, 3.05 ft in gage well, 4.0 ft from floodmarks outside gage), from rating curve extended above 300 cfs on basis of slope-area measurements at gage heights 2.92 and 3.05 ft; minimum, 1.6 cfs June 29, 30, July 1, 2, 3.

1959-63: Maximum discharge, that of Sept. 9, 1963; minimum daily, 1.4 cfs June 11, 12, 28, 1959.

Maximum stage known, about 15 ft, as determined in 1962 from old floodmarks. Major floods of Nov. 26, 1905 and Dec. 3, 1906, exceeded 20,000 cfs at Alma (downstream). See WSP 1313.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Discharge measurements generally made 1 to 3 times a month. Slight regulation at times by one small reservoir. Diversion for irrigation of about 500 acres above station.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

0.4	1.0	0.8	22
.5	2.9	1.0	43
.6	7.2	1.2	80
.7	14	1.4	135

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.0	5.0	2.1	9.5	1.7	2.1	1.3	5.1	3.0	1.8	2.4	3.0
2	5.0	5.0	1.4	1.1	4.7	2.0	1.2	4.8	3.1	1.8	5.7	1.5
3	5.0	5.0	1.1	1.3	3.3	1.7	1.1	4.5	3.2	1.9	4.0	4.0
4	6.9	5.0	9.9	1.1	2.4	1.5	1.1	4.4	3.1	1.9	7.1	2.5
5	6.6	5.0	9.2	1.1	2.2	1.3	1.0	4.1	3.0	2.3	4.2	1.5
6	5.0	5.5	7.8	9.2	2.1	1.4	9.7	4.3	3.0	2.0	4.2	1.0
7	5.0	5.5	7.8	8.5	2.0	1.3	9.4	4.1	2.8	2.1	4.7	8
8	5.0	5.0	7.8	8.5	2.0	1.3	8.6	4.0	2.8	2.4	4.5	8
9	5.0	5.5	7.8	9.2	1.8	1.2	7.6	3.9	2.8	2.6	3.8	12.5
10	5.0	6.0	7.2	1.1	2.1	1.2	7.1	4.1	2.8	2.7	6.5	5.0
11	5.0	6.0	7.2	1.1	3.0	1.1	6.9	4.1	2.9	2.8	4.6	2.5
12	5.0	5.5	7.8	6.0	2.8	1.1	6.3	3.8	3.0	2.7	7.3	2.0
13	5.0	6.0	6.6	4.6	1.8	1.1	6.9	3.7	2.8	2.5	9.6	1.5
14	5.0	6.6	7.2	6.6	1.9	1.1	6.7	3.7	2.7	2.3	7.5	1.2
15	5.0	9.2	6.6	6.6	2.4	1.1	6.2	4.0	2.6	2.3	2.2	2.5
16	5.0	8.5	6.6	8.5	1.9	9.9	5.5	4.1	2.6	2.7	4.7	2.0
17	2.9	7.8	7.8	7.6	2.0	1.0	5.7	4.1	2.5	3.1	1.8	1.9
18	10.4	7.8	1.1	7.1	1.9	1.1	5.8	3.9	2.6	2.6	4.8	2.1
19	8.0	6.6	1.2	6.0	1.8	1.1	5.8	3.9	2.4	2.6	4.7	2.1
20	2.6	6.6	1.2	9.9	2.0	1.2	5.8	4.0	2.3	2.5	8.8	2.5
21	1.6	7.2	9.9	7.2	2.6	1.3	5.8	4.0	2.3	2.4	9.1	2.5
22	1.1	6.6	7.8	8.0	3.7	1.3	5.0	3.8	2.1	2.4	1.7	1.9
23	9.2	6.6	7.8	8.2	4.1	1.3	4.5	3.7	2.1	2.3	1.6	1.5
24	8.5	7.2	1.1	8.5	3.3	1.2	4.6	3.7	2.0	2.1	1.2	1.3
25	8.5	6.6	1.1	9.2	3.0	1.1	4.6	3.5	2.0	2.2	6.5	1.2
26	9.2	6.6	1.1	8.6	2.6	1.1	7.6	3.4	2.0	2.3	6.0	1.0
27	8.5	6.0	9.2	8.8	2.6	1.0	6.3	3.3	2.0	2.6	1.5	9.0
28	7.2	6.6	1.1	8.5	2.4	1.1	5.6	3.3	1.9	2.8	1.0	8.0
29	6.6	6.6	7.2	9.2	-	1.2	5.4	3.2	1.9	2.6	6	7.0
30	6.6	1.2	7.2	9.2	-----	1.4	5.3	3.1	1.8	2.3	5	6.4
31	6.0	-----	7.8	9.9	-----	1.4	-----	3.0	-----	2.3	5	-----
Total	419.8	195.1	289.2	271.1	70.1	392.9	215.7	120.6	76.1	73.9	328.6	653.4
Mean	13.5	6.50	9.33	8.75	25.0	12.7	7.19	3.89	2.54	2.38	10.6	21.8
Ac-ft	833	387	574	538	1,390	779	428	239	151	147	652	1,300

Calendar year 1962: Max 320 Min 3.2 Mean 28.2 Ac-ft 20,380

Water year 1962-63: Max 125 Min 1.8 Mean 10.2 Ac-ft 7,420

Peak discharge (base, 200 cfs)

Note.--No gage-height record Aug. 27 to Sept. 16

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
10-18	0600	1.70	240	8-21	2000	2.51	564
8-15	1530	2.16	424	9-9	unknown	3.05	806



9-4440. San Francisco River near Glenwood, N. Mex.

Location.--Lat 33°15'05", long 108°52'40", in NE¼NW¼ sec.23, T.12 S., R.20 W., on left bank a quarter of a mile upstream from hot springs, 5 miles south of Glenwood, and 6 miles downstream from Whitewater Creek.

Drainage area.--1,653 sq mi.

Records available.--October 1927 to September 1963. Monthly discharge only for some periods, published in WSP 1313.

Gage.--Water-stage recorder. Datum of gage is 4,552.06 ft above mean sea level, datum of 1929. Prior to Feb. 15, 1934, at site ¼ miles upstream at datum 98.82 ft higher.

Average discharge.--26 years, 62.5 cfs (45,250 acre-ft per year).

Extremes.--Maximum discharge during year, 1,220 cfs Aug. 30 (gage height, 4.87 ft); minimum, 6.0 cfs July 1.

1927-63: Maximum discharge, 7,800 cfs Jan. 13, 1949 (gage height, 10.74 ft), from rating curve extended above 2,800 cfs on basis of slope-area measurement of peak flow; minimum daily, 2.5 cfs June 25, 1956.

A major flood probably occurred Jan. 19, 1916, when a discharge of 90,000 cfs was computed (by slope-conveyance method) for station at Clifton, Ariz. On Nov. 26, 1905, a peak of 25,000 cfs was measured (by float-area method) at station at Alma (about 12 miles upstream, drainage area, 1,560 sq mi); a similar measurement of 21,000 cfs was made at the Alma station for peak of Dec. 3, 1906.

Remarks.--Records fair except those for periods of no gage height record, which are poor. Discharge measurements generally made 1 to 3 times a month. Diversions for irrigation of about 2,000 acres above station.

Rating table (gage height, in feet, and discharge,  
in cubic feet per second)

1.8	6.6	2.7	160
1.9	11	3.0	280
2.1	30	3.4	460
2.4	80		

Discharge, in cubic feet per second, water year October 1962 to September 1963

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	26	102	36	36	66	98	32	22	7.2	14	120
2	26	27	76	36	39	62	100	28	15	6.2	21	93
3	26	26	58	40	64	54	88	33	15	8.0	37	40
4	25	26	50	42	66	52	72	30	18	12	227	74
5	25	26	42	42	58	52	62	30	19	18	30	327
6	26	24	39	39	52	51	54	30	18	16	23	118
7	26	24	38	39	57	51	46	29	22	18	21	55
8	25	24	38	39	60	48	48	28	22	17	43	50
9	24	24	38	38	62	42	51	32	18	14	53	94
10	20	24	36	39	78	39	52	33	18	14	38	193
11	19	24	34	46	125	38	52	34	18	22	38	120
12	19	24	34	48	157	39	50	36	14	18	22	45
13	18	23	34	32	120	38	45	30	10	18	52	45
14	18	23	34	29	108	34	42	28	11	16	56	50
15	16	44	36	28	110	36	56	27	12	16	50	90
16	21	54	34	29	110	33	56	28	14	15	65	40
17	28	48	36	30	92	32	50	28	10	15	66	40
18	128	44	40	33	82	34	38	27	15	10	30	45
19	227	38	42	33	76	34	32	24	14	10	20	46
20	120	34	46	30	74	34	32	18	13	9	437	86
21	62	32	44	30	78	33	26	20	11	9	223	104
22	45	30	39	30	90	32	30	21	11	8	298	85
23	36	28	39	34	102	30	29	20	10	9	120	82
24	30	28	39	36	108	28	26	22	12	9	92	60
25	28	28	44	36	95	27	27	20	10	10	70	45
26	40	28	42	34	88	27	44	17	11	11	139	32
27	33	28	40	34	78	22	58	21	8.5	12	110	27
28	30	28	40	33	70	19	51	21	8.0	15	66	26
29	29	26	39	32	-	20	45	22	7.5	17	79	28
30	25	38	39	32	-----	54	38	22	8.5	16	206	23
31	25	-----	38	34	-----	88	-----	25	-----	14	280	-----
Total	1,254	901	1,330	1,093	2,335	1,249	1,498	816	415.5	410.1	3,026	2,283
Mean	40.5	30.0	42.9	35.3	83.4	40.3	49.9	26.3	13.8	13.2	97.6	76.1
Ac-ft	2,490	1,790	2,640	2,170	4,630	2,480	2,970	1,620	824	813	6,000	4,530

Calendar year 1962: Max 1,250 Min 8.6 Mean 102 Ac-ft 73,500  
Water year 1962-63: Max 437 Min 6.9 Mean 45.5 Ac-ft 32,960

Peak discharge (base, 800 cfs).--Aug. 20 (0400) 1,090 cfs (4.70 ft); Aug. 30 (2240) 1,220 cfs (4.87 ft).

Note.--No gage-height record July 12-29, Aug. 18, 19, Sept. 3, 7, 8, 11-18.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analysis, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

#### Low-flow partial-record stations

Measurements of streamflow in the state at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a general picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1963

Discharge measurements made at low-flow partial-record stations during water year 1963						
Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
8-3865	Rio Ruidoso near Ruidoso, N. Mex.	SW $\frac{1}{4}$ sec.19, T.11 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 3 miles west of Ruidoso.	17.2	1953-63	12-18-62 3- 8-63 6- 5-63 9-11-63	7.34 8.44 2.86 25.8
8-3866	Carrizo Creek at Ruidoso, N. Mex.	SW $\frac{1}{4}$ sec.26, T.11 S., R.13 E., at mouth at Ruidoso.	24.2	1953-63	12-18-62 2-18-63 3- 8-63 3-22-63 4-11-63 4-23-63 5- 7-63 5-22-63 5- 6-63 9-11-63	2.74 3.92 3.25 3.11 3.64 3.30 3.26 3.08 2.13 3.13
Gila River basin						
9-4299	Snow Creek near Mogollon, N. Mex.	Lat 33°24'50", long 108°29'40", about 1,000 ft below Gila Wilderness boundary, 17.5 miles east of Mogollon.	89.6	1958-63	6-17-62 10-16-62 3-20-63	1.69 1.32 1.86

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Crest-stage partial-record stations

The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained, and discharge measurements made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

## Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Arkansas River basin							
7-1544	Carrizozo Creek near Kenton, Okla.	NE¼ sec.31, T.31 N., R.37E., under bridge on New Mexico State Highway 18, 4 miles southwest of Kenton.	111	1953-63	7- -62 8- -63	1.56 5.99	(†) (†)
7-2010	Raton Creek at Raton, N. Mex.	Lat 36°54', long 104°26', 60 ft above bridge on State Highway 72 at Raton.	14.4	1953-63	9-19-62 1963	1.16 1.46	(†) (†)
7-2115	Canadian River near Taylor Springs, N. Mex.	NW¼ sec.27, T.24N., R.23E., 1 mile above Chico Creek, 2¼ miles below Cimarron Creek, and 2¼ miles south of Taylor Springs.	2,853	1940-58 1959-63	7-24-62 9-21-63	8.08 7.48	4,380 3,680
7-2137	Canadian River tributary near Mills, N. Mex.	NE¼ sec.3, T.22 N., R.25 E., on downstream end of left bridge abutment on State Highway 39, 6 miles north of Mills.	a4.2	1954-63	7-31-62 8- -63	3.55 1.30	700 50
7-2209	Dog Creek near Shoemaker, N. Mex.	Lat 35°49'32", long 104°53'28", 0.5 mile above Valmore-Shoemaker road, and 1.8 miles northwest of Shoemaker.	11.2	1954-63	8- 2-61 7- -62 6- -63	b7.81 9.91 7.91	730 (†) (†)
7-2216	Lagartija Creek tributary near Sanchez, N. Mex.	SW¼SE¼, sec.5, T.16 N., R.24 E., at bridge on State Highway 65, 0.9 miles northeast of Sanchez.	a1	1961-63	7- -62 8- -63	1.84 2.63	(†) (†)
7-2223	Trementina Creek at Trementina, N. Mex.	NW¼ sec.8, T.14N., R.24 E., at bridge on State Highway 65 at Trementina.	a65	1959-63	7- -62 8- -63	(c) (c)	(†) (†)
7-2250	Pajarito Creek at Newkirk, N. Mex.	SW¼SW¼ sec.24, T.10 N., R.25 E., on downstream side of bridge on U.S. Highway 66, 1 mile east of Newkirk.	a35	1954-63	9- -62 6- 2-63	8.09 .92	(†) 45
7-2255	Ute Creek near Gladstone, N. Mex.	On line of secs.14 and 23, T.24 N., R.28 E., on bridge on State Highway 58, 3 miles east of Gladstone.	256	1953-63	4- -62 9- -63	.63 6.85	(†) 10,700
7-2262	Bueyeros Creek at Bueyeros, N. Mex.	E¼ sec.7, T.20 N., R.31 E., on downstream end of right abutment of bridge on State Highway 57 at Bueyeros.	a34	1957-63	7-21-61 9- -62 1963	b7.43 3.90 (f)	5,240 (†) (†)
7-2263	Carrizo Creek near Roy, N. Mex.	NW¼SE¼ sec.16, T.21 N., R.28 E., 800 ft below State Highway 120, and 15 miles northeast of Roy.	a68	1954-63	7- -62 9- -63	3.03 4.51	(†) 534
7-2270.5	Plaza Larga Creek tributary near Ragland, N. Mex.	NE¼ sec.15, T.7 N., R.30 E., at culvert on State Highway 18, 1.2 miles northwest of Ragland.	a.5	1952-63	7-23-62 6-18-63	5.39 5.88	56 99
7-2271.5	Arroyo del Puerto near Endee, N. Mex.	SW¼SW¼ sec.26, T.10 N., R.36 E., at bridge on State Highway 93, 5.4 miles south of Endee.	a25	1961-63	7- -62 1963	8.28 1.38	(d) (†)
7-2272.95	Sandy Arroyo tributary near Clayton, N. Mex.	NW¼ sec.21, T.25 N., R.34 E., above culvert on State Highway 58, 8 miles southwest of Clayton.	-	1952-63	1962 7- -63	.70 .78	(†) (†)
7-2273	Sandy Arroyo near Clayton, N. Mex.	At center of boundary of secs.2 and 3, T.24 N., R.35 E., on downstream side of bridge on State Highway 18, 7.5 miles south of Clayton.	a42	1953-63	8- -61 1962 8- -63	b1.60 1.50 2.10	(†) (†) (†)
Brazos River basin							
8-0793	Blackwater Draw tributary near Floyd, N. Mex.	NW¼SW¼ sec.13, T.1 S., R.30 E., 0.5 mile below section road and 10 miles west of Floyd.	a10	1963	1963	—	0

Explanation of symbols used with partial-record crest-stage station listings will be given at end of the tables.

## Annual maximum discharge at crest-stage partial record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Colorado River basin							
8-1236.1	Seminole Draw tributary near Lovington, N. Mex.	NW¼NE¼ sec.4, T.17 S., R.35 E., ½ mile above culvert on State Highway 483, and 5.1 miles south of Lovington.	a2	1963	9- -63	.62	(†)
Rio Grande basin							
8-2640	Red River near Red River, N. Mex.	NE¼ sec.36, T.28 N., R.14 E. (projected), 100 ft below confluence of Middle and East Forks and 6 miles south of Red River.	19.2	1940-55† 1956-62 (m)	5- -62	2.75	138
8-2690	Rio Pueblo de Taos near Taos, N. Mex.	Sec.26, T.26 N., R.13 E., 2½ miles east of Taos Pueblo and 4½ miles northeast of Taos.	67.2	1911-16† 1940-51† 1952-62 (m)	5- -62	2.33	200
8-2710	Rio Lucero near Arroyo Seco, N. Mex.	NE¼ sec. 10, T.26 N., R.13 E. (projected), in Antoine Leroux Grant, 2 miles southeast of Arroyo Seco.	17.1	1911-15† 1933-51† 1952-62 (m)	1962	2.09	133
8-2774	Rio Grande tributary at Rinconada, N. Mex.	SW¼NW¼ sec.21, T.23 N., R.10 E., at culvert on U.S. Highway 64, 0.6 mile west of Rinconada.	.021	1952-63	1962 1963	.5 --	(†) 0
8-2790	Embudo Creek at Dixon, N. Mex.	NW¼SW¼ sec. 19, T.23 N., R.10 E., at bridge on U.S. Highway 64, 0.5 mile above mouth, ¾ mile east of Embudo Post Office, and 1.6 miles northwest of Dixon.	305	1923-24† 1926-55† 1956-62 (m)	5- -62	4.52	755
8-2812	Wolf Creek near Chama N. Mex.	Lat 36°57'20", long 106°32'10", at bridge on State Highway 19, and 4½ miles northeast of Chama.	27.7	1959-63	1962 1963	3.06 2.64	(†) (†)
8-2840	Rito de Tierra Amarilla at Tierra Amarilla, N. Mex.	Lat 36°41'55", long 106°33'25", 400 ft below culvert on U.S. Highway 84, at Tierra Amarilla.	49.7	1957-63	4- -62 3- -63	3.58 2.62	(†) 167
8-2867	Arroyo Seco near Abiquiu, N. Mex.	Lat 36°16'55", long 106°28'15", 1,000 ft below bridge on U.S. Highway 84, and 10 miles northwest of Abiquiu.	162	1953-63	5- -62 8- -63	4.44 3.89	(†) (d)
8-2880	El Rito near El Rito, N. Mex.	Sec.19, T.25 N., R.7 E., 3 miles northwest of El Rito.	49.8	1932-51† 1952-63†	5- -62 1963	3.49 2.38	329 86
8-2920	Santa Clara Creek near Espanola, N. Mex.	SW¼SW¼ sec.11, T.20 N., R.7 E., 5½ miles southwest of Espanola.	34.5	1936-41† 1949-50† 1952-63	1962 1963	2.89 2.56	84 55
8-2950	Rio Nambé near Nambé, N. Mex.	SE¼ sec.24, T.19 N., R.9 E., in Nambé Pueblo Grant, 2½ miles southeast of Nambé Pueblo and 3½ miles southeast of Nambé.	38.2	1931-51† 1952-63	8-22-61 1962 1963	b6.07 (c) (c)	695 (†) (†)
8-3025	Tesuque Creek above diversions, near Santa Fe, N. Mex.	NW¼ sec.5, T.17 N., R.10 E., 500 ft above point of diversion of Cajon Grande ditch, 1 mile above Little Tesuque Creek, and 4 miles northeast of Santa Fe.	11.7	1936-51† 1953-63	1962 1963	4.53 j3.74	470 242
8-3131	Canada Ancha Tributary near Santa Fe, N. Mex.	Lat 35°44'05", long 106°07'00", in Caja del Rio Grant, 9 miles northwest of Santa Fe.	1.23	1940-48e 1952-63	1962 7- -63	-- 3.63	0 12
8-3134	Bland Canyon near Cochiti, N. Mex.	Lat 35°42'11", long 106°24'56", 200 ft south of Forest Service road, 0.3 mile inside Santa Fe National Forest, 7.5 miles north of Cochiti.	a9	1962-63	1962 9- -63	(f) 1.12	(†) (†)
8-3171	Arroyo Yupa tributary near Cerrillos, N. Mex.	S¼ NE¼ sec.13, T.15 N., R.7 E., 300 ft above culvert on U.S. Highway 85, 1.4 miles southwest of Turquoise Trading Post, and 6.5 miles north of Cerrillos.	.47	1957-63	7-10-62 7- -63	.68 .93	(†) (†)

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
8-3175	Galisteo Creek at Canoncito, N. Mex.	NW¼NW¼ sec.7, T.15 N., R.11 E., above railroad bridge, 0.2 mile above Apache Canyon at Canoncito.	11.3	1955-56 1959-63	8-14-61 7- -62 9- -63	2.81 2.79 3.78	899 (†) (†)
8-3176	San Cristobal Arroyo near Galisteo, N. Mex.	Lat 35°22'55", long 105°51'05", at bridge on U.S. Highway 285, 5½ miles east of Galisteo.	116	1955-63	8-17-61 7-24-62 9- -63	13.34 9.86 6.47	(d) (†) 1,650
8-3177	Jaspe Arroyo tributary near Galisteo, N. Mex.	Lat 35°21'55", long 105°50'40", at culvert on U.S. Highway 285, 6 miles southeast of Galisteo.	a1.5	1952-63	9- -62 9- -63	13.28 15.49	h107 h408
8-3178	Canada de las Minas tributary near Santa Fe, N. Mex.	Lat 35°36'27", long 105°54'42", at culvert on U.S. Highway 84,85, and 285, 1.3 miles north-east of Seton Village, and 5.7 miles south of Santa Fe.	0.56	1952-63	8-22-61 1962 7-10-63	b3.28 (f) 2.75	(†) (†) (d)
8-3189	San Pedro Creek near Golden, N. Mex.	Lat 36°13'45", long 106°18'00", 1 mile below bridge on State Highway 10 and 5½ miles southwest of Golden.	45.2	1953-63	8-23-61 7-10-62 9- -63	1.25 2.98 1.12	878 2,150 780
8-3219	Rio de las Vacas near Senorita, N. Mex.	Lat 35°59'35", long 106°47'45", at bridge on side road, 0.1 mile south of State Highway 126 and 6.5 miles east of Senorita.	26.8	1957-63	4- -62 1963	3.91 3.47	392 260
8-3219.2	Rock Creek near Cuba, N. Mex.	W½ sec.6, T.20 N., R.2 E., 1 mile east of State Highway 126, 8 miles east of village of Senorita, and 11 miles east of Cuba.	a3.7	1960-63	4- -62 1963	1.80 2.13	(†) (†)
8-3278	Arroyo Ojito at Zia Pueblo, N. Mex.	SE¼SE¼ sec.21, T.15 N., R.2 E., 100 ft upstream from culvert on State Highway 44, in Zia Pueblo Grant, 0.7 mile south of Zia Pueblo.	17.7	1961-63	8-14-61 7- -62 10-19-62	8.16 3.54 4.06	g5,360 (†) (†)
8-3304	Juan Toro Canyon near Miera, N. Mex.	W½SE¼ sec.7, T.9 N., R.6 E., 150 ft east of State Highway 10, 1 mile southeast of Cedro, and 4½ miles northwest of Miera.	1.57	1959-63	1962 8-12-63	(f) (f)	(†) (†)
8-3305	Tijeras Arroyo at Albuquerque, N. Mex.	Lat 35°03'40", long 106°28'40" 300 ft south of U.S. Highway 66 and 0.4 mile southeast of city limits of Albuquerque.	75.3	1943-48† 1958-63	7- 8-61 7- -62 9- -63	4.36 (f) 2.11	3,250 (†) (†)
8-3306	Tijeras Arroyo near Albuquerque, N. Mex.	SE¼SW¼ sec.17, T.9 N., R.3 E., at culvert on State Highway 47, 5.7 miles south of Central Avenue (U.S. Highway 66) in Albuquerque.	133	1952-63	7- -62 9- -63	1.46 1.16	750 (†)
8-3311	Belen Highline Canal tributary near Los Lunas, N. Mex.	Lat 34°49'20", long 106°49'10", above culvert on State Highway 6, 5.0 miles west of Los Lunas.	.16	1952-53 1955-63	9- -62 1963	3.76 3.63	(†) (†)
8-3316.5	Canada Montoso near Scholle, N. Mex.	SW¼SW¼ sec.12, T.2 N., R.4 E., 130 ft upstream from dip on abandoned highway, 700 ft upstream from bridge on U.S. Highway 60, 3.6 miles southwest of Scholle.	a35	1961-63	8-11-61 9- -62 1963	2.89 2.89 1.66	720 720 (†)
8-3317	Abo Arroyo tributary near Scholle, N. Mex.	Lat 34°24'10", long 106°30'35", at culvert on U.S. Highway 60, 2.5 miles southeast of junction of U.S. Highway 60 and State Highway 6, and 5.5 miles southwest of Scholle.	a.2	1954-63	9- -62 1963	4.18 (c)	(†) (†)
8-3413	Bluewater Creek above Bluewater Dam, near Bluewater, N. Mex.	NE¼ sec.20, T.12 N., R.12 W., 2.3 miles south of Bluewater Dam, and 8 miles west of Bluewater.	a75	1953-63	1962 1963	1.80 3.08	107 (†)
8-3485	Encinal Creek near Casa Blanca, N. Mex.	NW¼NW¼ sec.34, T.11 N., R.6 W., 1.8 miles north of Village of Encinal and 6.8 miles north of Casa Blanca.	6.19	1937-39† 1959-63	9- 9-61 8- -62 9- -63	5.27 5.02 2.59	2.88 261 31
8-3535	La Jencia Creek near Magdalena, N. Mex.	S½ sec. 1, T.2 S., R.4 W., 3½ miles northeast of Magdalena.	195	1957-63	7- 2-61 9- -62 8- 2-63	9.03 10.85 9.31	2,840 4,830 3,400
8-3536	La Jencia Creek tributary near Magdalena, N. Mex.	NE¼SE¼ sec.13, T.2 S., R.4 W., at Santa Fe Railroad bridge, 2.7 miles northeast of Magdalena.	5.67	1957-63	7- 2-61 8- -62 8- 2-63	4.10 1.81 1.90	2,510 (†) (†)

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
8-3586	Chupadera Wash tributary at Bingham, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.12, T.5 S., R.5 E., 75 ft upstream from culvert on U.S. Highway 380, 0.1 mile west of Bingham.	a1	1961-63	8- 2-62 8- 7-63	3.06 3.39	(†) (†)
8-3593	San Jose Arroyo near Monticello, N. Mex.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.10 S., R.4 W., at head of box canyon just below major tributary, 800 ft below culvert on U.S. Highway 85, 13 miles northeast of Monticello.	a27	1959-63	1962 9- -63	(f) 1.32	h200 (†)
8-3594	Lumber Canyon tributary near Monticello, N. Mex.	N $\frac{1}{4}$ NE $\frac{1}{4}$ sec.5, T.11 S., R.4 W., at culvert on U.S. Highway 85, 0.2 mile north of road to Red Rock ranger station, and 10.5 miles east of Monticello.	a.9	1952-63	8- -62 10- -62	.67 3.13	(†) (†)
8-3616.5	Percha Creek near Kingston, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.16 S., R.8 W., at bridge on State Highway 180, 3.3 miles east of Kingston.	21.5	1953-63	9- -61 8- -62 10- -62	b7.35 4.27 5.59	1,220 (†) (†)
8-3616.6	Percha Creek tributary near Kingston, N. Mex.	NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.14, T.16 S., R.8 W., 500 ft above culvert on State Highway 180, and 3.5 miles east of Kingston.	.58	1957-63	9- -61 8-21-62 10- -62	b1.31 3.50 1.85	80 323 (†)
8-3617	Percha Creek near Hillsboro, N. Mex.	SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.18, T.16S., R.7 W., 150 ft south of State Highway 180, and 2 miles west of Hillsboro.	35.4	1957-63	9- -61 7-19-62 8- -63	5.66 7.05 3.33	2,010 4,100 560
8-3618	Percha Creek at Caballo Dam near Arrey, N. Mex.	SW $\frac{1}{4}$ sec.24, T.16 S., R.5 W., at bridge on U.S. Highway 85, 0.5 mile above mouth and Caballo Reservoir, and 3.5 miles north of Arrey.	119	1953-63	7-10-62 1963	2.26 1.92	(†) (†)
8-3630.5	Arroyo Angostura (formerly Rio Grande tributary) near Rincon, N. Mex.	SE $\frac{1}{4}$ sec.13, T.19 S., R.3 W., 140 ft below dip on U.S. Highway 85, and 2.2 miles southwest of Rincon.	a8.5	1959-63	1962 9- -63	1.92 1.77	(†) (d)
8-3631	Rio Grande tributary near Radium Springs, N. Mex.	N $\frac{1}{4}$ NW $\frac{1}{4}$ sec.9, T.21 S., R.1 W., above culvert on U.S. Highway 85, 120 ft above mouth, and 1.4 miles west of Radium Springs.	.40	1955-63	1962 1963	5.82 5.65	(†) (†)
8-3632	Aleman Draw at Aleman, N. Mex.	SW $\frac{1}{4}$ sec.13, T.15 S., R.2 W., on Santa Fe Railroad bridge, 140 ft above dip on Engle-Rincon road, and $\frac{1}{4}$ mile west of Aleman.	a27	1959-63	7- -62 7- 9-63	5.58 6.00	(†) (d)
8-3793	Tecolote Creek at Tecolote, N. Mex.	Lat 35°27'20", long 105°16'55", on bridge on U.S. Highway 85 at Tecolote.	122	1954-63	8-17-61 1962 9- -63	12.92 7.94 6.08	12,300 2,140 800
8-3796	Pecos River tributary near Dilia, N. Mex.	Lat 35°12'50", long 105°04'50", above culvert on U.S. Highway 84, and 1.7 miles northwest of Dilia.	.16	1952-63	9- -61 1962 8- -63	1.02 .78 3.35	16 (†) (†)
8-3803	Gallinas River tributary at Gallinas, N. Mex.	Lat 35°41'19", long 105°21' 22", about 500 ft upstream from culvert on State Highway 65, at north edge of Gallinas.	a8	1957 1961-63	8-22-61 1962 1963	2.00 1.04 1.72	180 (†) (†)
8-3829	Pecos River tributary near Pintada, N. Mex.	Lat 34°58'06", long 105°05'38", in Anton Chico Grant, 1,500 ft south of U.S. Highway 66, 6.8 miles north of Pintada.	a10	1961-63	8-27-61 1962 1963	1.45 (f) (c)	117 (†) (†)
8-3832	Pintada Arroyo tributary near Clines Corners, N. Mex.	Lat 34°50'40", long 105°35'05", above culvert on U.S. Highway 285, 12.2 miles south of Clines Corners.	-	1952-63	7- -62 8- -63	1.64 1.54	(†) (†)
8-3832.1	Pintada Arroyo Tributary near Encino, N. Mex.	Lat 34°48'40", long 105° 34'00", above culvert on U.S. Highway 285, 0.1 mile south of ranch road, and 12 $\frac{1}{2}$ miles northwest of Encino.	a1	1959-63	1962 1963	(f) -	h1 0
8-3833	Pintada Arroyo near Santa Rosa, N. Mex.	NE $\frac{1}{4}$ sec.29, T.8 N., R.21 E., 300 ft above culvert on U.S. Highway 54, and 4 $\frac{1}{2}$ miles southwest of Santa Rosa.	896	1959-63	7-12-61 7- -62 8-25-63	5.52 5.85 2.40	2,980 (†) (†)
8-3833.7	Pecos River tributary near Puerto de Luna, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.32, T.8 N., R.22 E., 25 ft upstream from culvert on State Highway 91, 3.1 miles north of Puerto de Luna.	a2	1961-63	9-12-61 1962 8- -63	j8.0 6.39 5.23	116 (†) (†)

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Rio Grande basin--Continued							
8-3855.3	Alamosa Creek tributary near Jordan, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.7 N., R.28 E., 500 ft upstream from dip on State Highway 156, 6.9 miles west of Jordan.	a10	1962-63	9-19-62 5-27-63	2.47 1.99	(d) (†)
8-3856	Yeso Arroyo near Fort Sumner, N. Mex.	SE $\frac{1}{4}$ sec.35, T.1 N., R.25 E., at abandoned bridge 1 mile below State Highway 20, and 14.5 miles south of Fort Sumner.	242	1937 1952-63	7- -62 1963	2.20 2.04	(†) (†)
8-3856.7	Aragon Creek tributary near Encinosa, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.22, T.7 S., R.14 E., 0.3 mile upstream from wooden bridge on dirt road, 1.2 miles north of State Highway 48, 4.3 miles west of Encinosa.	6.07	1961-63	9- -61 1962 7- -63	5.1 2.91 3.51	1,610 (†) (d)
8-3856.9	Bonita Canyon tributary near Corona, N. Mex.	S $\frac{1}{2}$ sec.7, T.1 S., R.13 E., above culvert on U.S. Highway 54, and 1.8 miles southwest of Corona.	-	1959-63	1962 1963	1.47 (f)	(†) (†)
8-3857	Cloud Canyon near Gallinas, N. Mex.	SW $\frac{1}{4}$ sec.15, T.2 S., R.12 E., above culvert on U.S. Highway 54, and 2.0 miles southwest of Gallinas.	a10	1957-63	1962 1963	2.15 (f)	(†) (†)
8-3859	Salt Creek tributary near Roswell, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.9 S., R.24 E., at culvert on U.S. Highway 285, 4.7 miles north of junction of U.S. Highways 70 and 285, and 10 miles north of Roswell.	.045	1952-63	1962 1963	.58 2.07	(†) (†)
8-3880	Rio Ruidoso at Hondo, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.4, T.11 S., R.17 E., $\frac{1}{2}$ mile above confluence with Rio Bonito, and $\frac{1}{2}$ mile southwest of Hondo.	290	1931-55† 1956-62	8- 1-62 1963	7.7 (c)	1,990 (†)
8-3890	Rio Bonito near Fort Stanton, N. Mex.	SW $\frac{1}{4}$ sec.16, T.9 S., R.15 E., at bridge on U.S. Highway 380, 2.5 miles northeast of Fort Stanton.	a85	1955-63	1962 8- -63	4.11 4.10	(†) (†)
8-3890.6	Rio Bonito tributary near Fort Stanton, N. Mex.	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.15, T.9 S., R.15 E., at culvert on U.S. Highway 380, 150 ft above mouth, and 3.5 miles northeast of Fort Stanton.	.72	1955-63	7- -62 1963	2.69 -	(†) 0
8-3895	Rio Bonito at Hondo N. Mex.	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec.4, T.11 S., R.17 E., at bridge on U.S. Highway 70, at Hondo.	k295	1931-55† 1956-62	7-31-62 8-18-63	10.2 1.24	2,940 121
8-3901	Rio Hondo at Picacho, N. Mex.	W $\frac{1}{2}$ NW $\frac{1}{4}$ sec.15, T.11 S., R.18 E., by road bridge just off U.S. Highway 70, 1.3 miles northwest of Picacho.	715	1956-62†	8- -63	10.63	1,440
8-3901.5	Gallo Canyon (formerly Casey Canyon tributary) near Picacho, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.8, T.12S., R.18 E., 500 ft east of road, 5 miles south of Picacho.	a2	1962-63	1962 5- -63	(f) 2.54	(†) (†)
8-3937	Pancho Canyon near Arabella, N. Mex.	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.19, T.9 S., R.18 E., 200 ft downstream from dip on State Highway 368, 5.6 miles south of Arabella.	a16	1962-63	9-28-62 8-30-63	4.72 5.61	(†) (†)
8-3939	Eight Mile Draw near Roswell, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.32, T.10 S., R.23 E., and 6.5 miles west of Roswell.	397	1941 1952-63	1962 1963	(f) -	(†) 0
8-3973.9	Curtis Canyon near Mayhill, N. Mex.	E $\frac{1}{2}$ NE $\frac{1}{4}$ sec.4, T.17 S., R.14 E., $\frac{1}{2}$ mile above SCS dam, 0.4 mile west of State Highway 130, and 2.5 miles southwest of Mayhill.	10.3	1959-63	7-25-62 7- -63	1.51 1.45	(†) (†)
8-3974	Hyatt Canyon near Cloudcroft, N. Mex.	NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.9, T.16 S., R.13 E., $\frac{1}{2}$ mile south of State Highway 83, and 7 miles east of Cloudcroft.	3.08	1953-63	1962 9- 8-63	(f) .03	(†) (†)
8-3976	Rio Penaasco near Dunken, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.27, T.16 S., R.17 E., 1.5 miles above junction of State Highways 24 and 83, and $\frac{1}{2}$ miles north of Dunken.	a580	1952-56† 1956-62 1963	7- 8-63	4.47	314
8-3978	Bluewater Creek near Dunken, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.33, T.17 S., R.17 E., 300 ft above dip on State Highway 24, and 1.3 miles south of Dunken.	143	1958-63	8- 1-62 9- 5-63	3.53 1.60	(†) (†)

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

211

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Rio Grande basin--Continued							
8-4018	Rocky Arroyo near Carlsbad, N. Mex.	SW $\frac{1}{4}$ sec.23, T.21 S., R.24 E., 0.1 mile north of State Highway 137, 0.7 mile above dip on State Highway 137, and 14 miles west of Carlsbad.	254	1953-63	9- 3-62 8-13-63	43.20 44.88	6,900 (d)
8-4050.5	Last Chance Canyon tributary near Carlsbad Caverns, N. Mex.	E $\frac{1}{2}$ NW $\frac{1}{4}$ sec.21, T.23 S., R.23 E., above culvert on State Highway 137, 0.1 mile north of road to Sitting Bull Falls, and 12 $\frac{1}{2}$ miles northwest of Carlsbad Caverns.	a.2	1959-63	1962 9- -63	2.75 3.90	(†) (†)
8-4051	Mosely Canyon near White City, N. Mex.	SE $\frac{1}{4}$ sec.34, T.23 S., R.25 E., 600 ft below dip on Dark Canyon road, and 5 $\frac{1}{2}$ miles north of White City.	14.6	1959-63	1962 3-31-63	5.98 6.11	(†) (†)
8-4360	San Simon Swale tributary near Jal, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.4, T.25 S., R.35 E., 0.4 mile south of State Highway 128 and 10.7 miles west of Jal.	a20	1963	5- -63	(f)	(†)
Mimbres River basin							
8-4772	Iron Creek near Kingston, N. Mex.	Lat 32°54'50", long 107°46'35", 50 ft east of State Highway 180, 1.6 road miles west of Emory Pass, and 4.5 miles west of Kingston.	0.74	1955-63	9- -62 8- -63	4.12 4.27	(†) (†)
8-4775.6	Little Walnut Creek near Silver City, N. Mex.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.28, T.17 S., R.14 W., 85 ft above dip on Bear Mountain Road, and 2 miles north of Silver City.	5.10	1959-63	8- -62 8-16-63	2.23 2.40	(†) (d)
8-4775.7	Silva Creek tributary at Silver City, N. Mex.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.27, T.17 S., R.14 W., 350 ft above dip on Little Walnut Road, and 0.7 mile north of boundary of Silver City.	2.12	1958-63	7-20-62 8-16-63	2.64 (c)	270 (d)
8-4775.8	Silva Creek at Silver City, N. Mex.	Lat 32°46'41", long 108°16'41", 190 ft above Twelfth Street Bridge at Silver City.	10.0	1958-63	7-26-62 8-16-63	3.43 5.78	940 2,560
8-4775.9	Pinos Altos Creek at Silver City, N. Mex.	Lat 32°46'52", long 108°16'04", 2 blocks below U.S. Highway 260 at Silver City.	4.63	1958-63	7-20-62 8-16-63	3.49 (c)	840 (†)
8-4780	Cameron Creek at Central, N. Mex.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.36, T.17 S., R.13 W., 2,500 ft above culvert on U.S. Highway 260, at north edge of Central.	18.8	1954-63	7- -62 7- -63	1.46 1.76	(†) (†)
8-4780.2	Cherry Creek near White Signal, N. Mex.	NE $\frac{1}{4}$ sec.1, T.20 S., R.15 W., 180 ft above culvert on State Highway 180, and 3 $\frac{1}{2}$ miles northeast of White Signal.	3.80	1958-63 (n)	9-26-62 9- -63	.00 --	(†) --
8-4782	Mimbres River tributary near Spalding, N. Mex.	S $\frac{1}{2}$ sec.5, T.22 S., R.10 W., at culvert on U.S. Highway 260, 0.7 mile northeast of junction with State Highway 61, 4.5 miles southeast of Spalding.	--	1952-63	1962 10-18-62	1.50 1.00	(†) (†)
8-4875	Mimbres River at Deming, N. Mex.	On section line 22 and 27, T.23 S., R.9 W., at bridge on U.S. Highway 260, at north end of Deming.	1,370	1954-63	1962 8-21-63	.31 2.36	59 760
8-4786	Mimbres basin tributary near Florida, N. Mex.	Near boundary of sec.25 and 36, T.22 S., R.8 W., above culvert on State Highway 26, and 5 miles southwest of Florida.	a.4	1959-63	1962 8- -63	2.46 1.58	(†) (†)
8-4790	Hermanas Draw tributary at Hermanas, N. Mex.	SW $\frac{1}{4}$ sec.22, T.28 S., R.11 W., at Southern Pacific Railroad bridge, 110 ft above State Highway 9, 0.3 mile west of Hermanas.	10.8	1959-63	1962 1963	3.63 3.91	(†) (†)
8-4793	Deer Creek tributary near Antelope Wells, N. Mex.	Sec.6, T.34 S., R.18 W., 0.1 mile below dip on State Highway 79, 2 $\frac{1}{2}$ miles east of San Luis Pass, and 12 miles west of Antelope Wells.	a4.3	1959-63	1962 7- -63	.54 2.12	(†) (d)
Tularosa Valley							
8-4801	White Oaks Canyon at White Oaks, N. Mex.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.19, T.6 S., R.13 E., 40 ft upstream from culvert on State Highway 349, 1 mile northeast of White Oaks.	a3	1961-63	1962 9- 3-63	4.05 1.45	(†) (†)
8-4801.5	White Oaks Canyon near Carrizozo, N. Mex.	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.6, T.7 S., R.11 E., 100 ft upstream from culvert on U.S. Highway 54, 6 miles north of Carrizozo.	31	1959 1961-63	7-26-62 9- 3-63	4.49 (c)	(†) (†)



## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Tularosa Valley--Continued							
8-4802	Taylor Canyon tributary near Bingham, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.15, T.6 S., R.7 E., 200 ft north of U.S. Highway 380, 12 miles southeast of Bingham.	2.66	1961-63	8-12-61 9-29-62 9-3-63	2.39 1.09 .75	551 (†) (†)
8-4805.9	Tularosa basin tributary near Oscura, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.25, T.10 S., R.8 E., 50 ft below culvert on U.S. Highway 54, and 5.2 miles south of Oscura.	3.22	1958-63	1962 9- -63	(†) .63	(†) (†)
8-4806.5	Minnie Hall Draw near Three Rivers, N. Mex.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.35, T.10 S., R.9 E., 8 miles north-east of Three Rivers.	9.70	1956-63	1962 8- -63	111.1 113.1	(†) (†)
8-4807	Indian Creek near Three Rivers, N. Mex.	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.10, T.11 S., R.10 E., 150 ft above diversion dam, and 11 $\frac{1}{2}$ miles east of Three Rivers.	a6.8	1956-58 $\frac{1}{2}$ 1959-63	9- -61 9- -62 9- -63	7.50 2.74 7.10	g990 26 920
8-4809	Indian Creek at mouth near Three Rivers, N. Mex.	Lat 33°22'45", long 105°57'25", 75 ft above diversion dam, 0.35 mile above mouth, and 5 $\frac{1}{2}$ miles east of Three Rivers.	10.9	1956-58 $\frac{1}{2}$ 1959-63	1962 8- -63	3.50 4.50	158 445
8-4810	Three Rivers at Three Rivers, N. Mex.	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.3, T.12 S., R.9 E., 150 ft below Southern Pacific Railroad bridge, 400 ft above bridge on U.S. Highway 54, and 1.3 miles south of Three Rivers.	96.0	1956-63	7- -62 7- -63	12.6 4.80	g1,170 4,600
8-4811	Tularosa basin tributary near Three Rivers, N. Mex.	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.12 S., R.9 E., at culvert on U.S. Highway 54, 1.6 miles south of Three Rivers.	13.8	1952-63	1962 10- -62	.83 .30	1,980 260
8-4862	Black Prince Canyon tributary near Organ, N. Mex.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.33, T.21 S., R.4 E., above culvert on U.S. Highway 70, 2.3 miles east of San Augustin Pass, and 4.0 miles east of Organ.	.73	1959-63	1962 1963	.60 .53	(†) (†)
8-4864	Tularosa basin tributary near Orogrande, N. Mex.	S $\frac{1}{2}$ SE $\frac{1}{4}$ sec.1, T.22 S., R.8 E., at bridge on U.S. Highway 54, and 2.7 miles northeast of Orogrande.	2.53	1959-63	9- 4-62 9- -63	1.79 1.38	(†) (†)
Estancia Valley							
8-4880	Estancia Valley tributary at Cedar Grove, N. Mex.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.21, T.11 N., R.7 E., 50 ft upstream from culvert on State Highway 344, 0.1 mile south of Cedar Grove.	1.21	1955 1961-63	1962 9- -63	(†) 7.98	(†) (†)
8-4881	Juan Thomas Canyon near Edgewood, N. Mex.	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.19, T.10 N., R.7 E., 140 ft upstream from culvert on U.S. Highway 66, 2.5 miles northwest of Edgewood.	a20	1962-63	7- 9-62 1963	3.05 (†)	(†) (†)
8-4882	Osita Draw (formerly Estancia Valley tributary) near Clines Corners, N. Mex.	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec.17, T.9 N., R.11 E., 100 ft upstream from culvert on U.S. Highway 66, 7.5 miles west of Clines Corners.	a10	1961-63	9- -61 1962 1963	5.05 2.80 (†)	1,260 (†) (†)
8-4885	Canon de Torreon at Torreon, N. Mex.	Lat 34°43'20", long 106°17'50", at culvert on State Highway 19, in Torreon.	18.2	1954-63	8-11-61 1962 1963	2.44 1.22 2.29	1,220 (†) (†)
8-4890	Canada del Leon near Mountainair, N. Mex.	SE $\frac{1}{4}$ sec.10, T.2 N., R.7 E., $\frac{1}{2}$ mile above culvert on State Highway 10, and 8.4 miles southeast of Mountainair.	-	1953-63	1962 8- -63	-- 4.06	0 (d)
Salt basin							
8-4925	Cornucopia Canyon near Pinon, N. Mex.	NE $\frac{1}{4}$ sec.6, T.21 S., R.16 E., 0.2 mile above dip in ranch road, and 7.5 miles south of Pinon.	17.2	1959-63	8- -61 1962 1963	6.00 5.06 5.92	3,500 (†) (†)
San Juan River basin							
9-3462	Rio Amargo at Dulce, N. Mex.	NW $\frac{1}{4}$ sec.1, T.31 N., R.2 W., under bridge on State Highway 17, at Dulce.	168	1956-63	9-25-62 3- -63	1.56 5.28	(†) (†)
9-3508	Vaqueros Canyon near Gobernador, N. Mex.	SW $\frac{1}{4}$ sec.17, T.29 N., R.4 W., 100 ft east of State Highway 17 and 4.2 miles east of Gobernador.	a60	1956-63	9-27-61 8-27-63	2.12 4.49	58 g361
9-3557	Gobernador Canyon near Gobernador, N. Mex.	NW $\frac{1}{4}$ sec.36, T.29 N., R.6 W., 0.2 mile south of State Highway 17, and 4 miles southwest of Gobernador.	a22	1956-63	2-12-62 8- 6-63	3.81 19.3	(†) (d)

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
San Juan River basin--Continued							
9-3564	Manzanares Canyon near Turley, N. Mex.	W½SW¼ sec.8, T.29 N., R.8 W., 600 ft above culvert on State Highway 17 and 4.2 miles east of Turley.	a3.1	1956-63	1962 9- -63	(f) 1.38	(†) (†)
9-3567.5	Valdez Draw near Bloomfield, N. Mex.	NE¼SW¼ sec.20, T.29 N., R.10 W., above culvert on State Highway 17, 4 miles east of Bloomfield.	a1.3	1956-63	1961 1962 8- 6-63	2.07 1.85 7.28	40 17 (†)
9-3572	Gallegos Canyon tributary near Nageezi, N. Mex.	E½ sec.11, T.25 N., R.10 W., at culvert on State Highway 44, 1.1 miles northwest of Huerfano Trading Post and 12.5 miles northwest of Nageezi.	.04	1952-63	1962 10-17-62	-- j3.8	0 (†)
9-3675.3	San Juan River tributary near Kirtland, N. Mex.	NW¼NE¼ sec.15, T.29 N., R.14 W., on upstream side of abandoned culvert, 200 ft above U.S. Highway 550, 0.4 mile above mouth, and 3.3 miles east of Kirtland.	a3.0	1951-63	1962 8- 4-63	(f) j4.9	(†) (†)
9-3678.4	Yazzie Wash near Mexican Springs, N. Mex.	Lat 35°50'40", long 108°53'00", 5.0 miles northwest of Mexican Springs and 23 miles north of Gallup.	a2.1	1953-54 1956-63	8-24-61 1962 8- -63	4.11 1.33 3.19	g322 26 155
9-3678.6	Chusca Wash near Mexican Springs, N. Mex.	Lat 35°48'40", long 108°50'50", 1.8 miles northwest of Mexican Springs and 20 miles north of Gallup.	a8.7	1953-63	9-25-62 9- -63	1.57 3.86	242 1,400
9-3678.8	Catron Wash near Mexican Springs, N. Mex.	Lat 35°46'15", long 108°49'40", 1.5 miles south of Mexican Springs and 18 miles north of Gallup.	26.9	1954 1956-63	8-24-61 9-25-62 8- -63	b5.25 3.02 3.50	3,900 960 1,340
9-3679	Black Springs Wash near Mexican Springs, N. Mex.	Lat 35°45'40", long 108°49'00", 2.5 miles south of Mexican Springs and 17 miles north of Gallup.	7.05	1954-63	9-25-62 9- -63	-.10 .99	130 (d)
9-3679.5	Chaco River near Waterflow, N. Mex.	NE¼ sec.19, T.29 N., R.16 W., at Stanolind, 7 miles southwest of Waterflow, and 8 miles southeast of Shiprock.	4,350	1959-63	9- -61 1962 9- -63	b4.40 2.13 7.81	1,620 315 (†)
Little Colorado basin							
9-3861	Largo Creek near Quemado, N. Mex.	NE¼SE¼ sec.8, T.1 N., R.16 W., on downstream side of bridge on ranch road 2½ miles southwest of Quemado.	151	1954-63	1962 8- -63	1.63 2.42	(†) (†)
9-3861.5	Mangas Creek tributary near Pietown, N. Mex.	About at corner common to secs.13, 14, 23 and 24, T.1 N., R.13 W., above culvert on U.S. Highway 60, 1.3 miles west of Pietown Post Office.	-	1952-63	9-25-62 9- -63	.64 1.04	(†) (†)
9-3862	Carrizo Creek near Salt Lake, N. Mex.	SE¼ sec.3, T.3 N., R.21 W., on downstream side of bridge, 1.3 miles east of New Mexico-Arizona State line and 15 miles west of Salt Lake.	k560	1957-63	9-25-62 7- -63	.77 1.43	(†) (†)
9-3870.5	Galestena Canyon tributary near Black Rock, N. Mex.	SE¼ sec.30, T.9 N., R.17 W., 100 ft below bridge on State Highway 32 and 10.5 miles southeast of Black Rock.	a19	1957-63	1962 9- -63	1.51 6.09	(†) (d)
9-3954	Puerco River tributary near Fort Wingate, N. Mex.	Lat 35°25'55", long 108°33'30", 0.5 mile below culvert on secondary road between Fort Wingate and McGaffey and 3 miles south of Fort Wingate.	14.5	1949 1953-63	1962 1963	.69 -	(†) 0
9-3955	Puerco River at Gallup, N. Mex.	SW¼NW¼ sec.15, T.15 N., R.18 W., on right bank north of the Santa Fe RR. freight depot, 1,500 ft above Second Street Bridge at Gallup.	558	1940-46 † 1956-63	1962 8-10-63	4.00 8.25	860 4,950
9-3956	Puerco River tributary near Gamerco, N. Mex.	SE¼NE¼ sec.7, T.16 N., R.18 W., above abandoned culvert on former U.S. Highway 666, 0.5 mile north of junction of U.S. Highway 666 and State Highway 68, 4.5 miles north of Gamerco.	.42	1951-63	1962 8-10-63	.54 2.97	46 200

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Annual maximum discharge at crest-stage partial-record stations--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis-charge (cfs)
Gila River basin							
9-4298	Diamond Creek near Beaverhead, N. Mex.	E½ sec.7, T.12 S., R.12 W., 3.5 miles west of State Highway 61, 4 miles above Gila River, and 13 miles south of Beaverhead.	106	1957-63	1962 8-29-63	2.60 13.26	(†) (†)
*9-4299	Snow Creek near Mogollon, N. Mex.	Lat 33°24'50", long 108°29'40", 1,000 ft below Gila Wilderness boundary and 17.5 miles east of Mogollon.	89.6	1958-63	1962 1963	9.64 8.61	240 76
9-4303	Copperas Canyon near Pinos Altos, N. Mex.	NE¼SW¼ sec.17, T.14 S., R.13 W., on east side of Copperas Canyon road and 15 miles north of Pinos Altos.	4	1963	8- -63	3.38	(d)
9-4309	Duck Creek at Cliff, N. Mex.	SW¼SW¼ sec.28, T.15 S., R.17 W., at Cliff below bridge on State Highway 211, and 0.6 mile above mouth.	228	1957-63	9-26-62 8-21-63	5.96 10.30	(†) (†)
9-4310	Gila River near Cliff, N. Mex.	S½ sec.4, T.16 S., R.17 W., on downstream end of pair of bridge on U.S. Highway 260, 1½ miles downstream from Bear Creek, 1½ miles south of Cliff, and 2½ miles southwest of Gila.	2,438	1942-51† 1952-63	9- 8-61 8- 2-62 8-21-63	6.72 10.31 11.08	b2,410 8,720 10,300
9-4426.5	Trout Creek near New Mexico-Arizona State line near Luna, N. Mex.	W¼ sec.34, T.4 S., R.21 W., at culvert on Luna-Underwood Lake road, about 1 mile east of N. Mex.-Ariz. State line, and 8 miles north-west of Luna.	a9.9	1958-63	1962 3- -63	8.48 8.21	35 21
9-4426.6	Trout Creek near Luna, N. Mex.	NW¼ sec.29, T.5 S., R.20 W., 500 ft downstream from bridge on Luna-Red Hill road and 2.6 miles north of Luna.	a32	1954-63	1962 3- -63	1.81 1.65	138 105
9-4426.9	Tularosa River near Aragon, N. Mex.	NW¼ sec.3, T.5 S., R.16 W., about 100 ft to the left of State Highway 12 and 2 miles north-east of Aragon.	a89	1955-63	1962 8- -63	4.21 3.96	26 20
9-4426.95	Rito Negrito at Aragon, N. Mex.	NW¼NW¼ sec.18, T.5 S., R.16 W., above culvert on State Highway 12, at west edge of Aragon.	9.46	1958-63	9-10-61 1962 9-19-63	16.0 (f) 3.68	1,050 (†) 440
9-4427	Apache Creek near Apache Creek, N. Mex.	E½ sec.25, T.4 S., R.18 W., 7 miles north of Apache Creek.	94.6	1957-63	1962 9- -63	(f) 1.29	(†) (d)
9-4427.4	Tularosa River near Reserve, N. Mex.	SE¼ sec.33, T.6 S., R.18 W., 150 ft west of Eagle Peak Lookout road and 3.3 miles north-east of Reserve.	426	1956-63	1962 8- -63	1.84 3.67	165 700
9-4439.5	Colt Canyon at Pleasanton, N. Mex.	E½NE¼ sec.14, T.12 S., R.20 W., 175 ft above abandoned dip, 350 ft above culvert on U.S. Highway 260, about 1 mile south of Pleasanton.	3.1	1959-63	1962 8- -63	1.27 1.71	(†) (†)
9-4558	Steins Creek at Steins, N. Mex.	S½SE¼ sec.9, T.24 S., R.21 W., at culvert on State Highway 14, 0.9 mile west of Steins.	-	1959-63	1962 9- -63	3.29 4.08	(†) (d)
Animas Valley							
9-5390	Animas Creek near Cloverdale, N. Mex.	NE¼ sec.33, T.31 S., R.20 W., near head of small box canyon, 0.1 mile west of State Highway 338, and 11 miles north of Cloverdale.	157	1959-63	1962 1963	4.63 5.83	620 1,360

† Discharge not determined.

‡ Operated as a continuous-record gaging station.

\* Also low-flow station.

a Approximately.

b Revised.

c Gage height pending.

d Measurement computations not complete.

e Operated as a continuous-record gaging station by S.C.S.

f Peak did not reach bottom of gage.

g Unreviewed measurement.

h Estimated.

j From high-water mark.

k Contributing area.

m Converted to regular gaging station.

n Discontinued at end of water year.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

215

## Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table. Those that are measurements of base flow are designated by an asterisk(\*); measurements of peak flow by a dagger (†). Listings are in downstream order, by basins, streams, and individual measuring points. The order of major basins in this report will be: LOWER MISSISSIPPI BASIN, WESTERN GULF OF MEXICO BASINS, COLORADO RIVER BASIN.

## Discharge measurements made at miscellaneous sites during water year 1963

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin						
Red River	Rio Grande	SW $\frac{1}{4}$ sec.6, T.28 N., R.15 E., at Tall Pine Camp 1 $\frac{1}{2}$ miles above Town of Red River.	-	-	12- 4-61 12-15-61 12-26-61 1- 9-62 1-22-62 2- 8-62 2-19-62 3- 7-62 3-19-62 4- 2-62 4-12-62 4-24-62 5- 7-62 1-30-63 2-14-63 2-27-63 3-24-63	*7.78 *11.4 *5.27 *7.75 *5.97 *8.13 *5.78 *8.28 *6.21 15.7 19.8 35.2 31.4 *6.77 *6.28 *5.96 10.8
Rio del Oso	Rio Chama	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.35, T.22 N., R.7 E., 0.7 mile above U.S. 84, 0.8 mile west of Chili, and 3.5 miles northwest of Hernandez, N. Mex.	41.2	-	8-22-61	†11,600
Arroyo de la Presa	Rio Chama	NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.12, T.21 N., R.7 E., 1.2 miles west of Hernandez, N. Mex.	11.0	-	8-22-61	†12,300
Arroyo Cuyamungue	Rio Tesuque	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.17, T.19 N., R.9 E., 0.2 mile above U.S. Highway 84, 64, and 285, 1.4 miles south-east of Pojoaque, N. Mex.	3.86	-	8-22-61	†5,770
Santa Fe River	Rio Grande	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.24, T.17 N., R.10 E., at head of McClure Reservoir, 6 $\frac{1}{2}$ miles east of Santa Fe, N. Mex.	a15	1931-59 1962	11- 2-62 5- 2-63	*1.44 10.1
Hahn Arroyo	Rio Grande	SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.33, T.11 N., R.3 E. (projected), at culvert 5546, on Edith Blvd. NE, within Albuquerque, N. Mex.	7.6	-	8-11-61	†935
Arroyo del Embudo	Rio Grande	SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec.18, T.10 N., R.4 E., above Pennsylvania Ave. and below Hendola Dr. within city limits of Albuquerque, N. Mex.	14.6	-	8-11-61	†518
Tributary	Arroyo del Embudo	SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec.17, T.10 N., R.4 E., at intersection of I. 40 and Wyoming Blvd. within city limits of Albuquerque, N. Mex.	7.7	-	8-11-61	†572
Arroyo del Embudo	Rio Grande	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.12, T.10 N., R.3 E., above Palomas Drive, NE, and below San Pedro Drive, NE, within city limits of Albuquerque, N. Mex.	27.5	-	8-11-61	†3,590
Arroyo del Embudo	Rio Grande	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec.9, T.10 N., R.3 E., below Princeton Drive, NE, within city limits of Albuquerque, N. Mex.	34.1	-	8-11-61	†3,620
Tributary	Belen Highline Canal (Rio Grande)	Lat 34°45'28", long 106°47'13", 2.8 miles north-west of Los Chavez, N. Mex.	0.86	-	6-14-61	†2,230
Alamosa River	Rio Grande	SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.26, T.9 S., R.7 W., above San Mateo Canyon, 8 miles northwest of Monticello, N. Mex.	-	1961-62	10-26-62 12- 4-62 1- 9-63 1-21-63 2- 8-63 3- 8-63 4- 3-63 6-12-63 7-26-63 9-16-63	*3.69 *3.90 *4.11 *3.99 *3.77 *3.90 *3.71 *3.89 *1.58 *0.34

Note.--Symbols and footnotes are at end of list.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Measurements at miscellaneous sites

## Discharge measurements made at miscellaneous sites during water year 1963

Discharge measurements made at miscellaneous sites during water year 1963						
Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin (continued)						
Alamosa River	Rio Grande	E½ sec. 1, T.10 S., R.7 W., below Shipman Canyon, 6 miles northwest of Monticello, N. Mex.	-	1961-62	10-26-62	*7.67
					1-24-62	*6.74
					1- 9-63	*7.06
					1-21-63	*7.82
					2- 8-63	*6.54
					3- 8-63	*6.22
					4- 3-63	*6.42
					6-12-63	*6.45
					7-26-63	*4.28
					9-16-63	*2.36
Cuchilla Negro Creek	do	N½ sec.20, T.12 S., R.6 W., ½ mile above diversion, 7 miles west of Cuchillo, N. Mex.	-	1961-62	10-26-62	*3.19
					12- 5-62	*2.26
					1- 9-63	*2.39
					1-21-63	*1.95
					2- 8-63	*2.03
					3- 8-63	*2.39
					4- 4-63	*2.59
					6-11-63	*1.55
					7-26-63	*2.81
					9-18-63	*2.12
Palomas River	do	Sec.4, T.13 S., R.6 W., at box canyon, above diversion, about 13 miles northwest of Truth or Consequences, N. Mex.	-	1961-62	10-26-62	*3.14
					12- 4-62	*3.99
					1-10-63	*4.11
					1-21-63	*4.84
					2- 8-63	*4.84
					3- 8-63	*5.65
					4- 4-63	*6.21
					6-11-63	*2.89
					7-26-63	*1.53
					9-16-63	*3.82
do	do	SW¼ sec.5, T.14 S., R.5 W., above Palomas Community ditch, about 7 miles west of Truth or Consequences, N. Mex.	-	1961-62	10-26-62	*1.74
					12- 4-62	*2.76
					1-10-63	*2.65
					1-21-63	*2.79
					2- 8-63	*2.45
					3- 8-63	*2.14
					4- 4-63	*2.58
					6-11-63	*1.53
					7-26-63	*1.02
					9-16-63	*1.86
Carrizo Creek	Rio Ruidoso	NW¼ sec.4, T.12 S., R.13 E., at proposed damsite 1 mile upstream from Mescalero Apache Indian Reservation boundary, 3 miles above mouth, and 2 miles south of Ruidoso, N. Mex.	-	-	2- 6-63	*0.96
					2-18-63	*1.98
					3- 8-63	*2.09
					3-22-63	*1.62
					4-11-63	*1.33
					4-23-63	*.93
					5- 7-63	*.75
					5-22-63	*.32
					6- 6-63	*.10
do	do	SW¼ sec.33, T.11 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 2 miles above mouth, and 1½ miles south of Ruidoso, N. Mex.	-	1961-62	12-18-62	*1.35
					1- 8-63	*1.40
					2-18-63	*2.33
					3- 8-63	*2.95
					3-22-63	*1.98
					4-11-63	*2.50
					5- 7-63	*1.90
					5-22-63	*1.65
					6- 6-63	*1.31
					9-11-63	*1.38
Silver Springs Canyon	Elk Canyon	SE¼SE¼ sec.15, T.15 S., R.13 E., at Mescalero Apache Indian Reservation boundary, 6.2 miles northeast of Cloudcroft, N. Mex.	-	1958-62	12-17-62	*.38
					3-21-63	*.17
					6- 5-63	*.21
					9-10-63	1.14
do	do	SE¼NE¼ sec.14, T.15 S., R.13 E., at Parshall flume 1 mile downstream from Mescalero Apache Indian Reservation boundary, 7.2 miles northeast of Cloudcroft, N. Mex.	-	1961-62	12-17-62	*.67
					3-21-63	*.56
					6- 5-63	*.40
					9-10-63	1.40

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

217

## Measurements at miscellaneous sites

## Discharge measurements made at miscellaneous sites during water year 1963

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
Rio Grande basin (continued)						
Silver Springs	Elk Canyon	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.34, T.14 S., R.14 E., 3/4 mile above mouth, 12.2 miles northeast of Cloudfcroft, N. Mex.	-	1958-62	12-17-62 3-21-63 6- 5-63 9-10-63	*0.31 0 0 0
Black River	Pecos River	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec.3, T.26 S., R.24 E., below Mayes Ranch, 10 miles southwest of White City, N.Mex.	-	1953-62	10- 3-62 10-24-62 12- 3-62 1- 3-63 2- 8-63 2-27-63 4-12-63 5- 3-63 5-27-63 6-28-63 8- 8-63 9-11-63 9-30-63	b .53 b .65 b .56 b .84 b .54 b .53 b .62 b .59 b .51 b .43 b .33 b .46 b .44
Rattlesnake Springs	Black River	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec.23, T.25 S., R.24 E., 5 miles south of Carlsbad Caverns, 7.2 miles southwest of White City, and 25 miles southwest of Carlsbad, N. Mex.	-	1952-62	10- 3-62 10-24-62 12- 3-62 1- 3-63 2- 8-63 2-27-63 4-12-63 5- 3-63 5-27-63 6-28-63 8- 8-63 9-11-63 9-30-63	b 1.91 b 2.10 b 2.26 b 2.35 c 2.03 b 1.94 c .39 b .82 b 1.52 b .08 b .01 1.42 1.52
Blue Springs	do	SW $\frac{1}{4}$ sec.27, T.24 S., R.26 E., above all diversions 5 $\frac{1}{2}$ miles east of White City, N. Mex.	-	1907 1952-62	10-3-62 10-24-62 12- 3-62 1- 3-63 2- 8-63 2-27-63 4-12-63 5- 3-63 5-27-63 6-28-63 8- 8-63 9-11-63 9-30-63	b 10.2 b 9.65 b 9.73 b 9.77 b 11.9 b 12.3 b 11.0 b 10.3 b 9.45 b 9.76 b 9.43 b 7.90 b 9.11
San Juan River basin						
San Juan River	Colorado River	SE $\frac{1}{4}$ sec.10, T.30 N., R.8 W., 3 miles above gaging station "near Archuleta", and 3 $\frac{1}{2}$ miles below Navajo Dam.	-	-	8-15-63 8-21-63	309 315
do	do	SE $\frac{1}{4}$ sec.18, T.29 N., R.9 W., at river mile 125, at State Highway 17, 1 mile east of Blanco, N. Mex.	3,560	1927-55 $\frac{1}{2}$ 1962	7-24-63	190
do	do	Sec.27, T.29 N., R.12 W., at river mile 107, 5 $\frac{1}{2}$ miles southwest of Bloomfield, and 7 miles southeast of Farmington, N. Mex.	-	1962	7-24-63	202
do	do	SE $\frac{1}{4}$ sec.21, T.29 N., R.13 W., at river mile 99, above Animas River, 1 mile south of Farmington, N. Mex.	a 5,880	1962	7-24-63 7-25-63 8-14-63	203 278 256
Animas River	San Juan River	SW $\frac{1}{4}$ sec.9, T.30 N., R.11 W., at bridge $\frac{1}{2}$ mile west of Aztec, 15 miles upstream from mouth.	a 1,270	1904 1907-15 $\frac{1}{2}$	7-25-63	199
San Juan River	Colorado River	SE $\frac{1}{4}$ sec.12, T.29 N., R.14 W., at river mile 95, below mouth of La Plata River, 3 miles west of Farmington, N. Mex.	a 7,830	1962	7-26-63	286
do	do	E $\frac{1}{2}$ sec.8, T.29 N., R.16 W., at river mile 75, below Hogback diversion, 7 $\frac{1}{2}$ miles east of Shiprock, N. Mex.	-	-	10-10-62 11- 1-62	353 d523 503 d633

### Measurements at miscellaneous sites

Discharge measurements made at miscellaneous sites during water year 1963

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
San Juan River basin (continued)						
San Juan River	Colorado River	(Continued)			11-23-62	683
						d683
					11-29-62	652
						d652
					12- 7-62	523
						d523
					12-14-62	477
						d477
					12-21-62	494
						d494
					2-15-63	510
						d510
					2-28-63	471
						d471
					3-11-63	505
						d505
					3-18-63	444
	d444					
4-29-63	312					
	d575					
7-15-63	364					
	d569					
7-22-63	20					
	d217					
7-26-63	45.5					
	d355					
7-30-63	17					
	d217					
8-19-63	184					
	d382					
8-26-63	369					
	d596					
Hogback Indian Canal	San Juan River	E½ sec.8, T.29 N., R.16 W., at river mile 75, below Hogback diversion, 7½ miles east of Shiprock, N. Mex.	-	-	10-10-62	162
					11- 1-62	117
					11-23-62	0
					11-29-62	0
					12- 7-62	0
					12-14-62	0
					12-21-62	0
					2-15-63	0
					2-28-63	0
					3-11-63	0
					3-18-63	0
					4-29-63	256
					7-15-63	196
					7-22-63	184
					7-26-63	278
					7-30-63	192
					8-19-63	189
8-26-63	205					
Main Canal South	San Juan River	E½ sec.8, T.29 N., R.16 W., at river mile 75, below Hogback diversion, 7½ miles east of Shiprock, N. Mex.	-	-	10-10-62	7.52
					11- 1-62	4.43
					11-23-62	0
					11-29-62	0
					12- 7-62	0
					12-14-62	0
					12-21-62	0
					2-15-63	0
					2-28-63	0
					3-11-63	0
					3-18-63	0
					4-29-63	6.15
					7-15-63	0
					7-22-63	0
					7-26-63	0
					7-30-63	0
					8-19-63	9.05
8-26-63	21.9					

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

219

## Measurements at miscellaneous sites

## Discharge measurements made at miscellaneous sites during water year 1963

Stream	Tributary to	Location	Drainage area (sq mi)	Measured previously (water years)	Measurements	
					Date	Discharge (cfs)
San Juan River basin (continued)						
1st Indian ditch south	San Juan River	E½ sec.8, T.29 N., R.16 W., at river mile 75, below Hogback diversion, 7½ miles east of Shiprock, N. Mex.	-	-	10-10-62	0
					11- 1-62	8.96
					11-23-62	0
					11-29-62	0
					12- 7-62	0
					12-14-62	0
					12-21-62	0
					2-15-63	0
					2-28-63	0
					3-11-63	0
					3-18-63	0
					4-29-63	1.24
					7-15-63	8.71
					7-22-63	12.8
					7-26-63	11.4
					7-30-63	7.76
					8-19-63	0
					8-26-63	0
		Gila River basin				
New Model Canal	Gila River	NE¼SW¼ sec.6, T.19 S., R.21 W., 500 ft above New Mexico-Arizona State line and 2-3/4 miles west of Virden, N. Mex.	-	1939-53 1953-63	10- 1-62	0
					11- 7-62	4.50
					11-26-62	0
					1- 3-63	0
					1-25-63	0
					3-19-63	20.4
					5- 1-63	10-7
					5-24-63	0
					6-10-63	0
					6-25-63	0
					7-24-63	0
					9-19-63	6.57

\* Base flow.

† Peak flow.

‡ Former gaging station.

a Approximately.

b Spring flow.

c Flow affected by pumpage for Carlsbad Caverns water supply.

d Total flow in valley cross section.



## RIO GRANDE BASIN

## Rio Grande Seepage Investigation

A related series of discharge measurements was made Aug. 8, 9, 1963 covering a reach from the U. S. G. S. gaging station "near Lobatos" to the gaging station "at Embudo." During this series of discharge measurements a reach on the Red River (left-bank-tributary) was covered from the gaging station "near Questa" to the gaging station at mouth.

Another series of discharge measurements was made Oct. 14, 1963, covering a portion of the Aug. 8-9 reach. These measurements were made between the gaging stations "near Cerro" and the gaging station "at Embudo."

Stream and Location	Discharge in cubic feet per second					
	Aug. 8		Aug. 9		Oct. 14	
	Main stream	Tributary or diversion	Main stream	Tributary or diversion	Main stream	Tributary or diversion
Rio Grande near Lobatos, Colo. .... (gaging station)	11.2					
Costilla Creek near Jaroso, Colo. .... (former gaging station near mouth)		0				
Rio Grande below Ute Mountain .... Sec.31, T. 31 N., R.12 E.	14.5					
Latir Creek at mouth ..... Sec.32, T.30 N., R.12 E.		0				
Rio Grande below Latir Creek ..... Sec.32, T.30 N., R.12 E.	49.0					
Rio Grande below Rattlesnake Trail..... Sec.5, T.29 N., R.12 E.	59.1					
Rio Grande near Cerro, N. Mex..... (gaging station)	61.8				69.4	
Rio Grande at Bear Crossing ..... Sec.31, T.29 N., R.12 E.	56.1					
Rio Grande at Hole in Rock Trail ..... Sec.6, T.28 N., R.12 E.					97.3	
South ditch near Questa (left bank..... bypass canal, opposite river mile 9.2; established as a gaging station 10-2-63)		5.62				
Red River near Questa, at river..... mile 9.0 (regular gaging station)		10.5				
Red River at Canyon mouth, ..... Sec.2, T.28 N., R.12 E., at river mile 5.5.		16.5				
Red River near State Fish Hatchery..... Sec.9, T.28 N., R.12 E., river mile 3.5.		35.6				
Red River below State Fish Hatchery..... Sec.16, T.28 N., R.12 E., river mile 2.0		42.6				
Red River at mouth near Questa,..... river mile 0.15 (regular gaging station)		49.4			45.5	
Rio Grande below Red River ..... Sec.20, T.28 N., R.12 E.	156				157	
San Cristobal Creek below irrigation.... Sec.20, T.27 N., R.12 E.		.16				0
Rio Hondo near mouth,..... Sec.31, T.27 N., R.12 E.		6.91				7.47
Rio Grande near Arroyo Hondo, N. Mex. (regular gaging station)	171		168		167	
Rio Grande $1\frac{1}{2}$ miles below Bridge site ...					163	
Rio Grande at Rattlesnake Trail, near Taos Sec.36, T.26 N., R.11 E.			151			

RIO GRANDE BASIN

221

Rio Grande Seepage Investigation -- Continued

Stream and Location	Discharge in cubic feet per second					
	Aug. 8		Aug. 9		Oct. 14	
	Main stream	Tributary or diversion	Main stream	Tributary or diversion	Main stream	Tributary or diversion
Rio Grande above mouth of Rio Pueblo . . . . de Taos, Sec.1, T.24 N., R.11 E.					186	
Rio Pueblo de Taos at mouth, . . . . . Sec.1, T.24 N., R.11 E.				8.22		7.48
Rio Grande below Taos Junction Bridge, . . . near Taos, N. Mex. (regular gaging station)			193		190	
Pilar Diversion at Pilar, Sec.32, T.24 N., R.11 E.				.33		
Rio Grande at Glenwoody Bridge . . . . . Sec.12, T.23 N., R.10 E.			184			
Rinconada ditch near Rinconada, . . . . . Sec.15, T.23 N., R.10 E.				3.18		
Bolso ditch at Rinconada, . . . . . Sec.15, T.23 N., R.10 E.				.42		
Embudo Creek above mouth, . . . . . Sec.19, T.23 N., R.10 E.				4.63		9.04
Rio Grande at Embudo, . . . . . (regular gaging station)			213		206	

PECOS RIVER SEEPAGE INVESTIGATION  
Anton Chico to Walker Ranch, above Santa Rosa, N. Mex.

A series of discharge measurements was made Apr. 17, 1963, to study gains and losses of the Pecos River from the regular gaging station "near Anton Chico" to the ford at Walker Ranch (River Ranch), 8 miles northwest of Santa Rosa, N. Mex. There are no surface diversions in this reach. Bado de Juan Pais community ditch, which diverts from the Pecos upstream from the Anton Chico gage, was measured at a site opposite this gage. A portion of this water was returned to the river at mile 311.4.

The river channel is normally dry from above the mouth of the Gallinas River (river mile 300) to below Colonias (river mile 285). The only occurrence of flow through this reach is during periods of snow melt or flood runoff.

Overlap measurements were made at various sites. The results are listed one above the other in the tabulation below. The discharge shown above the line was the last measured by the engineer working downstream to this site and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1950.

River mile locations were obtained from the U. S. Geological Survey Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Previous seepage investigations of this reach were made in December 1954, May 1955, and April 1961. Results are published in the appropriate WSP or State Report.

Indicated gains or losses may be considerably in error because of fluctuations in discharge during the investigation. The regular gage "near Anton Chico" recorded a range in discharge from 165 cfs to 199 cfs during the 24 hours preceding the start of the investigation. A temporary recorder at river mile 295.0 showed a range in discharge from 113 cfs to 147 cfs during the day of the investigation. A similar recorder at Walker Ranch (river mile 277.8) showed a range from 63 cfs to 72 cfs during the same period. This diurnal fluctuation, the result of snow melt in the headwaters of the Pecos, is unavoidable. The Gallinas River was dry at its mouth during the period of the investigation.

Measuring conditions at the individual sites were rated from fair to good. Overall results of the investigation are rated as fair because of the magnitude of the fluctuation in discharge.

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
316.5	Pecos River	Lat 35°10'45", long 105°06'30", 2½ miles southeast of Anton Chico (regular gaging station)	0910	52	185	-	-
-	Bado de Juan Pais ditch†	Lat 35°11'20", long 105°06'20", opposite Pecos River gaging station	1020	52	-	(24.3)	-
314.0	Pecos River	Lat 35°10'10", long 105°05'00", ½ mile below Canyon Blanco	1110	58	192	-	+7
311.4 (mouth)	Bado de Juan Pais ditch Wasteway†	Lat 35°10'30", long 105°02'50", ½ mile above mouth	1400	64	-	+4.94	-
310.5	Pecos River	Lat 35°10'20", long 105°02'00", below all irrigation at Dilia	1250	58	189	-	-8
308.3	do.	Lat 35°11'40", long 105°01'20", below arroyo from left	1500	58	197	-	+8
307.0	Spring Creek†	Lat 35°11'20", long 105°00'10", at mouth.....	1620	59	-	Est. +.4	-
307.0	Pecos River	Lat 35°11'20", long 105°00'00", below Spring Creek	<u>1630</u> 0850	<u>60</u> 47	<u>170</u> 192	-	<u>-27</u> -
305.1	do.	Lat 35°11'30", long 104°58'20", at ford at La Cueva ruins	0940	52	196	-	+4
303.3	do.	Lat 35°11'10", long 104°57'20", below arroyo from left	1050	56	187	-	-9
302.0	do.	Lat 35°10'40", long 104°57'00".....	1310	61	187	-	0
300.7	do.	Lat 35°10'20", long 104°56'30".....	1210	58	171	-	-16
296.9	do.	Lat 35°09'40", long 104°55'40", 0.7 mile below Gallinas River	<u>1440</u> 0950	<u>64</u> 54	<u>142</u> 147	-	<u>-29</u> -
295.0	do.	Lat 35°09'00", long 104°55'20", at ford (temporary recorder)	1115	58	138	-	-9
293.2	do.	Lat 35°08'30", long 104°53'30".....	1230	62	121	-	-17
291.3	do.	Lat 35°07'50", long 104°52'30", at abandoned diversion dam	1345	64	116	-	-5
288.6	do.	Lat 35°06'50", long 104°50'40", at ford at Colonias	<u>1450</u> 0815	<u>65</u> 48	<u>89.4</u> 76.5	-	<u>-26.6</u> -
287.0	do.	Lat 35°06'00", long 104°49'50".....	0910	52	56.3	-	-20.2
285.4	do.	Lat 35°05'20", long 104°49'00".....	1010	59	51.4	-	-4.9
284.4	do.	Lat 35°05'30", long 104°47'50".....	1130	66	49.7	-	-1.7
283.2	do.	Lat 35°05'10", long 104°47'10".....	1225	66	54.0	-	+4.3
277.8	do.	NW¼NW¼ sec. 32, T.10 N., R.21 E., at ford at Walker Ranch (River Ranch) (temporary recorder)	1620	67	62.6	-	+8.6

Note.-Measurements not involved in the computation of gains or losses of the Pecos River are enclosed in parentheses.

† Left bank.

PECOS RIVER SEEPAGE INVESTIGATION  
Acme to Artesia, N. Mex.

223

A series of discharge measurements was made Jan. 31 - Feb. 1, 1963, to study gains and losses of the Pecos River from the gaging station "near Acme" northeast of Roswell to the gaging station "near Artesia." All known tributary inflow was measured. There were no diversions that affected the results of this investigation.

Overlap measurements were made at various sites and the results listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1950.

Locations of measurement sites were obtained from standard U. S. Geological Survey quadrangle maps. River mile locations were obtained from the U. S. G. S. Plan and Profile of the Pecos River, Lake McMillan to Pecos, N. Mex., maps.

Previous seepage investigations of this reach were made at least once each water year during 1953-60, 1962. Results are published in the appropriate WSP or State Report.

Indicated gains and losses between adjacent measuring sites may be in error because of only fair to good measuring conditions at some sites. Weather conditions were good with no precipitation recorded prior to or during the run. Minimum daily temperatures at Roswell were well below freezing for several weeks prior to Jan. 30. A warming trend began on Jan. 30 and continued during the period of the investigation. There was no fluctuation in discharge because of ice effect. Regular gaging stations are located at river mile 94.0, 30.6, and 12.4, and temporary gages at river mile 74.5, 58.1 and 46.7. The fluctuation in discharge at each gage downstream from mile 74.5 was generally less than  $\pm 5\%$  of the average discharge during the 24-hour period that began 12 hours prior to the measurement. Fluctuation at mile 94.0 ranged  $\pm 15\%$  of the average. Overall results of the investigation are classed as good below mile 84.9 and fair to poor above this site.

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Jan. 31, 1963							
94.0	Pecos River	NW¼ sec.14, T.9 S., R.25 E., near Acme (regular gaging station)	0830	40	40.9	-	-
89.0	do.	SE¼SW¼SE¼ sec.27, T.9 S., R.25 E., above Bitter Lakes	1100	44	28.3	-	-12.6
84.9	do.	NE¼SW¼SW¼ sec.11, T.10 S., R.25 E., at Bitter Lakes above inflow	1155	46	30.2	-	+1.9
84.9	Inflow*	NE¼SW¼SW¼ sec.11, T.10 S., R.25 E., from old river channel at Bitter Lakes	1215	54	-	0.85	-
78.4	Pecos River	NE¼NE¼NE¼ sec.33, T.10 S., R.25 E., above mouth of Bitter Creek	1355	54	33.8	-	+2.8
-	Bitter Creek*	NW¼NE¼SW¼ sec.28, T.10 S., R.25 E., 0.9 mile above mouth	1000	44	-	(5.36)	-
78.4	do.	NE¼NE¼NE¼ sec.33, T.10 S., R.25 E., at mouth....	1425	56	-	5.76	(+4.40)
77.5	Pecos River	NE¼SW¼SW¼ sec.34, T.10 S., R.25 E., at Tatum bridge	1510	56	42.8	-	+3.2
74.7	do.	SE¼SE¼NE¼ sec.9, T.11 S., R.25 E., above Rio Hondo	1600	56	43.8	-	+1.0
-	Hagerman Irrigation Co. well "b"	NE¼NE¼NE¼ sec.35, T.10 S., R.24 E.....	1150	72	-	(4.40)	-
-	Hagerman Canal	NW¼SW¼NE¼ sec.31, T.10 S., R.25 E., at head....	0655	47	-	(31.5)	-
-	South Spring Creek	SE¼SE¼SE¼ sec.8, T.11 S., R.25 E., at entrance to Hagerman Canal	1455	58	-	(2.42)	-
-	Pamona Drain	NW¼NW¼SE¼ sec.22, T.11 S., R.25 E., at entrance to Hagerman Canal	1630	56	-	(1.41)	-
-	Rio Hondo	NE¼SW¼SE¼ sec.32, T.10 S., R.25 E., at U. S. Hwy. 380 bridge	1350	55	-	(2.52)	-
-	South Spring Drain	SE¼NW¼SE¼ sec.9, T.11 S., R.25 E., at road crossing (tributary to Rio Hondo)	0720	46	-	(.46)	-
74.6	Rio Hondo*	NE¼NE¼SE¼ sec.9, T.11 S., R.25 E., at mouth....	1630	55	-	7.23	(+4.25)
74.5	Pecos River	SE¼NE¼SE¼ sec.9, T.11 S., R.25 E., below Rio Hondo (temporary recorder)	1700 0820	54 44	49.4 47.2	- -	-1.6 -
74.1	East Grand Plains Drainage District "D" line*	SE¼SW¼SW¼ sec.10, T.11 S., R.25 E., at mouth....	0725	54	-	.86	-
73.6	East Grand Plains Drainage District "A-B-C" line*	NW¼SW¼NE¼ sec.15, T.11 S., R.25 E., at mouth....	0750	50	-	1.28	-
72.7	Gravel Pit Drain*	SE¼SE¼NW¼ sec.14, T.11 S., R.25 E., at mouth....	1540	47	-	.87	-
71.4	Pecos River	NW¼SE¼SW¼ sec.13, T.11 S., R.25 E.....	0935	45	51.4	-	+1.2

PECOS RIVER SEEPAGE INVESTIGATION  
Acme to Artesia, N. Mex.--Continued

Pecos River mile	Stream	Location	Time	Water temp. °F	Discharge, in cubic feet per second		
					Main stream	Tributary or Diversion	Indicated gain or loss
Jan. 31, 1963--Continued							
67.7	Pecos River	SW¼NW¼NW¼ sec.36, T.11 S., R.25 E.....	1055	46	58.3	-	+6.9
67.5	Oasis-Miller Drain*	SW¼SW¼NW¼ sec.36, T.11 S., R.25 E., at mouth....	1600	50	-	0.08	-
67.3 <sup>+</sup>	Bottomless Lakes drain† (mouth)	SW¼SE¼NE¼ sec.36, T.11 S., R.25 E., at road crossing	1645	49	-	(a.47)	-
64.5	Pecos River	S½NE¼NE¼ sec.17, T.12 S., R.26 E., at Transwestern pipeline crossing	1210	49	57.5	-	-.9
61.7	do.	SE¼NE¼SE¼ sec.29, T.12 S., R.26 E.....	1320	51	59.9	-	+2.4
61.4	Nine Mile Draw*	SW¼SE¼SE¼ sec.29, T.12 S., R.26 E., at mouth....	0920	44	-	1.06	-
60.9	Pecos River	NW¼SW¼NW¼ sec.33, T.12 S., R.26 E.....	1430	54	62.1	-	+1.1
58.4	Zuber Hollow wasteway*	SE¼SE¼SE¼ sec.4, T.13 S., R.26 E., at mouth....	1150	43	-	1.29	-
58.1	Pecos River	SW¼NW¼NW¼ sec.10, T.13 S., R.26 E., at Dexter bridge (temporary recorder)	<u>1540</u> 0735	<u>56</u> 45	<u>60.9</u> 60.1	-	<u>-2.5</u> -
55.5	Berry drain*	NW¼NW¼SW¼ sec.14, T.13 S., R.26 E., at mouth	1050	39	-	.29	-
55.4	Pecos River	NE¼NW¼SW¼ sec.14, T.13 S., R.26 E.....	0840	46	58.9	-	-1.5
53.2	do.	SW¼SW¼SE¼ sec.23, T.13 S., R.26 E.....	0925	47	59.5	-	+6
52.8	Dexter-Green-field drain, "A" line*	SW¼SE¼SW¼ sec.23, T.13 S., R.26 E., at mouth....	0820	41	-	.49	-
51.8	Dexter-Green-field drain, "D" line*	SE¼NE¼SE¼ sec.27, T.13 S., R.26 E., at mouth....	0910	53	-	.54	-
50.7	Pecos River	NW¼SW¼NW¼ sec.35, T.13 S., R.26 E.....	1110	48	61.0	-	+5
-	Rio Felix*	SW¼SE¼SE¼ sec.34, T.13 S., R.26 E., ½ mile above mouth	1155	55	-	2.28	-
49.2	Pecos River	SW¼SE¼NW¼ sec.2, T.14 S., R.26 E.....	1250	53	66.1	-	+2.8
47.4	Hagerman Drain-age District "D" line*	SE¼NW¼NW¼ sec.12, T.14 S., R.26 E., at mouth....	0940	59	-	.03	-
46.7	Pecos River	SE¼NE¼NE¼ sec.12, T.14 S., R.26 E., at Hagerman bridge (temporary recorder)	1405	56	66.0	-	-.1
Feb. 1, 1963							
46.7	Pecos River	SE¼NE¼NE¼ sec.12, T.14 S., R.26 E., at Hagerman bridge (temporary recorder)	0830	49	70.9	-	-
44.2	do.	SW¼SW¼SE¼ sec.13, T.14 S., R.26 E.....	0920	50	74.3	-	+3.4
41.9	do.	NE¼SW¼SW¼ sec.25, T.14 S., R.26 E.....	1010	50	71.5	-	-2.8
39.8	do.	SE¼SE¼SW¼ sec.31, T.14 S., R.27 E., above Buffalo Valley pump	<u>1110</u> 0900	<u>53</u> 48	<u>72.0</u> 70.8	-	<u>+5</u> -
35.1	Steve Mason drain†	NE¼NW¼SW¼ sec.18, T.15 S., R.27 E., at mouth....	1000	56	-	.10	-
34.5	Pecos River	NW¼SW¼SE¼ sec.13, T.15 S., R.26 E.....	1005	49	67.2	-	-3.7
30.6	Pecos River	NE¼SW¼NE¼ sec.27, T.15 S., R.26 E., near Lake Arthur (regular gaging station)	1135	51	70.2	-	+3.0
26.5	do.	SE¼SE¼SE¼ sec.32, T.15 S., R.26 E.....	<u>1250</u> 0910	<u>55</u> 52	<u>69.6</u> 72.1	-	<u>-.6</u> -
20.6	Cottonwood Cr. *	NE¼SE¼NW¼ sec.26, T.16 S., R.26 E., at mouth....	1040	50	-	.86	-
20.5	Pecos River	NE¼SE¼NW¼ sec.26, T.16 S., R.26 E.....	1120	51	72.7	-	-.3
16.0	do.	NW¼NW¼NW¼ sec.12, T.17 S., R.26 E.....	1305	54	69.3	-	-3.4
16.0	Artesia sewage*	NW¼NW¼NW¼ sec.12, T.17 S., R.26 E., at mouth....	1340	54	-	.36	-
12.4	Pecos River	SE¼NW¼NW¼ sec.18, T.17 S., R.27 E., near Artesia (regular gaging station)	1500	57	69.8	-	+1

Note.--Measurements not involved in the computation of gains or losses of the Pecos River are enclosed in parentheses.

\* Right bank.

† Left bank.

a Water probably does not reach river.

PECOS RIVER SEEPAGE INVESTIGATION  
Malaga to Red Bluff, N. Mex.

225

A series of discharge measurements was made July 16-17, 1963, to study gains and losses of the Pecos River from the "near Malaga" regular gage to the "at Red Bluff" regular gage. There are no known perennial tributaries in this reach. The only diversion in operation was Moutry's pump.

Overlap measurements were made at the Pierce Canyon Crossing regular gage and the results listed one above the other. The discharge shown above the line was the last measured by the engineer working downstream to this site, and the discharge shown below the line was the first measured by the engineer working downstream from this site.

Records of chemical analyses of water samples obtained during this investigation are published in WSP 1950.

Locations of measurement sites were obtained from standard U. S. Geological Survey quadrangle maps or the Malaga Bend sheet of the U. S. G. S. Plan and Profile of the Pecos River. Site numbers included in the tabulation are used to establish the downstream order of the measurements and are used only for filing purposes; they have no relation to river mile.

Previous seepage investigations of portions of this reach were made in February 1955, March 1959, January 1961, October 1961, and March 1962. Results are published in the appropriate WSP or State Report.

Indicated gains and losses may be in error because of only fair to good measuring conditions. Weather conditions for this investigation were ideal.

Measurements were made through the entire reach on July 16. The portion from site No. 334 to site No. 337.2 which includes the "Malaga Bend" area was rerun on July 17. Fluctuation in discharge above site No. 335 was near minimum during the period of the investigation. Flow at site 337.2 fluctuated on July 16 because the rock diversion dam for the Moutry pump above site 337.1 was being repaired causing more water to be ponded. Flow at this site was constant during July 17. The discharge at Pierce Canyon Crossing (site 338.2) declined from a maximum of 18 cfs at 2400 July 15 to 14 cfs at 1600 July 16. The discharge at Red Bluff declined from 16 cfs at 1200 July 16 to 14 cfs at 1700 and then rose to 15 cfs at 2400.

Results of the investigation are good with the exception of that portion from site 335 to site 338.2 on July 16, which are poor because of fluctuations in discharge caused by repairs to the diversion dam.

Site No.	Stream	Location	July 16, 1963					July 17, 1963				
			Time	Water temp. °F	Discharge, in cfs			Time	Water temp. °F	Discharge, in cfs		
					Main Stream	Diversion	Indicated gain or loss			Main Stream	Diversion	Indicated gain or loss
333.5	Pecos River	NE¼NW¼ sec.19, T.24 S., R.29 E., near Malaga (regular gaging station)	0800	80	17.8	-	-	-	-	-	-	-
334	do.	SE¼NE¼ sec.17, T.24 S., R.29 E., at Fishing Rock ford (temporary gage)	0900	80	20.4	-	+2.6	0840	82	19.9	-	-
335	do.	SE¼NE¼ sec.16, T.24 S., R.29 E., above Dog Town Draw	0940	83	20.1	-	-.3	0930	84	19.0	-	-0.9
337	Moutry pump†	NW¼NW¼ sec.21, T.24 S., R.29 E., at Parshall flume	0730	76	-	4.34	-	1000	-	-	a3.9	-
337.1	Pecos River	SW¼SW¼ sec.16, T.24 S., R.29 E., below diversion dam	1045	82	13.6	-	-2.2	1035	84	16.0	-	+1.9
337.2	do.	SW¼SW¼ sec.16, T.24 S., R.29 E., at old ford (temporary gage)	1140	86	13.2	-	-.4	1120	89	15.0	-	-1.0
338.2	do.	SE¼NW¼ sec.27, T.24 S., R.29 E., at Pierce Canyon Crossing (regular gaging station)	1230 0830	85 80	15.2 17.0	-	+2.0 -	-	-	-	-	-
338.3	do.	SW¼SW¼ sec.27, T.24 S., R.29 E., at dry wash	0930	83	16.8	-	-.2	-	-	-	-	-
338.5	do.	SE¼NW¼ sec.33, T.24 S., R.29 E., at old ford	1020	84	16.6	-	-.2	-	-	-	-	-
339.5	do.	SE¼NE¼ sec.6, T.25 S., R.29 E., at old ford	1155	83	17.2	-	+1.6	-	-	-	-	-
340	do.	NW¼SE¼ sec.6, T.25 S., R.29 E., above Reed's pump	1300	85	16.4	-	-.8	-	-	-	-	-
342	do.	NW¼NE¼ sec.1, T.26 S., R.28 E., at Red Bluff (regular gaging station)	1705	89	13.7	-	-2.7	-	-	-	-	-

† Left bank.

a Discharge determined from State Engineer gage.

	Page		Page
Abo Arroyo tributary near Scholle .....	208	Chupadera Wash tributary at Bingham .....	209
Accuracy of field data and computed results .....	6	Chusca Wash near Mexican Springs .....	213
Acequia Madre at Costilla .....	59	Cimarron Creek, at Springer .....	21
Acre-foot, definition of .....	3	below Eagle Nest Dam .....	14
Agua Fria Creek near Holman .....	25	near Cimarron .....	18
Alamogordo Reservoir, contents of .....	177, 180	Cimarron River, near Guy .....	8
Alamosa River above San Mateo Canyon .....	215	Cimarron River, near Kenton, Okla. ....	9
Alamosa River below Shipman Canyon .....	216	Clear Creek near Ute Park .....	17
Alamosa River near Monticello .....	141	Cloud Canyon near Gallinas .....	210
Aleman Draw at Aleman .....	209	Computations, accuracy of results .....	6
Anderson ditch near Taos .....	-	Conchas canal .....	43
Animas Creek near Cloverdale .....	214	Conchas Reservoir, contents of .....	44
Animas River at Aztec .....	217	Conchas River at Variadero .....	42
Animas River at Farmington .....	193	Conejos Creek tributary near Dunlap .....	-
near Cedar Hill .....	192	Contents, definition of .....	3
Apache Creek near Apache .....	214	Control, definition of .....	3
Aragon Creek tributary near Encinoso .....	210	Cooperation, record of .....	2
Arroyo Angostura near Rincon .....	209	Cornucopia Canyon near Pinon .....	212
Arroyo Cuyamungue near Pojoaque .....	215	Costilla Creek, above Costilla Dam .....	51
Arroyo de la Mora near Dunlap .....	-	at Garcia, Colo. ....	58
Arroyo de la Pressa near Hernandez .....	215	below Costilla Dam .....	54
Arroyo del Embudo in Albuquerque .....	215	below diversion dam, at Costilla .....	57
Arroyo del Puerto near Endee .....	206	below Plaza de Arriba ditch .....	-
Arroyo Ojito at Zia Pueblo .....	208	below Plaza del Medio ditch .....	-
Arroyo San Juan de Dios tributary near Puerto de Luna ..	-	diversions from .....	59
Arroyo Seco near Abiquiu .....	207	near Amalia .....	55
Arroyo Yupa tributary near Cerrillos .....	207	near Costilla .....	56
Association ditch at Costilla .....	59	Costilla Lake, contents of .....	176, 179
Belen Highline Canal tributary near Los Lunas .....	208	Cottonwood Creek near Lake Arthur .....	162
Bell Ranch Canal near Conchas Dam .....	43	Cottonwood Springs east of Tularosa .....	-
Bernalillo floodwater retarding reservoir No. 1 (Piedra		Coyote Creek, above Guadalupe .....	32
Lisa Arroyo) near Bernalillo .....	121	below Black Lake .....	31
Black Prince Canyon near Organ .....	212	near Golondrinas .....	33
Black River above Malaga .....	171	Crest-stage station. (see partial record site) .....	206
Black River near White City .....	217	Cubic foot per second, definition of .....	3
Bland Canyon near Cochiti .....	207	Cuchillo Negro Creek above diversion .....	216
Blue Springs near White City .....	217	Curtis Canyon near Mayhill .....	210
Bluewater Creek at Grants .....	129	Data, accuracy of .....	6
above Bluewater Dam .....	208	Deer Creek tributary near Antelope Wells .....	211
below Bluewater Dam .....	127	Delaware River near Red Bluff .....	175
near Bluewater .....	128	Discharge measurements made at miscellaneous sites ..	215
near Dunken .....	210	Dog Creek near Shoemaker .....	206
Bluewater Lake, contents of .....	177, 179	Drainage area, definition of .....	3
Bonita Canyon tributary near Corona .....	210	Duck Creek at Cliff .....	214
Bueyeros Creek at Bueyeros .....	206	Eagle Nest Reservoir .....	13
Caballo Reservoir, contents of .....	177, 179	Eastdale No. 1 intake canal near Jaroso, Colo. ....	59
Cabresto Creek near Questa .....	70	Eight Mile Draw near Roswell .....	210
Cameron Creek at Central .....	211	Elephant Butte Reservoir, contents of .....	177, 179
Canadian River, at Logan .....	48	Elmendorf interior drain near San Antonio .....	139
below Conchas Dam .....	45	El Rito near El Rito .....	207
near Hebron .....	10	El Vado Reservoir, contents of .....	176, 179
near Roy .....	22	Embudo Creek near Dixon .....	85, 207
near Sanchez .....	41	Encinal Creek near Casa Blanca .....	208
near Taylor Springs .....	206	Estancia Valley tributary at Cedar Grove .....	212
tributary near Mills .....	206	Farmers Mutual ditch near Farmington .....	194
Canada Ancha tributary near Santa Fe .....	207	(Supplement to San Juan River at Farmington)	
Canada de las Minas tributary near Santa Fe .....	208	1st Indian ditch south near Shiprock .....	219
Canada del Leon near Mountainair .....	212	Fort Sumner main canal near Fort Sumner .....	156
Canada Montoso near Scholle .....	208	Four Mile Draw near Lakewood .....	166
Canon de Torreon at Torreon .....	212	Gaging station, definition of .....	3
Capacity, definition .....	3	Galestena Canyon tributary near Black Rock .....	213
Carlsbad main canal at head, near Carlsbad .....	169	Galisteo Creek at Domingo .....	155
Carrizo Creek (tributary to Rio Ruidoso), at Ruidoso ..	216	at Canoncito .....	208
Carrizo Creek near Roy .....	206	Gallegos Canyon tributary near Nageezi .....	213
Carrizo Creek near Salt Lake .....	213	Gallinas River at Montezuma .....	150
Carrizozo Creek near Kenton, Okla. ....	206	near Colonias .....	152
Casias Creek near Costilla .....	52	near Lourdes .....	151
Catron Wash near Mexican Springs .....	213	near Montezuma .....	149
Cebolla River near Golondrinas .....	29	tributary at Gallinas .....	209
Cedar Creek at Ruidoso .....	-	Gallo Canyon near Picacho .....	210
Cerro Canal, at Costilla .....	59	Gila River, below Blue Creek near Virden .....	200
near Jaroso, Colo. ....	59	near Cliff .....	214
New Mexico Branch, near Jaroso, Colo. ....	59	near Gila .....	198
Cfs-day, definition of .....	3	near Red Rock .....	199
Chaco River near Waterflow .....	213	Gobernador Canyon near Gobernador .....	212
Chamita ditch near Chamita .....	100	Government ditch at El Paso, Tex. ....	145
Cherry Creek near White Signal .....	211	Grants Canyon at Grants .....	130
Chinaberry Draw near White City .....	-	Guique ditch near San Juan Pueblo .....	89
Chico Arroyo near Guadalupe .....	126	Hahn Arroyo in Albuquerque .....	215

	Page		Page
Hermanas Draw tributary at Hermanas .....	211	Pecos River--Continued	
Hernandez ditch at Hernandez .....	101	Kaiser Channel, near Lakewood .....	165
Hogback Indian Canal near Shiprock .....	218	near Acme .....	157
Horse Lake Creek above Heron Reservoir .....	93	near Anton Chico .....	148
Hyatt Canyon near Cloudcroft .....	210	near Artesia .....	163
Hydrologic Conditions .....	7	near Lake Arthur .....	161
Indian Creek at mouth, near Three Rivers .....	212	near Lakewood .....	165
Indian Creek near Three Rivers .....	212	near Malaga .....	172
Iron Creek near Kingston .....	211	near Pecos .....	146
Jaspe Arroyo tributary near Galisteo .....	208	near Puerto de Luna .....	154
Jemez Canyon Reservoir, contents of .....	176, 179	seepage investigations .....	222
Jemez River, below East Fork near Jemez Springs ..	117	tributaries .....	222
below Jemez Canyon Dam .....	120	Penasquito ditch at Costilla .....	-
near Jemez .....	119	Percha Creek at Caballo Dam .....	209
Juan Thomas Canyon near Edgewood .....	212	near Hillsboro .....	209
Juan Toro Canyon near Miera .....	208	near Kingston .....	209
La Cueva Canal below La Cueva .....	27	tributary near Kingston .....	209
Largartija Creek tributary near Sanchez .....	209	Piedra River near Arboles .....	185
La Jencia Creek near Magdalena .....	208	Pinos Altos Creek at Silver City .....	211
tributary near Magdalena .....	208	Pintada Arroyo, near Santa Rosa .....	209
Lake Avalon, contents of .....	178, 180	tributary near Clines Corners .....	209
Lake Isabel feeder canal near Sapello .....	38	tributary near Encino .....	209
Lake McMillan, contents of .....	177, 180	Ponil Creek near Cimarron .....	19
La Plata River near Farmington .....	195	Puerco River at Gallup .....	213
Largo Creek near Mangas .....	197	tributary near Fort Wingate .....	213
near Quemado .....	213	tributary near Gamarco .....	213
Las Cruces Arroyo near Las Cruces .....	144	Rattlesnake Springs near White City .....	217
Last Chance Canyon near Carlsbad Caverns .....	211	Raton Creek at Raton .....	206
Latir Creek near Cerro .....	60	Rayado Creek at Sauble Ranch, near Cimarron .....	20
Little Walnut Creek near Silver City .....	211	Red Bluff Reservoir, contents of .....	178, 180
Little Tesuque Creek near Santa Fe .....	108	Red River at mouth, near Questa .....	71
Little Tesuque Creek Tributary No. 2 .....	109	below Zwergle damsite, near Red River .....	67
Llano ditch near Questa .....	69	near Questa .....	68
Los Pinos River, at La Boca, Colo. ....	187	near Red River .....	62-66
Lumber Canyon near Monticello .....	209	Reservoirs in Rio Grande basin .....	176-180
Main Canal South near Shiprock .....	218	Reuelto Creek near Logan .....	49
Mangas Creek tributary near Pietown .....	213	Rio Agua Negra near Holman .....	23
Manzanares Canyon near Turley .....	213	Rio Amargo at Dulce .....	212
McClure Reservoir, contents of .....	176, 179	Rio Bonito at Hondo .....	210
McEvoy Creek near Eagle Nest .....	15	Rio Bonito at Fort Stanton .....	210
McKelligon Canyon at El Paso, Tex. ....	145	tributary near Fort Stanton .....	210
Manuelitas Creek near Rociada .....	36	Rio Chama above Canones Creek .....	-
Measurements at miscellaneous sites .....	215	Rio Chama above Abiquiu Reservoir .....	96
Mesa ditch near Garcia, Colo. ....	59	Rio Chama below Abiquiu Dam .....	97
Middle Fork Tesuque Creek near Santa Fe .....	106	Rio Chama, below El Vado Dam .....	95
Mimbres River at Deming .....	211	near Abiquiu .....	98
tributary near Spalding .....	211	below Gonzales ditch .....	-
Mimbres River near Mimbres .....	181	near Chamita .....	102
Minnie Hall Draw near Three Rivers .....	212	near La Puente .....	91
Mora River, at La Cueva .....	28	Rio Chiquito near Talpa .....	81
near Golondrinas .....	30	Rio de la Casa near Cleveland .....	26
near Shoemaker .....	40	Rio de las Vacas near Senorita .....	208
near Watrous .....	34	Rio del Oso near Hernandez .....	215
Mosley Canyon near White City .....	211	Rio Felix at old highway bridge, near Hagerman ..	160
Navajo Reservoir .....	189	Rio Fernando de Taos near Taos .....	78
New Mexico Branch Cerro canal near Jaroso, Colo. .	59	Rio Grande above San Juan Pueblo .....	90
New Model canal, at New Mexico-Arizona State line.	202	at Albuquerque .....	123
near Virden .....	219	at Cochiti .....	113
Nichols Reservoir, contents of .....	176, 179	at Embudo .....	86
North Fork Tesuque Creek near Santa Fe .....	105	at Otowi Bridge, near San Ildefonso .....	110
North Spring River at Roswell .....	160	at San Acacia .....	137
Old Ranch Canyon near Carlsbad .....	-	at San Felipe .....	116
Order, downstream, and station numbers .....	3	at San Marcial .....	140
Osita Draw near Clines Corners .....	212	below Caballo Dam .....	143
Pajarito Creek at Newkirk .....	206	below Elephant Butte Dam .....	142
Palomas River at box canyon .....	216	below Taos Junction Bridge .....	84
Palomas River above Palomas Community ditch .....	216	near Arroyo Hondo .....	75
Pancho Canyon near Arabella .....	210	near Bernalillo .....	122
Partial record station, definition .....	7	near Bernardo .....	124
Annual maximum discharge at .....	206	near Cerro .....	61
Pecos River at Carlsbad .....	170	tributary at Rinconada .....	207
at damsite 3, near Carlsbad .....	168	tributary near Radium Springs .....	209
at Pierce Canyon Crossing, near Malaga .....	173	Rio Grande basin, Reservoirs in .....	176-180
at Red Bluff .....	174	Rio Grande de Ranchos near Talpa .....	80
Pecos River		Rio Guadalupe at Box Canyon, near Jemez .....	118
at Santa Rosa .....	153	Rio Hondo at Diamond A Ranch, near Roswell .....	159
below Alamogordo Dam .....	155	at Picacho .....	210
below Avalon Dam .....	169	Rio Hondo (tributary to Rio Grande), at Arroyo Hondo ..	74
below McMillan Dam .....	167	at damsite, at Valdez .....	72



	Page		Page
Rio Hondo near Valdez .....	72	Steins Creek at Steins .....	214
Rio Lucero near Arroyo Seco .....	77	Sunset Canal near Virden .....	201
Rio Nambe at Nambe .....	207	Taylor Canyon Tributary near Bingham .....	212
at Nambe Falls, near Santa Fe .....	104	Tecolote Creek at Tecolote .....	209
Rio Ojo Caliente at La Madera .....	99	near San Pablo .....	147
Rio Penasco, at Dayton .....	164	Terms and abbreviations, definitions .....	3
near Dunken .....	210	Tesuque Creek above diversions .....	207
Rio Penasco tributary near Elk .....	-	Three River at Three Rivers .....	212
Rio Pueblo de Taos, at Los Cordovas .....	82	Tijeras Arroyo at Albuquerque .....	208
below Los Cordovas .....	83	near Albuquerque .....	208
near Ranchito .....	79	Tolby Creek near Eagle Nest .....	16
near Taos .....	76	Tortugas Arroyo near Las Cruces .....	144
Rio Puerco, above Chico Arroyo, near Guadalupe .....	125	Trementina Creek near Trementina .....	206
at Rio Puerco .....	133	Trout Creek near Luna .....	214
near Bernardo .....	134	near New Mexico-Arizona State line .....	214
Rio Ruidoso, at Hollywood .....	158	Tularosa basin tributaries .....	211
at Hondo .....	210	Tularosa River near Aragon .....	214
near Ruidoso .....	205	near Reserve .....	214
Rio Salado near San Acacia .....	135	Ute Creek near Gladstone .....	206
Rio San Jose, at Correo .....	132	near Logan .....	46
near Grants .....	131	Ute Reservoir near Logan .....	47
Rio Tularosa near Bent .....	183	Valdez Draw near Bloomfield .....	213
Rio Tularosa northeast of Tularosa .....	-	Vaqueros Canyon near Gobernador .....	212
Rito de los Frijoles in Bandelier National Monument .....	112	Vermejo River near Dawson .....	11
Rito de los Frijoles near Los Alamos .....	111	Vigil Canyon near Holman .....	24
Rito de Tierra Amarilla at Tierra Amarilla .....	207	White Oaks Canyon at White Oaks .....	211
Rito Negrilo at Aragon .....	214	White Oaks Canyon near Carrizozo .....	211
Rocky Arroyo near Carlsbad .....	211	Willow Creek near Park View .....	94
Running Water Draw near Clovis .....	50	above Heron Reservoir, near Park View .....	92
Salado Creek tributary near Joffre .....	-	Wolf Creek near Chama .....	207
San Acacia drainage canal .....	-	WSP, definition of .....	3
Salt Creek tributary near Roswell .....	210	Yazzie Wash near Mexican Springs .....	213
San Antonio Riverside drain, near San Antonio .....	138	Yeso Arroyo near Fort Sumner .....	210
near San Marcial .....	139		
San Cristobal Arroyo near Galisteo .....	208		
Sandy Arroyo near Clayton .....	206		
tributary near Clayton .....	206		
San Francisco River near Reserve .....	203		
near Glenwood .....	204		
San Jose Arroyo near Monticello .....	209		
San Juan lateral above San Juan Pueblo .....	87		
San Juan Pueblo ditch above San Juan Pueblo .....	88		
San Juan River, at Bloomfield .....	191		
at Farmington .....	194		
at Rosa .....	186		
at Shiprock .....	196		
miscellaneous measurements .....	217		
near Shiprock .....	217		
near Carracas .....	184		
tributary near Kirtland .....	213		
San Lorenzo Arroyo near Polvadera .....	-		
San Pedro Creek near Golden .....	208		
San Simon Swale tributary near Jal .....	211		
Santa Clara Creek near Espanola .....	207		
San Vicente Arroyo at Silver City .....	182		
Santa Cruz River at Cundiyo .....	103		
Santa Fe River at Monument Rock .....	-		
at head of McClure Reservoir .....	215		
Santa Fe River near Santa Fe .....	114		
Santistevan Creek near Costilla .....	53		
Sapello Canal at Sapello .....	35		
Sapello River, at Sapello .....	37		
near Watrous .....	39		
Sapillo Creek miscellaneous measurements .....	-		
Seepage investigations .....	-		
Seminole Draw Tributary near Lovington .....	207		
Silva Creek at Silver City .....	211		
tributary at Silver City .....	211		
Silver Springs Canyon .....	216		
Six Mile Creek near Eagle Nest .....	12		
Snow Creek near Mogollon .....	205, 214		
Socorro main canal north at San Acacia .....	136		
Socorro main canal south near San Antonio .....	138		
South Fork Tesuque Creek near Santa Fe .....	107		
Spring Creek at La Boca, Colo. ....	188		
Stage-discharge relation, definition .....	3		