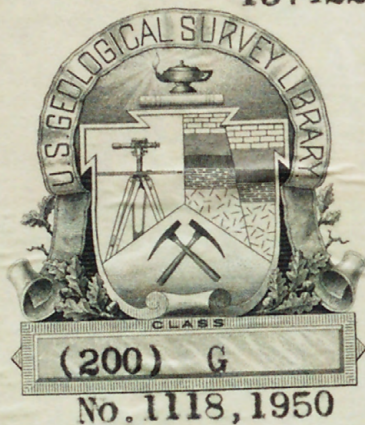






This copy is **PUBLIC PROPERTY** and is not to  
be removed from the official files. PRIVATE  
POSSESSION IS UNLAWFUL (R. S. Sup. Vol. 2, pp. 380,  
Sec. 749)

137422





(200)  
G  
78.1118

# Surface Water Supply of the United States 1948

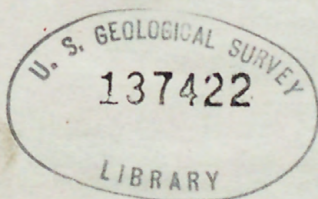
## Part 8. Western Gulf of Mexico Basins

*Prepared under the direction of C. G. PAULSEN, Chief Hydraulic Engineer*

---

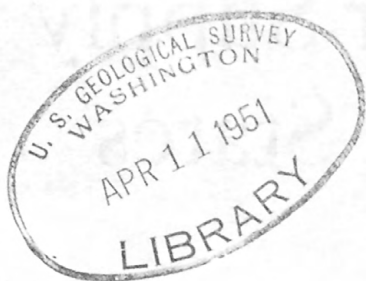
GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1118

*Prepared in cooperation with the States  
of Colorado, Louisiana, New Mexico,  
and Texas and other agencies*



This copy is **PUBLIC PROPERTY** and is not to  
be removed from the official files. **PRIVATE**  
**POSSESSION IS UNLAWFUL (R. S. Sup. Vol. 2, pp. 380,  
Sec. 749)**





UNITED STATES DEPARTMENT OF THE INTERIOR

Oscar L. Chapman, *Secretary*

GEOLOGICAL SURVEY

W. E. Wrather, *Director*



## PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Colorado, Louisiana, New Mexico, and Texas and other agencies, by personnel of the Water Resources Division under the direction of:

C. G. Paulsen-----Chief Hydraulic Engineer  
J. V. B. Wells-----Chief, Surface Water Branch  
B. J. Peterson-----Chief, Annual Reports Section

### District Engineers (Surface Water)

W. R. Eaton (succeeded by Fay Hansen)-----Baton Rouge, La.  
C. E. Ellsworth-----Austin, Tex.  
Robert Follansbee (succeeded by F. M. Bell)-----Denver, Colo.  
Berkeley Johnson-----Santa Fe, N. Mex.







# CONTENTS

	Page
Scope of work.....	1
Definition of terms.....	1
Explanation of data.....	2
Accuracy of field data and computed results.....	5
Publications.....	6
Records of discharge collected by agencies other than the Geological Survey.....	12
Cooperation.....	13
Division of work.....	14
Gaging-station records.....	15
Mermentau River Basin.....	15
Bayou Nezpieque near Basile, La.....	15
Payou des Cannes near Eunice, La.....	16
Calcasieu River Basin.....	17
Calcasieu River near Glenmora, La.....	17
Calcasieu River near Oberlin, La.....	19
Calcasieu River near Kinder, La.....	20
Whiskey Chitto Creek near Oberlin, La.....	21
Bundick Creek near Dry Creek, La.....	22
Beckwith Creek near De Quincy, La.....	23
Hickory Branch at Kernan, La.....	24
Sabine River Basin.....	25
Sabine River near Mineola, Tex.....	25
Sabine River near Gladewater, Tex.....	26
Sabine River near Tatum, Tex.....	27
Sabine River at Logansport, La.....	28
Sabine River near Milan, Tex.....	29
Sabine River near Bon Weir, Tex.....	30
Sabine River near Ruliff, Tex.....	31
Lake Fork Sabine River near Quitman, Tex.....	32
Big Sandy Creek near Big Sandy, Tex.....	33
Cherokee Bayou near Elderville, Tex.....	34
Neches River Basin.....	35
Neches River near Neches, Tex.....	35
Neches River near Alto, Tex.....	36
Neches River near Diboll, Tex.....	37
Neches River near Rockland, Tex.....	38
Neches River at Evadale, Tex.....	39
Mud Creek near Jacksonville, Tex.....	40
Angelina River near Alto, Tex.....	41
Angelina River near Lufkin, Tex.....	42
Angelina River at Horger, Tex.....	43
Striker Creek near Summerfield, Tex.....	44
Attoyac Bayou near Chireno, Tex.....	45
Village Creek near Kountze, Tex.....	46
Trinity River Basin.....	47
Bridgeport Reservoir above Bridgeport, Tex.....	47
West Fork Trinity River near Boyd, Tex.....	48
Eagle Mountain Reservoir above Fort Worth, Tex.....	49
West Fork Trinity River at Fort Worth, Tex.....	50
West Fork Trinity River at Grand Prairie, Tex.....	51
Trinity River at Dallas, Tex.....	52
Trinity River near Rosser, Tex.....	53
Trinity River near Oakwood, Tex.....	54
Trinity River near Midway, Tex.....	55
Trinity River at Riverside, Tex.....	56
Trinity River at Romayor, Tex.....	57
Trinity River at Liberty, Tex.....	58
Big Sandy Creek near Bridgeport, Tex.....	59
Clear Fork Trinity River near Aledo, Tex.....	61
Clear Fork Trinity River near Benbrook, Tex.....	62
Clear Fork Trinity River at Fort Worth, Tex.....	63
Lake Dallas near Lake Dallas, Tex.....	64
Elm Fork Trinity River near Carrollton, Tex.....	65
Denton Creek near Roanoke, Tex.....	66
Denton Creek near Grapevine, Tex.....	67
East Fork Trinity River near Rockwall, Tex.....	68
Cedar Creek near Mabank, Tex.....	69
Chambers Creek near Corsicana, Tex.....	70
Richland Creek near Richland, Tex.....	71
San Jacinto River Basin.....	72
West Fork San Jacinto River near Conroe, Tex.....	72
West Fork San Jacinto River near Humble, Tex.....	73
San Jacinto River near Huffman, Tex.....	74
Spring Creek near Spring, Tex.....	75
Cypress Creek near Westfield, Tex.....	76
East Fork San Jacinto River near Cleveland, Tex.....	77
Peach Creek at Splendora, Tex.....	78
Caney Creek near Splendora, Tex.....	79

## Gaging-station records--Continued.

San Jacinto River Basin--Continued.	Page
Barker Reservoir near Addicks, Tex.	80
Buffalo Bayou near Addicks, Tex.	81
Buffalo Bayou at Houston, Tex.	82
Addicks Reservoir near Addicks, Tex.	83
Whiteoak Bayou at Houston, Tex.	84
Brays Bayou at Houston, Tex.	85
Clear Creek Basin.	86
Clear Creek near Pearland, Tex.	86
Hickory Slough near Pearland, Tex.	87
Chocolate Bayou Basin.	88
Chocolate Bayou near Alvin, Tex.	88
Oyster Creek Basin.	89
Oyster Creek near Angleton, Tex.	89
Brazos River Basin.	90
Double Mountain Fork Brazos River at Lubbock, Tex.	90
Double Mountain Fork Brazos River near Aspermont, Tex.	90
Brazos River at Seymour, Tex.	91
Brazos River near South Bend, Tex.	92
Possam Kingdom Reservoir near Graford, Tex.	93
Brazos River near Palo Pinto, Tex.	94
Brazos River near Glen Rose, Tex.	95
Brazos River near Whitney, Tex.	95
Brazos River at Waco, Tex.	96
Brazos River near Marlin, Tex.	97
Brazos River near Bryan, Tex.	98
Brazos River near Hempstead, Tex.	99
Brazos River near San Felipe, Tex.	100
Brazos River at Richmond, Tex.	101
Brazos River at East Columbia, Tex.	102
Salt Fork Brazos River near Aspermont, Tex.	103
White River at Plainview, Tex.	104
Clear Fork Brazos River at Nugent, Tex.	105
Clear Fork Brazos River at Fort Griffin, Tex.	106
Clear Fork Brazos River near Crystal Falls, Tex.	107
Fort Phantom Hill Reservoir near Nugent, Tex.	108
Paluxy Creek at Glen Rose, Tex.	109
Nolands River at Blum, Tex.	110
Aquilla Creek near Aquilla, Tex.	111
North Bosque River near Clifton, Tex.	112
Leon River near Hasse, Tex.	113
Leon River near Belton, Tex.	114
Little River at Cameron, Tex.	115
Lampasas River at Youngsfort, Tex.	116
San Gabriel River at Georgetown, Tex.	117
Yagua Creek near Somerville, Tex.	118
Navasota River near Easterly, Tex.	119
American Canal Co.'s canal near Fulshear, Tex.	120
Richmond Irrigation Co.'s canal near Richmond, Tex.	121
Dry Creek near Richmond, Tex.	122
Big Creek near Needville, Tex.	123
Big Creek near Guy, Tex.	124
Fairchild Creek near Needville, Tex.	125
Colorado River Basin.	126
Colorado River near Ira, Tex.	127
Colorado River at Colorado City, Tex.	128
Colorado River at Robert Lee, Tex.	129
Colorado River at Ballinger, Tex.	130
Colorado River at Winchell, Tex.	131
Colorado River near San Saba, Tex.	132
Euchanan Reservoir near Burnet, Tex.	133
Marshall Ford Reservoir near Austin, Tex.	133
Colorado River at Austin, Tex.	134
Colorado River at Smithville, Tex.	135
Colorado River at La Grange, Tex.	136
Colorado River at Columbus, Tex.	137
Colorado River at Wharton, Tex.	138
Colorado River near Bay City, Tex.	139
Bull Creek near Ira, Tex.	140
Morgan Creek near Colorado City, Tex.	141
Chamlin Creek near Colorado City, Tex.	142
Elm Creek at Ballinger, Tex.	143
South Concho River at Christoval, Tex.	144
Lake Nasworthy near San Angelo, Tex.	145
South Concho River at San Angelo, Tex.	146
Concho River near San Angelo, Tex.	147
Concho River near Paint Rock, Tex.	148
South Concho Irrigation Co.'s canal at Christoval, Tex.	149
Middle Concho River near Tankersly, Tex.	150
Spring Creek near Tankersly, Tex.	151
Dove Creek near Knickerbocker, Tex.	152
Dove Creek Spring near Knickerbocker, Tex.	153
North Concho River at Sterling City, Tex.	154
North Concho River near Carlsbad, Tex.	155
North Concho River near San Angelo, Tex.	156
Brownwood Reservoir near Brownwood, Tex.	157
Pecan Bayou at Brownwood, Tex.	160



## Gaging-station records--Continued.

## Colorado River Basin--Continued.

	Page
Horts Creek Reservoir near Valera, Tex.....	161
San Saba River at Menard, Tex.....	162
San Saba River at San Saba, Tex.....	163
Noyes Canal at Menard, Tex.....	164
Brady Creek at Brady, Tex.....	165
North Llano River near Junction, Tex.....	166
Llano River near Junction, Tex.....	167
Llano River at Llano, Tex.....	168
Pedernales River near Johnson City, Tex.....	169
Barton Springs at Austin, Tex.....	169
Dry Creek at Buescher Lake, near Smithville, Tex.....	170
Lavaca River Basin.....	171
Lavaca River at Hallettsville, Tex.....	171
Lavaca River near Edna, Tex.....	172
Lavaca River seepage investigations.....	173
Navidad River near Ganado, Tex.....	174
Guadalupe River Basin.....	175
Guadalupe River at Humble, Tex.....	175
Guadalupe River at Comfort, Tex.....	176
Guadalupe River near Spring Branch, Tex.....	177
Guadalupe River above Comal River, at New Braunfels, Tex.....	178
Guadalupe River at Victoria, Tex.....	179
Johnson Creek near Ingram, Tex.....	180
Comal River at New Braunfels, Tex.....	181
San Marcos River at Luling, Tex.....	182
Blanco River at Wimberley, Tex.....	183
Plum Creek near Luling, Tex.....	184
Coletto Creek near Victoria, Tex.....	185
San Antonio River at San Antonio, Tex.....	186
San Antonio River near Falls City, Tex.....	187
San Antonio River at Goliad, Tex.....	188
Madina Lake near San Antonio, Tex.....	189
Madina River near San Antonio, Tex.....	197
Cibolo Creek near Bulverde, Tex.....	198
Cibolo Creek above Bracken, Tex.....	198
Cibolo Creek at Selma, Tex.....	199
Cibolo Creek near Falls City, Tex.....	200
Mission River Basin.....	201
Mission River at Refugio, Tex.....	201
Nueces River Basin.....	202
Nueces River at Laguna, Tex.....	202
Nueces River below Uvalde, Tex.....	203
Nueces River near Asherton, Tex.....	204
Nueces River at Cotulla, Tex.....	206
Nueces River near Tilden, Tex.....	207
Nueces River near Three Rivers, Tex.....	208
Nueces River near Mathis, Tex.....	209
Nueces River seepage investigation.....	210
Nueces River at Calallen, Tex.....	211
West Nueces River near Brackettville, Tex.....	212
Frio River at Concan, Tex.....	213
Frio River near Derby, Tex.....	214
Frio River at Callinham, Tex.....	215
Sabinal River near Sabinal, Tex.....	216
Leona River spring flow near Uvalde, Tex.....	217
Atascosa River at Whittsett, Tex.....	218
Rio Grande Basin.....	219
Rio Grande at Thirtymile Bridge, near Creede, Colo.....	219
Rio Grande at Wason, below Creede, Colo.....	220
Rio Grande near Del Norte, Colo.....	221
Rio Grande near Monte Vista, Colo.....	222
Rio Grande at Alamosa, Colo.....	223
Rio Grande above mouth of Tincher Creek, near La Sauses, Colo.....	224
Rio Grande near Lobatos, Colo.....	225
Rio Grande near Cerro, N. Mex.....	226
Rio Grande below Taos Junction Bridge, near Taos, N. Mex.....	227
Rio Grande at Embudo, N. Mex.....	228
Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.....	229
Rio Grande at Cochiti, N. Mex.....	230
Rio Grande at San Felipe, N. Mex.....	231
Rio Grande near Bernalillo, N. Mex.....	232
Rio Grande at Albuquerque, N. Mex.....	233
Rio Grande near Belen, N. Mex.....	234
Rio Grande near Bernardo, N. Mex.....	235
Rio Grande at San Acacia, N. Mex.....	236
Rio Grande at San Marcial, N. Mex.....	237
Rio Grande below Elephant Butte Dam, N. Mex.....	238
Rio Grande below Caballo Dam, N. Mex.....	239
Reservoirs in Rio Grande Basin.....	240
Transmountain diversions from Colorado River Basin to Rio Grande Basin.....	244
Clear Creek below Continental Reservoir, Colo.....	245
Goose Creek near Wagon Wheel Gap, Colo.....	246
South Fork Rio Grande at South Fork, Colo.....	247
Pinos Creek near Del Norte, Colo.....	248
Rock Creek near Monte Vista, Colo.....	249
Closed basin in San Luis Valley, Colo.....	250
Kerber Creek at Ashley Ranch, near Villa Grove, Colo.....	250

## Gaging-station records--Continued.

## Rio Grande Basin--Continued.

## Closed basin in San Luis Valley, Colo.--Continued.

	Page
Saguache Creek near Saguache, Colo.....	251
North Crestone Creek near Crestone, Colo.....	252
Carnero Creek near La Garita, Colo.....	253
La Garita Creek near La Garita, Colo.....	254
Alamosa Creek above Terrace Reservoir, Colo.....	255
Alamosa Creek below Terrace Reservoir, Colo.....	256
La Jara Creek at Callegos Ranch, near Capulin, Colo.....	257
Trinchera Creek above Turners Ranch, near Fort Garland, Colo.....	258
Trinchera Creek above Mountain Home Reservoir, near Fort Garland, Colo.....	259
Trinchera Creek below Smith Reservoir, near Blanca, Colo.....	260
Sangre de Cristo Creek near Fort Garland, Colo.....	261
Ute Creek near Fort Garland, Colo.....	262
Conejos River at Platoro, Colo.....	263
Conejos River near Mogote, Colo.....	264
Conejos River near La Sauses, Colo.....	265
San Antonio River at Ortiz, Colo.....	266
San Antonio River at mouth, near Manassa, Colo.....	267
Los Pinos River near Ortiz, Colo.....	268
Culebra Creek at San Luis, Colo.....	269
Culebra Creek below San Luis, Colo.....	270
Costilla Creek above reservoir, near Costilla, N. Mex.....	271
Costilla Creek below reservoir, near Costilla, N. Mex.....	272
Costilla Creek near Costilla, N. Mex.....	273
Costilla Creek at Garcia, Colo.....	274
Casias Creek near Costilla, N. Mex.....	275
Santistevan Creek near Costilla, N. Mex.....	276
Principal diversions from Costilla Creek, N. Mex. and Colo.....	277
Latir Creek near Cerro, N. Mex.....	278
Red River near Red River, N. Mex.....	279
Red River near Questa, N. Mex.....	280
Cabresto Creek near Questa, N. Mex.....	281
Llano ditch near Questa, N. Mex.....	282
Rio Hondo near Valdez, N. Mex.....	283
Rio Hondo at Arroyo Hondo, N. Mex.....	284
Rio Pueblo de Taos near Taos, N. Mex.....	285
Rio Taos at Los Cordovas, N. Mex.....	286
Rio Lucero near Arroyo Seco, N. Mex.....	287
Principal diversions from Rio Lucero, N. Mex.....	288
Embudo Creek at Dixon, N. Mex.....	289
Rio Chama at Park View, N. Mex.....	290
Rio Chama below El Vado Dam, N. Mex.....	291
Rio Chama near Abiquiu, N. Mex.....	292
Rio Chama near Chamita, N. Mex.....	293
Willow Creek near Park View, N. Mex.....	294
El Rito Creek near El Rito, N. Mex.....	295
Rio Ojo Caliente at La Madera, N. Mex.....	296
Rio Santa Cruz at Cundiyo, N. Mex.....	297
Rio Santa Cruz at Riverside, N. Mex.....	298
Nambe Creek near Nambe, N. Mex.....	299
Principal diversions from Nambe Creek, N. Mex.....	300
Rio Tesuque above diversions, near Santa Fe, N. Mex.....	301
Mitchell ditch near Santa Fe, N. Mex.....	302
Well ditch at San Ildefonso, N. Mex.....	302
Santa Fe Creek near Santa Fe, N. Mex.....	303
Jemez River near Bernalillo, N. Mex.....	304
Tijeras Creek near Albuquerque, N. Mex.....	305
Rio Puerco near Cabezon, N. Mex.....	306
Rio Puerco at Cabezon, N. Mex.....	307
Rio Puerco at Rio Puerco, N. Mex.....	308
Rio Puerco near Bernardo, N. Mex.....	309
Chico Arroyo near Guadalupe, N. Mex.....	310
Bluewater Creek near Bluewater, N. Mex.....	311
San Jose River near Grants, N. Mex.....	312
San Jose River at Correo, N. Mex.....	313
Rio Salado near San Acacia, N. Mex.....	314
Socorro main canal north at San Acacia, N. Mex.....	315
Socorro main canal south near San Antonio, N. Mex.....	315
San Antonio Riverside drain near San Antonio, N. Mex.....	315
San Antonio Riverside drain near San Marcial, N. Mex.....	316
Elmendorf interior drain near San Antonio, N. Mex.....	316
Pecos River near Pecos, N. Mex.....	317
Pecos River near Anton Chico, N. Mex.....	318
Pecos River at Santa Rosa, N. Mex.....	319
Pecos River near Puerto de Luna, N. Mex.....	320
Pecos River below Alamogordo Dam, N. Mex.....	321
Pecos River near Acme, N. Mex.....	322
Pecos River near Lake Arthur, N. Mex.....	323
Pecos River near Artesia, N. Mex.....	324
Pecos River below McMillan Dam, N. Mex.....	325
Pecos River below Major Johnson Springs, near Carlsbad, N. Mex.....	326
Pecos River at dam site 3, near Carlsbad, N. Mex.....	327
Pecos River at Carlsbad, N. Mex.....	328
Pecos River near Malaga, N. Mex.....	329
Pecos River at Red Bluff, N. Mex.....	330
Pecos River near Oria, Tex.....	331
Pecos River at Pecos, Tex.....	332



## Gaging-station records--Continued.

Rio Grande Basin--Continued.	Page
Pecos River below Grandfalls, Tex.....	333
Pecos River near Girvin, Tex.....	334
Pecos River near Sheffield, Tex.....	335
Gallinas River near Montezuma, N. Mex.....	336
Gallinas River at Montezuma, N. Mex.....	337
Rio Ruidoso at Hondo, N. Mex.....	338
Rio Hondo at Diamond A Ranch, near Roswell, N. Mex.....	339
Rio Bonito at Hondo, N. Mex.....	340
Rio Felix at old highway bridge, near Hagerman, N. Mex.....	341
Cottonwood Creek near Lake Arthur, N. Mex.....	342
Black River above Malaga, N. Mex.....	343
Delaware River near Red Bluff, N. Mex.....	344
Salt (Screwbean) Draw near Oria, Tex.....	345
Principal diversions from Pecos River between Red Bluff Reservoir and Imperial, Tex.....	346
Madera Canyon near Toyahvale, Tex.....	347
Toyah Creek below Toyah Lake, near Pecos, Tex.....	348
San Solomon Springs at Toyahvale, Tex.....	349
Comanche Springs at Fort Stockton, Tex.....	350
Devils River near Juno, Tex.....	351
Las Moras Springs at Brackettville, Tex.....	351
Mimbres River Basin.....	352
Mimbres River near Mimbres, N. Mex.....	352
Mimbres River near Paywood, N. Mex.....	353
Bear Canyon near Mimbres, N. Mex.....	354
Tularosa Valley.....	355
Rio Tularosa near Bent, N. Mex.....	355
Rio Tularosa near Tularosa, N. Mex.....	356
Alamogordo-La Luz ditch at La Luz, N. Mex.....	357
Alamogordo water supply near Alamogordo, N. Mex.....	357
Miscellaneous discharge measurements.....	358
Index.....	365

## ILLUSTRATION

Figure 1. Gaging-station structures: A, Sabine River near Gladewater, Tex.; B, Pecos River at Red Bluff, N. Mex.; C, Colorado River at San Saba, Tex.....	Page
	3

## SCOPE OF WORK

This volume is one of a series of 14 reports presenting results of measurements of stage and flow made on streams, lakes, and reservoirs in the United States during the water year ending September 30, 1948. The work was begun in 1888 in connection with special studies relating to irrigation. Measurements of the flow of streams and of the stage and contents of lakes and reservoirs have been made at about 11,370 gaging stations in the 48 States and also at many in the Territories of Alaska and Hawaii. In July 1948, 5,960 gaging stations, including those in Hawaii, were being maintained by the Geological Survey and cooperating organizations. Miscellaneous discharge measurements were made during the water year at many other points.

In the execution of the work many State and private organizations have cooperated, either by furnishing data or by assisting in collecting data. Cooperation of the first kind is acknowledged in connection with the description of each station affected; cooperation of the second kind is acknowledged, under the heading "Cooperation," in the introductory matter that precedes the gaging-station records in each volume. In the present volume, the section on cooperation of the second kind appears on page 13.

## DEFINITION OF TERMS

The units in which stream-flow data are presented in this report and other terms used herein are defined as follows:

"Second-foot" is an abbreviation for "cubic feet per second." A second-foot 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.

"Second-foot per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the runoff is distributed uniformly both as regards time and area.

"Runoff in inches" is the depth to which an area would be covered if all the water draining from it in a given period were uniformly distributed on its surface. It is used for comparing runoff with rainfall, which is usually expressed in inches.

An "acre-foot" is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet. The term is commonly used in connection with storage for irrigation.

"Second-foot-day" is the volume of water represented by a flow of 1 second-foot 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 an abbreviation for the term "relation between gage height and discharge."

"Control" is a term used to designate a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural section, a reach of the channel, or an artificial structure.

"Contents" is a term applied to the volume of water in a reservoir. It is computed on the basis of a level pool and does not include bank storage unless otherwise indicated.

#### EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage, measurements of discharge, and general information used to supplement the records of stage and discharge measurements in determining the daily flow. The records of stage are obtained either from direct readings on a nonrecording gage or from a water-stage recorder that gives a continuous record of the fluctuations. Measurements of discharge are made with a current meter by the general methods outlined in standard textbooks on the measurement of river discharge. Typical structures in use at gaging stations are shown in figure 1.

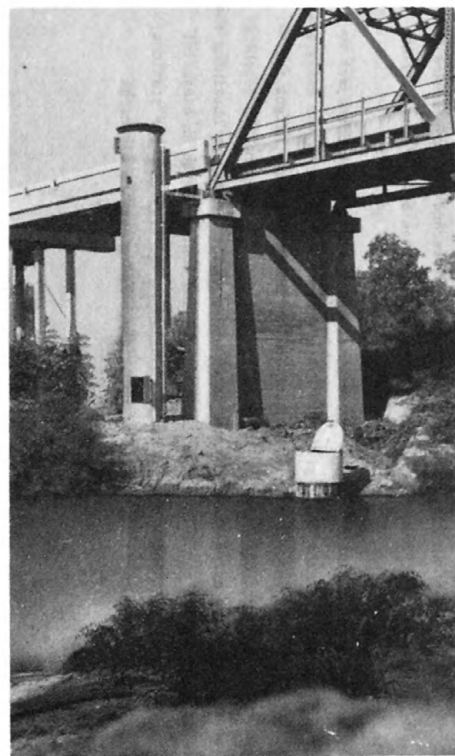
Rating tables giving the discharge for any stage are prepared from the discharge measurements. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the yearly mean discharge are computed. If the stage-discharge relation is subject 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. At times the stage-discharge relation for a station may be temporarily changed by the presence of aquatic growth or debris on the control. For such times the daily mean discharge is computed by what is essentially the "shifting-control" method, described above.

At some gaging stations the stage-discharge relation is affected by backwater from reservoirs, tributary streams, or other sources, which necessitates the use of the "slope method," in which the slope or fall in a reach of the stream is a factor in the determination of discharge. Information requisite for determining the slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage, and for them the rate of change of stage is used as a factor in the determination of discharge.

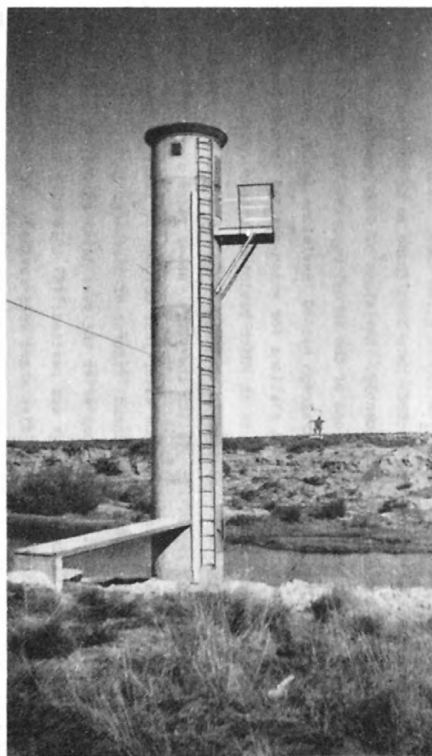
At most gaging stations in the northern part of the United States and at some in the mountainous regions of other parts the stage-discharge relation is affected by ice during the winter, which makes it impossible to compute the discharge in the usual manner. Discharge for periods of ice effect is computed 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 stations in the same or nearby basins. For those stations at which the stage-discharge relation is affected by ice, the days included in the periods of ice effect either are indicated in the table by symbols referring to a footnote that states this fact or are given in a general note following the table. The days on which discharge measurements were made during or between periods of ice effect, shortly before the first period, or shortly after the last period are similarly indicated by a footnote.

For most of the gaging stations on streams in the area covered by this report the data presented comprise a description of the station, a table showing the daily discharge of

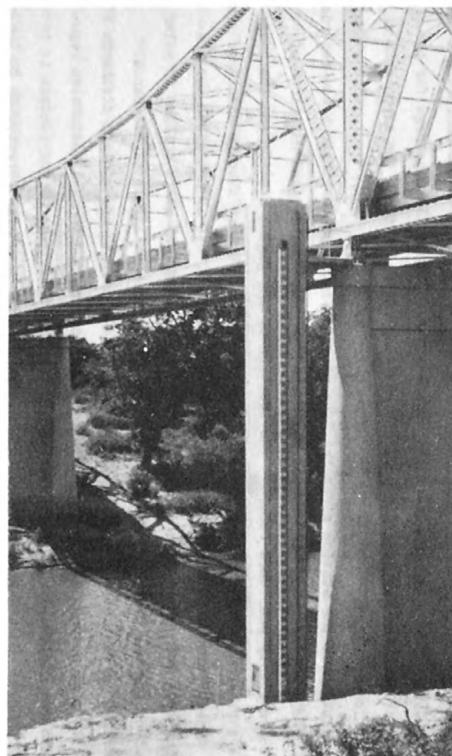




A. SABINE RIVER NEAR GLADEWATER, TEX.



B. PECOS RIVER AT RED BLUFF, N. MEX.



C. COLORADO RIVER NEAR SAN SABA, TEX.

FIGURE 1.—GAGING-STATION STRUCTURES.

the stream, and a table of monthly and yearly discharge and runoff. Skeleton rating tables are published for all stations except those at which the daily discharge for the greater part of the year was determined by the shifting-control method, the slope method, or other special methods.

The description of the station gives the type of gage, location, drainage area, records available, average discharge, extremes of discharge, general remarks, and notations of revisions of previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having less than 10 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 discharge if there is little or no regulation; the minimum daily discharge if there is extensive regulation (also the minimum discharge if useful); and the minimum gage height (unless it is of no importance). Unless otherwise qualified, the maximum discharge corresponds to the crest stage, obtained by use of a water-stage recorder or a nonrecording gage read at the time of the crest. Information pertaining to the accuracy of the records and conditions which affect the natural flow at the gaging station is given under "Remarks."

For some stations previously published records have been found to be in error on the basis of data or information obtained subsequently. Revisions of such records are usually published along with the current records in one of the annual reports. In order to make it easier to find such revised records, a paragraph headed "Revisions (water years)" has been added to the station description of all stations for which revised records have been published. Listed therein are all the reports in which revisions appear, each followed by the water years for which figures are revised in that report. In listing the report number, W. means Water-Supply Paper. In listing the years, water years are indicated by only 1 year, for instance, 1933 stands for the water year October 1, 1932, to September 30, 1933. If there were no daily, monthly, or annual figures of discharge involved in the revision, that fact is brought out by notations after the year dates as follows: (M) means that only the instantaneous maximum discharge was revised; (m) that only the instantaneous minimum was revised; and (P) that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given. It should be noted that for all stations for which second-feet per square mile and runoff in inches are published, a revision of the drainage area necessitates corresponding revision of all figures based on the drainage area. Revised figures of second-feet per square mile and runoff in inches resulting from a revision of the drainage area only are usually not published in the annual series of reports.

For stations equipped with water-stage recorders, except those on streams subject to sudden or rapid fluctuation, the table gives the discharge corresponding to the daily mean gage height. For stations subject to such fluctuation the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day or by using the discharge integrator, an instrument for obtaining the daily mean discharge from a continuous gage-height graph and containing as an essential element a curve representing the stage-discharge relation at the station. For stations equipped with nonrecording gages, the table of daily discharge gives the discharge



corresponding to either once-daily readings of the gage, the mean of twice-daily readings, or the mean gage height determined from gage-height graphs based on gage readings. For periods of rapidly changing stage, the daily mean discharge is determined from gage-height graphs based on gage readings, the frequency of which is stated in the station description.

In the table of monthly discharge the column headed "Second-foot-days" gives the sum for each month of the figures given in the table of daily discharge. The column headed "Maximum" gives the maximum daily discharge, not the momentary discharge when the water surface was at crest stage. Likewise, in the column headed "Minimum" the quantity given is the minimum daily discharge. The column headed "Mean" gives the average flow in cubic feet per second during the month.

Peak discharges with the times of their occurrence are listed below the table of monthly discharge for most stations. 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 will be presented. Peak discharges are not published for canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man.

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. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is usually given in the first report in which data for a station are published but is omitted from succeeding reports.

#### ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of stream-flow data depends primarily on (1) the permanency 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 flow, and interpretation of records.

The station description gives a statement in regard to the general 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 accurate than the daily records.

Yield at some stations as indicated by monthly means may vary widely from natural yield, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or other factors. For such stations figures of "second-feet per square mile" and "runoff in inches" are not published unless storage or diversion records are included indicating the extent of the regulation or diversion or unless satisfactory adjustments can be made for changes in contents or 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 its inclusion is indicated. Even at those stations where adjustments are made, in some instances large errors in computed yields may occur when relatively large negative adjustments are applied or when evaporation is large in comparison with the observed discharge. Figures of second-feet per square mile and runoff in inches are also omitted if the drainage area includes large noncontributing areas or if the average annual rainfall over the drainage area is less than 20 inches.

Many gaging stations on streams in the irrigated areas of the United States are situated above most of the diversions from those streams, and therefore the discharge recorded does not show the water supply available for further development, as prior appropriations below the station must first be satisfied.

The table of monthly discharge presents in summary the distribution of the flow past the station. The table of daily discharge affords opportunity for more detailed studies of the variation in flow. As further observations in each succeeding year may be expected to throw new light on data previously published, it should be borne in mind that such data are subject to revision in succeeding water-supply papers.

#### PUBLICATIONS

The results of stream-flow measurements are now published annually in 14 parts, each part covering an area whose boundaries coincide with natural drainage features as indicated below:

- Part 1. North Atlantic slope basins (St. John River to York River).  
 2. South Atlantic slope and eastern Gulf of Mexico basins (James River to Mississippi River).  
 3. Ohio River Basin.  
 4. St. Lawrence River Basin.  
 5. Hudson Bay and upper Mississippi River Basins.  
 6. Missouri River Basin.  
 7. Lower Mississippi River Basin.  
 8. Western Gulf of Mexico basins.  
 9. Colorado River Basin.  
 10. The Great Basin.  
 11. Pacific slope basins in California.  
 12. Pacific slope basins in Washington and upper Columbia River Basin.  
 13. Snake River Basin.  
 14. Pacific slope basins in Oregon and lower Columbia River Basin.

Water-supply papers and other publications of the Geological Survey containing data on the water resources of the United States may be obtained or consulted as explained below.

1. Copies may be purchased at nominal cost from the Superintendent of Documents, Government Printing Office, Washington, D. C., who will, on application, furnish lists giving prices.
2. Sets of the reports may be consulted in the libraries of the principal cities in the United States.
3. Sets are available for consultation in the offices of the water resources division of the Geological Survey as follows:

##### East of the Mississippi River:

Albany, N. Y., 526 Federal Building.  
 Asheville, N. C., 220 Post Office Building.  
 Atlanta, Ga., 411 Grand Theater Building.  
 Augusta, Maine, 420 Statehouse.  
 Baton Rouge, La., 538 Florida Street.  
 Boston, Mass., 339 Post Office Building.  
 Champaign, Ill., 605 South Neil Street.  
 Charleston, W. Va., 408 Union Building.  
 Charlottesville, Va., Cabell Hall, University of Virginia.  
 Chattanooga, Tenn., 442 Post Office Building.  
 College Park, Md., 106 Engineering Building, University of Maryland.  
 Columbia, S. C., 207 Creason Building.  
 Columbus, Ohio, 2590 West Hardin Street, Ohio State University.  
 Harrisburg, Pa., 490 Education Building.  
 Hartford, Conn., 203 Federal Building.  
 Indianapolis, Ind., 311 West Washington Street.  
 Jackson, Miss., 208 Millsaps Building.  
 Knoxville, Tenn., 337 Post Office Building.  
 Louisville, Ky., 531 Federal Building.  
 Madison, Wis., 666 State Office Building.  
 Montgomery, Ala., 507 Post Office Building.  
 New Philadelphia, Ohio, Muskingum Watershed Conservancy District Building.  
 Ocala, Fla., 302 Post Office Building.  
 Pittsburgh, Pa., 515 Plaza Building.  
 Raleigh, N. C., 908 Capitol Club Building.  
 St. Paul, Minn., 1427 New Post Office Building.  
 Trenton, N. J., 228 Federal Building.  
 Washington, D. C., General Services Administration Building.

## West of the Mississippi River:

Austin, Tex., 302 West Fifteenth Street.  
 Bismarck, N. Dak., 7 Eltinge Building.  
 Boise, Idaho, 429 Federal Building.  
 Denver, Colo., 126 New Customhouse.  
 Fort Smith, Ark., 6 Post Office Building.  
 Helena, Mont., 408 Federal Building.  
 Honolulu, Hawaii, 225 Federal Building.  
 Idaho Falls, Idaho, 204 Federal Building.  
 Iowa City, Iowa, 508 Hydraulic Laboratory, University of Iowa.  
 Lincoln, Nebr., 510 Rudge-Guenzel Building.  
 Los Angeles, Calif., 429-F United States Post Office and Courthouse.  
 Oklahoma City, Okla., 203 Council Building.  
 Pierre, S. Dak., 201 Federal Building.  
 Portland, Oreg., 606 Post Office Building.  
 Rolla, Mo., 211 Ramsey Building.  
 St. Louis, Mo., 1004 New Federal Building.  
 Salt Lake City, Utah, 303 Federal Building.  
 San Francisco, Calif., 702 Appraisers Building.  
 Santa Fe, N. Mex., 204 United States Courthouse.  
 Tacoma, Wash., 207 Federal Building.  
 Topeka, Kans., 305 Federal Building.  
 Tucson, Ariz., 210 Post Office Building.

A list of Geological Survey publications may be obtained by applying to the Director, Geological Survey, Washington, D. C.

Prior to publication, records of discharge in provisional form for individual stations may usually be obtained from the district offices listed above.

Early records of the flow of streams in the United States are published in the reports listed below. In many of these reports records for years earlier than those indicated have been included for some streams.

Stream-flow data for the years 1884-1901, in reports of the Geological Survey  
 (A = Annual Report; B = Bulletin; W = Water-Supply Paper)

Report	Character of data	Year
10th A, pt. 2	Descriptive information only.	
11th A, pt. 2	Monthly discharge and descriptive information.....	1884 to September 1890
12th A, pt. 2	.....do.....	1884 to June 30, 1891.
13th A, pt. 3	.....do.....	1884-92.
14th A, pt. 2	Monthly discharge.....	1888-93.
B 131.....	Descriptions, measurements, gage heights, and ratings.....	1893-94.
16th A, pt. 2	Descriptive information only.	
B 140.....	Descriptions, measurements, gage heights, ratings, and monthly discharge.	1895.
W 11.....	Gage heights.....	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge...	1895-96.
W 15.....	Descriptions, measurements, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries above Kansas River.	1897.
W 16.....	Descriptions, measurements, and gage heights of stream west of the Mississippi River, except Missouri River and tributaries above Kansas River.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge.	1897.
W 27.....	Measurements, ratings, and gage heights of streams east of the Mississippi River, and Missouri River and tributaries.	1898.
W 28.....	Measurements, ratings, and gage heights of streams west of the Mississippi River, except Missouri River and tributaries.	1898.
20th A, pt. 4	Monthly discharge.....	1898.
W 85 to 39.....	Descriptions, measurements, gage heights, and ratings.....	1899.
21st A, pt. 4	Monthly discharge.....	1899.
W 47 to 52.....	Descriptions, measurements, gage heights, and ratings.....	1900.
22d A, pt. 4	Monthly discharge.....	1900.
W 65, 66.....	Descriptions, measurements, gage heights, and ratings.....	1901.
W 75.....	Monthly discharge.....	1901.

Papers on surface water supply containing records from 1899 to date, grouped by years and drainage basins, are listed by number on page 8. The data for any particular gaging station will, in general, be found in the reports covering the years during which the station was maintained. For example, the data for 1910 to 1920 for any station in the area covered by part 3 are published in Water-Supply Papers 283, 303, 323, 353, 403, 433, 453, 473, and 503, which contain records for the Ohio River Basin for those years.



Numbers of water-supply papers containing results of stream measurements, 1899-1948 (for basins included see p. 6).

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1899 a.....	35	36	36	36	36	36	37	37	37	38	38	38	38	38
1900 b.....	47, 148	48	48	49	49	49	50	50	50	51	51	51	51	51
1901 c.....	65, 85	85	85	85	85	85	86	86	86	86	86	86	86	86
1902 d.....	65, 85	85	85	85	85	85	86	86	86	86	86	86	86	86
1903 e.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1904 f.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1905 g.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1906 h.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1907 i.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1908 j.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1909 k.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1910 l.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1911 m.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1912 n.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1913 o.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1914 p.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1915 q.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1916 r.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1917 s.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1918 t.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1919 u.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1920 v.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1921 w.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1922 x.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1923 y.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1924 z.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1925.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1926.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1927.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1928.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1929.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1930.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1931.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1932.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1933.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1934.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1935.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1936.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1937.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1938.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1939.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1940.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1941.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1942.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1943.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1944.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1945.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1946.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1947.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38
1948.....	37	37	37	37	37	37	38	38	38	38	38	38	38	38

a Rating tables and index to WSP 35-39.  
 b James River only.  
 c Gastañin, Guadalupe Rivers and Colorado River above Gunnison River.  
 d Gastañin, Guadalupe Rivers and Colorado River above Gunnison River.  
 e Mojave River only.  
 f Kings and Kern Rivers and south Pacific slope.  
 g Rating tables and index to WSP 47-52.  
 h Colorado River.  
 i Colorado River.  
 j Loup, Platte, and Elkhorn Rivers and tributaries below Platte River.  
 k Tributaries of Mississippi River from east.  
 l Lake Ontario and tributaries to St. Lawrence River proper.  
 m New England rivers only.  
 n Hudson River to Delaware River.  
 o Susquehanna River to Yackin River.  
 p Platte and Kansas Rivers.  
 q The Great Basin in California, except the Truckee and Carson River Basins.  
 r The Truckee and Carson River Basins.  
 s Rogue, Umpqua, and Stiletz Rivers only.

The records at most of the stations discussed in these reports extend over a series of years. Miscellaneous measurements at many points other than regular gaging stations have been made each year and are published under "Miscellaneous discharge measurements" at the end of each report, the streams and points of measurement listed appearing in the same relative order as the streams and gaging stations in the body of the report. An index of the records obtained prior to 1904 has been published in Water-Supply Paper 119.

Each of the reports on surface water supply for the year 1939, issued as Water-Supply Papers 871 to 884 (see table on p. 8), contains, for the area covered by that report, a summary of yearly discharge at gaging stations at which 10 or more complete years of record have been collected. These summaries are available also as separate reprints.

Reports have been published that are compilations of records for various areas, usually a single State or drainage basin. These reports contain records previously published (some of which have been revised), as well as some records not contained in the annual series of water-supply papers. The following table gives the numbers and titles of these reports, arranged alphabetically, some by States and some by drainage basins.

Reports containing compilations of records of discharge by States and drainage basins

Report	Period	Water-Supply Paper
<b>STATE</b>		
Alabama, Water powers of, with an appendix on stream measurements in Mississippi.	1895-1903	107
California, Water resources of, part 1, Stream measurements in Sacramento River Basin.	1887-1912	298
California, Water resources of, part 2, Stream measurements in San Joaquin River Basin.	1878-1912	299
California, Water resources of, part 3, Stream measurements in the Great Basin and Pacific Coast river basins.	1891-1912	300
California, southern, Surface water supply of Pacific slope of.	1890-1918	447
California, Surface water supply of Sacramento River Basin.	1895-1927	597-E
California, Surface water supply of San Joaquin River Basin.	1895-1927	636-D
California, southern, Surface water supply of Pacific slope basins in.	1894-1927	636-E
California, Surface water supply of minor San Francisco Bay, northern Pacific, and Great basins in.	1895-1927	637-A
Colorado, Water resources of.	1884-1900	74
Georgia, Water resources of.	1895-1905	197
Massachusetts, Surface waters of.	1848-1915	415
Massachusetts, Hydrology of, Part 1, Summary of stream-flow and precipitation records.	1863-1945	1105
Nebraska, Surface water supply of.	1894-1906	230
Oregon, Surface water supply of.	1878-1910	370
Texas, Summary of records of surface waters of.	1898-1937	850
Vermont, Surface waters of.	1875-1916	424
Washington, Summary of hydrometric data in.	1878-1919	492
Washington, Summary of records of surface waters of.	1919-35	870
Wisconsin, northern, Water power of.	1895-1905	156
Wyoming, Surface waters of, and their utilization.	1894-1921	469
<b>DRAINAGE BASIN</b>		
Colorado River (Ariz., Colo., N. Mex., Utah, Wyo.) and its utilization.	1888-1914	395
Colorado River, upper (Colo., Utah), and its utilization.	1897-1927	617
Colorado River Basin (Ariz., Calif., Colo., Utah, Wyo.), Surface waters at base stations in.	1891-1938	918
Colorado River Basin (Ariz., Calif., Nev., N. Mex., Utah), Surface waters at stations on tributaries in lower.	1888-1938	1049
Columbia River Basin, upper (Mont., Idaho), Surface waters of.	1898-1958	916
Great Salt Lake Basin, Water powers of.	1889-1920	517
Green River (Colo., Utah, Wyo.) and its utilization.	1894-1926	618
Kennebec River Basin (Maine), Water resources of.	1890-1906	198
Milk River. See St. Mary and Milk Rivers.		
Missouri and St. Mary River Basins (Mont.), Surface waters of.	1881-1958	917
New-Kanawha River Basin (N. C., Va., W. Va.), Surface water supply of.	1895-1920	536
Penobscot River Basin (Maine), Water resources of.	1904-9	279
Potomac River Basin (D. C., Md., W. Va.), Surface waters of.	1895-1906	192
Rio Grande Basin (Colo., N. Mex., Tex.), Water resources of.	1888-1913	358
St. Mary and Milk Rivers (Mont., Canada), Water supply of.	1898-1917	491
St. Mary River. See St. Mary and Milk Rivers; Missouri and St. Mary River Basin.		
Sevier Lake Basin (Utah), Utilization of surface water resources of.	1889-1937	920
Susquehanna River Basin (Pa., Md.) Hydrography of.	1890-1904	109

Records of discharge have been published also in State reports. Some of these are not contained in the publications of the Geological Survey or are revisions of records previously published in its water-supply papers. The following table contains a list of these reports.

## State reports containing compilations of records of discharge

State	Period	Report	Issued by
Alabama.....	1895-1915	Bull. 17, Water powers of Alabama.....	Geological Survey of Alabama.
Do.....	1904-47	Special Report 20, Water Resources and Hydrology of southeastern Alabama.	Do.
Arkansas.....	1857-1928	Stream-gaging Rept. 1.....	Arkansas Geological Survey.
Colorado.....	1881-1935	Water resources of Colorado, Appendix 2, Data on stream-gaging stations of Colorado. <sup>1</sup>	State Planning Commission, Water Conservation Board, State engineer.
Do.....	1881-1938	Water resources of Colorado, Appendix 3, vols. 1 and 2, Stream-flow data of Colorado.	Do.
Connecticut...	1900-1927	Bull. 44, Water resources of Connecticut...	State Geological and Natural History Survey.
Do.....	1912-33	5th biennial report.....	State Water Commission.
Florida.....	1898-1946	Bull. 31, Springs of Florida.....	Florida Geological Survey.
Georgia.....	1895-1906	Bull. 16, Water powers of Georgia.....	Geological Survey of Georgia.
Do.....	1907-19	Bull. 38, Water powers of Georgia.....	Do.
Illinois.....	1908-11	Water resources of Illinois.....	Rivers and Lakes Commission.
Do.....	1900-1934	Stream-flow data of Illinois.....	Division of Waterways.
Indiana.....	1923-27	Pub. 72, Surface water supply of Indiana...	Department of Conservation.
Do.....	1927-30	Pub. 112, Surface water supply of Indiana...	Do.
Iowa.....	1873-1932	Stream-flow records of Iowa.....	State Planning Board.
Do.....	1873-1940	Water-Supply Bull. 1, Summaries of yearly and flood flow relating to Iowa streams.	Iowa Geological Survey.
Do.....	1941-42	Water-Supply Bull. 2, Surface water resources of Iowa.	Do.
Kansas.....	1895-1919	Surface waters of Kansas.....	Kansas Water Commission.
Do.....	1919-24	.....do.....	Do.
Do.....	1924-28	Report of Division of Water Resources.....	State Board of Agriculture.
Do.....	1928-35	Stream-flow data of Kansas.....	Do.
Do.....	1935-39	.....do.....	Do.
Kentucky.....	1910-20	Surface waters of Kentucky.....	Kentucky Geological Survey.
Louisiana.....	1905-38	Geol. Bull. 16, Surface water supply of Louisiana.	Department of Conservation.
Maine.....	1887-1920	1st annual report.....	Maine Water Power Commission.
Maryland.....	1929-37	Flow data and draft storage curves for major streams in Maryland.	State Planning Commission and Water Resources Commission.
Do.....	1892-1943	Bull. 1, Summary of records of surface waters of Maryland and the Potomac River Basin.	Department of Geology, Mines, and Water Resources.
Minnesota.....	1909-12	Water-resources investigation of Minnesota.	State Drainage Commission.
Missouri.....	1857-1926	Vol. 20, 2d series, Water resources of Missouri.	Missouri Bureau of Geology and Mines.
Do.....	1927-39	Vol. 26, 2d series, Surface waters of Missouri.	Missouri Geological Survey and Water Resources.
Montana.....	1889-1911	5th biennial report.....	Office of the State Engineer.
Do.....	1881-1938	Special Rept. 10, vols. 1-4, Water resources of Montana.	Montana Agricultural Experiment Station.
Nebraska.....	1894-1914	1st hydrographic report.....	Bureau of Water Power, Irrigation, and Drainage.
Do.....	1914-28	2d hydrographic report.....	Do.
New Hampshire...	1889-1922	Annual and statistical report, vol. 12.....	Public Service Commission.
New Jersey.....	1892-1928	Bull. 33, Surface water supply of New Jersey.	Department of Conservation and Development.
Do.....	1928-34	Special Rept. 5, Surface water supply of New Jersey.	State Water Policy Commission.
Do.....	1934-40	Special Rept. 9, Surface water supply of New Jersey.	Do.
New Mexico....	1888-1925	Surface water supply of New Mexico.....	Office of the State Engineer.
North Carolina	1889-1923	Bull. 34, Discharge records of North Carolina streams.	Department of Conservation and Development.
Do.....	1889-1936	Bull. 39, Discharge records of North Carolina streams. <sup>2</sup>	Do.
Do.....	1866-1945	Hydrologic Data on the Neuse River Basin.	Do.
Do.....	1820-1945	Hydrologic Data on the Cape Fear River Basin.	Do.
Do.....	1866-1945	Hydrologic Data on the Yadkin-Pee Dee River Basin.	Do.
Do.....	1872-1945	Hydrologic Data on the Catawba and Broad River Basins.	Do.
North Dakota..	1919-21	Report to Governor of North Dakota on flood control.	State chief engineer.
Do.....	1882-1938	Surface water in North Dakota.....	State Planning Board.
Do.....	1882-1944	Supplement B, 4th biennial report.....	State Water Conservation Commission.
Ohio.....	1898-1921	Bull. 73, Ohio stream flow, Part 1.....	Engineering Experiment Station, Ohio State University.
Do.....	1898-1944	Bull. 127, Ohio stream flow, Part 2.....	Do.
Do.....	1902-39	Bull. 200, Compilation of stream-flow records of Ohio.	Department of Agriculture, Division of Conservation and Natural Resources.
Do.....	1898-1939	Bull. 111, Ohio stream-drainage areas and flow-duration tables.	Engineering Experiment Station, Ohio State University.
Oregon.....	1878-1914	Bull. 4, Water resources of the State of Oregon.	Office of the State Engineer.
Do.....	1914-24	Bull. 7, Water resources of the State of Oregon.	Do.
Do.....	1924-30	Bull. 8, Water resources of the State of Oregon.	Do.
Do.....	1930-36	Bull. 9, Water resources of the State of Oregon.	Do.
Do.....	1936-41	Bull. 10, Water resources of the State of Oregon.	Do.

1 Contains records of yearly discharge only.

2 Contains records of maximum and minimum daily, weekly, and monthly discharge and yearly mean discharge.



## State reports containing compilations of records of discharge--Continued

State	Period	Report	Issued by
Pennsylvania..	1890-1911	Report of the Water Supply Commission of Pennsylvania.	Water Supply Commission of Pennsylvania.
Do.....	1926-32	Stream-flow records of Pennsylvania.....	Department of Forests and Waters.
Rhode Island..	1929-41	7th annual report.....	Department of Public Works.
South Carolina	1884-1946	Bull. 17, Summary of records of surface water supply of South Carolina.	South Carolina Research, Planning and Development Board.
Tennessee....	1874-1924	Bull. 34, Water resources of Tennessee <sup>3</sup> ....	Department of Education.
Do.....	1920-30	Bull. 40, Surface waters of Tennessee.....	Do.
Utah.....	1889-1905	5th biennial report.....	Office of the State Engineer.
Do.....	1906-10	7th biennial report.....	Do.
Do.....	1911-16	10th biennial report.....	Do.
Virginia.....	1895-1927	Bull. 31, Water resources of Virginia.....	Virginia Geological Survey.
Do.....	1927-42	Bull. 4, Surface water supply of Virginia (Potomac, Rappahannock, and York River Basins).	Virginia Conservation Commission.
Do.....	1927-42	Bull. 5, Surface water supply of Virginia (James River Basin).	Do.
Do.....	1927-42	Bull. 6, Surface water supply of Virginia (Roanoke and Chowan River Basins).	Do.
Do.....	1927-42	Bull. 7, Surface water supply of Virginia (New, Tennessee, and Big Sandy River Basins).	Do.
Washington....	1878-1933	Bull. 5, Monthly and yearly summaries of hydrometric data.	Department of Conservation and Development.
Wisconsin.....	1888-1914	1st report of Railroad Commission of Wisconsin to Legislature on water powers.	Railroad Commission of Wisconsin.
Do.....	1914-23	2d report of Railroad Commission of Wisconsin to Legislature on water powers.	Do.

<sup>3</sup> Includes records of discharge for all stations in North Carolina in the Tennessee River Basin.

Note.- In addition to the records contained in the reports listed above, the following States have issued annual or biennial reports in which are contained records of discharge: California, Colorado, Connecticut, Idaho, Indiana, Kansas, Maine, Missouri, Montana, Nebraska, Nevada, New Mexico, New York (also New York City Board of Water Supply and city of Rochester), North Dakota, Oregon, Pennsylvania, Rhode Island, Washington, and Wyoming.

The reports listed in the foregoing tables contain the customary records of discharge collected during the systematic operation of gaging stations. Detailed information on the stage and discharge of many streams during major floods has been included in special reports on these floods published by the Geological Survey. The more recent of these special reports also contain other pertinent hydrologic information and analyses and compilations of data relating to earlier noteworthy floods. The following list gives the numbers and titles of these reports:

Water-Supply Paper	Title
88	The Passaic flood of 1902.
92	The Passaic flood of 1903.
96	Destructive floods in the United States in 1903.
147	Destructive floods in the United States in 1904.
162	Destructive floods in the United States in 1905.
334	The Ohio Valley flood of March-April 1913.
428	Southern California floods of January 1916.
487	The Arkansas River flood of June 3-5, 1921.
488	The floods in central Texas in September 1921.
520-G	Some floods in the Rocky Mountain region.
636-C	The New England flood of November 1927.
771	Floods in the United States, magnitude and frequency.
773-E	The New York State flood of July 1935.
796-B	Flood on Republican and Kansas Rivers, May and June 1935.
796-C	Flood in La Canada Valley, Calif., January 1, 1934.
796-G	Major Texas floods of 1935.
798	The floods of March 1936, part 1, New England rivers.
799	The floods of March 1936, part 2, Hudson River to Susquehanna River region.
800	The floods of March 1936, part 3, Potomac, James, and upper Ohio Rivers.
816	Major Texas floods of 1936.
836-A	Stages and flood discharges of the Connecticut River at Hartford, Conn.
838	Floods of Ohio and Mississippi Rivers, January-February, 1937.
842	Floods in Canadian and Pecos River Basins of New Mexico, May and June 1937.
843	Floods of December 1937 in northern California.
844	Floods of March 1938 in southern California.
847	Maximum discharges at stream-measurement stations through September 1938.
867	Hurricane floods of September 1938.
869	Flood of August 1935 in Muskingum River Basin, Ohio.
914	Texas floods of 1938 and 1939.
966	Minor floods of 1938 in North Atlantic States.
967-A	Floods of September 1939 in Colorado River Basin below Boulder (Hoover) Dam.
967-B	Flood of July 5, 1939, in eastern Kentucky.
967-C	Flood of August 21, 1939, in town of Baldwin, Maine.
994	Cloudburst floods in Utah, 1850 to 1938.
997	Floods in Colorado.
1046	Texas floods of 1940.
1066	Floods of August 1940 in the southeastern States.
1080	Floods of May-June 1948 in Columbia River Basin.

## RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The following table contains a list of gaging stations for the area covered by this report at which records of discharge were collected during the water year October 1947 to September 1948 by agencies other than the Geological Survey. The records for these stations are not contained in publications of the Geological Survey.

Records of discharge collected by agencies other than the Geological Survey

Stream	Location	Period	Collected by	Remarks
Alamito Creek...	Near Presidio, Tex....	1932-48	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Arrey Canal....	Near Arrey, N. Mex....	1918, 1920-48	Bureau of Reclamation.	Unpublished.
Bonita ditch....	Below Caballo Dam, N. Mex.	1938-48	....do.....	Do.
Carlsbad project main canal.	Near Carlsbad, N. Mex..	1941-48	....do.....	Do.
Devils River....	Near Del Rio, Tex.....	1931-48†	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
East Side Canal.	At Mesilla Dam, near Mesilla Park, N. Mex.	1916-18, 1920-48	Bureau of Reclamation.	Unpublished.
El Paso sewage outfall.	Near El Paso, Tex.....	1936-48	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Goodenough Springs.	Near Comstock, Tex.....	1931-48†	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Hagerman Canal...	Near Roswell, N. Mex....	1942-48	Hagerman Irrigation Co.	Unpublished.
Las Vacas Arroyo.	Near Villa Acuna, Coahuila, Mexico.	1938-48	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Leasburg Canal...	At head, near Fort Selden, N. Mex.	1917-18, 1920-48	Bureau of Reclamation.	Unpublished.
Pecos River.....	Near Comstock, Tex.....	1931-48†	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Pinto Creek.....	Near Del Rio, Tex.....	1931-48†	....do.....	Do.
Rio Alamo.....	Mier, Tamaulipas, Mexico.	1924-48	....do.....	Do.
Rio Conchas.....	Cuchillo Parado, Chihuahua, Mexico.	1945-48	....do.....	Do.
Rio Escondido.....	At Villa de Fuente, Coahuila, Mexico.	1922-48	....do.....	Records for 1923-24 and 1928 published in H. Doc. 359, 71st Cong., 2d sess., as Rio San Antonio above Puente; records for 1932-48 published in bulletins of International Boundary & Water Commission.
Rio Grande.....	Below American Dam, near El Paso, Tex.	1938-48	....do.....	Published in bulletins of International Boundary & Water Commission.
Do.....	Below Brownsville, Tex.	1934-48	....do.....	Do.
Do.....	County-line station near El Paso, Tex.	1938-48	....do.....	Do.
Do.....	Del Rio, Tex.....	1931-48†	....do.....	Do.
Do.....	Eagle Pass, Tex.....	1931-48†	....do.....	Do.
Do.....	Near El Paso, Tex.....	1931-48†	....do.....	Do.
Do.....	Below old Fort Quitman, Tex.	1931-48†	....do.....	Do.
Do.....	Hidalgo, Tex.....	1931-48†	....do.....	Do.
Do.....	At island station, near El Paso, Tex.	1938-48	....do.....	Do.
Do.....	At Johnson Ranch, Tex...	1938-48	....do.....	Do.
Do.....	Cuadad Juarez, Chihuahua, Mexico.	1938-48	....do.....	Do.
Do.....	Langtry, Tex.....	1931-48†	....do.....	Do.
Do.....	Laredo, Tex.....	1926-48†	....do.....	Do.
Do.....	Las Palmas, Tamaulipas, Mexico.	1945-48	....do.....	Do.
Do.....	Leasburg Dam, at Fort Selden, N. Mex.	1919-48	Bureau of Reclamation.	Unpublished.
Do.....	Matamoras, Tamaulipas, Mexico.	1926-48†	International Boundary & Water Commission.	Published in bulletins of International Boundary & Water Commission.
Do.....	Above Presidio, Tex....	1926-48†	....do.....	Do.
Do.....	Below Presidio, Tex....	1926-48†	....do.....	Do.
Do.....	Rio Grande City, Tex....	1932-48	....do.....	Do.
Do.....	Roma, Tex.....	1926-28†, 1931-48	....do.....	Do.
Do.....	Zapata, Tex.....	1932-48	....do.....	Do.
Rio Salado.....	Near Guerrero, Tamaulipas, Mexico.	1924-48†	....do.....	Do.

† Records for earlier years published in Geological Survey water-supply papers.

‡ Records for earlier years published in Geological Survey water-supply papers as Rio Grande near Brownsville, Tex.

## Records of discharge collected by agencies other than the Geological Survey--Continued

Stream	Location	Period	Collected by	Remarks
Rio San Diego...	Jimenez, Coahuila, Mexico.	1924-48	International Boundary & Water Commission.	Records for 1924-28 published in report of International Water Commission, United States and Mexico, U. S. Section; records for 1932-48 published in bulletins of International Boundary & Water Commission.
Rio San Juan....	Above Rio Grande City, Tex.	1946-48	....do.....	Published in bulletins of International Boundary & Water Commission.
Do.....	Below Rio Grande City, Tex.	1946-48	....do.....	Do.
Rio San Rodrigo.	Near El Moral, Coahuila, Mexico.	1922-48	....do.....	Records for 1923-24 and 1927-28 published in H. Doc. 359, 71st Cong., 2d sess.; records for 1932-48 published in bulletins of International Boundary & Water Commission.
San Felipe Creek	Near Del Rio, Tex.....	1931-48	....do.....	Published in bulletins of International Boundary & Water Commission.
Terlingua Creek.	Near Terlingua, Tex....	1932-48	....do.....	Do.
West Side Canal.	At Mesilla Dam, near Mesilla Park, N. Mex.	1920-48	Bureau of Reclamation.	Unpublished.

Note.- In addition to the gaging stations listed above, the International Boundary & Water Commission collects and publishes records of discharge in floodways in the lower Rio Grande Valley and records of diversions from the Rio Grande for irrigation and municipal use.  
The Soil Conservation Service of the United States Department of Agriculture has been collecting records of runoff from 3 areas of less than 200 acres each near Waco, Tex., beginning in 1938. These records are in the files of the Soil Conservation Service.

## COOPERATION

The work in the several States was done under cooperative agreements with the organizations listed below:

Colorado: Office of the State Engineer, M. C. Hinderlider, and Colorado Water Conservation Board, C. H. Stone, director.

Louisiana: State Department of Public Works, D. L. Pyburn, director, succeeded by J. L. White.

New Mexico: Office of the State Engineer, J. H. Bliss; Interstate Stream Commission, J. H. Bliss, secretary; New Mexico State Highway Department, B. G. Dwyre, State highway engineer; Colfax County, J. D. Hickman, chairman, Board of Commissioners.

Texas: State Board of Water Engineers, consisting of E. V. Spence, chairman, J. W. Pritchett, and H. A. Beckwith; Red Bluff Water Power Control District.

Financial assistance was furnished by the Corps of Engineers in the operation of 76 gaging stations, of which 4 were in Louisiana, 7 in New Mexico, and 65 in Texas.

Financial assistance was also furnished by the Office of Indian Affairs of the United States Department of the Interior in the operation of gaging stations on the Indian Pueblo lands in New Mexico.

Acknowledgments are due the Bureau of Reclamation of the United States Department of the Interior and the Weather Bureau of the United States Department of Commerce for assistance in collecting the records published herein.

Assistance in collecting records was rendered also by the following organizations:

New Mexico: Town of Alamogordo, Middle Rio Grande Conservancy District, and Public Service Company of New Mexico.

Texas: Dallas County; the cities of Abilene, Amarillo, Corpus Christi, Dallas, Houston, Longview, and San Angelo; Tarrant County Water Control and Improvement District No. 1; West Texas Utilities Co.; Lower Colorado River Authority; Brazos River Conservation and Reclamation District; Pecos County

Water Improvement District No. 1; Reeves County Water Improvement District No. 1; Dow Chemical Co.; Texas Highway Department; San Jacinto River Conservation and Reclamation District; Lower Neches Valley Authority; Texas Electric Service Co.; Bexar, Medina, Atascosa Counties Water Control and Improvement District No. 1; Brown County Water Improvement District No. 1.

#### DIVISION OF WORK

The stream-gaging work was conducted by the water resources division of the Geological Survey -- Carl G. Paulsen, chief hydraulic engineer and Joseph V. B. Wells, chief of the surface water branch. The data for the stations in the several States were collected and prepared for publication under the supervision of district engineers as follows: In Colorado, Robert Pollansbee until July 23, 1948, succeeded by F. M. Bell on July 26, 1948, the work being done in collaboration with M. C. Hinderlider, State engineer, and L. T. Burgess, State chief hydrographer; in Louisiana (except for Sabine River at Logansport), W. R. Eaton until September 16, 1948, succeeded by Fay Hansen on October 25, 1948; in New Mexico (except for Delaware River near Red Bluff and Pecos River at Red Bluff), Berkeley Johnson; in Texas and for Sabine River at Logansport, La., Delaware River near Red Bluff, N. Mex., and Pecos River at Red Bluff, N. Mex., C. E. Ellsworth.

The records were reviewed and the manuscript prepared for publication under the direction of B. J. Peterson, chief, annual reports section.



## MERMENTAU RIVER BASIN

Bayou Nezpique near Basile, La.

Location.- Water-stage recorder, lat. 30°28'50", long. 92°37'55", in NE¼NW¼ sec. 1, T. 7 S., R. 3 W., at bridge on U. S. Highway 190, a quarter of a mile downstream from New Orleans, Texas & Mexico Railway bridge and 2 miles west of Basile. Datum of gage is 3.39 feet above mean sea level, datum of 1929, supplementary adjustment of 1941. Auxiliary staff gage 7½ miles downstream. Datum of auxiliary gage is 1.03 feet below mean sea level (Louisiana Geodetic Survey bench mark).

Records available.- October 1938 to September 1948.

Average discharge.- 10 years, 869 second-feet.

Extremes.- Maximum discharge during year, 4,860 second-feet Dec. 18 (gage height, 21.36 feet); minimum, 0.1 second-foot June 22-23; minimum gage height, 1.00 foot June 28. 1938-48: Maximum discharge, 22,900 second-feet Aug. 11, 1940 (gage height, 31.08 feet); minimum, 0.1 second-foot June 7-13, 1943, June 22-29, 1948; minimum gage height, that of June 28, 1943.

Remarks.- Records good except those below 10 second-feet, which are fair. Discharge above about 60 second-feet computed by using fall as determined by twice-daily readings of auxiliary staff gage as a factor. Diversions above and below station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	23	27	189	262	4,130	2,440	21	139	3.5	0.3	55	90
2	20	88	103	738	4,010	2,440	18	59	1.5	4	49	83
3	18	126	54	879	3,670	2,790	15	37	1.8	288	51	66
4	15	94	39	775	3,400	3,270	12	22	.4	218	54	64
5	12	188	32	502	3,040	3,580	11	14	.3	104	43	50
6	9.9	218	30	290	2,680	3,910	9.5	11	.3	84	47	44
7	7.9	252	28	171	2,810	4,010	8.2	8.7	.3	40	75	41
8	7.1	268	35	117	1,530	4,080	7.3	7.8	.3	20	102	34
9	5.5	256	297	78	1,310	3,840	6.5	12	.3	4.7	79	39
10	4.4	683	1,020	61	1,620	3,450	5.5	31	.2	7.1	63	31
11	3.7	1,620	1,420	850	1,960	3,080	4.8	27	.2	429	48	28
12	3.3	1,930	1,650	878	2,000	2,640	4.5	21	.3	511	37	30
13	2.6	1,930	1,830	8424	1,980	2,120	13	16	.3	221	32	69
14	2.3	1,560	1,960	81,040	2,130	1,380	33	11	.3	173	29	106
15	1.8	1,220	2,920	81,210	2,270	585	35	8.7	.3	217	25	157
16	1.5	1,020	3,870	81,290	2,220	235	25	8.4	.2	197	22	219
17	1.2	869	4,520	81,300	1,990	122	19	5.4	.2	144	21	234
18	1.0	855	4,810	1,240	1,760	88	18	4.1	.2	91	25	212
19	.9	485	4,510	934	1,450	74	31	1.9	.2	63	17	175
20	.9	370	4,120	754	920	59	28	1.2	.2	47	16	125
21	.8	250	3,620	908	628	57	22	.7	.2	35	16	81
22	.8	322	3,160	1,170	1,230	49	15	.4	.1	24	18	56
23	.7	1,240	2,700	1,280	1,790	42	11	.4	.1	23	21	40
24	.7	1,790	2,090	1,420	2,390	37	7.5	.4	.1	24	21	31
25	.6	2,090	1,220	1,490	2,710	32	5.7	.4	.1	22	20	26
26	.6	1,990	472	1,510	2,920	30	237	.3	.1	21	19	21
27	.6	1,580	164	1,690	3,030	28	869	.3	.1	18	21	18
28	.6	1,030	66	2,300	2,690	33	1,140	.3	.1	20	34	16
29	.6	584	53	2,800	2,670	37	915	.5	.1	29	67	14
30	.8	328	51	3,420	-	31	383	5.8	.2	54	97	11
31	32	-	54	3,880	-	25	-	5.4	-	64	97	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	180.8	32	0.6	5.83	359
November.....	25,063	2,090	27	835	49,710
December.....	47,087	4,810	28	1,519	93,400
Calendar year 1947 .....	407,811.7	8,420	.6	1,117	808,900
January.....	34,061	3,880	1,039	1,039	67,560
February.....	66,536	4,130	626	2,294	132,000
March.....	44,594	4,080	25	1,439	88,450
April.....	3,930.5	1,140	4.5	131	7,800
May.....	461.1	139	.3	14.9	915
June.....	11.5	3.5	.1	.38	23
July.....	3,193.5	511	.3	103	6,330
August.....	1,321	102	16	42.6	2,620
September.....	2,201	234	11	73.4	4,370
Water year 1947-48 .....	228,640.4	4,810	.1	625	453,500

Peak discharge (base, 3,700 sec.-ft.)- Dec. 18 (7 p.m.) 4,860 sec.-ft.; Feb. 1 (8 a.m.) 4,160 sec.-ft.; Mar. 8 (5 a.m.) 4,110 sec.-ft.

g From graph based on wire-weight gage readings.

## MERMENTAU RIVER BASIN

Bayou des Cannes near Eunice, La.

Location.- Water-stage recorder, lat. 30°29'00", long. 92°29'25" in SW1/4 sec. 32, T. 6 S., R. 1 W. Louisiana meridian, at bridge on U. S. Highway 190, 3 miles downstream from New Orleans, Texas & Mexico Railway bridge and 4 miles west of Eunice. Datum of gage is 14.84 feet above mean sea level, datum of 1929 (Louisiana Geodetic Survey bench mark; levels by Corps of Engineers). Auxiliary staff gage 1.8 miles downstream.

Records available.- October 1938 to September 1948.

Average discharge.- 10 years, 277 second-feet.

Extremes.- Maximum discharge during year, 3,140 second-feet Mar. 4 (gage height, 16.98 feet); no flow June 23-27, 30, July 1.  
1938-48: Maximum discharge, 10,000 second-feet July 7, 1946 (gage height, 21.15 feet); no flow May 7, 10-18, July 10, 1939, June 23-27, 30, July 1, 1948.

Remarks.- Records good except those below 10 second-feet, which are fair. Discharge above about 70 second-feet computed by using fall as determined by twice-daily readings of auxiliary staff gage as a factor. Diversions above station for irrigation. Some regulation May to October by small irrigation diversion dams.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.8	10	18	15	1,460	154	1.8	190	4.4	0	36	59
2	7.4	3.6	13	43	1,210	822	1.7	30	2.5	30	23	54
3	7.2	2.4	9.9	92	844	1,960	1.4	13	1.0	50	21	46
4	8.3	2.1	9.1	69	372	2,870	1.2	9.5	.5	17	23	42
5	6.8	85	9.5	36	76	1,950	1.1	7.2	.3	9.5	81	37
6	3.9	70	9.0	17	47	1,580	1.1	10	.2	5.8	76	33
7	2.5	96	8.8	11	30	1,310	1.1	17	.7	6.4	136	28
8	1.8	153	9.3	8.8	79	1,100	1.0	44	.4	5.4	104	24
9	1.3	174	143	7.9	539	822	.8	48	.2	3.9	63	23
10	1.7	181	670	6.6	580	434	.7	30	.2	2.6	98	54
11	1.4	579	834	4.8	824	163	.5	16	.1	106	95	91
12	1.1	745	1,060	37	892	86	.5	9.7	.2	298	71	93
13	1.1	893	1,220	283	784	50	1.0	6.9	.5	197	52	86
14	1.4	888	1,150	498	849	22	9.7	4.0	.2	101	38	107
15	1.9	776	1,640	569	498	14	73	3.0	.2	63	25	225
16	1.8	720	2,120	507	209	10	48	3.1	.2	33	18	256
17	1.4	742	2,320	245	73	8.4	25	2.7	.2	23	18	182
18	.9	623	1,670	87	38	8.3	14	1.7	.2	42	17	116
19	.5	296	1,210	49	22	7.6	8.4	3.0	.2	26	16	83
20	.4	100	780	95	16	6.3	4.5	3.0	.1	19	12	50
21	.2	61	253	147	195	5.4	2.2	1.8	.1	21	12	33
22	.2	165	56	166	660	5.6	1.6	.8	0	28	11	18
23	.2	808	29	336	800	4.8	2.5	6.6	0	24	8.3	12
24	.2	959	19	465	1,090	3.9	1.1	3.3	0	17	5.0	9.3
25	.2	1,280	14	542	1,100	3.3	3.7	2.0	0	14	4.6	10
26	.2	1,240	13	455	1,110	3.0	704	1.0	0	16	7.9	10
27	.2	890	12	599	985	3.2	1,010	1.0	0	19	12	8.4
28	.2	400	11	778	708	3.3	1,320	4.1	.1	28	18	8.8
29	.2	82	9.3	993	265	2.6	1,110	17	.1	44	28	7.4
30	.2	34	8.3	1,390	-	2.1	677	14	0	43	25	5.0
31	1.1	-	8.8	1,560	-	1.9	-	7.4	-	48	45	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	62.7	8.3	0.2	2.02	124
November.....	13,036.1	1,280	2.1	435	25,860
December.....	15,337.0	2,320	8.3	495	30,420
Calendar year 1947 .....	119,587.5	4,200	.2	328	237,200
January.....	10,132.1	1,560	4.8	327	20,100
February.....	16,255	1,460	16	561	32,240
March.....	13,418.7	2,870	1.9	433	26,610
April.....	5,028.6	1,320	.5	168	9,970
May.....	510.8	190	.8	16.5	1,010
June.....	12.8	4.4	0	.43	25
July.....	1,340.6	298	0	43.2	2,650
August.....	1,177.8	136	4.6	39.0	2,340
September.....	1,810.9	256	5.0	60.4	3,590
Water year 1947-48 .....	78,121.1	2,870	0	213	154,900

Peak discharge (base, 1,800 sec.-ft.)- Dec. 17 (4 a.m.) 2,500 sec.-ft.; Mar. 4 (6 a.m.) 3,140 sec.-ft.

## CALCASIEU RIVER BASIN

17

Calcasieu River near Glenmora, La.

Location.- Wire-weight gage, lat. 30°59'40", long. 92°40'25", in SE<sup>1</sup>/<sub>4</sub>SE<sup>1</sup>/<sub>4</sub>, sec. 4, T. 1 S., R. 3 W. Louisiana meridian, at bridge on State Highway 113, 1.0 mile upstream from Prairie Branch and 4.6 miles northwest of Glenmora. Datum of gage is 110.77 feet above mean sea level (Louisiana Geodetic Survey bench mark).

Drainage area.- 499 square miles.

Records available.- August 1943 to September 1948.

Extremes.- Maximum discharge during year 5,100 second-feet Feb. 13 (gage height, 14.00 feet);

minimum 20 second-feet Aug. 18-24; minimum gage height, 4.29 feet Aug. 21, 22.

1943-48: Maximum discharge, 27,400 second-feet (revised) Apr. 4, 1945 (gage height, 18.0 feet, from graph based on gage readings); minimum, that of Aug. 18-24, 1948; minimum gage height, 4.28 feet Sept. 16, 1943.

Revisions.- The figures of maximum discharge for some water years have been revised as shown in the following table. They supersede those published in the water-supply papers indicated.

Water-Supply Paper	Water year	Date	Gage height (feet)	Discharge (second-feet)
1038.....	1944	May 5	g16.5	19,000
1038.....	1945	Apr. 4	g18.0	27,400
1058.....	1946	Jan. 9	16.20	17,800
1088.....	1947	Jan. 19	16.68	20,100

g From graph based on gage readings.

Remarks.- Records good. Gage read twice daily.

Revisions.- Revised figures of discharge for high-water periods in the water years 1944 to 1947 are given herewith. They supersede those published in Water-Supply Papers 1038, 1058, and 1088.

Day (water year)	Discharge (second-feet)	Day (water year)	Discharge (second-feet)	Day (water year)	Discharge (second-feet)
1943-44		1944-45		1945-46	
Jan. 18.....	7,200	Apr. 5.....	8,880	Feb. 13.....	6,650
May 5.....	14,500			Mar. 28.....	8,320
6.....	15,600	1945-46		29.....	7,760
7.....	10,000	Jan. 8.....	3,880	May 17.....	6,920
8.....	7,200	9.....	15,600	18.....	7,760
		10.....	13,900	19.....	5,820
1944-45		11.....	13,900		
Dec. 31.....	6,080	12.....	10,600	1946-47	
Jan. 1.....	5,550	13.....	7,200	Jan. 17.....	6,080
5.....	3,790	14.....	5,320	18.....	11,700
Apr. 2.....	5,360	Feb. 10.....	5,210	19.....	19,000
3.....	21,200	11.....	13,900	20.....	18,400
4.....	21,800	12.....	14,500	21.....	15,000
				22.....	9,440

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	30	27	685	237	2,050	1,590	375	119	83	41	27	27
2	30	28	386	262	2,370	1,800	331	107	83	41	25	26
3	30	28	216	360	2,550	1,800	245	95	66	39	24	25
4	28	30	188	540	2,370	1,500	188	119	56	39	23	24
5	28	37	274	685	2,200	1,330	181	153	51	39	23	23
6	28	56	630	890	1,800	1,410	160	188	46	39	23	23
7	28	72	815	1,070	1,500	1,410	153	281	46	37	24	22
8	28	95	970	970	1,410	1,330	140	223	44	34	23	22
9	28	89	1,070	655	1,410	1,330	133	262	41	32	23	23
10	28	69	1,330	475	1,590	1,260	119	262	39	32	22	23
11	27	64	1,690	360	1,800	1,260	113	223	39	32	22	24
12	27	95	2,550	317	2,370	1,190	107	188	37	37	22	26
13	27	126	2,740	405	4,720	1,020	107	133	37	41	22	37
14	27	167	2,940	655	4,720	930	222	146	34	41	22	39
15	27	202	3,350	745	3,810	780	354	160	34	39	21	37
16	27	375	3,350	815	3,350	655	691	133	34	66	21	37
17	27	515	3,140	1,070	2,940	580	2,180	113	37	56	21	39
18	27	605	3,140	1,260	2,370	440	2,940	34	46	20	37	
19	27	695	3,350	1,410	2,200	860	2,550	83	34	41	20	32
20	27	745	2,940	1,330	1,800	281	1,920	77	37	37	20	28
21	26	780	2,740	1,260	1,500	271	1,410	69	37	32	20	27
22	26	780	2,370	1,020	1,130	253	780	64	37	30	20	26
23	26	745	1,920	715	1,020	253	375	58	34	28	20	25
24	26	745	1,330	655	1,190	281	202	56	32	28	20	25
25	26	690	780	715	1,410	281	160	54	32	26	21	24
26	26	970	495	850	1,500	262	174	51	30	26	22	24
27	26	1,020	375	1,130	1,590	253	181	54	30	26	24	25
28	26	1,020	292	1,500	1,690	237	160	56	30	25	26	26
29	26	1,020	253	1,500	1,690	230	167	56	28	24	27	26
30	26	950	237	1,920	-	253	140	58	30	24	28	24
31	26	-	223	1,920	-	317	-	66	-	25	28	-

Peak discharge (base, 4,000 sec.-ft.)- Feb. 13 (5 p.m.) 5,100 sec.-ft.

Monthly discharge, in second-feet, of Calcasieu River near Glenmora, La., 1943-48

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-foot
August 25-31, 1943.....	193	29	27	27.6	0.055	0.01	353
September.....	1,348	119	24	44.9	.090	.10	2,670
October 1943.....	1,138	50	29	36.7	.074	.08	2,260
November.....	4,222	515	35	141	.263	.31	8,370
December.....	6,599	850	45	213	.427	.45	13,090
Calendar year.....	-	-	-	-	-	-	-
January 1944.....	60,999	7,200	458	1,967	3.94	4.55	121,000
February.....	35,245	2,160	685	1,215	2.43	2.63	69,910
March.....	21,266	2,010	133	687	1.36	1.59	42,220
April.....	23,114	2,160	119	770	1.54	1.72	45,850
May.....	77,405	15,600	146	2,497	5.00	5.77	153,500
June.....	4,163	540	43	139	.279	.31	8,260
July.....	1,269	56	35	40.6	.081	.09	2,500
August.....	1,584	128	35	51.1	.102	.12	3,140
September.....	3,900	420	35	130	.261	.29	7,740
Water year 1943-44.....	240,905	15,600	29	658	1.32	17.95	477,800
October 1944.....	2,418	345	33	78.0	.156	.18	4,800
November.....	6,980	685	31	299	.599	.67	17,810
December.....	22,832	6,080	146	737	1.46	1.70	45,260
Calendar year 1944.....	263,176	15,600	31	719	1.44	19.62	522,000
January 1945.....	65,157	5,550	317	2,102	4.21	4.86	129,200
February.....	40,466	3,090	245	1,445	2.90	3.02	80,260
March.....	39,295	2,480	495	1,268	2.54	2.93	77,940
April.....	90,061	21,800	153	5,002	6.02	6.71	178,800
May.....	35,732	2,680	113	1,153	2.31	2.66	70,870
June.....	4,552	262	89	152	.305	.34	9,030
July.....	31,162	4,380	95	1,005	2.01	2.32	61,810
August.....	5,033	281	61	162	.325	.38	9,980
September.....	2,245	167	50	74.8	.150	.17	4,450
Water year 1944-45.....	347,933	21,800	31	953	1.91	25.94	690,100
October 1945.....	18,387	2,050	72	593	1.19	1.37	36,470
November.....	11,660	1,320	153	369	.780	.87	23,130
December.....	27,003	1,500	317	871	1.75	2.01	53,560
Calendar year 1945.....	370,753	21,800	50	1,016	2.04	27.64	735,300
January 1946.....	127,282	15,600	405	4,106	8.23	9.49	252,500
February.....	86,660	14,500	930	3,095	6.20	6.46	171,900
March.....	50,182	8,320	271	1,619	3.24	3.74	99,530
April.....	12,369	2,050	113	412	.826	.92	24,530
May.....	56,066	7,760	89	1,809	3.63	4.18	111,200
June.....	28,107	4,720	119	937	1.88	2.09	55,750
July.....	15,956	1,500	115	315	1.03	1.19	31,640
August.....	4,850	750	58	156	.313	.36	9,820
September.....	7,988	930	64	266	.533	.60	15,840
Water year 1945-46.....	446,510	15,600	58	1,223	2.45	33.28	885,700
October 1946.....	8,104	890	86	261	.523	.60	16,070
November.....	31,699	3,570	123	1,057	2.12	2.36	62,870
December.....	39,677	2,940	283	1,280	2.57	2.96	78,700
Calendar year 1946.....	468,940	15,600	58	1,285	2.56	34.95	930,200
January 1947.....	142,960	19,000	750	4,612	9.24	10.65	283,600
February.....	14,729	1,590	253	526	1.05	1.10	29,210
March.....	34,090	3,140	281	1,100	2.20	2.54	67,620
April.....	39,245	5,100	216	1,308	2.62	2.92	77,840
May.....	8,151	1,020	83	263	.527	.61	16,170
June.....	5,353	655	61	178	.357	.40	10,620
July.....	1,587	146	32	51.2	.103	.12	3,150
August.....	951	37	28	30.7	.062	.07	1,850
September.....	1,023	64	27	34.1	.068	.08	2,030
Water year 1946-47.....	327,569	19,000	27	897	1.80	24.41	649,800
October 1947.....	844	30	26	27.2	.055	.06	1,670
November.....	13,010	1,020	27	434	.870	.97	25,800
December.....	46,769	3,350	188	1,509	3.02	3.49	92,760
Calendar year 1947.....	308,712	19,000	26	846	1.70	23.01	612,400
January 1948.....	27,696	1,920	237	893	1.79	2.06	54,930
February.....	62,050	4,720	1,020	2,140	4.29	4.62	123,100
March.....	25,147	1,800	230	911	1.63	1.87	49,880
April.....	16,958	2,940	107	565	1.13	1.26	33,640
May.....	3,802	261	51	123	.246	.28	7,540
June.....	1,232	83	28	41.1	.082	.09	2,440
July.....	1,105	66	24	35.6	.071	.08	2,190
August.....	704	28	20	22.7	.045	.05	1,400
September.....	826	39	22	27.5	.055	.06	1,640
Water year 1947-48.....	200,141	4,720	20	547	1.10	14.85	357,000

Time basis: Central War Time up to 2:00 a.m., Sept. 30, 1945; central standard time thereafter.  
To convert war time to standard time, subtract 1 hour.



## Calcasieu River near Oberlin, La.

Location.- Water-stage recorder, lat. 30°38'25", long. 92°48'50", in NW 1/4 sec. 7, T. 5 S., R. 4 W., at bridge on State Highway 52, 3 miles northwest of Oberlin and 15 miles upstream from Whiskey Chitto Creek. Datum of gage is 39.43 feet above mean sea level, datum of 1929 (Louisiana Geodetic Survey bench mark).

Drainage area. 753 square miles.

Records available. August 1922 to January 1925, September 1938 to September 1948.

Average discharge.- 12 years (1922-24, 1938-48), 1,298 second-feet.

Extremes.- Maximum discharge during year, 5,800 second-feet Feb. 17 (gage height, 15.56 feet); minimum, 40 second-feet Aug. 24 (gage height, 3.28 feet).  
1922-25, 1938-48: Maximum discharge, 34,700 second-feet Apr. 7, 1923 (gage height, 18.48 feet, datum then in use, or about 21 feet, present datum), from rating curve extended above 14,000 second-feet; minimum, that of Aug. 24, 1948.  
Flood of 1886 reached a stage about 1 foot higher than that of Apr. 7, 1923.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Paper mill at Elizabeth pumps about 5 second-feet from wells which is later discharged into Mill Creek 20 miles above station. This discharge is continuous and fairly constant.

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used May 19 to July 7)

Oct. 1 to July 7

July 8 to Sept. 30

3.5	44	6.0	443	12.0	2,730	3.3	42
4.0	92	6.5	580	13.0	3,330	3.5	61
4.5	149	7.0	736	14.0	4,067	4.1	122
5.0	221	9.0	1,430	15.0	5,040		
5.5	320	11.0	2,230	15.4	5,530		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	55	1,070	551	3,670	2,730	a380	257	83	58	51	52
2	60	56	1,070	523	3,200	3,330	a400	230	89	56	46	51
3	58	54	1,040	510	2,950	3,330	a400	198	105	58	51	52
4	59	53	900	496	2,730	4,710	a420	183	105	68	52	52
5	56	60	656	496	2,730	4,610	a400	169	95	66	51	51
6	54	66	523	580	2,890	4,060	a340	355	85	66	50	49
7	53	77	610	704	2,690	3,460	309	309	86	67	51	50
8	53	69	641	834	2,780	2,960	a280	176	75	76	52	48
9	53	82	818	1,000	3,070	2,570	a280	392	75	85	51	48
10	53	69	1,250	1,180	3,200	2,410	a260	404	76	113	51	52
11	52	117	1,460	1,210	3,070	2,230	a240	298	76	116	52	53
12	52	248	1,500	1,140	3,070	2,060	a220	309	86	109	51	53
13	51	198	1,690	1,430	3,460	1,930	a240	298	78	81	49	60
14	49	141	2,100	1,690	2,750	1,770	a280	238	68	99	49	61
15	48	157	3,300	1,610	4,230	1,650	267	213	68	68	48	73
16	47	238	4,710	1,430	3,400	1,580	238	183	69	66	49	67
17	47	230	5,530	1,280	5,530	1,430	298	183	67	66	48	65
18	47	248	5,530	1,250	4,930	1,280	392	183	67	66	47	63
19	46	469	4,710	1,320	4,060	1,070	672	144	67	70	45	61
20	46	541	3,980	1,390	3,460	867	1,280	143	65	73	44	59
21	45	641	3,600	1,580	3,200	736	2,060	127	62	71	42	58
22	48	688	3,600	1,690	3,900	656	2,460	122	61	66	44	55
23	48	934	3,460	1,810	3,820	720	2,320	112	61	61	42	51
24	47	1,250	3,200	1,850	3,530	641	1,970	101	62	56	42	50
25	47	1,280	2,890	1,730	3,460	523	1,500	102	60	56	46	48
26	47	1,140	2,510	1,580	3,200	496	1,000	101	53	51	51	49
27	47	968	2,100	1,940	2,780	482	537	102	54	51	58	46
28	47	934	1,580	2,780	2,460	456	404	96	54	52	60	45
29	47	1,000	1,070	3,200	2,270	430	299	95	55	56	56	44
30	48	1,040	736	3,750	-	392	267	92	58	61	55	46
31	53	-	580	4,060	-	380	-	88	-	65	54	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,570	61	46	50.6	3,110
November.....	13,223	1,280	53	441	26,230
December.....	68,414	5,530	523	2,207	135,700
Calendar year 1947.....	512,280	21,600	46	1,404	1,016,000
January.....	46,594	4,060	49	1,503	92,420
February.....	99,690	5,530	2,270	3,438	197,700
March.....	55,969	4,710	380	1,805	111,000
April.....	20,412	2,460	220	680	40,490
May.....	8,005	404	88	194	11,910
June.....	2,165	105	53	72.2	4,290
July.....	2,138	116	51	69.0	4,240
August.....	1,536	60	42	49.6	3,050
September.....	1,612	73	44	53.7	3,200
Water year 1947-48.....	319,330	5,530	42	872	633,300

Peak discharge (base, 8,000 sec.-ft.)- No peak above base.  
a No gage-height record; discharge computed on basis of weather records and records for nearby stations.

Note.- Gage-height record Apr. 15 to Aug. 9 computed from twice-daily readings of wire-weight gage.

## Calcasieu River near Kinder, La.

Location.- Water-stage recorder, lat. 30°30'10", long. 92°54'55", in NW 1/4 sec. 30, T. 6 S., R. 5 W., at bridge on U. S. Highway 190, 0.5 mile downstream from Whiskey Chitto Creek and 4 miles west of Kinder. Datum of gage is 12.02 feet above mean sea level, datum of 1929 (Louisiana Geodetic Survey bench mark).

Drainage area.- 1,700 square miles.

Records available.- August 1922 to January 1925, October 1938 to September 1948.

Average discharge.- 12 years (1922-24, 1938-48), 2,921 second-feet.

Extremes.- Maximum discharge during year, 10,900 second-feet Dec. 17 (gage height, 15.61 feet); minimum, 183 second-feet Aug. 19 (gage height, 2.04 feet).  
1922-25, 1938-48: Maximum discharge, 68,000 second-feet Dec. 23, 1923, corrected (gage height, 21.69 feet, datum then in use, or about 23.5 feet, present datum), from rating curve extended above 40,000 second-feet; maximum gage height, 24.7 feet Aug. 11, 1940 (discharge, 64,400 second-feet); minimum discharge, that of Aug. 19, 1948.  
Flood in 1913 reached a stage about 0.3 foot higher than that of Aug. 11, 1940.

Remarks.- Records good. Discharge above about 2,000 second-feet computed by using rate of change of stage as a factor. Paper mill at Elizabeth pumps about 5 second-feet from wells which is later discharged into Mill Creek 36 miles above station. This discharge is continuous and fairly constant. Water is diverted during period April to September at points just above station and 5 miles above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	365	464	1,510	1,470	8,900	4,600	1,060	709	416	306	234	352
2	358	400	1,470	1,350	7,850	5,350	1,060	843	362	262	231	330
3	355	480	1,430	1,390	6,690	6,780	1,060	594	327	265	231	309
4	358	577	1,390	1,590	5,650	7,200	1,060	544	324	271	262	299
5	355	676	1,240	1,510	4,820	7,040	1,060	528	321	284	262	312
6	352	544	1,160	1,350	4,180	7,200	985	544	306	318	244	259
7	349	512	1,510	1,280	4,150	6,830	915	845	309	330	240	262
8	346	676	1,320	1,310	4,150	5,770	880	1,060	290	340	255	296
9	338	743	2,360	1,390	4,820	5,010	845	1,280	290	318	234	302
10	336	870	3,400	1,510	5,820	4,330	828	1,280	287	340	251	544
11	333	1,430	3,650	1,710	6,060	3,990	794	950	284	512	228	560
12	332	1,280	3,840	1,980	6,170	3,660	777	760	278	610	222	464
13	330	915	4,270	3,250	6,970	3,360	862	692	265	496	222	480
14	327	1,020	5,020	3,710	7,870	2,990	1,160	709	296	416	222	480
15	321	1,310	6,700	3,480	7,930	2,670	1,240	643	287	374	216	448
16	318	1,350	9,170	3,180	7,580	2,550	1,200	577	268	349	207	416
17	318	1,590	10,600	2,850	7,580	2,400	1,280	512	268	312	201	432
18	318	2,050	10,900	2,480	7,060	2,200	1,200	512	265	336	222	432
19	318	2,700	10,100	2,250	6,210	2,010	1,120	496	268	333	204	387
20	315	2,430	9,070	2,330	5,270	1,790	1,280	448	259	333	219	358
21	312	1,870	6,730	2,500	4,850	1,590	1,710	432	262	416	222	340
22	318	1,750	5,040	2,600	6,150	1,510	2,250	394	259	374	222	327
23	324	2,920	4,460	2,700	6,590	1,470	2,550	390	253	336	219	318
24	343	3,380	4,140	2,880	7,040	1,510	2,550	371	253	302	219	309
25	333	2,880	3,780	2,910	7,500	1,430	2,200	352	271	284	225	299
26	324	2,820	3,480	2,910	7,310	1,350	1,670	378	256	256	315	290
27	318	2,570	3,100	3,840	6,320	1,280	1,200	378	247	240	362	290
28	315	1,960	2,600	6,050	5,580	1,200	985	374	274	262	362	290
29	318	1,620	2,050	7,250	4,620	1,120	880	397	302	231	387	287
30	323	1,550	1,630	8,170	-	1,120	794	480	321	225	374	287
31	320	-	1,390	9,080	-	1,090	-	464	-	231	352	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	10,569	390	312	334	20,870
November.....	45,327	3,350	400	1,511	89,900
December.....	129,110	10,900	1,160	4,165	256,100
Calendar year 1947.....	1,135,205	35,600	265	3,110	2,252,000
January.....	92,240	9,080	1,280	2,975	183,000
February.....	181,490	8,900	4,150	6,258	360,000
March.....	102,180	7,200	1,090	3,296	202,700
April.....	37,455	2,550	777	1,248	74,290
May.....	18,736	1,280	352	604	37,160
June.....	8,668	416	247	289	17,190
July.....	10,262	610	225	331	20,350
August.....	7,844	387	201	253	15,560
September.....	10,759	560	259	359	21,340
Water year 1947-48.....	654,440	10,900	201	1,788	1,298,000

Peak discharge (base, 13,000 sec.-ft.) - No peak above base.

## Whiskey Chitto Creek near Oberlin, La.

Location.- Water-stage recorder, lat. 30°41'55", long. 92°53'35", in NE $\frac{1}{4}$ NE $\frac{1}{4}$  sec. 20, T. 4 S., R. 5 W., at bridge on State Highway 52, 1 mile downstream from Termini Creek, 8 miles upstream from Bundick Creek, and 10 miles northwest of Oberlin. Datum of gage is 46.24 feet above mean sea level (Louisiana Geodetic Survey bench mark).

Drainage area.- 510 square miles.

Records available.- January 1939 to September 1948.

Extremes.- Maximum discharge during year, 3,350 second-feet Dec. 16 (gage height, 13.80 feet); minimum daily, 120 second-feet Aug. 17-23.  
1939-48: Maximum discharge, 35,000 second-feet Aug. 9, 1940 (gage height, 23.42 feet); minimum observed, 102 second-feet Sept. 19, 1939 (gage height, 3.72 feet).  
Maximum stage known, 25.7 feet in June 1886, from floodmarks preserved by local residents.

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

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Nov. 1-10)

Oct. 1 to Nov. 10

Nov. 11 to Sept. 30

4.1	151	3.8	108	7.0	787
4.5	214	4.5	226	9.0	1,410
5.0	302	5.5	407	11.0	2,140
6.0	496	6.0	513	14.0	3,440

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	170	189	369	427	2,570	1,080	598	279	252	164	140	157
2	169	181	350	479	2,250	1,870	588	261	235	162	140	148
3	170	275	332	701	1,780	2,400	588	244	223	166	179	143
4	169	275	332	758	1,180	2,060	578	244	214	171	225	138
5	169	248	578	563	961	1,690	578	244	209	181	174	155
6	164	231	617	479	990	1,620	569	407	205	191	154	135
7	162	388	932	427	890	1,580	560	659	202	202	143	135
8	162	457	1,080	417	903	1,450	550	687	198	188	145	135
9	160	330	1,250	407	1,470	1,250	550	816	195	189	140	198
10	160	359	1,350	398	2,020	1,050	341	513	195	191	157	350
11	160	513	1,480	407	2,020	1,080	332	369	191	378	134	252
12	158	350	1,580	427	2,140	1,020	332	323	191	279	132	235
13	157	479	1,550	673	2,780	845	332	332	202	212	130	214
14	156	604	1,800	961	2,910	729	350	388	191	207	126	191
15	156	604	2,610	1,080	2,740	645	398	332	184	205	124	182
16	154	701	3,500	961	2,440	617	645	296	179	191	124	214
17	152	1,080	3,210	687	1,760	590	590	288	177	176	120	224
18	152	1,480	2,990	590	1,180	590	417	279	174	172	120	193
19	152	1,310	2,740	590	900	563	360	252	177	167	120	172
20	154	903	1,690	576	820	525	332	235	179	162	120	162
21	162	616	961	525	790	502	314	226	174	164	120	154
22	162	604	758	513	790	490	296	223	167	157	120	150
23	163	961	673	550	990	479	288	214	167	154	120	147
24	178	990	617	563	1,850	513	288	212	164	152	130	143
25	166	1,110	563	563	2,190	537	279	207	162	147	140	142
26	163	1,150	513	673	2,020	490	296	211	160	143	155	138
27	160	787	490	1,350	1,800	447	296	221	157	140	152	138
28	157	513	468	2,480	1,410	427	323	226	157	140	152	140
29	156	437	447	2,480	1,180	437	350	279	157	138	164	140
30	160	398	437	2,650	-	427	305	314	157	154	184	140
31	169	-	427	2,820	-	407	-	279	-	147	171	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-foot
October	5,022	183	152	162	0.318	0.37	9,960
November	18,723	1,480	181	624	1.22	1.37	37,140
December	36,264	3,300	332	1,170	2.29	2.64	71,930
Calendar year 1947	515,794	8,840	152	865	1.70	23.04	626,300
January	27,185	2,820	398	877	1.72	1.98	53,920
February	47,764	2,910	790	1,647	3.23	3.48	94,740
March	28,410	2,400	407	916	1.80	2.07	56,350
April	10,823	645	279	361	.708	.79	21,470
May	10,060	816	207	325	.637	.73	19,950
June	5,595	252	157	186	.365	.41	11,100
July	5,590	378	138	180	.353	.41	11,090
August	4,433	223	120	143	.280	.32	8,790
September	5,145	350	135	172	.337	.38	10,200
Water year 1947-48	205,014	3,300	120	560	1.10	14.95	406,600

Peak discharge (base, 3,000 sec.-ft.) - Dec. 16 (6 p.m.) 3,350 sec.-ft.  
Note.- No gage-height record Feb. 16-23, Aug. 17-25; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.

## Bundick Creek near Dry Creek, La.

Location.- Water-stage recorder, lat. 30°40'55", long. 93°02'15", on line between NE $\frac{1}{4}$  and NW $\frac{1}{4}$  sec. 25, T. 4 S., R. 7 W., at bridge on State Highway 251, 1 mile northeast of town of Dry Creek and 8 miles upstream from mouth. Datum of gage is 56.92 feet above mean sea level (Louisiana Geodetic Survey bench mark).

Drainage area.- 238 square miles.

Records available.- January 1939 to September 1948.

Extremes.- Maximum discharge during year, 1,730 second-feet Dec. 15 (gage height, 12.86 feet); minimum daily, 55 second-feet Aug. 20-25.  
1939-48: Maximum discharge, 22,000 second-feet Aug. 10, 1940 (gage height, 19.12 feet, present datum, from floodmark), from rating curve extended above 10,000 second-feet by velocity-area method; minimum, 49 second-feet on many days in September and October 1939; minimum gage height, 2.53 feet, present datum, Sept. 24, 25, 1939.

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

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Oct. 1 to Nov. 13)

Oct. 1 to May 8

May 9 to Sept. 30

3.1	68	5.0	257	11.0	1,200	2.7	49	4.0	153
3.5	99	6.0	389	12.0	1,420	3.1	78	4.5	200
4.0	141	7.0	533	13.0	1,780	3.5	111	5.1	270
4.5	195	9.0	848						

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	83	141	172	1,400	459	132	105	105	a70	66	72
2	73	172	132	213	1,320	915	132	96	92	a75	67	70
3	72	178	128	296	1,120	910	132	91	85	a70	66	68
4	72	166	123	335	623	593	128	89	83	a70	66	67
5	73	119	146	290	459	431	123	88	82	a70	66	67
6	72	95	290	201	459	533	123	99	81	a75	66	66
7	72	108	459	172	417	569	119	207	80	84	65	67
8	72	231	533	161	403	488	115	283	80	78	66	69
9	72	219	608	156	790	417	115	270	80	77	65	234
10	71	212	702	172	910	445	115	239	79	89	65	150
11	71	247	798	238	926	459	111	153	79	128	66	97
12	70	128	678	348	1,170	403	107	124	78	92	64	91
13	69	172	977	533	1,340	348	123	111	78	99	64	96
14	69	309	862	578	1,140	283	195	111	77	100	62	91
15	69	a380	1,540	578	943	238	290	119	a75	93	61	83
16	69	a360	1,540	445	766	219	302	111	a75	82	a60	77
17	69	a420	1,590	361	533	213	290	102	a75	76	a60	79
18	69	a900	1,610	290	339	207	201	108	a75	71	a60	79
19	69	782	1,580	284	335	207	136	94	a75	69	a60	74
20	68	375	1,030	250	a300	195	119	92	a75	72	a55	89
21	69	348	389	244	a600	183	111	89	a70	73	a55	68
22	69	322	309	250	a750	178	105	86	a70	71	a55	67
23	68	518	270	250	a700	178	101	86	a70	69	a55	66
24	69	403	244	264	1,010	172	97	84	a70	67	a55	67
25	69	533	225	296	1,030	172	99	83	a70	66	a55	66
26	68	548	207	389	977	166	146	84	a70	66	67	67
27	68	389	195	969	878	156	115	88	a70	65	75	68
28	68	225	163	1,260	702	146	123	90	a70	65	83	67
29	68	172	178	1,160	548	141	146	100	a75	66	87	68
30	69	151	172	1,400	-	141	128	128	a75	65	83	68
31	83	-	166	1,420	-	141	-	124	-	65	76	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	2,182	83	68	70.4	0.296	0.34	4,330
November	2,283	900	83	309	1.30	1.45	18,370
December	16,195	1,610	123	587	2.47	2.84	36,090
Calendar year 1947	145,126	4,950	68	398	1.67	22.68	287,900
January	15,955	1,420	156	450	1.89	2.18	27,680
February	22,938	1,400	300	791	3.32	3.58	45,500
March	10,301	915	141	432	1.39	1.61	20,430
April	4,279	302	97	143	.601	.67	8,490
May	3,734	283	83	120	.504	.58	7,410
June	2,319	105	70	77.3	.325	.36	4,600
July	2,378	128	65	76.7	.322	.37	4,720
August	2,016	87	55	65.0	.273	.32	4,000
September	2,436	234	66	81.2	.341	.38	4,850
Water year 1947-48	93,996	1,610	55	257	1.08	14.68	186,400

Peak discharge (base, 1,500 sec.-ft.)- Dec. 15 (2 p.m.), 1,730 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for nearby stations.



## Beckwith Creek near DeQuincy, La.

Location.- Wire-weight gage, lat. 30°28'10", long. 93°21'50", in NW 1/4 sec. 11, T. 7 S., R. 10 W., at bridge on State Highway 7, a quarter of a mile upstream from New Orleans, Texas & Mexico Railway bridge, 2 1/2 miles upstream from unnamed tributary, and 4 miles northeast of DeQuincy.

Drainage area.- 148 square miles.

Records available.- August 1945 to September 1948.

Extremes.- Maximum discharge during year, 1,370 second-feet Jan. 28 (gage height, 15.0 feet, from graph based on gage readings); minimum, 0.6 second-foot Aug. 21-24, Sept. 28, 30; minimum gage height, 1.14 feet Aug. 22, 23, Sept. 30.

1945-48: Maximum discharge, 5,650 second-feet (revised) June 1, 1946 (gage height, 20.8 feet, from graph based on gage readings); minimum, that of Aug. 21-24, Sept. 28, 30, 1948; minimum gage height, that of Aug. 22, 23, Sept. 30, 1948.

Revisions: The maximum discharges for the water years 1946 and 1947 have been revised to 5,650 second-foot June 1, 1946 (gage height, 20.8 feet, from graph based on gage readings), and 4,960 second-foot, June 21, 1947 (gage height, 20.35 feet), superseding figures published in Water-Supply Papers 1058 and 1088, respectively.

Remarks.- Records good except those below 1 second-foot and those for periods of doubtful gage-height record, which are poor. Gage read twice daily.

Revisions.- Revised figures of discharge, in second-feet, for the high-water period in the water year 1946, superseding those published in Water-Supply Paper 1058 are given herewith:

June 1..... 4,380

Month	Second-foot days	Maximum	Minimum	Mean	Per square mile	Runoff in inches	Runoff in acre-feet
June.....	19,706	4,380	28	657	4.44	4.95	59,090
Water year 1945-46...	115,092.7	4,380	4.9	315	2.13	28.92	228,500
Calendar year 1946...	112,050.1	4,380	4.9	307	2.07	28.14	222,200

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.4	8.3	22	908	225	17	16	7.8	11	1.6	1.7
2	1.0	1.8	6.9	28	862	382	15	12	6.6	6.3	1.6	1.5
3	.9	1.9	8.2	35	802	467	13	9.6	5.8	7.5	1.6	1.4
4	.8	1.7	6.9	48	667	270	15	8.4	4.3	4.9	1.5	1.4
5	1.4	3.0	16	44	409	298	14	7.5	3.8	7.2	1.9	1.3
6	1.3	2.6	17	35	215	697	14	8.7	3.6	11	1.8	1.1
7	2.4	3.4	17	27	156	286	13	11	3.4	4.3	2.0	1.0
8	2.2	3.1	23	24	256	207	12	9.0	3.2	3.7	1.7	.8
9	2.0	3.0	65	21	447	207	12	8.8	3.1	2.9	2.2	.9
10	1.8	19	94	20	391	238	12	9.0	3.2	2.7	11	1.0
11	1.7	19	119	18	355	156	11	8.7	3.1	41	5.4	.9
12	1.6	12	119	37	533	129	11	8.4	3.1	28	3.2	.9
13	1.5	7.5	339	86	510	104	158	7.8	3.4	14	2.2	1.0
14	1.4	29	667	135	391	76	223	7.3	6.6	41	1.4	1.7
15	1.3	207	1,220	122	278	67	149	6.6	3.8	92	1.3	2.3
16	1.2	132	1,000	122	254	52	135	6.3	3.1	41	1.1	2.4
17	1.1	82	624	177	215	48	86	6.1	2.7	17	1.1	2.4
18	1.0	70	533	122	129	46	39	5.7	2.6	24	.9	2.0
19	1.0	52	545	142	92	41	22	5.1	2.5	30	.9	1.7
20	2.4	40	488	142	76	39	17	4.7	2.4	11	.8	1.6
21	2.4	24	196	129	357	35	13	4.5	2.3	6.6	.6	1.5
22	2.2	26	70	98	1,040	34	12	4.1	2.2	4.9	.6	1.3
23	2.0	169	50	81	467	32	10	3.9	2.2	4.1	.6	1.1
24	1.9	82	43	98	911	30	9.1	3.8	2.1	3.9	.6	1.1
25	1.8	55	37	149	877	27	8.5	3.8	2.2	3.5	.8	.9
26	1.7	50	28	254	583	24	85	3.6	2.0	3.3	1.0	.8
27	1.6	38	27	857	437	24	76	4.3	2.0	2.7	1.4	.7
28	1.5	20	24	1,090	409	22	54	5.8	1.9	2.4	1.7	.6
29	1.4	13	22	817	329	21	39	9.9	1.8	2.2	1.5	.7
30	1.3	9.9	21	1,200	-	20	24	12	7.8	1.9	1.6	.6
31	1.2	-	20	988	-	17	-	10	-	1.7	1.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
October.....	48.1	2.4	0.8	1.55	0.010	0.01	.95
November.....	1,180.3	207	1.4	39.3	.266	.30	2,340
December.....	6,452.3	1,220	6.2	208	1.41	1.62	12,800
Calendar year 1947.....	81,431.3	3,180	0.8	223	1.51	20.45	161,500
January.....	7,168	1,200	18	231	1.56	1.80	14,220
February.....	15,356	1,040	76	461	3.11	3.36	26,490
March.....	4,519	697	17	139	.939	1.09	8,570
April.....	1,321.6	223	8.5	44.1	.298	.33	2,620
May.....	232.4	16	3.6	7.50	.051	.08	461
June.....	104.6	7.8	1.8	3.49	.024	.03	207
July.....	438.3	92	1.7	14.1	.095	.11	869
August.....	57.2	11	0.6	1.85	.012	.01	113
September.....	38.3	2.4	0.6	1.28	.0086	.01	76
Water year 1947-48.....	34,716.1	1,220	0.6	94.9	.641	8.73	58,860

Peak discharge (base, 1,400 sec.-ft.).- No peak above base.

Note.- Doubtful gage-height record Oct. 6-12, 14-31; discharge computed on basis of weather records and records for Hickory Branch at Kernan.

## Hickory Branch at Kernan, La.

Location.- Wire-weight gage lat. 30°30'05", long. 93°16'45", in NW<sup>1</sup> sec. 34, T. 6 S., R. 9 W., at bridge on State Highway 7, 120 feet upstream from New Orleans, Texas & Mexico Railway bridge, 0.7 mile southwest of Kernan, 3 miles upstream from Cowpen Creek, and 10 miles northeast of De Quincy.

Drainage area.- 82.2 square miles.

Records available.- August 1945 to September 1948.

Extremes.- Maximum discharge during year, 2,280 second-feet Feb. 25 (gage height, 16.7 feet, from graph based on gage readings); minimum, 0.1 second-foot on many days; minimum gage height, 2.07 feet Aug. 21.

1945-48: Maximum discharge, 5,950 second-feet June 31, 1947 (gage height, 26.0 feet, from graph based on gage readings); minimum, 0.1 second-foot on many days in 1946, 1947, 1948; minimum gage height, that of Aug. 21, 1948.

Remarks.- Records good except those below 5 second-feet, which are fair. Gage read twice daily.

Rating tables, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 15					Dec. 16 to Sept. 30				
2.5	0.2	2.9	9.1	4.5 115	2.3	0.2	3.0	15	8.0 511
2.6	.5	3.0	14	5.0 168	2.4	.3	3.4	38	10.0 789
2.7	1.9	3.6	47	5.4 212	2.5	.6	4.0	84	11.0 949
2.8	4.8	4.0	74		2.6	1.5	4.8	154	12.0 1,130
Note.- Same as following table above					2.7	3.2	5.4	212	13.0 1,340
5 4 feet					2.8	6.1	6.0	279	15.0 1,820

Note.- Same as following table above  
5.4 feet.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	1.2	2.4	10	392	127	5.0	3.2	0.3	4.4	0.1	0.1
2	.1	1.2	1.9	19	158	414	4.1	2.4	.3	2.8	.1	.1
3	.1	1.0	1.5	15	100	463	4.1	1.8	.2	2.2	.1	.1
4	.1	1.2	3.0	13	92	216	3.6	1.5	.2	5.0	.1	.1
5	.1	4.8	3.5	12	100	428	3.2	1.2	.2	10	.1	.1
6	.1	2.4	2.4	9.4	104	745	2.8	1.9	.2	45.0	.1	.1
7	.2	4.1	1.9	8.6	88	252	2.8	1.5	.2	1.6	.1	.1
8	.3	3.8	22	7.3	151	127	2.6	1.2	.1	.8	.1	.2
9	.3	3.0	44	6.9	463	136	2.4	1.2	.1	.6	.2	.3
10	.3	10	74	6.5	404	118	2.4	1.2	.7	.4	.7	.7
11	4.3	39	53	13	212	109	2.2	1.0	.3	12	.7	.6
12	4.3	12	99	29	679	36	2.1	1.2	.3	5.7	.5	1.4
13	.3	5.2	439	286	699	31	7.7	1.0	.2	2.8	.4	2.6
14	.3	22	427	236	392	29	136	.8	.2	1.5	.3	1.8
15	.3	81	1,150	72	182	24	64	.6	2.8	.8	.2	.8
16	.2	56	819	46	96	20	25	.5	1.5	.6	.1	.4
17	.3	18	391	31	60	18	12	.4	.9	.4	.1	.3
18	.3	12	128	15	43	17	8.1	.4	.6	1.8	.1	.2
19	.5	8.2	49	32	36	16	6.1	.3	.4	1.8	.1	.1
20	.5	8.2	34	120	33	15	4.7	.3	.3	3.0	.1	.1
21	1.0	30	27	127	481	14	3.6	.3	.3	2.6	.1	.1
22	1.9	138	18	84	475	13	3.0	.2	.2	1.5	.1	.1
23	1.2	102	14	72	279	14	2.2	.2	.2	1.0	.1	.1
24	1.2	50	12	172	744	14	1.9	.2	.1	.4	.1	.1
25	.9	21	11	267	1,980	13	1.8	.2	.1	.3	.1	.1
26	.8	13	9.4	335	848	10	27	.2	.1	.2	.1	.1
27	.8	7.2	8.6	1,010	279	8.6	25	.4	.1	.2	.2	.1
28	.8	5.2	7.7	844	163	7.3	15	.7	.1	.2	.2	.1
29	.9	3.8	6.9	789	212	6.1	8.6	.5	.1	.1	.2	.1
30	1.0	3.0	6.9	1,170	-	5.7	5.0	.4	3.0	.1	.2	.1
31	1.0	-	6.9	671	-	4.7	-	.3	-	.1	.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	15.5	1.2	0.1	0.50	0.0061	0.007	31
November	667.5	138	1.0	22.2	.270	.30	1,320
December	3,864.0	1,150	1.5	125	1.52	1.75	7,860
Calendar year 1947	54,683.0	3,860	0.1	150	1.82	24.74	108,500
January	6,528.7	1,170	6.5	211	2.57	2.95	12,950
February	9,945	1,980	33	343	4.17	4.50	19,730
March	3,450.4	745	4.7	111	1.35	1.56	6,840
April	394.0	136	1.8	13.1	.159	.18	781
May	27.2	3.2	.2	.88	.011	.01	54
June	14.3	3.0	.1	.48	.0058	.006	28
July	69.9	12	.7	2.25	.027	.03	139
August	6.0	-	.1	.19	.0023	.003	12
September	11.2	2.6	.1	.37	.0045	.005	22
Water year 1947-48	24,993.7	1,980	0.1	68.3	.831	11.30	49,570

Peak discharge (base, 2,000 sec.-ft.)- Feb. 25 (2 p.m.) 2,280 sec.-ft.

a No gage-height record; discharge computed on basis of records for Beckwith Creek near De Quincy.

## Sabine River near Mineola, Tex.

Location.- Water-stage recorder, lat. 32°36'45", long. 95°29'10", at bridge on U. S. Highway 69, 3.2 miles south of Mineola, Wood County, 4.5 miles upstream from International-Great Northern Railroad bridge, and 16.5 miles upstream from Lake Fork. Datum of gage is 304.2 feet above mean sea level, datum of 1929.

Drainage area.- 1,445 square miles.

Records available.- May 1939 to September 1948.

Extremes.- Maximum discharge during year, 21,300 second-feet May 14 (gage height, 18.69 feet); minimum, 0.7 second-foot Aug. 23-25.

1939-48: Maximum discharge, 76,000 second-feet Apr. 1, 1945 (gage height, 24.00 feet); maximum gage height, 24.37 feet June 8, 1943; no flow at times.

Maximum stage from about 1919 to 1933, 20.6 feet Jan. 25, 1938, from information by local resident.

Remarks.- Records good. No large diversion above station.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	50	505	1,760	810	1,750	142	92	692	135	306	36
2	13	50	143	2,200	964	6,790	117	70	410	141	153	22
3	12	44	90	2,200	1,130	6,510	100	54	171	229	76	14
4	11	195	300	4,040	1,340	7,480	90	55	139	160	45	11
5	10	180	585	3,780	1,560	7,240	80	45	123	94	31	8.6
6	9.4	98	504	8,070	1,680	9,600	77	145	86	54	26	7.1
7	9.0	127	1,010	5,190	1,760	6,860	75	547	110	35	22	5.7
8	8.8	379	2,960	3,230	2,050	4,530	72	856	78	78	17	4.6
9	8.6	750	4,350	1,650	2,540	5,100	152	1,140	56	131	12	3.6
10	8.2	770	6,400	708	3,090	1,920	264	1,370	41	105	10	3.7
11	7.6	314	7,080	312	3,570	1,050	149	2,560	33	127	7.8	3.6
12	7.3	106	7,160	223	3,830	519	125	4,040	27	118	6.5	3.6
13	7.1	55	5,980	195	3,830	313	182	6,900	23	89	5.2	3.1
14	7.3	45	4,320	169	3,370	247	531	20,000	20	156	4.3	2.7
15	7.1	61	3,310	148	2,790	223	692	17,200	17	148	3.4	4.4
16	6.9	167	4,170	154	2,350	209	620	10,500	15	96	2.5	7.1
17	6.9	504	5,200	324	2,000	195	551	7,080	14	77	1.8	5.7
18	6.7	750	8,070	435	1,510	181	363	5,030	12	60	1.4	4.6
19	6.7	876	10,500	353	1,020	169	168	3,000	12	35	1.4	3.8
20	6.5	585	9,690	295	583	163	114	1,470	11	28	1.3	3.1
21	6.4	364	6,580	396	489	157	79	569	9.8	18	1.1	2.6
22	6.0	1,030	4,540	776	685	250	61	213	8.8	13	.9	2.4
23	6.0	1,440	2,840	1,030	920	839	52	132	8.0	10	.7	1.8
24	6.2	1,720	1,690	1,010	1,010	1,580	52	100	8.0	7.6	.7	1.6
25	6.4	2,050	1,110	784	803	2,180	78	82	8.6	6.4	.8	1.3
26	21	2,380	610	519	425	2,480	187	87	8.0	5.5	1.3	1.3
27	44	2,950	276	858	332	2,740	223	80	7.8	4.4	1.7	1.2
28	39	3,350	188	1,130	435	2,360	181	99	8.8	8.8	2.2	1.2
29	28	2,840	157	970	661	1,360	148	345	110	143	208	1.2
30	53	1,590	142	703	-	492	119	520	157	362	169	1.3
31	54	-	246	661	-	196	-	638	-	422	74	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-feet
October	444.1	54	6.0	14.3	0.010	0.01	881
November	25,820	3,350	44	861	1.596	.86	51,210
December	100,606	10,500	90	3,245	2.25	2.55	199,600
Calendar year 1947	283,725.7	10,500	1.6	777	.538	7.29	562,800
January	50,273	9,780	148	1,622	1.12	1.29	99,720
February	47,558	3,830	332	1,639	1.13	1.22	94,290
March	73,783	9,600	157	2,380	1.65	1.90	146,300
April	5,684	592	52	195	.135	.15	11,630
May	85,030	20,000	45	2,743	1.90	2.19	168,700
June	2,424.8	692	7.8	80.8	.056	.08	4,810
July	3,097.7	422	4.4	99.9	.083	.08	6,140
August	1,194.0	305	.7	38.5	.027	.03	2,370
September	173.9	36	1.2	5.80	.0040	.004	345
Water year 1947-48	396,248.5	20,000	.7	1,083	.749	10.18	785,900
Peak discharge (base, 11,000 sec.-ft.)	-	-	-	-	-	-	-
Dec. 19 (7 p.m.)	11,100 sec.-ft.	-	-	-	-	-	-
Jan. 5 (9 a.m.)	12,300 sec.-ft.	-	-	-	-	-	-
May 14 (5 p.m.)	21,300 sec.-ft.	-	-	-	-	-	-

## Sabine River near Gladewater, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 32°32', long. 94°57', at bridge on U. S. Highway 271, half a mile downstream from Glade Creek and 1 mile southwest of Gladewater, Gregg County. Datum of gage is 243.85 feet above mean sea level (Texas Reclamation Department bench mark based on Geological Survey datum).

Drainage area.- 2,846 square miles.

Records available.- October 1932 to September 1948.

Average discharge.- 16 years, 2,214 second-feet.

Extremes.- Maximum discharge during year, 23,000 second-feet May 18 (gage height, 35.40 feet); minimum, 22 second-feet Aug. 26.

1932-48: Maximum discharge, 138,000 second-feet Apr. 2, 1945 (gage height, 44.16 feet, from floodmark), from rating curve extended above 91,000 second-feet; minimum, 5.6 second-feet Aug. 16, 1939.

Maximum stage known prior to 1945, 41.7 feet in May 1914 (discharge, 71,100 second-feet), from information by local resident.

Remarks.- Records good except those computed on basis of loop curves, which are fair. Small diversions above station for oil-field operations and municipal supply.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	133	236	3,260	1,830	3,110	2,200	4,100	965	1,160	202	699	171
2	122	226	3,350	2,120	3,080	4,760	3,080	790	1,190	267	769	153
3	113	215	3,110	2,720	3,020	5,320	1,750	822	1,140	285	580	110
4	106	202	2,600	2,200	2,960	5,800	1,020	685	954	285	362	88
5	105	202	1,990	3,830	3,020	6,920	790	601	668	312	240	75
6	105	322	1,710	4,350	3,170	8,260	748	708	506	312	177	60
7	102	559	2,190	4,900	3,410	9,600	708	664	713	267	139	47
8	100	528	4,420	2,959	3,830	10,800	685	748	601	217	112	43
9	94	486	4,900	7,120	4,550	11,900	664	1,120	496	185	97	40
10	92	685	4,960	7,650	5,000	12,100	622	1,600	475	182	88	41
11	92	1,010	5,080	7,050	5,360	11,400	664	3,590	422	268	80	47
12	92	1,140	5,280	6,250	6,000	10,300	834	6,060	352	433	71	50
13	92	1,010	5,760	4,960	6,570	8,540	1,050	6,860	312	372	62	49
14	89	685	6,350	3,440	7,050	7,050	1,320	7,440	285	322	53	50
15	88	496	7,310	2,170	7,240	5,490	1,470	8,350	258	332	48	50
16	87	412	8,350	1,550	7,380	3,800	1,780	11,300	233	332	45	50
17	87	382	9,000	1,430	7,180	2,480	2,040	20,000	211	342	42	46
18	85	412	9,290	1,340	6,860	1,760	2,230	23,000	192	322	38	43
19	83	769	9,440	1,410	6,520	1,450	2,290	21,000	184	258	36	40
20	81	1,120	9,600	1,540	5,900	1,340	2,150	18,000	177	208	36	39
21	79	1,320	10,500	1,680	5,280	1,270	1,630	15,200	168	177	40	39
22	79	1,590	11,400	1,730	4,390	2,320	1,030	12,600	160	146	37	39
23	77	1,710	13,100	1,810	3,470	2,510	708	10,500	150	125	31	39
24	77	1,860	13,100	1,940	2,620	2,280	580	8,020	139	109	25	37
25	79	2,040	11,900	2,070	2,230	2,180	622	6,250	134	98	23	40
26	120	2,230	10,500	2,290	2,040	2,430	1,010	4,550	130	91	26	41
27	197	2,400	8,440	2,960	2,040	2,820	1,190	2,910	119	85	39	40
28	276	2,570	6,980	3,230	2,020	3,320	1,270	1,920	132	79	51	40
29	342	2,790	5,490	3,230	1,780	3,830	1,230	1,440	185	77	57	39
30	322	3,020	3,770	3,140	-	4,230	1,100	1,050	189	74	46	39
31	267	-	2,460	3,110	-	4,390	-	1,050	-	303	42	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-feet
October	3,863	342	77	125	0.044	0.05	7,660
November	32,827	3,020	202	1,088	.382	.43	64,710
December	205,590	15,100	1,710	6,632	2.33	2.69	407,800
Calendar year 1947	672,863	13,100	34	1,843	.648	8.82	1,335,000
January	102,060	7,650	1,340	3,292	1.16	1.33	202,400
February	127,080	7,580	1,780	4,382	1.54	1.66	252,100
March	162,800	12,100	1,270	5,252	1.85	2.13	322,900
April	40,361	4,100	580	1,345	.473	.53	80,050
May	199,592	23,000	601	6,438	2.26	2.61	395,900
June	12,033	1,190	119	401	.141	.16	23,870
July	7,067	433	74	228	.080	.09	14,020
August	4,191	769	23	135	.047	.05	8,310
September	1,695	171	37	56.5	.020	.02	3,360
Water year 1947-48	898,959	23,000	23	2,456	.863	11.75	1,783,000

Peak discharge (base, 6,500 sec.-ft.)- Dec. 23 (10 p.m.) 13,400 sec.-ft.; Jan. 10 (6 a.m.) 7,650 sec.-ft.; Feb. 16 (8 a.m.) 7,580 sec.-ft.; Mar. 10 (6 a.m.) 12,400 sec.-ft.; May 18 (8 a.m.) 23,000 sec.-ft.

Note.- Discharge computed on basis of loop curves Dec. 8 to Jan. 1, Jan. 3-17, Feb. 9-29, Mar. 1-19, May 11-29.



## Sabine River near Tatum, Tex.

Location.- Water-stage recorder, lat. 32°22', long. 94°28', at bridge on State Highway 43, 5 miles upstream from Potter Creek, 5.2 miles northeast of Tatum, Rusk County, and 7 miles downstream from Cherokee Bayou. Datum of gage is 204.2 feet above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.- 3,586 square miles.

Records available.- January 1939 to September 1948.

Extremes.- Maximum discharge during year, 15,300 second-feet May 24 (gage height, 25.20 feet); minimum not determined.

1939-48: Maximum discharge, 123,000 second-feet Apr. 4, 1945 (gage height, 33.80 feet, from graph based on gage readings), from rating curve based on extension of ratings for main channels above 40,000 second-feet and measured overflow at gage height 31.5 feet; minimum observed, 9.1 second-feet Oct. 9, 1939.

Maximum stage known prior to 1945, 32 feet in May 1884, from information by local residents.

Remarks.- Records good except those for period of no gage-height record, which are poor. Several small diversions above station for oil-field operations and municipal supply.

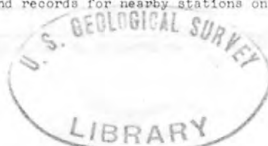
Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	219	610	3,400	9,600	4,820	4,730	4,290	1,620	3,660	360	166	110
2	201	452	3,000	8,900	4,560	5,220	4,400	1,470	2,050	330	335	94
3	188	380	3,150	7,780	4,460	5,490	4,340	1,300	1,660	320	686	98
4	174	350	3,360	8,440	4,340	5,490	3,680	1,190	1,500	390	725	164
5	164	330	3,600	5,190	4,180	5,430	2,370	1,360	1,330	420	610	164
6	161	310	3,900	4,620	4,120	5,550	1,540	1,470	1,120	420	446	137
7	156	370	3,460	4,510	4,120	5,790	1,300	1,580	890	420	323	121
8	154	450	3,770	4,560	4,400	6,030	1,220	1,440	860	420	245	107
9	154	380	4,620	4,680	5,280	6,330	1,190	1,220	920	370	197	105
10	151	460	5,070	4,900	5,790	6,720	1,160	1,500	775	320	171	121
11	146	560	5,250	5,190	6,030	7,250	1,080	2,460	700	322	161	126
12	144	700	5,190	5,550	6,580	7,880	1,050	4,820	654	447	139	106
13	139	860	5,190	5,910	7,040	8,600	1,190	5,910	588	802	129	98
14	135	1,050	5,130	6,150	7,110	9,060	1,860	6,390	536	804	121	84
15	132	1,300	5,250	6,390	7,180	9,400	2,340	6,720	483	588	105	81
16	132	1,350	5,490	6,390	7,110	9,500	2,200	6,780	452	483	98	78
17	132	1,100	5,850	3,150	7,040	9,400	2,160	6,720	410	462	91	76
18	129	900	6,150	5,870	6,910	8,980	2,290	6,840	370	452	84	78
19	127	720	6,460	3,950	6,910	8,180	2,420	7,180	340	452	78	70
20	126	640	6,720	2,920	6,980	6,910	2,520	8,480	320	420	73	67
21	126	760	6,980	2,850	7,110	5,070	2,470	10,200	300	360	72	61
22	126	1,250	7,250	3,300	7,320	4,120	2,200	12,100	281	320	73	58
23	124	1,550	7,460	3,520	7,390	4,840	1,700	14,000	262	272	73	57
24	124	1,750	7,740	3,300	7,320	5,190	1,330	15,300	243	243	73	56
25	123	1,900	8,100	3,100	7,250	4,950	1,190	14,900	232	220	74	55
26	131	2,100	8,580	3,100	7,040	4,290	1,620	13,600	230	202	73	54
27	176	2,400	9,140	3,890	6,650	3,740	2,020	12,400	222	197	80	55
28	370	2,600	9,700	4,620	5,970	3,580	2,020	11,300	224	186	85	54
29	430	2,900	10,000	4,900	5,310	3,580	1,900	10,000	252	178	76	54
30	567	3,200	10,000	4,840	-	3,800	1,780	8,540	310	169	85	54
31	700	-	9,920	4,730	-	4,020	-	6,390	-	162	108	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acre-feet
October	6,061	700	123	196	0.055	0.08	12,020
November	33,692	3,200	310	1,123	0.313	0.35	66,810
December	189,080	10,000	3,000	6,099	1.70	1.96	375,000
Calendar year 1947	869,103	10,000	76	2,361	0.664	9.01	1,724,000
January	157,200	9,600	2,850	5,071	1.41	1.63	311,800
February	176,120	7,390	4,120	6,073	1.69	1.83	349,300
March	189,020	9,500	3,580	6,097	1.70	1.96	374,900
April	62,830	4,400	1,050	2,094	0.584	0.65	124,600
May	204,960	15,300	1,190	6,612	1.84	2.13	406,500
June	22,174	3,660	222	739	0.206	0.23	43,980
July	11,511	804	162	371	0.103	0.12	22,830
August	5,845	725	72	189	0.053	0.06	11,590
September	2,627	164	54	87.6	0.024	0.03	5,210
Water year 1947-48	1,061,130	15,300	54	2,899	0.809	11.01	2,105,000

Peak discharge (base, 6,800 sec.-ft.), Dec. 30 (6 a.m.) 10,000 sec.-ft.; Feb. 15 (11 p.m.) 7,180 sec.-ft.; Feb. 23 (1 p.m.) 7,390 sec.-ft.; Mar. 16 (1 p.m.) 9,600 sec.-ft.; May 24 (2 p.m.) 15,300 sec.-ft.

Note.- No gage-height record Nov. 8 to Dec. 2, Sept. 15-22, 29, 30; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations on Sabine River.



## Sabine River at Logansport, La.

Location.- Wire-weight gage, lat. 31°58', long. 94°00', at bridge on U. S. Highway 84, 200 feet upstream from Texas & New Orleans Railroad bridge in Logansport, De Soto Parish, and 3 miles upstream from Bayou Castor. Datum of gage is 147.72 feet above mean sea level, datum of 1929.

Drainage area.- 4,858 square miles.

Records available.- July 1903 to September 1948. (January 1907 to September 1923, monthly records only in Water-Supply Paper 850.) U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Average discharge.- 42 years (1903-19, 1922-48), 3,287 second-feet.

Extremes.- Maximum discharge during year, 13,200 second-feet Feb. 15, 16 (gage height, 25.16 feet, from graph based on gage readings); minimum observed, 71 second-feet Sept. 29, 30.

1903-48: Maximum discharge, 92,000 second-feet Apr. 8, 1945 (gage height, 44.07 feet, from floodmark); minimum observed during periods of daily records, 16 second-feet Sept. 26-28, Oct. 3, 4, 1939.

Maximum stage known prior to 1945, 39.4 feet in May 1884, present datum.

Remarks.- Records good except those for periods of backwater or no gage-height record, which are fair. Gage read twice daily. Small diversion above station.

Cooperation.- Gage-height record collected in cooperation with the U. S. Weather Bureau.

Revisions (water years).- W 850: 1903-6 (monthly and annual means).

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	336	476	2,600	8,500	7,310	10,800	5,570	2,760	12,900	336	152	85
2	304	628	2,720	8,900	7,380	10,500	5,100	2,490	12,800	377	140	83
3	280	648	2,840	9,220	7,310	9,940	4,350	2,190	12,300	440	132	91
4	258	568	3,040	a9,480	7,040	9,380	4,950	1,900	10,600	540	134	99
5	244	476	3,210	9,700	6,740	9,060	4,850	1,750	7,660	530	316	98
6	237	422	3,480	9,780	6,440	9,220	4,360	1,700	4,270	476	530	100
7	223	c422	a3,860	9,540	6,140	a9,380	3,290	1,940	2,370	494	548	124
8	210	c422	4,270	8,820	c6,260	9,300	2,410	2,150	1,730	512	476	152
9	204	a422	4,550	7,800	a7,170	9,060	1,970	a2,260	1,390	512	386	152
10	198	c494	4,850	6,620	c8,290	8,740	1,830	1,940	1,450	476	304	132
11	192	c762	5,100	5,740	c9,540	8,590	a1,830	a2,010	1,370	476	244	112
12	192	c858	5,250	5,350	10,800	8,360	1,900	c3,240	1,170	476	204	111
13	186	c932	5,300	5,400	12,200	8,220	2,450	c6,270	a1,040	422	180	112
14	186	c1,010	a5,350	5,570	13,000	8,290	c3,720	8,010	906	449	162	113
15	180	c1,090	a5,400	5,740	13,100	8,430	4,800	9,220	834	648	152	118
16	174	a1,200	c5,520	5,960	13,100	8,660	4,850	10,200	738	762	146	111
17	174	c1,340	a5,620	5,700	12,900	8,980	4,500	10,600	870	870	146	102
18	c188	c1,390	a5,680	6,380	12,700	9,300	4,040	10,700	608	a568	135	100
19	c168	c1,250	c5,790	6,580	12,400	9,700	3,550	10,400	568	494	127	a99
20	c162	c1,090	5,900	6,560	11,900	10,000	3,170	9,780	a512	449	116	94
21	c162	984	6,020	6,140	11,600	a10,400	3,040	9,220	476	431	107	94
22	157	906	6,240	5,570	11,400	10,700	3,000	8,820	440	413	100	91
23	157	1,250	6,440	5,350	11,300	11,300	2,920	8,580	433	377	93	89
24	152	1,630	6,560	5,400	11,200	11,400	2,760	8,580	386	328	87	85
25	152	2,040	a6,740	a5,350	11,000	11,200	a2,370	8,820	360	288	84	82
26	a157	2,300	6,920	5,050	11,100	10,800	2,220	9,220	344	251	82	76
27	157	2,340	7,100	5,300	11,200	10,600	2,490	9,860	320	223	82	75
28	182	2,370	7,310	a5,920	11,200	a10,100	2,820	10,600	304	204	81	73
29	182	2,410	7,590	c5,360	11,100	9,380	3,080	11,400	332	192	80	71
30	a210	2,480	7,800	c5,920	-	8,080	3,000	12,100	320	174	79	71
31	c336	-	8,080	7,100	-	6,620	-	12,600	-	162	79	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-foot
October	8,240	336	152	201	0.041	0.05	12,380
November	34,620	2,490	422	1,154	.237	.25	68,670
December	167,130	8,080	2,600	5,391	1.11	1.28	331,500
Calendar year 1947	1,314,240	12,900	106	3,601	.741	10.06	2,607,000
January	212,560	9,780	5,050	6,857	1.41	1.63	421,600
February	292,720	13,100	6,140	10,090	2.08	2.24	580,600
March	294,400	11,400	6,620	9,497	1.95	2.25	583,900
April	101,690	5,570	1,830	3,390	.698	.78	201,700
May	211,290	12,600	1,700	6,816	1.40	1.62	419,100
June	79,561	12,900	304	2,652	.546	.61	157,800
July	13,140	762	162	424	.087	.10	26,060
August	5,684	548	79	183	.038	.04	11,270
September	2,995	152	71	99.8	.021	.02	5,940
Water year 1947-48	1,422,020	13,100	71	3,885	.800	10.88	2,821,000

a No gage-height record; discharge computed on basis of estimated gage heights.

c Backwater from Bayou Castor.

## Sabine River near Milam, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 31°28', long. 93°45', at bridge on State Highway 21, 2.8 miles downstream from Patroon Bayou, 6.5 miles north-east of Milam, Sabine County, and 7.2 miles upstream from Palo Gaucho Bayou. Datum of gage is 97.96 feet above mean sea level, datum of 1929, Alluvial Valley supplementary adjustment of 1941.

Drainage area.- 6,543 square miles.

Records available.- January 1939 to September 1948. October 1923 to August 1925, at Sabinetown, 7.4 miles downstream, records equivalent except those for periods of extreme low flow or high runoff from Palo Gaucho Bayou.

Extremes.- Maximum discharge during year, 18,800 second-feet Feb. 15, 1945; maximum gage height, 31.84 feet Feb. 15; minimum discharge, 91 second-feet Sept. 30 (gage height, 6.03 feet).

1939-48: Maximum discharge, 83,400 second-feet Apr. 12, 1945 (gage height, 48.87 feet); minimum observed, 32 second-feet Oct. 15, 22, 1939.

Maximum stage known prior to 1945, 48 feet about July 28, 1933, from information by observer.

Remarks.- Records good except those for periods of no gage-height record, which are fair. No large diversions above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used July 29 to Sept. 10)

6.0	86	8.5	830	18.0	6,200
6.3	146	10.0	1,400	22.0	9,450
6.7	250	12.0	2,350	26.0	13,100
7.3	431	14.5	3,780	32.0	19,000

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	495	208	2,350	7,920	8,770	15,400	9,810	3,240	10,900	479	258	108
2	431	315	2,400	8,520	8,940	14,600	7,920	3,010	11,200	463	244	104
3	387	447	2,520	8,940	9,020	14,000	6,420	2,740	11,300	495	219	106
4	352	594	3,060	9,200	8,940	13,300	5,680	2,400	11,500	544	204	106
5	322	627	4,230	9,450	9,770	12,800	5,450	2,150	11,600	610	191	104
6	304	561	4,380	9,450	8,340	13,300	5,310	2,350	11,300	650	183	106
7	287	528	3,840	9,540	8,000	13,400	5,030	2,620	9,360	644	298	114
8	270	544	4,100	9,540	8,860	12,700	4,230	2,300	5,160	610	528	118
9	256	561	4,890	9,540	14,000	12,200	3,180	2,250	2,740	610	561	137
10	242	561	5,680	9,110	15,500	11,800	2,520	2,250	2,000	627	512	180
11	230	544	6,200	8,180	16,400	11,200	2,200	2,300	1,720	630	431	201
12	222	711	6,280	7,030	17,000	10,700	2,050	3,010	1,670	630	365	188
13	214	970	6,280	6,350	17,800	10,200	7,090	4,620	1,540	630	310	168
14	209	1,000	6,280	6,280	18,400	9,630	16,000	6,280	1,320	660	270	153
15	204	1,080	6,800	6,850	18,800	9,280	17,600	7,510	1,180	720	233	142
16	199	1,280	7,670	6,500	18,800	9,110	17,200	8,520	1,040	790	217	142
17	193	1,400	7,590	6,580	18,600	9,110	14,600	9,110	935	840	199	146
18	188	1,490	7,270	6,650	18,400	9,200	12,000	9,540	865	860	188	142
19	191	1,670	7,030	6,800	18,200	9,360	9,020	9,900	796	810	183	135
20	193	1,670	6,720	6,950	17,600	9,540	6,500	10,100	745	720	178	126
21	191	1,440	6,580	7,030	17,200	9,720	4,820	10,100	677	640	170	120
22	186	1,400	6,420	6,950	17,400	9,990	3,900	9,900	644	580	160	116
23	180	1,850	6,420	6,580	17,600	10,400	3,540	9,540	594	530	153	114
24	173	2,150	6,500	6,200	17,600	10,800	3,240	9,110	561	500	144	114
25	168	2,100	6,580	6,120	17,600	11,100	3,010	8,770	528	470	137	110
26	165	2,250	6,650	6,050	17,400	11,300	2,840	8,680	512	420	133	106
27	168	2,400	6,600	6,120	17,000	12,100	2,740	8,940	479	380	126	100
28	173	2,400	6,950	6,720	18,600	12,600	2,790	9,810	463	340	124	99
29	170	2,350	7,110	7,670	16,000	12,300	3,060	10,500	495	301	118	97
30	180	2,300	7,270	8,180	-	11,900	3,300	10,500	561	275	116	93
31	191	-	7,510	8,600	-	11,200	-	10,600	-	253	112	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-foot
October	7,334	495	165	237	0.036	0.04	14,550
November	37,397	2,400	206	1,247	.191	.21	74,180
December	180,340	7,670	2,350	5,817	.889	1.02	357,700
Calendar year 1947	1,907,604	22,200	141	5,226	.799	10.84	3,783,000
January	235,010	9,540	6,050	7,581	1.16	1.34	466,100
February	433,540	18,800	8,000	14,950	2.28	2.46	859,900
March	354,240	15,400	9,110	11,430	1.75	2.01	702,600
April	193,250	17,600	2,050	6,442	.994	1.10	383,300
May	202,650	10,600	2,150	6,537	.999	1.15	402,000
June	104,365	11,600	463	3,479	.532	.59	207,000
July	17,721	860	253	572	.087	.10	36,150
August	7,265	561	312	234	.036	.04	14,410
September	3,795	201	93	126	.019	.02	7,330
Water year 1947-48	1,776,907	18,800	93	4,855	.742	10.08	3,524,000

Peak discharge (base, 15,000 sec.-ft.)- Feb. 15 (2 p.m.) 18,800 sec.-ft.; Apr. 15 (10 p.m.) 17,800 sec.-ft.

Note.- No gage-height record Apr. 24-28, July 11-28; discharge computed on basis of recorded range in stage and records for stations at Logansport and near Bon Weir.

## Sabine River near Bon Wier, Tex.

Location.- Wire-weight gage, lat. 30°44', long. 93°37', at bridge on U. S. Highway 190, 1 1/2 miles east of Bon Wier, Newton County, and 2.4 miles upstream from Caney Creek. Datum of gage is 46.4 feet above mean sea level, datum of 1929.

Drainage area.- 8,323 square miles.

Records available.- October 1923 to September 1934, January 1939 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1913.

Average discharge.- 20 years (1923-34, 1939-48), 8,112 second-feet.

Extremes.- Maximum discharge during year, 28,100 second-feet Apr. 18 (gage height, 19.46 feet, from graph based on gage readings); minimum observed, 331 second-feet Sept. 29, 30.

1923-34, 1939-48: Maximum discharge, 75,500 second-feet Apr. 17, 18, 1945; maximum gage height, 23.10 feet Apr. 18, 1945; minimum discharge observed, 185 second-feet Sept. 11, 22, 24, 1925.

Maximum stage known, 26 feet in May 1864, present site and datum, from information by local resident.

Remarks.- Records good. Gage read twice daily, oftener during high stages. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,000	649	3,190	9,500	12,200	19,400	12,900	4,150	11,000	978	628	408
2	875	850	3,100	11,600	12,000	18,700	12,100	4,250	10,900	1,000	608	401
3	805	715	3,100	11,800	11,400	18,000	10,900	4,150	11,000	1,090	588	401
4	760	628	3,280	11,500	10,800	16,800	9,080	4,050	11,200	1,060	588	377
5	692	715	4,950	11,000	10,600	16,000	7,580	4,150	11,400	1,000	588	367
6	649	1,260	8,240	10,600	10,500	16,000	6,930	3,950	11,500	1,000	544	367
7	628	1,260	9,500	10,500	10,100	17,000	6,580	4,150	11,600	1,030	528	360
8	588	1,320	8,800	10,500	9,920	17,600	6,440	4,880	11,200	1,060	528	380
9	568	1,290	11,600	10,500	12,100	17,000	5,980	4,450	9,220	1,060	512	457
10	548	1,120	12,100	10,600	17,200	16,200	5,210	3,950	5,650	1,000	588	544
11	528	1,230	11,500	11,200	20,200	15,600	4,450	3,550	3,750	1,030	715	692
12	508	1,380	10,800	10,500	21,800	14,500	3,850	3,750	3,010	1,060	760	588
13	488	1,260	10,800	10,600	23,000	13,500	4,300	4,250	2,650	1,170	715	548
14	460	1,350	12,000	11,800	23,000	12,600	11,600	4,770	2,380	1,230	670	536
15	457	3,440	13,400	10,900	23,300	11,800	18,900	6,090	2,300	1,120	608	508
16	449	4,880	15,400	9,780	23,000	11,200	24,300	7,320	2,060	1,030	538	472
17	430	3,370	15,600	8,940	22,100	10,800	27,000	8,520	1,840	978	520	453
18	430	3,010	14,400	8,660	21,600	10,900	27,700	9,360	1,720	978	488	441
19	453	3,550	11,600	8,660	20,700	10,800	24,600	9,920	1,620	1,030	468	434
20	457	3,460	9,920	8,520	20,200	10,800	18,800	10,300	1,450	1,140	457	416
21	438	3,100	9,080	8,660	19,400	10,600	12,700	10,600	1,350	1,140	416	412
22	449	2,920	8,520	8,940	20,200	10,900	8,940	10,800	1,280	1,060	416	394
23	441	3,650	8,100	8,800	21,000	11,400	6,680	10,800	1,200	978	434	380
24	434	5,870	7,840	8,520	21,600	11,800	5,650	10,600	1,170	900	419	380
25	430	6,200	7,710	8,100	21,800	12,100	4,990	10,100	1,120	875	419	391
26	423	4,990	7,580	7,970	21,800	12,100	4,770	9,640	1,090	828	405	370
27	401	3,850	7,580	8,800	21,600	12,100	4,660	9,640	1,000	805	419	357
28	412	3,460	7,710	10,900	21,000	12,600	4,450	10,800	978	782	426	347
29	401	3,370	7,840	11,500	20,200	13,400	4,250	11,600	950	760	430	331
30	426	3,280	7,970	12,200	-	13,700	4,150	11,600	978	670	419	331
31	468	-	8,380	12,600	-	13,400	-	11,500	-	692	419	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	16,496	1,000	401	532	0.064	0.07	32,720
November	77,427	6,200	628	2,581	.310	.35	153,600
December	281,590	15,600	3,100	9,084	1.09	1.26	558,500
Calendar year 1947	2,852,414	37,500	401	7,815	.939	12.75	5,658,000
January	314,650	12,600	7,970	10,150	1.22	1.41	624,100
February	524,320	23,300	9,920	18,080	2.17	2.34	1,040,000
March	429,300	19,400	10,600	13,850	1.66	1.92	851,500
April	311,420	27,700	3,850	10,580	1.25	1.39	617,700
May	227,640	11,600	3,550	7,343	.882	1.02	451,500
June	138,546	11,600	950	4,618	.555	.62	274,800
July	39,534	1,230	670	985	.118	.14	60,560
August	16,259	760	405	524	.063	.07	32,250
September	12,843	692	331	428	.051	.06	25,470
Water year 1947-48	2,381,025	27,700	331	6,506	.782	10.65	4,723,000

Peak discharge (base, 19,000 sec.-ft.)- Feb. 15 (4 a.m. to 2 p.m.) 23,300 sec.-ft.; Apr. 18 (4 to 8 a.m.) 28,100 sec.-ft.

## Sabine River near Ruliff, Tex.

Location.— Wire-weight gage, lat. 30°18'10", long. 93°44'40", at bridge on State Highway 235, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from Kansas City-Southern Railway bridge, and 4.5 miles downstream from Cypress Creek. Datum of gage is 4.08 feet above mean sea level, datum of 1929.

Drainage area.— 9,440 square miles.

Records available.— October 1924 to September 1948.

Average discharge.— 24 years, 9,082 second-feet.

Extremes.— Maximum discharge during year, 28,600 second-feet Feb. 26-28; maximum gage height, 14.56 feet Feb. 26, 27; minimum discharge observed, 438 second-feet Sept. 30 (gage height, 2.15 feet).

1924-48: Maximum discharge, 85,300 second-feet Apr. 22, 1945; maximum gage height, 17.9 feet May 24, 25, 1935, present site and datum; minimum discharge observed, 338 second-feet Sept. 25-27, Oct. 2, 3, 22-24, 1939.

Higher stages are known to have occurred in the past.

Remarks.— Records good except those for periods of no gage-height record, which are fair. Gage read twice daily. No large diversions above station. Records of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	620	4,000	10,200	19,100	26,800	14,800	5,030	12,200	1,450	950	590
2	1,550	8732	3,770	10,600	19,100	24,200	15,100	5,290	12,700	1,450	890	575
3	1,400	970	3,700	11,000	18,500	23,400	15,100	5,160	12,700	1,450	872	560
4	1,300	1,130	3,570	12,000	18,000	21,800	14,800	5,160	12,700	1,550	785	515
5	1,220	1,050	3,770	13,600	17,000	21,800	14,500	4,910	12,700	1,550	785	488
6	1,130	950	4,570	14,200	15,400	21,000	13,800	4,910	12,700	1,500	750	475
7	1,050	1,220	6,370	14,500	14,900	21,000	13,600	4,910	13,000	1,450	715	475
8	990	1,650	8,000	14,500	14,200	20,400	10,800	4,680	13,000	1,450	698	462
9	910	1,700	9,730	14,200	14,200	20,400	9,730	4,910	12,700	1,500	680	462
10	872	1,900	10,800	13,800	14,200	20,400	9,110	5,160	12,200	1,550	650	500
11	838	1,850	11,500	13,800	14,500	20,400	8,740	4,910	11,000	1,600	650	590
12	820	1,750	13,000	13,600	15,800	19,700	6,370	4,370	10,400	1,600	680	680
13	768	1,800	15,400	13,800	18,000	18,500	5,560	4,180	6,800	1,600	785	802
14	732	2,000	15,800	14,200	21,800	18,000	5,850	4,400	4,470	1,650	890	820
15	715	2,200	18,000	14,200	25,900	17,500	6,370	4,800	3,630	1,750	930	750
16	698	3,030	19,100	14,800	27,700	17,000	10,400	5,200	3,210	1,700	855	732
17	685	4,000	21,000	14,200	27,700	15,800	12,700	5,700	2,920	1,550	750	715
18	665	4,470	22,500	13,600	26,800	15,100	115,800	6,370	2,640	1,500	665	665
19	650	4,000	23,400	13,000	25,900	14,500	23,400	8,000	2,580	1,500	635	620
20	650	3,840	23,400	12,700	25,000	13,800	25,900	9,200	2,420	1,500	620	590
21	650	4,000	17,000	12,200	25,900	13,600	26,800	9,800	2,310	1,550	605	560
22	665	3,920	18,000	11,700	25,900	13,300	26,800	10,200	2,100	1,600	590	530
23	665	3,700	15,800	11,700	25,900	13,000	23,400	10,600	2,000	1,600	560	530
24	650	3,770	14,500	11,700	26,800	13,000	18,500	10,600	1,900	1,600	a545	515
25	635	5,160	12,700	11,700	27,700	13,300	16,600	10,600	1,800	1,350	560	500
26	a620	6,170	11,000	12,000	28,600	13,300	11,500	10,800	1,700	1,220	545	488
27	620	6,600	10,400	12,700	28,600	13,600	9,320	11,000	1,600	1,170	545	475
28	605	6,370	10,200	13,800	28,600	13,800	6,600	10,800	1,600	1,130	590	462
29	590	5,700	9,730	15,800	26,800	14,200	6,000	10,800	a1,500	1,090	620	450
30	590	a4,680	9,730	17,000	-	14,200	5,560	10,800	1,450	1,050	620	438
31	605	-	9,940	19,100	-	14,500	-	11,500	-	970	605	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	26,218	1,700	590	846	0.900	0.10	52,000
November	90,932	6,600	620	3,031	.321	1.36	180,400
December	380,380	23,400	3,570	12,270	1.30	1.50	754,500
Calendar year 1947	3,671,966	52,900	590	10,060	1.07	14.46	7,283,000
January	415,900	19,100	10,200	13,420	1.42	1.64	824,900
February	638,400	28,600	14,200	22,010	2.33	2.51	1,265,000
March	541,300	26,800	15,000	17,460	1.85	2.13	1,074,000
April	402,610	26,800	5,560	13,420	1.42	1.59	798,600
May	224,750	11,500	4,180	7,250	.768	.89	445,800
June	194,430	13,000	1,450	6,481	.686	.77	385,600
July	45,180	1,750	970	1,457	.154	.18	89,610
August	21,620	950	545	697	.074	.09	42,880
September	17,014	820	438	567	.080	.07	33,750
Water year 1947-48	2,998,734	28,600	438	8,193	.868	11.83	5,948,000

Peak discharge (base, 22,000 sec.-ft.)— Dec. 19, 20, 23,400 sec.-ft.; Feb. 26-28, 28,600 sec.-ft.; Apr. 21, 22, 26,800 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage heights.

Note.— No gage-height record May 14-16, 19-22; discharge computed on basis of records for station near Bon Wier.



## Lake Fork Sabine River near Quitman, Tex.

Location.- Wire-weight gage, lat. 32°46', long. 95°28', at bridge on State Highway 37, half a mile downstream from Dry Creek and 2.5 miles south of Quitman, Wood County. Datum of gage is 317.42 feet above mean sea level, datum of 1929.

Drainage area.- 586 square miles.

Records available.- June 1924 to April 1926, February 1939 to September 1948.

Average discharge.- 10 years (1924-25, 1939-48), 515 second-feet.

Extremes.- Maximum discharge during year, 19,200 second-feet May 12 (gage height, 20.66 feet, from graph based on gage readings); no flow at times. 1924-26, 1939-48: Maximum discharge, 75,600 second-feet Mar. 30, 1945 (gage height, 29.85 feet, from floodmark), from rating curve extended above 49,000 second-feet; no flow at times.

From information by local residents, the flood of July 1895 reached about the same stage as that of July 7, 1943, which was 25.9 feet.

Remarks.- Records good. Gage read twice daily, oftener during high stages. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7	0.2	170	1,050	566	1,230	102	62	64	5.0	a31	0.2
2	2.1	79	32	1,860	760	4,130	90	46	45	4.6	18	.2
3	1.8	105	26	3,840	910	5,020	78	40	39	4.4	12	.1
4	1.5	76	209	2,850	1,050	4,770	70	40	28	4.3	8.9	0
5	1.2	26	334	1,580	1,050	2,480	66	81	23	4.1	6.5	0
6	1.0	14	324	752	932	1,480	64	404	21	3.7	5.0	0
7	.8	78	821	290	956	1,220	64	1,010	51	3.4	4.3	0
8	.7	294	1,940	184	1,340	1,330	65	1,370	48	3.0	3.5	0
9	.6	212	2,980	163	2,230	1,410	170	1,130	28	3.0	2.9	0
10	.5	184	2,800	138	2,540	866	177	932	36	5.3	2.3	0
11	.4	71	2,360	128	2,050	488	81	1,490	42	22	1.9	0
12	.3	36	1,600	121	1,800	304	63	10,900	31	170	1.6	0
13	.2	16	828	108	1,860	228	374	14,300	22	166	1.3	0
14	.2	11	516	96	2,050	198	956	5,740	16	142	1.0	.1
15	.1	44	1,200	87	2,050	191	1,100	2,420	13	54	.8	.2
16	.1	138	4,840	124	1,490	191	932	1,340	11	36	.8	.2
17	.1	331	9,540	268	910	184	491	980	8.9	23	.7	.2
18	0	378	5,340	378	584	170	222	760	7.2	15	.7	.1
19	0	268	2,380	378	402	156	121	1,140	6.2	8.9	.5	a0
20	0	228	a1,160	314	344	146	87	2,120	4.8	7.0	.4	a0
21	0	328	760	344	590	142	68	1,450	3.9	3.9	.4	a0
22	0	442	584	470	926	238	52	554	2.9	3.4	.3	0
23	0	a548	700	500	1,330	764	38	156	2.4	2.8	.2	a0
24	0	860	1,080	428	1,000	2,660	a52	96	2.1	2.3	.2	a0
25	.1	866	756	390	566	2,900	132	76	1.9	1.9	.2	a0
26	a.2	1,050	341	354	366	1,600	294	64	1.8	1.6	.4	a0
27	.2	966	177	a334	378	738	354	105	1.6	24	.6	0
28	.1	337	149	a314	516	274	284	342	1.6	528	.6	a0
29	0	276	128	a304	602	177	174	268	7.5	680	.4	a0
30	0	244	121	a314	-	135	93	146	6.7	186	.4	a0
31	0	-	581	390	-	118	-	102	-	64	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Runoff Acre-feet
October	14.9	2.7	0	0.48	0.00082	0.0009	30
November	8,206.2	1,050	.2	274	.467	.52	16,280
December	44,777	9,540	26	1,444	2.46	2.84	88,810
Calendar year 1947	137,166.3	9,540	-	376	.641	8.70	272,100
January	18,851	3,840	87	608	1.04	1.20	37,390
February	32,147	2,540	344	1,109	1.89	2.04	63,760
March	35,998	5,020	118	1,161	1.98	2.28	71,400
April	6,914	1,100	38	230	.392	2.44	13,710
May	49,864	14,300	40	1,602	2.73	3.15	98,510
June	576.5	64	1.6	19.2	.033	.04	1,140
July	2,182.6	680	1.6	70.4	.120	.14	4,330
August	108.2	31	.2	3.49	.006	.007	215
September	1.3	.2	0	.04	.00007	.0001	2.6
Water year 1947-48	199,440.7	14,300	0	545	.930	12.66	395,600

Peak discharge (base, 6,600 sec.-ft.)- Dec. 17 (12 m.) 10,500 sec.-ft.; May 12 (10 p.m.) 19,200 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and estimated gage heights.

## Big Sandy Creek near Big Sandy, Tex.

Location.- Water-stage recorder, lat. 32°37', long. 95°06', at county highway bridge 2.2 miles northeast of Big Sandy, Upshur County, and 7.8 miles upstream from mouth.  
Datum of gage is 281.6 feet above mean sea level, unadjusted.

Drainage area.- 235 square miles.

Records available.- February 1939 to September 1948.

Extremes.- Maximum discharge during year, 3,340 second-feet May 14 (gage height, 16.38 feet); minimum, 14 second-feet Aug. 24, 25.

1939-48: Maximum discharge, 38,000 second-feet Mar. 31, 1945 (gage height, 22.4 feet, from floodmark), from rating curve extended above 3,000 second-feet; minimum observed, 7.7 second-feet Sept. 30, 1939.

Maximum stage known prior to 1945, 20.4 feet (probably backwater from Sabine River) in January 1938, from information by observer.

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

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Nov. 21 to Dec. 6)

5.1	13	7.0	81	12.0	620	14.5	1,600
5.3	18	8.0	146	12.5	726	15.0	1,940
5.5	23	9.0	224	13.0	866	15.5	2,330
5.8	39	10.0	324	13.5	1,050	16.1	2,920
6.5	58	11.0	450	14.0	1,300		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	45	136	344	464	884	180	208	153	43	26	17
2	27	45	108	372	450	936	156	184	139	40	32	18
3	27	43	89	591	424	1,420	142	139	114	38	37	23
4	28	42	152	1,480	424	2,860	132	142	92	38	37	24
5	29	40	172	983	450	1,620	128	142	78	38	35	20
6	29	40	160	670	450	913	125	150	79	39	31	17
7	29	50	391	501	424	680	122	118	166	38	24	16
8	29	53	980	385	510	526	114	104	95	38	21	16
9	29	58	682	302	526	450	111	101	84	37	21	17
10	29	60	750	251	580	398	111	122	81	36	20	20
11	29	62	750	216	562	372	108	378	84	72	19	20
12	28	67	728	196	544	356	104	787	84	75	19	20
13	28	60	660	184	494	302	162	2,370	76	60	18	19
14	28	62	283	176	464	271	224	2,800	67	53	18	19
15	28	74	600	172	424	251	336	1,580	58	44	17	19
16	28	74	776	180	385	242	385	900	54	39	17	18
17	28	67	1,480	208	348	224	424	704	52	35	18	18
18	28	65	1,840	208	313	216	424	660	78	32	18	19
19	28	67	1,450	208	281	208	372	526	58	31	23	20
20	28	67	936	216	271	208	291	424	58	30	24	20
21	28	98	662	271	281	208	216	324	54	28	21	19
22	28	156	511	324	324	242	164	291	52	27	17	19
23	28	172	396	324	348	251	132	281	49	26	15	19
24	28	180	313	302	348	251	114	251	44	25	15	20
25	28	172	261	291	360	261	148	208	39	25	15	20
26	31	156	224	324	372	271	224	188	36	25	20	19
27	50	156	208	424	398	302	208	168	34	24	21	19
28	67	164	192	358	437	302	196	164	35	25	20	19
29	60	168	180	f372	437	271	196	153	42	25	19	19
30	50	160	168	f372	-	233	208	142	44	24	18	19
31	46	-	172	424	-	200	-	146	-	24	18	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff
						Inches Acre-feet
October	1,010	67	27	32.6	0.139	0.16 2,000
November	2,723	180	40	90.8	0.388	0.43 5,440
December	16,957	1,840	89	540	2.30	2.65 33,200
Calendar year 1947	71,922	1,840	21	197	.838	11.39 142,600
January	11,669	1,480	172	376	1.60	1.85 23,150
February	12,133	580	271	418	1.78	1.92 24,070
March	16,089	2,860	200	519	2.21	2.55 31,910
April	5,957	424	104	199	.847	.94 11,820
May	14,855	2,800	101	479	2.04	2.35 29,460
June	2,179	166	34	72.6	.309	.34 4,320
July	1,134	75	24	36.6	.156	.18 2,250
August	674	37	15	21.7	.092	.11 1,340
September	572	24	16	19.1	.081	.09 1,130
Water year 1947-48	85,732	2,860	15	234	.996	13.57 170,000

Peak discharge (base, 1,500-sec.-ft.)- Dec. 18 (12 m.), 1,900 sec.-ft.; Jan. 4 (8 a.m.), 1,600 sec.-ft.; Mar. 4 (7 a.m.), 3,100 sec.-ft.; May 14 (1 a.m.), 3,340 sec.-ft.

f Computed on basis of partly estimated gage-height record.

Note.- No gage-height record Dec. 9-20, Feb. 6 to Mar. 2; discharge computed on basis of recorded range in stage, weather records, and discharge measurements made on Feb. 6, Mar. 2.

SABINE RIVER BASIN  
Cherokee Bayou near Elderville, Tex.

Location.- Water-stage recorder, lat. 32°20', long. 94°42', at bridge on county highway 3.8 miles southeast of Elderville, Gregg County, 4.5 miles upstream from bridge on State Highway 149; and 19.3 miles upstream from mouth. Datum of gage is 266.8 feet above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.- 116 square miles.

Records available.- August 1939 to January 1949 (discontinued).

Extremes.- 1947-48: Maximum discharge during water year, 960 second-feet May 13 (gage height, 6.27 feet); no flow at times.

1948-49: Maximum discharge during period October to January, 168 second-feet Dec. 18 (gage height, 4.67 feet); minimum, 0.1 second-foot Oct. 1.

1939-49: Maximum discharge, 10,200 second-feet Nov. 23, 1940 (gage height, 12.81 feet), from rating curve extended above 4,500 second-feet by logarithmic plotting; no flow at times.

Maximum stage known, about 14.0 feet in September 1913, from information by local residents.

Remarks.- Records fair. No diversion above station.

Revision.- W 1088: Drainage area.

Discharge, in second-feet, 1947-49

1947-48												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.8	24	30	180	240	222	101	69	43	34	1.0	0.1
2	9.3	22	30	274	280	294	96	58	38	24	.9	.1
3	9.1	22	30	308	235	319	89	56	30	19	.7	0
4	8.7	20	71	192	202	314	80	74	27	19	.6	0
5	8.9	19	110	124	192	237	77	70	26	13	.6	0
6	8.7	18	202	101	192	209	79	111	25	10	.5	0
7	8.9	36	253	91	219	200	75	104	24	8.7	.5	0
8	9.1	37	248	84	232	75	106	24	7.1	.5	.4	.4
9	8.7	42	237	80	250	227	92	99	24	5.8	.5	2.2
10	8.5	62	288	80	754	188	80	77	24	5.6	.4	1.5
11	8.3	57	202	79	459	178	74	195	25	8.7	.3	.8
12	8.3	41	134	82	440	171	70	477	27	11	.2	.6
13	8.3	37	104	96	562	153	102	860	25	7.4	.1	.6
14	8.3	58	87	91	531	142	126	543	24	18	0	1.4
15	8.2	62	118	96	562	140	148	280	21	20	0	1.3
16	8.2	57	166	125	280	142	155	155	20	12	0	1.0
17	8.0	68	261	200	227	144	110	130	20	7.1	0	.8
18	8.2	66	232	245	202	155	79	146	18	5.3	0	.7
19	11	50	148	258	190	148	63	217	16	4.4	0	.9
20	12	42	108	217	183	132	56	164	15	4.0	0	.9
21	10	44	94	207	227	143	49	99	14	3.5	0	.9
22	9.6	86	87	258	302	272	44	72	13	3.0	0	.9
23	9.3	92	80	294	362	467	77	60	13	2.7	0	.8
24	9.6	101	77	272	283	476	92	53	12	2.4	0	.6
25	9.5	106	72	207	277	280	140	50	13	2.2	0	.5
26	15	82	69	197	283	202	209	58	14	1.9	0	.4
27	26	57	66	318	297	166	212	62	13	1.7	0	.3
28	24	43	63	429	258	146	227	60	17	1.6	0	.4
29	25	36	63	a429	222	134	136	63	44	1.4	0	.2
30	31	32	63	a300	-	117	86	66	41	1.2	.1	.2
31	27	-	78	a243	-	110	-	54	-	1.1	.2	-

a No gage-height record; discharge computed on basis of known rating in stage.

1948-49														
Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.	Day	Oct.	Nov.	Dec.	Jan.
1	0.1	11	42	71	9	0.6	13	29	38	17	4.3	106	106	-
2	.2	12	42	57	10	1.1	13	29	38	18	4.8	114	156	-
3	.2	12	38	50	11	4.6	13	29	38	19	4.1	146	102	-
4	.2	12	35	45	12	4.4	17	29	38	20	3.8	90	73	-
5	.2	16	35	42	13	3.6	22	30	-	21	3.6	90	64	-
6	.2	16	33	40	14	3.3	29	31	-	22	3.8	90	54	-
7	.6	15	31	39	15	3.6	37	44	-	23	4.1	70	48	-
8	.8	13	30	38	16	3.8	94	79	-	24	4.3	76	44	-

Monthly discharge, in second-feet, 1947-49

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acro-feet
October 1947	374.6	31	8.0	12.1	0.104	0.12	743
November	1,518	106	18	50.6	.436	.49	3,010
December	3,871	288	30	125	1.08	1.24	7,680
Calendar year 1947	51,822	2,400	3.1	142	1.22	17.44	102,800
January 1948	6,159	429	79	199	1.72	1.97	12,220
February	9,179	754	183	317	2.73	2.94	18,210
March	6,420	476	110	207	1.78	2.06	12,730
April	3,100	227	44	103	.888	.99	6,150
May	4,688	860	50	151	1.30	1.50	9,300
June	688	44	12	22.9	.197	.22	1,360
July	266.8	34	1.1	8.61	.074	.09	529
August	7.1	1.0	0	.23	.0020	.002	14
September	18.4	2.2	0	.61	.0053	.006	36
Water year 1947-48	36,289.9	860	0	99.2	.855	11.63	71,980
October 1948	93.7	5.3	.1	3.02	.026	.03	186
November	1,440	146	11	48.0	.414	.46	2,860
December	1,612	156	29	52.0	.448	.52	3,200
Calendar year 1948	33,672	860	0	92.0	.793	10.79	66,800
January 1-12, 1949	534	71	38	44.5	.384	.17	1,060
The period	-	-	-	-	-	-	7,310

## Neches River near Neches, Tex.

Location.- Water-stage recorder, lat. 31°54', long. 95°26', at bridge on U. S. Highway 79, half a mile downstream from International-Great Northern Railroad bridge, 1 mile downstream from Walnut Creek, and 4.4 miles northeast of Neches, Anderson County. Datum of gage is 263.9 feet above mean sea level, datum of 1929.

Drainage area.- 1,129 square miles.

Records available.- February 1939 to September 1948.

Extremes.- Maximum discharge during year, 6,780 second-feet Mar. 7 (gage height, 15.91 feet); minimum, 12 second-feet Aug. 24, 25 (gage height, 2.12 feet).

1939-48: Maximum discharge, 45,500 second-feet Apr. 2, 1945 (gage height, 22.07 feet); no flow Oct. 3-5, 1939.

Flood of May 1908 reached a stage of 24.3 feet, from information by local resident.

Flood of May 1884 was probably higher.

Remarks.- Records good. No large diversions above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used Nov. 10 to Dec. 15)

2.1	12	6.0	215	12.0	1,160
2.5	24	7.0	294	13.0	1,730
3.0	42	8.0	390	14.0	2,810
3.5	64	9.0	510	15.0	4,400
4.0	91	10.0	660	15.5	5,500
5.0	150	11.0	860	16.0	7,200

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	150	312	714	1,390	1,240	985	612	496	201	29	14
2	67	144	312	696	1,540	1,240	935	612	468	174	28	14
3	64	135	303	678	1,780	1,200	838	580	410	168	26	15
4	60	129	340	860	1,910	1,240	754	524	340	174	26	15
5	58	126	468	844	1,960	1,390	678	444	294	162	25	15
6	58	120	538	844	1,960	2,510	596	420	254	138	24	15
7	56	129	566	678	1,960	6,110	552	432	230	129	23	15
8	56	162	628	754	2,000	6,060	496	410	208	138	22	13
9	56	180	696	860	2,360	4,700	482	420	187	141	22	14
10	56	174	816	935	2,670	3,550	510	420	187	132	21	16
11	54	187	910	1,020	2,740	2,740	482	456	201	186	20	20
12	53	215	910	1,040	2,740	2,260	444	691	201	201	20	20
13	52	208	910	1,040	2,880	1,960	541	1,070	187	168	19	18
14	52	215	935	985	3,100	1,780	794	2,200	168	150	18	17
15	52	254	1,040	885	3,250	1,620	838	4,020	153	132	18	16
16	52	262	1,200	774	3,100	1,480	838	5,500	138	114	16	16
17	51	246	1,340	754	2,950	1,390	774	5,760	126	99	16	16
18	50	246	1,450	774	2,740	1,240	678	4,800	117	88	15	16
19	49	270	1,450	794	2,540	1,160	628	3,800	108	80	14	16
20	49	262	1,340	774	2,310	1,020	612	2,950	99	72	14	16
21	48	246	1,290	816	2,150	960	566	2,420	91	64	13	16
22	47	262	1,420	860	2,000	935	524	2,050	83	57	13	16
23	47	321	1,620	910	1,860	980	456	1,730	77	52	13	16
24	48	360	1,760	960	1,730	960	420	1,450	74	48	12	16
25	48	350	1,730	960	1,580	960	429	1,160	70	45	12	15
26	48	330	1,620	935	1,450	985	722	935	68	41	13	15
27	58	303	1,390	1,020	1,390	985	794	734	67	38	13	14
28	99	294	1,200	1,080	1,340	1,020	774	596	68	36	14	14
29	111	303	1,040	1,200	1,290	1,080	524	524	143	34	14	13
30	126	303	910	1,290	-	1,080	644	496	222	32	14	13
31	147	-	794	1,340	-	1,040	-	496	-	30	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Runoff Acre-feet
October	1,944	147	47	62.7	0.056	0.06	3,860
November	6,886	360	120	230	.204	.23	13,660
December	31,258	1,780	303	1,008	.893	1.03	62,000
Calendar year 1947	317,819	6,780	32	871	.771	10.46	630,400
January	27,474	1,340	644	886	.785	.90	54,490
February	62,670	3,250	1,290	2,161	1.91	2.06	124,300
March	56,855	6,110	935	1,834	1.62	1.87	112,800
April	19,498	985	420	650	.576	.64	38,670
May	48,712	5,760	410	1,571	1.39	1.60	96,820
June	5,535	496	67	184	.163	.18	10,980
July	3,324	201	30	107	.095	.11	6,590
August	561	29	12	18.1	.016	.02	1,110
September	465	20	13	15.5	.014	.02	922
Water year 1947-48	265,182	6,110	12	725	.642	8.72	526,000

Peak discharge (base, 4,000 sec.-ft.).- Mar. 7 (9 p.m.) 6,780 sec.-ft.; May 17 (3 a.m.) 5,910 sec.-ft.

## Neches River near Alto, Tex.

Location.- Water-stage recorder, lat. 31°34', long. 95°10', at bridge on State Highway 21, 600 feet downstream from Bowles Creek and 7½ miles southwest of Alto, Cherokee County. Datum of gage is 198.29 feet above mean sea level, datum of 1929, supplementary adjustment of 1937.

Drainage area.- 1,903 square miles.

Records available.- January 1944 to September 1948.

Extremes.- Maximum discharge during year, 4,700 second-feet May 23; maximum gage height, 17.34 feet Mar. 13; minimum discharge, 21 second-feet Aug. 24, 25; minimum gage height, 1.56 feet Sept. 29-30.

1944-48: Maximum discharge, 42,800 second-feet Apr. 4, 1945 (gage height, 26.85 feet); minimum, that of Aug. 24, 25, 1948.

Maximum stage known, about 28.2 feet in May 1884, from information by local residents.

Remarks.- Records good. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	162	180	445	1,740	1,800	2,460	1,310	1,330	1,120	285	67	53
2	149	188	445	1,740	1,800	2,340	1,310	1,310	896	285	64	43
3	137	198	445	1,660	1,800	2,290	1,330	1,280	782	325	60	37
4	133	206	530	1,510	1,840	2,200	1,330	1,260	712	345	56	33
5	125	203	712	1,330	1,880	2,100	1,330	1,220	670	315	53	30
6	121	206	768	1,170	1,940	2,060	1,310	1,150	618	285	50	30
7	117	229	754	1,070	1,980	1,980	1,220	1,110	554	265	48	31
8	117	238	912	1,010	2,150	1,940	1,130	1,030	485	256	46	31
9	117	238	1,050	978	2,670	1,940	1,130	944	435	238	44	32
10	117	229	1,130	978	2,920	2,100	1,110	824	395	229	42	34
11	117	238	1,090	1,050	3,120	2,640	1,050	796	355	275	39	33
12	113	256	1,030	1,090	3,230	3,620	996	1,110	325	345	39	34
13	113	265	1,010	1,130	3,480	4,280	1,090	1,220	305	355	38	34
14	109	285	1,010	1,170	3,620	4,100	1,310	1,150	305	295	34	36
15	105	345	1,110	1,220	3,620	3,620	1,430	1,090	295	275	32	40
16	105	345	1,260	1,240	3,480	3,120	1,510	1,130	285	256	30	41
17	105	345	1,330	1,310	3,480	2,830	1,540	1,310	265	224	30	40
18	101	395	1,360	1,380	3,480	2,530	1,540	1,570	247	193	29	37
19	101	425	1,360	1,380	3,350	2,340	1,460	1,910	4224	175	28	35
20	105	425	1,380	1,380	3,350	2,200	1,410	2,420	4211	153	26	34
21	109	395	1,410	1,430	3,480	2,030	1,360	3,320	4193	137	26	33
22	105	415	1,430	1,480	3,770	2,150	1,310	4,280	4175	125	25	32
23	105	518	1,460	1,480	3,620	2,150	1,480	4,480	162	113	24	31
24	101	554	1,480	1,460	3,480	2,100	1,190	3,930	153	105	22	30
25	101	554	1,480	1,430	3,120	2,060	1,130	3,350	145	98	24	29
26	100	554	1,510	1,430	2,920	1,980	1,380	2,920	137	91	23	28
27	100	530	1,540	1,570	2,830	1,880	1,510	2,670	137	86	27	26
28	101	485	1,570	1,770	2,670	1,700	1,510	2,460	137	80	28	24
29	113	455	1,630	1,800	2,530	1,540	1,410	2,200	180	76	34	23
30	141	445	1,660	1,770	-	1,360	1,380	1,910	238	71	39	25
31	157	-	1,660	1,880	-	1,330	-	1,500	-	68	45	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
October	3,602	162	100	116	0.061	0.07	7,140
November	10,347	554	180	345	.181	.20	20,520
December	35,961	1,660	445	1,160	.610	.70	71,330
Calendar year 1947	560,265	7,760	100	1,590	.836	11.33	1,151,000
January	42,956	1,800	978	1,386	.728	.84	85,200
February	83,410	3,770	1,800	2,876	1.51	1.63	165,400
March	73,020	4,280	1,330	2,355	1.24	1.43	144,800
April	39,506	1,540	996	1,317	.692	.77	78,360
May	58,184	4,480	796	1,877	.986	1.14	115,400
June	11,141	1,120	137	371	.195	.22	22,100
July	6,424	355	68	207	.109	.13	12,740
August	1,172	67	22	37.8	.020	.02	2,320
September	997	53	23	33.2	.017	.02	1,960
Water year 1947-48	366,720	4,480	22	1,002	.527	7.17	727,300

Peak discharge (base, 5,000 sec.-ft.).- No peak above base.

d Doubtful gage-height record; discharge computed on basis of estimated gage heights.

Note.- No gage-height record Nov. 16 to Dec. 1, Mar. 24-30, Apr. 1 to May 11; discharge computed on basis of recorded range in stage, weather records, and records for Neches River near Neches, Angelina River near Lufkin, and Mud Creek near Jacksonville.



## NECHES RIVER BASIN

37

Neches River near Diboll, Tex.

Location.- Wire-weight gage, lat. 31°08', long. 94°48', at bridge on U. S. Highway 59, 630 feet downstream from Texas & New Orleans Railroad bridge, 2.9 miles downstream from Alabama Creek, and 3.8 miles south of Diboll, Angelina County. Datum of gage is 134.46 feet above mean sea level, datum of 1929.

Drainage area.- 2,670 square miles.

Records available.- November 1923 to August 1925, March 1939 to September 1948.

Average discharge.- 10 years (1924-25, 1939-48), 2,258 second-feet.

Extremes.- Maximum discharge during year, 7,350 second-feet Feb. 12 (gage height, 14.10 feet); minimum observed, 28 second-feet Sept. 30.

1923-25, 1939-48: Maximum discharge, 49,900 second-feet May 4, 1944 (gage height, 18.70 feet); no flow Aug. 15-22, 1925.

Maximum stage known, about 21.0 feet in May 1884, present site, from information by local residents.

Remarks.- Records good. Gage read once or twice daily. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	192	109	486	1,580	2,340	4,770	2,520	2,420	3,550	186	91	38
2	180	114	486	1,620	2,340	4,770	2,250	2,020	3,430	198	86	41
3	180	126	468	1,690	2,340	4,670	2,100	1,810	3,200	230	80	40
4	174	146	534	1,770	2,340	4,500	1,900	1,690	2,850	275	77	41
5	168	162	730	1,810	2,250	4,220	1,770	1,580	2,420	321	73	44
6	162	174	874	1,810	2,160	4,220	1,720	1,520	1,960	342	71	46
7	a157	192	1,010	1,810	2,160	4,080	1,650	1,450	1,520	342	65	44
8	a152	216	1,110	1,770	2,540	3,810	1,580	1,330	1,160	335	62	39
9	a147	242	1,140	1,770	4,190	3,680	1,550	1,550	874	314	57	40
10	a142	249	1,300	1,720	6,260	3,430	1,580	1,160	690	294	54	41
11	a136	242	1,520	1,650	7,180	3,200	1,550	1,160	650	288	52	43
12	a131	236	1,650	1,580	7,350	2,960	1,550	1,220	540	282	50	45
13	a126	230	1,690	1,520	6,700	2,850	1,600	1,550	504	268	48	42
14	121	230	1,520	1,480	5,990	2,740	3,390	2,020	450	282	47	39
15	119	242	1,450	1,480	5,480	2,520	5,540	2,100	394	314	43	38
16	119	249	1,420	1,450	4,870	2,620	5,520	1,810	363	328	41	38
17	118	256	1,390	1,420	4,500	2,740	4,290	1,550	342	308	38	38
18	113	268	1,420	1,390	4,500	3,200	3,310	1,420	328	294	38	37
19	112	379	1,450	1,390	4,360	3,680	2,420	1,330	314	268	36	36
20	108	418	1,420	1,420	4,360	4,080	1,900	1,270	294	249	35	38
21	107	434	1,390	1,480	4,500	4,220	1,810	1,300	282	223	34	38
22	105	450	1,390	1,520	4,500	4,220	1,690	1,360	256	204	33	38
23	106	522	1,390	1,550	4,670	4,080	1,690	1,390	236	186	32	37
24	105	558	1,390	1,580	4,670	3,940	1,720	1,480	223	168	31	36
25	108	594	1,390	1,580	4,870	3,940	a1.990	1,620	204	156	30	35
26	108	594	1,420	1,620	4,980	3,940	2,160	1,830	192	141	31	33
27	107	594	1,420	1,690	5,100	3,810	2,520	2,600	186	131	32	32
28	106	558	1,450	1,770	4,980	3,550	3,080	3,610	174	124	33	30
29	106	522	1,450	1,810	4,870	3,200	3,200	3,940	180	116	33	29
30	107	504	1,480	1,900	-	3,080	2,960	3,810	180	106	34	28
31	107	-	1,520	2,160	-	2,850	-	3,680	-	99	56	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Runoff Acro-feet
October	4,029	192	105	130	0.049	0.06	7,990
November	9,810	594	109	327	0.122	0.14	19,460
December	38,758	1,690	468	1,250	0.468	0.54	76,880
Calendar year 1947	825,885	10,300	105	2,263	0.847	11.51	1,638,000
January	50,790	2,160	1,390	1,638	0.613	0.71	100,700
February	127,350	7,350	2,160	4,391	1.64	1.77	252,600
March	113,570	4,770	2,520	3,664	1.37	1.58	225,300
April	72,710	5,540	1,550	2,424	0.908	1.01	144,200
May	58,780	3,940	1,160	1,896	0.710	0.82	116,600
June	27,946	3,550	174	932	0.349	0.39	55,450
July	7,372	342	99	258	0.089	0.10	14,620
August	1,503	91	30	48.5	0.018	0.02	2,980
September	1,144	46	28	38.1	0.014	0.02	2,270
Water year 1947-48	513,762	7,350	28	1,404	0.526	7.16	1,019,000

Peak discharge (base, 2,700 sec.-ft.) - Feb. 12 (8 a.m.) 7,350 sec.-ft.; Mar. 22 (8 a.m.) 4,220 sec.-ft.; Apr. 15 (6:30 p.m.) 5,860 sec.-ft.; Apr. 29 (8 a.m.) 3,310 sec.-ft.; May 28 (9 p.m.) 4,080 sec.-ft.

a No gage-height record; discharge interpolated.



## Neches River at Evadale, Tex.

Location.- Staff gage, lat. 30°21', long. 94°05', at bridge on U. S. Highway 96, 200 feet upstream from Gulf, Colorado & Santa Fe Railway bridge at Evadale, Jasper County, and 15 miles upstream from Village Creek. Datum of gage is 8.25 feet (revised) above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936.

Drainage area.- 7,908 square miles.

Records available.- July 1904 to December 1906, October 1923 to September 1948.

Average discharge.- 27 years (1904-6, 1923-48), 6,757 second-feet.

Extremes.- Maximum discharge during year, 22,800 second-feet Feb. 24, 25 (gage height, 18.10 feet); minimum observed, 280 second-feet Sept. 7, 8, 30.  
1904-6, 1923-48: Maximum discharge, 92,100 second-feet May 11, 1944 (gage height, 23.58 feet, from floodmark); minimum observed, about 148 second-feet Sept. 10, 1925.  
Maximum stages known, 26.2 feet in May 1884 (discharge, about 175,000 second-feet, from rating curve extended above 72,000 second-feet by logarithmic plotting), and 24.5 feet in August 1915 (discharge not determined), from records of Gulf, Colorado & Santa Fe Railway Co.

Remarks.- Records good. Gage read twice daily. No large diversions above station.

Records of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1138.

Revisions (water years).- W 718: 1929.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	565	490	2,500	3,960	7,760	18,600	8,660	8,100	7,120	760	478	290
2	590	502	2,260	4,180	7,760	18,000	8,660	7,920	7,120	760	452	290
3	602	490	2,080	4,430	7,600	17,500	8,460	7,440	7,120	730	440	282
4	628	490	1,980	4,520	7,600	17,000	8,100	7,120	6,820	715	440	268
5	628	490	2,030	4,430	7,440	17,000	7,760	6,820	6,280	715	410	268
6	628	528	2,700	4,430	7,280	17,000	7,280	6,680	5,910	715	390	268
7	615	615	3,750	4,430	7,280	18,000	8,960	8,280	5,550	790	410	260
8	602	655	4,700	4,340	7,280	15,500	6,540	5,910	5,220	855	370	260
9	578	700	5,440	4,260	7,440	15,100	6,280	5,440	4,900	960	360	282
10	565	760	6,280	4,100	7,920	14,700	6,030	4,900	4,430	1,060	350	290
11	540	790	6,680	4,030	9,280	13,900	5,790	4,700	3,890	1,100	340	320
12	515	890	6,410	4,180	11,400	13,500	5,400	4,610	3,340	1,100	340	430
13	502	1,030	6,410	4,700	13,500	13,500	5,220	4,520	2,800	1,260	330	440
14	490	1,180	6,540	5,110	15,500	12,800	5,350	4,260	2,300	1,220	330	430
15	478	1,260	7,440	5,440	17,000	12,200	6,280	3,890	1,980	1,140	312	410
16	465	1,260	8,100	5,550	18,000	11,700	8,660	3,890	1,800	1,060	305	380
17	452	1,420	8,660	5,440	18,600	10,400	11,700	3,960	1,670	995	298	360
18	452	1,460	9,660	4,900	19,800	9,500	13,500	4,180	1,500	925	290	340
19	465	1,420	8,660	4,700	20,400	8,860	15,100	4,430	1,380	925	290	330
20	452	1,540	7,760	4,610	21,000	8,280	16,500	4,520	1,300	960	282	330
21	452	1,670	6,680	4,700	21,600	7,920	16,500	4,610	1,220	995	275	312
22	465	1,850	5,910	4,700	22,200	7,600	15,500	4,430	1,140	960	275	305
23	478	2,160	5,330	4,700	22,200	7,280	14,300	4,180	1,060	890	275	298
24	478	2,400	5,000	4,610	22,800	7,440	12,800	4,030	1,030	820	268	290
25	478	2,920	4,700	4,610	22,800	7,760	11,100	3,960	960	760	268	282
26	478	3,400	4,520	4,520	21,600	8,100	9,500	3,820	925	715	268	275
27	478	3,680	4,260	4,900	21,000	8,460	7,920	3,890	890	655	268	268
28	478	3,540	4,180	5,220	20,400	8,660	7,280	4,430	820	615	268	268
29	465	3,220	4,030	5,910	19,200	8,660	7,600	5,910	790	578	282	268
30	465	2,800	4,030	6,820	-	8,660	7,920	6,960	760	552	290	260
31	465	-	3,960	7,440	-	8,660	-	7,120	-	502	282	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	15,992	628	452	516	0.065	0.08	31,720
November	45,610	3,680	490	1,520	.192	.21	90,470
December	162,040	9,060	1,980	5,227	.661	.76	321,400
Calendar year 1947	2,904,958	34,600	440	7,959	1.01	13.66	5,762,000
January	143,870	7,440	3,960	4,835	.612	.71	297,300
February	433,640	22,800	7,280	14,950	1.89	2.04	860,100
March	370,240	18,600	7,280	11,940	1.51	1.74	734,400
April	278,670	16,500	5,220	9,289	1.18	1.31	552,700
May	162,910	8,100	3,820	5,255	.665	.77	323,100
June	92,025	7,120	760	3,068	.388	.43	182,500
July	28,787	1,260	502	864	.109	.13	53,130
August	10,236	478	268	350	.042	.05	20,300
September	9,354	440	260	312	.039	.04	18,550
Water year 1947-48	1,757,374	22,800	260	4,802	.607	8.27	3,486,000

## Mud Creek near Jacksonville, Tex.

Location.- Water-stage recorder, lat. 31°58'40", long. 95°09'40", at bridge on U. S. Highway 79, 0.6 mile downstream from Caney Creek, 8.9 miles downstream from another Caney Creek, 4 miles downstream from International-Great Northern Railroad bridge, and 6.9 miles east of Jacksonville, Cherokee County. Datum of gage is 271.6 feet above mean sea level, datum of 1929.

Drainage area.- 382 square miles.

Records available.- May 1939 to September 1948.

Extremes.- Maximum discharge during year, 3,510 second-feet May 14 (gage height, 8.70 feet); minimum, 0.2 second-foot Aug. 21, 22 (gage height, 1.18 feet).

1939-48: Maximum discharge, 23,400 second-feet May 3, 1944 (gage height, 14.09 feet); no flow at times.

Maximum stage known occurred in May 1884, from information by local residents.

Remarks.- Records good. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	52	83	341	818	486	270	318	120	80	54	9.8
2	33	52	80	324	744	561	242	177	102	67	4.8	9.1
3	32	47	80	292	677	635	218	142	88	52	6.3	7.7
4	32	42	179	324	660	618	198	129	80	44	6.3	6.1
5	31	40	312	348	669	635	184	135	75	41	4.8	4.5
6	31	40	292	348	677	677	180	184	70	39	4.3	3.6
7	31	47	384	283	669	652	180	227	65	36	3.9	3.0
8	31	56	635	232	840	582	177	252	62	34	3.7	2.4
9	31	76	660	210	1,610	522	247	270	60	32	3.7	1.8
10	30	88	610	206	1,280	498	348	264	56	33	5.2	1.5
11	30	83	644	202	1,400	475	276	312	54	44	5.4	5.6
12	29	80	714	202	1,640	455	214	1,330	52	48	4.8	13
13	28	78	704	222	1,420	450	234	2,560	48	48	3.6	12
14	28	80	582	252	1,180	450	544	3,080	45	39	2.7	12
15	28	100	547	247	1,090	440	540	1,880	43	31	2.0	12
16	27	114	596	242	1,020	398	465	1,120	41	26	1.2	15
17	27	120	547	303	855	372	450	764	39	23	.8	12
18	27	120	596	348	744	348	418	610	37	20	.4	15
19	27	108	704	381	635	336	294	418	34	18	.3	15
20	27	111	754	460	561	324	194	284	32	16	.3	13
21	26	111	660	547	568	302	160	232	30	15	.2	12
22	28	117	516	618	618	464	142	194	28	12	.4	10
23	28	138	369	589	589	694	135	165	26	11	1.5	9.8
24	27	149	284	547	627	754	138	142	24	9.4	2.4	8.5
25	27	163	252	540	644	916	188	135	22	8.7	2.2	7.7
26	27	166	232	582	635	879	426	142	23	7.7	1.8	5.8
27	31	160	218	806	596	724	398	170	23	7.1	1.8	3.9
28	35	135	206	754	561	561	372	177	26	6.3	4.3	3.2
29	43	105	198	677	510	430	426	170	53	6.7	4.6	2.7
30	50	91	194	714	-	363	455	163	86	6.7	6.1	2.7
31	50	-	198	794	-	312	-	142	-	5.8	8.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-foot
October	966	50	26	31.2	0.082	0.09	1,920
November	2,869	166	40	95.6	.250	.28	5,690
December	13,010	754	80	420	1.10	1.27	25,800
Calendar year 1947	146,162	5,730	6.7	400	1.05	14.23	289,900
January	12,945	806	202	418	1.09	1.26	25,680
February	24,537	1,640	510	846	2.21	2.39	48,670
March	16,313	916	302	526	1.38	1.59	32,360
April	8,713	544	135	290	.759	.85	17,280
May	16,286	3,080	129	525	1.37	1.59	32,300
June	1,544	120	22	51.5	.135	.15	3,060
July	867.4	80	5.8	28.0	.073	.08	1,720
August	103.5	8.1	.2	3.33	.0087	.01	205
September	240.4	15	1.5	8.01	.021	.02	477
Water year 1947-48	98,394.1	3,080	.2	269	.704	9.58	195,200

Peak discharge (base, 1,400 sec.-ft.)- Feb. 9 (2 p.m.) 1,720 sec.-ft.; Feb. 12 (9 a.m.) 1,700 sec.-ft.; May 14 (12:30 a.m.) 3,510 sec.-ft.

## NECHES RIVER BASIN

41

Angelina River near Alto, Tex.

Location.- Chain gage, lat. 31°40', long. 94°58', at bridge on State Highway 21, 3 miles upstream from Bingham Creek and 7 miles east of Alto, Cherokee County. Datum of gage is 204.3 feet above mean sea level, datum of 1929.

Drainage area.- 1,274 square miles.

Records available.- May to August 1940 (discharge measurements only). September 1940 to September 1948 (fragmentary for 1941, 1942, 1944-48).

Extremes.- Maximum gage height observed during year, 18.26 feet Feb. 15 (discharge not determined); minimum discharge observed, 14 second-feet Aug. 25.  
1940-48: Maximum gage height observed, 21.52 feet May 5, 1944 (may have been higher during period of no gage-height record in November 1940); minimum discharge observed, 11 second-feet Aug. 30, 31, Sept. 25-27, 1943.

Remarks.- Records good. Discharge above 2,300 second-feet not computed. Gage read twice daily. No large diversions above station.

Revisions.- W 1088: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	132	114	416	702	2,180	-	1,800	1,200	622	146	54	52
2	112	118	392	734	-	-	1,560	1,180	322	222	49	48
3	101	123	368	766	-	2,300	1,320	1,100	440	228	41	48
4	97	128	404	834	-	2,180	1,120	978	392	212	44	46
5	94	123	466	906	-	2,030	942	834	333	223	37	40
6	92	128	480	960	-	1,960	834	782	300	186	32	36
7	92	141	536	978	2,300	1,890	750	a854	262	171	30	32
8	92	146	750	978	-	1,830	702	a578	234	146	29	30
9	90	156	782	942	-	1,770	654	a536	218	132	28	28
10	89	186	852	906	-	1,710	622	508	206	123	26	26
11	88	201	978	834	-	1,660	592	564	191	114	26	26
12	88	206	1,120	750	-	1,610	592	960	181	113	24	26
13	87	218	1,200	702	-	1,520	734	960	171	141	23	26
14	85	256	1,280	654	-	1,430	998	1,060	156	166	22	26
15	84	311	1,340	622	-	1,360	1,100	1,320	146	161	22	26
16	84	300	1,360	636	-	1,280	1,180	1,890	136	156	20	28
17	82	300	1,360	702	-	1,220	1,200	-	128	123	20	28
18	81	356	1,360	750	-	1,180	1,240	-	123	104	19	30
19	82	368	1,340	798	-	1,140	1,260	-	114	95	19	30
20	82	356	1,320	888	-	1,080	1,220	-	109	86	18	29
21	82	392	1,280	978	-	1,060	1,140	-	104	78	17	28
22	80	416	1,240	1,080	-	1,410	a998	1,960	100	71	16	28
23	81	440	1,220	1,180	-	1,430	870	1,540	92	65	15	28
24	82	440	1,200	1,220	-	1,470	766	1,100	88	59	15	27
25	82	466	a1,140	1,300	-	1,610	782	734	85	54	15	26
26	82	494	1,080	1,380	-	1,830	1,020	550	81	49	16	26
27	82	508	978	1,560	-	2,120	1,020	508	78	46	16	24
28	90	466	870	1,660	-	-	1,080	522	76	43	18	23
29	96	440	750	1,740	-	-	1,140	550	100	40	30	22
30	108	428	670	1,830	-	2,300	1,200	606	108	37	40	22
31	114	-	622	1,960	-	2,030	-	670	-	45	53	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Runoff Acre-feet
October	2,813	132	80	90.7	0.072	0.08	5,580
November	8,725	508	114	291	.231	.26	17,310
December	29,154	1,360	368	940	.745	.86	57,830
Calendar year	-	-	-	-	-	-	-
January	31,912	1,960	622	1,029	.816	.94	63,300
February	-	-	2,180	-	-	-	-
March	-	-	1,060	-	-	-	-
April	30,436	1,800	592	1,015	.805	.90	60,370
May	-	-	508	-	-	-	-
June	5,896	622	76	197	.156	.17	11,690
July	3,675	262	37	119	.094	.11	7,290
August	834	54	15	26.9	.021	.02	1,650
September	915	52	22	30.5	.024	.03	1,910
Water year	-	-	-	-	-	-	-

a No gage-height record; discharge computed on basis of estimated gage heights.



## Angelina River near Lufkin, Tex.

Location.- Water-stage recorder, lat. 31°27'40", long. 93°43'35", at bridge on U. S. Highway 59, 400 feet upstream from Procaccia Creek, half a mile downstream from Little Loco Bayou, 1.5 miles upstream from Texas & New Orleans Railroad bridge and 8 miles north of Lufkin, Angelina County. Datum of gage is 164.72 feet above mean sea level, datum of 1929.

Drainage area.- 1,575 square miles.

Records available.- October 1923 to September 1934, July 1939 to September 1948.

Average discharge.- 20 years, 1,438 second-feet.

Extremes.- Maximum discharge during year, 5,630 second-feet Feb. 22 (gage height, 11.76 feet); minimum, 20 second-feet Aug. 26.

1923-34, 1939-48: Maximum discharge, 38,200 second-feet Feb. 24, 1932; maximum gage height, 18.55 feet May 7, 1944; minimum discharge, 2.3 second-feet Oct. 12, 1939.

Maximum stage known, about 26.5 feet in May 1884, from information by local residents.

Remarks.- Records good. No large diversions above station.

Revisions (water years).- W 718: 1924, 1926.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used Oct. 7 to Jan. 13)

0.8	18	3.5	140	8.0	1,080
1.0	22	4.0	173	9.0	1,680
1.2	28	4.5	208	10.0	2,450
1.5	36	5.0	254	10.5	3,090
2.0	55	5.5	325	11.0	3,900
2.5	79	6.0	420	11.5	4,980
3.0	108	7.0	680	12.0	6,300

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	184	117	465	1,130	2,160	3,400	2,400	1,290	715	137	49	40
2	163	120	452	1,060	2,200	3,240	2,450	1,320	715	150	49	54
3	146	120	440	990	2,250	3,160	2,400	1,350	680	184	54	56
4	124	124	528	968	2,350	3,020	2,250	1,320	605	248	53	52
5	120	130	680	945	2,450	2,950	2,040	1,280	528	248	48	50
6	114	137	715	945	2,620	2,950	1,800	1,200	452	238	47	49
7	108	150	635	1,010	2,740	2,880	1,500	1,180	400	238	45	46
8	102	163	802	1,060	3,670	2,740	1,230	1,080	352	224	41	43
9	102	166	1,230	1,080	5,240	2,620	1,060	880	316	198	38	44
10	99	163	1,540	1,100	4,980	2,450	945	698	300	184	35	39
11	99	166	1,410	1,130	4,620	2,300	880	808	272	176	34	38
12	96	178	1,200	1,060	4,280	2,200	820	1,060	254	166	32	35
13	93	187	1,130	1,060	5,990	2,120	1,820	1,180	233	156	21	32
14	90	194	1,180	968	3,820	2,080	2,500	1,410	220	150	30	32
15	90	204	1,290	880	3,820	2,000	1,900	1,350	208	160	29	30
16	87	233	1,440	820	3,990	1,960	1,700	1,230	198	173	28	30
17	87	280	1,540	802	4,280	1,880	1,540	1,290	187	176	27	30
18	87	293	1,600	820	4,860	1,800	1,410	1,180	180	170	25	30
19	84	361	1,630	860	5,240	1,700	1,410	1,700	170	156	24	31
20	82	361	1,630	922	5,240	1,600	1,410	1,930	163	134	24	32
21	82	352	1,600	968	5,240	1,500	1,410	2,160	153	117	24	33
22	82	380	1,600	1,060	5,630	1,630	1,380	2,450	146	105	23	33
23	82	465	1,570	1,160	5,240	1,860	1,380	2,680	137	93	22	32
24	79	502	1,570	1,230	4,980	1,930	1,320	2,740	127	84	21	31
25	79	490	1,500	1,290	4,500	2,040	1,260	2,620	124	76	21	30
26	79	465	1,470	1,380	4,180	a2,120	1,540	2,160	120	69	20	30
27	79	465	1,440	1,660	3,900	a2,000	1,700	1,540	117	64	22	28
28	79	478	1,410	1,900	3,750	a2,000	1,730	1,060	114	60	24	27
29	79	490	1,290	2,000	3,480	a2,080	1,540	945	117	56	26	26
30	90	478	1,180	2,080	-	2,200	1,350	820	124	53	29	25
31	111	-	1,080	2,120	-	2,300	-	752	-	50	35	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	3,088	184	79	99.6	0.063	0.07	6,120
November	8,390	502	117	280	.178	.20	16,640
December	37,247	1,630	440	1,202	.763	.88	73,880
Calendar year 1947	636,829	10,100	62	1,745	1.11	15.04	1,263,000
January	36,528	2,120	802	1,178	.748	.86	72,450
February	115,680	5,630	2,160	3,999	2.53	2.73	229,400
March	70,690	3,400	1,500	2,280	1.45	1.67	140,200
April	48,075	2,500	820	1,602	1.02	1.14	95,360
May	44,913	2,740	698	1,449	.920	1.06	89,080
June	8,427	715	114	281	.178	.20	16,710
July	4,493	248	50	145	.092	.11	8,910
August	1,010	54	20	32.6	.021	.02	2,000
September	1,088	56	25	36.3	.023	.03	2,160
Water year 1947-48	379,629	5,630	20	1,037	.658	8.97	752,900

Peak discharge (base, 2,900 sec.-ft.)- Feb. 9 (6 p.m.) 5,370 sec.-ft.; Feb. 19 (4 p.m.) 5,240 sec.-ft.; Feb. 22 (12 m.) 5,630 sec.-ft.

No gage-height record; discharge computed on basis of recorded range in stage and weather records.

## Angelina River at Horger, Tex.

Location.- Wire-weight gage, lat. 31°00', long. 94°10', at bridge on State Highway 63, a quarter of a mile east of Horger, Jasper County, 7 miles upstream from Indian Creek, and 20 miles upstream from mouth. Datum of gage is 68.6 feet above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.- 3,435 square miles.

Records available.- March 1928 to September 1948.

Average discharge.- 20 years, 3,246 second-feet.

Extremes.- Maximum discharge during year, 11,500 second-feet Feb. 18 (gage height, 20.47 feet); minimum observed, 66 second-feet Aug. 25 (gage height, 0.62 foot).

1928-48: Maximum discharge, 49,900 second-feet May 6, 1944 (gage height, 36.90 feet); minimum observed, 13 second-feet Sept. 22, 1937.

Maximum discharge known, 82,000 second-feet in August 1915 (gage height, 39.5 feet, from information by local residents), from rating curve extended above 50,000 second-feet.

Remarks.- Records good. Gage read twice daily, oftener during high stages. Occasional backwater from Neches River. No large diversions above station.

Revision (water year).- W 928: 1932 (yearly total acre-feet).

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Oct. 1 to Nov. 22,  
June 11 to Aug. 16)

0.6	64	2.5	490	8.0	3,050
.8	90	3.0	646	10.0	4,200
1.0	124	3.5	828	13.0	6,000
1.2	162	4.0	1,040	16.0	8,000
1.5	224	5.0	1,490	19.0	10,150
2.0	348	6.0	1,980	21.0	12,000

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	265	182	828	1,930	3,740	8,700	3,560	3,160	3,390	246	146	75
2	258	190	788	1,980	3,680	8,420	3,450	2,940	2,550	243	137	80
3	248	238	750	2,140	3,680	8,140	3,220	2,720	1,730	253	128	84
4	238	282	953	2,340	3,680	7,790	3,220	2,340	1,400	296	122	87
5	238	291	1,670	2,190	3,680	7,300	2,990	2,080	1,220	309	117	87
6	220	286	2,770	1,980	3,620	7,040	2,990	1,980	1,130	343	115	93
7	206	322	2,850	1,830	3,620	7,040	2,940	1,880	1,040	359	113	101
8	194	296	2,940	1,680	4,090	6,650	2,880	1,980	954	374	119	110
9	186	322	3,050	1,540	6,960	6,260	2,830	2,290	870	374	120	202
10	174	505	2,940	2,030	8,630	6,260	2,660	2,190	788	374	120	142
11	166	582	3,050	2,400	9,780	6,000	2,400	2,190	697	430	111	128
12	162	490	3,050	2,240	10,300	5,460	2,140	1,930	646	416	106	129
13	158	402	3,450	2,500	10,300	5,040	3,110	1,780	598	388	103	131
14	158	445	3,500	2,850	10,600	4,820	2,830	2,080	550	348	96	128
15	154	490	3,850	2,190	10,900	4,320	9,850	2,190	520	327	92	133
16	150	535	4,320	2,030	11,100	4,080	10,300	2,190	490	330	87	131
17	150	598	4,030	2,240	11,400	3,850	9,480	2,290	460	356	86	122
18	148	788	3,270	2,140	11,500	3,740	8,420	2,340	430	348	82	113
19	162	808	2,770	2,000	11,000	3,500	7,510	2,290	402	340	79	103
20	172	1,060	2,500	1,980	10,200	3,330	6,480	2,240	374	322	76	96
21	182	1,130	2,340	1,930	9,700	3,160	5,520	2,190	366	296	74	93
22	184	1,130	2,240	1,930	9,700	3,220	4,680	2,240	343	277	71	87
23	190	1,540	2,190	1,880	9,550	3,450	3,680	2,190	322	260	69	84
24	194	2,500	2,080	1,880	9,050	3,680	2,940	2,080	294	238	69	84
25	186	2,340	2,030	1,880	8,770	3,680	2,720	2,140	270	220	68	82
26	178	2,140	1,980	1,930	8,700	3,560	3,160	2,400	262	206	76	79
27	170	1,730	1,930	2,290	8,700	3,560	3,620	3,270	258	192	76	76
28	166	1,440	1,880	3,390	8,700	3,620	3,740	3,270	248	180	74	76
29	162	1,170	1,830	3,680	8,770	3,740	3,680	3,390	243	162	82	74
30	182	954	1,830	3,620	-	3,790	3,390	3,680	236	156	79	74
31	178	-	1,780	3,680	-	3,680	-	3,740	-	150	74	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff
						Inches Acre-foot
October	5,779	265	148	186	0.054	0.06 11,460
November	25,186	2,500	182	840	.245	.27 49,960
December	75,399	4,320	750	2,432	.708	.82 149,600
Calendar year 1947	1,333,590	16,100	136	3,654	1.06	14.44 2,645,000
January	70,030	3,680	1,540	2,259	.658	.76 138,900
February	234,190	11,500	5,620	8,072	2.35	2.54 464,300
March	156,680	9,700	5,160	5,054	1.47	1.70 310,800
April	135,170	10,300	2,140	4,506	1.31	1.46 268,100
May	75,670	3,740	1,780	2,441	.711	.82 150,100
June	23,081	3,390	236	769	.224	.25 45,780
July	9,112	430	150	294	.086	.10 18,070
August	2,973	146	68	95.9	.028	.03 5,900
September	3,084	202	74	103	.030	.03 6,120
Water year 1947-48	816,264	11,500	68	2,230	.649	6.84 1,619,000

Peak discharge (base, 9,000 sec.-ft.)- Feb. 18 (10 a.m.) 11,500 sec.-ft.; Apr. 16 (7 a.m.) 10,400 sec.-ft.

## Striker Creek near Summerfield, Tex.

Location.- Wire-weight gage, lat. 32°00'10", long. 94°59'35", at bridge on U. S. Highway 79, 3½ miles downstream from Johnson Creek and 6½ miles northeast of Summerfield, Cherokee County. Datum of gage is 287.0 feet above mean sea level, datum of 1925.

Drainage area.- 148 square miles.

Records available.- May to August 1940 (discharge measurements only). September 1940 to September 1948.

Extremes.- Maximum discharge observed during year, 1,710 second-feet May 13 (gage height, 9.34 feet); minimum observed, 1.2 second-feet Aug. 24, 25.

1940-48: Maximum discharge, 10,800 second-feet Nov. 24, 1940 (gage height, 17.23 feet, from floodmark), from rating curve extended above 5,000 second-feet by velocity-area studies; minimum observed, 0.7 second-foot Aug. 31, Sept. 1, 1943.

Remarks.- Records fair. Gage read twice daily, oftener during high stages. No large diversions above station.

Revisions (water years).- W 1088: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	24	48	111	284	222	116	121	70	40	3.4	15
2	18	24	44	281	289	218	110	102	58	47	3.2	11
3	17	23	44	432	268	268	104	91	49	52	3.1	8.2
4	17	21	69	318	232	324	99	82	43	53	3.1	6.3
5	17	20	164	200	212	273	94	78	37	47	3.0	5.2
6	17	20	574	145	214	235	92	92	34	38	2.9	4.4
7	17	26	515	116	246	237	92	164	32	31	2.8	3.8
8	17	33	476	102	352	251	92	235	30	27	2.8	3.3
9	17	50	739	94	814	226	93	183	29	25	2.5	3.1
10	17	65	665	92	1,260	202	105	131	28	22	2.6	3.1
11	17	61	400	90	839	194	120	149	28	21	2.5	3.1
12	17	53	248	90	641	183	116	954	25	20	2.5	3.2
13	17	55	169	92	814	167	145	1,560	24	21	2.4	3.3
14	17	60	128	103	789	153	256	899	23	22	2.3	3.9
15	17	59	128	135	544	148	387	395	21	23	2.2	4.0
16	17	77	201	135	580	145	330	204	20	21	2.0	4.2
17	17	99	446	138	291	145	226	131	19	17	1.9	4.5
18	18	95	428	200	230	145	156	104	18	14	1.7	4.7
19	18	88	266	273	204	145	125	92	17	12	1.6	4.7
20	18	80	172	235	186	136	109	87	15	10	1.5	4.2
21	18	75	130	208	200	132	98	80	14	8.8	1.5	4.0
22	18	83	114	263	260	228	88	71	13	7.8	1.4	3.7
23	18	96	105	364	414	395	84	63	12	7.1	1.3	3.4
24	18	137	99	345	367	641	84	56	11	6.5	1.2	3.3
25	18	169	92	270	295	428	105	53	11	6.0	1.2	3.2
26	18	140	86	224	273	278	179	51	10	5.4	1.5	3.0
27	19	109	83	327	284	206	352	53	11	5.0	1.9	3.0
28	19	85	79	618	273	162	374	54	17	4.7	2.8	2.9
29	20	68	77	595	244	142	256	71	27	4.3	6.8	2.7
30	22	55	76	404	-	126	161	91	31	3.9	16	2.5
31	23	-	78	300	-	119	-	83	-	3.7	19	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
October	556	23	17	17.9	0.121	0.14	1,100
November	2,050	169	20	68.3	.462	.52	4,070
December	6,943	739	44	224	1.51	1.74	13,770
Calendar year 1947	65,192.0	3,360	7.1	179	1.21	16.38	129,300
January	7,300	618	90	235	1.59	1.83	14,480
February	11,689	1,260	186	403	2.72	2.94	23,180
March	6,874	641	119	222	1.50	1.73	13,630
April	4,748	387	84	158	1.07	1.19	9,420
May	6,580	1,560	51	212	1.43	1.65	13,050
June	777	70	10	25.9	.175	.20	1,540
July	626.2	53	3.7	20.2	.136	.16	1,240
August	104.6	19	1.2	3.37	.023	.03	207
September	154.9	15	2.5	4.50	.030	.03	268
Water year 1947-48	48,382.7	1,560	1.2	132	.892	12.16	95,960

Peak discharge (base, 1,800 sec.-ft.)- No peak above base.

## Attoyac Bayou near Chireno, Tex.

Location.- Water-stage recorder, lat. 31°30'15", long. 94°18'15", at bridge on State Highway 21, 3 miles northeast of Chireno, Macogdoches County, and 7 miles downstream from Arenoso Creek. Datum of gage is 169.9 feet above mean sea level, datum of 1929.

Drainage area.- 502 square miles.

Records available.- January 1924 to August 1925, July 1939 to September 1948.

Extremes.- Maximum discharge during year, 3,530 second-feet Feb. 12 (gage height, 17.53 feet); minimum, 16 second-feet Aug. 23-25, Sept. 28.

1924-25, 1939-48: Maximum discharge, 31,900 second-feet Nov. 24, 1940 (gage height, 25.97 feet); minimum observed, 7.0 second-feet Aug. 27, 1925.

Maximum stage known, 29.9 feet in June 1912 (result of local storm), from information by local residents.

Remarks.- Records good. No large diversions above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

2.8	15	4.2	70	12.0	710	16.0	1,830
3.0	21	5.0	111	13.0	840	16.5	2,250
3.2	28	6.0	180	14.0	1,020	17.0	2,790
3.4	36	8.0	340	15.0	1,300	17.6	3,610
3.8	52	10.0	518	15.5	1,520		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	38	88	132	357	769	1,170	324	300	236	63	28	30
2	37	70	129	491	769	1,040	300	236	168	107	34	30
3	37	66	126	491	756	906	276	200	136	157	31	28
4	37	63	156	419	732	756	260	192	120	114	28	25
5	36	66	314	332	710	628	244	176	106	88	31	23
6	36	70	419	276	678	618	236	377	100	72	28	21
7	36	246	392	244	648	658	228	554	95	63	26	20
8	36	308	374	220	890	638	220	509	92	57	25	19
9	36	188	556	212	1,720	599	212	308	88	52	25	22
10	36	157	710	204	1,800	554	204	228	85	46	24	34
11	35	160	756	204	2,030	491	196	682	80	55	23	33
12	35	157	756	200	3,310	437	188	891	75	70	23	32
13	34	132	743	212	3,040	392	707	1,000	72	98	22	29
14	34	152	625	292	2,560	366	1,470	806	75	136	20	28
15	34	204	464	410	2,160	348	2,120	668	70	136	20	28
16	34	204	473	383	1,830	357	1,600	668	63	120	19	26
17	34	162	446	332	1,630	357	1,230	710	61	78	19	24
18	34	382	401	316	1,470	340	1,020	756	57	56	18	23
19	50	410	348	308	1,360	332	780	680	55	49	17	23
20	88	300	300	332	1,140	324	437	360	52	44	17	22
21	54	252	268	348	1,090	316	300	220	50	40	17	21
22	46	398	244	357	1,170	348	260	184	47	38	17	20
23	44	668	228	410	1,300	491	260	160	45	36	17	19
24	44	590	220	455	1,300	572	363	143	44	34	16	19
25	43	357	204	464	1,460	608	446	132	42	33	16	18
26	42	268	196	464	1,800	648	608	132	43	32	19	18
27	42	236	192	527	1,690	710	658	265	44	30	25	17
28	44	192	188	618	1,470	756	599	473	43	29	30	17
29	47	160	184	658	1,340	658	545	464	47	29	28	17
30	75	143	184	688	-	446	428	357	68	28	28	17
31	106	-	195	732	-	357	-	308	-	27	29	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	1,344	106	34	43.4	0.086	0.10	2,670
November	6,849	668	63	228	.454	.51	13,580
December	10,923	756	126	352	.701	.81	21,670
Calendar year 1947	187,237	5,480	30	513	1.02	13.87	371,400
January	11,956	732	200	386	.769	.89	23,710
February	42,622	3,310	648	1,470	2.93	3.16	84,540
March	17,221	1,370	316	556	1.11	1.28	34,160
April	16,739	2,120	188	558	1.11	1.24	33,200
May	13,139	1,000	132	424	.845	.97	26,060
June	2,359	236	42	78.6	.157	.17	4,680
July	2,019	157	27	65.1	.130	.15	4,000
August	720	34	16	23.2	.046	.05	1,430
September	703	34	17	23.4	.047	.05	1,390
Water year 1947-48	126,594	3,310	16	346	.689	9.38	251,100

Peak discharge (base, 1,900 sec.-ft.).- Feb. 12 (11:30 a.m.) 3,530 sec.-ft.; Apr. 15 (4 a.m.) 2,300 sec.-ft.

## Village Creek near Kountze, Tex.

Location.—Water-stage recorder, lat. 30°24', long. 94°16', at bridge on Kountze-Sillsbee county highway, 1.2 miles upstream from Gulf, Colorado & Santa Fe Railway bridge, 3.2 miles northeast of Kountze, Hardin County, and 4½ miles downstream from Beech Creek. Datum of gage is 25.1 feet above mean sea level, datum of 1929.

Drainage area.—837 square miles.

Records available.—May 1924 to November 1929, April 1939 to September 1948. October 1927 to November 1929 (discharge measurements only).

Average discharge.—12 years (1924-27, 1939-48), 992 second-feet.

Extremes.—Maximum discharge during year, 2,500 second-feet Feb. 28 (gage height, 12.48 feet); minimum, 48 second-feet Aug. 22-25.

1924-27, 1939-48: Maximum discharge, 67,200 second-feet Nov. 26, 1940 (gage height, 27.6 feet, from floodmark), from rating curve extended above 35,000 second-feet by logarithmic plotting; minimum, 32 second-feet Sept. 28, 1939.

Maximum stage known, 34 feet in August 1915, present site and datum. Flood of May 27, 1929, reached a stage of about 32 feet, present site and datum. Above stages were determined on basis of information by engineers of Gulf, Colorado & Santa Fe Railway for site 1.2 miles downstream.

Remarks.—Records good. No diversions above station.

Rating tables, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to Dec. 16

Dec. 17 to Sept. 30

2.0	87	6.0	550	1.5	45	4.0	300	9.0	1,320
2.5	105	7.0	750	2.0	82	5.0	450	11.0	1,900
3.0	150	9.0	1,200	2.5	126	6.0	615	12.5	2,500
4.0	255	10.0	1,450	3.0	178	7.0	810		
5.0	386	11.2	1,850						

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	90	141	190	482	1,380	1,720	450	350	300	80	76	76
2	88	180	180	598	1,180	1,320	434	280	230	84	75	78
3	87	146	175	730	998	1,050	434	254	194	97	72	74
4	84	128	180	691	854	900	403	230	167	136	74	71
5	83	116	216	564	810	810	366	218	156	151	77	68
6	83	110	459	498	854	1,080	350	224	141	151	72	62
7	84	123	772	430	854	1,240	336	236	136	148	71	59
8	86	141	794	418	770	1,150	328	294	131	131	69	57
9	87	141	750	403	854	1,050	321	358	126	156	68	58
10	85	155	1,010	388	1,150	1,100	321	300	123	200	65	65
11	85	160	1,270	388	1,400	1,180	314	248	120	230	64	64
12	85	180	1,370	434	1,630	1,240	294	261	117	184	62	59
13	85	180	1,250	530	1,610	1,100	300	356	115	321	60	61
14	83	200	1,180	710	1,900	876	580	434	115	373	59	65
15	83	195	1,510	610	1,900	730	1,180	403	113	314	58	67
16	81	231	1,850	770	1,900	672	1,430	300	113	218	56	68
17	81	418	2,080	634	1,780	653	1,520	242	108	178	54	68
18	80	351	2,040	634	1,540	634	1,180	212	104	224	53	65
19	84	261	1,860	653	1,210	615	672	194	101	162	51	64
20	85	265	1,130	691	924	564	466	184	97	172	51	63
21	86	273	790	810	832	547	366	287	93	189	50	63
22	99	261	672	900	1,080	530	343	274	89	151	48	63
23	111	285	598	876	1,260	634	307	206	88	136	48	62
24	107	324	547	810	1,630	924	287	172	84	126	48	60
25	98	514	514	810	2,080	998	280	156	82	114	48	57
26	93	498	462	854	2,320	854	314	151	80	104	49	56
27	91	358	450	998	2,460	691	434	156	80	95	53	58
28	89	279	434	1,260	2,460	581	530	167	81	89	58	56
29	88	233	418	1,320	2,150	564	530	372	82	84	64	55
30	92	208	418	1,490	-	514	482	564	82	80	67	53
31	100	-	418	1,520	-	466	-	434	-	77	68	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Inches	Acres-feet
October	2,743	111	80	88.5	0.106	0.12	5,440
November	6,993	514	110	233	.278	.31	13,870
December	25,807	2,080	175	832	.994	1.15	51,190
Calendar year 1947	335,906	11,600	80	920	1.10	14.91	666,300
January	23,124	1,520	368	746	.891	1.03	45,870
February	41,970	2,460	770	1,447	1.73	1.86	83,250
March	26,987	1,720	466	871	1.04	1.20	53,530
April	15,574	1,520	280	519	.620	.69	30,890
May	8,497	564	151	274	.327	.38	16,850
June	3,648	300	80	122	.146	.16	7,240
July	4,953	373	77	160	.191	.22	9,820
August	1,888	77	48	60.9	.073	.08	3,740
September	1,895	78	53	63.2	.076	.08	3,760
Water year 1947-48	164,079	2,460	48	448	.535	7.28	325,400

Peak discharge (base, 3,900 sec.-ft.)—No peak above base.



## Bridgeport Reservoir above Bridgeport, Tex.

Location.- Staff gage, lat. 33°13'20", long. 97°50'10", at Bridgeport Dam on West Fork Trinity River, 2.0 miles west of Bridgeport, Wise County, and 5.8 miles upstream from Big Sandy Creek. Datum of gage is 0.06 foot above mean sea level, datum of 1929 (levels by engineers of Tarrant County Water Control and Improvement District No. 1)

Drainage area.- 978 square miles.

Records available.- April 1932 to September 1948.

Extremes.- Maximum contents observed during year, 157,600 acre-feet June 30, July 1 (gage height, 810.8 feet); minimum observed, 110,600 acre-feet Sept. 27-30 (gage height, 803.6 feet).

1932-48: Maximum contents observed, 407,600 acre-feet Apr. 29, 30, 1942 (gage height, 836.2 feet); minimum observed at monthly intervals since appreciable storage began, 2,200 acre-feet Dec. 31, 1933.

Remarks.- Reservoir formed by a rolled-fill earthen-type dam, containing a concrete service spillway with three 20-foot bays, two of which are equipped with vertical lift gates, and the other left open and two emergency spillways of natural ground. Dam completed Dec. 15, 1931; storage began Apr. 1, 1932. Capacity, 291,000 acre-feet between gage heights 751.4 feet (bottom of three 48-inch outlet conduits) and 826.1 feet (top of service spillway). Dead storage is negligible. Reservoir used for flood control and municipal supply for city of Fort Worth.

Cooperation.- Capacity curve and records of daily gage heights furnished by Tarrant County Water Control and Improvement District No. 1.

Monthly gage height and contents, water year October 1947 to September 1948

	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre feet)
Sept. 30.....	805.5	122,000	
Oct. 31.....	806.2	126,300	+4,300
Nov. 30.....	805.3	120,800	-5,500
Dec. 31.....	807.5	134,800	+14,000
Calendar year 1947.....	-	-	-59,800
Jan. 31.....	807.8	136,700	+1,900
Feb. 29.....	809.5	148,500	+11,800
Mar. 31.....	810.4	154,800	+6,300
Apr. 30.....	810.3	154,100	-700
May 31.....	810.7	156,900	+2,800
June 30.....	810.8	157,600	+700
July 31.....	809.2	146,400	-11,200
Aug. 31.....	806.8	130,200	-16,200
Sept. 30.....	803.6	110,600	-19,600
Water year 1947-48.....	-	-	-11,400

† Gage height at 7 a.m.

## West Fork Trinity River near Boyd, Tex.

Location.- Water-stage recorder, lat. 33°04'30", long. 97°32'20", at bridge on State Highway 114, 0.8 mile downstream from Deep Creek, 1.2 miles east of Boyd, Wise County, 1.5 miles upstream from Little Blue Creek, and 2.1 miles upstream from Chicago, Rock Island & Pacific Railway bridge. Datum of gage is 655.1 feet above mean sea level, datum of 1929.

Drainage area.- 1,603 square miles.

Records available.- January 1947 to September 1948.

Extremes.- Maximum discharge during year, 2,270 second-feet Feb. 26 (gage height, 15.81 feet); no flow Aug. 5-12.

Maximum stage known, about 21.7 feet occurred sometime during period Apr. 20-30, 1942, from information by local resident.

Remarks.- Records good. Flow regulated by Bridgeport Reservoir, 23 miles upstream. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	2.3	2.7	2,150	15	186	20	6.4	7.9	732	0.7	271
2	244	1.9	2.7	1,090	17	131	20	6.0	7.1	752	.4	271
3	257	1.6	3.7	152	19	210	20	5.8	6.4	734	.2	271
4	264	1.2	17	a56	22	203	20	182	5.8	734	.2	264
5	167	1.1	28	a35	21	111	19	65	5.5	734	.1	264
6	17	.9	20	25	21	78	19	21	5.0	734	0	264
7	6.6	.8	1,150	21	20	64	18	14	4.7	228	0	264
8	8.3	1.0	1,920	19	20	55	22	8.8	4.4	93	0	87
9	5.1	1.1	795	17	19	48	25	6.7	4.1	40	0	14
10	3.8	1.0	92	16	19	45	18	31	14	21	0	9.0
11	3.7	.9	36	15	18	40	16	79	30	12	0	5.8
12	2.8	.7	20	14	20	34	16	85	a9.6	10	487	4.4
13	2.4	.9	13	13	25	34	18	71	a4.2	19	664	3.6
14	2.0	374	10	13	32	37	24	31	2.7	10	664	3.0
15	1.9	581	646	12	38	38	16	17	1.7	142	350	2.5
16	1.9	716	1,590	11	36	37	13	10	1.2	292	278	2.0
17	1.9	716	427	10	26	33	12	8.2	.9	292	278	1.8
18	2.2	292	74	11	22	31	11	6.2	1.5	299	278	476
19	3.3	29	37	11	19	31	10	4.8	1.1	299	278	647
20	2.2	12	24	11	17	36	9.7	6.0	429	292	271	647
21	1.8	7.7	17	12	19	36	9.2	4.6	681	292	271	647
22	1.5	6.6	13	14	44	34	9.0	3.4	698	192	271	647
23	1.4	9.4	11	13	50	34	8.6	3.1	698	17	271	647
24	1.2	9.0	9.7	12	29	30	8.3	2.8	438	5.4	271	647
25	1.4	6.9	8.8	12	1,580	28	16	76	102	3.3	271	647
26	90	6.2	7.9	12	2,200	26	14	86	273	2.5	285	647
27	147	4.7	7.1	11	1,830	24	19	56	310	2.0	313	647
28	46	3.7	6.7	10	697	22	14	45	469	1.9	271	173
29	9.7	3.3	6.6	13	379	20	9.7	27	252	1.3	299	14
30	4.7	2.8	6.4	12	-	20	7.5	15	362	.9	271	6.4
31	3.1	-	1,120	12	-	20	-	10	-	.9	271	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,377.9	264	1.2	44.4	2,730
November.....	2,895.7	716	.7	96.5	5,740
December.....	7,922.3	1,920	2.7	256	15,710
Calendar year .....	-	-	-	-	-
January.....	3,835	2,150	10	124	7,610
February.....	7,074	2,200	15	244	14,030
March.....	1,756	210	20	56.6	3,480
April.....	462.1	25	7.5	15.4	917
May.....	993.8	182	2.8	32.1	1,970
June.....	4,829.8	698	.9	161	9,580
July.....	6,988.2	752	.9	225	13,860
August.....	6,594.6	664	0	213	13,800
September.....	8,494.5	647	1.8	283	16,850
Water year 1947-48 .....	5,3223.9	2,200	0	146	105,600

Peak discharge (base, 2,000 sec.-ft.)- Dec. 8 (2:30 p.m.), 2,010 sec.-ft.; Jan. 1 (1 p.m.), 2,230 sec.-ft.; Feb. 26 (1 p.m.), 2,270 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage-height record.

## Eagle Mountain Reservoir above Fort Worth, Tex.

Location.- Staff gage, lat. 32°52'35", long. 97°28'15", at Eagle Mountain Dam on West Fork Trinity River, 3.0 miles downstream from Ash Creek, 4.1 miles downstream from Walnut Creek, and 14.6 miles northwest of Fort Worth, Tarrant County. Datum of gage is at mean sea level, datum of 1929.

Drainage area.- 1,821 square miles.

Records available.- February 1934 to September 1948.

Extremes.- Maximum contents observed during year, 227,200 acre-feet Feb. 28 (elevation, 650.5 feet); minimum observed, 176,100 acre-feet Sept. 1-6, 11-20 (elevation, 644.9 feet).

1934-48: Maximum contents observed, 333,500 acre-feet Apr. 26, 1942 (elevation, 659.9 feet); minimum observed at monthly intervals since appreciable storage began, 9,320 acre-feet June 30, 1934.

Remarks.- Reservoir formed by a composite rolled-fill and hydraulic-fill earthen-type dam, containing a concrete service spillway with four 25-foot bays, three of which are equipped with vertical lift gates. In addition there is an emergency spillway of natural ground. Dam completed Oct. 24, 1932, and storage began Feb. 28, 1934. Capacity, 214,000 acre-feet between elevations 599.9 feet (bottom of four 48-inch outlet conduits) and 649.1 feet (top of service spillway). Dead storage is negligible. Reservoir used to maintain level of Lake Worth from which city of Fort Worth derives its municipal supply.

Cooperation.- Capacity curves and records of daily elevations furnished by Tarrant County Water Control and Improvement District No. 1.

Monthly gage height and contents, water year October 1947 to September 1948

	Elevation (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	648.4	207,600	
Oct. 31.....	646.6	191,400	-16,000
Nov. 30.....	647.0	195,000	+3,600
Dec. 31.....	648.1	204,900	+9,900
Calendar year 1947.....	-	-	-2,700
Jan. 31.....	648.1	204,900	0
Feb. 29.....	650.3	225,400	+20,500
Mar. 31.....	648.4	207,600	-17,800
Apr. 30.....	647.8	202,200	-5,400
May 31.....	647.7	201,300	-900
June 30.....	646.6	191,400	-9,900
July 31.....	646.0	186,000	-5,400
Aug. 31.....	645.0	177,000	-9,000
Sept. 30.....	645.1	177,900	+900
Water year 1947-48.....	-	-	-29,700

† Elevation at 8 a.m.

## West Fork Trinity River at Fort Worth, Tex.

Location.—Water-stage recorder above Texas Electric Service Co.'s concrete dam, lat. 32°46', long. 97°20', in old pump house of Texas Electric Service Co.'s plant in Fort Worth, Tarrant County, 150 feet upstream from Paddock viaduct and a quarter of a mile downstream from Clear Fork. Datum of gage is 519.2 feet above mean sea level (Texas Reclamation Department bench mark based on Coast & Geodetic Survey datum).

Drainage area.—2,501 square miles.

Records available.—October 1920 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1910.

Average discharge.—28 years, 469 second-feet.

Extremes.—Maximum discharge during year, 14,500 second-feet Feb. 25 (gage height, 15.27 feet); minimum, 21 second-feet Nov. 6 (gage height, 1.13 feet).

1920-48: Maximum discharge, 85,000 second-feet Apr. 25, 1922 (gage height, 23.95 feet), by slope-area method, data furnished by city engineer of Fort Worth; no flow at times.

Remarks.—Records good. Flow partly regulated by Bridgeport, Eagle Mountain, and Lake Worth Reservoirs (combined capacity, 527,000 acre-feet). Considerable diversion above station for municipal supply of city of Fort Worth. Several small diversions above Fort Worth.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

(Shifting-control method used Oct. 1-7, Feb. 25, 26, Apr. 13-24, Aug. 1-26)

1.1	16	2.0	356	4.0	2,160
1.2	37	2.2	483	4.5	2,830
1.3	66	2.4	626	5.0	3,570
1.4	98	2.6	780	6.0	5,170
1.6	186	3.0	1,100	7.2	8,840
1.8	250	3.5	1,550		

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	37	40	45	2,240	128	3,150	142	63	57	82	37	159
2	35	42	45	396	128	2,420	134	63	57	60	105	145
3	35	35	76	502	128	1,900	134	63	54	337	251	142
4	35	32	163	916	128	1,120	131	60	46	293	181	134
5	37	32	88	1,140	131	2,100	131	66	51	568	82	131
6	37	32	72	988	124	1,500	134	57	51	727	37	121
7	54	42	630	772	131	1,140	131	54	54	596	30	98
8	185	35	517	718	142	1,080	128	54	46	392	30	66
9	416	35	118	718	134	1,000	124	54	51	195	30	72
10	518	32	82	687	131	1,010	114	84	48	174	28	45
11	538	32	69	562	134	924	111	608	48	95	28	45
12	567	35	60	250	134	812	108	304	45	66	28	45
13	604	35	57	178	134	836	98	118	42	51	37	45
14	569	146	61	128	145	710	98	88	45	42	105	45
15	574	76	557	111	146	490	98	72	40	42	118	45
16	626	66	532	108	142	368	98	66	147	40	111	45
17	772	51	156	101	128	270	92	63	295	37	98	48
18	664	60	114	92	121	228	88	146	189	37	101	51
19	422	45	1405	121	121	241	79	374	82	30	101	54
20	270	51	208	118	124	205	79	219	48	248	101	48
21	214	54	418	128	114	218	69	101	40	362	101	45
22	145	114	552	121	114	518	76	82	37	424	95	48
23	82	66	439	108	114	245	72	69	151	269	95	48
24	57	51	224	101	124	201	72	57	300	117	95	48
25	88	51	145	98	6,840	186	145	188	260	57	95	54
26	224	51	108	98	6,090	186	118	322	541	42	186	151
27	209	48	95	101	2,760	170	95	214	440	42	322	302
28	112	45	88	92	2,220	156	72	128	381	35	232	280
29	63	45	82	101	2,160	152	60	98	439	35	193	143
30	45	45	79	111	-	166	63	95	133	35	208	79
31	40	-	742	124	-	159	-	69	-	35	197	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8,294	772	35	268	16,450
November.....	1,524	146	32	50.8	3,020
December.....	6,727	742	45	217	13,340
Calendar year 1947 .....	101,596	2,240	32	278	201,500
January.....	12,013	2,240	92	388	23,850
February.....	23,172	6,840	114	799	45,960
March.....	23,842	3,150	152	769	47,290
April.....	3,094	145	60	103	6,140
May.....	4,099	608	54	132	8,130
June.....	4,222	541	37	141	8,370
July.....	5,625	727	35	181	11,160
August.....	3,460	322	28	112	6,860
September.....	2,782	302	45	92.7	5,520
Water year 1947-48 .....	98,854	6,840	28	270	196,100

Peak discharge (base, 4,000 sec.-ft.)—Feb. 25 (4 p.m.) 14,500 sec.-ft.; Mar. 1 (7:30 p.m.) 6,180 sec.-ft.

## West Fork Trinity River at Grand Prairie, Tex.

Location.- Water-stage recorder, lat. 32°46', long. 96°59', 440 feet downstream from bridge on Grand Prairie-Sowers-Irving Highway, 1 mile northeast of Grand Prairie, Dallas County, and 6 miles upstream from Mountain Creek. Datum of gage is 412.98 feet above mean sea level, datum of 1929.

Drainage area.- 2,956 square miles.

Records available.- March 1925 to September 1948.

Average discharge.- 23 years, 618 second-feet.

Extremes.- Maximum discharge during year, 11,000 second-feet Feb. 27 (gage height, 22.91 feet); minimum, 68 second-feet Oct. 6, 7, Sept. 25, 26.

1925-48: Maximum discharge, 29,500 second-feet Mar. 31, 1945 (gage height, 26.05 feet), from rating curve extended above 17,000 second-feet; minimum observed, 3.2 second-feet June 6, 1925.

Maximum stage known, 29 feet in April 1922.

Remarks.- Records good except those for period of no gage-height record, which are poor. Flow partly regulated by Bridgeport, Eagle Mountain, and Lake Worth Reservoirs (combined capacity, 527,000 acre-feet). City of Fort Worth diverts considerable water for municipal supply. Several small diversions above Fort Worth.

Revisions (water year).- W 628: 1925.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Oct. 1 to Dec. 4, Mar. 22 to May 19)

1.8	64	2.5	162	6.0	1,090	13.0	3,480	20.0	7,360
2.0	83	3.0	276	8.0	1,680	15.0	4,420	22.0	9,200
2.2	108	4.0	535	10.0	2,320	19.0	6,650	23.0	11,300

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	97	83	2,860	254	2,710	274	134	a107	243	80	234
2	80	87	79	2,270	262	4,910	247	130	a107	164	79	182
3	79	81	85	658	269	2,920	242	123	a107	412	107	164
4	71	77	195	672	266	2,120	258	128	a106	532	271	160
5	77	80	482	1,040	264	2,180	235	123	a108	420	233	154
6	73	79	242	1,240	264	2,390	240	122	a105	750	140	141
7	72	79	826	1,040	269	1,740	242	122	a104	773	97	138
8	85	78	2,160	868	300	1,580	235	115	a102	746	82	127
9	146	81	678	784	295	1,290	225	111	a101	472	76	108
10	389	75	266	784	266	1,240	216	113	a101	394	76	101
11	494	71	189	714	269	1,210	211	510	a100	533	78	90
12	520	74	158	481	278	1,090	200	1,270	a98	183	78	78
13	520	73	143	345	281	1,010	195	452	a95	147	76	74
14	562	195	138	276	286	1,040	184	234	a94	127	76	75
15	562	514	1,790	216	308	896	180	182	a92	113	115	77
16	548	180	2,840	191	288	700	182	160	a121	104	139	78
17	589	118	812	180	274	562	182	141	a661	101	145	77
18	728	101	363	174	254	454	178	134	a571	95	134	77
19	672	123	269	162	238	428	162	917	a274	88	134	77
20	454	98	235	189	235	428	156	648	158	110	134	73
21	320	113	302	221	218	389	158	345	105	283	132	74
22	262	195	520	242	218	1,000	152	704	88	402	129	75
23	200	206	630	218	209	938	151	170	88	454	122	75
24	138	150	535	191	211	454	149	145	158	319	125	75
25	108	105	330	176	2,220	376	168	291	350	179	113	73
26	157	98	238	170	8,500	348	289	a412	338	112	132	72
27	336	93	197	178	10,400	355	216	a179	895	100	182	106
28	312	86	176	184	6,430	360	184	a41	98	325	224	
29	180	82	160	180	2,880	281	158	a111	1,430	88	252	298
30	193	84	158	189	-	286	143	a107	572	84	204	178
31	140	-	341	218	-	286	-	a108	-	84	212	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	9,153	728	72	295	18,150
November.....	3,571	514	71	119	7,080
December.....	15,618	2,840	79	504	30,980
Calendar year 1947.....	156,653	6,700	71	429	310,700
January.....	17,111	2,660	162	552	33,940
February.....	36,704	10,400	209	1,266	72,800
March.....	35,691	4,910	281	1,151	70,790
April.....	5,990	268	143	200	11,880
May.....	8,064	1,270	107	280	15,990
June.....	7,971	1,430	86	266	15,810
July.....	8,710	773	84	281	17,280
August.....	4,278	325	76	138	8,490
September.....	3,605	298	72	120	7,150
Water year 1947-48.....	156,466	10,400	71	428	310,300

Peak discharge (base, 5,000 sec.-ft.)- Feb. 27 (7 a.m.) 11,000 sec.-ft.; Mar. 2 (12:30 p.m.)

5,500 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for station at Fort Worth.

## Trinity River at Dallas, Tex.

Location.- Water-stage recorder, lat. 32°47', long. 96°48', at Commerce Street viaduct in Dallas, Dallas County, 54 miles downstream from confluence of West and Elm Forks. Datum of gage is 368.14 feet above mean sea level, datum of 1929.

Drainage area.- 6,001 square miles.

Records available.- July 1903 to July 1930, October 1932 to September 1948 (January 1907 to September 1920, monthly records only, in Water-Supply Paper 850). October 1928 to December 1929 (gage heights only) at site 2 miles upstream. July 1930 to September 1932 at site 6 miles downstream. U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Average discharge.- 45 years (1903-43), 1,577 second-feet.

Extremes.- Maximum discharge during year, 46,300 second-feet Feb. 27 (gage height, 40.50 feet); minimum, 170 second-feet Nov. 11 (gage height, 12.38 feet).

1903-48: Maximum discharge, 184,000 second-feet May 25, 1908 (gage height, 52.6 feet), from rating curve extended above 109,000 second-feet; minimum observed for periods 1903-5, 1920-48, 5.8 second-feet Sept. 11, 1924.

Remarks.- Records good except those for periods of no recorder record and those for periods of backwater from return of overbank storage, which are fair. Flow partly regulated by Bridgeport, Eagle Mountain, Lake Worth, Mountain Creek, and Lake Dallas Reservoirs (combined capacity, 757,000 acre-feet). Cities of Fort Worth and Dallas divert water for municipal supply. During the current year city of Dallas diverted 59,000 acre-feet. Sewage effluent from Dallas enters river below station. Several small diversions on West Fork above Fort Worth.

Revisions (water years).- W 850: 1903-6 (monthly and annual means).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	360	282	312	8,420	535	18,700	570	240	330	845	417	552
2	351	282	262	11,800	880	14,900	535	240	330	760	408	500
3	363	262	289	5,680	1,010	10,200	465	240	315	2,380	414	482
4	345	226	800	1,800	700	6,610	396	240	315	2,860	535	465
5	357	226	845	1,260	991	5,840	396	1,200	308	1,160	588	482
6	354	224	577	1,310	740	5,720	390	883	285	1,200	482	465
7	306	233	3,950	1,140	780	5,540	405	327	278	1,370	435	435
8	726	189	12,500	1,130	822	6,300	395	258	258	1,210	417	429
9	375	178	5,010	1,020	822	4,400	375	240	2,390	1,570	402	450
10	500	172	1,780	1,090	700	3,700	411	240	1,710	2,090	387	450
11	605	170	628	1,070	1,050	2,800	432	2,030	500	1,940	393	429
12	640	193	435	822	1,110	1,860	393	7,680	500	624	396	405
13	660	242	381	880	740	1,760	375	5,040	482	535	405	390
14	680	465	487	570	760	1,360	354	1,610	423	860	390	387
15	680	570	5,520	535	890	1,210	348	1,460	378	588	399	393
16	680	535	13,300	482	1,000	1,160	339	1,260	375	500	450	384
17	680	360	8,280	450	800	935	297	1,020	384	450	450	384
18	800	252	3,480	450	680	822	291	500	465	450	435	396
19	780	224	1,400	915	605	822	288	435	570	450	420	390
20	622	235	720	553	570	780	309	845	500	435	435	384
21	465	255	622	518	552	780	306	640	420	570	450	375
22	399	744	780	535	535	2,920	297	435	378	700	450	378
23	363	720	912	518	981	1,980	233	387	405	760	450	378
24	303	450	845	482	640	997	226	327	570	700	435	378
25	265	387	640	465	3,700	800	330	321	640	570	450	387
26	360	321	552	758	16,200	720	402	1,310	605	482	482	393
27	500	288	465	465	35,100	690	345	1,560	875	939	482	396
28	518	275	450	450	41,100	640	321	3,350	3,010	1,360	640	552
29	384	275	435	450	27,600	622	297	3,420	8,200	759	605	588
30	390	316	414	450	-	605	242	2,270	2,780	428	535	482
31	369	-	1,900	482	-	588	-	1,110	-	423	518	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	15,180	800	265	490	30,110
November.....	9,662	744	170	319	18,970
December.....	68,951	13,300	262	2,224	136,800
Calendar year 1947.....	414,294	18,500	170	1,135	821,600
January.....	46,740	11,800	450	1,508	92,710
February.....	143,573	41,100	535	4,351	284,800
March.....	106,781	18,700	588	3,445	211,800
April.....	10,761	570	226	359	21,340
May.....	41,115	7,680	240	1,326	81,550
June.....	28,983	9,200	258	966	57,490
July.....	29,766	2,860	423	960	59,400
August.....	14,155	640	387	457	28,080
September.....	12,959	588	375	432	25,700
Water year 1947-48.....	528,526	41,100	170	1,444	1,048,000

Peak discharge (base, 11,000 sec.-ft.)- Dec. 8 (4 p.m.) 14,000 sec.-ft.; Dec. 16 (time unknown) about 15,800 sec.-ft.; Jan. 2 (3:30 p.m.) 12,200 sec.-ft.; Feb. 27 (11 p.m.) 46,300 sec.-ft.

Note.- No recorder record Nov. 8 to Dec. 1, Dec. 11-16, Apr. 23 to May 19 and May 24 to July 1; discharge computed from graph based on once-daily readings of wire-weight gage furnished by U. S. Weather Bureau. Stage-discharge relation affected by return flow from overbank storage Dec. 8-10, 16-19, Jan. 3-9, Feb. 27 to Mar. 17, Mar. 23, 24, May 13-16, 29-31, June 30, July 4, 5; discharge computed on basis of loop curves.



## Trinity River near Rosser, Tex.

Location.- Water-stage recorder, lat. 32°25'40", long. 96°27'50", at bridge on State Highway 34, 1.4 miles downstream from Texas & New Orleans Railroad bridge, 1.9 miles downstream from East Fork, and 2.5 miles south of Rosser, Kaufman County. Datum of gage is 302.6 feet above mean sea level, datum of 1929.

Drainage area.- 8,057 square miles.

Records available.- November 1938 to September 1948. July 1924 to September 1925 (October 1924 to September 1925, gage heights only) at site 1.7 miles upstream.

Extremes.- Maximum discharge during year, 33,700 second-feet Mar. 2 (gage height, 34.78 feet); minimum, 289 second-feet Nov. 13 (gage height, 5.70 feet).

1924, 1938-48: Maximum discharge not determined, but occurred Apr. 23 or 24, 1942, following numerous breaks in levee system on both banks; maximum gage height, 41.55 feet Apr. 22, 1942, just prior to levee breaks; minimum discharge, 34 second-feet Sept. 8-11, 1924.

Flood of May 1908 reached a stage of about 33.0 feet, present site and datum, from information by Corps of Engineers (discharge believed to have been approximately the same as that of Apr. 23 or 24, 1942).

Remarks.- Records good. Flow partly regulated by reservoirs above Dallas. Levee system constructed in 1916. Cities of Fort Worth and Dallas divert considerable water for municipal supply. Several small diversions on West Fork above Fort Worth.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	449	536	555	8,380	1,200	29,900	1,250	518	2,590	5,100	536	594
2	449	555	555	9,720	1,620	33,300	1,230	483	992	2,440	500	614
3	453	518	556	10,500	2,600	31,600	1,150	449	866	1,740	483	574
4	449	401	819	11,600	2,780	27,800	1,040	818	3,140	483	536	536
5	433	345	1,620	11,100	2,520	23,100	940	555	7700	4,060	594	536
6	433	321	1,770	9,000	2,820	219,000	940	1,360	7594	2,630	656	536
7	433	1,150	3,720	7,630	2,710	215,100	940	1,280	7536	1,970	574	536
8	417	734	11,000	5,960	3,060	212,400	940	1,150	500	2,280	500	518
9	786	361	11,600	4,290	3,100	210,600	915	992	622	2,310	466	518
10	650	321	11,600	2,980	2,980	8,750	915	818	2,470	2,520	466	536
11	614	329	10,000	2,200	2,820	7,060	915	3,470	2,110	2,710	433	500
12	746	305	5,660	1,970	3,140	5,720	940	10,400	915	2,460	433	500
13	770	297	3,610	1,680	3,100	4,390	2,310	10,100	700	1,170	449	466
14	794	663	3,310	1,420	2,780	3,740	1,830	9,630	614	7818	466	449
15	818	2,380	5,100	1,250	2,340	2,860	1,070	10,600	574	890	433	449
16	818	1,500	10,500	1,170	2,340	2,420	890	12,000	536	842	433	449
17	818	966	10,900	1,120	2,380	2,140	890	10,800	536	723	500	449
18	794	746	11,400	1,040	2,140	1,900	746	7,880	536	678	518	433
19	915	700	12,100	992	1,940	1,710	614	4,520	678	594	500	449
20	915	536	11,300	1,360	1,740	1,620	594	2,620	746	555	483	433
21	746	555	8,580	1,870	1,530	1,560	594	1,750	594	518	500	433
22	536	1,740	6,860	1,710	1,420	1,960	574	1,100	536	514	500	433
23	466	2,170	5,380	1,470	1,340	4,010	574	794	518	794	500	433
24	417	1,650	4,240	1,310	1,620	3,920	574	704	536	842	500	433
25	353	1,310	3,060	1,120	1,530	2,940	603	614	842	794	500	433
26	345	1,150	2,030	1,040	4,180	2,670	915	979	915	614	518	433
27	614	1,070	1,530	1,250	7,350	2,600	842	2,270	2,180	555	555	433
28	635	890	1,310	1,150	9,350	2,560	746	2,900	2,400	1,030	555	449
29	656	678	1,200	1,020	16,300	2,000	656	3,560	4,700	1,560	700	374
30	1,600	594	1,120	966	-	1,420	594	4,340	6,400	1,180	700	700
31	694	-	1,950	992	-	1,280	-	4,210	-	635	635	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	19,996	1,600	345	645	39,660
November.....	25,471	2,380	297	849	50,520
December.....	164,915	12,100	536	5,320	327,100
Calendar year 1947.....	752,890	12,600	297	2,063	1,493,000
January.....	109,260	11,600	966	3,525	216,700
February.....	94,730	16,300	1,200	3,267	187,900
March.....	272,030	33,300	1,280	8,775	539,600
April.....	27,731	2,310	574	924	55,000
May.....	113,329	12,000	449	3,656	224,800
June.....	38,304	6,400	500	1,277	75,970
July.....	48,766	5,100	518	1,573	96,730
August.....	16,069	700	433	518	31,870
September.....	14,829	700	433	494	29,410
Water year 1947-48.....	945,430	33,300	297	2,583	1,875,000

Peak discharge (base, 13,000 sec.-ft.)- Mar. 2 (11 a.m.) 33,700 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.

f Computed on basis of partly estimated gage-height record.

g Computed from graph based on gage readings.

## Trinity River near Oakwood, Tex.

**Location.**- Water-stage recorder, lat. 31°39', long. 95°47', at bridge on U. S. Highways 79 and 84, 1½ miles upstream from International-Great Northern Railroad bridge and 6 miles northeast of Oakwood, Leon County. Datum of gage is 175.03 feet above mean sea level, datum of 1929.

**Drainage area.**- 12,840 square miles.

**Records available.**- July 1932 to September 1948. January 1905 to July 1932 at site 1½ miles downstream (January 1905 to September 1923, monthly and yearly records only, in Water-Supply Papers 850 and 878). U. S. Weather Bureau has collected gage-height records in this vicinity since 1904.

**Average discharge.**- 25 years (1923-48), 5,364 second-feet.

**Extremes.**- Maximum discharge during year, 50,100 second-feet May 17 (gage height, 44.32 feet); minimum, 428 second-feet Sept. 28.  
1923-48: Maximum discharge, 153,000 second-feet Apr. 29, 1942 (gage height, 51.64 feet); minimum observed for period 1924-48, 22 second-feet Aug. 18, 1934.  
Flood of June 4, 1908, reached a stage of about 52.2 feet, present site and datum, from information by U. S. Weather Bureau (discharge, about 164,000 second-feet).

**Remarks.**- Records good. Flow partly regulated by reservoirs above Dallas. Records of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	656	980	1,200	2,000	2,970	7,820	2,550	1,500	5,010	3,730	1,610	729
2	625	1,420	1,000	3,320	3,280	10,300	2,090	1,260	4,780	5,550	1,360	816
3	585	1,080	908	7,620	3,810	13,000	1,910	1,080	4,110	6,320	908	772
4	545	750	980	10,200	4,420	13,100	1,790	932	2,780	5,250	687	708
5	572	708	1,130	12,000	5,550	16,400	1,700	858	1,780	3,560	625	687
6	509	656	1,350	12,700	6,620	18,300	1,580	908	1,340	3,200	585	866
7	509	585	2,240	13,200	7,100	24,200	1,500	1,160	1,150	4,730	565	585
8	509	491	3,440	13,100	7,680	34,800	1,420	2,470	1,000	5,110	825	545
9	509	491	4,600	12,700	9,240	36,800	1,160	2,750	908	3,690	687	565
10	509	1,080	7,750	12,100	10,400	34,800	1,850	2,090	860	2,890	625	585
11	491	1,260	10,700	10,400	11,200	32,300	1,640	2,330	794	2,970	585	585
12	729	980	12,600	6,980	10,900	29,200	1,450	8,920	1,140	3,280	545	585
13	772	687	14,000	4,280	9,880	26,900	1,700	13,000	2,250	3,650	527	565
14	566	565	14,700	2,080	8,930	23,000	3,740	15,500	1,970	3,810	509	545
15	772	545	15,200	2,580	8,090	19,000	5,910	22,700	1,280	2,790	509	527
16	838	509	13,800	2,350	7,300	15,400	7,420	45,400	932	1,730	473	545
17	860	1,070	11,800	2,250	6,320	10,500	5,960	47,700	794	1,230	455	527
18	884	2,190	11,900	2,090	5,110	6,870	3,360	39,000	750	1,150	473	509
19	884	2,090	13,000	2,080	4,160	4,450	2,030	32,900	687	1,080	491	509
20	838	1,560	14,100	2,150	3,650	3,200	1,560	26,100	656	932	527	491
21	838	1,180	14,900	2,150	3,600	2,550	1,310	21,500	625	860	565	455
22	932	1,050	15,800	2,550	3,280	2,850	1,150	18,700	687	794	565	473
23	980	1,200	15,800	3,860	2,890	3,120	1,050	15,200	772	729	527	491
24	860	2,060	15,400	3,860	2,650	5,160	1,030	10,100	708	687	509	491
25	794	3,280	14,400	4,070	2,510	6,440	1,150	4,740	625	729	545	491
26	585	3,650	12,000	3,560	2,440	7,100	1,450	2,430	605	838	585	473
27	491	3,600	7,800	3,480	2,610	6,800	1,790	1,880	645	908	625	455
28	473	3,160	4,460	4,960	3,310	5,200	2,310	2,020	972	884	605	423
29	473	2,120	2,860	5,500	5,600	3,940	2,410	3,850	1,790	772	585	439
30	645	1,530	2,220	4,600	-	3,440	1,910	5,400	2,610	687	605	473
31	794	-	1,970	3,520	-	3,120	-	5,500	-	1,080	645	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	21,006	980	473	678	41,680
November.....	42,537	3,650	491	1,418	84,370
December.....	263,818	15,800	908	6,510	523,300
Calendar year 1947.....	1,502,339	24,700	391	4,116	2,980,000
January.....	179,870	13,200	2,000	5,802	356,800
February.....	165,500	11,200	2,440	5,707	328,300
March.....	429,860	36,800	2,550	13,870	852,600
April.....	68,330	7,420	1,030	2,278	135,500
May.....	359,856	47,700	838	11,610	713,800
June.....	45,000	5,010	605	1,500	89,260
July.....	75,620	6,320	687	2,439	150,000
August.....	19,732	1,610	455	637	39,140
September.....	16,710	816	423	557	33,140
Water year 1947-48.....	1,687,841	47,700	423	4,612	3,348,000
Peak discharge (base, 17,000 sec.-ft.).....	Mar. 9 (6 a.m.)	36,800 sec.-ft.	May 17 (11 p.m.)	50,100 sec.-ft.	

## TRINITY RIVER BASIN

55

Trinity River near Midway, Tex.

Location.- Wire-weight gage, lat. 31°04'40", long. 95°42'00", at bridge on State Highway 21, 5 miles northeast of Midway, Madison County, and 8 miles downstream from Boggy Creek. Datum of gage is 117.6 feet above mean sea level, datum of 1929.

Drainage area.- 14,890 square miles.

Records available.- April 1939 to September 1948.

Extremes.- Maximum discharge during year, 29,100 second-feet May 22 (gage height, 37.12 feet); minimum observed, 430 second-feet Sept. 29.

1939-48: Maximum discharge, 146,000 second-feet May 1, 1942 (gage height, 48.58 feet); minimum observed, 100 second-feet Oct. 4, 1939.

Maximum discharge known occurred in May 1890 (gage height, about 45.0 feet, discharge not determined), from information by local residents. Flood of May 27, 1930, reached a stage of 46.7 feet, from floodmark (flow confined within levee system constructed in 1916). Flood of June 9, 1908, reached a stage of 44.3 feet, from floodmarks and from information by local residents.

Remarks.- Records good. Gage read twice daily, oftener during high stages. Flow partly regulated by reservoirs above Dallas.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,020	865	2,260	3,000	5,240	5,370	3,720	2,430	5,240	2,300	825	552
2	905	965	1,890	3,120	4,200	7,180	2,240	1,990	4,850	2,820	1,060	670
3	825	1,240	1,800	3,480	3,720	8,950	2,760	1,690	4,520	3,350	1,460	745
4	785	1,420	1,500	6,080	4,080	10,600	2,430	1,460	4,200	5,570	1,140	805
5	745	1,140	1,740	8,050	4,520	12,100	2,210	1,320	3,420	5,710	845	745
6	705	945	1,890	8,800	5,110	13,600	2,100	1,420	2,100	5,180	725	688
7	705	925	2,260	10,200	6,060	14,900	1,990	1,740	1,790	4,850	635	552
8	688	925	2,760	11,400	7,900	16,300	1,840	1,840	1,550	4,460	618	535
9	688	865	3,660	11,900	11,400	18,300	2,180	1,840	1,280	4,330	618	618
10	670	825	4,460	11,700	12,300	20,700	3,360	1,780	805	4,020	670	618
11	670	925	6,480	11,300	11,700	23,100	2,540	2,820	1,060	3,120	688	550
12	670	1,420	8,500	10,400	11,900	25,000	2,380	3,540	1,000	2,760	670	618
13	652	1,500	10,100	8,880	12,100	26,300	3,120	7,280	965	3,000	618	582
14	865	1,320	11,300	5,850	11,600	27,000	3,660	10,400	1,630	3,360	582	600
15	905	1,060	13,400	4,080	10,400	27,400	4,850	12,100	1,990	3,600	565	582
16	785	985	13,700	3,120	9,180	27,600	6,200	14,100	1,600	3,240	550	565
17	885	985	13,700	2,210	8,050	27,200	7,040	16,900	1,340	2,160	535	565
18	965	1,100	12,800	1,790	7,180	25,600	6,760	20,400	925	2,150	520	550
19	985	2,080	12,200	2,260	6,130	21,400	5,110	24,000	845	1,280	505	535
20	965	2,650	11,300	2,760	5,180	14,400	3,060	26,600	765	1,190	505	535
21	945	2,380	11,700	3,000	4,330	8,900	2,210	28,300	670	1,100	535	505
22	945	2,100	12,400	2,940	4,260	6,200	1,840	29,000	688	965	550	490
23	21,000	1,790	13,200	3,000	4,260	4,720	1,600	29,000	670	885	600	475
24	1,020	1,640	13,300	3,840	3,780	4,330	1,500	28,000	725	825	618	505
25	1,000	1,980	13,500	4,200	3,360	5,240	2,240	26,500	785	705	600	505
26	965	3,000	13,700	4,590	3,120	6,340	3,660	22,000	785	670	582	505
27	885	3,840	12,300	4,850	3,120	7,180	3,840	15,200	670	705	582	490
28	670	4,140	9,100	4,980	3,300	6,900	2,700	8,220	652	865	618	460
29	618	3,960	6,200	5,110	3,960	5,920	2,600	5,440	1,360	905	635	445
30	600	3,000	3,960	5,240	-	4,980	2,760	3,840	1,790	865	652	445
31	670	-	3,120	5,370	-	4,330	-	4,590	-	785	635	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	25,401	1,020	600	619	50,380
November.....	51,970	4,140	825	1,732	103,100
December.....	250,580	13,700	1,500	8,083	497,000
Calendar year 1947.....	1,855,512	21,700	535	5,084	3,680,000
January.....	177,380	11,800	1,790	5,722	351,800
February.....	191,440	12,300	3,120	6,601	379,700
March.....	438,040	27,600	4,330	14,130	868,800
April.....	95,600	7,040	1,500	3,187	189,600
May.....	355,750	29,000	1,320	11,480	705,600
June.....	50,470	5,240	652	1,682	100,100
July.....	77,135	5,710	670	2,488	153,000
August.....	20,941	1,460	505	676	41,540
September.....	17,335	805	445	578	34,380
Water year 1947-48.....	1,752,042	29,000	445	4,787	3,475,000

Peak discharge (base, 20,000 sec.-ft.) - Mar. 16 (10 a.m.) 27,600 sec.-ft.; May 22 (6 p.m.) 29,100 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage heights.

## Trinity River at Riverside, Tex.

Location.- Wire-weight gage, lat. 30°52', long. 95°24', at bridge on State Highway 45, 1,200 feet upstream from International-Great Northern Railroad bridge, 0.5 mile north of Riverside, Walker County, and three-quarters of a mile downstream from Harmon Creek. Datum of gage is 89.86 feet above mean sea level, datum of 1929.

Drainage area.- 15,510 square miles.

Records available.- January 1903 to December 1906, October 1923 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Average discharge.- 28 years (1903-6, 1923-48), 7,274 second-feet.

Extremes.- Maximum discharge during year, 28,500 second-feet May 24 (gage height, 26.30 feet); minimum observed, 511 second-feet Aug. 20, Sept. 30.

1903-6, 1923-48: Maximum discharge, 121,000 second-feet May 5, 1942 (gage height, 52.75 feet, from floodmark); minimum observed, 70 second-feet Aug. 20-26, Sept. 8-13, 1925, Sept. 29 to Oct. 4, 1931.

Flood of June 11, 1908, reached a stage of 50.1 feet, present site and datum (discharge, 100,000 second-feet).

Remarks.- Records good. Gage read twice daily. Flow partly regulated by reservoirs above Dallas.

Cooperation.- Gage-height record collected in cooperation with U. S. Weather Bureau.

Revisions (water year).- W 828: 1935 (mean discharge).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,360	726	3,240	3,510	5,940	7,200	3,870	2,750	6,390	2,190	786	687
2	1,170	900	2,510	3,530	5,040	7,600	3,420	2,350	6,300	2,990	804	704
3	1,020	1,080	1,950	3,240	4,230	9,200	2,830	1,870	5,940	4,140	1,340	732
4	960	1,400	2,190	4,770	4,140	10,200	2,270	1,520	5,490	5,760	1,480	816
5	900	1,550	5,940	7,600	4,590	13,800	1,990	1,270	4,770	6,840	1,140	840
6	840	1,240	5,440	9,500	5,220	15,500	1,790	1,200	3,600	6,120	870	792
7	822	1,050	4,500	10,900	6,300	15,500	1,670	1,520	2,590	4,580	709	774
8	780	990	4,320	11,900	10,300	16,400	1,520	2,030	1,910	3,870	626	744
9	768	960	5,760	12,600	18,500	17,700	1,670	1,950	1,550	4,950	616	714
10	768	900	7,020	12,800	17,900	19,500	4,400	2,510	1,400	5,400	604	687
11	768	804	7,300	12,700	16,300	21,400	5,400	3,870	1,270	4,500	676	682
12	762	870	8,700	12,200	15,400	23,000	6,930	5,580	1,140	3,600	698	687
13	750	1,520	10,400	11,100	14,800	24,200	7,200	6,480	1,080	3,240	670	692
14	774	1,520	11,900	8,600	14,400	25,000	9,200	9,910	1,080	3,600	616	687
15	960	1,300	14,000	5,850	12,800	25,600	6,570	12,400	2,110	3,870	599	687
16	990	1,050	16,000	4,140	11,100	26,000	6,660	14,000	2,350	4,050	588	682
17	950	1,240	17,000	3,420	9,600	26,200	7,700	15,900	1,830	3,240	560	660
18	1,020	3,330	15,600	3,150	8,500	26,200	7,700	19,200	1,340	2,270	544	643
19	1,080	3,070	13,800	2,990	7,400	24,700	6,480	22,000	1,050	1,550	536	638
20	1,110	3,330	12,800	2,990	6,300	20,600	4,500	24,600	960	1,300	511	632
21	1,110	2,910	12,700	3,150	6,520	11,900	2,750	26,200	840	1,200	528	604
22	1,080	2,830	13,400	3,240	7,400	7,300	1,830	27,400	792	1,080	538	594
23	1,050	2,910	14,100	3,240	6,210	7,200	1,400	28,200	828	960	599	560
24	1,080	2,430	14,800	3,420	5,490	6,480	1,140	28,500	792	870	626	550
25	1,170	2,110	15,200	4,410	4,410	5,940	3,200	28,300	840	810	621	555
26	1,140	2,590	15,400	5,040	3,780	6,120	6,300	27,100	990	756	601	550
27	1,020	3,870	15,000	5,580	3,690	6,750	5,670	24,100	900	732	638	555
28	900	4,590	13,600	5,940	4,410	7,200	4,140	17,800	840	780	632	550
29	804	4,680	10,200	5,940	4,680	6,840	3,070	9,500	1,110	870	682	538
30	768	4,140	6,930	6,210	-	5,760	2,670	6,030	1,670	900	714	511
31	714	-	4,230	6,570	-	4,590	-	5,940	-	840	709	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	29,388	1,380	714	948	58,290
November.....	61,890	4,680	726	2,063	122,800
December.....	305,930	17,000	1,950	9,869	606,800
Calendar year 1947.....	2,286,749	38,300	555	6,265	4,536,000
January.....	199,930	12,800	2,990	6,449	396,600
February.....	245,350	18,500	3,690	8,460	486,600
March.....	451,580	26,200	4,590	14,570	895,700
April.....	125,940	9,200	1,140	4,198	249,800
May.....	381,980	28,500	1,200	12,320	757,600
June.....	63,752	6,390	792	2,125	126,500
July.....	87,958	6,940	732	2,837	174,500
August.....	21,866	1,480	511	705	43,370
September.....	19,747	840	511	658	39,170
Water year 1947-48.....	1,995,311	28,500	511	5,452	3,958,000

a No gage-height record; discharge computed on basis of estimated gage height.

## Trinity River at Romayor, Tex.

Location.- Water-stage recorder, lat. 30°25'30", long. 94°51'05", at county highway bridge 1.5 miles south of Romayor, Liberty County, 2.0 miles downstream from Gulf, Colorado & Santa Fe Railway bridge, and 4½ miles downstream from Big Creek. Datum of gage is 35.92 feet above mean sea level, datum of 1929.

Drainage area.- 17,200 square miles.

Records available.- October 1943 to September 1948. May 1924 to September 1943 at site 2.0 miles upstream.

Average discharge.- 24 years (1924-48), 8,143 second-feet.

Extremes.- Maximum discharge during year, 28,500 second-feet May 26 (gage height, 20.83 feet); minimum, 595 second-feet Sept. 29.

1924-48: Maximum discharge, 111,000 second-feet May 9, 1942 (gage height, 35.8 feet, from floodmarks, present site and datum); minimum observed, 132 second-feet Aug. 21, 22, 1925.

Remarks.- Records good. Flow partly regulated by reservoirs above Dallas. Records of chemical analyses for water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,700	785	3,920	5,710	7,360	6,440	6,260	4,200	6,610	1,250	1,000	765
2	1,500	745	3,440	4,580	7,100	9,420	5,490	4,010	6,610	1,700	975	765
3	1,310	745	2,630	4,390	6,260	9,140	5,070	3,820	6,610	2,380	900	745
4	1,160	852	2,460	4,010	5,490	9,860	4,680	3,350	6,260	3,350	925	745
5	1,050	1,020	3,500	4,300	5,070	11,000	4,200	12,810	5,820	4,640	1,310	765
6	975	1,280	6,260	6,400	5,170	15,200	3,820	12,630	5,380	5,710	1,400	808
7	925	1,370	6,750	8,720	5,600	18,100	3,540	12,720	4,580	5,710	1,160	852
8	875	1,220	5,170	10,300	6,490	17,500	3,440	12,380	3,720	4,680	950	830
9	852	1,080	4,680	11,600	15,600	18,100	3,260	12,720	2,990	3,820	852	808
10	830	1,050	5,820	12,500	24,300	19,500	3,260	2,810	12,540	4,230	785	808
11	808	1,050	7,230	12,800	23,600	20,900	3,900	12,810	12,300	5,270	765	808
12	785	975	7,230	13,000	21,300	22,400	6,150	3,780	12,140	4,770	745	765
13	765	900	8,160	12,700	20,300	23,600	8,440	5,600	11,910	3,920	765	745
14	765	1,000	9,560	11,800	19,100	24,900	10,900	7,100	11,630	3,440	785	745
15	765	1,400	11,600	9,700	17,500	25,700	14,300	9,700	1,470	3,350	765	745
16	765	1,530	14,400	7,100	15,400	26,400	11,600	12,300	1,560	3,630	745	745
17	852	1,340	16,700	5,380	13,200	26,800	9,000	13,900	2,380	3,820	725	745
18	900	1,250	17,100	4,580	11,300	27,200	9,000	16,100	2,380	3,630	705	745
19	975	1,880	15,900	4,100	9,860	27,200	9,000	19,900	1,840	2,900	685	725
20	1,020	3,440	14,300	4,010	8,720	26,200	8,160	22,600	1,470	2,140	685	705
21	1,020	3,170	12,800	3,920	7,750	22,600	6,370	24,500	1,220	1,700	665	685
22	1,020	3,170	12,500	3,920	10,300	15,900	4,740	26,000	1,110	1,470	648	685
23	1,020	3,440	13,000	4,010	10,200	12,000	4,090	27,000	1,050	1,340	665	665
24	1,020	3,440	13,700	3,920	8,580	10,800	6,260	27,700	1,000	1,190	665	665
25	1,000	2,990	14,400	3,920	7,490	9,560	4,870	28,300	950	1,110	685	630
26	1,000	2,380	15,200	4,480	6,260	8,160	8,780	28,500	925	1,050	705	612
27	1,080	2,140	15,400	5,270	5,490	7,490	12,300	28,300	950	975	725	612
28	1,080	2,720	15,200	6,260	5,270	7,880	9,860	27,000	975	925	725	612
29	1,000	3,630	13,700	7,100	5,600	8,300	7,100	22,200	975	900	725	612
30	925	4,010	11,200	7,100	-	8,300	5,130	14,200	975	900	745	612
31	852	-	7,910	6,970	-	7,360	-	8,320	-	950	745	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	30,594	1,700	765	987	60,680
November.....	56,002	4,010	745	1,060	111,100
December.....	311,800	17,100	2,460	10,060	618,400
Calendar year 1947.....	2,665,417	47,700	700	7,303	5,287,000
January.....	214,550	13,000	3,920	6,921	425,600
February.....	315,660	24,300	5,070	10,880	626,100
March.....	503,910	27,200	6,440	16,280	999,500
April.....	202,970	14,300	3,260	6,766	402,600
May.....	407,260	28,500	2,380	13,140	807,800
June.....	80,330	6,810	925	2,678	159,300
July.....	86,850	5,710	900	2,802	172,300
August.....	25,325	1,400	648	817	50,230
September.....	21,754	852	612	725	43,150
Water year 1947-48.....	2,257,005	28,500	612	6,167	4,477,000

Peak discharge (base, 24,000 sec.-ft.)- Feb. 10 (6 p.m.) 24,900 sec.-ft.; Mar. 19 (4 a.m.) 27,400 sec.-ft.; May 26 (11 a.m.) 28,500 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for station upstream.

f Computed on basis of partly estimated gage-height record.

## Trinity River at Liberty, Tex.

Location.- Wire-weight gage, lat. 30°03'25", long. 94°49'05", at bridge on U. S. Highway 90 in Liberty, Liberty County, 450 feet downstream from Texas & New Orleans Railroad bridge. Datum of gage is 2.22 feet below mean sea level, datum of 1929.

Drainage area.- 17,500 square miles.

Records available.- October 1938 to September 1940 (gage heights, discharge measurements, and some records of daily discharge), October 1940 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Extremes.- Maximum discharge during year, 26,700 second-feet May 28 (gage height, 26.10 feet); minimum not determined (affected by tides); minimum gage height observed, 4.5 feet Sept. 27.

1938-48: Maximum discharge, 114,000 second-feet May 12, 1942 (gage height, 29.38 feet); minimum discharge not determined (affected by tides); minimum gage height observed, 2.5 feet Nov. 4, 1939.

A stage 28.6 feet was reached May 8-11, 1922, from observation by U. S. Weather Bureau at chain gage on railroad bridge upstream.

Remarks.- Records good. Gage read once daily. Discharge not computed below 10-foot gage height because tides affect stage-discharge relation.

Cooperation.- Gage readings furnished by U. S. Weather Bureau.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3,920	8,800	8,030	8,030	8,470	7,400	5,160	13,100	-	-	-	-
2	3,920	8,380	8,030	7,600	8,200	3,990	10,100	-	-	-	-	-
3	-	5,160	7,600	9,790	5,320	3,710	8,470	-	-	-	-	-
4	-	4,680	8,830	9,790	4,760	-	7,400	-	-	-	-	-
5	-	4,440	6,110	10,700	4,280	-	6,650	-	-	-	-	-
6	-	4,580	5,080	5,480	12,800	3,780	-	5,930	4,440	-	-	-
7	-	6,740	7,300	5,570	15,200	-	-	5,240	5,570	-	-	-
8	-	6,830	9,570	6,110	18,200	-	-	4,520	5,840	-	-	-
9	-	5,750	11,200	8,890	16,700	-	-	3,570	4,920	-	-	-
10	-	5,480	12,200	16,200	17,200	-	-	-	4,060	-	-	-
11	-	6,650	12,800	19,700	18,000	-	-	-	4,280	-	-	-
12	-	7,700	13,100	20,100	18,900	3,920	-	-	5,240	-	-	-
13	-	8,380	13,300	19,300	19,900	6,110	-	-	4,840	-	-	-
14	-	9,580	13,000	18,400	21,200	8,360	5,480	-	4,060	-	-	-
15	-	11,100	12,200	16,900	22,200	10,700	7,300	-	-	-	-	-
16	-	12,800	10,400	15,400	23,400	12,700	10,500	-	-	-	-	-
17	-	14,700	7,920	14,400	24,200	10,900	12,500	-	-	-	-	-
18	-	15,800	6,110	13,000	25,100	9,130	14,300	-	3,710	-	-	-
19	-	16,200	5,160	11,700	25,600	8,800	16,100	-	-	-	-	-
20	-	15,800	4,920	10,300	25,600	8,580	18,400	-	-	-	-	-
21	-	14,700	4,760	9,240	25,100	7,810	20,100	-	-	-	-	-
22	-	13,900	4,520	9,240	22,600	6,200	21,500	-	-	-	-	-
23	-	13,600	4,440	11,300	18,600	4,600	23,000	-	-	-	-	-
24	-	13,900	4,440	11,200	15,800	3,990	23,400	-	-	-	-	-
25	-	14,300	4,360	10,000	13,500	5,750	24,200	-	-	-	-	-
26	-	14,800	4,520	9,130	11,200	5,930	25,600	-	-	-	-	-
27	-	15,200	5,080	7,700	9,350	8,740	26,100	-	-	-	-	-
28	-	15,200	6,110	6,650	8,470	10,900	26,700	-	-	-	-	-
29	-	15,100	7,200	6,200	8,470	9,130	25,600	-	-	-	-	-
30	-	13,900	7,700	-	8,580	6,920	22,200	-	-	-	-	-
31	-	11,100	7,920	-	8,360	-	17,400	-	-	-	-	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	-	-	-	-	-
November.....	-	-	-	-	-
December.....	-	16,200	-	-	-
Calendar year .....	-	-	-	-	-
January.....	234,770	13,300	4,360	7,573	465,700
February.....	318,710	20,100	5,480	10,990	632,200
March.....	496,580	25,600	6,470	16,020	985,000
April.....	-	12,700	-	-	-
May.....	-	26,700	-	-	-
June 1-9 .....	64,980	13,100	3,570	7,220	128,900
July.....	-	5,840	-	-	-
August.....	-	-	-	-	-
September.....	-	-	-	-	-
Water year .....	-	-	-	-	-

Peak discharge (base, 22,000 sec.-ft.)- Mar. 20 (7 a.m.) 25,600 sec.-ft.; May 28 (7 a.m.) 26,700 sec.-ft.



## TRINITY RIVER BASIN

59

Big Sandy Creek near Bridgeport, Tex.

Location.- Water-stage recorder, lat. 33°13', long. 97°41', at bridge on State Highway 24, 1.9 miles upstream from Turkey Creek, 4.4 miles upstream from mouth, and 5 miles east of Bridgeport, Wise County. Datum of gage is 727.44 feet above mean sea level, datum of 1929.

Drainage area.- 346 square miles.

Records available.- October 1936 to September 1948.

Average discharge.- 11 years (1937-48), 120 second-feet.

Extremes.- 1946-47: Maximum discharge during water year, 5,300 second-feet Dec. 11 (gage height, 9.91 feet); no flow at times.  
 1947-48: Maximum discharge during water year, 2,660 second-feet Dec. 7 (gage height, 9.28 feet); no flow at times.  
 1936-48: Maximum discharge, 53,000 second-feet June 10, 1941 (gage height, 15.69 feet, from floodmark), from rating curve extended above 22,000 second-feet by logarithmic plotting; no flow at times.

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, 1946-48  
 1946-47

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	7.3	16	12	12	14	1,090	30	2.9		0
2		56	7.2	22	11	11	14	139	26	2.3		0
3		786	6.8	22	12	11	13	69	20	2.1		0
4		1,670	6.8	22	12	11	14	48	18	1.6		0
5		831	7.2	22	12	12	31	37	15	1.6		0
6		218	7.6	22	12	12	17	29	13	1.0		0
7		58	8.0	22	12	16	12	55	12	.5		0
8		24	8.1	26	12	21	12	214	11	.2		0
9		16	37	23	11	20	12	275	11	.1		0
10		43	170	21	11	18	12	186	9.6	0		0
11		13	2,460	20	12	17	13	70	8.8	0		0
12		9.8	2,690	20	12	18	12	101	8.0	0		0
13		8.8	926	19	12	20	30	1,430	6.9	0		0
14		8.1	113	18	12	16	519	1,160	6.1	0		0
15		8.1	66	17	12	14	2,430	129	6.0	0		36
16		8.0	50	16	12	14	1,780	82	6.0	0		3.9
17		7.7	38	14	13	14	260	68	5.7	0		0
18		6.8	30	14	12	23	103	54	5.1	0		0
19		6.7	27	17	12	198	72	51	4.6	0		0
20		7.1	26	18	14	100	55	220	4.7	0		0
21		7.4	25	16	14	41	45	1,160	70	0		0
22		7.4	23	14	13	26	38	824	46	0		0
23		7.2	22	14	13	48	34	120	44	0		0
24		7.2	21	15	12	70	34	107	117	0		0
25		7.6	20	16	12	25	102	733	55	0		0
26		8.5	20	15	11	18	46	231	44	0		0
27		9.0	20	15	11	16	32	79	12	0		0
28		8.0	20	14	12	14	33	52	7.2	0		0
29		7.3	18	14	-	14	36	62	5.3	0		0
30		7.2	16	14	-	14	282	55	3.8	0		0
31		-	15	13	-	14	-	35	-	0		-

Peak discharge (base, 1,600 sec.-ft.)- Nov. 4 (8 a.m.) 1,730 sec.-ft.; Dec. 11 (7:30 p.m.) 5,300 sec.-ft.; Apr. 15 (3 p.m.) 2,810 sec.-ft.; May 14 (5 a.m.) 1,980 sec.-ft.

## TRINITY RIVER BASIN

Discharge, in second-feet, of Big Sandy Creek near Bridgeport, Tex., 1946-48--Continued

1947-48											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.
1	0	0.1	0	348	6.9	36	10	2.4	1.4	18	0
2	0	0	0	42	9.0	114	9.2	2.2	1.0	7.6	0
3	0	0	0	16	10	120	9.5	45	.7	4.9	0
4	0	0	24	9.6	9.6	58	9.6	55	.4	5.6	0
5	0	0	8.2	7.3	8.6	29	11	10	.1	4.0	0
6	0	0	5.3	6.5	8.7	25	11	5.7	0	20	0
7	0	0	1,870	6.0	8.6	23	17	3.7	0	67	0
8	8.6	0	216	6.0	8.5	21	15	2.5	0	19	0
9	3.9	0	27	6.0	7.2	19	8.2	2.2	40	7.3	0
10	1.0	0	10	5.6	7.5	19	7.9	17	31	4.6	0
11	.2	0	5.3	5.1	9.0	14	8.1	66	5.3	9.7	0
12	0	0	3.7	5.3	8.4	16	12	69	1.8	10	0
13	0	0	3.2	5.0	5.9	18	11	25	.6	5.0	0
14	0	3.6	2.8	4.4	13	18	6.0	13	.2	2.6	0
15	0	7.4	484	4.4	16	18	5.8	7.3	0	1.5	0
16	0	2.3	129	4.4	12	17	5.8	5.2	0	1.0	0
17	0	1.0	28	4.1	9.2	15	5.5	3.2	0	.6	0
18	0	.4	13	3.7	8.4	15	4.9	2.3	0	.4	0
19	0	.2	7.3	4.4	8.2	20	4.3	1.6	0	.2	0
20	0	.1	5.5	5.0	7.2	16	4.0	1.2	0	0	0
21	0	0	4.6	5.2	28	17	3.8	1.0	0	0	0
22	0	0	4.2	5.4	26	19	3.8	.8	0	0	0
23	0	4.8	4.0	5.3	12	15	3.6	.6	0	0	0
24	6.6	4.5	3.7	4.5	11	14	3.4	.5	112	0	0
25	18	2.2	3.4	3.8	694	13	6.6	14	194	0	0
26	83	1.2	3.4	3.7	747	13	10	13	214	0	0
27	36	.5	3.4	5.8	238	11	6.0	21	656	0	0
28	6.5	.2	3.4	5.8	198	9.2	3.7	16	158	0	.6
29	3.0	.1	3.5	5.8	60	10	3.0	6.8	362	0	.1
30	1.4	0	3.6	5.7	-	11	2.6	3.6	122	0	0
31	.5	-	135	5.9	-	11	-	2.0	-	0	0

Peak discharge (base, 1,600 sec.-ft.)--Dec. 7 (5 a.m.) 2,660 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage height.

## Monthly discharge, in second-feet, 1946-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October 1946	0	0	0	0	0
November	3,862.9	1,670	0	125	7,660
December	6,912	2,690	6.8	223	13,710
Calendar year 1946	54,857.4	3,680	0	150	108,800
January 1947	551	26	13	17.8	1,090
February	338	14	11	12.1	670
March	878	198	11	28.3	1,740
April	6,107	2,430	12	204	12,110
May	8,965	1,430	29	289	17,780
June	631.8	117	3.8	21.1	1,250
July	12.3	2.9	0	.40	24
August	0	0	0	0	0
September	39.9	36	0	1.33	78
Water year 1946-47	28,297.9	2,690	0	77.5	56,110
October 1947	168.7	83	0	5.44	335
November	28.6	7.4	0	.95	57
December	3,014.5	1,870	0	97.2	5,980
Calendar year 1947	20,734.8	2,430	0	56.8	41,120
January 1948	555.7	348	3.7	17.9	1,103
February	2,193.9	747	5.9	75.7	4,350
March	752.2	120	9.2	24.3	1,450
April	222.3	17	2.6	7.41	441
May	418.8	69	.5	13.5	831
June	1,900.5	656	0	63.4	3,770
July	189.0	67	0	6.10	375
August	.7	0	0	.02	1.4
September	0	0	0	0	0
Water year 1947-48	9,444.9	1,870	0	25.8	18,730

Clear Fork Trinity River near Aledo, Tex.

Location.- Water-stage recorder, lat. 32°38'25", long. 97°33'50", 3 miles downstream from Turkey Creek, 3½ miles upstream from bridge on U. S. Highway 377, 4 miles south-east of Aledo, Parker County, and 11.8 miles upstream from Benbrook Dam (under construction). Datum of gage is 723.3 feet above mean sea level, datum of 1929.

Drainage area.- 246 square miles.

Records available.- August 1947 to September 1948.

Extremes.- 1947: Maximum discharge during period August to September, 6.2 second-feet Sept. 12 (gage height, 2.60 feet); no flow most of time.

1947-48: Maximum discharge during water year, 8,450 second-feet Feb. 25 (gage height, 22.53 feet); no flow at times.

Maximum stage known since 1858, about 34 feet between Apr. 25 and May 9, 1922, from information by local resident.

Remarks.- Records good. No diversions above station.

Discharge, in second-feet, 1947-48

1947											
Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.	Day	Aug.	Sept.
1	-	0.1	9	0	0	17	0	0.3	25	0	0
2	-	0	10	0	0	18	0	0	26	0	0
3	-	0	11	0	0	19	0	0	27	0	0
4	-	0	12	0	0	20	0	0	28	.6	0
5	-	0	13	0	.5	21	0	0	29	1.2	0
6	-	0	14	0	.7	22	0	0	30	.7	0
7	-	0	15	0	1.1	23	0	0	31	.4	-
8	0	0	16	0	.5	24	0	0			

1947-48												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2.1	4.8	1,240	22	249	26	12	12	6.1	0.1	
2	0	2.0	5.2	86	22	171	26	12	10	4.6	.1	
3	0	2.0	5.8	49	24	120	25	12	9.3	10	0	
4	0	2.1	17	36	24	104	25	13	8.6	8.0	0	
5	0	2.3	13	29	22	165	26	13	8.0	7.7	0	
6	0	2.0	7.2	26	21	128	26	12	6.8	50	0	
7	0	2.0	47.8	23	22	102	26	10	5.9	28	0	
8	0	2.0	74	22	23	89	24	10	6.6	15	0	
9	0	2.0	20	22	22	82	23	10	5.7	6.8	0	
10	0	2.2	12	19	22	74	23	13	5.2	9.6	0	
11	0	2.3	9.0	18	24	59	23	155	5.0	7.2	0	
12	0	2.2	8.4	18	25	80	22	58	4.5	5.0	0	
13	0	7.5	16	20	65	23	22	4.0	3.6	0		
14	0	16	7.2	15	30	82	22	16	3.4	3.0	0	
15	0	18	222	15	36	74	21	14	3.0	2.5	0	
16	0	6.3	157	15	28	53	20	12	2.6	1.9	0	
17	90	4.2	30	14	24	48	20	12	2.5	1.4	0	
18	6.9	4.0	19	13	22	47	19	14	2.1	1.1	0	
19	2.1	4.4	15	16	22	47	16	366	1.6	.8	0	
20	1.2	4.4	13	16	20	46	16	54	1.4	.6	0	
21	.8	4.4	12	16	19	49	16	24	1.4	.4	0	
22	.7	5.4	11	17	20	62	16	17	1.1	.2	0	
23	.7	6.0	11	16	20	45	16	14	.8	.1	0	
24	.7	6.9	10	14	21	39	15	12	.9	.1	0	
25	3.4	5.0	9.4	13	2,710	36	27	58	1.2	.1	0	
26	49	4.6	9.0	13	2,120	35	38	118	91	0	0	
27	69	4.8	9.0	16	889	32	18	56	63	0	2.0	
28	9.6	5.0	9.4	11	258	29	14	41	14	0	4.5	
29	3.8	5.0	9.7	16	171	30	13	20	43	3.0	1.3	
30	3.1	4.8	9.4	13	-	30	12	15	12	1.0	.2	
31	2.5	-	552	19	-	28	-	12	-	.2	0	

Peak discharge (base, 3,000 sec.-ft.).- Feb. 25 (10:30 p.m.) 8,450 sec.-ft.

Monthly discharge, in second-feet, 1947-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
August 8-31, 1947.....	2.9	1.2	0	0.12	5.8
September.....	3.2	1.1	0	.11	6.3
Water year.....	-	-	-	-	12
October 1947.....	243.5	90	0	7.85	483
November.....	137.2	18	2.0	4.57	272
December.....	1,777.0	552	4.8	57.3	3,520
Calendar year.....	-	-	-	-	-
January 1948.....	1,873	1,240	11	60.4	3,720
February.....	6,703	2,710	19	231	13,300
March.....	2,258	249	28	72.8	4,480
April.....	637	38	12	21.2	1,280
May.....	1,227	366	10	59.6	2,430
June.....	336.6	91	.8	11.2	668
July.....	178.0	50	0	5.74	353
August.....	8.2	4.5	0	.26	16
September.....	0	0	0	0	0
Water year 1947-48.....	15,378.5	2,710	0	42.0	30,500

## TRINITY RIVER BASIN

Clear Fork Trinity River near Benbrook, Tex.

Location.- Water-stage recorder, lat. 32°39'54", long. 97°26'30", 1½ miles downstream from Benbrook Dam (under construction), 1.7 miles southeast of Benbrook, Tarrant County, 2.1 miles downstream from Dutch Creek, and 2.9 miles upstream from Marys Creek. Datum of gage is 604.2 feet above mean sea level, datum of 1929.

Drainage area.- 435 square miles.

Records available.- July 1947 to September 1948.

Extremes.- 1947: Maximum discharge during period July to September, 890 second-feet Sept. 12 (gage height, 5.52 feet); no flow Sept. 9-11.

1947-48: Maximum discharge during year, 18,000 second-feet Feb. 25 (gage height, 24.64 feet), from rating curve extended above 11,000 second-feet on basis of area-velocity studies and slope-area determination in 1949 at gage height 28.72 feet; no flow at times.

Remarks.- Records good except those above 3,000 second-feet, which are fair. No diversions above station.

## Discharge, in second-feet, 1947-48

1947															
Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	July	Aug.	Sept.
1	-	1.0	1.0	9	-	0.6	0	17	3.9	0.4	1.6	25	1.4	0.3	0.8
2	-	.9	.5	10	-	.6	0	18	3.2	.4	1.0	26	1.4	1.6	.8
3	-	.8	.4	11	-	.9	4.1	19	2.7	.3	.8	27	1.4	4.2	.8
4	-	.6	.3	12	-	1.0	170	20	2.2	.3	1.4	28	1.2	1.4	.8
5	-	.5	.2	13	-	.6	8.5	21	2.0	.4	1.2	29	1.2	1.0	.8
6	-	.6	.2	14	-	.4	3.3	22	1.8	.4	.9	30	1.0	.6	.8
7	-	.8	.1	15	-	.4	41	23	1.8	.4	.8	31	1.0	.6	-
8	-	.8	.1	16	-	.4	4.3	24	1.6	.3	.8				

## 1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	3.6	8.0	1,520	70	1,290	76	24	21	13	1.9	1.4
2	.8	3.0	11	216	70	580	74	22	18	7.5	1.9	.9
3	.8	2.7	13	127	70	398	72	22	16	336	1.9	.7
4	.8	2.7	70	101	70	341	72	23	14	120	1.7	.5
5	.8	2.7	34	88	65	519	72	23	13	350	1.4	.4
6	.8	3.6	19	79	64	393	72	21	12	106	1.3	.2
7	.6	3.9	736	73	73	307	71	17	10	80	1.1	.1
8	.6	3.6	340	72	77	294	67	15	8.8	80	1.0	0
9	.6	3.9	52	70	68	259	64	15	8.8	25	1.0	.1
10	.6	4.3	33	64	72	258	62	24	8.8	21	1.0	0
11	.8	4.3	24	59	77	200	59	533	7.5	22	.7	0
12	.4	4.6	21	59	77	175	55	139	7.2	14	.6	0
13	.3	5.8	20	53	70	178	50	66	6.4	11	.5	0
14	.4	22	19	50	91	172	49	48	6.1	8.8	.3	0
15	.4	35	389	50	91	166	48	39	5.4	7.2	.2	0
16	.8	16	360	48	79	152	48	32	4.7	6.8	.2	0
17	124	9.1	82	42	70	135	48	29	4.4	5.4	.1	0
18	24	8.0	57	43	67	135	43	43	4.0	5.0	0	0
19	7.5	7.0	48	50	67	133	40	340	3.8	4.7	0	0
20	3.9	7.0	42	60	60	123	37	91	3.2	4.4	0	0
21	2.5	49	38	73	57	128	36	41	2.9	3.8	0	0
22	2.0	33	36	62	62	358	35	29	2.3	3.4	0	0
23	1.6	14	35	51	64	146	35	23	2.3	3.2	0	0
24	1.6	12	33	44	65	125	32	18	3.7	3.0	0	0
25	3.6	11	31	43	4,490	115	67	190	4.4	2.9	0	0
26	151	8.6	30	44	3,460	113	71	191	187	2.7	0	0
27	103	6.6	29	47	1,470	98	42	114	132	2.7	.1	0
28	26	6.6	29	44	699	93	32	71	275	2.3	.9	0
29	10	6.6	29	48	497	96	27	40	138	2.1	.7	0
30	6.6	7.0	28	47	-	91	25	30	36	2.1	.8	0
31	5.2	-	701	62	-	83	-	24	-	2.0	1.6	-

Peak discharge (base, 3,900 sec.-ft.)- Feb. 25 (11:30 a.m.) 18,000 sec.-ft.; Feb. 26 (4:30 a.m.) 7,850 sec.-ft.; Mar. 1 (4 p.m.) 4,700 sec.-ft.

## Monthly discharge, in second-feet, 1947-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 17-31, 1947	27.8	3.9	1.0	1.85	55
August	23.7	4.2	.3	.76	47
September	247.3	170	0	8.24	491
The period	-	-	-	-	593
October 1947	482.4	151	.3	15.6	957
November	307.2	49	2.7	10.2	609
December	3,397.0	736	8.0	110	6,740
Calendar year	-	-	-	-	-
January 1948	3,489	1,520	42	113	6,920
February	12,312	4,490	57	425	24,420
March	7,734	1,290	83	249	15,340
April	1,581	76	25	52.7	3,140
May	2,337	533	15	75.4	4,640
June	966.9	275	2.3	32.2	1,920
July	1,238.0	350	2.0	39.9	2,460
August	20.9	1.9	0	.67	41
September	4.3	1.4	0	.14	8.5
Water year 1947-48	33,869.7	4,490	0	92.5	67,200

## Clear Fork Trinity River at Fort Worth, Tex.

Location.- Water-stage recorder and concrete control, lat 32°44', long 97°21', at bridge on Vickery Boulevard (revised), Fort Worth, Tarrant County, 388 feet downstream from Texas & Pacific Railway bridge, and 3 miles upstream from mouth. Datum of gage is 532.91 feet above mean sea level, datum of 1929.

Drainage area.- 522 square miles.

Records available.- March 1924 to September 1948.

Average discharge.- 24 years, 108 second-feet.

Extremes.- Maximum discharge during year, 16,800 second-feet Feb. 25 (gage height, 19.14 feet); no flow at times.

1924-48: Maximum discharge, 27,000 second-feet Mar. 30, 1945 (gage height, 22.10 feet), from rating curve extended above 17,000 second-feet; no flow at times.

Maximum discharge known, 74,300 second-feet Apr. 25, 1922 (gage height, 27.5 feet, present datum), by slope-area method, data furnished by city engineer of Fort Worth.

Remarks.- Records good. Texas & Pacific Railway Co. diverts small amount of water from pool in which gage is located.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	9.7	11	2,090	83	1,670	a114	30	28	23		0
2	0	3.8	13	237	80	780	a111	28	26	14		.2
3	0	3.8	28	143	80	488	a104	28	25	347		0
4	0	4.8	76	114	83	406	a100	28	23	131		0
5	0	2.0	40	97	76	808	93	28	21	354		0
6	0	.7	28	83	76	552	90	28	19	136		0
7	0	3.8	683	76	86	406	86	23	14	84		0
8	0	0	426	80	90	354	86	21	13	79		0
9	0	0	61	76	76	332	83	21	13	38		0
10	0	0	32	67	80	284	80	31	13	30		0
11	0	0	23	64	86	222	76	603	11	25		0
12	0	0	21	64	90	218	67	193	9.7	17		0
13	0	0	19	58	86	237	67	70	9.7	14		0
14	0	21	26	55	107	222	61	49	9.7	9.7		0
15	0	42	451	55	111	206	61	38	7.1	8.4		0
16	0	23	468	55	100	193	58	32	5.9	8.4		0
17	75	13	97	52	86	170	55	28	5.9	7.1		0
18	36	13	64	52	86	166	52	147	3.8	5.9		0
19	7.1	7.1	52	61	86	166	46	387	2.8	3.8		0
20	2.8	8.7	46	73	76	154	43	128	2.0	2.0		0
21	2.0	8.9	43	93	73	158	40	58	0	1.5		0
22	.2	70	43	80	80	444	40	43	0	.2		0
23	0	16	43	64	83	197	40	32	0	0		0
24	0	14	38	58	86	158	38	26	.6	0		0
25	6.2	16	35	55	6,820	143	86	210	4.2	0		0
26	105	16	38	55	4,970	139	83	222	173	.5		0
27	111	16	40	58	2,010	a139	58	153	170	0		0
28	33	11	43	49	880	a136	40	83	278	0		0
29	11	13	43	55	585	a129	35	52	235	0		0
30	7.1	13	43	64	-	a121	32	40	49	0		0
31	9.7	-	765	73	-	a118	-	30	-	0		-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	406.1	111	0	13.1	805
November.....	350.3	70	0	11.7	695
December.....	3,839	765	11	124	7,610
Calendar year 1947.....	30,975.5	2,220	0	84.9	61,430
January.....	4,356	2,090	49	141	8,640
February.....	17,311	6,820	73	587	34,340
March.....	9,914	1,670	118	320	19,660
April.....	2,025	114	32	67.5	4,020
May.....	2,890	603	21	93.2	5,730
June.....	1,174.4	278	0	39.1	2,330
July.....	1,339.3	354	0	43.2	2,660
August.....	0	0	0	0	0
September.....	.2	.2	0	.01	.4
Water year 1947-48.....	43,605.3	6,820	0	119	86,490

Peak discharge (base 3,900 sec.-ft.)- Feb. 25 (2:15 a.m.) 16,800 sec.-ft.; Mar. 1 (6:15 p.m.) 5,880 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.

## Lake Dallas near Lake Dallas, Tex.

Location.- Water-stage recorder, lat. 33°07', long. 96°59', in gatehouse at Garza Dam on Elm Fork Trinity River, 1.6 miles upstream from Little Elm Creek and 2.0 miles southeast of town of Lake Dallas, Denton County. Datum of gage is 0.08 foot above mean sea level, datum of 1929.

Drainage area.- 1,160 square miles.

Records available.- December 1928 to September 1948.

Extremes.- Maximum contents during year, 232,800 acre-feet Feb. 27 (gage height, 528.47 feet); minimum, 76,500 acre-feet Dec. 3 (gage height, 512.00 feet).  
1928-48: Maximum contents not determined; maximum gage height, 534.0 feet Apr. 25, 1942, from floodmark; all gates were open during passing of crest through lake; minimum contents observed, 42,500 acre-feet Apr. 1, 1940 (gage height, 505.8 feet).

Remarks.- Reservoir is formed by earthen hydraulic-fill dam, consisting of 567 feet of concrete service spillway and two dikes. There are two emergency earthen spillways beyond right end of dam. Dam completed in November 1927 and storage began Feb. 16, 1928. Capacity, 194,000 acre-feet (gage height, 525.0 feet, top of service spillway). Water can be withdrawn through one 18-inch outlet gate (gage height of bottom of gate, 474.0 feet), four 48-inch outlet gates (gage height of bottom of gate, 463.0 feet), and one 6-inch gate (gage height of bottom of gate, 474.0 feet). Dead storage is negligible. Water is used by city of Dallas for municipal supply. Figures given herein represent total contents.

Cooperation.- Capacity table furnished by city of Dallas.

Monthly gage height and contents, water year October 1947 to September 1948

	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	516.1	107,600	-
Oct. 31.....	513.8	89,100	-18,500
Nov. 30.....	512.2	77,900	-11,200
Dec. 31.....	520.4	146,200	+68,300
Calendar year 1947....	-	-	-5,000
Jan. 31.....	522.9	171,200	+25,000
Feb. 29.....	526.6	211,600	+40,400
Mar. 31.....	521.2	154,200	-57,400
Apr. 30.....	520.5	147,200	-7,000
May 31.....	524.4	187,400	+40,200
June 30.....	523.0	172,200	-15,200
July 31.....	522.2	164,200	-8,000
Aug. 31.....	518.6	129,100	-35,100
Sept. 30.....	514.4	93,500	-35,600
Water year 1947-48.....	-	-	-14,100

† Gage height at 12 p.m.



## Elm Fork Trinity River near Carrollton, Tex.

Location.- Water-stage recorder above spillway of California Dam, lat. 32°52'25", long. 96°55'50", at bridge on State Highway 114, 100 feet downstream from Hackberry Creek and 5.5 miles southwest of Carrollton, Dallas County. Datum of gage is 410.46 feet above mean sea level, datum of 1929.

Drainage area.- 2,542 square miles.

Records available.- July 1938 to September 1948. January 1907 to December 1928 at site near Dallas, 7 miles downstream (January 1907 to September 1920, monthly records only in Water-Supply Paper 850). November 1923 to July 1938 at site 8.5 miles upstream, at Carrollton Dam. Records equivalent except following intense local rains and during periods of low flow affected by municipal pumping between present site and former site near Dallas.

Average discharge.- 40 years (1907-22, 1923-48), 873 second-feet.

Extremes.- Maximum discharge during year, 27,600 second-feet Feb. 27 (gage height, 16.59 feet); minimum, 163 second-feet Apr. 18, 19, May 3, 4.

1907-48: Maximum gage height, about 28 feet May 25, 1908, present site and datum, from floodmarks, furnished by State Reclamation Department (discharge not determined); maximum discharge subsequent to 1908, 90,700 second-feet Apr. 26, 1942 (gage height, 21.05 feet); no flow at times.

Remarks.- Records good except those computed on basis of backwater curve, which are fair.

Flow regulated by Lake Dallas (see preceding page). No diversion above station.

Revisions (water year).- W 788: 1924.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Feb. 26 to Mar. 4,  
Mar. 13 to May 4)

1.5	155	4.0	1,900	12.0	8,200
1.7	257	5.0	2,900	12.5	9,900
2.0	419	6.0	3,700	13.0	12,300
2.5	710	7.0	4,320	14.0	17,500
3.0	1,040	8.0	4,880	16.0	28,800
3.5	1,440	10.0	6,080		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	348	200	215	5,500	310	11,300	342	175	321	673	464	447
2	348	200	210	7,020	364	17,720	337	170	310	631	458	447
3	348	195	205	2,740	414	6,610	241	165	299	544	458	447
4	348	195	359	716	447	3,600	185	649	299	804	458	447
5	348	195	386	544	464	3,700	185	810	294	643	458	447
6	348	195	321	447	469	3,770	190	414	289	608	458	441
7	278	195	1,730	414	515	3,630	195	252	284	544	458	441
8	284	195	4,880	366	555	3,480	195	206	370	561	458	441
9	236	195	2,490	370	521	3,320	190	190	2,780	1,300	458	441
10	231	195	932	364	436	3,240	195	195	870	756	458	441
11	226	195	447	348	408	2,150	195	1,720	492	538	458	441
12	226	195	337	337	436	1,710	185	4,380	481	498	458	441
13	221	195	305	326	464	1,580	185	2,830	469	538	458	441
14	221	226	278	321	532	578	190	1,660	458	680	464	441
15	221	241	3,950	310	655	515	215	1,660	458	578	464	441
16	195	236	7,220	305	716	498	200	1,480	453	509	464	436
17	180	231	5,570	299	544	469	175	810	453	475	458	436
18	185	226	893	294	458	447	165	326	453	464	458	436
19	195	215	521	289	408	436	200	278	447	458	458	436
20	195	215	419	294	380	456	226	268	447	447	458	436
21	195	226	364	299	364	436	226	268	447	447	458	436
22	195	247	337	305	380	567	221	262	447	447	458	436
23	195	273	321	305	458	486	200	262	458	447	458	436
24	185	299	305	299	464	441	190	257	464	447	453	436
25	180	273	294	294	3,760	414	241	278	458	447	458	436
26	231	252	284	294	13,000	402	238	425	481	475	458	436
27	236	226	278	289	26,400	380	221	935	481	1,190	453	436
28	210	221	273	284	22,400	370	210	3,140	661	1,360	453	430
29	205	221	273	289	15,300	359	195	3,240	830	648	453	430
30	231	215	268	289	-	353	185	2,740	649	469	453	430
31	210	-	931	310	-	353	-	502	-	464	453	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	7,465	348	180	241	14,810
November.....	8,598	299	195	220	13,070
December.....	35,598	7,220	205	1,148	70,600
Calendar year 1947.....	209,056	7,220	180	573	414,700
January.....	24,881	7,020	284	803	49,350
February.....	92,022	26,400	310	3,173	162,500
March.....	61,750	11,300	353	1,992	122,500
April.....	8,315	342	165	210	12,530
May.....	30,946	4,380	165	998	61,380
June.....	16,103	2,780	284	537	31,940
July.....	19,090	1,360	447	616	37,860
August.....	14,192	464	453	458	28,150
September.....	13,167	447	430	439	26,120
Water year 1947-48.....	328,116	26,400	165	896	650,800

Peak discharge (base, 8,100 sec.-ft.)- Feb. 27 (10 a.m.) 27,600 sec.-ft.

Backwater from return of overbank flow; discharge computed on basis of backwater curve.

## Denton Creek near Roanoke, Tex.

Location.- Water-stage recorder, lat. 33°02', long. 97°12', 340 feet upstream from bridge on U. S. Highway 377, a quarter of a mile downstream from Texas & Pacific Railway bridge, and 2.2 miles northeast of Roanoke, Denton County. Datum of gage is 523.6 feet above mean sea level, datum of 1929.

Drainage area.- 634 square miles.

Records available.- October 1923 to December 1927, March 1939 to September 1948.

Average discharge.- 12 years (1924-27, 1939-48), 208 second-feet.

Extremes.- Maximum discharge during year, 16,300 second-feet Feb. 25 (gage height, 24.78 feet); no flow at times.

1923-27, 1939-48: Maximum discharge, 49,700 second-feet Apr. 20, 1942 (gage height, 30.20 feet), from rating curve extended above 32,000 second-feet on basis of velocity-area studies; no flow at times.

Maximum stage known, 31 feet in May 1908, from information by local residents.

Remarks.- Records good. No large diversions above station.

Revisions (water years).- W 850: 1926 (July mean); W 898: 1924(M).

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Oct. 26-29,  
Dec. 15, 16, and June 8-27)

2.12	0	2.7	15	3.6	130	6.0	958
2.2	.4	2.8	21	3.8	174	8.0	1,750
2.3	1.6	2.9	29	4.0	222	10.0	2,610
2.4	3.6	3.0	38	4.2	278	12.0	3,560
2.5	6.4	3.2	62	4.6	420	16.0	5,630
2.6	10	3.4	92	5.0	570	20.1	8,800

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	4.4	3.6	3,320	58	490	58	17	15	184		
2	0	2.1	2.4	1,250	89	380	52	16	13	67		
3	0	.8	84	331	96	292	49	15	12	31		
4	0	.2	12	180	96	251	48	261	10	46		
5	0	0	6.8	117	89	302	49	242	8.9	60		
6	0	0	23	92	87	341	52	66	7.5	27		
7	0	0	1,070	78	96	272	52	32	6.0	17		
8	0	0	964	70	103	225	50	20	8.8	14		
9	0	0	663	69	81	208	61	18	8.2	10		
10	0	0	164	62	81	196	52	26	5.2	23		
11	0	0	70	54	94	165	47	172	4.4	9.3		
12	0	0	39	53	108	132	43	150	4.6	76		
13	0	0	26	50	86	145	42	86	4.9	235		
14	0	2.3	20	43	141	161	78	68	5.2	114		
15	0	.3	1,870	39	174	152	52	46	3.4	41		
16	0	.4	992	38	148	134	40	29	2.2	17		
17	0	2.8	333	35	118	116	36	22	1.4	8.5		
18	0	9.3	145	31	96	108	33	17	.9	4.9		
19	0	6.4	80	32	87	118	30	15	.7	3.1		
20	0	5.5	52	37	75	114	27	13	.3	1.9		
21	0	3.6	39	41	76	112	26	12	.2	1.3		
22	0	3.8	33	45	130	128	25	10	0	.4		
23	0	3.4	30	41	148	110	25	9.6	0	.4		
24	0	2.6	26	35	118	92	24	9.6	0	.2		
25	0	2.6	26	33	8,770	89	26	12	0	0		
26	4.6	13	22	30	6,250	84	37	88	.1	0		
27	4.2	11	21	36	3,590	75	41	54	.3	0		
28	.1	8.2	20	25	1,390	66	30	41	194	0		
29	7.5	6.0	20	41	564	62	24	32	182	0		
30	14	4.6	20	40	-	63	20	23	218	0		
31	7.8	-	1,470	42	-	62	-	18	-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	30.2	14	0	0.97	60
November.....	95.3	0	0	3.11	185
December.....	8,346.8	1,870	2.4	269	16,580
Calendar year 1947.....	33,802.2	2,260	0	92.6	67,050
January.....	6,390	3,320	25	206	12,670
February.....	23,039	8,770	58	794	45,700
March.....	5,245	490	62	169	10,400
April.....	1,229	78	20	41.0	2,440
May.....	1,680.2	281	9.6	53.6	3,290
June.....	779.9	218	0	26.0	1,550
July.....	992.4	235	0	32.0	1,970
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48.....	47,805.8	8,770	0	131	94,820

Peak discharge (base, 7,200 sec.-ft.)- Feb. 25 (8 p.m.) 16,300 sec.-ft.

d Doubtful gage-height record; discharge computed on basis of estimated gage heights.

## Denton Creek near Grapevine, Tex.

Location.- Water-stage recorder, lat. 32°59'15", long. 97°00'45", at bridge on State Highway 121, 1.3 miles downstream from Bakers Branch, 4.3 miles downstream from Grapevine Dam, now under construction, 5.0 miles northeast of Grapevine, Tarrant County, and 6.1 miles upstream from mouth. Datum of gage is 439.13 feet above mean sea level, unadjusted. Prior to Oct. 6, staff gage at same site and datum.

Drainage area.- 746 square miles.

Records available.- October 1947 to September 1948.

Extremes.- Maximum discharge during year, 13,900 second-feet Feb. 26 (gage height, 30.38 feet), from rating curve extended above 5,000 second-feet by conveyance-slope method; no flow at times.

Maximum stage known occurred in May 1908 and was slightly higher than flood of April 1942, which reached a stage of 35.9 feet, from information by local resident.

Remarks.- Records good except those above 5,000 second-feet, which are poor. No diversions above station.

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Oct. 27 to Dec. 5)

Oct. 1 to Feb. 28

Feb. 29 to Sept. 30

2.92	0	5.5	51	22	2,500	2.92	0	4.0	13	7.0	165
3.0	.2	6.0	76	24	3,400	3.0	.2	4.4	24	8.0	247
3.2	.8	7.0	143	25	4,200	3.2	1.1	4.8	37	10	440
3.4	1.8	8.0	223	25.5	4,750	3.4	2.8	5.0	44	12	657
3.6	3.6	10	408	26	5,500	3.6	5.4	5.5	67	14	907
3.8	6.2	12	628	27	7,200	3.8	8.8	6.0	96	15	1,060
4.0	9.8	14	898	28	9,000						
4.5	21.8	16	1,230	29	10,900						
5.0	34	20	2,000								

Note.- Same as preceding table above  
15 feet.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	g.0.1	8.7	5.5	2,860	46	585	72	25	20	247		
2	g.1	5.4	4.7	2,280	67	528	65	22	16	123		
3	g.2	3.7	6.3	516	104	350	61	20	13	58		
4	g.2	2.4	35	241	108	301	59	83	12	136		
5	g.2	1.7	12	151	104	292	60	342	10	63		
6	g.1	1.4	9.8	104	94	370	61	119	8.3	46		
7	g.3	1.1	549	91	98	340	62	52	7.1	28		
8	a.6	.8	891	72	118	274	59	34	55	21		
9	.6	.8	902	67	108	238	60	25	165	17		
10	.5	.7	277	64	82	220	66	34	16	33		
11	.3	.6	97	58	98	203	56	159	8.4	37		
12	.2	.6	48	52	122	156	52	219	5.3	11		
13	.2	.5	32	50	108	149	49	112	1.6	164		
14	.2	.7	26	46	111	175	56	84	.4	189		
15	.1	2.2	1,220	42	183	175	76	62	.2	72		
16	.1	3.4	2,000	42	191	160	52	43	.1	24		
17	.1	2.8	555	41	143	142	44	31	.3	.8		
18	.1	2.0	174	38	104	124	40	25	.5	.2		
19	.1	2.9	94	36	88	124	38	21	.2	.1		
20	0	8.3	82	37	76	135	34	19	.2	0		
21	0	6.1	41	42	64	128	32	16	.1	0		
22	0	4.9	34	48	89	138	30	15	.1	0		
23	0	4.2	30	47	165	138	30	14	.2	0		
24	0	4.7	28	42	140	118	30	12	.3	0		
25	0	3.5	25	39	2,220	105	38	12	.3	0		
26	24	2.9	24	36	10,600	99	35	43	1.2	0		
27	10	4.7	22	33	5,240	93	44	76	.7	0		
28	2.7	12	21	39	2,690	81	42	49	159	0		
29	1.4	9.0	21	29	868	75	33	38	229	0		
30	.9	6.9	20	46	-	75	28	30	171	0		
31	2.6	-	235	43	-	75	-	23	-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	45.9	24	0	1.48	91
November.....	109.6	12	.5	3.65	217
December.....	7,501.3	2,000	4.7	242	14,880
Calendar year.....	-	-	-	-	-
January.....	7,332	2,860	29	237	14,540
February.....	24,227	10,600	46	835	48,050
March.....	6,166	585	75	199	12,230
April.....	1,464	76	28	48.8	2,900
May.....	1,859	342	12	60.0	3,690
June.....	902.1	229	.1	30.1	1,790
July.....	1,270.1	247	0	41.0	2,520
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48.....	50,877.0	10,600	0	139	100,900

Peak discharge (base, 7,200 sec.-ft.) - Feb. 26 (6 a.m.) 13,900 sec.-ft.

a No gage-height record; Discharge computed on basis of estimated gage height.

g Computed from graph based on gage readings.

## East Fork Trinity River near Rockwall, Tex.

Location.- Chain gage, lat. 32°55'25", long. 96°30'20", at bridge on U. S. Highway 67, 3 miles southwest of Rockwall, Rockwall County, and 8 miles upstream from Muddy Creek. Datum of gage is 404.3 feet above mean sea level, datum of 1929.

Drainage area.- 831 square miles.

Records available.- November 1923 to September 1948.

Average discharge.- 25 years, 504 second-feet.

Extremes.- Maximum discharge during year, 20,400 second-feet May 12 (gage height, 17.30 feet); no flow Aug. 23 to Sept. 30.

1923-48: Maximum discharge determined, 64,800 second-feet June 16, 1935 (gage height, 23.39 feet), by slope-area method; maximum gage height, 24.82 feet Apr. 20, 1942, while levees were breaking; no flow at times.

A stage of 24.6 feet was reached in April 1922. Levees also broke during this flood.

Remarks.- Records good. Gage read twice daily. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.8	132	28	3,720	210	2,510	185	48	265	182	11	
2	4.0	35	27	4,900	303	3,300	170	45	187	38	7.8	
3	3.6	22	24	5,410	435	2,830	155	42	88	23	6.1	
4	3.6	18	146	1,690	564	2,640	150	228	63	100	4.5	
5	3.6	14	446	616	720	1,070	146	965	51	786	3.4	
6	3.4	9.6	492	435	905	980	146	736	44	1,120	3.2	
7	3.3	7.4	1,220	369	940	1,180	155	446	37	968	2.9	
8	3.0	6.7	1,920	336	1,020	980	175	261	34	281	2.2	
9	2.9	6.9	2,310	314	1,020	654	190	58	30	292	1.8	
10	3.4	14	3,120	303	629	588	141	39	154	162	1.4	
11	9.0	11	1,170	281	424	504	123	1,610	39	94	1.1	
12	8.6	7.8	369	250	540	424	115	16,900	25	81	1.0	
13	5.4	5.8	250	240	886	380	141	11,000	21	74	.8	
14	4.0	16	225	225	640	380	265	4,750	19	96	.6	
15	3.4	102	1,220	200	654	402	208	1,680	18	141	.4	
16	2.9	260	2,830	190	600	380	122	528	16	141	1.0	
17	2.1	107	7,380	185	492	314	104	325	14	46	.5	
18	1.7	46	5,330	165	413	292	98	245	13	25	.4	
19	1.5	39	1,600	150	369	276	90	200	12	22	.6	
20	1.4	22	574	170	347	358	80	170	11	20	.5	
21	1.3	38	424	200	303	276	73	141	9.0	18	.4	
22	1.2	138	552	220	303	619	69	122	7.0	16	.3	
23	1.1	314	504	205	402	1,410	66	107	5.6	14	.1	
24	1.4	457	358	165	358	1,260	63	94	63	12	0	
25	1.2	337	292	136	424	636	73	82	380	9.8	0	
26	1.2	132	255	121	1,220	336	95	240	654	9.0	0	
27	2.3	74	240	128	14,100	281	121	699	265	7.8	0	
28	12	44	230	116	8,900	240	103	845	364	57	0	
29	1.1	34	220	136	4,730	205	68	445	696	112	0	
30	136	31	210	150	-	195	55	205	602	29	0	
31	314	-	1,180	185	-	195	-	240	-	16	0	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	548.4	314	1.1	17.7	1,090
November.....	2,481.2	457	5.8	82.7	4,920
December.....	35,146	7,380	24	1,134	69,710
Calendar year 1947.....	134,063.3	7,380	0	367	265,900
January.....	21,911	5,410	116	707	43,450
February.....	42,651	14,100	210	1,471	84,600
March.....	25,995	3,300	195	839	51,550
April.....	3,745	265	55	125	7,450
May.....	43,506	16,900	39	1,403	86,290
June.....	4,186.6	696	5.6	140	8,300
July.....	4,990.6	1,120	7.8	161	9,900
August.....	52.0	11	0	1.68	105
September.....	0	0	0	0	0
Water year 1947-48.....	185,212.8	16,900	0	506	367,400

Peak discharge (base, 6,100 sec.-ft.)- Dec. 17 (5 p.m.) 9,250 sec.-ft.; Jan. 2 (8 p.m.) 7,900 sec.-ft.; Feb. 27 (8:50 a.m.) 18,000 sec.-ft.; May 12 (11:30 a.m.) 20,400 sec.-ft.

Cedar Creek near Mabank, Tex.

Location.- Water-stage recorder, lat. 32°19'45", long. 96°10'05", at bridge on State Farm Highway 85, 2 miles downstream from Lacys Fork and 5½ miles southwest of Mabank, Kaufman County. Datum of gage is 285.39 feet above mean sea level (Texas Reclamation Department bench mark based on Geological Survey datum, unadjusted).

Drainage area.- 741 square miles.

Records available.- December 1938 to September 1948.

Extremes.- Maximum discharge during year, 16,100 second-feet Dec. 9 (gage height, 19.00 feet), from rating curve extended above 13,000 second-feet on basis of slope-area determination at gage height 23.5 feet, at location 12 miles downstream; no flow at times.

1938-48: Maximum discharge, 44,800 second-feet Mar. 30, 1945 (gage height, 25.43 feet), from rating curve extended above 13,000 second-feet on basis of slope-area determination at gage height 23.5 feet, at location 12 miles downstream; no flow at times.

Maximum stage known prior to establishment of station, about 23.5 feet Sept. 29, 1936, from information by local residents; peak discharge of this flood at site about 12 miles below station (drainage area, 910 square miles), 35,400 second-feet, by slope-area method.

Remarks.- Records good. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.8	11	14	1,610	869	1,180	29	15	25	58	16	11
2	.6	4.6	12	2,930	1,210	5,410	26	12	17	26	6.5	3.7
3	.5	2.8	11	4,200	1,260	5,490	23	11	14	26	3.8	2.1
4	.4	2.2	261	2,140	1,190	3,920	20	13	14	12	2.7	1.5
5	.3	1.6	853	317	1,100	1,670	20	9.8	13	11	2.1	1.1
6	.2	1.5	777	108	1,290	1,440	19	138	12	6.5	1.6	.8
7	.1	1.7	562	72	1,360	1,020	19	55	11	6.5	1.1	.5
8	.1	236	4,320	56	1,530	358	a18	30	11	58	.9	.4
9	0	316	13,300	47	2,100	168	a18	14	10	38	.6	.7
10	0	59	6,440	41	1,940	128	a17	67	8.1	18	.4	.4
11	0	18	2,200	37	957	105	a17	2,770	6.8	24	.3	10
12	0	12	411	34	982	81	a19	11,900	5.9	34	.2	12
13	0	7.8	123	32	1,440	68	93	15,100	5.3	11	.1	3.7
14	0	7.0	78	29	1,480	59	983	6,910	4.9	5.7	.1	2.6
15	0	74	1,090	27	883	55	374	2,770	4.2	3.8	0	2.0
16	0	494	5,390	29	364	54	90	768	3.6	2.9	0	1.4
17	0	203	9,390	41	165	52	42	153	3.2	2.4	0	1.0
18	0	45	5,960	64	118	48	28	60	2.7	2.0	0	.7
19	0	24	1,940	50	92	44	20	36	2.4	1.6	0	.5
20	0	17	290	82	79	40	15	35	2.1	1.3	0	.3
21	0	159	112	674	68	62	13	27	1.9	1.0	0	.2
22	0	1,130	77	1,350	59	1,290	11	21	1.7	.9	0	.1
23	0	1,680	59	1,020	51	2,060	10	16	1.6	.8	0	0
24	0	2,140	49	321	45	2,060	11	13	1.4	.6	0	0
25	0	1,580	41	133	42	755	45	14	1.3	.4	.1	0
26	0	229	36	106	41	136	322	18	1.1	.3	.2	0
27	0	62	32	434	86	84	178	153	1.0	.2	.1	0
28	0	35	29	507	456	60	76	468	1.0	.66	.26	0
29	26	24	27	a288	582	46	36	259	62	262	90	0
30	20	18	25	a92	-	37	22	86	52	70	41	0
31	15	-	51	313	-	32	-	58	-	37	35	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	64.0	26	0	2.06	127
November.....	8,575.2	2,140	1.5	286	17,010
December.....	53,958	13,300	11	1,741	107,000
Calendar year 1947.....	197,753.8	-	0	542	392,300
January.....	17,184	4,200	27	554	34,080
February.....	21,839	2,100	41	753	43,320
March.....	28,010	5,490	32	904	55,560
April.....	2,614	983	10	87.1	5,180
May.....	39,989.8	13,100	9.8	1,290	79,320
June.....	301.2	62	1.0	10.0	597
July.....	787.7	262	.2	25.4	1,560
August.....	228.8	90	0	7.38	454
September.....	56.7	12	0	1.89	112
Water year 1947-48.....	173,608.4	13,300	0	474	344,300

Peak discharge (base, 5,300 sec.-ft.)- Dec. 9 (4 a.m.) 16,100 sec.-ft.; Dec. 17 (10:30 a.m.) 10,600 sec.-ft.; Mar. 2 (6 p.m.) 5,170 sec.-ft.; May 13 (2:30 a.m.) 15,300 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage and weather records.

## TRINITY RIVER BASIN

Chambers Creek near Corsicana, Tex.

Location.- Water-stage recorder, lat. 32°06'30", long. 96°22'15", at bridge on State Highway 31, 500 feet upstream from St. Louis Southwestern Railway bridge, 6 miles east of Corsicana, Navarro County, and 17 miles upstream from Richland Creek. Datum of gage is 294.26 feet above mean sea level, datum of 1929.

Drainage area.- 958 square miles.

Records available.- March 1939 to September 1948.

Extremes.- Maximum discharge during year, 18,200 second-feet May 12 (gage height, 24.27 feet); no flow Aug. 7 to Sept. 30.

1939-48: Maximum discharge, 48,000 second-feet May 3, 1944 (gage height, 27.19 feet); no flow at times.

Maximum stage known, about 27½ feet in December 1913, from information by local residents.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	30	41	2,110	270	1,020	96	a40	a152	534	1.9	
2	14	18	39	2,720	444	3,900	88	a36	a158	413	1.4	
3	12	8.9	27	1,230	818	1,620	80	a33	a142	206	.8	
4	12	6.5	125	404	834	525	75	a32	a110	567	.4	
5	11	5.0	266	310	834	502	78	70	a91	1,280	.2	
6	10	3.9	113	270	694	474	78	432	a78	1,090	.1	
7	9.6	4.3	91	240	652	360	78	285	a66	242	0	
8	9.1	121	1,400	215	994	300	75	62	a55	134	0	
9	8.6	49	2,370	208	1,380	270	70	a35	47	419	0	
10	7.5	28	2,000	192	667	250	68	311	42	353	0	
11	10	18	427	172	486	230	63	4,970	37	630	0	
12	11	13	280	158	889	192	70	15,800	34	575	0	
13	7.8	11	240	152	532	184	2,170	11,400	31	96	0	
14	11	12	206	139	474	192	2,830	5,500	27	60	0	
15	8.3	99	864	127	426	188	727	2,370	24	56	0	
16	6.4	146	2,960	133	f340	176	154	770	21	65	0	
17	5.1	88	2,970	139	f300	158	105	380	18	35	0	
18	4.1	56	1,840	135	f280	145	85	321	15	26	0	
19	2.9	38	498	124	f260	135	66	452	14	21	0	
20	1.8	34	404	154	f240	138	56	1,610	12	17	0	
21	1.4	60	340	646	210	139	48	1,070	10	14	0	
22	2.2	229	310	462	184	583	44	305	8.6	12	0	
23	5.3	124	280	310	180	399	41	220	7.6	9.9	0	
24	3.6	126	250	215	176	245	41	a176	7.0	8.6	0	
25	2.3	138	225	162	180	188	88	a155	6.5	7.5	0	
26	2.2	91	206	166	184	145	362	478	498	6.0	0	
27	4.4	70	201	250	415	130	342	1,850	232	4.8	0	
28	71	58	201	174	882	116	97	2,300	276	4.0	0	
29	40	49	196	152	670	105	61	697	600	3.8	0	
30	29	44	168	162	-	102	46	233	982	2.2	0	
31	19	-	251	192	-	99	-	a176	-	1.6	0	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	357.6	71	1.4	11.5	709
November.....	1,776.6	229	3.9	59.2	3,520
December.....	19,619	2,970	37	633	38,910
Calendar year 1947 .....	134,612.4	13,300	0	369	267,000
January.....	12,222	2,720	124	394	24,240
February.....	14,895	1,380	176	507	29,150
March.....	13,209	3,900	99	426	26,200
April.....	8,280	2,830	41	276	16,420
May.....	52,349	15,800	32	1,689	103,800
June.....	3,781.7	962	6.5	126	7,500
July.....	6,895.0	1,280	1.6	222	13,670
August.....	4.6	1.9	0	.15	9.1
September.....	0	0	0	0	0
Water year 1947-48 .....	133,187.5	15,800	0	364	264,100

Peak discharge (base, 13,000 sec.-ft.).- May 12 (10 a.m.) 18,200 sec.-ft.  
 a No gage-height record; discharge computed on basis of weather records and records for Cedar Creek near Mabank and Richland Creek near Richland.

f Computed on basis of partly estimated gage-height record.

g Computed from graph based on gage readings.



## TRINITY RIVER BASIN

71

Richland Creek near Richland, Tex.

Location.- Water-stage recorder, lat. 31°57', long. 96°25', at bridge on U. S. Highway 75, 750 feet downstream from Texas & New Orleans Railroad bridge, 1 mile north of Richland, Navarro County, and 3½ miles downstream from Pinoak Creek. Datum of gage is 299.0 feet above mean sea level, datum of 1929.

Drainage area.- 760 square miles.

Records available.- December 1924 to February 1925 (discharge measurements only), March 1939 to September 1948.

Extremes.- Maximum discharge during year, 58,900 second-feet May 12 (gage height, 24.16 feet); no flow at times.

1939-48: Maximum discharge, that of May 12, 1948; no flow at times.

Maximum stage known, 25.5 feet in December 1913, from information by engineers of Texas & New Orleans Railroad.

Remarks.- Records fair except those for period of no gage-height record, which are poor. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0	14	33	628	24	12	62	68	1.8		
2	1	0	49	129	8,700	24	10	51	42	1.6		
3	1	0	47	144	7,310	21	8.9	45	150	1.4		
4	0	0	36	163	546	19	8.1	38	88	1.0		
5	0	0	29	234	166	19	7.9	34	555	.6		
6	0	0	22	180	173	19	614	32	478	.4		
7	0	0	18	135	111	20	297	40	202	.2		
8	0	0	15	161	78	23	89	30	75	.1		
9	0	0	14	647	64	22	24	23	47	0		
10	0	0	13	246	58	22	24	20	112	0		
11	0	0	12	114	53	24	7,890	18	224	0		
12	0	0	11	171	46	20	42,800	16	396	0		
13	0	0	9.5	152	38	1,210	11,500	15	59	0		
14	0	2.1	7.7	88	40	926	4,910	13	32	0		
15	0	102	6.7	78	48	159	467	12	22	0		
16	0	90	6.2	64	43	54	167	11	18	0		
17	0	22	5.5	49	41	29	144	9.7	15	0		
18	0	6.6	4.4	42	38	20	375	8.4	12	0		
19	0	3.9	5.0	38	33	16	547	7.0	11	0		
20	0	3.9	7.0	35	31	14	358	6.2	9.1	0		
21	0	3.8	46	33	35	12	141	5.5	7.9	0		
22	0	3.7	84	28	836	11	100	4.7	7.0	0		
23	0	3.7	72	24	644	9.8	83	4.4	6.1	0		
24	0	3.6	50	23	142	9.5	72	3.8	5.2	0		
25	0	3.6	30	23	59	39	61	3.4	4.5	0		
26	0	3.4	24	24	42	485	580	3.4	3.9	0		
27	0	3.3	156	26	55	162	1,490	3.2	3.7	0		
28	0	3.3	140	99	32	50	719	7.4	3.7	0		
29	0	3.2	38	78	29	24	414	43	3.3	0		
30	0	3.1	21	-	24	15	107	208	2.6	0		
31	0	3.3	14	-	24	-	78	-	2.2	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0.4	0.2	0	0.01	0.8
November.....	0	0	0	0	0
December.....	268.5	102	0	8.66	533
Calendar year 1947.....	139,481.5	20,800	0	382	276,600
January.....	1,007.0	156	4.4	32.5	2,000
February.....	3,293	647	23	113	6,470
March.....	20,147	8,700	24	650	39,960
April.....	3,502.3	1,210	9.5	117	6,950
May.....	74,097.9	42,800	7.9	2,390	147,000
June.....	778.1	208	3.2	25.9	1,540
July.....	2,665.2	555	2.2	86.0	5,290
August.....	7.1	1.8	0	.23	14
September.....	0	0	0	0	0
Water year 1947-48.....	105,736.5	42,800	0	289	209,800

Peak discharge (base, 12,000 sec.-ft.)- Mar. 3 (2 a.m.) 12,000 sec.-ft.; May 12 (7:30 a.m.) 58,900 sec.-ft.

Note.- No gage-height record Dec. 14 to Jan. 5; discharge computed on basis of weather records and records for Cedar Creek near Mabank and Chambers Creek near Corsicana.

## West Fork San Jacinto River near Conroe, Tex.

Location.- Water-stage recorder, lat. 30°15', long. 95°28', at bridge on U. S. Highway 75, 285 feet upstream from International-Great Northern Railroad bridge, 3½ miles downstream from Lake Creek, and 4½ miles south of Conroe, Montgomery County. Datum of gage is 100.1 feet above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936, and Houston supplementary adjustment of 1943.

Drainage area.- 832 square miles.

Records available.- May 1924 to September 1927, July 1939 to September 1948.

Average discharge.- 12 years (1924-27, 1939-48), 702 second-feet.

Extremes.- Maximum discharge during year, 3,320 second-feet Mar. 2 (gage height, 11.28 feet); minimum, 12 second-feet Aug. 19-24.

1924-27, 1939-48: Maximum discharge, 110,000 second-feet Nov. 25, 1940 (gage height, 25.85 feet), from rating curve extended above 43,000 second-feet on basis of velocity-area studies; minimum, 9.3 second-feet Oct. 1, 2, 1939. Maximum stage prior to 1940, 25.2 feet in December 1913, present site and datum, at railroad bridge 285 feet downstream, from information by engineers of International-Great Northern Railroad (discharge, 101,000 second-feet, from rating curve extended above 43,000 second-feet on basis of velocity-area studies).

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

Revisions (water years).- W 1058: 1926.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	24	76	87	342	1,170	158	344	69	25	17	18
2	21	23	70	88	225	2,790	151	230	62	31	16	15
3	21	23	67	87	194	2,880	144	181	55	43	15	15
4	20	25	114	93	187	2,200	136	154	49	42	15	14
5	20	25	191	92	184	1,280	130	134	46	51	15	14
6	20	25	201	86	175	636	126	139	42	40	15	14
7	20	27	167	80	167	791	121	150	39	32	15	14
8	19	26	272	76	202	1,840	115	140	36	32	15	17
9	19	26	388	75	550	2,240	110	130	35	36	15	18
10	20	33	388	71	530	1,300	106	122	49	32	15	22
11	21	47	246	70	749	795	104	128	50	28	15	25
12	21	35	196	70	1,630	742	122	211	39	30	15	23
13	21	34	326	61	al,620	601	136	256	34	44	15	22
14	20	45	376	77	a930	414	446	256	32	33	15	20
15	20	62	392	75	al,140	334	294	284	30	28	15	18
16	19	57	425	76	a792	294	238	247	29	26	14	18
17	19	52	353	105	a464	274	415	165	28	24	15	20
18	19	54	438	113	a302	256	344	127	28	27	13	19
19	31	51	628	125	a239	238	188	109	27	24	13	21
20	24	50	580	393	209	230	130	95	27	22	13	19
21	30	49	268	312	207	213	108	86	26	22	13	18
22	27	a77	168	273	572	249	96	79	26	21	13	18
23	25	al06	149	264	808	522	115	74	26	20	13	17
24	24	94	117	223	1,500	555	181	69	26	19	13	16
25	22	80	106	182	1,740	647	355	68	26	18	15	17
26	22	87	99	155	866	584	1,500	66	25	18	17	17
27	21	99	94	174	438	349	1,340	70	25	17	20	16
28	20	103	89	246	388	238	1,230	72	24	16	16	16
29	22	94	86	246	353	204	1,160	77	24	16	15	16
30	32	83	82	342	-	182	782	90	23	15	21	15
31	26	-	82	490	-	168	-	81	-	18	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-feet
October	686	32	19	22.1	0.027	0.03	1,360
November	1,618	106	23	53.9	.065	.07	3,210
December	7,232	628	67	233	.280	.32	14,340
Calendar year 1947	163,812	18,600	19	449	.540	7.32	324,900
January	4,927	490	70	159	.191	.22	9,770
February	17,703	1,740	167	610	.733	.79	35,110
March	25,216	2,880	188	813	.977	1.13	50,020
April	10,581	1,500	96	353	.424	.47	20,990
May	4,434	344	66	143	.172	.20	6,790
June	1,057	69	23	35.2	.042	.05	2,100
July	850	51	15	27.4	.033	.04	1,690
August	475	23	13	15.3	.018	.02	942
September	532	25	14	17.7	.021	.02	1,060
Water year 1947-48	75,311	2,880	13	206	.248	3.36	149,400

Peak discharge (base, 2,700 sec.-ft.)- Mar. 2 (11 p.m.) 3,320 sec.-ft.  
a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.

## West Fork San Jacinto River near Humble, Tex.

Location.- Water-stage recorder, lat. 30°01'35", long. 95°15'30", at bridge on U. S. Highway 59, 1,160 feet upstream from Texas & New Orleans Railroad bridge, about half a mile downstream from Spring Creek, and 2½ miles north of Humble, Harris County. Datum of gage is 30.53 feet above mean sea level, datum of 1929.

Drainage area.- 1,811 square miles.

Records available.- October 1928 to September 1948.

Average discharge.- 20 years, 1,202 second-feet.

Extremes.- Maximum discharge during year, 5,640 second-feet Mar. 3 (gage height, 9.27 feet); minimum, 27 second-feet Sept. 7-9.  
1928-48: Maximum discharge, 187,000 second-feet May 31, 1929, Nov. 25, 26, 1940; maximum gage height, 32.7 feet May 31, 1929, Nov. 26, 1940, present site and datum (flood of Nov. 26, 1940, affected by backwater from East Fork and it is believed flood of May 31, 1929, occurred under similar conditions); minimum discharge observed 14 second-feet Sept. 8-10, 1931.

Remarks.- Records good except those subsequent to March, which are fair. No diversion above station.

Revisions (water years).- W 898: 1929(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	72	96	160	756	798	295	950	164	56	40	52
2	67	67	89	167	551	2,630	260	557	128	62	46	53
3	66	64	96	171	408	5,160	240	403	109	61	45	49
4	67	64	297	167	376	4,400	225	320	98	64	43	40
5	66	62	1,020	171	376	2,860	207	265	91	139	42	34
6	66	62	1,180	171	376	1,700	199	280	89	109	41	30
7	64	69	965	156	370	1,220	182	310	83	109	40	28
8	62	66	819	146	365	1,800	171	265	80	98	40	27
9	62	64	965	136	588	3,220	156	245	78	87	38	29
10	59	66	912	134	1,070	2,680	153	220	78	96	37	101
11	58	72	763	131	1,070	1,660	235	212	87	96	36	102
12	58	76	587	136	1,670	1,300	350	245	93	96	36	74
13	55	76	1,210	153	2,740	1,180	240	330	85	89	35	66
14	55	83	1,260	171	2,000	942	310	420	78	82	34	59
15	55	83	1,430	178	1,480	735	664	473	74	80	32	56
16	55	98	1,660	174	1,560	644	557	467	72	74	31	50
17	55	98	1,560	195	1,180	575	431	386	70	72	30	55
18	55	96	1,260	250	716	535	535	280	64	64	31	52
19	82	89	1,140	350	527	497	497	203	64	62	30	52
20	76	82	1,140	749	443	467	310	153	62	64	30	49
21	91	82	847	972	403	437	230	131	53	64	30	46
22	76	129	527	756	570	443	182	120	52	56	29	43
23	67	310	398	664	1,020	545	274	117	50	50	29	41
24	61	315	325	569	1,660	868	392	107	50	49	29	37
25	61	220	275	479	2,620	958	398	98	50	42	32	35
26	61	153	230	376	2,050	972	1,520	107	50	41	36	34
27	59	164	203	503	1,140	770	2,680	265	49	37	45	34
28	58	174	191	563	868	563	2,300	285	48	36	45	34
29	63	139	178	624	798	443	1,950	280	50	35	52	35
30	72	109	167	631	-	368	1,610	255	53	35	46	35
31	74	-	167	749	-	350	-	199	-	34	49	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	1,973	91	55	63.6	0.035	0.04	3,910
November	3,304	315	62	110	.061	.07	6,550
December	21,957	1,660	89	708	.391	.45	43,550
Calendar year 1947	350,388	12,400	55	960	.530	7.20	695,000
January	10,957	972	131	353	.195	.23	21,730
February	29,751	2,740	365	1,026	.567	.61	59,010
March	41,736	5,160	350	1,346	.743	.86	82,780
April	17,751	2,680	153	592	.327	.36	35,210
May	8,948	950	98	289	.160	.18	17,750
June	2,252	164	48	75.1	.041	.05	4,470
July	2,139	139	34	69.0	.038	.04	4,240
August	1,159	52	29	37.4	.021	.02	2,300
September	1,432	102	27	47.7	.026	.03	2,840
Water year 1947-48	143,359	5,160	27	392	.216	2.94	284,300

Peak discharge (base, 8,900 sec.-ft.).- No peak above base.

## San Jacinto River near Huffman, Tex.

Location.- Water-stage recorder, lat. 29°59'40", long. 95°08'00", at Beaumont, Sour Lake & Western Railway bridge, 0.4 miles downstream from confluence of East and West Forks and 3.4 miles southwest of Huffman, Harris County. Datum of gage is 1.93 feet above mean sea level, datum of 1929.

Drainage area.- 2,791 square miles.

Records available.- October 1936 to September 1948.

Average discharge.- 12 years, 2,157 second-feet.

Extremes.- Maximum discharge during year, 5,930 second-feet Mar. 4 (gage height, 16.22 feet); minimum, 68 second-feet about Aug. 23-25.

1936-48: Maximum discharge observed, 253,000 second-feet Nov. 26, 1940 (gage height, 51.2 feet); minimum observed, 49 second-feet Sept. 1, 1939, Sept. 13, 14, 1940. Flood of May 31, 1929, reached a stage of 50.3 feet, from information by Beaumont, Sour Lake & Western Railway Co. (discharge, 237,000 second-feet). Flood of April 1876 reached a stage about 1½ feet lower, from information by local resident.

Remarks.- Records good except those above 3,000 second-feet and those for period of no gage-height record, which are fair. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	115	149	224	321	1,320	1,860	472	1,650	257	189	93	134
2	117	149	209	318	1,080	3,020	428	985	226	181	98	113
3	119	142	293	332	835	5,110	407	862	199	204	92	100
4	121	147	1,200	329	767	5,400	391	523	g194	221	86	93
5	123	140	1,930	311	767	4,160	379	454	g179	276	90	88
6	121	138	2,140	307	772	3,360	367	486	167	229	86	86
7	121	149	1,650	297	750	2,600	355	508	160	218	86	85
8	123	140	1,290	290	734	2,820	347	552	155	184	86	85
9	127	140	1,360	283	865	3,920	347	613	151	176	86	88
10	136	144	1,360	275	1,620	4,080	407	446	147	176	83	145
11	130	158	1,160	270	1,680	3,040	835	428	167	174	80	202
12	125	160	865	273	2,600	2,370	955	446	179	176	78	153
13	121	167	2,010	329	3,840	1,930	674	583	162	238	77	134
14	119	218	2,220	371	3,600	1,520	690	745	147	226	76	121
15	117	194	2,740	407	2,670	1,160	1,160	696	138	161	74	113
16	117	196	2,670	407	2,440	955	1,160	640	138	149	74	110
17	117	212	2,370	428	2,000	895	1,020	523	134	147	72	113
18	117	226	1,790	477	1,390	835	925	450	130	126	a72	115
19	149	207	1,490	718	1,080	806	696	428	125	130	a72	117
20	142	204	1,420	1,320	925	756	486	355	123	130	a71	115
21	164	207	1,160	1,720	835	723	395	393	123	123	a70	110
22	158	289	1,080	1,390	1,040	745	339	329	121	121	a70	104
23	149	441	593	1,160	2,480	955	366	280	121	111	a68	97
24	140	500	500	1,020	4,250	1,360	1,230	251	121	106	a68	92
25	134	477	454	895	5,200	1,460	1,420	244	121	100	a71	90
26	132	363	415	778	4,590	1,520	2,120	260	121	93	a83	86
27	130	311	383	985	3,200	1,260	4,420	446	113	90	a102	88
28	127	307	363	1,230	2,440	925	4,000	399	113	86	a123	85
29	132	283	347	1,230	2,070	718	3,520	459	142	88	a125	86
30	172	247	336	1,260	-	624	2,820	387	150	88	a113	86
31	151	-	332	1,290	-	548	-	311	-	88	a155	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-feet
October	4,066	172	115	131	0.047	0.05	8,060
November	6,805	500	138	227	.081	.09	13,500
December	56,354	2,740	209	1,173	.402	.48	72,110
Calendar year 1947	589,133	20,000	113	1,614	.578	7.93	1,169,000
January	21,022	1,720	270	678	.243	.28	41,700
February	57,840	5,200	734	1,994	.714	.77	114,700
March	61,435	5,400	548	1,982	.710	.82	121,900
April	35,131	4,420	339	1,104	.396	.44	65,710
May	16,022	1,850	244	517	.185	.21	31,780
June	4,524	257	113	151	.054	.06	8,970
July	4,829	276	86	156	.056	.06	9,580
August	2,680	155	68	86.5	.031	.04	5,320
September	3,234	202	85	108	.039	.04	6,410
Water year 1947-48	251,942	5,400	68	688	.247	3.34	499,700

Peak discharge (base, 14,000 sec.-ft.)- No peak above base.  
 a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.  
 g Computed from graph based on twice-daily readings of outside gage.

## Spring Creek near Spring, Tex.

Location.- Water-stage recorder, lat. 30°06'35", long. 95°26'10", at bridge on U. S. Highway 75, 4,500 feet upstream from International-Great Northern Railroad bridge, 2.4 miles northwest of Spring, Harris County, and 4 miles downstream from Willow Creek. Datum of gage is 78.10 feet (revised) above mean sea level, datum of 1929.

Drainage area.- 400 square miles.

Records available.- April 1939 to September 1948.

Extremes.- Maximum discharge during year, 1,430 second-feet Mar. 3 (gage height, 11.00 feet); minimum, 10 second-feet Aug. 20.

1939-48: Maximum discharge, 42,700 second-feet Nov. 25, 1940 (gage height, 28.60 feet, from graph based on gage readings); minimum observed, 7.7 second-feet Sept. 13, 1940.

Maximum stage known, 29.3 feet May 30, 1929, from floodmarks identified by local resident (discharge, 48,300 second-feet).

Remarks.- Records good except those for period of no gage-height record and those above 500 second-feet, which are fair. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	26	26	38	86	111	52	63	30	19	a16	23
2	18	24	25	40	72	596	52	54	28	18	a14	17
3	18	21	25	41	65	1,280	50	50	27	19	a14	16
4	17	20	53	39	63	426	48	48	26	20	a14	17
5	17	20	242	38	70	148	48	43	25	21	a14	16
6	17	20	342	36	84	128	48	44	24	21	a14	g15
7	17	22	190	35	88	152	47	57	24	22	a14	g15
8	17	21	109	34	89	148	46	55	24	28	a13	g16
9	17	21	120	34	200	124	48	47	24	28	a13	g17
10	16	22	128	34	350	136	57	44	26	36	a13	71
11	16	28	88	34	250	144	54	43	26	28	a13	35
12	16	28	68	34	220	116	48	48	25	26	a13	25
13	16	28	144	46	368	89	46	76	24	21	a12	21
14	16	26	270	54	255	77	50	85	22	19	a12	20
15	16	28	318	48	165	73	132	66	21	18	a12	18
16	15	40	508	46	116	72	95	50	20	18	a12	17
17	15	39	402	52	94	70	63	43	20	17	a12	18
18	15	31	132	64	81	66	50	39	19	17	a11	17
19	28	29	84	79	75	66	46	37	19	17	g11	17
20	48	28	66	183	70	63	43	34	18	16	g11	18
21	30	27	55	178	69	61	42	37	18	16	g13	18
22	20	36	49	128	113	65	41	41	18	a16	g12	16
23	17	74	45	93	178	73	46	38	18	a16	g11	16
24	17	73	42	73	220	132	109	34	18	a16	g11	16
25	17	49	40	61	192	105	98	33	18	a16	g12	17
26	17	40	38	54	156	76	414	65	18	a16	g14	16
27	17	33	36	61	132	66	466	94	18	a16	16	15
28	17	29	36	106	132	61	309	69	18	a15	16	15
29	19	27	36	152	124	58	124	48	19	a15	15	15
30	22	26	36	109	-	54	40	19	19	a15	14	16
31	26	-	36	98	-	53	-	34	-	a16	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
October	592	48	15	19.1	0.048	0.06	1,170
November	936	74	20	31.2	0.078	.09	1,860
December	3,789	508	25	122	.305	.35	7,520
Calendar year 1947	71,487	2,960	15	196	.490	6.64	141,800
January	2,102	183	34	67.8	.170	.20	4,170
February	4,157	368	63	143	.358	.39	8,250
March	4,891	1,280	53	158	.395	.45	9,700
April	2,853	466	41	95.1	.238	.27	5,660
May	1,557	94	33	50.2	.126	.14	3,090
June	654	30	18	21.8	.054	.06	1,300
July	602	36	15	19.4	.048	.06	1,190
August	415	23	11	13.4	.034	.04	823
September	670	97	15	22.3	.056	.06	1,330
Water year 1947-48	23,218	1,280	11	63.4	.158	2.17	46,060

Peak discharge (base, 1,600 second-ft.) - No peak above base.

a No gage-height record; discharge computed on basis of engineer's notes, weather records, and records for nearby stations.

g Computed from graph based on twice-daily gage readings.

## Cypress Creek near Westfield, Tex.

Location.- Water-stage recorder, lat. 30°02'08", long. 95°25'43", at bridge on U. S. Highway 75, 0.9 mile upstream from Senger Gully, 1.8 miles northwest of Westfield, Harris County, 2.0 miles upstream from International-Great Northern Railroad bridge, and 11.0 miles upstream from mouth. Datum of gage is 75.9 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 262 square miles.

Records available.- July 1944 to September 1948.

Extremes.- Maximum discharge during year, 424 second-feet Dec. 17 (gage height, 6.95 feet); no flow Aug. 3-12, Aug. 18 to Sept. 5.

1944-48: Maximum discharge, 10,700 second-feet Aug. 31, 1945 (gage height, 19.03 feet); no flow Aug. 3-12, Aug. 18 to Sept. 5, 1948.

Maximum stage known, about 22 feet in May 1929, from information by local resident. Flood of November 1940 reached a stage of about 20.2 feet, from information by State Highway Department.

Remarks.- Records good except those for period of no gage-height record, which are fair. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a3.9	3.1	4.2	5.3	35	53	3.9	17	8.7	2.7	0.2	0
2	a2.5	2.3	3.5	4.8	29	54	3.7	11	6.1	2.5	.1	0
3	a1.8	1.8	3.1	4.5	24	145	3.5	7.7	4.7	2.0	0	0
4	a1.6	1.5	81	4.2	22	199	3.3	5.9	4.2	4.9	0	0
5	a2.1	1.2	211	4.1	21	167	3.2	5.0	3.6	12	0	1.7
6	a3.3	1.1	246	3.8	18	110	3.2	10	3.0	8.4	0	3.6
7	a5.3	1.0	255	3.8	16	58	3.1	9.2	2.4	5.4	0	2.7
8	a5.9	1.0	246	3.8	18	49	2.9	9.8	2.1	5.8	0	2.1
9	a5.2	1.0	171	3.8	31	96	3.1	8.4	2.0	10	0	1.8
10	a3.5	1.0	101	3.7	28	93	4.8	6.6	5.3	5.4	0	1.7
11	a2.6	1.1	69	3.6	47	64	235	9.8	2.5	4.1	0	1.8
12	a1.9	1.2	56	3.7	96	57	80	15	1.7	3.7	.6	1.6
13	a1.5	1.3	242	6.8	101	49	23	15	1.5	3.1	.5	4.5
14	a1.3	1.6	211	7.0	113	35	58	62	2.2	2.4	.4	5.7
15	a1.3	1.7	333	5.2	93	23	98	54	2.9	2.1	.4	4.5
16	1.3	1.8	375	5.6	64	14	68	22	2.2	1.8	.2	3.7
17	2.8	1.6	411	9.4	43	12	26	13	1.6	2.0	.2	3.1
18	3.0	3.2	330	8.4	30	9.8	14	9.4	1.4	2.0	.1	3.0
19	3.3	2.2	184	35	21	8.9	9.4	6.5	1.2	1.6	0	2.8
20	6.6	3.0	98	98	15	8.6	6.6	7.6	1.1	1.4	0	2.3
21	4.2	3.5	58	79	15	7.9	5.2	11	1.0	1.3	0	1.9
22	2.5	21	38	82	28	7.9	4.2	8.6	.8	1.2	0	1.6
23	2.5	42	26	74	26	7.6	9.7	5.6	.8	1.1	0	1.3
24	2.5	22	19	55	77	6.5	10	4.2	.7	1.0	0	1.0
25	2.1	14	14	39	90	5.6	89	4.3	.7	.8	0	1.3
26	1.8	17	11	27	70	5.4	116	43	.7	.7	0	3.8
27	1.4	14	8.9	39	60	5.6	171	30	.6	.5	0	4.8
28	1.2	9.2	7.9	38	52	5.2	98	88	.7	.4	0	5.0
29	3.6	6.6	6.8	25	46	4.5	46	90	1.2	.3	0	4.5
30	5.3	5.0	6.2	33	-	4.3	30	42	2.5	.3	0	3.7
31	4.8	-	5.7	41	-	4.2	-	16	-	.2	0	-
Month				Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff			
									Inches	Acre-feet		
October				92.6	6.6	1.2	2.99	0.011	0.01	184		
November				189.0	42	1.0	6.27	.024	.03	373		
December				3,832.3	411	3.1	124	4.73	.54	7,600		
Calendar year 1947				53,282.8	1,620	.6	146	.557	7.58	105,700		
January				756.5	98	3.6	24.4	.093	.11	1,500		
February				1,329	113	15	45.8	.175	.19	2,640		
March				1,370.0	199	4.2	44.2	.169	.19	2,720		
April				1,274.0	235	2.9	42.5	.162	.18	2,530		
May				647.6	90	4.2	20.9	.080	.09	1,280		
June				70.1	8.7	.6	2.34	.009	.01	139		
July				91.1	12	.2	2.94	.011	.01	181		
August				2.7	.6	0	.09	.0003	.0004	5.4		
September				75.5	5.7	0	2.52	.010	.01	150		
Water year 1947-48				9,729.4	411	0	26.6	.102	1.37	19,300		

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

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.



East Fork San Jacinto River near Cleveland, Tex.

Location.- Water-stage recorder, lat. 30°20', long. 95°07', at bridge on State Highway 105, 83 feet downstream from Gulf, Colorado & Santa Fe Railway bridge, 1½ miles west of Cleveland, Liberty County, and 4 miles downstream from Nebbles Creek. Datum of gage is 113.0 feet above mean sea level, datum of 1929.

Drainage area.- 330 square miles.

Records available.- April 1939 to September 1948.

Extremes.- Maximum discharge during year, 1,060 second-feet Apr. 27 (gage height, 5.64 feet); minimum, 11 second-feet Aug. 20-24.

1939-48: Maximum discharge, 77,500 second-feet Nov. 24, 1940 (gage height, 20.37 feet), from rating curve extended above 14,000 second-feet by logarithmic plotting; minimum, 7.2 second-feet Sept. 6, 1939.

Maximum stage known prior to 1940, 19.9 feet May 5, 1935, from information by local resident (discharge, 69,500 second-feet, from rating curve extended above 14,000 second-feet by logarithmic plotting).

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	22	31	43	86	110	76	104	43	27	16	16
2	20	20	31	45	77	130	76	88	37	25	16	16
3	20	19	37	43	69	110	73	80	34	24	16	15
4	21	20	108	40	69	95	69	74	31	31	16	14
5	21	21	188	38	74	88	67	69	30	33	16	14
6	21	21	96	37	70	80	66	95	30	29	16	14
7	20	20	76	37	65	90	65	277	27	27	14	14
8	19	24	83	38	75	170	63	134	26	28	14	14
9	19	25	113	38	149	228	72	87	26	26	14	14
10	19	24	88	38	130	312	250	79	26	27	14	19
11	19	29	72	38	110	344	98	76	26	71	14	19
12	19	28	66	40	130	249	69	154	27	154	13	16
13	19	26	112	43	170	164	62	141	24	66	13	16
14	19	25	118	49	140	131	137	113	23	44	13	16
15	19	27	162	40	110	121	253	94	23	33	13	15
16	19	32	147	40	100	116	333	79	22	29	12	16
17	19	29	102	54	95	113	157	69	22	26	12	18
18	17	35	74	55	88	107	87	65	21	24	12	19
19	20	49	63	60	82	104	67	92	20	29	12	19
20	19	37	56	115	78	100	59	141	19	33	12	17
21	19	31	51	98	76	98	52	74	19	26	12	16
22	19	37	45	87	120	126	48	60	19	23	12	16
23	17	99	44	70	220	178	162	55	19	20	12	15
24	17	80	42	62	190	242	364	51	18	19	12	14
25	18	52	40	53	170	233	354	45	18	19	12	14
26	18	41	40	52	150	142	890	45	18	19	14	14
27	18	36	38	71	125	113	1,040	79	18	18	16	13
28	18	33	38	87	120	98	914	156	22	18	20	13
29	19	32	38	87	105	87	422	80	63	16	21	13
30	20	31	38	98	-	83	145	56	33	16	19	13
31	23	-	40	98	-	80	-	49	-	16	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	595	23	17	19.2	0.058	0.07	1,180
November	1,005	99	19	33.5	.102	.11	1,990
December	2,277	188	31	73.5	.223	.26	4,520
Calendar year 1947	75,301	6,620	17	206	.624	8.50	149,400
January	1,795	115	37	57.9	.175	.20	3,560
February	3,253	220	65	112	.339	.37	6,450
March	4,442	344	80	143	.433	.50	8,810
April	6,591	1,040	48	220	.667	.74	13,070
May	2,861	277	45	92.3	.280	.32	5,670
June	784	63	18	26.1	.079	.09	1,560
July	996	154	16	32.1	.097	.11	1,980
August	444	21	12	14.3	.043	.05	881
September	462	19	13	15.4	.047	.05	916
Water year 1947-48	25,505	1,040	12	69.7	.211	2.87	50,590

Peak discharge (base, 2,500 sec.-ft.).- No peak above base.

Note.- No gage-height record Feb. 10 to Mar. 8, July 29 to Aug. 15; discharge computed on basis of weather records, discharge measurement made on Aug. 13, and records for other stations in basin.

## Peach Creek at Splendora, Tex.

Location (revised).- Water-stage recorder, lat. 30°14', long. 95°10', at county road bridge between Splendora and Conroe, about 1,500 feet west of depot at Splendora, Montgomery County, 2.5 miles upstream from Texas & New Orleans Railroad bridge, 2.5 miles upstream from U. S. Highway 59 bridge, 9.7 miles upstream from Caney Creek. Datum of gage is 86.61 feet above mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1936.

Drainage area.- 120 square miles.

Records available.- December 1943 to September 1948.

Extremes.- Maximum discharge during year, 341 second-feet Apr. 27 (gage height, 5.85 feet); minimum, 9.6 second-feet Aug. 18-21.

1943-48: Maximum discharge, 7,980 second-feet Apr. 1, 1945 (gage height, 13.85 feet); minimum, that of Aug. 18-21, 1948.

Maximum stage known since about 1895, 17.0 feet in November 1940, from floodmarks (adjusted to present site and datum), from information by local resident.

Remarks.--Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	20	22	37	53	67	37	43	22	23	14	12
2	16	18	22	41	58	67	35	39	21	19	13	12
3	16	17	25	42	56	67	34	36	30	20	12	12
4	16	17	59	37	58	57	33	34	20	30	12	11
5	16	17	164	35	67	55	32	32	20	28	12	11
6	16	18	123	34	87	99	31	37	19	29	12	11
7	17	18	67	33	60	94	32	77	19	22	12	10
8	16	17	65	33	63	72	31	72	19	20	12	10
9	16	19	80	33	106	88	31	44	18	19	12	12
10	17	20	72	34	113	114	52	35	19	21	12	12
11	17	22	50	34	87	90	77	34	22	22	12	14
12	17	24	42	34	124	65	45	60	23	21	12	14
13	16	23	106	62	144	54	37	70	21	24	11	14
14	16	22	108	54	113	50	41	56	19	21	11	13
15	16	21	152	50	82	50	56	38	18	18	11	13
16	16	28	124	40	87	51	44	32	18	17	10	13
17	16	32	84	46	65	51	33	29	17	16	10	13
18	16	24	60	58	60	49	29	28	17	16	9.8	13
19	16	28	49	76	58	46	27	52	17	16	9.6	16
20	17	30	44	148	57	45	26	49	17	19	9.6	14
21	18	24	42	111	60	45	25	33	17	21	9.6	14
22	18	25	40	82	107	66	24	27	17	16	9.8	13
23	16	51	38	65	126	92	132	25	17	16	9.8	12
24	16	72	37	57	220	77	217	24	16	15	9.8	12
25	16	51	36	52	164	54	152	23	16	14	11	12
26	16	30	35	52	127	46	292	31	16	14	12	11
27	16	26	35	78	111	44	282	33	18	14	17	11
28	16	25	34	94	97	42	130	32	18	13	16	11
29	16	24	34	82	77	38	67	29	18	13	14	11
30	17	23	34	74	-	37	51	25	21	13	16	11
31	18	-	35	70	-	37	-	23	-	13	15	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	508	18	16	16.4	0.137	0.16	1,010
November	786	72	17	26.2	.218	.24	1,560
December	1,918	164	22	61.9	.516	.59	3,800
Calendar year 1947	30,176	1,660	15	82.7	.689	9.34	59,860
January	1,778	148	35	57.4	.478	.55	3,530
February	2,655	220	56	91.6	.763	.82	5,270
March	1,909	114	37	61.6	.515	.59	3,790
April	2,135	292	24	71.2	.593	.66	4,230
May	1,202	77	23	38.8	.323	.37	2,380
June	560	23	16	18.7	.156	.17	1,110
July	583	30	13	18.8	.157	.18	1,160
August	369.0	17	9.6	11.9	.099	.11	732
September	368	16	10	12.3	.102	.11	730
Water year 1947-48	14,771.0	292	9.6	40.4	.337	4.55	29,300

Peak discharge (base, 900 sec.-ft.).- No peak above base.

## SAN JACINTO RIVER BASIN

79

Caney Creek near Splendora, Tex.

Location.- Water-stage recorder, lat. 30°16', long. 95°18', at county road bridge, 4 miles downstream from Gulf, Colorado & Santa Fe Railway bridge and 8 miles west of Splendora, Montgomery County. Datum of gage is 123.44 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 104 square miles.

Records available.- January 1944 to September 1948.

Extremes.- Maximum discharge during year, 852 second-feet Apr. 26 (gage height, 7.37 feet); minimum, 11 second-feet Aug. 14-24, Sept. 5-8, 26-29.

1944-48: Maximum discharge, 14,900 second-feet Apr. 1, 1945 (gage height, 18.19 feet), from rating curve extended above 6,000 second-feet by logarithmic plotting; minimum, that of Aug. 14-24, Sept. 5-8, 26-29, 1948.

Maximum stage known since about 1885, 22.0 feet in November 1940, present site and datum, from information by local resident. Flood of May 1935 reached a stage of 19.3 feet, present site and datum, from information by local resident.

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	17	21	29	44	73	27	35	19	16	14	13
2	15	16	22	31	40	136	27	32	19	16	14	12
3	15	16	23	28	37	64	26	31	18	25	13	12
4	15	17	82	27	38	46	25	29	18	24	13	12
5	15	16	55	26	40	41	25	28	18	23	13	12
6	15	16	50	25	39	49	25	35	18	19	13	12
7	15	17	44	25	38	57	25	46	18	18	13	12
8	15	17	45	25	42	45	24	32	20	17	13	12
9	21	17	45	25	133	47	24	28	17	17	13	13
10	21	18	32	25	142	165	26	27	17	16	12	15
11	17	21	29	25	66	79	26	30	17	17	12	15
12	16	20	28	26	85	49	24	63	17	17	12	14
13	16	18	59	31	184	42	25	74	17	17	12	14
14	16	19	51	35	87	39	207	38	16	17	11	14
15	16	32	62	28	60	39	74	30	16	16	11	13
16	15	25	71	28	46	39	38	27	16	15	11	13
17	15	21	48	36	42	38	29	26	16	15	11	13
18	15	24	35	40	39	36	25	25	16	15	12	14
19	18	24	31	46	38	35	23	25	15	16	11	14
20	22	21	29	89	37	34	22	24	15	18	12	14
21	17	21	28	84	41	33	21	22	15	15	12	13
22	16	30	27	50	400	43	20	22	15	14	12	12
23	16	56	27	41	149	79	39	22	15	14	12	12
24	16	35	26	36	80	55	44	21	15	14	12	12
25	16	27	26	34	69	37	72	21	15	14	13	12
26	16	24	25	35	60	35	541	25	16	14	15	12
27	16	23	25	42	63	32	199	33	17	14	14	11
28	16	22	25	60	68	29	62	25	16	14	13	11
29	16	22	25	55	57	28	45	22	17	14	13	12
30	18	21	25	46	-	27	38	21	17	14	14	12
31	20	-	26	44	-	28	-	20	-	14	13	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	511	22	15	16.5	0.159	0.18	1,010
November	673	56	16	22.4	.215	.24	1,330
December	1,147	82	21	37.0	.356	.41	2,280
Calendar year 1947	25,270	1,810	14	69.2	.665	9.03	50,130
January	1,177	89	25	38.0	.365	.42	2,330
February	2,264	400	37	78.1	.751	.81	4,490
March	1,577	165	27	50.9	.489	.56	3,130
April	1,828	541	20	60.9	.586	.65	3,630
May	939	74	20	30.3	.291	.34	1,860
June	501	20	15	16.7	.161	.18	994
July	507	25	14	16.4	.158	.18	1,010
August	389	15	11	12.5	.120	.14	772
September	382	15	11	12.7	.122	.14	758
Water year 1947-48	11,895	541	11	32.5	.312	4.25	23,590

Peak discharge (base, 800 sec.-ft.)- Apr. 26 (8 p.m.) 852 sec.-ft.  
 Note.- No gage-height record July 25 to Aug. 16; discharge computed on basis of estimated gage heights, 1 discharge measurement, weather records, and records for nearby stations.

## SAN JACINTO RIVER BASIN

## Barker Reservoir near Addicks, Tex.

Location.- Water-stage recorder, lat. 29°46'05", long. 95°38'45", at dam on Buffalo Bayou 45 feet upstream from reservoir outlet works, 1,160 feet upstream from Addicks-Howell county road, 1.1 miles south of Addicks, Harris County, and 1.2 miles upstream from South Mayde Creek. Auxiliary water-stage recorder, lat. 29°43'10", long. 95°44'00", on Buffalo Bayou, 2.8 miles west of Clodine, Fort Bend County, 4.8 miles (2.7 miles by reservoir) upstream from Mason Creek, 9.0 miles (6.4 miles by reservoir) upstream from reservoir outlet works. Datum of both gages is 0.3 foot below mean sea level, datum of 1929, Galveston-Houston supplementary adjustment and Houston supplementary adjustment of 1943.

Drainage area.- 150 square miles at outlet works; 105 square miles at upper gage.

Records available.- August 1945 to September 1948.

Extremes.- Maximum gage height at dam during year, 78.8 feet Dec. 15, 16 (contents, 35 acre-feet); maximum at upper gage, 96.2 feet Dec. 6, 7, 14-16.  
1945-48: Maximum gage height at dam, 90.4 feet Aug. 30, 1945 (contents, 11,240 acre-feet); maximum at upper gage, 98.6 feet Aug. 28, 1945.  
Maximum stage known near site of upper gage prior to construction of reservoir, 98.1 feet in December 1935, from floodmark about 1,100 feet to right of and 1,100 feet downstream from upper gage.

Remarks.- Reservoir is formed by rolled-fill earthen-type dam 72,844 feet long. Dam completed Feb. 3, 1946, but was first used for flood control in spring of 1945. Reservoir is operated for flood protection of city of Houston. It is a detention reservoir with no provision for permanent storage. Outlet works consist of five concrete conduits, four of which are uncontrolled. The middle conduit is controlled by two vertical-lift steel gates and remains closed except during recession of large floods or during emergencies. Capacity, 127,900 acre-feet between gage heights 75.0 feet (bottom of conduits) and 101.9 feet (top of design flood pool). No constructed emergency spillways; runoff considerably in excess of designed capacity will be discharged around ends of dam. Gage heights and contents not published for floods that do not produce a gage height of 82.0 feet or higher at dam.

Cooperation.- Capacity table furnished by Corps of Engineers.

## Buffalo Bayou near Addicks, Tex.

Location (revised).- Water-stage recorder, lat. 29°45'44", long. 95°36'21" at Dairy-Ashford road bridge over rectified channel, 1.8 miles downstream from South Mayde Creek, 2.6 miles southeast of Addicks, Harris County, 3.0 miles downstream from outlet works of Addicks Reservoir, and 3.2 miles downstream from outlet works of Barker Reservoir. Datum of gage is 0.30 foot below mean sea level, datum of 1929, Galveston-Houston supplementary adjustment of 1943. Feb. 2 to May 20 staff gage at same site and datum. Prior to Feb. 2, 1948, water-stage recorder on natural channel at site 1,200 feet to right and at same datum.

Drainage area.- 310 square miles.

Records available.- Aug. 1945 to September 1948.

Extremes.- Maximum discharge during year, 2,070 second-feet Dec. 16 (gage height, 71.45 feet); no flow at times.

1945-48: Maximum discharge, 11,200 second-feet Aug. 29, 1945 (gage height, 81.23 feet); no flow at times during 1948.

Maximum stage known since about 1896, 85.6 feet in December 1935 present datum, (adjusted to former site 1,200 feet to right of present gage, from floodmark half a mile downstream, on basis of slope of flood of Aug. 29, 1945), from information by local resident.

Remarks.- Records poor. Flood partly regulated by Barker Reservoir (see preceding page) and Addicks Reservoir (see p. 83). No diversion above station.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	6	16	12	80	130	5	20	9	4	1	0
2	8	5	11	12	67	190	5	13	9	4	1	0
3	9	4	10	10	67	190	5	8	8	4	1	0
4	9	3	129	9	67	160	5	6	6	4	0	2
5	10	3	672	8	70	110	5	4	5	4	0	2
6	10	2	761	8	72	100	5	7	4	4	0	2
7	8	3	621	8	74	110	5	6	3	4	0	3
8	7	2	835	7	72	150	5	8	3	4	0	4
9	7	2	663	8	72	240	5	6	10	4	0	9
10	8	2	551	7	72	420	5	5	18	3	0	8
11	8	4	391	6	73	330	74	15	70	3	0	7
12	8	3	318	7	150	250	58	165	16	3	0	6
13	8	3	953	20	400	120	44	210	7	3	0	35
14	8	17	1,140	20	300	70	38	130	4	3	0	30
15	8	14	1,580	10	160	50	82	50	3	2	0	23
16	8	13	1,880	10	100	43	60	20	2	2	0	19
17	8	12	1,360	10	70	35	38	13	2	2	0	17
18	8	10	882	20	64	30	25	180	1	2	0	14
19	25	6	579	100	56	27	18	165	1	2	0	10
20	60	4	338	400	50	23	13	250	1	2	0	7
21	52	4	197	350	100	20	9	150	1	1	0	8
22	30	140	142	300	160	18	7	60	0	1	0	10
23	16	356	97	200	380	16	15	25	0	1	0	4
24	9	303	66	130	280	14	40	10	0	1	0	3
25	5	241	43	90	210	12	70	14	0	1	1	6
26	4	170	29	65	190	10	110	12	0	1	10	40
27	4	100	22	150	130	9	90	35	0	1	34	34
28	4	61	18	220	160	8	60	30	0	1	2	25
29	7	38	14	180	140	7	40	10	1	1	0	19
30	15	23	12	150	-	6	30	9	3	1	0	14
31	9	-	12	110	-	6	-	9	-	1	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acre-feet
October	368	80	4	12.5	0.040	0.05	770
November	1,554	356	2	51.8	.167	.19	3,080
December	14,142	1,880	10	456	1.47	1.70	28,050
Calendar year 1947	71,145.4	1,960	2	196	.629	8.54	141,100
January	2,637	400	6	85.1	.275	.32	5,230
February	3,956	400	50	136	.439	.47	7,850
March	2,904	420	6	93.7	.302	.35	5,760
April	971	110	5	32.4	.105	.12	1,930
May	1,645	250	4	53.1	.171	.20	3,260
June	187	70	0	6.23	.020	.02	371
July	74	4	1	2.39	.008	.01	147
August	50	34	0	1.61	.005	.01	99
September	363	40	0	12.1	.039	.04	720
Water year 1947-48	28,871	1,880	0	78.9	.255	3.48	57,270

Note.- Stage-discharge relation indefinite Oct. 1-5, 11-19, 22-26, Jan. 15 to Sept. 30 (no gage-height record Jan. 15 to Feb. 1); discharge computed on basis of discharge measurements, weather records, and records for station at Houston.

## Buffalo Bayou at Houston, Tex.

Location.- Water-stage recorder, lat. 29°45'42", long. 95°23'52", at Waugh Drive Bridge in Houston, Harris County, 0.41 mile (revised) upstream from Texas & New Orleans Railroad bridge, and 3.1 miles (revised) upstream from Whiteoak Bayou. Datum of gage is 4.08 feet below mean sea level, datum of 1929.

Drainage area.- 362 square miles.

Records available.- May 1936 to September 1948.

Average discharge.- 12 years, 312 second-feet.

Extremes.- Maximum discharge during year, 2,130 second-feet Dec. 17 (gage height, 18.26 feet); minimum, 3.1 second-feet Sept. 26.

1936-48: Maximum discharge, 10,900 second-feet Aug. 30, 1945 (gage height, 34.23 feet); minimum not determined.  
Maximum stage known, 54.4 feet Dec. 9, 1935, present site and datum, (discharge, 40,000 second-feet, furnished by county engineer, Harris County). Flood of May 31, 1929, reached a stage of 48.9 feet, present site and datum (discharge, 19,000 second-feet at bridge on Capitol Avenue, 2 miles downstream, from rating curve extended above 15,300 second-feet, stage-discharge relation materially affected by interference of bridge; furnished by city of Houston).

Remarks.- Records good. Flood flow partly regulated by Barker Reservoir (see p. 80) and Addicks Reservoir (see following page). No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	29	31	24	128	160	15	34	28	14	44	7.5
2	13	23	23	21	105	137	13	20	26	11	13	6.1
3	10	18	22	21	84	190	13	16	27	14	15	6.3
4	9.8	25	16	21	80	190	13	13	10	22	8.8	5.5
5	5.7	10	159	19	87	152	14	10	7.5	25	8.6	4.6
6	16	9.0	674	17	94	106	13	45	6.6	22	6.6	5.0
7	17	12	696	16	87	106	14	13	7.2	22	8.2	5.7
8	13	5.2	630	15	88	153	14	19	7.2	49	6.1	7.2
9	15	4.2	674	15	78	243	14	28	6.8	19	6.1	15
10	13	8.8	630	15	84	394	12	23	13	19	6.1	9.5
11	13	73	498	13	106	420	43	35	22	9.0	6.1	8.8
12	13	15	430	37	204	340	74	26	70	9.5	6.1	7.5
13	9.8	20	970	58	331	214	57	69	24	19	6.3	8.2
14	6.3	90	1,160	30	405	111	47	121	12	g10	6.3	34
15	4.3	49	1,510	37	286	76	74	56	8.0	g15	6.8	29
16	4.2	44	1,800	35	178	62	82	28	6.8	28.2	6.1	25
17	4.5	49	2,060	34	119	51	53	14	6.3	4.6	5.7	18
18	5.2	60	1,550	89	90	45	38	162	6.8	5.2	5.2	18
19	66	45	879	177	73	41	28	141	5.7	7.5	4.8	16
20	65	32	520	287	62	37	21	172	5.9	18	5.2	9.8
21	58	224	306	405	126	35	17	202	9.0	13	4.8	13
22	56	196	193	340	137	35	15	141	11	7.5	4.6	31
23	43	273	131	260	250	29	37	62	13	5.5	5.0	9.2
24	19	368	95	166	392	28	36	43	6.8	4.5	14	5.7
25	7.4	305	71	106	272	24	71	62	7.8	4.3	11	3.7
26	4.5	234	56	79	220	21	48	53	7.2	4.6	19	77
27	37	138	46	182	196	19	106	112	6.6	8.5	24	40
28	14	87	38	227	190	15	90	27	6.1	6.8	34	39
29	14	60	33	202	184	17	62	12	22	5.5	14	30
30	68	48	29	196	-	16	33	9.8	28	5.7	14	22
31	39	-	29	172	-	15	-	9.0	-	16	8.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff	
						Inches	Acres-feet
October	683.7	68	4.2	22.1	0.061	0.07	1,360
November	2,354.2	368	4.2	78.5	.217	.24	4,670
December	15,959	2,060	16	515	1.42	1.64	31,650
Calendar year 1947	89,051.4	2,710	4.2	244	.674	9.13	176,600
January	3,316	405	13	107	.296	.34	6,580
February	4,736	405	62	163	.450	.49	9,390
March	3,482	420	15	112	.309	.36	6,910
April	1,169	106	12	39.0	.108	.12	2,320
May	1,777.8	202	9.0	57.3	.158	.18	3,530
June	424.3	70	5.7	14.1	.039	.04	842
July	404.9	49	4.3	15.1	.036	.04	803
August	332.3	44	4.6	10.7	.030	.03	659
September	517.3	77	3.7	17.2	.048	.05	1,030
Water year 1947-48	35,156.5	2,060	3.7	96.1	.265	3.60	69,740

g Computed from graph based on gage readings.



## Addicks Reservoir near Addicks, Tex.

Location.- Water-stage recorder, lat. 29°47'30", long. 95°37'25", at dam on South Mayde Creek, 65 feet upstream from reservoir outlet works, 2,700 feet upstream from U. S. Highway 90, 1.2 miles east of Addicks, Harris County, and 1.4 miles upstream from mouth. Auxiliary water-stage recorder: lat. 29°48'05", long. 95°41'30", on South Mayde Creek at Groeschke Road bridge, 3.2 miles west of Addicks, 4.6 miles (3.5 miles by reservoir) upstream from Langham Creek and 5.5 miles (4.2 miles by reservoir) upstream from reservoir outlet works; lat. 29°50'10", long. 95°37'25", on Langham Creek at Clay Road bridge, 3.6 miles north of Addicks, 4.4 miles (2.7 miles by reservoir) upstream from mouth and 5.3 miles (3.1 miles by reservoir) upstream from reservoir outlet works. Datum of all gages is mean sea level, datum of 1929, Galveston-Houston supplementary adjustment and the Houston supplementary adjustment of 1943.

Drainage area.- 129 square miles at outlet works; 30 square miles at gage on South Mayde Creek; and 49 square miles at gage on Langham Creek.

Records available.- June to September 1948.

Extremes.- Maximum elevation at dam during period, 75.5 feet Aug. 25 (contents, 5 acre-feet); maximum at gage on South Mayde Creek, 101.8 feet (backwater from small dam built by contractor) June 14; maximum at gage on Langham Creek, 92.7 feet June 12. Maximum stage known, 89.9 feet in December 1935 at U. S. Highway 90 bridge, 2,700 feet downstream from outlet works, from information by Corps of Engineers. This flood, from floodmarks, from information by local residents, reached a stage of 109.3 feet, 0.2 mile downstream, and 0.1 mile to right of gage on South Mayde Creek; and a stage of 104.5 feet, 1,900 feet to left and 700 feet upstream from gage on Langham Creek.

Remarks.- Reservoir is formed by rolled-fill earthen type dam 61,166 feet long. Dam completed in fall of 1948. Reservoir is operated for flood protection of city of Houston. It is a detention reservoir with no provision for permanent storage. Outlet works consist of five concrete conduits, four of which are uncontrolled. The middle conduit is controlled by two vertical lift gates. Capacity, 188,030 acre-feet between gage heights 73.0 feet (bottom of conduits) and 113.0 feet (top of design flood pool). No constructed emergency spillways; runoff considerably in excess of designed capacity will be discharged around ends of dam. Elevations and contents not published for floods that do not produce an elevation of 79.0 feet or higher at dam.

Cooperation.- Capacity table furnished by Corps of Engineers.

## Whiteoak Bayou at Houston, Tex.

Location.- Water-stage recorder and concrete control (completed July 9, 1948), lat. 29°46'31", long. 95°23'54", at Yale Street Bridge, in Houston, Harris County, 80 feet (revised) downstream from Texas & New Orleans Railroad bridge and 2.5 miles (revised) upstream from Little Whiteoak Bayou. Datum of gage is 4.08 feet below mean sea level, datum of 1929.

Drainage area.- 92.0 square miles.

Records available.- May 1936 to September 1948.

Average discharge.- 12 years, 87.8 second-feet.

Extremes.- Maximum discharge during year, 534 second-feet Dec. 13 (gage height, 24.12 feet); minimum, 0.2 second-foot Aug. 15-17, 22.

1936-48: Maximum discharge, 8,600 second-feet Nov. 2, 1943 (gage height, 42.45 feet); minimum, 0.2 second-foot Aug. 7, 8, 1940 Aug. 15-17, 22, 1948.

Maximum stage known, 51.5 feet Dec. 9, 1935, present datum (discharge, 14,750 second-feet, furnished by county engineer, Harris County). Discharge for flood of May 31, May 31, 1929, 9,360 second-feet (gage height, 47.0 ± 0.5 feet, present site and datum), computed on basis of current-meter measurement at stage 1 foot below crest, made at bridge 1 block downstream from gage; furnished by city of Houston.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.0	12	5.0	5.0	49	23	5.5	10	7.5	g5.2	9.5	1.6
2	1.2	5.8	4.0	4.7	33	20	5.0	6.9	6.4	g5.5	1.4	1.2
3	1.2	3.8	4.0	4.2	28	17	4.7	5.8	5.0	g3.1	1.2	1.0
4	1.0	2.9	5.4	4.0	25	13	4.4	5.2	4.0	g2.9	1.3	.9
5	.8	2.3	287	3.8	35	14	4.4	4.4	43.6	g3.1	1.0	.6
6	.7	2.5	210	3.6	39	22	4.4	18	a2.9	g5.3	.9	.7
7	.9	2.7	91	3.4	29	20	4.4	11	a2.5	g3.6	.8	.6
8	1.0	2.3	80	3.6	26	23	5.0	11	g2.3	g10	.6	.6
9	.9	1.9	100	3.6	25	76	4.4	8.1	g3.4	2.9	.5	1.7
10	.8	2.0	54	3.4	26	110	7.3	6.1	g3.8	1.6	.7	2.2
11	.8	15	36	2.9	26	63	181	11	g16	1.2	.6	2.2
12	.9	7.1	45	6.7	147	33	221	18	g2.0	1.2	.5	1.6
13	.8	5.0	456	35	159	21	61	13	g2.3	1.0	.5	1.2
14	.7	36	405	24	88	16	78	7.2	2.1	1.0	.5	1.1
15	1.0	25	342	14	47	14	134	5.8	1.9	1.0	.4	1.1
16	1.0	11	335	16	31	12	66	4.4	1.6	1.0	.2	1.1
17	1.0	8.0	167	22	24	10	37	3.4	1.5	1.0	.3	1.1
18	1.0	13	93	28	20	9.9	25	16	1.9	1.1	.4	1.3
19	21	8.4	56	67	17	9.3	18	54	2.0	1.1	.5	1.4
20	5.7	7.5	39	164	16	8.4	12	7.6	1.8	1.8	.5	1.1
21	3.4	5.7	28	113	37	8.4	9.3	4.7	1.4	6.5	.5	1.0
22	2.0	56	21	66	32	10	7.5	4.2	1.4	2.6	.3	1.0
23	1.5	134	17	47	62	10	29	3.6	1.9	1.4	.5	.9
24	1.1	72	13	38	159	8.7	32	4.8	1.5	1.1	.5	.9
25	.8	29	10	27	129	8.1	31	16	1.4	.8	1.3	.9
26	.6	21	8.1	21	82	7.5	41	34	1.4	.6	4.3	.6
27	.5	16	6.9	84	58	7.2	49	34	1.4	.8	3.5	.5
28	.6	13	6.1	149	44	6.1	29	17	1.4	.6	2.8	.6
29	24	9.3	5.2	82	30	5.5	20	13	g2.2	.6	2.4	.7
30	281	6.6	5.0	98	-	5.5	16	8.7	g5.7	1.1	2.2	.8
31	50	-	5.2	75	-	5.5	-	7.5	-	4.0	1.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Acres-foot
October	408.9	281	0.5	13.2	0.143	0.17	811
November	536.8	134	1.9	17.9	.195	.22	1,060
December	2,939.9	456	4.0	94.8	1.03	1.19	5,850
Calendar year 1947	20,120.9	1,320	.5	55.1	.599	8.14	39,900
January	1,218.9	164	2.9	39.3	.427	.49	2,420
February	1,523.1	159	16	52.5	.571	.62	3,020
March	617.1	110	5.5	19.9	.216	.25	1,220
April	1,146.3	221	4.4	38.2	.415	.46	2,270
May	374.4	54	3.4	12.1	.132	.15	743
June	97.2	16	1.4	3.24	.035	.04	193
July	74.7	10	.5	2.41	.026	.03	148
August	41.8	9.5	.2	1.35	.015	.02	83
September	32.2	2.2	.5	1.07	.012	.01	64
Water year 1947-48	9,011.2	456	.2	24.6	.267	3.65	17,860

Peak discharge (base, 820 sec.-ft.) - No peak above base.

a No gage-height record; discharge computed from graph based on weather records.

g Computed from graph based on gage readings.

## SAN JACINTO RIVER BASIN

85

Brays Bayou at Houston, Tex.

Location.- Water-stage recorder, lat. 29°42'06", long. 95°24'06", at Old Main Street Bridge in southwest section of Houston, Harris County, three-quarters of a mile upstream from Harris Gully and about 15 miles upstream from Buffalo Bayou. Datum of gage is 3.90 feet below mean sea level, datum of 1929.

Drainage area.- 100 square miles.

Records available.- May 1936 to September 1948.

Average discharge.- 12 years, 103 second-feet.

Extremes.- Maximum discharge during year, 1,440 second-feet Dec. 13 (gage height, 38.44 feet); minimum, 2.1 second-feet June 20, 26, July 30, Sept. 25, 30.  
1936-48: Maximum discharge, 8,120 second-feet Nov. 2, 1943; maximum gage height, 51.70 feet Aug. 28, 1945; minimum discharge, 0.1 second-foot Oct. 10-13, 1937.  
Maximum discharge known, 11,095 second-feet May 31, 1929 (gage height, 50.4 feet, present site and datum), from current-meter measurement at Lawndale Avenue Bridge about 12 miles below gage; furnished by city of Houston.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	5.6	10	8.0	114	48	6.9	6.6	7.7	27	60	4.4
2	3.6	4.4	10	6.8	78	39	6.6	6.2	6.8	15	20	5.8
3	3.4	4.2	9.8	6.6	64	27	6.2	6.2	5.8	7.3	11	4.2
4	a3.6	5.6	10	6.4	a57	20	6.4	5.9	6.1	7.3	7.8	3.8
5	a3.8	4.8	12	6.2	a92	33	6.4	5.6	5.3	9.9	5.6	4.6
6	a3.9	4.4	27	6.2	a100	52	6.4	26	5.6	8.0	5.0	5.3
7	a4.2	5.4	26	3.1	a70	36	6.1	7.5	6.1	6.4	4.6	5.4
8	4.2	4.0	27	6.1	a57	48	6.2	6.9	6.2	6.4	4.8	5.3
9	4.0	4.4	85	5.9	a57	342	5.9	6.9	7.1	55	5.4	14
10	4.2	5.3	5.6	5.9	a63	288	5.8	6.8	9.9	30	5.0	8.0
11	4.4	80	86	5.8	a77	119	5.8	24	75	13	4.5	4.6
12	4.0	20	97	14	a100	65	5.9	11	36	8.8	4.4	4.4
13	3.9	15	1,190	57	a186	42	7.3	8.2	16	8.6	4.4	4.4
14	3.9	76	584	30	a354	29	10	53	10	6.8	4.4	4.4
15	4.0	51	881	16	a175	23	5.9	39	7.3	7.1	4.5	4.4
16	4.4	23	554	25	a92	20	5.9	15	7.1	6.8	5.3	3.9
17	4.0	18	263	32	a57	16	5.8	9.2	5.8	6.9	5.8	3.9
18	4.4	65	144	29	a36	13	5.8	130	5.1	6.2	4.6	3.8
19	25	40	80	261	30	12	5.6	256	4.6	6.4	4.5	3.8
20	6.6	15	54	471	25	11	6.1	93	3.9	13	5.1	4.0
21	5.3	9.8	37	214	227	10	6.4	27	5.0	5.5	5.0	4.5
22	5.4	276	27	116	484	13	6.2	13	4.0	5.0	4.5	4.0
23	5.8	472	20	90	348	10	11	8.4	5.1	6.1	7.5	3.9
24	7.8	160	15	77	649	9.2	8.4	7.1	4.2	5.0	12	3.8
25	6.4	74	11	58	341	8.4	23	25	4.2	4.2	8.9	5.2
26	6.2	49	9.4	53	208	8.4	9.7	44	3.9	4.4	8.6	5.1
27	5.1	33	8.6	365	135	8.0	6.8	61	4.5	4.0	9.4	5.1
28	4.2	22	7.8	322	89	7.5	6.6	14	4.6	4.4	6.4	4.4
29	76	15	7.5	220	61	7.3	6.6	8.2	13	3.9	5.1	4.2
30	32	12	7.5	308	-	7.1	6.4	8.2	25	4.6	5.0	3.4
31	9.4	-	8.4	206	-	7.3	-	8.6	-	13	4.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Per square mile	Runoff Inches	Runoff Acre-feet
October	266.9	76	3.4	8.61	0.086	0.10	529
November	1,573.9	472	4.0	52.5	.525	.59	3,120
December	4,365	1,190	7.5	141	1.41	1.62	8,660
Calendar year 1947	29,836.2	2,350	3.4	81.7	.817	11.09	59,180
January	3,034.0	471	5.8	97.9	.979	1.13	6,020
February	4,426	649	25	153	1.53	1.65	8,780
March	1,379.2	342	7.1	44.5	.445	.51	2,740
April	217.9	23	5.6	7.26	.073	.08	432
May	947.5	256	5.6	30.6	.306	.35	1,880
June	310.9	75	3.9	10.4	.104	.12	617
July	373.6	64	3.9	12.1	.121	.14	741
August	253.9	60	4.4	8.19	.082	.09	504
September	146.0	14	3.4	4.87	.049	.05	290
Water year 1947-48	17,294.8	1,190	3.4	47.3	.473	6.43	34,310

Peak discharge (base, 1,300 sec.-ft.)- Dec. 13 (10 a.m.) 1,440 sec.-ft.  
a No gage-height record; discharge interpolated, or computed on basis of recorded range in stage, weather records, and records for stations on nearby streams.

## Clear Creek near Pearland, Tex.

Location.- Water-stage recorder, lat. 29°35'50", long. 95°17'12", at bridge on State Highway 35, 0.8 mile downstream from Gulf, Colorado & Santa Fe Railway bridge, about 1 mile above Hickory Slough, and 2.3 miles north of Pearland, Brazoria County. Datum of gage is 35.73 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to June 9, 1948, staff gage at same site and datum.

Records available.- July to October 1944, March to October 1946, April 1947 to September 1948.

Extremes.- Maximum discharge during year, 551 second-feet Feb. 24 (gage height, 7.94 feet, from graph based on gage readings); no flow at times.  
1944, 1946, 1947-48: Maximum discharge not determined, no flow at times.

Remarks.- Records good except those above 300 second-feet, which are fair. Staff gage read twice daily. Large area of rice land above station is irrigated with water from Brazos River. Low flow is largely drainage from irrigated lands. Diversions for irrigation above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	3.2	2.8	2.4	67	39	1.0	9.5	6.7	17	1.5	4.6
2	17	1.7	2.2	1.8	48	28	.8	4.5	4.2	8.8	.3	5.0
3	17	1.1	2.8	1.5	49	18	.8	4.7	7.1	13	.3	4.1
4	17	.8	4.2	1.3	54	12	.8	3.5	9.5	12	.2	8.0
5	19	.5	5.2	1.3	54	11	.8	1.6	16	32	1.0	9.3
6	18	.3	4.8	1.0	39	26	.8	12	4.3	34	.4	6.1
7	17	.3	4.2	1.0	30	21	.8	26	8.8	22	.3	2.8
8	16	.5	4.0	1.0	26	34	.5	15	9.5	18	.3	3.1
9	23	.3	3.9	1.0	27	189	.4	7.6	2.5	16	.4	6.4
10	21	.3	3.3	1.0	22	173	.5	3.5	6.6	11	.4	71
11	19	3.2	3.8	1.0	20	94	.4	3.6	14	9.2	.3	49
12	19	1.9	14	1.1	67	47	.4	12	11	4.8	.3	37
13	22	1.3	154	2.0	88	29	.5	22	11	6.3	.3	29
14	30	9.2	111	1.5	65	18	.8	59	13	6.2	.2	22
15	26	18	223	1.3	41	15	.6	59	7.5	6.4	.1	20
16	23	9.8	134	1.5	30	12	.4	28	5.3	4.8	0	18
17	21	5.7	82	2.9	22	8.9	.5	13	2.6	3.0	0	15
18	20	5.4	52	2.1	18	6.4	.7	5.3	.2	2.7	.2	12
19	30	5.4	35	74	15	5.2	.7	3.9	.2	1.1	.3	10
20	33	3.6	25	130	12	3.9	.5	1.9	.1	2.2	.2	8.5
21	35	2.4	18	85	76	3.2	2.4	4.2	.3	10	.2	5.8
22	24	8.3	13	51	179	3.2	4.8	2.1	.3	2.9	0	4.1
23	13	49	9.8	35	114	2.9	8.4	.3	.1	.3	0	4.2
24	14	37	6.9	26	447	2.0	8.7	.7	.1	.3	.1	8.9
25	12	22	4.7	20	327	1.7	7.5	60	.1	.2	2.0	8.2
26	7.5	19	3.9	21	214	1.7	16	155	1.2	.1	4.3	6.8
27	5.9	15	2.9	63	134	1.6	18	189	.1	0	9.5	4.0
28	4.3	11	2.1	77	85	1.3	21	53	.1	0	8.7	3.0
29	2.1	6.2	1.9	71	52	1.2	14	26	1.2	0	11	5.6
30	6.3	3.9	1.6	130	-	1.1	6.9	14	5.6	0	8.3	6.9
31	5.2	-	2.1	96	-	1.1	-	8.7	-	.2	5.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	553.3	35	2.1	17.8	1,100
November.....	246.3	49	.3	8.21	489
December.....	936.0	223	1.6	30.3	1,860
Calendar year.....	-	-	-	-	-
January.....	905.7	130	1.0	29.2	1,800
February.....	2,422	447	12	83.5	4,800
March.....	811.4	189	1.1	26.2	1,610
April.....	120.4	21	.4	4.01	239
May.....	788.6	169	.3	25.4	1,560
June.....	149.2	16	.1	4.97	296
July.....	244.5	34	0	7.89	485
August.....	56.5	11	0	1.82	112
September.....	456.0	71	2.8	15.2	904
Water year 1947-48.....	7,691.9	447	0	21.0	15,260

Peak discharge (base, 600 sec.-ft.)- No peak above base.

## Hickory Slough near Pearland, Tex.

Location (revised).- Staff gage, lat. 29°34'47", long. 95°17'40", at county road bridge, 0.2 mile upstream from Gulf, Colorado & Santa Fe Railway bridge, 1.2 miles north of Pearland, Brazoria County, and 1.9 miles upstream from mouth. Datum of gage is 42.14 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943. Prior to Apr. 8, 1948, at datum 2.50 feet higher.

Records available.- July to October 1944, March to October 1946, April to October 1947, April to September 1948.

Extremes.- Maximum discharge during period not determined; no flow at times.  
1944, 1946-48: Maximum discharge not determined; no flow at times.

Remarks.- Records good below 10 second-feet, fair above. Gage read twice daily. Large area of rice land above station is irrigated with water from Brazos River. Low flow is largely drainage from irrigated lands. Diversions for irrigation above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	MAY	June	July	Aug.	Sept.
1	0.2						-	5.9	6.4	4.9	0.4	1.7
2	.2						-	1.5	3.0	2.3	.4	1.5
3	4.3						-	.4	.8	7.9	.2	1.1
4	5.5						-	.4	.9	7.3	0	.7
5	3.4						-	.6	1.1	9.6	0	.4
6	1.6						-	5.3	1.3	17	.4	.6
7	.8						-	7.1	.8	8.6	.4	1.7
8	.6						0.3	.3	.6	3.2	.6	1.7
9	.7						.3	.5	0	1.2	1.1	(e)
10	.5						.3	.6	2.5	.4	1.5	(e)
11	5.3						0	1.9	7.3	4.2	1.1	22
12	6.5						0	5.3	4.3	2.4	.4	15
13	6.2						.2	3.9	1.1	1.8	0	9.2
14	6.0						.4	16	5.8	1.0	0	4.3
15	5.5						.1	15	8.9	1.3	0	.8
16	5.3						0	8.9	3.3	1.1	0	1.2
17	6.8						.1	5.9	2.8	.4	.3	3.4
18	6.8						.1	5.7	3.8	.9	1.2	3.1
19	8.0						.1	8.9	4.3	1.4	.9	2.8
20	3.7						.9	3.8	4.0	1.4	.8	2.8
21	1.7						2.0	.8	3.2	3.6	.4	3.6
22	1.7						1.3	4.3	3.8	3.2	.3	3.7
23	.9						1.9	8.7	4.0	5.4	0	3.0
24	.1						3.4	3.0	2.5	2.8	.3	2.8
25	0						4.7	(e)	1.7	2.0	(e)	3.6
26	0						12	(e)	1.4	1.2	(e)	2.8
27	1.4						6.4	(e)	1.1	.5	(e)	3.1
28	0						5.1	(e)	1.1	.2	4.0	2.6
29	0						8.1	18	1.7	1.6	3.7	2.5
30	0						5.3	10	2.5	.4	2.6	1.9
31	0						-	11	-	.1	1.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	83.7	8.0	0	2.70	166
November.....	-	-	-	-	-
December.....	-	-	-	-	-
Calendar year .....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April 8-30 .....	53.0	12	0	2.30	105
May.....	86.0	8.9	.3	2.87	171
June.....	99.3	17	.1	3.20	197
July.....	-	-	0	-	-
August.....	-	-	.4	-	-
September.....	-	-	-	-	-
Water year .....	-	-	-	-	-

e Stage above limits of rating; discharge not computed.

## Chocolate Bayou near Alvin, Tex.

Location.- Staff gage, lat. 29°22'19", long. 95°19'14", at Rosharon-Alvin county road bridge, 5½ miles southwest of Alvin, Brazoria County and 6½ miles upstream from State Highway 35.

Records available.- August to October 1944, March 1946 to September 1948.

Extremes.- Maximum discharge during year, 1,080 second-feet Feb. 25 (gage height, 14.76 feet); minimum observed, 1.8 second-feet Nov. 10.  
1944, 1946, 1947-48: Maximum discharge not determined; minimum observed, 1.0 second-foot Oct. 31, 1944.

Remarks.- Records good. Gage read twice daily. Large area of rice land above station is irrigated with water from Brazos River. Low flow is largely drainage from the irrigated lands. Diversions for irrigation above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	12	5.9	6.8	173	83	5.4	36	79	54	44	70
2	82	9.6	4.7	5.4	164	61	5.4	50	68	53	46	61
3	81	5.7	5.6	4.9	248	46	5.3	72	68	68	41	56
4	72	4.6	7.8	4.5	286	33	4.6	72	70	83	40	61
5	74	4.3	10	4.2	272	39	4.0	72	74	115	38	68
6	74	4.2	12	4.5	180	118	4.0	95	a81	95	39	72
7	72	3.3	a10	4.5	112	83	4.6	82	90	70	40	76
8	68	2.7	8.6	4.2	92	27	4.3	39	72	58	a42	81
9	63	a2.0	8.6	4.2	79	257	3.5	38	61	52	a40	167
10	55	1.8	11	4.7	61	524	3.8	38	63	42	a38	371
11	51	3.8	18	4.2	50	421	3.8	37	119	32	a37	416
12	43	5.7	33	3.6	96	157	3.8	63	105	49	a37	344
13	38	6.4	262	4.3	199	76	4.5	45	88	72	a34	213
14	36	14	398	4.7	173	52	4.9	56	74	72	33	124
15	a37	23	407	4.7	a124	39	4.9	178	54	68	a34	90
16	40	20	380	4.9	78	33	4.3	93	50	54	34	72
17	38	13	286	6.0	53	29	4.3	42	53	58	37	72
18	46	12	122	14	41	23	3.8	41	47	68	42	86
19	51	12	70	77	33	18	5.4	46	40	74	41	88
20	48	8.0	41	203	28	16	11	45	38	74	40	88
21	46	7.2	a24	241	100	18	13	40	36	72	35	88
22	43	14	23	175	634	14	18	30	36	72	32	90
23	29	65	19	105	780	13	19	34	36	66	33	98
24	21	72	16	88	980	10	25	40	32	58	56	102
25	19	38	a13	70	927	8.8	34	61	38	52	79	110
26	16	29	a10	77	648	8.8	52	204	38	54	68	115
27	13	27	8.4	138	412	8.0	38	304	33	56	68	137
28	13	20	6.8	161	222	6.6	28	312	30	48	98	179
29	13	11	5.7	140	112	5.7	35	227	34	41	86	155
30	14	7.8	5.4	253	-	5.4	44	a185	50	41	72	131
31	15	-	5.4	266	-	5.4	-	129	-	41	58	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,365	82	13	44.0	2,710
November.....	459.1	72	1.8	15.3	911
December.....	2,237.9	407	4.7	72.2	4,440
Calendar year 1947.....	35,185.5	1,120	1.8	76.4	69,790
January.....	2,088.3	266	3.6	67.4	4,140
February.....	7,567	980	28	254	14,610
March.....	2,238.7	524	5.4	72.2	4,440
April.....	401.6	52	3.5	13.4	797
May.....	2,806	312	30	90.5	5,670
June.....	1,757	119	30	58.6	3,480
July.....	1,914	115	32	61.7	3,800
August.....	1,452	88	32	46.8	2,880
September.....	3,881	416	56	129	7,700
Water year 1947-48.....	27,967.6	980	1.8	76.4	55,480

Peak discharge (base, 800 sec.-ft.)- Feb. 25 (7:40 a.m.) 1,080 sec.-ft.  
a No gage-height record; discharge computed on basis of estimated gage heights, weather records, and records for nearby stations.



## Oyster Creek near Angleton, Tex.

Location.- Water-stage recorder, lat. 29°09'25", long. 95°28'35", at bridge on State Highway 35, 2 1/2 miles west of Angleton, Brazoria County, 4.0 miles upstream from Missouri Pacific Railroad bridge, 4 1/2 miles downstream from another Missouri Pacific Railroad bridge, and about 45 miles upstream from mouth at Gulf of Mexico. Datum of gage is 1.31 feet below mean sea level, datum of 1929.

Records available.- October 1944 to September 1948.

Extremes.- Maximum discharge during year, 643 second-feet Feb. 25 (gage height, 17.70 feet); minimum, 5.4 second-feet Sept. 15.  
1944-48: Maximum discharge, 2,230 second-feet Nov. 7, 1946 (gage height, 26.25 feet); minimum, that of Sept. 15, 1948.

Flood of December 1913 reached a stage of about 32 feet, from information by State Highway Department; flood of Dec. 5, 1940, reached a stage of 30.7 feet, from levels to floodmark on bridge to which gage is attached. At extreme high stages the Brazos River overflows into Oyster Creek above this station and there may be some relation between stage of Brazos River at East Columbia and stage at this station.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Diversions above station for irrigation. A large part of low flow at this station is water released from Harris Reservoir for industrial use below station. Harris Reservoir is supplied with water diverted from Brazos River during periods of flood flow.

Cooperation.- Five discharge measurements furnished by Dow Chemical Co.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	24	28	21	128	299	80	27	25	39	43	20
2	30	24	28	21	128	252	76	35	22	36	50	20
3	32	24	27	20	213	220	74	35	23	32	40	20
4	34	25	27	21	246	188	72	35	22	32	31	26
5	34	29	28	24	220	175	71	35	22	35	31	33
6	32	25	28	32	175	156	71	35	23	34	30	32
7	32	24	28	34	162	134	71	35	25	35	29	30
8	31	24	27	35	162	131	71	31	53	37	29	29
9	30	24	29	34	150	191	71	29	47	37	27	46
10	30	24	30	33	134	312	70	29	30	35	27	85
11	29	24	30	32	125	325	68	30	29	32	26	61
12	29	24	40	32	128	299	68	37	31	33	26	27
13	29	25	179	31	146	259	70	37	30	40	26	16
14	31	25	175	31	156	213	88	33	29	36	27	9.8
15	30	25	207	31	150	181	76	33	29	34	31	6.6
16	30	25	200	30	137	146	72	37	27	31	32	19
17	31	25	153	33	128	125	68	38	27	29	35	35
18	30	25	97	33	122	106	65	39	27	28	38	40
19	32	26	55	62	116	91	63	40	27	28	40	40
20	32	26	39	134	109	76	46	30	29	28	40	34
21	31	26	32	103	139	67	44	24	29	29	40	32
22	29	29	28	68	325	58	41	32	29	31	40	26
23	27	35	27	50	406	51	41	39	29	34	40	20
24	27	26	26	43	598	48	38	37	29	38	44	18
25	27	25	26	38	634	43	39	36	29	36	47	18
26	26	30	26	35	546	41	42	36	27	34	53	17
27	26	29	27	53	484	64	33	36	27	32	46	16
28	26	29	27	79	419	82	22	33	29	31	37	16
29	26	28	25	75	351	85	18	31	34	31	35	16
30	25	28	24	140	-	82	17	29	37	32	35	16
31	25	-	22	156	-	82	-	28	-	35	27	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	920	34	25	29.7	1,820
November.....	782	35	24	26.1	1,550
December.....	1,747	207	22	56.4	3,470
Calendar year 1947.....	33,648	1,140	16	92.2	66,750
January.....	1,566	156	20	50.5	3,110
February.....	6,939	634	109	239	13,760
March.....	4,582	325	41	148	9,090
April.....	1,746	88	17	58.2	3,460
May.....	1,041	40	24	35.6	2,060
June.....	876	53	22	29.2	1,740
July.....	1,036	40	28	33.4	2,050
August.....	1,102	53	26	35.5	2,190
September.....	824.4	85	6.6	27.5	1,640
Water year 1947-48.....	23,161.4	634	6.6	63.3	45,940

Note.- No gage-height record Nov. 12, 13, Dec. 29 to Jan. 7, Jan. 9-16, Aug. 5-12; discharge computed on basis of recorded range in stage, weather records, and record of water delivered to Oyster Bayou from Harris Reservoir.

## Double Mountain Fork Brazos River at Lubbock, Tex.

Location.- Water-stage recorder and masonry control, lat. 33°35'05", long. 101°49'40", in Mackenzie State Park in Lubbock, Lubbock County, 1.9 miles downstream from Yellowhouse Creek. Datum of gage is 3,132.7 feet above mean sea level, datum of 1929.

Records available.- September 1939 to September 1948.

Extremes.- No flow during year.

1939-48: Maximum discharge, 892 second-feet June 6, 1941 (gage height, 6.73 feet), from rating curve extended above 120 second-feet on basis of slope-area determination at gage height 6.72 feet; no flow most of time.

No flow since May 24, 1947.

Remarks.- Figures of daily discharge represent inflow into pool computed on basis of outflow and change in contents with no correction for evaporation, transpiration, or seepage. Several dams form small pools above station which affect low flow. Figures for calendar year 1947 are as follows: total second-foot-days, 2.3; maximum daily, 2.3 second-feet; minimum daily, no flow; mean, 0.01 second-foot; runoff, 4.6 acre-feet.

## Double Mountain Fork Brazos River near Aspermont, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 33°00', long. 100°11', at bridge on U. S. Highway 83, 8 miles downstream from Mountain Creek and 10 miles south of Aspermont, Stonewall County.

Drainage area.- 7,979 square miles, of which 6,470 square miles is probably noncontributing.

Records available.- December 1923 to September 1934, June 1939 to September 1948.

Average discharge.- 19 years (1924-34, 1939-48), 175 second-feet.

Extremes.- Maximum discharge during year, 22,200 second-feet June 24 (gage height, 10.20 feet); no flow at times.

1924-34, 1939-48: Maximum discharge, 52,000 second-feet Oct. 15, 1926 (gage height, 18 1/4 feet, from floodmark), by slope-area method; no flow at times.

Remarks.- Records poor. Daily discharge published only to show distribution of runoff. No large diversion above station.

Revisions (water years).- W 733: 1927(M).

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	1.2	0.2		0.2	92	0.2	0	1,320	16	161	68
2	0	1.1	.2	0.8	.2	57	.2	0	304	9.9	457	28
3	0	1.0	26		.2	36	.2	0	102	94	173	16
4	0	.9	1,290	.5		26	.2	0	40	270	100	10
5	0	.8	758	.5	1.0	19	.2	0	32	3,840	58	5.2
6	.7	.7	218	.4		15	.2	0	26	6,270	39	1.8
7	.2	.7	171	.4		13	.2	0	18	849	27	.5
8	0	.5	82	.4		11	.2	0	11	221	20	.2
9	256	.5	56	.4	.6	10	.2	0	8.6	147	16	.5
10	66	.4	34	.4		8.3	.2	0	6.9	76	201	.2
11	10	.4	22	.3		8.0	.2	.1	5.5	52	173	0
12	1.6	.3	13	.3		5.2	.2	.1	4.0	141	98	0
13	.4	.2	10	.3		6.9	.2	0	287	33	52	0
14	.4	29	8.9	.3	.4	5.0	.2	0	176	52	28	0
15	.4	2.0	8.0	.3		3.8	.1	0	41	70	15	0
16	.4	1.7	7.6	.2		2.6	.1	0	169	52	8.3	0
17	.3	13	7.2	.2		2.2	0	0	68	39	4.6	0
18	.3	99	6.9	.2		2.1	0	0	30	32	2.6	0
19	.2	13	6.6	.2		2.0	.1	0	12	23	1.8	0
20	.2	1.8	6.0	.2		1.5	.2	0	6.2	17	1.0	0
21	.2	30	5.0	.2	.2	1.6	.2	0	2.7	13	.4	0
22	.2	3.6	4.0	.2		1.6	.2	0	.7	9.9	.2	0
23	.1	1.0	3.0	.2		.9	0	0	3,670	4,350	.1	0
24	0	.7	2.5	.2		.7	0	0	4,970	594	.1	0
25	217	.5	2.0	.2		.4	0	55	133	228	0	0
26	60	.4	1.5	.2	12	.3	.1	6.8	139	98	0	0
27	5.0	.3	1.0	.2	4,600	.3	0	60	184	56	0	0
28	1.8	.3	.5	.2	381	.3	0	36	260	35	0	0
29	1.5	.3	.5	.2	133	.4	0	19	73	33	.4	0
30	1.4	.3	.5	.2	-	.2	0	5.3	28	56	782	0
31	1.3	-	.5	.2	-	.2	-	1,620	-	39	232	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	625.6	256	0	20.2	1,240
November.....	205.5	99	.2	6.85	408
December.....	2,705.6	1,290	.2	87.3	5,370
Calendar year 1947 .....	85,446.9	14,800	0	179	129,800
January.....	10.1	-	.2	.33	20
February.....	5,136.4	4,600	-	177	10,190
March.....	333.5	92	.2	10.8	661
April.....	4.0	.2	0	.13	7.9
May.....	1,802.3	1,620	0	58.1	3,570
June.....	12,127.6	4,970	.7	404	24,050
July.....	17,717.8	6,270	9.9	572	35,140
August.....	2,651.9	782	0	85.5	5,260
September.....	130.4	68	0	4.35	259
Water year 1947-48 .....	43,450.7	6,270	0	119	86,180

Peak discharge (base, 8,800 sec.-ft.)- Feb. 27 (8 a.m.) 11,300 sec.-ft.; May 31 (8 p.m.) 9,400 sec.-ft.; June 24 (12:15 a.m.) 22,200 sec.-ft.; July 5 (9:30 p.m.) 18,300 sec.-ft.; July 23 (3:15 p.m.) 12,000 sec.-ft.

f Computed on basis of partly estimated gage height.

Note.- Flowing channel removed from recorder and no gage-height record Oct. 1-3, 12-24, Oct. 27 to Nov. 12, Nov. 20 to Dec. 3, Dec. 9-18, Dec. 20 to Feb. 2, Feb. 4-26, Mar. 1-7, June 3-6, 19-21, June 29 to July 2, July 15, 16; discharge computed on basis of engineer's notes, weather records, and records for station Salt Fork Brazos River near Aspermont.

## Brazos River at Seymour, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 33°34', long. 99°16', at bridge on U. S. Highways 277 and 283, three-quarters of a mile upstream from Wichita Valley Railway bridge and 1 mile southwest of courthouse in Seymour, Baylor County. Datum of gage is 1,258.7 feet above mean sea level (Texas State Highway bench mark).

Drainage area.- 14,490 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- November 1923 to September 1948.

Average discharge.- 24 years (1924-48), 459 second-feet.

Extremes.- Maximum discharge during year, 13,300 second-feet July 6 (gage height, 7.14 feet); no flow at times.

1923-48: Maximum discharge, 95,400 second-feet Oct. 16, 1926 (gage height, 15.16 feet, from floodmarks), by slope-area method; no flow at times.

Maximum stage known, about 21.0 feet, sometime prior to 1916.

Remarks.- Records poor. No large diversions above station.

Revisions (water years).- W 808: 1924-29.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	25	24	21	16	796	5.7	0.7	502	1,060	75	37
2	0	19	22	55	18	534	6.4	.1	1,960	584	1103	112
3	0	16	37	25	14	353	6.4	0	1,350	441	350	70
4	0	11	1,170	24	11	238	5.7	0	765	1339	388	44
5	0	8.5	1,270	21	18	185	4.6	0	467	1,170	211	32
6	0	6.4	1,350	18	24	156	4.6	0	311	5,420	141	27
7	0	2.2	760	17	23	124	3.8	0	1166	6,320	98	15
8	3.8	1.8	572	17	25	107	2.6	0	99	2,200	77	110
9	53	1.4	425	14	21	88	3.0	0	75	1,030	1105	13
10	31	.9	329	14	22	75	5.7	0	54	662	230	9.3
11	32	.5	265	14	17	73	3.0	.2	40	651	1140	5.0
12	17	.4	216	11	9.9	68	1.8	.5	93	361	55	3.0
13	45	1.3	142	11	11	63	.9	.1	48	275	159	4.9
14	46	92	116	9.9	18	58	1.8	0	40	187	98	5.4
15	29	68	95	11	25	47	1.8	8.8	20	141	72	2.8
16	27	83	81	9.2	17	36	1.0	9.7	220	118	66	1.8
17	20	51	88	6.4	11	34	1.4	3.8	149	131	148	1.0
18	11	96	60	8.5	9.2	35	2.2	2.2	65	120	40	.7
19	5.0	116	54	9.9	5.7	32	.9	11	49	95	30	.4
20	2.2	169	47	9.9	3.8	28	.7	1.4	70	78	22	0
21	.7	250	41	8.5	2.2	32	.7	20	52	66	15	10
22	0	323	38	5.0	2.6	30	.8	49	36	52	111	3.2
23	0	184	34	11	2.6	23	3.8	23	277	404	110	3.4
24	116	76	31	12	4.2	20	12	13	2,360	3,710	13.8	1.4
25	19.1	56	29	13	13	17	20	16	5,950	1,180	4.6	0
26	154	51	28	12	37	12	14	96	1,340	691	3.8	0
27	270	42	26	6.4	157	9.9	11	893	795	523	2.8	0
28	198	35	25	4.6	3,280	11	5.7	253	4,920	284	2.6	0
29	103	30	24	5.7	1,250	11	3.8	99	8,800	183	2.8	0
30	61	25	19	9.9	-	9.9	2.2	64	3,760	118	12	0
31	41	-	17	11	-	5.0	-	71	-	83	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,074.8	270	0	34.7	2,130
November.....	1,821.4	323	.4	60.7	3,610
December.....	7,415	1,350	17	239	14,710
Calendar year 1947 .....	181,200.1	43,700	0	496	359,400
January.....	425.9	55	4.6	13.7	845
February.....	5,048.2	3,260	2.2	174	10,010
March.....	3,310.8	796	5.0	107	6,570
April.....	138.0	20	.7	4.60	274
May.....	1,635.5	893	0	52.8	3,240
June.....	34,833	8,800	20	1,161	63,090
July.....	28,657	6,320	52	924	56,840
August.....	2,490.4	388	2.6	80.3	4,940
September.....	402.3	112	0	13.4	798
Water year 1947-48 .....	87,252.3	8,800	0	238	173,100

Peak discharge (base, 11,000 sec.-ft.)- June 25 (3:30 a.m.) 10,800 sec.-ft.; June 29 (4:30 a.m.) 11,800 sec.-ft.; July 8 (11 p.m.) 13,300 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage height.

f Computed on basis of partly estimated gage-height record.

Notes.- Discharge for Dec. 11-22, Dec. 30 to Jan. 1, Jan. 15 to Feb. 2, Feb. 7-9, 12, 13, Mar. 5-17, July 28 to Aug. 1, Aug. 7, 8, 12, 15, 16, Sept. 4-7, 20 computed from graph based on twice-daily readings of wire-weight gage.

## Brazos River near South Bend, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 33°01'30", long. 98°38'50", at bridge on State Highway 67, 0.3 mile upstream from Wichita Falls & Southern Railroad bridge, 1.6 miles downstream from Clear Fork Brazos River, and 2.0 miles northeast of South Bend, Young County. Datum of gage is 1,003.0 feet above mean sea level, datum of 1929.

Drainage area.- 21,600 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- September 1938 to September 1948.

Average discharge.- 10 years, 1,051 second-feet.

Extremes.- Maximum discharge during year, 16,700 second-feet June 29 (gage height, 12.58 feet); no flow Oct. 17-21.

1938-48: Maximum discharge, 87,400 second-feet May 4, 1941 (gage height, 27.35 feet); no flow at times.

Maximum stage known, 36.2 feet in 1876, from information by Texas State Highway Department and Corps of Engineers.

Remarks.- Records fair. Wire-weight gage read once daily and readings used for major portion of year when water-stage recorder record was not available. Flow partly regulated by reservoirs in Elm Creek Basin (see p. 109), and Lakes Sweetwater and Trammel in Sweetwater Creek Basin, which have a combined capacity of about 106,000 acre-feet. Many small diversions above station for municipal supply and oil-field operations. Records of chemical analyses for the period 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	469	72	78	31	1,340	42	5.6	4,600	5,080	450	13
2	3.4	256	60	306	28	1,140	39	2.1	2,220	2,300	349	11
3	2.7	172	60	142	28	930	39	1.3	3,010	1,200	235	9.4
4	1.5	124	104	85	29	774	34	.5	1,810	1,060	202	13
5	.9	92	987	66	32	487	31	.5	1,060	1,890	612	102
6	.7	74	1,580	61	35	366	31	12	1,060	7,430	640	77
7	.5	61	3,270	56	39	285	30	2.4	594	10,600	418	52
8	.5	49	2,950	52	39	226	25	1.1	382	7,190	294	37
9	1.1	37	1,080	56	61	179	23	.4	304	4,660	225	28
10	1.1	31	721	68	35	146	23	1.0	208	3,360	186	24
11	.7	26	550	60	50	213	22	38	155	2,120	183	27
12	.7	22	379	56	94	103	21	699	115	1,060	255	25
13	.2	25	274	50	78	98	16	570	r228	970	210	19
14	.2	39	226	44	31	98	17	219	r394	690	144	14
15	.2	29	204	42	34	85	16	125	230	665	98	11
16	.1	30	163	36	35	81	15	58	82	442	98	7.8
17	0	32	124	35	30	70	15	37	58	328	115	6.8
18	0	117	107	39	29	63	13	28	45	255	90	5.9
19	0	369	103	31	29	66	10	46	41	228	72	5.9
20	0	236	92	32	29	53	9.2	75	64	210	60	3.9
21	0	344	87	30	31	47	8.6	21	46	212	49	3.5
22	1.3	570	85	29	29	49	8.6	8.6	35	205	41	2.2
23	2.1	500	85	25	29	60	8.6	3.2	29	164	34	2.3
24	2.1	482	68	33	28	50	16	.1	1,260	150	28	2.1
25	131	322	63	69	34	52	116	18	4,190	2,570	24	1.7
26	6,260	201	60	32	52	308	915	43	7,390	1,500	23	1.4
27	1,680	134	55	83	877	130	259	4,690	5,930	1,100	29	1.1
28	r749	105	52	43	959	87	65	3,870	4,970	795	40	.9
29	2,840	98	49	55	2,740	68	26	912	13,600	675	25	.8
30	3,370	83	46	47	-	58	15	595	12,000	406	17	.6
31	r641	-	44	76	-	50	-	1,610	-	321	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	15,694.4	6,260	0	506	31,130
November.....	5,139	570	22	171	10,190
December.....	13,798	3,270	44	445	27,370
Calendar year 1947.....	312,615.6	28,200	0	856	620,000
January.....	1,917	306	25	61.6	3,800
February.....	5,575	2,740	28	192	11,060
March.....	7,762	1,340	47	250	15,400
April.....	1,909	915	8.6	63.6	3,790
May.....	13,692.8	4,690	.1	442	27,160
June.....	66,110	13,600	29	2,204	131,100
July.....	59,836	10,600	150	1,930	118,700
August.....	5,262	640	16	170	10,440
September.....	509.3	102	.6	17.0	1,010
Water year 1947-48.....	197,204.5	13,600	0	539	391,200

Peak discharge (base, 11,000 sec.-ft.)- June 29 (6 p.m.) 16,700 sec.-ft.; July 7 (9 p.m.) 13,200 sec.-ft.

f Computed on basis of partly estimated gage-height record.

Note.- Discharge, except for Oct. 26-31, Dec. 5-9, Feb. 29 to Mar. 3, Apr. 26, May 12, 27-29, 31, June 1-4, 13, 14, 24-31, July 1-11, 21-27, computed from graph based on once-daily wire-weight gage readings.

## BRAZOS RIVER BASIN

93

Possum Kingdom Reservoir near Graford, Tex.

Location.- Mercury U-tube gage, lat. 32°52', long. 98°26', in powerhouse at dam on Brazos River, 2.6 miles upstream from Loving Creek and 11.3 miles southwest of Graford, Palo Pinto County. Datum of gage is 0.10 foot above mean sea level, datum of 1929 (levels by Brazos River Conservation and Reclamation District).

Drainage area.- 22,550 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- March 1941 to September 1948.

Extremes.- Maximum contents observed during year, 615,000 acre-feet July 12-24 (gage height, 994.0 feet); minimum observed, 424,500 acre-feet May 22-27 (gage height, 981.1 feet).  
1941-48: Maximum contents observed, 743,700 acre-feet Oct. 5, 1941 (gage height, 1,001.0 feet); minimum observed, 378,900 acre-feet Feb. 18-27, 1944 (gage height, 977.3 feet).

Remarks.- Reservoir is formed by reinforced concrete dam of flat slab deck, massive buttress type, with nine roof-weir (modified bear-trap) type gates, two bulkhead sections, and earthen dike section. Dam completed and storage began Mar. 21, 1941. Total capacity, 724,700 acre-feet (gage height, 1,000.0 feet, top of closed roof-weir gates). Usable capacity for power development, 698,900 acre-feet between gage heights 911.5 feet (still of powerhouse penstock) and 1,000.0 feet (top of closed roof-weir gates). Water below gage height 911.5 feet can be withdrawn through high pressure outlet down to gage height 874.8 feet. Figures given herein represent total contents. Water used for power development, industry, and irrigation. Records of water analyses for the water year 1948 are given in Water-Supply Paper 1133. Water samples are collected immediately below dam.

Cooperation.- Records of daily gage height and capacity table furnished by Brazos River Conservation and Reclamation District.

Monthly gage height and contents, water year October 1947 to September 1948

	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	986.4	495,600	-
Oct. 31.....	986.9	502,700	+7,100
Nov. 30.....	986.5	497,000	-5,700
Dec. 31.....	987.3	508,300	+11,300
Calendar year 1947.....	-	-	-119,300
Jan. 31.....	985.5	483,000	-25,300
Feb. 29.....	984.4	467,900	-15,100
Mar. 31.....	984.1	463,800	-4,100
Apr. 30.....	982.0	436,600	-27,200
May 31.....	982.9	447,800	+11,200
June 30.....	989.1	534,200	+86,400
July 31.....	992.8	593,600	+59,400
Aug. 31.....	989.2	535,800	-57,800
Sept. 30.....	986.9	502,700	-33,100
Water year 1947-48	-	-	+7,100

† Gage height at 12 p. m.

## Brazos River near Palo Pinto, Tex.

Location.- Water-stage recorder, lat. 32°51'45", long. 98°18'10", at bridge on Palo Pinto-Graford highway, 300 feet downstream from Dark Valley Creek, 6½ miles north of Palo Pinto, Palo Pinto County, and 20 miles downstream from Possum Kingdom Dam. Datum of gage is 831.23 feet above mean sea level, datum of 1929.

Drainage area.- 22,760 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- November 1933 to September 1948. January 1924 to November 1933 at site near Mineral Wells.

Average discharge.- 14 years (1934-48), 1,197 second-feet.

Extremes.- Maximum discharge during year, 12,800 second-feet Dec. 7 (gage height, 8.09 feet); minimum, 19 second-feet May 31.

1933-48.- Maximum discharge, 64,900 second-feet May 20, 1935, from rating curve extended above 32,000 second-feet; maximum gage height, 17.42 feet Oct. 17, 1942; no flow at times.

Maximum stage known was reached by flood of 1876, according to data of Corps of Engineers, and was several feet higher than any subsequent flood. A stage of about 24.0 feet was reached in June 1930, from information by local residents.

Remarks.- Records good. Flow largely regulated by Possum Kingdom Reservoir (see preceding page) and several smaller reservoirs above Nugent in Clear Fork Basin, having a combined capacity of 831,000 acre-feet. Many small diversions above station for irrigation, municipal supply, and oil-field operation.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.3	17	1.0	183	1.8	486	3.5	1,750
.4	37	1.2	239	2.0	610	4.0	2,230
.6	81	1.4	303	2.5	950	4.5	2,870
.8	130	1.6	384	3.0	1,340	5.0	3,820

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	442	133	45	641	105	247	512	633	102	310	268	1,500
2	396	70	212	140	549	363	447	178	291	477	81	740
3	389	37	884	139	1,140	414	298	747	84	401	166	481
4	567	131	589	93	888	556	88	643	532	86	259	573
5	170	184	198	74	998	695	198	391	795	183	350	297
6	132	152	558	270	1,030	402	471	794	809	239	112	112
7	543	302	2,870	352	508	105	757	136	509	140	66	341
8	689	138	310	392	233	101	967	118	1,100	624	318	1,540
9	530	74	350	549	265	278	696	112	1,070	895	511	658
10	437	37	451	634	530	529	445	545	893	870	1,290	177
11	417	144	394	419	1,010	465	204	879	804	494	1,280	63
12	238	91	369	328	717	100	232	267	851	350	1,280	96
13	98	196	260	523	278	198	609	72	825	1,010	1,210	192
14	199	266	306	312	110	82	184	41	156	1,230	757	314
15	468	143	664	348	81	99	247	272	740	1,240	386	118
16	363	143	393	548	56	494	241	221	1,030	1,260	234	275
17	396	129	343	442	257	498	252	411	1,060	976	736	564
18	423	623	297	187	390	513	103	438	1,070	453	731	509
19	118	560	292	252	322	409	87	430	750	553	862	442
20	86	598	280	1,180	273	317	474	90	371	1,080	1,190	157
21	364	780	222	923	452	110	692	43	410	1,080	1,990	935
22	397	542	104	956	217	93	557	369	858	1,200	1,350	1,050
23	404	181	354	953	83	238	1,560	140	919	954	1,820	946
24	215	79	510	523	630	489	434	53	546	600	1,760	764
25	153	110	102	299	914	514	269	121	666	519	1,690	490
26	138	153	63	524	536	508	128	340	431	551	1,620	81
27	88	157	54	630	514	277	605	85	87	1,310	1,760	56
28	49	76	52	342	148	82	1,020	50	80	1,120	1,590	58
29	113	91	63	207	122	50	1,140	65	190	969	1,040	91
30	221	74	319	86	-	309	1,110	45	84	1,010	670	182
31	195	-	992	224	-	451	-	33	-	601	1,350	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	9,438	689	49	304	18,720
November.....	6,394	780	37	213	12,680
December.....	12,900	2,870	45	416	25,590
Calendar year 1947.....	362,260	20,300	37	992	718,600
January.....	15,500	1,180	74	435	26,780
February.....	13,356	1,140	56	461	26,490
March.....	9,986	695	50	322	19,810
April.....	15,007	1,560	67	500	29,770
May.....	8,762	879	33	283	17,380
June.....	17,713	1,100	80	590	35,130
July.....	22,785	1,310	86	735	45,190
August.....	28,707	1,990	66	926	56,940
September.....	13,602	1,540	56	453	26,980
Water year 1947-48.....	172,150	2,870	33	470	341,500

## Brazos River near Glen Rose, Tex.

Location.- Water-stage recorder, lat. 32°15'40", long. 97°41'50", a quarter of a mile upstream from bridge on U. S. Highway 67, 2 miles upstream from Paluxy Creek, and 4 miles northeast of Glen Rose, Somervell County. Datum of gage is 567.82 feet above mean sea level, datum of 1929.

Drainage area.- 24,840 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- October 1923 to September 1948.

Average discharge.- 25 years, 1,639 second-feet.

Extremes.- Maximum discharge during year, 12,500 second-feet Feb. 25 (gage height, 8.68 feet); minimum, 86 second-feet June 7 (gage height, 0.72 foot).

1923-48: Maximum discharge, 97,600 second-feet May 18, 1935 (gage height, 23.68 feet), from rating curve extended above 68,000 second-feet; no flow at times prior to construction of Possum Kingdom Dam.

Maximum stage known, about 30.0 feet May 8 or 9, 1922, from information by local residents.

Remarks.- Records good. Flow partly regulated by Possum Kingdom Reservoir on Brazos River (see p. 93) and several smaller reservoirs. Many small diversions above station for irrigation, municipal supply, and oil-field operation.

Revisions (water year).- W 1058: 1932.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.7	77	1.4	615	3.5	3,850
.8	122	1.6	850	4.0	4,520
.9	175	1.8	1,100	4.5	5,200
1.0	240	2.0	1,400	5.0	5,950
1.1	315	2.5	2,250	6.0	7,450
1.2	405	3.0	3,100	7.0	9,000

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	387	220	164	1,770	672	2,160	315	447	278	661	1,070	1,410
2	285	182	188	2,940	505	1,770	240	934	201	457	985	650
3	188	154	201	2,030	369	910	188	1,020	354	292	934	1,070
4	233	159	208	1,240	278	707	377	1,090	127	315	560	1,240
5	465	201	188	696	278	814	549	650	113	455	387	1,060
6	396	201	182	475	592	886	516	396	100	820	270	604
7	396	182	2,000	360	1,020	790	425	842	154	942	201	549
8	527	159	4,730	308	886	898	333	1,360	280	1,220	170	1,060
9	351	127	4,210	278	1,050	922	248	922	661	1,220	240	614
10	248	118	2,500	240	934	672	379	658	527	684	255	342
11	316	170	1,070	368	560	485	802	3,720	608	560	182	578
12	604	240	672	387	387	405	958	1,600	922	898	133	1,080
13	516	214	658	646	396	405	661	593	910	1,050	361	549
14	475	220	582	658	621	650	549	890	850	838	1,020	342
15	425	287	604	527	1,010	661	360	742	707	538	1,070	255
16	315	286	802	442	672	445	333	465	802	480	1,130	194
17	255	168	2,310	558	505	342	527	308	830	970	1,050	154
18	532	208	2,180	387	333	324	333	334	308	1,100	604	182
19	475	278	1,090	405	262	300	255	363	596	1,140	455	248
20	405	234	707	582	220	405	270	706	874	1,090	313	175
21	387	208	593	593	194	626	270	467	922	790	605	409
22	405	382	485	378	311	790	262	672	958	495	698	485
23	308	604	445	478	415	650	201	505	560	617	898	445
24	208	707	405	970	333	505	219	308	549	970	1,510	297
25	194	862	351	946	7,520	378	754	214	435	996	1,530	766
26	620	571	315	958	6,910	285	778	297	1,500	1,060	1,660	874
27	1,400	360	328	910	4,320	240	910	1,130	a2,340	858	1,930	860
28	1,480	285	549	560	3,480	455	571	1,070	a1,370	582	2,380	650
29	803	227	346	333	2,520	582	405	1,160	3,030	505	2,050	492
30	471	188	255	360	-	538	285	821	1,000	710	1,860	306
31	308	-	313	790	-	425	-	415	-	1,050	1,660	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	14,378	1,480	188	464	28,520
November.....	8,422	862	118	281	16,700
December.....	29,411	4,730	164	949	58,540
Calendar year 1947 .....	415,699	20,500	118	1,139	824,600
January.....	22,533	2,940	240	727	44,690
February.....	37,553	7,520	194	1,295	74,490
March.....	20,425	2,160	240	659	40,510
April.....	13,273	958	188	442	26,330
May.....	24,979	3,720	214	806	49,550
June.....	22,346	3,030	100	745	44,320
July.....	24,343	1,220	292	785	48,280
August.....	28,167	2,380	133	909	55,870
September.....	17,928	1,410	154	598	35,560
Water year 1947-48 .....	263,758	7,520	100	721	523,200

a No gage-height record; discharge computed on basis of recorded range in stage and discharge measurement on June 28.



## Brazos River near Whitney, Tex.

Location.- Wire-weight gage, lat. 31°54'10", long. 97°23'05", at bridge on State Highway 22, 1.8 miles upstream from Towash Creek and 5 miles southwest of Whitney, Hill County. Datum of gage is 432.06 feet above mean sea level, datum of 1929 (Brazos River Conservation and Reclamation District bench mark).

Drainage area.- 26,090 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- October 1938 to September 1948.

Average discharge.- 10 years, 1,950 second-feet.

Extremes.- Maximum discharge during year, 28,300 second-feet Feb. 25 (gage height, 17.96 feet, from floodmark); minimum observed, 135 second-feet Aug. 14.

1938-48: Maximum discharge, 66,400 second-feet May 1, 1944 (gage height, 29.3 feet, from floodmark); minimum observed, 2.0 second-feet Oct. 31, Nov. 1, 1939.

Maximum stage known, 46 feet May 9, 1922, from information by local residents.

Remarks.- Records good. Gage read twice daily, oftener during high water. Flow partly regulated by Possum Kingdom Reservoir on Brazos River (see p. 93) and several smaller reservoirs in Clear Fork Basin. Many small diversions above station for irrigation, municipal supply, and oil-field operation. Records of chemical analyses for water year 1948 are given in Water-Supply Paper 1133.

Rating table, water year 1947-48 (gage height, in feet,

and discharge, in second-feet)

(Shifting-control method used Oct. 1-5,  
Jan. 6 to Feb. 15, Apr. 26 to May 2).

5.2	135	6.5	965	9.5	4,580
5.3	175	7.0	1,390	10.0	5,800
5.4	220	7.5	1,870	11.0	8,000
5.6	326	8.0	2,400	12.0	10,600
5.8	450	8.5	3,020	13.0	13,300
6.0	590	9.0	3,750		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	193	411	260	1,260	957	2,150	562	418	604	1,260	1,090	1,620
2	325	308	225	2,640	848	5,190	464	331	424	949	1,080	1,440
3	349	255	211	2,890	690	2,340	385	855	331	2,550	1,000	750
4	250	216	325	1,970	590	1,390	337	1,040	260	1,950	925	941
5	167	184	471	1,340	457	1,220	325	1,160	220	1,370	646	1,220
6	281	184	303	901	398	1,340	604	786	193	3,750	444	1,110
7	404	230	3,450	690	411	1,300	604	520	175	1,140	337	682
8	392	220	3,510	562	1,180	1,180	520	546	159	1,530	280	597
9	485	225	6,580	464	949	1,260	457	1,440	184	1,480	202	2,170
10	437	211	3,450	418	1,160	1,220	373	965	423	1,530	184	1,270
11	314	167	2,070	367	1,110	1,040	314	6,060	590	981	250	590
12	240	143	1,220	361	825	825	705	5,420	525	675	240	385
13	471	193	901	492	576	728	1,010	1,980	901	917	180	1,200
14	597	320	750	576	492	682	735	1,070	933	1,100	143	705
15	506	492	1,870	705	625	893	611	981	632	925	837	478
16	437	379	1,970	675	1,150	949	464	941	742	682	1,040	361
17	411	424	1,190	478	802	728	373	705	772	492	1,100	281
18	325	320	2,570	639	660	597	520	562	625	925	1,050	230
19	375	250	2,170	492	508	562	437	520	398	1,130	660	193
20	485	280	1,270	492	398	541	337	682	406	1,150	492	220
21	437	331	933	576	325	534	308	750	818	1,160	373	260
22	398	276	795	705	303	885	314	548	893	848	404	211
23	404	349	690	520	281	1,110	314	735	1,280	604	632	546
24	392	632	632	424	506	885	292	668	5,130	506	788	464
25	281	705	590	1,020	10,900	690	331	464	1,440	965	1,340	390
26	245	870	548	1,010	11,600	590	812	385	1,900	981	1,580	553
27	773	698	492	1,030	7,740	492	870	373	4,890	1,200	1,870	870
28	1,200	485	437	1,010	5,310	411	1,040	2,210	2,440	870	1,870	855
29	1,340	361	618	639	3,990	464	712	1,300	2,110	646	2,180	682
30	856	314	548	424	-	675	527	1,290	3,450	569	1,920	597
31	576	-	478	430	-	690	-	1,040	-	576	1,820	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	14,346	1,340	167	463	28,450
November.....	10,413	870	143	347	20,850
December.....	41,527	6,580	211	1,340	82,370
Calendar year 1947 .....	516,855	20,500	143	1,416	1,025,000
January.....	26,200	2,890	361	845	51,970
February.....	55,719	11,600	281	1,921	110,500
March.....	33,561	5,190	411	1,083	66,570
April.....	15,657	1,040	292	522	31,060
May.....	36,845	6,060	331	1,189	73,080
June.....	34,048	5,130	159	1,135	67,530
July.....	35,411	3,750	492	1,142	70,240
August.....	26,717	2,180	143	862	52,990
September.....	21,871	2,170	193	729	43,360
Water year 1947-48.....	352,315	11,600	143	963	698,800

## Brazos River at Waco, Tex.

Location.- Water-stage recorder, lat. 31°33'40", long. 97°07'45", at Washington Avenue Bridge in Waco, McLennan County, 2½ miles downstream from Bosque River. Datum of gage is 356.80 feet above mean sea level, datum of 1929, supplementary adjustment of 1942.

Drainage area.- 28,500 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- September 1898 to September 1948. (January 1912 to September 1914, monthly records only, in Water-Supply Paper 850). U. S. Weather Bureau has collected gage-height records in this vicinity since 1900.

Average discharge.- 50 years, 2,698 second-feet.

Extremes.- Maximum discharge during year, 36,800 second-feet Feb. 26 (gage height, 20.48 feet); minimum, 134 second-feet Aug. 16.

1898-1948: Maximum discharge, 246,000 second-feet Sept. 27, 1936 (gage height, 40.90 feet, levee on left bank was overtopped and broken by flood); minimum discharge for periods of daily record, 1898-1911, 1914-48, no flow Aug. 20, 21, 1918, and probably for several days in August 1923.

A stage of 39.7 feet was reached Dec. 3, 1913, when levee on left bank was broken by flood, from information by U. S. Weather Bureau.

Remarks.- Records good except those above 5,000 second-feet, which are poor. Flow partly regulated by Possum Kingdom Reservoir on Brazos River (see p. 93), several small reservoirs in Clear Fork Basin, and Lake Waco (capacity, 22,000 acre-feet, revised) on Bosque River near Waco. A siltation survey on Lake Waco by the Soil Conservation Service of the U. S. Department of Agriculture in December 1947 indicates a 44.07 percent capacity loss from siltation since storage began in April 1930. Many small diversions above station for municipal supply, irrigation, and oil-field operation do not appreciably affect flow.

Revisions (water years).- W 850 and W 878: (monthly and yearly summaries only, 1899-1905, 1907-10).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	244	578	342	555	495	5,110	750	608	1,040	3,010	590	1,700
2	228	445	304	1,350	819	3,550	644	500	632	1,770	1,050	1,560
3	317	356	283	2,970	836	3,630	550	401	470	2,140	1,090	1,330
4	410	288	328	2,500	715	2,200	470	905	370	3,360	1,030	792
5	338	240	320	1,900	626	1,560	410	1,200	300	3,600	940	956
6	284	212	445	1,380	520	1,460	388	1,280	252	2,690	694	1,200
7	265	204	450	916	465	1,560	602	884	216	3,210	495	1,040
8	445	224	4,660	894	573	1,480	650	614	196	1,520	383	820
9	435	236	5,410	584	1,150	1,330	596	722	179	3,030	296	749
10	470	240	4,360	515	1,050	1,420	515	1,460	172	4,820	232	2,700
11	480	212	2,900	465	1,210	1,420	440	5,420	462	3,470	185	1,240
12	374	186	1,900	795	1,130	1,200	406	15,200	566	1,090	200	620
13	292	165	1,240	435	1,140	988	2,030	4,530	485	736	244	476
14	378	176	908	520	694	852	1,230	2,100	806	964	193	1,020
15	572	252	964	560	578	806	932	1,280	884	1,280	148	687
16	505	392	2,100	743	694	988	715	1,150	785	948	516	495
17	460	420	1,700	680	1,100	1,040	560	1,040	687	729	932	388
18	430	396	1,340	555	860	820	445	799	701	560	996	308
19	365	360	2,350	620	694	687	505	918	614	841	964	248
20	324	280	1,880	590	555	638	515	2,540	430	1,280	662	200
21	495	288	1,240	545	470	632	392	836	342	1,240	495	182
22	465	342	924	620	420	668	352	799	708	1,210	396	244
23	420	312	764	785	383	1,060	356	632	836	908	347	212
24	415	284	674	602	360	1,280	356	701	2,490	656	578	370
25	415	470	614	505	3,470	1,030	1,700	694	5,410	540	736	425
26	352	626	566	966	22,200	813	1,140	540	1,830	1,010	1,250	388
27	288	778	535	1,050	9,590	687	996	4,140	4,880	1,090	1,560	428
28	665	674	490	1,020	6,880	584	988	3,160	4,250	1,100	1,750	808
29	1,170	510	460	1,010	5,230	505	1,130	2,050	2,450	900	1,800	806
30	1,280	406	555	694	-	540	806	1,330	2,500	701	2,050	687
31	844	-	584	540	-	729	-	1,280	-	632	1,850	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	14,405	1,280	228	465	28,570
November.....	10,552	778	265	352	20,930
December.....	41,590	5,410	283	1,342	82,790
Calendar year 1947 .....	686,549	20,100	165	1,881	1,362,000
January.....	27,664	2,970	435	892	54,870
February.....	64,907	22,200	360	2,236	128,700
March.....	41,247	5,110	505	1,331	81,810
April.....	21,569	2,030	352	719	42,780
May.....	59,713	15,200	401	1,926	118,400
June.....	35,945	5,410	172	1,198	71,290
July.....	51,035	4,820	540	1,646	101,200
August.....	24,653	2,050	148	795	48,900
September.....	23,069	2,700	182	769	45,760
Water year 1947-48.....	416,347	22,200	148	1,138	825,700

Note.- Discharge July 12-27 computed from graph based on once-daily readings of outside gage by U. S. Weather Bureau.

## Brazos River near Marlin, Tex.

Location.- Wire-weight gage, lat. 31°17'20", long. 96°58'10", at bridge on State Highway 139, 1 mile upstream from Deer Creek and 4.5 miles southwest of Marlin, Falls County. Datum of gage is 312.15 feet above mean sea level, datum of 1929.

Drainage area.- 29,150 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- October 1938 to September 1948.

Average discharge.- 10 years, 3,307 second-feet.

Extremes.- Maximum discharge during year, 35,900 second-feet Feb. 26 (gage height, 17.35 feet, from graph based on gage readings); minimum, 128 second-feet Aug. 17 (computed from graph based on gage readings).

1938-48: Maximum discharge, 132,000 second-feet May 3, 1944 (gage height, 33.3 feet, from floodmark); minimum not determined.

Maximum stage known, 35.8 feet Dec. 3 or 4, 1913, from information by local residents. Flood of Sept. 28, 1936, reached a stage of 35.2 feet.

Remarks.- Records good. Gage read twice daily, oftener during high stages. Flow partly regulated by reservoirs above Waco. Many small diversions above stations for irrigation, municipal supply, and oil-field operation do not appreciably affect flow.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	334	892	465	726	766	6,000	732	829	1,470	3,200	682	1,850
2	292	856	410	662	674	5,900	759	558	1,380	4,000	644	1,800
3	272	510	383	1,830	1,020	5,800	686	570	918	2,050	1,040	1,650
4	272	415	356	3,130	1,070	3,780	587	485	609	3,000	1,120	al,290
5	370	356	396	2,820	938	2,320	528	850	516	4,180	1,060	915
6	352	304	352	2,100	822	1,700	480	1,120	450	4,620	968	1,070
7	292	260	480	1,520	706	1,800	495	1,200	392	3,960	726	1,290
8	321	238	2,520	1,100	626	1,700	700	864	347	3,230	548	1,100
9	465	260	4,380	864	706	1,600	871	662	308	2,120	460	1,340
10	415	276	6,020	712	1,380	1,470	656	761	284	3,480	352	1,320
11	435	272	4,190	632	1,380	1,520	554	2,430	272	4,920	256	a2,700
12	480	256	3,060	538	1,560	1,470	490	20,000	194	3,900	205	1,380
13	378	226	2,100	914	1,340	1,240	2,460	10,300	423	1,520	194	773
14	304	248	1,520	592	1,720	1,050	3,060	3,520	554	1,070	240	604
15	326	222	1,240	632	1,640	930	1,620	2,100	794	1,200	212	1,060
16	554	272	1,380	604	801	878	1,000	1,380	938	1,340	160	801
17	495	388	2,650	773	885	1,060	773	1,340	871	1,160	372	565
18	455	475	1,950	836	1,290	1,120	609	1,240	780	945	984	490
19	410	440	1,800	726	1,100	922	505	1,120	836	738	1,060	420
20	352	420	2,760	766	915	864	526	1,620	726	1,010	1,000	312
21	312	338	2,150	758	752	801	543	2,650	495	1,290	787	278
22	455	380	1,520	674	650	700	460	977	420	1,380	543	240
23	450	356	1,160	706	582	732	401	850	738	1,290	435	202
24	420	365	945	892	536	1,050	435	759	908	1,010	347	252
25	415	320	829	745	759	1,240	843	801	4,820	829	582	284
26	415	435	752	680	20,900	1,060	2,590	885	3,480	700	773	455
27	374	759	700	1,110	12,600	836	1,380	1,240	1,690	992	1,760	425
28	334	871	662	1,290	8,750	732	1,060	5,410	6,650	1,120	2,360	420
29	643	752	620	1,240	a6,680	638	992	2,670	4,640	1,200	1,800	843
30	1,240	576	609	1,110	-	538	1,080	2,320	2,680	984	1,950	871
31	1,340	-	759	984	-	576	-	1,600	-	794	1,950	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	13,972	1,340	272	451	27,710
November.....	12,495	892	222	417	24,790
December.....	49,118	6,020	352	1,584	97,420
Calendar year 1947.....	787,868	21,300	222	2,159	1,563,000
January.....	32,646	3,130	538	1,053	64,750
February.....	73,550	20,900	538	2,536	145,900
March.....	51,527	6,000	538	1,662	102,200
April.....	27,893	3,060	401	930	55,320
May.....	73,209	20,000	485	2,362	145,200
June.....	39,683	6,650	194	1,323	78,710
July.....	63,212	4,920	700	2,039	125,400
August.....	25,550	2,360	160	824	50,680
September.....	26,998	2,700	202	900	53,550
Water year 1947-48.....	489,854	20,900	160	1,338	971,600

a No gage-height record; discharge computed on basis of estimated gage-height record.

## Brazos River near Bryan, Tex.

Location.- Water-stage recorder, lat. 30°37', long. 96°29', 2.4 miles downstream from Little Brazos River and 9 miles southwest of Bryan, Brazos County. Datum of gage is 192.3 feet above mean sea level, datum of 1929.

Drainage area.- 38,430 square miles, of which 9,240 square miles is probably non-contributing.

Records available.- September 1925 to September 1948. February 1918 to September 1925 at site near College Station, 7½ miles downstream. August 1899 to December 1902 at site near College Station, 7½ miles downstream, daily records published in U. S. Department of Agriculture, Office of Experiment Stations, Bulletins Nos. 104, 119, and 133.

Average discharge.- 29 years (1918-25, 1926-48), 6,064 second-feet.

Extremes.- Maximum discharge during year, 30,000 second-feet May 13 (gage height, 18.04 feet); minimum, 322 second-feet Aug. 19.

1925-48: Maximum gage height, 46.1 feet May 20, 1930, present site and datum (discharge not determined); minimum discharge, 87 second-feet Aug. 24, 1934.

Maximum stage known, about 54.0 feet Dec. 5, 1913, present datum.

Remarks.- Records good. Flow partly regulated by reservoirs above Waco. Many small diversions above station for irrigation, municipal supply, and oil-field operation do not appreciably affect flow.

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge in second-feet)  
(Shifting-control method used Nov. 1-30)

Oct. 1-31		Nov. 1-Sept. 30	
3.9	460	3.2	290
4.1	540	3.5	405
4.5	750	4.0	650
		4.5	910
		5.0	1,250
		5.5	1,650
		6.0	2,110
		7.0	3,250
		8.0	4,480
		9.0	6,050
		10.0	8,000
		11.0	10,200
		13.0	15,200
		15.0	21,000
		17.4	28,200

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	620	1,140	975	975	1,490	8,640	910	1,740	3,850	4,480	975	1,960
2	570	1,180	850	1,010	1,290	8,000	910	1,530	2,810	3,470	820	1,960
3	528	910	779	1,010	1,140	6,410	1,030	1,290	2,640	4,480	774	1,780
4	504	942	800	1,080	1,110	5,870	1,040	1,110	2,310	5,890	756	1,650
5	484	910	1,410	2,720	1,410	4,760	975	975	1,920	4,840	1,010	1,490
6	480	790	942	3,050	1,450	3,590	910	942	1,370	3,470	1,080	1,220
7	540	695	850	2,480	1,570	2,870	850	1,180	1,110	3,500	1,040	942
8	536	625	850	2,010	1,880	2,420	790	1,830	910	4,900	975	1,080
9	500	558	1,270	1,610	3,960	2,310	752	1,740	880	4,040	801	1,140
10	472	522	4,030	1,550	2,870	2,260	959	1,490	790	2,480	650	1,080
11	532	517	5,520	1,350	2,480	2,060	1,450	1,410	752	4,160	566	1,220
12	575	504	4,090	1,180	2,420	1,960	1,530	8,760	686	6,050	499	1,610
13	570	493	3,350	1,040	2,010	1,960	1,220	27,900	600	5,690	441	2,110
14	504	504	2,810	975	1,880	1,850	3,240	15,700	585	4,440	401	1,250
15	545	494	2,360	1,140	1,740	1,650	6,980	8,000	768	2,110	365	1,450
16	492	476	2,110	942	1,650	1,490	4,480	5,200	757	1,740	357	1,410
17	472	472	1,920	975	1,290	1,450	3,050	3,710	933	1,740	365	1,290
18	610	508	2,360	1,040	1,140	1,370	2,140	2,640	1,010	1,570	341	1,010
19	630	640	2,640	1,110	1,290	1,450	1,610	2,310	942	1,350	442	790
20	585	708	2,010	1,220	1,450	1,450	1,290	2,210	880	1,110	880	670
21	545	696	2,480	1,220	1,350	1,290	1,110	1,830	880	975	975	585
22	516	713	2,640	1,180	1,220	1,220	1,040	2,910	790	1,180	975	508
23	488	745	2,010	1,140	1,080	1,140	1,010	2,020	655	1,290	769	450
24	540	682	1,650	1,080	1,010	1,110	910	1,410	576	1,350	625	413
25	575	665	1,450	1,080	910	1,140	880	1,290	782	1,220	558	389
26	550	665	1,410	1,180	973	1,410	1,130	1,250	2,540	1,040	522	385
27	532	615	1,290	1,110	19,000	1,570	3,310	2,360	3,710	850	640	385
28	532	660	1,180	1,040	16,500	1,410	3,710	4,510	2,540	774	839	486
29	528	850	1,110	1,250	10,200	1,220	2,870	8,000	4,160	1,010	1,800	486
30	500	975	1,040	1,350	-	1,140	2,240	5,200	4,480	1,080	2,420	472
31	683	-	1,010	1,650	-	1,010	-	4,760	-	1,110	2,010	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	16,834	683	472	543	33,390
November.....	20,866	1,180	472	696	41,390
December.....	59,196	5,520	779	1,910	117,400
Calendar year 1947.....	1,494,533	44,700	472	4,095	2,964,000
January.....	41,687	3,050	942	1,345	82,680
February.....	87,543	19,000	910	3,019	173,600
March.....	77,460	8,640	1,010	2,499	153,600
April.....	54,286	6,980	752	1,810	107,700
May.....	127,207	27,900	942	4,103	252,300
June.....	47,596	4,480	576	1,587	94,410
July.....	81,849	6,050	774	2,840	162,500
August.....	25,671	2,420	341	1,056	50,920
September.....	31,671	2,110	385	1,056	62,820
Water year 1947-48.....	671,866	27,900	341	1,856	1,333,000

Peak discharge (base, 41,000 sec.-ft.)- No peak above base.

## Brazos River near Hempstead, Tex.

Location.- Wire-weight gage, lat. 30°07'25", long. 96°11'00", at bridge on U. S. Highway 290, 4,500 feet upstream from Texas & New Orleans Railroad bridge, 6.5 miles northwest of Hempstead, Waller County, and 8 miles upstream from Caney Creek. Datum of gage is 118.07 feet above mean sea level, datum of 1929.

Drainage area.- 42,670 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- October 1938 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity at intermittent periods since 1903.

Average discharge.- 10 years, 8,517 second-feet.

Extremes.- Maximum discharge during year, 24,000 second-feet May 14 (gage height, 19.25 feet, from graph based on gage readings); minimum observed, 418 second-feet Aug. 21, 1938-48; Maximum discharge, 116,000 second-feet Nov. 30, 1940 (gage height, 44.04 feet); minimum, 254 second-feet Nov. 8, 1939.  
Maximum stage known, 56.1 feet Dec. 8, 1913, from data by engineers of Texas & New Orleans Railroad, obtained at bridge 4,500 feet downstream.

Remarks.- Records fair. Flow partly regulated by reservoirs above Waco. Gage read twice daily, oftener during high stages. Many small diversions above station for irrigation, municipal supply, and oil-field operation do not appreciably affect flow.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,010	660	1,060	1,260	2,010	12,200	1,430	3,240	7,700	4,660	1,060	2,010
2	880	720	1,160	1,230	2,080	10,100	1,330	2,730	7,400	4,920	1,080	1,890
3	788	1,150	1,180	1,180	2,010	9,610	1,260	2,400	6,230	4,560	995	1,830
4	742	1,300	1,330	1,260	1,890	8,310	1,230	2,140	5,040	4,430	885	1,770
5	700	1,120	1,950	1,280	1,890	8,160	1,280	1,890	4,110	4,680	808	1,650
6	680	1,090	2,400	1,540	1,950	7,700	1,280	1,770	3,340	4,000	808	1,600
7	640	1,090	2,600	2,660	2,010	6,230	1,260	1,650	2,600	5,820	972	1,480
8	640	955	2,400	2,800	2,200	4,920	1,160	1,480	2,140	6,800	1,040	1,280
9	680	832	2,530	2,530	3,980	4,350	1,110	1,600	1,630	5,430	1,020	1,130
10	680	742	1,950	2,200	6,230	4,440	1,040	1,950	1,650	4,920	928	1,130
11	640	680	2,790	1,950	6,800	4,220	1,040	2,010	1,540	3,690	790	1,180
12	602	621	5,820	1,890	4,230	3,780	1,200	2,270	1,430	3,780	702	1,200
13	640	621	5,820	1,650	5,430	3,340	1,770	10,900	1,330	5,560	840	1,230
14	680	602	4,440	1,540	4,580	2,960	2,600	22,800	1,280	6,370	625	1,650
15	720	602	3,780	1,430	4,000	2,730	4,000	14,300	1,130	5,040	565	1,830
16	720	602	4,220	1,430	3,560	2,400	8,830	8,790	1,080	3,140	492	1,380
17	700	621	3,240	1,600	3,340	2,140	8,310	6,650	1,180	2,140	468	1,430
18	640	4,780	2,730	1,650	3,140	2,010	6,370	5,170	1,260	1,890	442	1,430
19	621	3,760	2,400	1,650	2,880	1,890	5,170	4,220	1,380	1,770	442	1,430
20	720	2,340	2,600	1,650	2,660	1,890	4,330	3,560	1,480	1,600	430	1,230
21	765	1,830	2,400	1,890	3,140	2,010	3,670	3,560	1,430	1,430	442	928
22	742	1,430	2,140	1,890	4,680	2,080	2,960	3,560	1,580	1,230	755	825
23	700	1,200	2,400	1,770	4,560	2,340	2,600	4,000	1,330	1,130	905	738
24	680	1,160	2,400	1,650	3,890	2,080	2,340	4,560	1,280	1,260	885	685
25	621	1,110	2,010	1,650	2,880	2,010	1,890	3,890	1,130	1,120	808	610
26	660	1,060	1,650	1,650	2,340	1,950	2,660	3,560	1,060	1,330	702	550
27	6700	932	1,540	1,890	2,700	1,830	2,400	2,730	1,580	1,280	640	535
28	680	905	1,480	1,480	15,700	1,830	2,800	2,270	3,320	1,080	610	505
29	680	905	1,380	1,200	15,800	1,830	4,440	4,030	3,670	950	640	492
30	700	972	1,280	2,140	-	1,770	4,110	9,070	3,340	885	905	550
31	700	-	1,160	2,080	-	1,600	-	8,950	-	995	1,770	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	21,751	1,010	602	702	43,140
November.....	36,432	4,780	602	1,214	72,260
December.....	75,850	5,820	1,060	2,447	150,400
Calendar year 1947.....	2,317,451	55,900	602	6,349	4,596,000
January.....	55,390	2,800	1,180	1,787	109,900
February.....	124,540	15,800	1,890	4,234	247,000
March.....	124,680	12,700	1,600	4,022	247,300
April.....	85,870	8,830	1,040	2,862	170,300
May.....	151,700	22,800	1,480	4,894	300,900
June.....	74,450	7,700	1,060	2,462	147,700
July.....	98,170	6,800	885	3,167	194,700
August.....	24,254	1,770	430	782	48,110
September.....	36,178	2,010	492	1,206	71,760
Water year 1947-48.....	909,265	22,800	430	2,484	1,803,000

Peak discharge (base, 50,000 sec.-ft.)- No peak above base.

No gage-height record; discharge computed on basis of estimated gage-height record.

## Brazos River near San Felipe, Tex.

Location.- Water-stage recorder, lat. 29°46'20", long. 96°02'10", at bridge on U. S. Highway 90, 200 feet downstream from Missouri-Kansas-Texas Railroad bridge, 1.3 miles downstream from Irons Creek, and 5.0 miles southeast of San Felipe post office, Austin County. Datum of gage is 79.32 feet above mean sea level, datum of 1929.

Drainage area.- 43,690 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- December 1938 to September 1948 (October 1945 to September 1948, gage heights only).

Extremes.- Maximum gage height during year, 17.82 feet May 14; minimum, 7.22 feet Aug. 22. 1938-48: Maximum gage height, 41.10 feet Nov. 25, 1940 (discharge, 152,000 second-feet); minimum, 6.57 feet Oct. 9, 1939.

Maximum stage known, 49.0 feet Dec. 9, 1913, from information by local resident.

Remarks.- Discharge not computed. Flow partly regulated by reservoirs above Waco. Many small diversions above station for irrigation, municipal supply, and oil-field operation do not appreciably affect flow.

Gage height, in feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.68	8.17	8.31	8.74	9.28	15.78	8.87	10.34	12.04	9.83	8.17	8.64
2	8.63	8.11	8.42	8.72	9.26	14.61	8.79	9.96	11.85	10.54	8.28	9.06
3	8.52	8.14	8.58	8.68	9.31	13.59	8.68	9.61	11.44	10.70	8.28	8.98
4	8.42	8.52	8.75	8.62	9.34	12.99	8.58	9.37	11.00	10.51	8.18	8.97
5	8.35	8.72	9.29	8.62	9.34	12.66	8.55	9.20	10.51	10.61	8.05	8.95
6	8.29	8.64	10.06	8.62	9.33	12.96	8.60	9.10	10.07	10.72	7.95	8.88
7	8.24	8.57	10.51	8.89	9.32	12.73	8.60	8.96	9.70	10.63	7.92	8.78
8	8.19	8.56	10.00	9.66	9.42	12.10	8.54	8.86	9.30	11.39	8.09	8.66
9	8.16	8.48	9.88	9.74	10.11	11.55	8.45	8.69	8.92	11.63	8.20	8.54
10	8.18	8.37	9.62	9.55	11.08	11.21	8.39	8.78	8.68	11.06	8.18	8.34
11	8.22	8.30	9.38	9.32	11.63	11.00	8.32	9.08	8.48	10.67	8.11	8.29
12	8.18	8.21	10.07	9.14	11.83	10.83	8.30	9.16	8.30	10.10	7.97	8.34
13	8.14	8.12	11.90	9.03	11.65	10.61	8.45	9.56	8.15	10.05	7.83	8.30
14	8.13	8.12	11.85	8.87	11.25	10.40	9.04	16.42	8.02	11.00	7.80	8.35
15	8.19	8.09	11.29	8.73	10.83	10.22	9.68	16.48	7.95	11.40	7.61	8.74
16	8.22	8.09	11.52	8.69	10.56	9.99	10.96	13.99	7.85	10.80	7.45	8.93
17	8.25	8.08	11.65	8.75	10.38	9.71	12.68	12.56	7.85	9.90	7.38	8.60
18	8.23	8.23	10.65	8.81	10.26	9.42	12.06	11.70	7.95	9.32	7.33	8.62
19	8.18	11.05	10.24	8.94	10.14	9.13	11.33	11.10	8.15	9.08	7.32	8.62
20	8.11	10.64	10.01	9.29	9.99	9.10	10.84	10.58	8.20	9.00	7.31	8.50
21	8.14	9.61	10.02	9.12	10.00	8.98	10.50	10.27	8.20	8.86	7.29	8.29
22	8.25	9.28	9.81	9.06	10.70	9.00	10.19	10.20	8.10	8.67	7.23	8.28
23	8.25	9.15	9.66	8.98	11.23	9.03	9.89	10.20	7.95	8.48	7.59	7.92
24	8.20	8.87	9.78	8.87	10.97	9.40	9.64	10.44	7.85	8.46	7.97	7.77
25	8.15	8.68	9.67	8.80	10.69	9.34	9.52	10.66	7.75	8.43	8.06	7.63
26	8.12	8.60	9.41	8.81	10.21	9.28	9.73	10.33	7.60	8.53	8.00	7.51
27	8.10	8.51	9.20	8.96	9.82	9.19	9.84	10.15	7.60	8.54	7.83	7.41
28	8.15	8.40	9.07	9.26	12.33	9.07	9.51	9.76	7.85	8.45	7.66	7.34
29	8.22	8.35	8.98	9.46	16.07	9.09	9.82	9.54	9.82	8.35	7.58	7.30
30	8.21	8.32	8.87	9.36	-	9.11	10.50	10.68	9.88	8.15	7.58	7.29
31	8.23	-	8.83	9.30	-	9.02	-	12.47	-	8.04	7.83	-

Note.- No gage-height record Mar. 2-24, June 9-28, Aug. 15-17; gage heights computed on basis of records for stations near Hempstead and at Richmond.

## Brazos River at Richmond, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 29°35', long. 95°45', at bridge on U. S. Highway 59 in Richmond, Fort Bend County, about 925 feet downstream from Texas & New Orleans Railroad bridge. Datum of gage is 40.8 feet above mean sea level, datum of 1929.

Drainage area.- 44,050 square miles, of which 9,240 square miles is probably noncontributing.

Records available.- January 1903 to June 1906, June 1931 to September 1948. October 1922 to September 1931 at site at Rosenberg, 7.6 miles upstream; records equivalent except for diversion by Richmond Irrigation Co.'s canal. June to November 1901 and June to September 1902 at Texas & New Orleans Railroad bridge about 925 feet upstream, daily records published in U. S. Department of Agriculture, Office of Experiment Stations, Bulletins Nos. 119 and 133. U. S. Weather Bureau has collected gage-height records in this vicinity since 1914.

Average discharge.- 28 years (1903-5, 1922-48), 8,157 second-feet.

Extremes.- Maximum discharge during year, 22,100 second-feet May 15 (gage height, 13.22 feet); minimum, 198 second-feet Aug. 24.

1903-6, 1931-48: Maximum discharge, 117,000 second-feet Nov. 28, 1940 (gage height, 38.40 feet); minimum, 33 second-feet Aug. 23, 24, 1934.

Flood of June 6, 1929, reached a stage of 40.6 feet, present site and datum, from floodmarks (discharge, 120,000 second-feet). Flood of Dec. 10, 1913, reached a stage of 48.2 feet, present datum, from floodmarks on right bank 1,000 feet upstream from gage.

Remarks.- Records good. Wire-weight gage read once daily. Flow partly regulated by reservoirs above Waco. Considerable water diverted above station for irrigation and municipal supply. See records of American Canal Co.'s canal near Pilshear (p. 121) and Richmond Irrigation Co.'s canal near Richmond (p. 121). Records of chemical analyses for water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	930	1,020	1,180	1,760	2,260	18,100	2,170	3,880	7,700	2,620	774	495
2	1,080	960	1,180	1,680	2,260	15,700	2,040	3,640	6,780	2,710	780	960
3	1,050	930	1,260	1,680	2,260	12,800	1,920	2,990	5,960	3,780	870	1,600
4	1,020	930	1,440	1,800	2,260	11,300	1,840	2,530	5,520	4,140	900	1,600
5	990	1,180	1,720	1,560	2,350	10,100	1,720	2,260	4,680	3,890	840	1,590
6	930	1,480	2,530	1,520	2,350	9,160	1,680	2,080	3,880	4,140	769	1,560
7	870	1,440	3,640	1,520	2,350	9,600	1,680	1,920	3,090	4,270	698	1,480
8	870	1,320	4,400	1,720	2,260	8,300	1,600	1,760	2,620	4,270	598	1,400
9	840	1,320	3,520	2,620	2,440	6,960	1,480	1,640	2,080	5,800	664	1,360
10	810	1,260	3,300	2,800	3,660	6,120	1,400	1,440	1,680	5,960	769	1,320
11	810	1,280	2,890	2,620	5,960	5,520	1,260	1,520	1,480	4,820	774	1,260
12	840	1,080	2,620	2,350	7,140	5,380	1,180	1,840	1,260	4,140	708	1,180
13	774	1,020	5,070	2,080	7,140	4,820	1,120	1,920	1,120	3,300	626	1,180
14	725	1,020	7,900	1,960	6,600	4,540	1,280	7,000	990	3,308	545	1,150
15	780	930	7,320	1,760	5,520	4,140	1,760	21,200	900	5,100	470	1,180
16	810	900	6,120	1,600	4,820	3,880	2,530	14,600	840	5,800	410	1,480
17	840	900	6,600	1,560	4,680	3,520	5,560	10,100	730	4,400	365	1,760
18	900	900	6,280	1,560	4,400	3,190	8,300	7,900	659	2,990	334	1,440
19	1,120	1,110	4,680	1,760	4,140	2,890	6,780	6,440	810	2,220	306	1,360
20	1,050	4,720	4,010	2,000	3,880	2,710	5,240	5,100	870	1,920	266	1,400
21	990	4,160	3,640	2,260	3,640	2,620	4,540	4,140	840	1,840	239	1,320
22	960	2,890	3,520	2,080	3,780	2,530	3,880	3,640	870	1,640	222	1,150
23	1,050	2,530	3,190	2,000	5,100	2,620	3,520	3,410	840	1,480	210	990
24	1,050	2,170	2,990	1,960	6,120	2,710	2,990	3,410	780	1,290	283	870
25	1,050	1,840	3,090	1,840	5,660	2,890	2,620	3,880	747	1,080	664	769
26	990	1,640	2,890	1,760	4,960	2,620	2,530	4,400	708	1,080	780	686
27	960	1,520	2,620	1,800	4,140	2,530	2,710	3,880	637	1,150	758	560
28	930	1,400	2,260	1,920	3,410	2,440	2,800	3,410	555	1,150	626	490
29	990	1,290	2,120	2,260	14,200	2,260	2,440	2,800	625	1,080	515	455
30	1,080	1,220	2,000	2,530	-	2,260	2,890	2,620	2,100	990	455	505
31	1,120	-	1,860	2,440	-	2,260	-	4,880	-	870	410	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	29,209	1,120	725	942	57,940
November.....	46,260	4,720	900	1,542	91,760
December.....	107,860	7,900	1,180	3,479	213,900
Calendar year 1947.....	2,410,365	49,800	685	6,604	4,781,000
January.....	60,560	2,800	1,520	1,954	120,100
February.....	129,720	14,200	2,260	4,473	257,300
March.....	176,470	18,100	2,260	5,693	350,000
April.....	83,440	8,300	1,120	2,781	185,500
May.....	142,230	21,200	1,440	4,588	282,100
June.....	62,351	7,700	555	2,078	123,700
July.....	93,190	5,960	870	3,006	184,800
August.....	17,628	900	210	569	34,960
September.....	34,520	1,760	455	1,151	68,470
Water year 1947-48.....	983,438	21,200	210	2,687	1,951,000

Peak discharge (base, 39,000 sec.-ft.)- No peak above base.



## Brazos River at East Columbia, Tex.

Location.—Wire-weight gage, lat. 29°09', long. 95°37', at bridge on State Highway 35 at East Columbia, Brazoria County, 1 mile downstream from Yarners Creek. Datum of gage is 2.9 feet below mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.—44,540 square miles, of which 9,240 square miles is probably noncontributing.

Records available.—October 1938 to September 1939 (gage heights only), October 1939 to September 1940, February 1942 to September 1948 (gage heights, discharge measurements, and daily discharge above 8,000 second-feet); October 1940 to September 1941 (discharge measurements only).

Extremes.—Maximum discharge during year, 25,600 second-feet May 15 (gage height, 14.10 feet); from graph based on gage readings; minimum gage height observed, 1.73 feet Jan. 1 (affected by tides).

1938-48: Maximum gage height observed, 34.12 feet Dec. 5, 1940 (discharge not determined); minimum, 1.54 feet Aug. 22, 1939 (affected by tides).

Maximum stage known, 35.3 feet Dec. 11 or 12, 1913. Flood of 1899 reached a stage of 35.0 feet. Stages from information by local residents.

Remarks.—Records fair and are for main channel only. Discharge for periods below 8,000 second-feet not published because of effect from tides. Gage read twice daily, oftener during high stages. Flow partly regulated by reservoirs above Waco. Considerable water diverted above station for irrigation and municipal supply.

Gage height, in feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.84	3.62	3.68	2.58	3.93	12.25	3.29	4.27	4.33	3.48	3.73	4.36
2	5.30	3.46	4.72	2.78	3.87	12.50	3.70	4.68	6.12	3.69	4.13	4.73
3	5.23	3.54	4.32	3.36	4.00	11.30	4.10	4.77	6.13	4.58	3.98	4.54
4	5.14	3.52	4.25	3.15	4.05	10.10	4.36	4.49	5.30	4.91	4.16	5.15
5	4.19	3.49	4.02	3.35	4.40	10.05	4.15	4.61	5.66	5.40	4.14	4.27
6	3.98	4.12	4.82	3.56	3.90	8.60	4.28	4.49	4.76	5.36	4.31	5.54
7	3.99	3.46	4.98	3.48	3.74	8.15	4.24	4.51	4.62	5.32	3.64	4.19
8	3.81	3.94	4.98	4.06	4.05	8.42	4.32	5.26	4.27	5.21	3.40	4.26
9	3.50	4.65	5.94	4.06	3.60	8.35	4.20	5.38	3.93	4.78	3.54	3.58
10	4.32	5.29	5.08	3.00	4.08	7.38	4.27	5.13	3.36	5.00	3.20	3.75
11	4.11	4.25	4.98	4.77	5.04	7.27	4.97	4.57	3.00	5.12	2.93	4.79
12	4.76	4.72	5.00	4.66	5.14	6.60	4.84	4.34	3.62	4.56	2.84	4.90
13	4.89	5.09	4.72	3.64	5.82	6.38	4.70	4.14	3.28	3.88	2.99	4.58
14	4.70	5.42	5.97	3.24	6.55	6.88	4.18	3.73	3.14	3.92	3.65	4.24
15	4.34	3.64	7.60	3.64	6.49	5.90	4.22	8.57	3.02	4.22	3.50	5.06
16	3.64	3.92	7.42	3.94	5.54	5.48	4.76	12.90	3.38	5.00	3.34	5.46
17	3.27	4.80	7.10	3.33	5.34	5.14	3.77	10.10	3.58	5.64	3.68	5.59
18	3.36	4.06	7.04	3.66	5.00	5.11	3.55	7.85	3.74	4.72	3.86	5.64
19	4.00	4.08	6.75	4.63	5.00	5.22	6.70	6.80	3.96	4.77	3.58	5.60
20	3.07	4.03	5.79	4.69	4.23	4.76	6.42	5.95	3.76	4.70	3.86	5.36
21	3.76	6.20	5.12	3.70	4.34	5.16	5.69	5.52	4.10	4.47	3.32	5.20
22	3.94	5.68	4.89	4.29	5.74	4.81	5.56	4.90	4.12	4.14	4.88	4.80
23	3.93	4.84	4.59	3.77	6.00	4.57	6.12	4.68	4.14	3.77	3.40	4.20
24	4.05	4.40	3.77	2.60	7.09	4.86	6.15	4.42	3.21	3.70	3.76	3.72
25	4.14	4.55	3.77	4.48	6.82	3.87	6.13	4.44	3.85	3.42	3.69	4.70
26	4.44	4.54	4.04	4.82	6.72	5.25	5.57	4.64	3.86	3.28	3.83	3.94
27	4.37	4.27	3.68	4.63	6.34	5.12	4.91	4.44	3.69	3.12	3.97	4.15
28	4.65	4.27	3.76	3.06	5.57	4.20	4.43	4.02	3.43	3.06	3.92	4.19
29	4.74	3.00	3.84	3.14	5.45	4.53	4.14	3.78	3.12	3.30	4.32	3.90
30	4.11	3.44	4.14	3.22	-	4.26	4.24	3.62	3.00	3.48	4.40	3.89
31	4.18	-	4.51	3.98	-	4.11	-	3.58	-	4.47	4.46	-

Discharge measurements, water year October 1947 to September 1948

Date	Width (feet)	Area (square feet)	Mean velocity (feet per second)	Gage height (feet)	Discharge (second-feet)
Dec. 15.....	317	3,790	2.49	7.60	9,450
Feb. 25.....	274	3,670	2.18	6.92	8,010
Mar. 2.....	345	6,100	3.27	12.37	19,900
June 2.....	274	3,470	2.01	6.16	6,960
July 6.....	286	3,430	1.32	5.47	4,540

Discharge, in second-feet, water year October 1947 to September 1948

Date	Discharge	Date	Discharge	Date	Discharge	Date	Discharge
Dec. 15	9,480	Mar. 1	21,200	Mar. 6	11,300	Mar. 11	8,780
16	9,080	2	20,100	7	11,300	16	21,400
17	8,370	3	17,500	8	11,300	17	14,700
18	8,240	4	14,700	9	10,800	18	9,760
Feb. 24	8,370	5	14,300	10	9,060	19	8,110

Note.—Discharge in excess of 8,000 sec.-ft. on May 15; discharge not computed because of tide effect for major portion of day.

## BRAZOS RIVER BASIN

Salt Fork Brazos River near Aspermont, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 33°20' long. 100°14', at bridge on U. S. Highway 83, 5½ miles downstream from Dove Creek and 13.2 miles northwest of Aspermont, Stonewall County. Datum of gage is 1,588.7 feet above mean sea level, datum of 1929.

Drainage area.- 4,834 square miles, of which 2,770 square miles is probably noncontributing.

Records available.- December 1923 to August 1925, June 1939 to September 1948.

Extremes.- Maximum discharge during year, 12,800 second-feet June 24, 28; maximum gage height, 8.31 feet June 24; minimum discharge, 0.1 second-foot at times 1923-25, 1939-48; Maximum discharge 27,400 second-feet May 16, 1947 (gage height, 11.35 feet); no flow at times.  
Maximum stage known, 14.4 feet in December 1913. Flood of November 1934 reached a stage of 13.7 feet. Stages from information by local residents.

Remarks - Records poor. Wire-weight gage read once daily. Daily discharge published only to show distribution of runoff. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0.1	0.1	1.0	3.8	30	0.2	6.9	f1280	655	465	f1.4
2	.1	.1	.1	1.8	3.8	23	.2	.4	f495	420	97	f.4
3	.1	.1	f125	2.6	2.6	18	.2	.1	f173	253	42	.5
4	.1	.1	f826	2.6	2.2	15	.2	.1	71	162	28	.2
5	.1	.1	f297	2.6	8.0	13	.2	.1	30	1,370	17	.2
6	.1	.1	f86	1.8	12	12	.2	.1	15	1,920	10	.2
7	.1	.1	43	1.0	8.4	12	.2	.1	7.2	705	6.8	.2
8	.1	.1	23	.8	6.4	10	.2	.1	4.7	272	5.5	.2
9	.1	.1	16	.5	4.7	8.9	.2	.1	2.2	145	12	6.9
10	.1	.1	11	.2	4.3	8.4	.2	.1	.7	f264	3.8	4.8
11	.1	.1	8.9	.2	3.4	5.1	.2	.1	2.6	60	4.8	.4
12	.1	.1	8.4	.2	1.4	7.8	.2	.1	1.4	40	28	.2
13	.1	.5	7.2	.2	2.6	7.2	.2	.1	13	108	13	.1
14	.1	30	6.4	.2	1.8	6.4	.2	.1	78	180	6.8	.1
15	.1	8.4	5.1	.2	2.2	5.5	.4	.1	52	81	2.6	.1
16	.1	.7	4.3	.2	1.4	4.3	.4	.1	34	42	1.0	.1
17	.1	8.3	3.8	.2	1.4	3.8	.5	.1	11	f25	.7	.1
18	.1	47	3.0	.2	1.4	3.8	.5	5.6	3.0	16	.5	.1
19	.1	11	2.2	.2	1.0	4.3	.4	25	.5	11	.5	.1
20	.1	5.1	2.2	.2	.5	3.4	.5	6.7	.2	7.2	.5	.1
21	.1	26	1.8	.4	.4	5.1	.4	.8	.1	4.7	.5	.1
22	.1	22	1.4	.4	.2	3.4	.4	.4	.1	2.6	.5	.1
23	.1	6.8	1.0	.4	.2	2.6	.4	.5	13	f1,550	.5	.1
24	.7	4.3	.8	.4	.4	2.2	.2	.4	2,930	f976	.5	.1
25	.2	2.6	.8	.5	.8	.8	.2	19	322	f263	.5	.1
26	.1	.7	.7	.5	235	.4	.2	12	131	105	.4	.1
27	.1	.2	.7	.7	f2010	.2	.2	6.4	109	f54	.2	.1
28	.1	.2	.7	.8	128	.2	.2	5.1	6,670	f32	4.4	.1
29	.1	.2	.5	1.8	51	.2	.4	1.8	4,370	18	6.0	.1
30	.1	.1	.4	2.2	-	.1	23	.5	885	9.4	1.8	.1
31	.1	-	.4	1.8	-	.2	-	557	-	192	1.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3.8	0.7	0.1	0.12	7.5
November.....	175.3	47	.1	5.84	348
December.....	1,487.9	826	.1	48.0	2,950
Calendar year 1947 .....	51,316.5	11,200	0	141	101,800
January.....	26.8	2.6	.2	.86	53
February.....	2,499.3	2,010	.2	86.2	4,960
March.....	217.3	30	.1	7.01	431
April.....	31.1	23	.2	1.04	62
May.....	650.0	557	.1	21.0	1,290
June.....	17,684.7	6,670	.1	589	35,080
July.....	9,942.9	1,920	2.6	321	19,720
August.....	762.6	465	.2	24.6	1,510
September.....	17.4	6.9	.1	.58	35
Water year 1947-48 .....	33,499.1	6,670	.1	91.5	66,450

Peak discharge (base, 12,000 sec.-ft.)- June 24 (6 a.m.) 12,800 sec.-ft.; June 28 (9 a.m.) 12,800 sec.-ft.

f Computed on basis of partly estimated gage-height record.

## White River at Plainview, Tex.

Location.- Water-stage recorder, lat. 34°11', long. 101°41', at bridge on Broadway Street in Plainview, Hale County, 0.7 mile upstream from Atchison, Topeka & Santa Fe Railway bridge. Datum of gage is 3,341.1 feet above mean sea level, datum of 1929.

Records available.- June 1939 to September 1948.

Extremes.- Maximum discharge during year, 46 second-feet Aug. 15 (gage height, 2.82 feet); no flow most of time.

1939-48: Maximum discharge, 12,000 second-feet June 6, 1941 (gage height, 8.75 feet), by slope-area method; no flow most of time.

Maximum stage known prior to 1941, about 6.50 feet in May 1927 (discharge, about 1,100 second-feet), from information by local resident. Flood of May 24, 1937, reached about same stage as that of May 1927.

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0		0	0	0		0	0
2					0		0	0	0		0	0
3					0		0	0	0		0	0
4							0	0	0		.4	0
5					.2		0	0	0		0	0
6					0		0	0	0		0	0
7					0		0	0	0		0	0
8					0		0	0	0		0	1.4
9					0		0	0	0		0	0
10					0		0	0	0		0	0
11					0		0	0	0		0	0
12					0		0	0	0		0	0
13					0		0	0	0		0	0
14					0		0	0	0		0	0
15					0		0	0	0		8.9	0
16					0		0	0	0		0	0
17					0		0	0	0		0	0
18					0		0	0	0		0	0
19					0		0	0	0		0	0
20					0		0	0	0		0	0
21					0		.2	0	0		0	0
22					0		.6	0	0		0	0
23					0		0	0	.3		0	0
24					0		0	0	0		0	0
25					0		0	1.7	.6		0	0
26					.1		0	0	.2		0	0
27					.1		0	0	.2		0	0
28					0		0	0	.1		0	0
29					0		0	0	0		0	0
30					-		0	0	0		0	0
31					-		-	0	-		0	-
Month	Second-foot-days		Maximum		Minimum		Mean		Runoff in acre-feet			
October.....	0		0		0		0		0		0	
November.....	0		0		0		0		0		0	
December.....	0		0		0		0		0		0	
Calendar year 1947.....	735.0		379		0		2.01		1,460			
January.....	0		0		0		0		0		0	
February.....	.4		.2		0		.01		.8			
March.....	0		0		0		0		0		0	
April.....	.8		.6		0		.03		1.6			
May.....	1.7		1.7		0		.05		3.4			
June.....	1.4		.6		0		.05		2.8			
July.....	0		0		0		0		0		0	
August.....	9.3		8.9		0		.30		18			
September.....	1.4		1.4		0		.05		2.8			
Water year 1947-48.....	15.0		8.9		0		.04		29			

Peak discharge (base, 10 sec.-ft.)- Aug. 15 (6:30 a.m.) 46 sec.-ft.

## Clear Fork Brazos River at Nugent, Tex.

Location.- Water-stage recorder, lat. 32°41', long. 99°40', at county highway bridge in Nugent, Jones County, 4 miles upstream from Deadman Creek.

Drainage area.- 2,220 square miles.

Records available.- February 1924 to September 1948.

Average discharge.- 24 years, 150 second-feet

Extremes.- Maximum discharge during year, 6,720 second-feet Oct. 27 (gage height, 13.87 feet); no flow at times.

1924-48: Maximum discharge observed, 47,000 second-feet Sept. 8, 1932 (gage height, 27.05 feet, site then in use), from rating curve extended above 25,000 second-feet; no flow at times.

Maximum stage known, about 30.0 feet in 1876, from information by local residents.

Remarks.- Records fair. Flow partly regulated by reservoirs in Elm Creek Basin (see p. 109) and Lakes Sweetwater and Trammel in Sweetwater Creek Basin, which have a combined capacity of about 106,000 acre-feet. Diversions above station for municipal supply and oil-field operation materially affect low flow.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	20	6.8	9.6	7.9	312	3.2	2.0	27	7.3	42	44
2	0	14	6.8	38	7.9	24	5.5	1.3	12	5.9	113	40
3	0	12	93	14	8.4	15	3.9	1.8	559	4.6	127	6.8
4	0	10	335	10	8.4	12	4.6	2.3	404	3.2	55	6.8
5	0	9.0	430	9.5	9.0	10	5.5	2.3	90	162	10	2.3
6	0	8.4	114	9.0	9.0	10	5.5	2.3	20	470	5.9	1.5
7	.1	7.3	60	9.0	9.0	9.0	5.9	1.8	9.0	1,190	3.5	.8
8	.1	6.4	23	9.0	9.0	9.0	6.4	1.3	7.9	1,140	2.5	.4
9	6.4	6.8	15	8.4	9.0	10	5.9	45	6.4	662	2.0	.4
10	65	6.4	12	8.4	8.4	10	5.5	9.8	5.5	74	3.2	.1
11	7.9	6.4	10	8.4	8.4	9.5	5.0	2.8	5.0	51	2.5	.1
12	6.4	5.9	9.5	8.4	9.0	9.5	4.6	2.5	4.6	206	1.5	1.3
13	3.9	5.9	9.0	8.4	8.4	9.0	4.6	2.3	73	46	.8	2.7
14	2.5	32	8.4	7.9	8.4	9.0	5.0	1.8	60	32	.5	.6
15	2.0	215	8.4	7.9	7.9	9.0	5.0	1.8	20	28	.4	.2
16	1.3	33	8.4	7.9	7.9	7.9	5.5	2.3	8.4	14	.1	.1
17	1.3	14	7.9	7.9	7.9	7.9	5.9	117	4.6	10	.1	.1
18	1.8	112	8.4	7.3	7.9	9.5	5.0	15	2.8	7.3	0	0
19	1.5	360	8.4	7.3	7.9	16	3.9	71	2.0	5.9	0	0
20	1.3	56	8.4	7.9	7.3	18	4.2	9.0	.6	5.0	.7	0
21	1.1	20	7.9	7.9	6.8	48	3.5	3.9	1.3	4.6	2.2	0
22	1.0	36	7.3	7.9	6.4	365	3.9	2.3	1.1	3.9	.3	0
23	.8	34	7.3	7.9	7.3	206	3.5	1.1	.6	15	.1	0
24	.8	19	7.9	7.9	7.9	22	3.2	.8	.6	5.5	0	0
25	275	15	7.3	8.4	9.0	11	3.2	1.5	.5	207	0	0
26	1,540	11	7.3	8.4	10	7.9	3.2	21	272	126	0	0
27	5,690	9.0	7.3	8.4	194	5.5	3.2	125	26	54	0	0
28	918	7.9	6.8	8.4	249	4.6	2.8	138	435	10	1.2	0
29	271	7.9	6.8	8.4	219	3.9	2.8	99	94	5.9	74	0
30	93	7.3	7.3	8.4	-	3.5	2.5	30	14	3.5	164	0
31	37	-	8.4	7.9	-	3.2	-	60	-	2.3	280	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8,927	5,690	0	288	17,710
November.....	1,107.6	360	5.9	36.9	2,200
December.....	1,264	6.8	6.8	40.8	2,510
Calendar year 1947.....	28,917.5	5,690	0	79.2	57,370
January.....	294.1	38	7.3	9.49	583
February.....	876.4	249	6.4	30.2	1,740
March.....	1,204.9	365	3.2	38.9	2,390
April.....	150	6.4	2.5	4.33	258
May.....	776	138	.8	25.0	1,540
June.....	2,148.9	539	.5	71.6	4,260
July.....	4,561.9	1,190	2.3	147	9,050
August.....	892.5	280	0	28.8	1,770
September.....	108	44	0	3.60	214
Water year 1947-48.....	22,289.3	5,690	0	60.9	44,220

Peak discharge (base, 2,300 sec.-ft.)- Oct. 27 (11:30 a.m.) 6,720 sec.-ft.

Computed on basis of partly estimated gage-height record.

Note.- No gage-height record June 6-17; discharge computed on basis of recorded range in stage, weather records, and records for station at Fort Griffin.

## Clear Fork Brazos River at Fort Griffin, Tex.

Location.- Water-stage recorder, lat. 32°56', long. 99°13', at bridge on Fort Griffin-Throckmorton highway, half a mile east of Fort Griffin, Shackelford County, and 1.3 miles upstream from Mill Creek. Datum of gage is 1,174.09 feet above mean sea level, datum of 1929, Fort Worth Supplementary adjustment of 1942.

Drainage area.- 3,974 square miles.

Records available.- December 1903 to September 1948.

Average discharge.- 24 years (1924-48), 276 second-feet.

Extremes.- Maximum discharge during year, 5,350 second-feet Oct. 29 (gage height, 15.18 feet); no flow at times.

1923-48: Maximum discharge, 33,600 second-feet Sept. 10, 1932 (gage height, 35.09 feet); no flow at times.

Maximum stage known, about 38.0 feet in 1900, from information by local residents.

Remarks.- Records good. Flow partly regulated by reservoirs above Nugent. Diversions above station for irrigation, municipal supply, and oil-field operation materially affect low flow.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	120	37	25	6.2	212	9.8	0	1,070	296	18	0
2	0	78	34	12	6.6	355	8.1	0	1,470	142	18	0
3	0	52	29	9.3	7.0	186	6.2	0	456	84	184	46
4	0	35	48	11.8	6.8	82	5.8	0	239	55	235	30
5	0	26	592	18	7.0	43	5.8	0	585	46	142	19
6	0	20	830	24	8.5	28	6.6	0	170	1,850	102	15
7	0	16	495	25	8.9	19	6.6	0	107	1,670	53	14
8	0	12	213	20	8.5	15	9.3	0	62	1,700	32	9.3
9	0	8.9	107	16	8.5	12	8.9	0	36	1,310	20	7.7
10	0	7.0	61	14	8.5	10	8.5	53	22	900	13	6.2
11	0	5.4	39	13	8.5	8.1	6.2	591	15	254	8.9	4.7
12	0	3.7	29	12	8.1	7.0	4.7	122	11	128	5.4	3.4
13	0	3.7	24	9.8	7.7	6.2	3.1	65	8.5	127	3.1	1.9
14	0	4.7	19	8.9	7.7	4.7	2.8	30	6.6	163	2.1	1.2
15	0	4.0	17	8.5	7.0	4.4	1.9	19	4.7	73	1.0	.6
16	0	85	15	7.7	6.6	3.4	1.3	12	17	41	.6	.4
17	0	160	13	6.6	7.0	2.8	.8	7.4	18	26	.1	.2
18	0	136	12	6.2	7.4	2.3	.5	4.7	17	18	0	0
19	0	136	10	7.0	7.0	2.1	.2	3.4	20	13	0	0
20	0	324	8.1	7.0	5.0	2.3	.1	2.3	13	8.5	0	0
21	0	253	6.6	6.6	4.4	2.6	.1	1.5	8.5	5.8	0	0
22	0	113	6.6	6.2	4.7	2.3	.1	8.1	5.0	4.0	0	0
23	0	85	8.5	6.2	6.6	2.3	.1	30	236	3.4	0	0
24	0	75	9.3	6.2	7.4	412	.1	92	770	2.3	0	0
25	0	65	9.3	5.8	8.9	153	.4	138	1,540	1.5	0	0
26	129	58	9.3	5.8	26	80	.3	1,330	666	1.5	0	0
27	458	49	8.9	6.6	62	49	.2	456	233	1.3	0	0
28	3,600	45	8.5	6.6	11	31	.1	208	1,130	37	0	0
29	2,680	42	8.5	6.6	223	22	.1	210	1,590	96	0	0
30	332	39	8.1	6.6	-	17	0	162	1,100	46	0	0
31	221	-	135	6.2	-	13	-	787	-	28	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	7,420	3,600	0	239	14,720
November.....	2,061.4	324	3.7	69.7	4,090
December.....	2,850.7	850	6.6	92.0	5,650
Calendar year 1947 .....	76,632.9	7,290	0	210	152,000
January.....	330.4	25	5.8	10.7	655
February.....	502.3	223	4.4	17.3	996
March.....	1,769.5	412	2.1	57.7	3,550
April.....	98.7	9.8	0	3.29	196
May.....	4,332.4	1,330	0	140	8,590
June.....	11,576.3	1,590	4.7	386	22,960
July.....	9,131.3	1,850	1.3	295	18,110
August.....	838.2	235	0	27.0	1,660
September.....	159.6	46	0	5.32	317
Water year 1947-48 .....	41,090.8	3,600	0	112	81,490

Peak discharge (base, 3,900 sec.-ft.)- Oct. 29 (1 a.m.) 5,350 sec.-ft.; May 26 (7 p.m.) 4,200 sec.-ft.

Note.- No gage-height record Nov. 23 to Dec. 17, Aug. 18 to Sept. 2, Sept. 17-20; discharge computed on basis of recorded range in stage, engineer's notes, weather records, and records for stations at Nugent and near Crystal Falls. Gage-height record doubtful Apr. 29 to May 9 because of extremely low stage; discharge computed on basis that stage was known to be extremely low.

## Clear Fork Brazos River near Crystal Falls, Tex.

Location.- Water-stage recorder above concrete dam, lat. 32°54', long. 98°50', at Texas Co.'s pumping plant, 2½ miles downstream from Hubbard Creek and 3¼ miles northeast of Crystal Falls, Stephens County. Datum of gage is 1,055.25 feet above mean sea level, datum of 1929.

Drainage area.- 5,658 square miles.

Records available.- July 1928 to September 1948.

Average discharge.- 20 years, 462 second-feet.

Extremes.- Maximum discharge during year, 7,560 second-feet Oct. 26, May 27; maximum gage height, 12.93 feet Oct. 26; no flow at times.

1928-48: Maximum discharge, 35,800 second-feet June 11, 1941 (gage height, 33.45 feet), from rating curve extended above 23,000 second-feet; no flow at times.

Maximum stage known, about 34.0 feet in 1900, present site and datum, from information by local residents.

Remarks.- Records good. Flow partly regulated by reservoirs above Nugent. Diversions above station for irrigation, municipal supply, and oil-field operation materially affect low flow.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	182	20	86	5.5	186	11	9.7	2,020	874	108	2.3
2	0	103	18	56	5.5	198	6.9	6.9	1,370	284	82	.9
3	0	72	22	26	5.5	334	5.5	6.9	1,140	153	35	.1
4	0	50	71	16	5.5	169	4.7	3.1	296	99	121	0
5	0	35	145	11	5.5	89	4.7	2.3	333	1,240	197	0
6	0	26	718	9.7	5.5	58	3.1	.9	380	1,320	117	0
7	0	18	2,280	11	5.5	40	2.3	.3	142	1,640	86	0
8	0	14	895	20	6.9	29	1.5	0	86	1,640	47	0
9	0	8.3	265	24	6.9	24	.9	0	58	1,720	33	0
10	0	6.9	184	20	6.9	16	.6	0	37	1,400	22	0
11	0	5.5	128	16	8.3	12	7.6	53	24	795	14	0
12	0	5.5	82	12	9.7	9.7	6.9	1,000	18	280	6.9	0
13	0	6.9	58	11	9.7	8.3	1.5	233	16	157	3.1	0
14	0	8.3	44	9.7	8.3	5.5	.6	103	216	202	1.2	0
15	0	8.3	35	8.3	8.3	4.7	.3	52	27	189	.3	0
16	0	6.9	29	6.9	8.3	4.7	0	31	6.9	96	0	0
17	0	16	22	5.5	8.3	3.9	0	18	5.5	58	0	0
18	0	159	26	4.7	8.3	3.9	0	20	2.3	35	0	0
19	0	135	24	4.7	6.9	3.9	0	11	.6	22	0	0
20	0	120	20	4.7	6.9	3.9	0	3.9	3.1	16	0	0
21	0	322	16	4.7	5.5	3.9	0	1.5	6.9	9.7	0	0
22	0	224	11	4.7	6.9	3.9	0	.9	6.9	8.3	0	0
23	0	150	9.7	4.7	6.9	3.1	0	0	13	5.5	0	0
24	0	89	8.3	4.7	8.3	2.3	0	0	668	4.7	0	0
25	1,920	61	5.5	4.7	9.7	274	431	80	1,160	3.1	0	0
26	4,850	42	5.5	4.7	8.3	139	595	401	3,960	3.1	0	0
27	834	33	5.5	4.7	200	72	110	6,150	3,000	1.5	0	0
28	1,150	40	5.5	4.7	206	50	47	644	1,200	5.5	0	0
29	3,250	33	8.3	4.7	64	35	31	280	3,340	9.7	0	0
30	1,640	26	9.7	4.7	-	24	22	215	1,930	28	.2	0
31	284	-	20	4.7	-	16	-	443	-	58	3.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	13,928	4,850	0	449	27,630
November.....	2,098.6	322	5.5	66.9	3,980
December.....	5,191.0	2,280	5.5	167	10,300
Calendar year 1947.....	87,204.5	6,330	0	239	173,000
January.....	414.9	86	4.7	13.4	823
February.....	732.5	206	5.5	25.3	1,450
March.....	1,826.7	334	2.3	58.9	3,620
April.....	1,294.1	595	0	43.1	2,570
May.....	9,770.4	6,150	0	315	19,380
June.....	21,446.2	3,960	.6	715	42,540
July.....	12,357.1	1,720	1.5	399	24,510
August.....	876.8	197	0	28.3	1,740
September.....	3.3	2.3	0	.11	6.5
Water year 1947-48.....	69,847.6	6,150	0	191	138,500

Peak discharge (base, 6,000 sec.-ft.).- Oct. 26, (7:30 a.m.) 7,560 sec.-ft.; May 27 (9:30 a.m.) 7,560 sec.-ft.

## BRAZOS RIVER BASIN

109

Fort Phantom Hill Reservoir near Nugent, Tex.

Location.- Staff gage, lat. 32°37', long. 99°40', on outlet tower at dam on Elm Creek, 4 miles upstream from Clear Fork Brazos River and 5 miles south of Nugent, Jones County. Datum of gage is 1,580.0 feet above mean sea level.

Drainage area.- 478 square miles.

Records available.- July 1940 to September 1948.

Extremes.- Maximum contents observed during year, 41,700 acre-feet Dec. 11-15 (gage height, 44.6 feet); minimum observed, 33,240 acre-feet Sept. 29, 30 (gage height, 41.1 feet).

1940-48: Maximum contents observed, 80,900 acre-feet Oct. 17, 1941 (gage height, 56.8 feet); minimum observed, 20,290 acre-feet Aug. 12, 13, 1940 (gage height, 34.7 feet).

Remarks.- Reservoir is formed by earth-fill dam with rock riprap face; dam completed and storage began in October 1938. Capacity, 69,550 acre-feet between gage heights 1.6 feet (sill of lowest outlet gate) and 54.0 feet (crest of spillway). Dead storage, 450 acre-feet. Records given herein represent total-contents. Water is used for municipal supply. Gage read once daily at 8 a.m. Lake Abilene on Elm Creek, Lake Kirby on Cedar Creek, and Lytle Lake on Lytle Creek (combined capacity, 19,300 acre-feet) are smaller reservoirs above station in Elm Creek Basin.

Cooperation.- Gage-height record and capacity table furnished by city of Abilene.

Monthly gage height and contents, water year October 1947 to September 1948

	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	43.1	38,040	
Oct. 31.....	44.0	40,200	+2,160
Nov. 30.....	43.4	38,760	-1,440
Dec. 31.....	44.2	40,700	+1,940
Calendar year 1947.....	-	-	-2,500
Jan. 31.....	44.0	40,200	-500
Feb. 29.....	44.1	40,450	+250
Mar. 31.....	44.0	40,200	-250
Apr. 30.....	43.3	38,520	-1,680
May 31.....	43.1	38,040	-480
June 30.....	43.7	39,480	+1,440
July 31.....	42.9	37,560	-1,920
Aug. 31.....	42.0	35,400	-2,160
Sept. 30.....	41.1	33,240	-2,160
Water year 1947-48.....	-	-	-4,800

† Gage height at 8 a.m.



## Paluxy Creek at Glen Rose, Tex.

Location.- Water-stage recorder, lat. 32°13'50", long. 97°46'30", at bridge on U. S. Highway 67, 1 mile upstream from Cross Branch, 1.2 miles southwest of Glen Rose, Somerville County, and 4.7 miles upstream from mouth. Datum of gage is 609.7 feet above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Drainage area.- 399 square miles.

Records available.- May 1947 to September 1948. October 1923 to September 1925 at site 1.8 miles downstream; records equivalent except for inflow from Cross Branch.

Extremes.- Maximum discharge during year, 11,000 second-feet Feb. 25 (gage height, 13.92 feet); minimum, 1.0 second-foot Aug. 24, 25.

1924-25, 1947-48: Maximum discharge not determined but probably occurred Apr. 25, 1924, at gage height 7.10 feet, site and datum then in use.

Maximum stage known, 27.2 feet Apr. 17, 1908, present site and datum. Flood of May 21, 1922, reached a stage of 26.0 feet, present site and datum. Flood of November 1918 reached about same stage as flood of May 21, 1922, from information by local resident.

Remarks.- Records excellent except those for period of no gage-height record, which are fair. No diversion above station.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Apr. 15 to May 9, May 21-25,  
July 15 to Sept. 8, Sept. 13-30)

2.3	0.7	3.0	99	5.0	1,090
2.4	1.3	3.2	160	6.0	1,740
2.5	5.5	3.4	235	7.0	2,470
2.6	15	3.8	420	8.0	3,330
2.7	31	4.2	630	9.1	4,460
2.8	51	4.6	850		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.8	7.5	7.5	494	15	573	22	14	24	99	4.4	4.4
2	3.8	6.8	8.3	87	15	319	22	14	21	50	4.4	3.8
3	3.8	6.8	9.6	49	16	134	22	14	19	393	4.4	2.8
4	3.8	6.8	15	35	16	105	22	14	16	436	3.8	2.4
5	5.5	6.1	11	26	16	108	22	14	15	86	3.3	2.4
6	3.3	9.8	11	21	16	94	22	16	12	70	3.3	1.7
7	2.8	22	763	18	16	86	22	16	12	51	3.3	1.4
8	3.8	9.0	82	15	15	76	22	14	10	31	2.8	47
9	4.4	6.1	45	14	15	71	22	12	10	114	2.8	425
10	3.8	6.1	33	14	14	62	22	18	9.1	38	2.4	34
11	2.8	6.1	26	12	14	55	22	691	9.1	24	2.4	14
12	2.4	5.5	24	12	15	51	21	97	8.3	22	2.0	9.1
13	2.4	6.1	22	12	16	49	22	41	8.3	25	2.0	6.8
14	2.4	44	21	11	14	49	21	28	7.5	19	1.7	5.5
15	2.0	51	19	11	12	49	21	21	7.5	15	1.7	5.0
16	2.4	17	68	11	12	45	21	18	6.8	14	2.8	5.0
17	2.4	12	37	10	12	41	19	16	6.1	12	2.4	5.0
18	2.0	11	22	10	12	39	19	17	5.5	17	1.7	5.0
19	1.7	10	19	11	12	39	18	100	5.5	10	1.3	5.0
20	1.7	9.1	15	15	11	37	18	26	5.0	9.1	1.2	5.0
21	1.4	9.1	14	16	11	39	18	18	4.4	8.3	1.2	5.0
22	1.4	10	14	16	11	67	16	15	3.8	7.5	1.2	4.4
23	1.4	10	12	15	11	45	16	12	4.4	6.8	1.1	4.4
24	1.7	10	11	14	12	37	16	11	62	6.8	1.1	3.8
25	306	9.1	11	12	4,450	35	33	18	59	6.1	1.2	3.3
26	153	9.1	11	12	450	33	37	317	574	5.5	9.2	2.8
27	38	8.3	11	14	378	29	28	1,300	190	6.1	70	2.4
28	16	8.3	10	12	190	28	21	138	194	5.5	19	2.4
29	12	7.5	10	16	116	28	16	62	490	4.4	9.1	2.4
30	10	7.5	10	14	-	26	15	41	62	4.4	6.8	2.4
31	8.3	-	371	16	-	26	-	31	-	4.4	5.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	610.0	306	1.4	19.7	1,210
November.....	347.7	51	5.5	11.6	690
December.....	1,743.4	763	7.5	56.2	3,460
Calendar year.....	-	-	-	-	-
January.....	1,045	494	10	33.7	2,070
February.....	5,915	4,450	11	204	11,730
March.....	2,477	573	26	79.9	4,910
April.....	638	37	15	21.3	1,270
May.....	3,164	1,300	11	102	6,280
June.....	1,861.3	574	3.8	62.0	3,590
July.....	1,595.9	436	4.4	51.5	3,170
August.....	179.0	70	1.1	5.77	355
September.....	623.6	425	1.4	20.8	1,240
Water year 1947-48.....	20,199.9	4,450	1.1	55.2	40,080

Peak discharge (base, 2,500 sec.-ft.)- Dec. 7 (7 a.m.) 3,060 sec.-ft.; Feb. 25 (10:30 a.m.) 11,000 sec.-ft.; May 11 (9:30 a.m.) 2,880 sec.-ft.

Note.- No gage-height record Dec. 8-16; discharge computed on basis of estimated gage-height record and discharge measurement made Dec. 16.

Nolands River at Blum, Tex.

Location.- Staff gage, lat. 32°08'49", long. 97°23'48", at Gulf, Colorado & Santa Fe Railway bridge at Blum, Hill County, 2.3 miles downstream from Mustang Creek, 3.7 miles upstream from Rock Creek, and 8.7 miles upstream from mouth. Datum of gage is 556.5 feet above mean sea level, datum of 1929. Former gage at same site and datum.

Drainage area.- 275 square miles.

Records available.- July 1924 to September 1925, November 1947 to September 1948.

Extremes.- Maximum discharge during period November 1947 to September 1948, 12,700 second-feet Dec. 7 (gage height, 15.60 feet, from floodmarks); minimum observed, 0.5 second-foot Sept. 2.

1924-25, 1947-48: Maximum discharge, that of Dec. 7, 1947; no flow at times in 1924-25.

Maximum stage known since 1887, 35.6 feet on May 8, 1922, from information by Gulf, Colorado & Santa Fe Railway Company.

Remarks.- Records good. Gage read twice daily, oftener during high stages. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		-	4.3	344	58	925	38	16	13	113	3.8	1.1
2		-	4.0	94	64	938	35	16	12	93	3.3	.8
3		-	5.0	71	75	151	36	18	11	1,740	3.0	1.0
4		-	131	55	73	124	37	223	9.6	545	2.6	.9
5		-	70	48	71	671	38	21	8.3	2,200	2.1	.8
6		-	30	44	64	200	41	16	8.3	752	1.8	1.0
7		-	4,840	45	60	139	40	16	7.4	82	1.6	1.0
8		-	285	43	66	122	36	15	6.7	57	1.6	1.8
9		-	71	43	57	127	34	15	5.7	33	1.6	233
10		-	45	40	54	108	31	16	5.4	42	1.6	21
11		-	33	39	55	87	31	3,940	5.4	28	1.4	7.4
12		-	28	36	57	80	30	374	5.0	23	1.4	4.3
13		-	26	31	51	90	34	668	4.7	19	1.1	3.8
14	154	23	32	60	87	28	94	4.0	18	1.1	3.5	
15	106	1,650	32	57	82	28	57	3.8	16	1.5	3.0	
16	31	273	33	54	73	27	38	3.0	14	1.5	3.0	
17	13	92	29	48	64	24	30	2.6	13	1.0	3.0	
18	8.7	17	28	44	64	23	30	2.8	11	.8	3.0	
19	8.3	60	32	44	68	21	356	2.6	9.6	.6	2.6	
20	6.7	50	42	41	57	20	62	2.6	8.7	.8	2.6	
21	5.4	47	82	35	71	20	32	2.3	7.4	.9	2.6	
22	13	44	62	33	154	20	27	1.6	6.7	.6	2.6	
23	26	40	48	37	100	19	91	1.8	6.4	.6	2.6	
24	14	37	36	42	68	17	19	1,250	8.0	.6	2.3	
25	9.2	35	31	2,520	58	175	18	64	5.4	.6	1.8	
26	7.8	33	32	1,250	60	60	16	1,610	4.7	1.1	1.6	
27	6.0	33	38	1,190	51	32	19	250	4.3	6.5	1.6	
28	4.7	33	39	254	44	23	19	250	4.3	28	1.6	
29	3.5	32	41	160	44	19	18	427	3.8	6.3	1.4	
30	4.0	31	40	-	44	17	17	50	3.5	2.1	1.4	
31	-	47	57	-	43	-	15	-	3.8	1.4	-	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	-	-	-	-	-
November 14-30.....	421.3	154	3.5	24.8	856
December.....	8,149.3	4,840	4.0	263	16,160
Calendar year.....	-	-	-	-	-
January.....	1,663	344	28	53.6	3,300
February.....	6,674	2,520	33	230	13,240
March.....	4,982	938	43	181	9,900
April.....	1,034	175	17	34.5	2,050
May.....	6,242	3,940	15	201	12,380
June.....	4,030.2	1,610	1.6	134	7,990
July.....	5,873.6	2,200	3.5	189	11,650
August.....	82.9	28	.6	2.67	164
September.....	317.9	233	.6	10.6	651
The period.....	-	-	-	-	78,300

Peak discharge (base, 5,000 sec.-ft.)-- Dec. 7 (3 p.m.) 12,700 sec.-ft.; Feb. 25 (2 p.m.) 7,090 sec.-ft.; May 11 (2 p.m.) 10,900 sec.-ft.; July 5 (7 p.m.) 7,480 sec.-ft.

## Aquilla Creek near Aquilla, Tex.

Location.- Water-stage recorder, lat. 31°51', long. 97°12', at bridge on Abbot-Aquilla county road, three-quarters of a mile upstream from Palls Branch and 1 mile southeast of Aquilla, Hill County.

Drainage area.- 309 square miles.

Records available.- December 1924 to August 1925, December 1938 to September 1948.

Extremes.- Maximum discharge during year, 8,260 second-feet May 11 (gage height, 26.72 feet); no flow at times.

1924-25, 1938-48: Maximum gage height, 30.84 feet May 2, 1944 (discharge not determined); no flow at times.

Maximum stage known, 34 feet Aug. 31, 1887, from information by local resident.

Flood of Sept. 27, 1936, reached a stage of about 33 feet, from floodmark. Peak discharge of this flood as determined about 9 miles below station, 84,500 second-feet, by slope-area method (drainage area, 370 square miles).

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.2	1.6	179	15	19	11	5.1	8.2	11	0.2	
2	.2	.2	2.0	42	19	87	10	4.0	6.2	55	.2	
3	.2	.2	2.9	14	25	36	9.7	3.6	4.8	155	.1	
4	.2	.2	6.2	7.7	26	21	10	3.1	4.2	475	.1	
5	.2	.2	5.1	4.6	29	19	10	3.3	3.3	204	0	
6	.2	.2	2.0	2.9	24	22	10	3.3	2.4	75	0	
7	.2	2.9	1.6	2.5	24	22	9.7	2.7	1.8	75	0	
8	.2	12	161	2.0	32	20	8.5	2.4	1.2	536	0	
9	.2	2.4	29	2.0	52	21	7.7	1.9	.9	72	0	
10	.2	1.3	12	1.9	30	21	6.9	1.6	.7	1,590	0	
11	.2	.7	7.2	1.5	26	17	6.7	3,510	.6	73	0	
12	.2	.5	5.3	1.6	27	12	7.2	2,930	.5	21	0	
13	.2	.5	3.8	1.5	20	17	11	137	.4	12	0	
14	.2	.7	4.2	1.6	24	19	56	253	.2	7.0	0	
15	.2	1.0	68	1.2	21	17	20	64	.2	4.2	0	
16	.2	1.8	284	2.4	18	16	11	44	.2	2.4	0	
17	.2	.9	29	4.0	17	14	8.0	34	.2	1.4	0	
18	.2	.7	13	3.8	15	13	6.4	156	.2	1.0	0	
19	.2	.6	8.8	3.1	15	13	5.1	1,280	.2	.9	0	
20	.2	.8	6.7	4.0	14	14	3.6	222	.1	.7	0	
21	.2	.9	5.7	13	11	14	3.1	41	.1	.7	0	
22	.1	.9	5.1	18	9.7	47	2.5	29	.1	.6	0	
23	.1	1.4	4.6	13	10	45	2.2	21	.1	.5	0	
24	0	2.0	4.6	11	11	26	2.2	16	1.1	.4	0	
25	0	1.5	4.0	8.2	13	18	463	14	36	.4	0	
26	0	1.2	3.6	7.7	15	16	234	13	47	.2	0	
27	1.0	.9	3.3	8.5	32	14	23	18	118	8.3	0	
28	.7	1.4	3.6	7.5	56	11	13	16	36	.2	0	
29	.3	1.5	3.6	7.2	27	10	8.5	15	618	.2	0	
30	.2	1.5	3.8	6.7	-	11	6.4	12	36	.2	0	
31	.2	-	20	10	-	11	-	9.4	-	.2	0	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	6.8	1.0	0	0.22	13
November.....	41.0	12	.2	1.37	81
December.....	715.3	284	1.6	23.1	1,420
Calendar year 1947.....	26,846.3	4,620	0	73.6	53,260
January.....	394.1	179	1.2	12.7	782
February.....	657.7	56	9.7	22.7	1,300
March.....	663	463	10	21.4	1,320
April.....	986.4	463	2.2	32.9	1,960
May.....	8,667.4	3,510	1.6	286	17,590
June.....	928.9	618	.1	31.0	1,840
July.....	3,375.5	1,590	.2	109	6,700
August.....	.6	.2	0	.02	1.2
September.....	0	0	0	0	0
Water year 1947-48.....	16,636.7	3,510	0	45.5	33,010

Peak discharge (base, 7,000 sec.-ft.)- May 11 (3:15 p.m.) 8,260 sec.-ft.

g Computed from graph based on gage readings.

Note.- No gage-height record July 1, 13-26, 28, 29; discharge computed on basis of estimated gage heights, weather records, and records for nearby stations.

## North Bosque River near Clifton, Tex.

Location.- Staff gage above spillway of masonry dam, lat. 31°48', long. 97°35', 730 feet upstream from Gulf, Colorado & Santa Fe Railway bridge and 1.4 miles northwest of Clifton, Bosque County. Datum of gage is 622.7 feet above mean sea level, datum of 1929.

Drainage area.- 974 square miles.

Records available.- November 1923 to September 1948.

Average discharge.- 25 years, 228 second-feet.

Extremes.- Maximum discharge during year, 31,900 second-feet Feb. 25 (gage height, 19.9 feet, from floodmark); minimum, 0.7 second-foot Aug. 22-25.

1923-48: Maximum discharge, 39,000 second-feet Apr. 22, 1945 (gage height, 23.2 feet, from floodmark); no flow at times.

Flood of May 9, 1923, reached a stage of 25 feet, from information by local resident.

Remarks.- Records good except those for periods of doubtful or no gage-height record, WHICH are fair. Railway company pumps about 100,000 gallons a day (0.15 second-foot) from pool formed by control dam a third of a mile below gage. Gage read twice daily, oftener during high stages.

Revisions (water years).- W 788: 1924-33. W 1058: 1945(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.1	1.4	7.5	417	b11	271	48	20	48	104	4.1	16
2	4.1	3.6	7.5	204	b11	895	43	18	39	101	4.1	14
3	4.1	3.6	11	120	20	238	39	17	37	487	4.1	11
4	3.6	3.6	18	58	18	144	39	17	34	485	4.1	9.2
5	3.6	3.6	17	35	17	133	37	14	21	254	4.1	9.2
6	3.6	3.6	16	28	17	129	32	14	20	620	3.6	9.2
7	3.0	3.0	1,050	23	17	126	28	11	18	182	3.6	8.3
8	4.1	3.0	664	18	17	123	28	10	18	221	3.6	7.5
9	5.2	3.0	164	18	17	117	24	9.2	18	172	3.0	1,100
10	4.1	2.5	68	17	14	107	24	9.2	18	733	2.8	166
11	3.6	2.0	46	17	14	96	24	2,210	16	196	2.5	74
12	3.6	1.6	28	16	14	86	26	788	11	98	1.6	37
13	3.6	1.3	21	14	14	83	56	107	8.3	63	1.6	23
14	3.0	9.1	20	13	14	92	39	66	6.6	53	1.6	17
15	3.0	18	24	13	13	92	30	41	6.6	32	1.6	17
16	3.0	d17	23	16	11	86	24	28	5.8	21	1.6	16
17	71	17	34	16	10	77	24	20	5.2	17	1.3	14
18	6.6	10	43	14	10	68	21	645	5.2	24	1.3	11
19	3.0	6.6	32	13	10	66	21	280	4.1	11	1.1	7.5
20	2.5	5.8	26	*11	9.2	66	21	75	3.6	10	.9	5.8
21	2.0	5.2	21	11	9.2	63	18	37	3.0	7.5	.9	5.2
22	2.0	16	18	11	48.3	111	18	28	3.0	7.5	.8	4.7
23	1.7	21	18	11	8.3	144	17	17	3.0	6.6	.7	4.1
24	1.8	8.3	16	11	8.3	95	16	13	4,110	5.8	.7	3.6
25	1.8	8.3	13	11	14,200	71	d118	11	338	5.2	.7	3.0
26	1.7	8.3	13	11	5,200	63	d68	225	373	5.2	103	3.0
27	1.6	8.3	10	11	635	58	34	3,250	292	4.7	55	3.0
28	1.6	7.8	10	11	454	53	34	700	166	4.7	66	3.0
29	1.5	7.6	10	11	231	53	32	166	390	4.7	51	3.0
30	1.4	7.5	10	b11	-	48	26	86	270	4.7	32	3.0
31	1.4	-	28	b11	-	46	-	63	-	4.7	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	161.0	71	1.4	5.19	319
November.....	217.2	21	1.3	7.24	431
December.....	2,487.0	1,050	7.5	80.2	4,930
Calendar year 1947 .....	31,930.3	3,080	1.3	87.5	63,320
January.....	1,202	417	11	38.8	2,380
February.....	19,032.3	14,200	8.3	656	37,750
March.....	3,900	895	46	126	7,740
April.....	1,012	118	16	33.7	2,010
May.....	10,995.4	4,210	9.2	355	21,810
June.....	6,287.4	4,110	3.0	210	12,470
July.....	3,915.3	733	4.7	126	7,770
August.....	388.0	103	.7	12.5	766
September.....	1,608.3	1,100	3.0	53.6	3,190
Water year 1947-48 .....	51,203.9	14,200	.7	140	101,600

Peak discharge (base, 8,300 sec.-ft.)- Feb. 25 (7 p.m.) 31,900 sec.-ft.; May 11 (5 p.m.) 11,700 sec.-ft.; June 24 (10 a.m.) 12,800 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

c Doubtful gage-height record; discharge computed on basis of weather records and records for Aquilla Creek near Aquilla.

Note.- No gage-height record Oct. 25 to Nov. 3, Jan. 19, 25-29, Feb. 8, 12, Mar. 11, Apr. 28; discharge computed on basis of weather records and records for Aquilla Creek near Aquilla.

## BRAZOS RIVER BASIN

Leon River near Hasse, Tex.

Location.- Water-stage recorder and concrete control, lat. 31°57', long. 98°28', at bridge on U. S. Highway 67, 1,000 feet upstream from Gulf, Colorado & Santa Fe Railway bridge, 0.4 mile upstream from Walnut Creek, and 2.1 miles northeast of Hasse, Comanche County. Datum of gage is 1,115.1 feet above mean sea level, datum of 1929.

Drainage area.- 1,276 square miles.

Records available.- January 1939 to September 1948.

Extremes.- Maximum discharge during year, 1,160 second-feet July 6 (gage height, 10.27 feet); no flow at times.

1939-48: Maximum discharge, 16,900 second-feet Mar. 30, 1945; maximum gage height, 17.72 feet Oct. 19, 1942; no flow at times.

Maximum stage known, about 25.0 feet in May 1908, from information by Texas State Highway Department.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	10	1.2	287	9.8	85	11	7.8	366	104	2.0	0
2	0	6.0	1.2	334	11	57	10	4.3	78	32	3.4	0
3	0	3.4	1.5	121	12	41	9.3	3.1	29	82	.7	0
4	0	2.1	2.6	56	14	34	8.8	2.1	17	60	.2	0
5	0	1.6	2.4	32	14	30	8.3	1.7	12	229	0	0
6	0	1.2	3.7	23	13	27	7.8	1.5	9.3	820	0	0
7	0	.8	1.5	18	12	26	7.3	1.1	9.8	170	0	0
8	0	.5	592	14	12	23	8.3	.9	8.3	77	0	0
9	0	.1	460	13	11	22	8.3	.8	7.3	34	0	207
10	0	.1	174	12	11	21	9.3	.7	7.8	37	0	52
11	0	0	75	11	12	17	9.3	151	5.2	233	0	13
12	0	0	41	11	10	17	8.8	162	4.3	145	0	4.9
13	0	0	75	9.8	10	17	7.8	38	3.4	37	0	2.4
14	0	.7	16	8.3	11	16	6.8	17	2.8	20	0	1.6
15	0	1.5	14	8.3	10	17	6.8	8.8	2.6	14	0	1.2
16	0	1.1	236	7.8	9.8	16	6.8	4.9	1.7	8.3	0	.8
17	0	1.4	373	6.8	10	14	5.2	3.4	1.5	4.9	0	.6
18	0	1.4	137	6.8	11	14	6.0	3.1	1.5	3.1	0	.4
19	0	1.4	64	7.8	11	14	4.9	64	1.1	2.1	0	.3
20	0	.8	38	9.8	10	13	4.3	21	.7	1.4	0	.1
21	0	.8	25	11	9.3	12	3.7	5.2	.4	.7	0	0
22	0	.9	18	10	9.3	15	3.4	2.6	0	.5	0	0
23	0	.9	14	8.8	9.8	18	3.7	1.9	0	.4	0	0
24	0	1.1	12	8.3	11	25	6.0	1.4	0	.2	0	0
25	12	1.1	10	8.3	80	36	6.8	1.4	0	0	0	0
26	498	1.4	8.8	4.9	141	24	42	407	50	0	0	0
27	616	1.2	8.3	d5.8	475	18	59	767	356	0	0	0
28	404	1.1	7.8	d5.6	376	17	40	751	168	0	0	0
29	134	1.1	7.8	6.6	156	14	17	499	360	0	0	0
30	49	1.1	7.8	7.7	-	12	9.3	111	221	0	0	0
31	22	-	7.8	8.8	-	11	-	165	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,735	616	0	56.0	3,440
November.....	44.8	10	0	1.49	89
December.....	2,549.9	592	1.2	82.3	5,060
Calendar year 1947 .....	18,583.3	1,340	0	50.9	36,860
January.....	1,085.0	354	4.9	34.9	2,150
February.....	1,492.0	475	9.3	51.4	2,960
March.....	723	85	11	23.3	1,430
April.....	346.0	59	3.4	11.5	686
May.....	3,209.7	767	.7	104	6,370
June.....	1,724.7	366	0	57.5	3,420
July.....	2,115.6	820	0	68.2	4,200
August.....	6.3	3.4	0	.20	12
September.....	284.3	207	0	9.48	564
Water year 1947-48 .....	15,314.3	820	0	41.8	30,380

Peak discharge (base, 1,800 sec.-ft.).- No peak above base.

d Doubtful gage-height record; discharge computed on basis of engineer's notes and weather records.

Note.- No gage-height record Jan. 29-31, Sept. 9-30; discharge computed on basis of engineer's notes, weather records, floodmarks, and records for station near Belton.

Leon River near Belton, Tex.

Location.- Water-stage recorder above spillway of concrete dam, lat. 31°04'15", long. 97°26'30", 1,400 feet upstream from bridge on U. S. Highway 81 and 2 miles east of Belton, Bell County. Datum of gage is 476.9 feet above mean sea level, datum of 1929.

Drainage area.- 3,547 square miles.

Records available.- October 1923 to September 1948.

Average discharge.- 25 years, 744 second-feet.

Extremes.- Maximum discharge during year, 10,600 second-feet Feb. 26 (gage height, 8.95 feet); no flow Aug. 12-27.  
1923-48: Maximum discharge, 70,600 second-feet Apr. 22, 1945 (gage height, 24.41 feet), from rating curve extended above 45,000 second-feet; no flow at times.  
Maximum stage known, 25 feet in December 1913, from information by local residents.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Several small pumping plants divert water above station. City of Temple diverted an average of about 5 second-feet from gage pool for municipal use during 1947 and 1948. No information available in regard to amount diverted prior to 1947.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	448	23	26	36	417	112	107	870	323	4.0	6.5
2	3.5	344	23	28	39	432	80	88	1,220	395	3.4	2.6
3	3.5	193	26	26	42	494	76	80	604	432	2.9	2.3
4	3.5	112	72	26	45	463	72	92	316	510	2.5	1.8
5	3.4	80	42	28	45	352	72	88	212	432	2.3	1.6
6	3.2	60	42	239	48	224	68	80	316	237	2.0	1.6
7	3.3	48	52	289	48	136	64	68	243	230	1.7	1.4
8	3.4	36	281	164	52	121	93	60	184	212	1.4	1.1
9	3.5	30	178	102	45	121	157	52	136	854	1.1	307
10	3.6	28	72	68	45	116	68	48	107	811	.7	388
11	3.6	23	470	48	48	121	64	7718	76	1,480	.3	112
12	3.6	21	395	45	48	112	60	11,770	56	748	0	901
13	3.6	19	502	36	48	102	342	11,560	45	440	0	1,040
14	3.6	19	359	33	45	97	270	527	842	402	0	372
15	3.5	15	218	30	45	102	136	388	836	218	0	205
16	3.4	15	199	33	45	102	147	410	830	141	0	158
17	3.2	19	112	33	45	102	102	8410	26	193	0	116
18	3.2	26	84	33	45	121	76	8303	26	158	0	88
19	3.1	26	68	36	42	126	64	368	19	102	0	72
20	3.0	23	48	36	42	126	56	131	19	76	0	56
21	3.0	23	48	33	42	116	58	107	13	56	0	42
22	2.9	26	265	30	42	116	52	88	10	42	0	33
23	2.9	30	170	30	39	182	52	80	9.0	33	0	28
24	2.9	36	102	28	36	218	48	68	7.7	30	0	23
25	2.9	36	72	30	617	141	349	84	7.7	26	0	19
26	2.6	36	48	33	3,630	224	323	88	12	23	0	17
27	2.7	28	42	30	7456	230	310	1,150	12	19	292	13
28	2.7	28	36	28	2,590	158	230	1,200	214	15	126	12
29	2.6	23	30	30	1,780	131	141	2,460	376	10	80	9.0
30	88	23	28	30	-	126	107	1,530	224	9.0	45	5.6
31	165	-	28	30	-	131	-	870	-	5.6	21	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	346.6	165	2.6	11.2	687
November.....	1,874	448	15	62.5	3,720
December.....	4,135	502	23	135	8,200
Calendar year 1947.....	157,591.2	8,180	2.6	432	312,600
January.....	1,691	289	26	54.5	3,350
February.....	10,130	3,630	36	349	20,090
March.....	5,760	494	97	186	11,420
April.....	3,847	349	48	128	7,630
May.....	15,053	2,480	48	486	29,860
June.....	5,448.4	1,220	7.7	182	10,810
July.....	8,660.6	1,480	5.6	279	17,180
August.....	586.3	292	0	18.9	1,160
September.....	4,035.5	1,040	1.1	135	8,000
Water year 1947-48.....	61,567.4	3,630	0	168	122,100

Peak discharge (base, 11,000 sec.-ft.).- No peak above base.  
a No gage-height record; discharge computed on basis of recorded range in stage and weather records.  
f Computed on basis of partly estimated gage-height record.

## Little River at Cameron, Tex.

Location.- Water-stage recorder, lat. 30°50', long. 96°57', at site of old McCowan bridge, 2,020 feet upstream from bridge on U. S. Highway 77 and 2 miles southeast of Cameron, Milam County. Datum of gage is 281.9 feet above mean sea level, datum of 1929.

Drainage area.- 7,034 square miles.

Records available.- November 1916 to September 1948.

Average discharge.- 31 years (1917-48), 2,001 second-feet.

Extremes.- Maximum discharge during year, 8,670 second-feet May 13 (gage height, 23.06

feet); minimum, 16 second-feet Aug. 19 (gage height, 2.50 feet).

1916-48: Maximum discharge, 647,000 second-feet Sept. 10, 1921 (gage height, 53.2 feet, present datum, from floodmark), by slope-area method; minimum, 2.6 second-feet Sept. 3, 5, 7, 1918.

Flood of 1852 reached about same stage as that of Sept. 10, 1921. Flood of December 1913 reached a stage of 49.0 feet. Stages based on information by local residents.

Remarks.- Records good. Many small diversions for irrigation and municipal supply affect very low flows. Slight regulation caused by pumping above station.

Revisions (water years).- W 718: 1918-22.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Sept. 14-30)

2.5	16	3.6	106	5.0	480	12.0	3,190
2.6	19	3.8	136	6.0	840	14.0	4,080
2.8	28	4.0	174	7.0	1,210	16.0	5,040
3.0	41	4.2	217	8.0	1,580	18.0	6,040
3.2	58	4.4	272	9.0	1,960	20.0	7,060
3.4	80	4.7	372	10.0	2,340		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	67	106	154	147	2,840	199	314	1,250	706	50	143
2	84	188	102	149	145	1,210	188	238	1,210	661	42	106
3	81	484	100	149	149	804	186	230	1,280	422	38	82
4	81	390	192	141	158	768	178	199	1,060	1,240	34	66
5	82	260	149	141	170	786	172	180	588	1,960	a32	58
6	81	196	178	140	190	660	170	188	404	1,510	a30	a47
7	82	164	206	140	199	552	168	831	328	923	a29	40
8	84	138	166	267	512	466	164	285	379	516	a28	38
9	82	123	149	397	394	397	158	201	285	397	a26	37
10	81	114	285	301	294	362	632	160	335	600	a24	39
11	81	107	302	243	225	335	419	632	190	988	a24	261
12	82	103	254	210	196	314	208	5,260	164	2,080	a22	274
13	81	100	534	188	180	294	215	6,920	143	1,720	a21	196
14	79	100	570	174	176	285	3,850	2,870	128	822	a20	1,140
15	78	102	624	164	170	272	2,930	1,380	116	624	a19	678
16	78	103	505	156	164	288	1,060	786	109	440	a18	352
17	76	109	397	152	160	263	588	606	99	272	a18	217
18	74	112	324	150	156	249	444	570	87	206	a17	160
19	73	126	269	158	154	238	324	433	80	206	16	123
20	70	130	230	170	150	230	252	499	74	182	18	103
21	68	125	203	168	158	230	215	527	67	150	18	88
22	66	126	188	170	206	227	196	294	62	125	18	78
23	65	125	176	162	160	220	174	233	59	109	17	69
24	65	123	330	158	152	217	158	196	57	95	17	61
25	64	120	288	152	152	243	164	180	54	85	18	54
26	64	119	233	150	156	365	1,100	832	55	75	20	48
27	64	131	208	152	5,140	321	1,280	2,060	83	67	139	43
28	64	122	186	149	3,210	307	914	3,860	170	61	1,020	38
29	70	117	172	152	2,160	301	660	2,640	314	56	924	33
30	74	112	164	150	-	246	446	2,500	2,020	52	365	32
31	70	-	160	149	-	215	-	2,190	-	50	210	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,328	84	64	75.1	4,620
November.....	4,436	484	67	148	8,800
December.....	7,948	624	100	256	15,760
Calendar year 1947 .....	503,401	22,000	64	1,379	998,400
January.....	5,458	397	140	176	10,820
February.....	15,583	5,140	145	537	30,910
March.....	14,505	2,840	215	468	28,770
April.....	17,814	3,850	158	594	35,330
May.....	38,294	6,920	160	1,235	75,960
June.....	11,250	2,020	54	375	22,310
July.....	17,400	2,080	50	561	34,510
August.....	3,292	1,020	16	106	6,530
September.....	4,704	1,140	32	157	9,330
Water year 1947-48 .....	143,010	5,920	16	391	283,600

Peak discharge (base, 11,000 sec.-ft.)- No peak above base.  
a No gage-height record; discharge computed on basis of weather records and records for nearby stations.



## Lampasas River at Youngsfort, Tex.

Location.- Water-stage recorder, lat. 30°57', long. 97°43', 300 feet upstream from bridge on county highway and half a mile southeast of Youngsfort, Bell County.

Drainage area.- 1,242 square miles.

Records available.- February 1924 to September 1948.

Average discharge.- 24 years, 320 second-feet.

Extremes.- Maximum discharge during year, 12,600 second-feet Feb. 25 (gage height, 12.01 feet, from floodmark); minimum, 2.8 second-feet Aug. 16-18.

1924-48: Maximum discharge, 53,200 second-feet Sept. 28, 1936 (gage height, 33.5 feet, from floodmarks), from rating curve extended above 40,000 second-feet; no flow July 17 to Aug. 18, 1925, July 22, 23, Aug. 9 to Sept. 8, 1934.

Flood of September 1873 reached a stage of 44.2 feet and that of Dec. 2, 1913, reached a stage of 33.6 feet, present datum, from information by local residents.

Remarks.- Records good. Small diversions above station for municipal use.

Revisions (water years).- W 788: 1926, 1928, 1931.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	15	23	21	21	106	21	40	40	8.4	4.6	21
2	16	13	25	20	23	89	21	35	32	51	5.0	15
3	16	14	28	21	25	64	21	32	26	268	5.5	13
4	16	14	42	21	25	53	21	30	23	466	6.1	13
5	16	14	28	21	25	45	21	26	21	166	5.0	12
6	15	15	25	20	25	42	21	25	19	76	5.0	11
7	15	14	25	20	25	37	21	21	17	48	4.6	10
8	15	15	28	20	25	35	21	21	15	32	4.6	9.7
9	16	17	28	20	23	35	23	21	14	42	4.6	16
10	16	20	26	20	23	32	21	21	15	32	4.6	19
11	15	19	25	20	23	30	20	734	14	1,040	4.6	21
12	14	19	21	20	23	30	19	1,040	14	179	4.1	15
13	14	19	21	19	23	30	885	111	13	76	4.1	12
14	14	23	23	19	21	28	471	146	13	48	3.7	11
15	14	25	35	19	21	26	130	106	12	28	3.2	10
16	13	25	35	23	21	26	67	a83	10	21	3.2	10
17	13	26	35	21	20	26	45	a56	9.7	17	3.2	10
18	13	28	28	20	20	26	32	a40	9.0	15	3.2	10
19	13	26	25	23	20	26	26	a30	7.7	13	3.2	11
20	13	26	23	25	20	25	21	26	6.6	12	3.7	10
21	13	25	23	26	20	25	21	25	6.6	10	4.1	9.0
22	13	26	21	25	19	25	21	21	6.1	9.7	3.7	8.4
23	13	28	21	23	20	94	20	20	5.5	8.4	3.7	7.7
24	14	32	20	20	21	106	19	20	6.1	7.7	3.7	7.7
25	13	26	20	20	f2,700	64	262	19	5.0	7.2	4.6	7.2
26	14	23	20	21	f2,610	48	347	21	9.0	6.6	929	6.6
27	15	23	20	21	254	37	163	1,470	11	6.1	531	6.6
28	16	23	20	21	189	30	86	263	11	6.1	f118	6.1
29	24	23	20	23	134	28	59	120	11	5.5	56	6.1
30	20	23	20	23	-	25	45	76	9.0	5.0	32	7.2
31	17	-	21	21	-	21	-	53	-	5.0	28	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	465	24	13	15.0	922
November.....	639	32	13	21.3	1,270
December.....	775	42	20	25.0	1,540
Calendar year 1947.....	63,635	3,620	13	174	126,200
January.....	657	26	19	21.2	1,300
February.....	6,419	2,700	19	221	12,730
March.....	1,314	106	21	42.4	2,610
April.....	2,971	885	19	99.0	5,890
May.....	4,752	1,470	19	153	9,430
June.....	411.3	40	5.0	13.7	816
July.....	2,715.7	1,040	5.0	87.6	5,390
August.....	1,799.6	929	3.2	58.1	3,570
September.....	332.3	21	6.1	11.1	659
Water year 1947-48.....	23,250.9	2,700	3.2	63.5	46,130

Peak discharge (base, 6,300 sec.-ft.)- Feb. 25 (12 p.m.) 12,600 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage-height record.

f Computed on basis of partly estimated gage-height record.

## San Gabriel River at Georgetown, Tex.

Location.- Water-stage recorder and concrete control, lat. 30°39'10", long. 97°39'20", 100 feet downstream from Missouri-Kansas-Texas Railroad bridge, 1½ miles downstream from confluence of North and South Forks, and 1½ miles northeast of Georgetown, Williamson County. Datum of gage is 643.71 feet above mean sea level, datum of 1929.

Drainage area.- 415 square miles.

Records available.- July 1934 to September 1948. February 1924 to August 1925 at site 1 mile upstream; records equivalent except those for extremely low flow.

Average discharge.- 14 years, 177 second-feet.

Extremes.- Maximum discharge during year, 14,000 second-feet May 11 (gage height, 11.07 feet); minimum, 0.8 second-foot July 30, 31 (gage height, 0.78 foot).  
1924-25, 1934-48: Maximum discharge, 37,500 second-feet June 6, 1944 (gage height, 19.49 feet), from rating curve extended above 24,000 second-feet; minimum, 0.2 second-foot July 31, Aug. 1, 29, 30, 1942.  
Maximum stage known, 39.36 feet in September 1921, present site and datum (discharge, 160,000 second-feet by slope-area method), from information by Missouri-Kansas-Texas Railroad Co.

Remarks.- Records good. Several small diversions have some effect on low flow which is also regulated at times by gates in recreation dam 3,000 feet upstream.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	8.2	10	11	11	17	10	21	15	11	1.7	7.2
2	10	8.8	10	11	13	16	10	20	20	13	2.4	4.5
3	10	8.2	11	11	16	15	10	20	22	40	2.7	1.1
4	10	8.8	18	10	16	15	10	21	20	38	3.1	1.7
5	10	8.2	15	11	16	15	10	20	18	17	3.4	2.1
6	10	8.2	13	11	20	15	10	28	17	14	4.1	1.9
7	10	9.4	12	11	21	14	10	20	15	12	3.7	3.4
8	10	8.2	12	11	20	14	9.4	17	14	10	3.7	4.1
9	10	8.2	11	11	19	15	9.5	17	13	9.4	3.7	6.7
10	11	9.4	11	11	18	15	17	16	13	71	3.7	8.2
11	10	9.4	11	11	17	14	13	3,550	13	122	3.7	6.2
12	10	9.4	10	11	17	14	12	411	12	41	3.7	5.7
13	10	9.4	10	11	15	13	3,990	101	11	18	3.4	5.7
14	10	13	11	11	14	13	270	66	10	14	3.4	5.7
15	10	12	20	10	14	13	76	33	9.4	10	3.4	5.3
16	10	11	16	12	13	14	49	39	8.8	8.2	3.7	5.3
17	10	16	14	11	13	13	37	35	8.2	7.2	3.7	5.7
18	10	20	13	11	13	13	31	32	7.7	6.7	3.7	6.2
19	10	13	12	15	13	13	26	54	7.2	6.2	3.4	6.7
20	9.4	11	12	15	13	13	18	29	7.2	5.7	3.7	5.3
21	9.4	11	11	13	13	13	11	27	6.7	5.7	3.7	5.3
22	9.4	13	11	12	13	13	20	25	6.7	5.7	3.7	5.3
23	9.4	14	11	11	13	13	20	22	6.2	5.3	3.7	4.9
24	8.8	13	11	11	14	12	18	22	6.7	5.3	3.7	4.9
25	8.2	12	11	11	15	11	657	22	23	4.9	4.1	4.9
26	8.8	11	11	13	17	13	169	402	12	4.9	513	4.9
27	8.8	11	11	13	20	12	52	1,330	10	4.9	182	4.5
28	8.8	10	11	11	17	11	37	97	15	4.5	38	4.9
29	8.8	10	11	11	17	11	17	53	32	4.5	19	4.5
30	8.8	9.4	11	11	-	11	18	40	13	2.8	11	4.5
31	8.8	-	11	11	-	10	-	34	-	.9	8.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	298.4	11	8.2	9.63	592
November.....	324.2	20	8.2	10.8	643
December.....	373	20	10	12.0	740
Calendar year 1947.....	43,039.1	1,460	8.1	118	85,370
January.....	355	15	10	11.5	704
February.....	451	21	11	15.6	895
March.....	414	17	10	13.4	821
April.....	5,734.4	3,990	9.4	191	11,370
May.....	6,624	3,550	16	214	13,140
June.....	392.8	32	6.2	13.1	779
July.....	523.8	122	.9	16.9	1,040
August.....	857.8	513	1.7	27.7	1,700
September.....	147.3	8.2	1.1	4.91	292
Water year 1947-48.....	16,495.7	3,990	.9	45.1	32,720

Peak discharge (base, 3,600 sec.-ft.)- Apr. 13 (8:30 a.m.) 11,400 sec.-ft.; May 11 (4:30 p.m.) 14,000 sec.-ft.; May 28 (11 p.m.) 5,130 sec.-ft.  
a No gage-height record; discharge interpolated.

## Yegua Creek near Somerville, Tex.

Location.- Water-stage recorder, lat. 30°19', long 96°30', at bridge on State Highway 36, 760 feet downstream from Gulf, Colorado & Santa Fe Railway bridge, 2 miles south of Somerville, Burleson County, and 5 miles upstream from Davidson Creek. Datum of gage is 199.29 feet above mean sea level, datum of 1929.

Drainage area.- 990 square miles.

Records available.- May 1924 to September 1948.

Average discharge.- 24 years, 318 second-feet.

Extremes.- Maximum discharge during year, 898 second-feet Feb. 9 (gage height, 6.44 feet); no flow at times.

1924-48: Maximum discharge, 56,800 second-feet July 1, 1940 (gage height, 19.27 feet); no flow at times.

Maximum stage known, about 22.0 feet Dec. 5, 1913, present site and datum, from information by Gulf, Colorado & Santa Fe Railway Co.

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0	0.1	2.5	6.9	45	7.3	3.9	51	106		
2	.3	0	.1	2.6	7.3	36	6.4	2.5	26	113		
3	.3	0	.1	2.3	13	24	5.9	1.8	15	27		
4	.3	0	1.4	2.0	22	18	5.4	1.2	9.8	11		
5	.3	0	24	2.2	26	23	5.2	.7	6.6	45		
6	.3	0	60	2.1	26	24	5.4	13	4.8	17		
7	.2	0	19	2.0	26	18	5.1	13	3.7	4.6		
8	.2	0	9.1	1.8	140	13	4.8	5.1	2.5	17		
9	.2	0	6.9	1.7	799	30	4.5	2.6	1.4	21		
10	.2	0	5.7	1.5	659	47	4.4	1.5	.9	9.4		
11	.2	0	4.2	1.4	188	24	4.4	71	.5	14		
12	.2	0	3.3	1.4	80	17	4.1	291	.3	4.4		
13	.1	0	8.1	1.4	58	14	4.2	125	.2	2.0		
14	.1	0	12	1.6	41	11	5.2	81	.2	7.7		
15	.1	0	215	3.1	28	10	5.4	36	.1	3.8		
16	.1	0	294	3.0	22	9.8	5.2	26	.1	1.8		
17	.1	0	95	8.1	17	8.7	4.6	17	0	.6		
18	.1	.1	34	13	15	7.9	3.7	11	0	.3		
19	.1	.1	15	10	12	8.7	3.3	8.7	0	.2		
20	0	.1	9.4	10	11	14	2.8	7.7	0	.1		
21	0	.1	6.7	8.1	140	12	2.4	7.3	0	.1		
22	0	.1	5.4	6.7	490	12	2.0	5.2	0	0		
23	0	.2	4.4	5.1	256	13	1.4	3.7	0	0		
24	0	.2	3.6	3.9	79	13	1.0	2.5	0	0		
25	0	.1	2.8	3.3	43	13	2.9	1.6	0	0		
26	0	.2	2.4	4.6	33	17	7.7	39	0	0		
27	0	.1	2.1	15	46	18	9.4	314	0	0		
28	0	.1	1.9	16	102	14	15	595	0	0		
29	0	.1	1.9	13	79	11	10	668	0	0		
30	0	.1	1.9	9.8	-	9.4	5.9	332	5.0	0		
31	0	-	2.1	8.3	-	8.3	-	113	-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3.7	0.3	0	0.12	7.3
November.....	1.6	.2	0	.05	3.2
December.....	849.6	294	.1	27.4	1,690
Calendar year 1947 .....	120,400.1	20,000	0	330	238,800
January.....	167.5	16	1.4	5.40	332
February.....	3,465.2	799	6.9	119	6,870
March.....	543.8	47	7.9	17.5	1,080
April.....	155.0	15	1.0	5.17	307
May.....	2,801.0	668	.7	90.4	5,560
June.....	128.1	51	0	4.27	254
July.....	406.0	113	0	13.1	805
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48 .....	8,521.5	799	0	23.3	16,910

Peak discharge (base, 1,400 sec.-ft.).- No peak above base.

## Navasota River near Easterly, Tex.

Location.- Water-stage recorder, lat. 31°10'10", long. 96°17'55", at bridge on U. S. Highway 79, 1 mile upstream from Missouri Pacific Railroad bridge and 6 miles north-east of Easterly, Robertson County. Datum of gage is 276.42 feet above mean sea level, datum of 1929.

Drainage area.- 949 square miles.

Records available.- March 1924 to September 1948.

Average discharge.- 24 years, 462 second-feet.

Extremes.- Maximum discharge during year, 4,010 second-feet May 14 (gage height, 14.84 feet); minimum, 1.0 second-foot Sept. 7-9.

1924-48: Maximum discharge, 60,300 second-feet May 2, 1944 (gage height, 22.13 feet); no flow at times.

Maximum stage known, about 24.0 feet in 1900, from information by local residents, (discharge, about 71,000 second-feet).

Remarks.- Records fair. No diversion above station.

Revisions (water years).- W 898: 1924, 1926, 1927, 1928(M), 1929, 1930, 1931(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.4	3.0	5.4	16	195	304	30	108	39	257	1.8	1.6
2	4.1	3.1	5.1	15	345	225	26	72	31	118	1.8	1.8
3	3.7	2.9	5.2	83	470	693	24	53	24	47	1.7	1.4
4	3.8	3.3	30	84	388	1,090	23	40	20	26	1.5	1.5
5	3.8	3.0	39	52	364	1,380	22	36	16	18	1.5	1.2
6	3.8	3.6	56	33	546	772	21	119	14	60	1.4	1.1
7	3.6	4.4	116	24	828	284	20	429	12	49	1.4	1.0
8	3.6	4.4	89	19	982	207	20	177	10	135	1.4	1.0
9	3.6	4.1	115	18	1,210	148	19	100	9.2	166	1.4	1.0
10	3.6	4.7	274	16	1,580	114	42	60	8.3	102	1.4	1.6
11	3.4	4.0	180	15	1,620	122	86	357	7.1	77	1.4	4.1
12	3.1	4.1	92	14	1,170	134	142	1,180	6.4	66	1.4	3.3
13	3.0	4.4	56	13	580	106	356	1,800	6.0	70	1.4	2.6
14	2.9	4.8	38	13	620	82	720	3,100	5.4	34	1.3	2.3
15	2.8	4.8	31	12	488	65	828	3,360	5.1	21	1.3	2.0
16	2.8	5.1	29	12	333	80	784	2,300	4.5	14	1.3	1.8
17	2.8	5.4	32	14	222	56	591	1,050	4.4	11	1.2	1.8
18	2.8	6.1	133	19	152	53	223	194	4.3	8.5	1.2	1.8
19	4.1	5.8	114	192	114	50	134	130	3.7	6.8	1.3	1.8
20	3.6	6.0	56	232	96	48	93	124	3.1	5.4	1.3	1.7
21	2.8	5.8	34	180	90	43	67	114	2.9	4.4	1.3	1.7
22	2.6	12	24	202	175	41	52	91	2.7	3.8	1.3	1.6
23	2.6	9.7	20	326	380	39	45	70	2.6	3.3	1.3	1.6
24	2.6	9.9	17	206	235	43	37	60	2.6	3.0	1.3	1.5
25	2.8	8.7	15	94	139	86	122	39	2.5	2.8	1.4	1.5
26	2.9	6.8	14	63	106	70	231	87	2.5	2.6	1.5	2.0
27	2.9	5.7	13	92	153	52	396	58	2.9	2.4	1.8	1.6
28	2.9	5.0	12	248	348	42	580	45	3.8	2.2	1.8	1.4
29	2.9	4.7	12	580	436	37	501	32	15	2.0	1.7	1.5
30	3.0	5.1	12	2374	-	37	178	30	142	1.8	1.7	1.2
31	3.0	-	13	230	-	35	-	42	-	1.8	1.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	100.3	4.4	2.6	3.24	199
November.....	160.4	12	2.9	5.35	318
December.....	1,681.7	274	5.1	54.2	3,340
Calendar year 1947 .....	171,353.8	8,550	2.6	469	339,900
January.....	3,491	580	12	113	6,920
February.....	14,345	1,620	90	495	28,450
March.....	6,518	1,380	35	210	12,930
April.....	6,411	828	19	214	12,720
May.....	15,453	3,360	30	498	30,650
June.....	411.2	142	2.5	13.7	816
July.....	1,321.8	257	1.8	42.6	2,620
August.....	45.1	1.8	1.2	1.45	89
September.....	51.6	4.1	1.0	1.72	102
Water year 1947-48 .....	49,990.1	3,360	1.0	137	99,150

Peak discharge (base, 3,100 sec.-ft.)- May 14 (10:30 p.m.) 4,010 sec.-ft.

f Computed on basis of partly estimated gage-height record.

American Canal Co.'s canal near Fulshear, Tex.

Location.- Water-stage recorder, lat. 29°39', long. 95°54', 1 mile downstream from point of diversion and 3 miles south of Fulshear, Fort Bend County.

Records available.- October 1931 to September 1948.

Average discharge.- 17 years, 73.0 second-feet.

Extremes.- Maximum daily discharge during year, 349 second-feet May 15; no flow at times.  
1931-48: Maximum daily discharge, 363 second-feet May 17, 1942; no flow for several months each year.

Remarks.- Records good. Station above all diversions from canal. Flow controlled by pumping plant located on left bank of Brazos River 18 miles above Richmond. Figures of discharge represent water actually pumped from river for irrigation in vicinity of Sugarland.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	179	0	81.4	5,010
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1947..	349	0	114	82,310
January.....	0	0	0	0
February.....	0	0	0	0
March.....	0	0	0	0
April.....	325	0	193	11,500
May.....	349	269	293	17,990
June.....	325	229	265	15,780
July.....	309	237	271	16,640
August.....	253	237	251	15,410
September.....	261	92	207	12,300
Water year 1947-48..	349	0	130	94,630

Richmond Irrigation Co.'s canal near Richmond, Tex.

Location.- Water-stage recorder, lat. 29°34', long. 95°47', 600 feet downstream from crossing of U. S. Highway 59, 1½ miles downstream from point of diversion, and 1½ miles west of Richmond, Fort Bend County.

Records available.- October 1931 to September 1948.

Average discharge.- 17 years, 36.5 second-feet.

Extremes.- Maximum daily discharge during year, 230 second-feet May 22; no flow at times.  
1931-48: Maximum daily discharge, 234 second-feet June 5, 6, 1938; no flow for several months each year.

Remarks.- Records good. Canal diverts water by pumping from right bank of Brazos River 8 miles upstream from Richmond for irrigation. Figures of discharge represent water pumped from river except for a diversion upstream from station which is used to irrigate 80 acres.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	92	0	14.1	868
November.....	0	0	0	0
December.....	0	0	0	0
Calendar year 1947...	200	0	57.3	41,460
January.....	0	0	0	0
February.....	0	0	0	0
March.....	2.2	0	.07	4.4
April.....	154	0	85.7	5,100
May.....	230	0	121	7,430
June.....	198	.1	156	9,290
July.....	192	95	149	9,150
August.....	192	15	151	9,260
September.....	120	0	68.2	4,060
Water year 1947-48...	230	0	62.2	45,160

## BRAZOS RIVER BASIN

Dry Creek near Richmond, Tex.

Location.- Staff gage, lat. 29°30'19", long. 95°42'39", at county road bridge, 3.8 miles upstream from mouth and 6 miles southeast of Richmond, Fort Bend County. Datum of gage is 65.96 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 10.3 square miles.

Records available.- May 1947 to September 1948.

Extremes.- 1947: Maximum discharge observed during period May to September, 382 second-feet May 25 (gage height, 9.00 feet); no flow at times.

1947-48: Maximum discharge during water year, 173 second-feet Dec. 13 (gage height, 7.23 feet, from graph based on gage readings); no flow at times.

Flood of August 1945, highest of recent years, reached a stage of 13.6 feet, gage datum, at a point 0.7 mile to left of gage, from information by observer.

Remarks.- Records fair. Gage read once daily, oftener during high stages. Low flow affected by drainage from irrigated lands. No diversions above station.

## Discharge, in second-feet, 1947-48

1947

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								-	0.4	0.4	1.5	0.8
2								-	.2	.7	1.6	.6
3								-	0	.6	1.5	.3
4								-	0	.5	1.4	.2
5								-	.3	.7	1.4	.1
6								-	.1	.8	1.2	.1
7								-	.4	.8	1.2	0
8								-	.8	1.5	1.0	0
9								-	1.1	2.5	.9	0
10								-	1.3	1.8	1.1	.1
11								-	1.0	1.0	2.3	.1
12								-	.6	1.1	2.9	.1
13								-	.6	8.0	3.0	.1
14								0.8	8.4	8.3	2.9	0
15								1.0	.4	4.5	2.4	0
16								.7	.3	1.8	1.6	.1
17								.6	.3	1.2	1.2	.2
18								33	.1	1.0	1.1	.2
19								48	.5	1.3	1.0	.4
20								63	.8	1.2	1.2	.4
21								102	.8	1.2	2.9	.4
22								11	.6	1.0	3.4	.2
23								62	.4	1.0	2.6	.1
24								151	.4	.6	2.4	0
25								303	.4	.6	23	0
26								46	.4	1.2	20	0
27								11	.4	1.6	10	0
28								3.7	.4	1.7	84.3	.4
29								1.7	.4	1.5	2.4	.5
30								1.2	.4	1.5	1.5	.4
31								.8	-	1.5	1.0	-

Peak discharge (base, 200 sec.-ft.).- May 21 (1 a.m.) 260 sec.-ft.; May 25 (8 a.m.) 382 sec.-ft.  
a No gage-height record; discharge computed on basis of estimated gage heights.

Discharge, in second-feet, of Dry Creek near Richmond, Tex., 1947-48--Continued

1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					6.6	1.6	0	0	0.1	1.9	0.9	1.6
2	0.2	0	0.2	0	2.7	1.4	0	0	0	1.7	.8	2.3
3	.1	0	.2	0	11	1.2	0	0	0	1.0	.8	2.3
4	0	0	.3	0	19	1.1	0	0	0	1.1	.8	2.3
5	0	0	1.0	0	14	1.6	0	0	0	1.0	.9	2.3
6	0	0	2.4	0	6.0	3.4	0	0	0	.6	.9	2.2
7	0	0	.6	0	2.5	2.1	0	0	0	.5	.9	2.0
8	0	0	.4	0	1.5	2.1	0	0	0	.1	.6	2.1
9	.1	0	.4	0	2.1	57	0	0	0	0	.8	2.8
10	.2	0	.4	0	1.5	28	0	0	.7	0	1.1	4.7
11	.2	0	.6	0	1.0	9.0	0	7.0	1.5	.2	1.6	4.5
12	.2	0	4.5	0	19	3.2	0	2.7	1.0	.5	2.3	3.1
13	.1	0	84	0	11	1.3	0	.7	.4	.6	2.4	1.6
14	.1	.2	32	0	4.1	1.1	0	.3	.4	.8	2.2	1.2
15	0	2.1	82	0	2.0	.7	0	0	.2	.4	1.4	.8
16	0	1.2	25	.1	1.2	.8	0	0	0	.3	1.2	.6
17	0	.4	9.0	3.7	.8	.6	0	0	0	.8	1.1	.8
18	0	.5	3.9	1.1	.6	.4	0	.1	0	1.1	1.2	1.8
19	0	1.9	1.8	38	.6	.3	0	8.9	.2	1.0	1.2	3.0
20	.1	.8	1.2	41	.4	.3	0	3.6	.2	1.2	1.8	2.3
21	0	.8	.8	11	4.8	.2	0	.8	.1	1.6	2.1	2.2
22	0	9.3	.4	4.2	16	.2	0	.4	0	3.4	2.0	1.8
23	0	20.0	.3	2.5	16	.1	0	0	0	3.4	1.9	1.0
24	0	4.1	.3	1.0	34	0	0	0	0	1.6	2.2	.6
25	0	1.4	.1	.8	22	0	0	.1	0	1.1	2.4	.5
26	0	.8	.1	1.5	12	0	0	49	.4	1.0	2.3	.3
27	0	.6	0	28	6.9	0	.2	41	.5	1.1	1.5	.2
28	0	.5	0	14	3.9	0	.1	7.1	.5	1.4	1.6	.5
29	0	.4	0	13	2.1	0	0	.9	.8	1.1	1.2	.8
30	0	.3	0	16	-	0	0	.6	1.1	1.1	1.1	1.5
31	0	-	0	15	-	0	-	.6	-	1.0	1.2	-

Peak discharge (base, 200 sec.-ft.).- No peak above base.

Monthly discharge, in second-feet, 1947-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October					
November					
December					
Calendar year					
January	-	-	-	-	-
February	-	-	-	-	-
March	-	-	-	-	-
April	-	-	-	-	-
May 14-31, 1947	840.5	303	0.6	46.7	1,670
June	14.2	1.3	0	3.47	28
July	53.1	8.3	.4	1.71	105
August	105.9	23	.9	3.42	210
September	5.4	.8	0	.18	11
The period	-	-	-	-	2,020
October 1947	1.5	.2	0	.05	3.0
November	45.3	20	0	1.51	90
December	252.2	84	0	8.14	500
Calendar year	-	-	-	-	-
January 1948	190.9	41	0	6.16	379
February	225.3	34	.4	7.77	447
March	117.7	57	0	3.80	233
April	.3	.2	0	.01	.6
May	123.8	49	0	3.99	246
June	8.1	1.5	0	.27	16
July	32.6	3.4	0	1.05	65
August	44.4	2.4	.6	1.43	89
September	55.9	4.7	.2	1.80	107
Water year 1947-48	1,096.0	84	0	2.99	2,170



## Big Creek near Needville, Tex.

Location.- Wire-weight gage, lat. 29°28'35", long. 95°48'45", at bridge on State Highway 38, 1.6 miles downstream from Coon Creek, 5½ miles north of Needville, Fort Bend County, and 10½ miles upstream from Fairchild Creek. Datum of gage is 69.4 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 37.6 square miles.

Records available.- May 1947 to September 1948.

Extremes.- Maximum discharge during year, 582 second-feet Dec. 13 (gage height, 10.08 feet, from graph based on gage readings); no flow at times.  
1947-48: Maximum discharge, 1,120 second-feet May 25, 1947 (gage height, 12.70 feet, from floodmark); no flow at times.  
Flood of August 1945 reached a stage of 14.4 feet, from information by local resident.

Remarks.- Records fair. Gage read once or twice daily. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.9	0.8	23	7.7	0	0	0.4	0		
2		0	.6	.6	13	6.2	0	0	2.2	0		
3		0	2.1	.4	60	5.1	0	0	.1	0		
4		0	1.8	.4	105	4.0	0	0	0	0		
5		0	3.1	.3	73	5.7	0	0	0	1.1		
6		0	14	.2	32	28	0	0	0	1.2		
7		0	19	0	16	16	0	0	0	.2		
8		0	18	0	12	18	0	0	0	0		
9		0	8.6	0	17	324	0	0	0	0		
10		0	5.1	0	11	156	0	0	0	0		
11		0	6.1	0	12	54	0	42	0	0		
12		1.4	41	0	110	23	0	31	0	0		
13		1.0	445	0	62	13	0	4.6	0	0		
14		32	362	0	26	8.5	0	1.7	0	0		
15		44	366	0	12	5.8	0	5.5	0	0		
16		27	200	0	7.5	4.0	0	2.7	0	0		
17		11	89	0	5.6	2.5	0	.8	0	0		
18		37	46	0	4.0	1.9	0	2.0	0	0		
19		7.0	26	.62	3.1	1.6	0	355	0	0		
20		1.4	16	112	2.8	1.4	0	70	0	0		
21		1.2	10	35	15	1.0	0	13	0	0		
22		49	8.0	17	67	.9	0	16	0	0		
23		200	5.9	10	34	.9	0	4.5	0	0		
24		59	5.1	7.3	81	.6	88.5	.3	0	0		
25		20	4.0	6.5	46	.6	24	0	0	0		
26		11	3.0	6.0	27	.5	7.2	0	0	0		
27		4.7	2.5	107	18	.3	1.0	47	0	0		
28		3.4	2.0	80	13	.2	.2	9.6	0	0		
29		2.4	1.5	41	9.8	0	0	4.6	0	0		
30		1.4	1.1	32	-	0	0	2.4	0	0		
31		-	.9	38	-	0	-	.9	-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	513.9	200	0	17.1	1,020
December.....	1,732.3	445	.6	55.9	3,440
Calendar year.....	-	-	-	-	-
January.....	556.5	112	0	18.0	1,100
February.....	917.6	110	2.8	31.6	1,820
March.....	691.4	324	0	22.3	1,370
April.....	40.9	24	0	1.36	81
May.....	613.6	355	0	19.8	1,220
June.....	.7	.4	0	.02	1.4
July.....	2.5	1.2	0	.08	5.0
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48.....	5,069.6	445	0	13.9	10,060

Peak discharge (base, 500 sec.-ft.).- Dec. 13 (1 p.m.) 582 sec.-ft.; May 19 (9 a.m.) 528 sec.-ft.  
a No gage-height record; discharge estimated.

## BRAZOS RIVER BASIN

125

## Big Creek near Guy, Tex.

Location.- Staff gage, lat. 29°24'45", long. 95°42'35", at county road bridge 0.2 mile upstream from Gulf Colorado & Santa Fe Railway bridge, 0.3 mile downstream from Deer Creek, 1.0 mile downstream from Fairchild Creek, 5 miles northeast of Guy, Fort Bend County, and 19 miles upstream from mouth. Datum of gage is 45.57 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 112 square miles.

Records available.- June 1947 to September 1948.

Extremes.- Maximum discharge during year, 945 second-feet Dec. 15 (gage height, 7.90 feet, from Floodmark), from rating curve extended above 600 second-feet by logarithmic plotting; no flow Nov. 8.

1947-48: Maximum discharge, that of Dec. 15, 1947; no flow Nov. 8, 1947.

Flood of August 1945, the highest of recent years and caused by tropical storm, reached a stage of 18.1 feet, gage datum, at railroad bridge 0.2 mile downstream, from information by observer, local resident.

Remarks.- Records fair. Gage read twice daily. Low flow is affected by drainage from irrigated lands. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	4.5	0.6	6.0	2.7	111	20	2.1	24	30	32	19	17
2	3.8	.5	4.1	2.6	72	15	1.9	29	28	38	24	18
3	4.2	.4	4.2	2.5	174	13	1.9	31	25	40	27	21
4	5.4	.2	3.8	2.3	236	12	1.9	13	24	39	31	24
5	6.0	.2	5.5	2.3	228	17	1.9	6.4	28	45	32	23
6	6.1	.2	14	2.3	144	69	1.9	12	30	48	31	23
7	5.0	.2	16	2.2	81	61	1.8	16	25	40	50	22
8	5.6	.1	19	2.3	50	45	1.6	13	17	39	27	25
9	2.8	.2	18	2.2	43	197	1.6	7.5	13	45	25	37
10	2.5	.2	12	2.2	40	538	1.6	6.4	12	38	24	55
11	1.9	.4	9.6	2.0	31	323	1.5	10	13	30	23	59
12	1.7	.6	11	2.0	173	132	1.6	21	18	30	23	53
13	1.4	.6	331	2.0	252	86	2.8	57	21	35	24	39
14	1.3	1.0	653	1.6	187	34	9.1	35	22	31	24	28
15	1.1	1.5	822	1.7	77	20	13	18	22	25	26	19
16	2.0	24	593	3.3	40	14	14	12	23	24	31	15
17	2.8	27	394	14	22	10	16	11	23	25	31	19
18	3.6	14	201	9.9	16	7.5	19	12	21	24	33	26
19	3.2	21	112	70	12	6.5	18	19	23	25	32	29
20	2.5	23	64	340	8.9	5.2	15	198	18	23	32	27
21	1.5	11	37	220	10	4.0	14	210	14	26	31	25
22	1.3	8.8	22	103	57	3.8	17	77	9.7	27	30	23
23	.9	56	15	52	104	3.4	30	39	11	23	30	22
24	.7	210	11	28	219	3.0	40	29	13	21	32	25
25	.5	122	8.1	17	204	2.7	35	30	13	19	46	25
26	.5	60	6.0	14	126	2.5	31	40	14	18	50	22
27	.4	31	4.6	48	78	2.5	33	60	18	16	45	15
28	.4	20	3.5	145	48	2.3	23	84	21	14	35	11
29	.4	13	3.4	132	33	2.2	20	85	24	14	23	8.9
30	.6	8.9	3.1	132	-	2.2	18	40	28	14	19	8.3
31	.8	-	3.0	168	-	2.2	-	35	-	15	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	73.4	6.1	0.4	2.37	146
November.....	656.6	210	.1	21.9	1,300
December.....	3,409.9	822	3.0	110	6,760
Calendar year .....	-	-	-	-	-
January.....	1,538.1	340	1.6	49.6	3,050
February.....	2,846.9	252	8.9	98.2	5,850
March.....	1,635.8	538	2.2	52.8	3,240
April.....	389.2	40	1.5	13.0	772
May.....	1,284.3	210	6.4	41.4	2,550
June.....	597.7	30	9.7	19.9	1,190
July.....	883	48	14	28.5	1,750
August.....	906	50	16	29.2	1,800
September.....	764.2	59	8.3	25.5	1,520
Water year 1947-48 .....	14,985.1	822	.1	40.9	29,730

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

## Fairchild Creek near Needville, Tex.

Location.- Staff gage, lat. 29°26'45", long. 95°45'40", at county road bridge 3.0 miles upstream from mouth and 5½ miles northeast of Needville, Fort Bend County. Datum of gage is 60.4 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 24.9 square miles.

Records available.- May 1947 to September 1948.

Extremes.- Maximum discharge observed during year, 312 second-feet Dec. 13 (gage height, 5.80 feet); no flow at times.

1947-48: Maximum discharge, 792 second-feet May 21, 1947 (gage height, 8.36 feet, from floodmark); no flow at times.

Maximum stage since about 1910, 12.5 feet in August 1945, from floodmark 195 feet downstream and 520 feet to left of gage, from information by local resident.

Remarks.- Records good. Gage read twice daily. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	0.2	0.2	15	2.2		0				
2		0	.1	.3	13	1.9		0				
3		0	.7	.4	78	1.5		0				
4		0	.7	.3	74	1.2		0				
5		0	4.2	.2	40	3.4		0				
6		0	3.3	.2	17	21		0				
7		0	1.6	.1	9.0	6.1		0				
8		0	.8	0	6.6	5.7		.1				
9		0	.5	0	13	159		0				
10		0	.4	0	6.6	79		0				
11		0	.3	0	4.2	18		.1				
12		0	2.0	0	71	7.6		9.0				
13		0	202	0	34	4.8		1.9				
14		0	.75	0	14	3.0		.8				
15		0	142	0	7.0	1.6		.3				
16		0	35	.1	3.7	1.4		.1				
17		.1	12	2.0	2.8	1.0		0				
18		.3	7.6	2.5	1.9	.8		0				
19		1.3	6.0	72	1.4	.6		5.3				
20		.8	3.2	71	1.1	.4		5.5				
21		.6	2.2	20	2.4	.2		1.9				
22		2.6	1.6	9.7	17	.2		1.0				
23		27	1.0	5.0	15	.2		.4				
24		7.5	.8	2.6	62	.2		.2				
25		2.2	.6	1.8	30	.1		0				
26		1.6	.4	1.7	14	0		.3				
27		1.4	.3	51	8.7	0		.5				
28		.8	.2	24	5.1	0		1.7				
29		.4	.2	18	5.3	0		.7				
30		.3	.2	60	-	0		.2				
31		-	.2	46	-	0		0				

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	46.9	27	0	1.56	93
December.....	505.3	202	.1	16.3	1,000
Calendar year .....	-	-	-	-	-
January.....	389.1	72	0	12.6	772
February.....	572.8	76	1.1	19.8	1,140
March.....	321.1	159	0	10.4	637
April.....	0	0	0	0	0
May.....	30.0	9.0	0	.97	60
June.....	0	0	0	0	0
July.....	0	0	0	0	0
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48 .....	1,865.2	202	0	5.10	3,700

Peak discharge (base, 200 sec.-ft.),- Dec. 13 (8 a.m.) 312 sec.-ft.; Jan. 19 (8 p.m.) 244 sec.-ft.; Mar. 9 (1 p.m.) 237 sec.-ft.

## Colorado River near Ira, Tex.

Location.- Water-stage recorder, lat.  $32^{\circ}32'$ , long.  $101^{\circ}03'$ , 269 feet downstream from county road bridge,  $\frac{3}{4}$  miles upstream from Willow Creek,  $\frac{3}{4}$  miles downstream from Bluff Creek, 4.4 miles southwest of Ira, Scurry County, and 7 miles downstream from Bull Creek. Prior to Oct. 30, 1947, staff gage at site 75 feet upstream at same datum.

Drainage area.- 3,617 square miles, of which 2,590 square miles is probably noncontributing.

Records available.- October 1947 to September 1948.

Extremes.- Maximum discharge during year, 20,500 second-feet July 6 (gage height, 21.35 feet), from rating curve extended above 9,600 second-feet by conveyance-slope method; no flow at times.

Maximum stage known, about 32 feet June 16, 1913, from levels to a point about 255 feet upstream from gage, from information by local resident. Flood of May 1947 reached a stage of 25.1 feet, from floodmark at bridge 269 feet upstream from gage.

Remarks.- Records good except those above 10,000 second-feet, which are poor. Staff gage read once or twice daily. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.4	0.9	0.9	0.9	0.7	0.1	0	2,680	36	298	10
2	0	.4	1.1	.7	.9	1.1	0	0	2,270	20	86	5.4
3	0	.2	.95	.9	1.1	.9	0	0	668	13	26	3.3
4	no	.2	412	1.1	1.5	.5	.1	0	107	9.1	13	2.8
5	no	.2	133	.7	1.5	.4	.1	0	36	5,430	7.6	1.8
6	.1	.2	37	.9	1.3	.5	.1	0	15	15,600	5.0	.9
7	.1	.1	16	.7	1.5	.9	.1	0	6.8	3,300	3.3	.4
8	.1	.2	9.1	.7	.9	.4	.1	0	4.0	324	2.0	.4
9	.1	.2	6.0	.9	.7	.7	0	0	2.8	112	1.3	2.6
10	a.1	.2	5.0	.5	.4	.4	0	0	2.0	48	.9	.1
11	.1	.2	3.6	.5	.5	.2	0	0	1.1	29	.4	.1
12	0	.2	3.6	.9	.2	.2	0	0	.7	18	.2	.1
13	.1	.4	2.8	.4	.4	.2	0	0	.5	13	.2	.1
14	.1	1.8	2.5	.4	.5	.2	0	0	.4	9.8	.2	.1
15	.1	1.1	2.2	.5	.4	.2	0	0	.2	7.2	.2	.1
16	0	.7	1.5	1.1	.4	.2	0	1,110	.1	5.0	.2	0
17	0	8.9	1.3	.2	.4	.2	0	36	.1	3.6	.2	.1
18	.1	26	1.1	.4	.4	.2	0	14	0	2.8	.2	.1
19	a.1	16	1.1	.7	.7	.2	0	8.1	.1	1.8	.2	.1
20	.1	5.7	1.1	.5	.2	.2	0	5.7	.1	1.5	.2	.1
21	0	3.3	.9	.7	.2	.2	0	4.3	0	1.1	.2	.1
22	0	2.2	.9	.7	.2	.1	.2	3.3	0	5.7	.2	.1
23	0	1.8	.9	.7	.2	.2	.7	2.5	0	al,550	.2	.1
24	no	1.5	.9	.9	.5	.1	.2	168	0	8476	.2	.1
25	.2	1.3	.9	.9	.2	.1	.1	2,600	0	8256	.1	.1
26	18	1.1	.7	1.1	9.8	.1	.1	465	0	65	.1	8.5
27	3.3	1.8	.9	.7	10	.1	.1	177	20	38	.1	1.1
28	2.0	.9	.9	.7	1.8	.1	.1	46	2,150	al,7	12	.2
29	1.1	.9	.9	.7	1.3	.1	.1	20	8371	al,1	46	.2
30	.7	.9	1.1	.7	-	0	0	f13	76	al,7.6	8.8	.2
31	.9	-	1.1	1.1	-	.1	-	f104	-	60	10	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	27.4	18	0	0.88	54
November.....	79.0	26	.1	2.63	157
December.....	746.0	412	.7	24.1	1,480
Calendar year .....	-	-	-	-	-
January.....	22.5	1.1	.2	.73	45
February.....	39.0	10	.2	1.34	77
March.....	9.7	1.1	0	.31	19
April.....	2.2	.7	0	.07	4.4
May.....	4,776.9	2,600	0	154	9,470
June.....	8,411.9	2,680	0	280	16,680
July.....	25,471.0	13,600	1.1	822	50,520
August.....	523.2	298	.1	16.9	1,040
September.....	173.9	78	0	5.80	345
Water year 1947-48 .....	40,282.7	13,600	0	110	79,890

Peak discharge (base, 1,000 sec.-ft.).- May 16 (5:30 a.m.) 3,980 sec.-ft.; May 25 (3 p.m.) 4,150 sec.-ft.; June 1 (8:15 p.m.) 3,980 sec.-ft.; June 28 (12 m.) 5,050 sec.-ft.; July 6 (8 p.m.) 20,500 sec.-ft.; July 23 (6 p.m.) 5,690 sec.-ft.

a No gage-height record; discharge interpolated or computed on basis of recorded range in stage and weather records.

f Computed on basis of partly estimated gage-height record.

g Computed from graph based on gage readings.

## Colorado River at Colorado City, Tex.

Location.- Water-stage recorder and concrete control, lat. 32°24', long. 100°51', at Colorado City, Mitchell County, 3,517 feet upstream from bridge on U. S. Highway 80, 4,100 feet upstream from Texas & Pacific Railway bridge, and 1.6 miles upstream from Lone Wolf Creek. Datum of gage is 2,030.2 feet above mean sea level, datum of 1929, Fort Worth supplementary adjustment of 1942.

Drainage area.- 4,082 square miles (revised), of which 2,590 square miles (revised) is probably noncontributing.

Records available.- November 1923 to August 1925, May 1946 to September 1948.

Extremes.- Maximum discharge during year 24,900 second-feet July 6 (gage height, 22.37 feet, from floodmark); no flow at times.

1924-25, 1946-48: Maximum discharge, that of July 6, 1948; no flow at times.

Maximum stage known, 35.9 feet June 20, 1939, present site and datum, based on floodmarks 1,000 feet upstream and 3,740 feet downstream from gage (discharge, 66,000 second-feet, by slope-area method at site 2.5 miles upstream from gage).

Remarks.- Records good. No diversions above station. Records of chemical analyses for water year 1948 are given in Water-Supply Paper 1133.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2.9	2.3	2.0	2.6	17	0.3	0	21,620	78	250	26
2	0	2.6	2.6	2.3	2.6	9.9	.1	0	22,520	37	388	12
3	0	1.7	30	2.0	2.9	8.3	0	0	21,810	23	116	9.1
4	0	2.0	610	2.0	2.9	6.2	0	0	2354	18	51	6.2
5	0	1.5	422	2.3	3.2	5.6	0	0	118	7,430	23	3.6
6	4.3	1.5	121	2.0	3.2	4.5	0	0	53	16,000	16	2.3
7	11	1.1	48	2.0	3.2	3.6	0	0	26	10,100	11	1.7
8	5.6	.9	23	2.0	2.9	3.6	0	0	14	1,030	8.3	1.3
9	3.2	.7	13	2.0	3.2	3.6	0	0	8.3	319	5.6	2.3
10	2.3	1.1	9.9	1.7	2.6	3.2	0	0	6.2	146	4.5	13
11	1.5	.7	8.3	1.7	2.0	2.9	0	0	4.5	80	3.6	11
12	1.1	.7	6.2	2.0	2.0	3.2	0	0	2.9	66	2.9	5.6
13	1.1	1.1	4.0	1.7	2.6	2.9	0	0	2.3	39	2.0	3.6
14	.7	1.5	3.6	1.7	2.3	2.6	0	0	2.0	26	1.5	2.6
15	.4	19	3.6	1.5	2.0	2.6	0	0	.9	17	1.3	1.7
16	.3	12	3.2	1.5	2.0	2.0	0	1,020	.3	12	.9	1.3
17	.2	12	3.2	1.3	2.0	1.7	0	330	0	9.9	.6	.9
18	0	26	2.9	1.5	1.7	2.0	0	59	0	8.3	.4	.7
19	0	62	3.6	1.7	2.0	2.6	0	21	0	6.2	.4	.6
20	0	34	2.9	1.7	1.5	1.5	0	12	0	4.0	.3	.4
21	0	18	2.6	1.7	1.5	2.3	0	9.9	0	3.2	.1	.6
22	0	12	2.6	1.7	1.3	1.5	3.9	5.0	0	7.4	.1	.6
23	0	9.1	2.3	2.0	1.1	1.1	7.2	11	0	449	0	12
24	0	6.2	2.3	2.3	1.3	1.1	8.6	6.3	0	2,130	0	65
25	348	5.0	2.3	2.0	1.5	1.1	3.2	2,000	0	508	0	20
26	156	4.0	2.0	2.3	151	1.3	1.3	21,690	0	213	0	12
27	44	3.6	1.7	2.6	2,180	.4	.6	2367	0	90	0	7.6
28	17	3.2	2.0	2.0	83	.6	.7	8205	741	53	0	5.6
29	9.9	2.9	1.7	2.3	31	.3	.2	278	1,230	28	0	6.2
30	6.2	2.6	1.7	2.3	-	.4	0	237	236	20	117	4.5
31	4.0	-	2.0	2.6	-	.2	-	214	-	17	83	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	616.8	348	0	19.9	1,220
November.....	251.6	62	.7	8.39	499
December.....	1,346.5	610	1.7	43.4	2,670
Calendar year 1947 .....	48,742.2	11,700	0	154	96,680
January.....	60.4	2.6	1.3	1.95	120
February.....	2,501.1	2,180	1.1	86.2	4,960
March.....	99.8	17	.2	3.22	198
April.....	26.1	8.6	0	.87	52
May.....	5,865.2	2,000	0	189	11,630
June.....	8,749.4	2,520	0	292	17,350
July.....	38,966.0	16,000	3.2	1,257	77,290
August.....	1,087.5	388	0	35.1	2,160
September.....	240.0	65	.4	8.00	476
Water year 1947-48 .....	59,810.4	16,000	0	163	118,600

Peak discharge (base, 4,000 sec.-ft.)- Feb. 27 (5:30 a.m.) 6,110 sec.-ft.; June 1 (9 p.m.) 4,100 sec.-ft.; July 6 (1 a.m.) 24,900 sec.-ft.; July 24 (2:30 a.m.) 5,140 sec.-ft.  
g Computed from graph based on gage readings.

## Colorado River at Robert Lee, Tex.

Location.- Water-stage recorder, lat. 31°53'05" long. 100°28'45", at bridge on State Highway 208 in Robert Lee, Coke County, half a mile upstream from Mountain Creek. Datum of gage is 1,771.7 feet above mean sea level, datum of 1929 (levels by Bureau of Reclamation)

Drainage area.- 15,770 square miles, of which 11,600 square miles (revised) is probably noncontributing.

Records available.- April 1939 to September 1948. September 1915 to September 1920 (October 1918 to September, revised, 1920, gage heights only) at site near Bronte, 16 miles downstream. October 1923 to December 1927 at site near Robert Lee, 9 miles downstream. Records equivalent except during periods of local runoff between sites.

Average discharge.- 15 years (1915-18, 1924-27, 1939-48), 211 second-feet.

Extremes.- Maximum discharge during year, 28,000 second-feet July 8 (gage height, 20.61 feet); no flow Oct. 24, May 2-18.

1939-48: Maximum discharge, 31,700 second-feet June 22, 1939 (gage height, 21.70 feet, from graph based on gage readings), by slope-area method; no flow at times.

Remarks.- Records good. About 2,200 acres irrigated above station. Records of chemical analyses and water temperatures for water year 1948 are give in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	53	12	12	4.6	216	5.0	0.2	505	385	202	62
2	.4	36	11	12	4.6	121	4.6	.1	3,170	214	276	35
3	.4	30	139	11	5.0	76	4.1	0	2,190	132	490	55
4	.3	23	204	11	5.0	54	3.7	0	1,460	85	376	56
5	.2	18	767	11	5.0	43	3.7	0	550	328	245	37
6	.3	15	605	11	5.0	37	3.2	0	2,766	12,400	171	26
7	.8	12	376	11	5.0	32	3.2	0	174	23,900	121	21
8	6.2	11	147	11	4.6	27	2.9	0	115	18,600	94	18
9	30	11	81	11	4.6	24	2.6	0	83	1,900	74	16
10	20	9.9	56	11	4.6	22	2.3	0	64	756	60	14
11	16	9.2	43	11	4.1	20	2.0	0	51	460	51	13
12	13	8.5	37	11	7.9	16	1.4	0	44	327	42	11
13	8.5	7.9	31	11	9.2	15	1.4	0	36	249	36	9.9
14	5.0	8.5	26	11	8.5	11	1.2	0	31	196	33	8.5
15	3.2	13	24	10	7.9	9.2	1.1	0	28	165	32	7.9
16	2.0	13	21	10	6.7	8.5	.9	0	26	126	27	6.7
17	1.2	18	19	9.2	6.1	8.5	.8	0	25	94	25	6.1
18	.8	59	16	8.5	6.1	7.9	.8	459	26	78	23	5.5
19	.6	43	16	8.5	6.1	7.3	.7	250	20	62	21	6.1
20	.2	54	15	8.5	5.5	6.7	.5	144	14	49	18	6.1
21	.1	107	14	7.9	5.0	247	.5	92	9.9	40	16	5.5
22	.1	83	13	7.9	4.6	437	1.2	62	6.1	35	14	346
23	.1	58	13	6.7	4.6	158	2.0	44	4.6	33	15	1,220
24	.8	44	13	6.7	4.6	70	1.4	565	2.9	446	11	441
25	2,850	33	13	6.1	4.6	43	.9	827	247	2,100	9.9	142
26	3,570	28	13	5.5	511	30	.6	2,240	858	657	9.9	70
27	890	24	13	5.0	3,020	22	.4	1,620	62	490	8.5	40
28	288	20	13	4.6	2,090	18	.3	593	27	518	8.5	37
29	138	17	13	4.6	450	12	.2	388	55	306	9.9	28
30	85	15	12	4.6	-	7.3	.2	1,000	1,020	222	75	20
31	64	-	12	4.6	-	5.5	-	773	-	193	166	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	7,993.8	3,570	0.1	258	15,860
November.....	880.0	107	7.9	29.3	1,750
December.....	2,788	767	11	89.9	5,530
Calendar year 1947.....	100,329.5	20,500	0	275	199,000
January.....	274.9	12	4.6	8.87	545
February.....	6,210.5	3,020	4.1	214	12,320
March.....	1,811.9	437	5.5	58.4	3,590
April.....	53.8	5.0	.2	1.79	107
May.....	9,057.3	2,240	0	292	17,960
June.....	11,180.5	3,170	2.9	373	22,180
July.....	55,544	23,900	33	2,114	130,000
August.....	2,758.7	490	8.5	89.0	5,470
September.....	2,768.3	1,220	5.5	92.3	5,490
Water year 1947-48.....	111,321.7	23,900	0	304	220,800

Peak discharge (base, 7,700 sec.-ft.).- Oct. 26 (1:30 a.m.) 8,540 sec.-ft.; July 8 (3 a.m.) 28,000 sec.-ft.

Note.- Discharge Oct. 1-7, 11-23, 30, Nov. 1-5, Mar. 14-20, Mar. 29 to May 17, June 20-24, 29, July 10-12 computed from graph based on gage readings.

## Colorado River at Ballinger, Tex.

Location.- Water-stage recorder, lat. 31°43'50", long. 99°56'25", at bridge on U. S. Highway 83 in Ballinger, Runnels County, 2,000 feet upstream from Elm Creek. Datum of gage is 1,593.7 feet above mean sea level, datum of 1929.

Drainage area.- 16,840 square miles, of which 11,600 square miles (revised) is probably noncontributing.

Records available.- June 1907 to September 1948. (June 1907 to November 1915, monthly records only, in Water-Supply Paper 850.) U. S. Weather Bureau collected gage-height records in this vicinity from 1903 to 1929.

Average discharge.- 41 years, 404 second-feet.

Extremes.- Maximum discharge during year, 28,300 second-feet July 9 (gage height, 21.00 feet); minimum, 0.7 second-foot Apr. 21.

1907-48: Maximum discharge, 75,400 second-feet Sept. 18, 1936 (gage height, 28.6 feet); no flow at times.

Maximum stage known, about 36.0 feet in 1884, present site and datum, from information by local residents. A stage of about 32.0 feet occurred Aug. 6, 1906, present site and datum, from floodmarks (backwater from Elm Creek).

Remarks.- Records good. Small diversions above station for irrigation affect low flow.

Revisions (water years).- W 850, W 878: 1916, 1917.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.4	90	18	15	9.0	461	9.9	4.8	1,460	746	500	107
2	3.2	89	17	14	9.0	284	9.0	4.0	1,410	393	252	96
3	2.9	53	49	14	9.0	167	7.2	4.0	2,760	839	235	60
4	2.4	40	930	13	9.0	107	6.6	4.0	1,800	458	481	43
5	2.2	32	366	13	9.0	82	6.6	3.4	1,120	2,020	347	36
6	2.2	28	1,100	13	9.0	66	6.6	2.6	518	11,800	227	48
7	2.4	22	748	12	9.0	55	6.6	2.2	320	18,800	159	36
8	151	19	454	12	9.0	45	6.0	2.2	214	22,800	120	221
9	105	16	243	12	9.0	36	5.2	2.2	144	16,800	95	283
10	12	15	152	12	9.0	34	4.0	2.1	101	1,590	79	87
11	7.2	14	104	12	9.0	28	3.2	3.7	71	812	66	38
12	12	13	79	12	9.0	26	3.2	4.8	50	535	55	28
13	11	14	60	*11	8.4	24	2.6	3.4	43	383	45	24
14	9.0	13	50	11	8.4	22	2.4	3.7	48	316	43	21
15	7.2	11	45	11	8.4	18	2.4	4.0	30	256	38	19
16	6.0	11	36	11	8.4	16	1.7	4.4	21	218	34	18
17	5.6	13	34	9.9	8.4	17	1.7	4.0	16	190	32	17
18	4.8	50	28	9.9	8.4	15	2.1	3.2	12	159	28	15
19	4.8	120	26	9.0	8.4	14	2.1	209	9.9	141	26	13
20	4.8	82	24	9.0	7.2	15	1.5	222	8.4	124	24	14
21	4.4	45	22	11	7.2	15	1.2	117	8.4	111	24	14
22	4.0	77	21	11	6.6	229	1.8	66	7.8	101	22	16
23	3.7	111	19	11	6.6	350	90	43	6.0	201	21	496
24	3.7	76	24	9.9	6.6	174	83	114	4.4	120	19	777
25	2,420	60	17	9.0	6.6	82	283	789	27	1,380	16	349
26	8,090	43	16	8.4	7.2	45	68	862	3,250	1,210	17	204
27	2,520	36	16	9.0	1,710	30	24	2,830	678	1,160	17	120
28	794	28	16	8.4	5,980	18	13	930	137	466	17	87
29	369	22	15	b8	1,030	15	8.4	468	55	466	17	60
30	218	21	15	-	-	13	6.0	511	194	277	24	58
31	141	-	16	9.0	-	11	-	970	-	186	34	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	14,926.9	8,090	2.2	482	29,610
November.....	1,242	120	11	41.4	2,450
December.....	4,790	1,100	15	155	9,500
Calendar year 1947.....	135,572.1	20,200	2.1	371	268,900
January.....	338.1	15	-	10.9	671
February.....	6,934.8	3,980	5.6	239	13,750
March.....	2,494	461	11	80.5	4,950
April.....	4,790	285	1.2	22.3	1,330
May.....	8,193.7	2,830	2.1	264	16,250
June.....	14,523.9	3,250	4.4	484	28,810
July.....	84,658	22,600	101	2,731	167,900
August.....	3,115	500	17	100	6,180
September.....	3,585	777	13	113	6,710
Water year 1947-48.....	145,270.4	22,600	1.2	397	288,100
Peak discharge (base, 9,000 sec.-ft.).. Oct. 26 (1 a.m.) 9,380 sec.-ft.; July 9 (5 a.m.) 28,300 sec.-ft.					

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.



## Colorado River at Winchell, Tex.

Location.- Water-stage recorder, lat. 31°28'05", long. 99°09'45", at bridge on U. S. Highway 283, 0.3 mile south of Winchell, Brown County, and 6.2 miles downstream from Home Creek. Datum of gage is 1,264.86 feet above mean sea level, datum of 1929.

Drainage area.- 24,580 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- January 1939 to September 1948. November 1923 to September 1934 at site near Milburn, 4.2 miles downstream.

Average discharge.- 19 years (1924-34, 1939-48), 741 second-feet.

Extremes.- Maximum discharge during year, 46,000 second-feet July 9 (gage height, 39.68 feet); minimum, 0.7 second-foot Oct. 3.

1923-34, 1939-48: Maximum discharge, 75,100 second-feet Oct. 15, 1930, at site then in use (gage height, 51.8 feet, present site and datum); no flow at times. Maximum stage known, 62.2 feet Sept. 19, 1936, present site and datum, from information by Gulf, Colorado & Santa Fe Railway at railway bridge 1,000 feet above present gage.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Diversions above station for irrigation and municipal supply. Flow partly regulated by Lake Nasworthy (capacity, 13,720 acre-feet, with flashboards) on South Concho River (see p. 146).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	326	53	36	20	1,470	43	72	848	215	1,940	16
2	5.5	224	48	37	22	835	36	44	1,630	447	2,150	15
3	4.9	168	45	43	21	492	32	40	2,000	620	835	14
4	4.8	131	53	35	21	319	27	31	1,170	2,520	394	13
5	3.2	104	580	32	22	226	25	251	2,010	2,020	290	13
6	4.2	88	898	28	22	170	22	78	1,540	5,200	550	58
7	4.2	72	3,340	32	22	136	20	20	927	20,700	370	52
8	3.7	61	1,340	31	21	112	17	15	580	37,200	270	640
9	15	53	1,080	28	22	95	14	11	364	37,000	205	3,090
10	20	45	564	30	22	82	13	9.1	353	18,500	158	310
11	177	39	364	29	22	73	10	al,110	281	13,310	228	311
12	250	38	255	28	21	65	9.1	al,890	314	1,940	102	219
13	143	34	191	27	20	58	8.4	a717	158	1,400	85	123
14	84	32	154	27	20	53	7.7	311	111	1,250	62	79
15	64	34	129	26	20	49	7.0	168	188	806	62	56
16	200	38	108	26	19	44	6.0	102	99	564	55	42
17	363	32	91	26	18	43	a5.1	68	56	426	50	35
18	164	28	79	25	18	39	3.6	45	a42	345	45	29
19	82	27	71	24	19	35	3.2	34	a36	a327	39	26
20	50	26	65	25	17	34	3.2	26	a28	a298	35	22
21	28	24	73	24	20	33	2.7	21	a22	a270	33	20
22	32	27	61	26	22	29	2.7	16	16	a243	29	18
23	17	108	51	26	21	28	2.7	109	16	a217	26	188
24	8.0	95	48	24	20	27	3.2	104	d13	a192	26	385
25	209	76	44	20	20	217	23	75	d10	a176	24	1,650
26	2,300	113	41	19	21	215	1,290	261	d13	a477	74	976
27	8,400	104	32	17	23	141	675	1,480	a2,090	1,740	33	546
28	3,190	84	40	15	740	95	277	13,120	a2,210	1,790	21	333
29	1,420	72	36	20	4,190	72	157	1,360	a501	833	20	237
30	1,080	62	37	17	-	57	105	3,600	a266	568	19	178
31	532	-	38	18	-	50	-	1,040	-	519	18	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	18,868.4	8,400	3.2	609	37,420
November.....	2,365	326	24	78.8	4,690
December.....	10,011	3,340	32	323	19,860
Calendar year 1947.....	192,424.3	20,500	0	527	381,600
January.....	821	43	15	26.5	1,830
February.....	5,486	4,190	17	169	10,880
March.....	5,394	1,470	27	174	10,700
April.....	2,850.6	1,290	2.7	95.0	5,850
May.....	16,226.1	3,600	9.1	523	32,180
June.....	19,872	3,170	10	662	39,420
July.....	142,113	37,200	176	4,584	281,900
August.....	8,248	2,150	18	266	16,360
September.....	9,694	3,090	13	323	19,230
Water year 1947-48.....	241,949.1	37,200	2.7	623	479,900

Peak discharge (base, 9,200 sec.-ft.)- Oct. 26 (11 p.m.) 9,340 sec.-ft.; July 9 (2 a.m.) 46,000 sec.-ft.

a No gage-height record; discharge computed on basis of weather record and records for nearby stations.

d Doubtful gage-height record; discharge computed as explained in footnote a.

f Computed on basis of partly estimated gage-height record.

## Colorado River near San Saba, Tex.

Location.- Water-stage recorder, lat. 31°13'05", long. 98°33'50", at bridge on U. S. Highway 190, 5.2 miles downstream from San Saba River and 9.2 miles east of San Saba, San Saba County. Datum of gage is 1,096.22 feet above mean sea level, datum of 1929.

Drainage area.- 30,600 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- August 1930 to September 1948. October 1915 to October 1922 at site near Chadwick, 1.2 miles upstream. October 1923 to December 1934 at site near Tow, 44 miles downstream.

Average discharge.- 23 years (1916-19, 1920-22, 1930-48), 1,692 second-feet.

Extremes.- Maximum discharge during year, 34,100 second-feet July 11 (gage height, 23.78 feet); minimum, 37 second-feet Oct. 7-9 (gage height, 1.73 feet).

1915-22, 1930-48: Maximum discharge, 224,000 second-feet July 23, 1938 (gage height, 63.2 feet, present site, based on floodmarks at site then in use); minimum observed, 1.5 second-feet Aug. 22, 23, 1918.

Maximum stage known prior to 1938, 58.4 feet Sept. 25, 1900 (discharge, 184,000 second-feet), present site, based on floodmarks at former site.

Remarks.- Records good except those for period of no gage-height record, which are fair. Diversions above station for irrigation and municipal use. Flow partly regulated by Hords Creek Reservoir (see p. 161) and Brownwood Reservoir (see p. 157) in Pecan Bayou Basin, and Lake Nasworthy on South Concho River (see p. 146), having a combined capacity of 171,000 acre-feet. Record of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1133.

Revisions (water years).- W 858: 1900(M), 1922(M), 1936(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	792	146	182	109	3,780	139	282	1,490	566	877	74
2	50	525	136	153	115	1,680	123	214	972	702	5,330	63
3	50	364	133	171	115	1,020	115	175	1,560	420	3,420	52
4	46	270	179	167	115	754	106	142	2,130	806	al,180	46
5	43	258	198	160	117	570	104	123	2,940	3,240	a910	44
6	41	186	198	146	117	435	104	1,150	2,070	3,770	a738	43
7	37	156	2,700	142	120	355	101	1,190	1,660	5,410	a606	44
8	37	136	5,890	139	120	298	98	349	1,040	13,000	g500	44
9	39	120	2,020	133	120	250	96	179	728	20,300	a420	1,070
10	39	112	1,460	126	117	222	88	117	515	28,800	a346	5,560
11	41	104	972	123	115	198	86	4,300	425	33,000	a286	1,250
12	46	98	694	123	115	179	112	6,450	360	13,600	a258	792
13	85	66	525	120	115	183	417	2,590	368	2,120	196	585
14	247	88	450	115	115	152	102	1,080	346	1,440	156	391
15	206	130	378	112	115	146	69	732	218	1,280	136	266
16	152	139	328	109	112	139	65	480	156	880	126	198
17	126	112	290	106	112	126	60	332	175	688	160	156
18	616	101	262	104	115	123	177	238	163	560	117	135
19	410	96	246	104	115	117	202	182	115	455	98	117
20	226	101	222	104	112	115	146	146	86	362	88	112
21	142	96	206	106	109	115	96	139	69	328	81	98
22	106	96	194	109	106	348	73	106	56	282	74	91
23	83	106	182	112	106	167	362	96	54	250	71	151
24	71	115	171	109	106	117	142	88	79	222	128	693
25	63	117	167	106	3,650	101	631	79	65	202	194	302
26	83	142	160	106	572	96	756	199	1,040	190	198	1,310
27	1,700	160	156	109	400	113	1,020	1,060	546	182	171	1,090
28	7,560	142	152	112	206	306	1,060	1,880	2,010	1,440	142	754
29	3,340	175	152	112	278	250	633	3,040	2,240	1,800	163	540
30	1,610	160	149	109	-	202	405	1,680	1,080	990	106	396
31	1,210	-	146	109	-	160	-	3,790	-	704	86	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	18,539	7,560	37	598	36,770
November.....	5,283	792	86	176	10,480
December.....	19,262	5,890	133	621	38,210
Calendar year 1947.....	246,975	18,300	35	677	489,800
January.....	3,848	-	-	-	-
February.....	7,839	3,650	106	124	7,650
March.....	12,777	3,760	96	412	25,340
April.....	7,690	1,060	60	256	15,250
May.....	32,608	6,450	79	1,052	64,680
June.....	24,854	2,940	54	828	49,300
July.....	138,109	33,000	182	4,455	273,900
August.....	17,332	5,330	71	559	34,380
September.....	16,470	5,560	43	549	32,670
Water year 1947-48.....	304,611	33,000	37	832	604,200

Peak discharge (base, 19,300 sec.-ft.)- July 11 (1 p.m.) 34,100 sec.-ft.

a No gage-height record; discharge computed on basis of estimated gage-height record.

g Computed from graph based on gage reading.

COLORADO RIVER BASIN  
Buchanan Reservoir near Burnet, Tex.

133

Location.- Selsyn indicator, lat. 30°45'05", long. 98°25'00", at Buchanan Dam on Colorado River, 1 mile upstream from bridge on State Highway 29 and 10 miles west of Burnet, Burnet County. Datum of gage is 0.48 foot above mean sea level, datum of 1929 (levels by Lower Colorado River Authority).

Drainage area.- 31,250 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- May 1937 to September 1948.

Extremes.- Maximum contents observed during year, 775,000 acre-feet July 13-15 (gage height, 1,010.0 feet); minimum observed, 483,000 acre-feet May 6 (gage height, 993.6 feet).

1937-48: Maximum contents, 1,004,000 acre-feet July 27, 1938 (gage height, 1,020.5 feet; several taintor gates were open); minimum after filling of reservoir in July 1938, that of May 6, 1948.

Remarks.- Reservoir is formed by two reinforced concrete multiple-arch sections, three banks of taintor gates, and a 1,088-foot reinforced concrete spillway section. Dam completed and storage began May 20, 1937. Total capacity, 992,000 acre-feet (gage height, 1,020.0 feet, top of spillway section). Usable capacity, 955,000 acre-feet between gage heights 937.0 feet (sill of powerhouse penstock) and 1,020.0 feet (top of spillway section). Water below gage height 937.0 feet can be withdrawn through two 5-foot Bunger gates (emergency) down to gage height of 890.0 feet. Figures given herein represent total contents. Water used for power development and irrigation of rice on several districts below Columbus.

Cooperation.- Records of daily gage height and capacity table furnished by Lower Colorado River Authority.

Monthly gage height and contents, water year October 1947 to September 1948

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	1,007.0	716,000	-
Oct. 31.....	1,004.8	674,200	-41,800
Nov. 30.....	1,001.8	619,400	-54,800
Dec. 31.....	1,001.3	610,400	-9,000
Calendar year 1947...	-	-	-9,000
Jan. 31.....	999.3	575,100	-35,300
Feb. 29.....	997.4	543,400	-31,700
Mar. 31.....	996.0	521,000	-22,400
Apr. 30.....	994.1	490,800	-30,400
May 31.....	997.0	537,000	+46,400
June 30.....	996.8	533,800	-3,200
July 31.....	1,008.7	749,000	+215,200
Aug. 31.....	1,007.3	721,700	-27,300
Sept. 30.....	1,005.8	693,200	-28,500
Water year 1947-48...	-	-	-22,800

† Average of 11 p.m. and 1 a.m. readings.

Marshall Ford Reservoir near Austin, Tex.

Location.- Bailey indicator gage, lat. 30°23'20", long. 97°54'35", in powerhouse at dam on Colorado River, 7.3 miles downstream from Sandy Creek and 12 miles northwest of Austin, Travis County. Datum of gage is 0.12 foot above mean sea level, datum of 1929 (levels by Bureau of Reclamation).

Drainage area.- 37,900 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- September 1940 to September 1948.

Extremes.- Maximum contents observed during year, 698,100 acre-feet July 10, 11 (gage height, 650.6 feet); minimum observed, 497,900 acre-feet June 23 (gage height, 632.8 feet).

1940-48: Maximum contents observed, 1,377,000 acre-feet Oct. 23, 1942 (gage height, 691.2 feet); minimum observed, that of June 23, 1948.

Remarks.- Reservoir is formed by concrete gravity-type dam. Storage began Sept. 9, 1940; dam completed early in 1942. Total capacity, 1,950,000 acre-feet (gage height, 714.0 feet, top of spillway). Capacity between gage heights 681.0 (revised) and 714.0 feet is 778,000 acre-feet (revised), and is reserved for flood control. Usable capacity, 1,144,000 acre-feet (revised) between gage heights 535.8 feet (bottom of 24 8½-foot diameter Paradox gates) and 681.0 feet, revised, (maximum power pool). Bottom of penstocks, gage height 552.0 feet. Figures given herein represent total contents. Water used for power development and for irrigation of rice in several districts below Columbus.

Cooperation.- Records of daily gage heights and capacity curve furnished by Lower Colorado River Authority.

Monthly gage height and contents, water year October 1947 to September 1948

Date	Gage height (feet)†	Contents (acre feet)	Change in contents during month (acre feet)
Sept. 30.....	639.2	564,000	-
Oct. 31.....	638.8	559,700	-4,300
Nov. 30.....	638.8	559,700	0
Dec. 31.....	638.8	559,700	0
Calendar year 1947...	-	-	-295,000
Jan. 31.....	637.4	545,300	-14,400
Feb. 29.....	637.6	547,400	+2,100
Mar. 31.....	637.8	549,400	+2,000
Apr. 30.....	639.4	566,200	+16,800
May 31.....	638.1	552,500	-13,700
June 30.....	647.1	656,500	+104,000
July 31.....	648.2	669,500	+13,000
Aug. 31.....	643.6	615,200	-54,300
Sept. 30.....	642.9	606,900	-8,300
Water year 1947-48...	-	-	+42,900

† Average of 11 p.m. and 1 a.m. readings.

## Colorado River at Austin, Tex.

Location.- Water-stage recorder, lat. 30°14'40", long. 97°41'20", at southeast edge of Austin, Travis County, at Montopolis Bridge on U. S. Highway 290, 2.8 miles upstream from Walnut Creek, 3.8 miles downstream from Waller Creek, and 5 miles downstream from Barton Creek. Datum of gage is 407.3 feet above mean sea level, datum of 1929.

Drainage area.- 38,160 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- February 1898 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Average discharge.- 50 years, 2,666 second-feet.

Extremes.- Maximum discharge during year, 4,060 second-feet Aug. 11 (gage height, 6.55 feet); minimum daily, 332 second-feet Feb. 15.  
1898-1948: Maximum discharge, 481,000 second-feet June 15, 1935 (gage height, 45.0 feet, present site and datum, from floodmark); minimum, 13 second-feet Aug. 18, 1918. Maximum stage known, 46.0 feet July 7, 1869, present site and datum (adjusted to present site on basis of record for flood of June 15, 1935), determined from information concerning stage at former site furnished by Prof. T. U. Taylor.

Remarks.- Records fair. Flow partly regulated by Buchanan and Marshall Ford Reservoirs (see preceding page), and smaller reservoirs having a combined capacity of 3,150,000 acre-feet (revised). About 36,000 acres irrigated above station. Record of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1133.

Revisions (water years).- W 528: 1900(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	629	897	806	588	388	948	1,150	1,040	1,840	1,680	1,560	2,160
2	1,040	838	854	487	1,730	962	762	1,200	1,790	1,720	1,820	2,070
3	1,130	636	1,184	444	1,770	839	670	1,450	1,880	1,360	1,860	1,870
4	831	875	1,220	487	1,320	1,360	660	1,100	2,000	1,300	2,050	1,190
5	706	974	1,010	532	2,070	2,260	752	1,400	1,780	1,550	1,810	916
6	800	1,490	1,160	773	1,850	1,010	1,430	1,230	1,810	1,820	2,020	g670
7	1,390	1,130	1,010	1,660	925	710	2,080	1,180	1,830	1,890	1,990	1,390
8	1,570	831	982	1,460	372	740	2,180	1,100	2,320	1,820	1,790	2,310
9	1,250	720	1,200	1,590	974	1,040	1,400	1,100	2,640	2,090	2,020	1,600
10	1,110	752	1,250	804	2,250	1,870	788	1,350	2,270	1,640	2,480	g712
11	782	863	1,380	460	3,000	1,470	670	1,750	1,980	1,760	3,540	g712
12	615	848	1,210	1,140	1,920	1,040	1,170	885	1,710	1,830	3,430	g670
13	920	1,840	870	1,340	528	860	1,220	885	1,720	2,260	3,070	g690
14	1,580	1,350	838	1,600	396	640	750	1,340	1,760	2,770	1,980	866
15	1,700	886	942	1,330	332	670	827	1,200	1,850	2,880	1,590	801
16	1,900	748	953	2,050	514	1,170	1,070	1,040	2,030	2,760	1,890	712
17	2,090	1,980	948	607	591	1,470	733	1,460	2,560	2,040	2,270	963
18	1,190	2,110	850	404	738	1,490	595	1,280	2,510	1,670	2,320	958
19	748	1,880	941	840	595	1,200	850	1,190	1,740	2,140	2,160	945
20	724	2,220	803	1,380	690	773	1,220	1,070	1,470	2,480	2,220	1,340
21	1,490	2,240	657	568	541	740	1,180	1,440	1,910	2,360	2,200	1,640
22	1,280	1,650	792	724	380	784	1,230	1,360	1,830	2,410	1,630	2,080
23	1,310	783	1,090	1,390	444	740	1,050	1,380	2,020	2,430	1,930	2,080
24	1,840	1,000	642	781	845	720	1,160	1,840	1,730	1,780	2,170	1,690
25	939	1,060	514	466	809	773	796	2,000	1,890	1,790	1,490	965
26	748	838	568	1,310	1,470	839	830	1,540	1,480	2,240	1,890	780
27	699	769	633	1,040	1,220	740	844	858	1,570	2,740	1,550	858
28	685	776	769	932	514	660	1,110	1,110	1,890	2,910	1,530	758
29	1,340	755	737	550	586	730	1,320	1,380	1,890	3,160	1,320	712
30	1,080	776	1,150	496	-	761	1,380	1,390	1,830	2,540	1,680	690
31	1,090	-	1,420	396	-	1,410	-	1,900	-	2,060	1,950	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	35,206	2,090	615	1,136	69,830
November.....	34,515	2,240	636	1,150	68,460
December.....	29,363	1,420	514	947	58,240
Calendar year 1947.....	635,678	3,740	514	1,742	1,261,000
January.....	28,427	2,050	396	917	56,380
February.....	29,762	3,000	332	1,026	59,030
March.....	31,219	2,260	640	1,007	61,920
April.....	31,677	2,180	595	1,056	62,830
May.....	40,428	2,000	858	1,304	80,190
June.....	57,530	2,640	1,470	1,918	114,100
July.....	65,860	3,160	1,300	2,125	130,600
August.....	63,110	3,540	1,320	2,036	125,200
September.....	35,778	2,310	670	1,193	70,960
Water year 1947-48.....	482,875	3,540	332	1,319	957,700

g Computed from graph based on gage readings.

Note.- Discharge computed on basis of partly estimated gage-height record Oct. 4, 10, 11, 13, 18, 19, Dec. 24, Dec. 30 to Jan. 6, Jan. 9-11, 13, 14, Jan. 17 to Feb. 1, Feb. 3-10, 12, 13, 15-19, 21-25, Mar. 1, 2, Apr. 28, May 12-18, Sept. 6, 10-13.

## Colorado River at Smithville, Tex.

Location.- Water-stage recorder, lat. 30°01', long. 97°10', 1,200 feet upstream from bridge on State Highway 71 at Smithville, Bastrop County, and 3.7 miles downstream from Alum Creek. Datum of gage is 270.14 feet above mean sea level, datum of 1929.

Drainage area.- 39,650 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- July 1930 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1920.

Average discharge.- 18 years, 3,254 second-feet.

Extremes.- Maximum discharge during year, 3,620 second-feet Aug. 13 (gage height, 6.34 feet); minimum, 675 second-feet Oct. 30.

1930-48: Maximum discharge, 305,000 second-feet June 16, 1935 (gage height, 42.5 feet, from floodmarks), by slope-area method; minimum, 76 second-feet Nov. 2, 1934.

Maximum stage known, about 47.4 feet Dec. 4, 1913, from information by local residents.

Remarks.- Records good. Many diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	808	1,120	868	1,140	860	892	876	1,170	1,380	2,000	2,550	1,630
2	808	1,010	852	1,290	822	924	1,280	1,200	1,600	1,860	2,000	1,860
3	838	838	860	876	977	1,130	1,040	1,080	1,630	1,800	1,800	1,930
4	1,060	830	1,030	815	1,740	985	860	1,140	1,630	1,860	1,930	1,860
5	1,290	725	1,290	778	1,580	1,000	800	1,320	1,730	1,800	1,930	1,730
6	958	1,000	1,290	770	1,630	1,400	808	1,140	1,800	1,660	2,000	1,320
7	830	976	1,230	845	1,800	1,660	876	1,350	1,730	1,730	1,930	1,110
8	1,010	1,570	1,160	1,030	1,760	1,000	1,220	1,260	1,660	1,860	2,000	962
9	1,580	1,100	994	1,470	1,070	900	1,630	1,170	1,730	1,860	2,000	1,420
10	1,580	916	908	1,400	868	967	1,580	1,170	2,240	1,860	1,860	2,070
11	1,420	822	1,070	1,380	1,660	1,100	1,260	1,170	2,150	2,000	2,000	1,440
12	1,280	924	1,180	900	2,400	1,470	892	1,520	2,000	1,860	2,930	990
13	932	924	1,290	830	2,270	1,280	830	1,600	1,860	1,860	3,480	880
14	800	1,120	1,110	1,290	1,610	985	1,200	1,110	1,660	1,860	3,340	825
15	1,290	1,740	958	1,360	976	808	1,160	1,050	1,630	2,240	2,800	825
16	1,630	1,320	994	1,540	908	778	868	1,320	1,730	2,670	1,930	908
17	1,740	985	985	1,550	852	830	958	1,260	1,730	2,800	1,800	935
18	1,970	1,110	1,000	1,540	1,030	1,060	1,020	1,200	2,010	2,550	2,000	880
19	1,960	2,030	985	940	940	1,140	770	1,440	2,240	2,070	2,150	1,020
20	1,070	2,030	924	868	1,080	1,280	745	1,980	2,150	1,860	2,150	1,050
21	830	2,150	985	1,220	1,020	949	770	1,320	1,800	2,070	2,150	990
22	876	2,330	860	1,240	1,190	838	1,060	1,170	1,660	2,240	2,240	1,260
23	1,530	2,090	808	932	976	792	1,020	1,350	1,800	2,240	2,070	1,500
24	1,170	1,600	908	1,100	916	770	1,080	1,350	1,800	2,340	1,660	1,800
25	1,580	976	1,070	1,300	1,000	770	1,110	1,380	2,000	2,240	2,000	1,730
26	1,470	1,230	815	1,020	1,220	800	1,110	1,830	1,860	1,860	1,930	1,570
27	924	1,220	762	937	1,400	852	880	2,070	1,930	1,860	1,660	1,110
28	770	976	792	1,270	1,580	852	880	1,730	1,730	2,240	1,800	908
29	710	892	892	1,300	1,130	778	880	1,170	2,340	2,670	1,860	908
30	748	908	822	1,060	-	762	990	1,140	2,150	3,060	1,670	880
31	1,210	-	976	916	-	822	-	1,290	-	2,800	1,380	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	36,672	1,970	710	1,183	72,740
November.....	37,462	2,330	725	1,249	74,300
December.....	30,658	1,290	762	989	60,810
Calendar year 1947.....	766,802	15,300	710	2,101	1,521,000
January.....	34,907	1,550	770	1,126	69,240
February.....	37,265	2,400	822	1,285	73,910
March.....	30,574	1,660	762	986	60,640
April.....	30,453	1,630	745	1,015	60,400
May.....	41,450	2,070	1,050	1,337	82,210
June.....	55,360	2,340	1,380	1,845	109,800
July.....	65,680	3,060	1,660	2,119	130,300
August.....	64,700	3,480	1,380	2,087	128,300
September.....	38,301	2,070	825	1,277	75,970
Water year 1947-48.....	503,482	3,480	710	1,376	998,600

## Colorado River at La Grange, Tex.

Location.—Wire-weight gage, lat. 29°53'45", long. 96°52'15", at bridge on U. S. Highway 77 in La Grange, Fayette County, 1.2 miles downstream from Buckner Creek. Datum of gage is 211.23 feet above mean sea level, datum of 1929.

Drainage area.—40,200 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.—July and August 1938 (flood discharge measurements only), November 1938 to September 1948.

Extremes.—Maximum discharge during year, 4,130 second-feet May 27 (gage height, 4.50 feet, from graph based on gage readings); minimum, 790 second-feet Oct. 30-31 (gage height, 1.14 feet, from graph based on gage readings).

1938-48: Maximum discharge observed, 200,000 second-feet July 27, 1938 (gage height, 42.95 feet); minimum observed, 430 second-feet Mar. 7, 1940.

Maximum stage known, about 56.7 feet probably July 9, 1869 (from marble high-water marker in La Grange). Data on other flood as follows: Dec. 5, 1913, stage 56.4 feet, from floodmarks; June 17, 1935, stage 50.84 feet, from floodmarks (discharge, 255,000 second-feet, from rating curve extended as a straight line above 200,000 second-feet).

Remarks.—Records good. Gage read twice daily. Diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	840	1,270	960	1,150	1,030	1,150	895	1,110	1,230	2,200	2,870	1,480
2	840	1,230	928	1,270	960	960	1,030	1,350	1,350	1,980	2,470	1,830
3	840	1,070	928	1,270	960	995	1,230	1,310	1,680	1,780	1,930	2,200
4	868	928	995	960	1,290	1,180	1,030	1,230	1,680	1,730	1,730	2,200
5	1,070	895	1,230	895	1,780	1,070	895	1,230	1,680	1,830	1,830	1,930
6	1,230	868	1,270	895	1,630	1,110	868	1,230	1,830	1,780	1,880	1,880
7	928	1,150	1,230	895	1,830	1,670	868	1,190	1,830	1,580	1,980	1,310
8	868	1,150	1,270	960	1,980	1,570	960	1,480	1,680	1,680	1,880	1,070
9	1,030	1,480	1,230	1,220	1,880	1,110	1,310	1,350	1,680	1,780	1,880	1,110
10	1,480	1,190	1,070	1,480	1,190	995	1,530	1,230	1,930	1,780	1,930	1,930
11	1,580	995	1,030	1,440	1,070	1,070	1,400	1,150	2,420	1,780	1,780	2,420
12	1,310	995	1,150	1,290	1,240	1,350	1,190	1,150	2,250	1,780	2,140	1,530
13	1,150	1,070	1,400	928	2,520	1,480	928	2,800	2,200	1,730	3,170	1,030
14	928	1,030	1,400	1,000	2,250	1,350	868	2,030	1,830	1,680	3,530	928
15	868	1,490	1,400	1,350	1,520	1,070	995	2,030	1,630	1,830	3,410	868
16	1,350	1,680	1,190	1,480	1,110	960	995	1,110	1,580	2,300	2,690	840
17	1,580	1,400	1,070	1,350	995	960	895	1,310	1,730	2,750	1,980	960
18	1,780	1,110	1,070	1,780	928	960	960	1,270	1,880	2,750	1,780	960
19	1,980	1,780	1,070	1,500	1,070	1,190	995	1,400	2,200	2,250	2,030	895
20	1,680	2,030	1,030	995	995	1,230	840	1,480	2,300	1,980	2,420	1,030
21	1,070	1,980	995	960	1,270	1,310	840	2,030	2,030	1,780	2,360	1,070
22	895	2,300	1,070	1,310	1,440	1,070	1,050	1,230	1,680	2,030	2,250	995
23	1,060	2,420	960	1,230	1,310	928	1,230	1,110	1,580	2,200	2,470	1,420
24	1,440	2,030	895	1,030	1,070	895	1,190	1,310	1,730	2,250	2,200	1,880
25	1,350	1,620	960	1,270	995	895	1,270	1,680	1,880	2,300	1,780	2,250
26	1,680	1,030	1,070	1,400	1,110	895	1,310	3,410	2,030	2,140	2,300	2,030
27	1,350	1,230	895	1,310	1,270	895	1,230	4,010	1,880	1,780	2,080	1,730
28	960	1,230	868	1,440	1,880	928	995	3,290	1,880	1,830	1,780	1,230
29	868	995	928	1,400	1,530	895	960	1,790	2,570	2,250	1,980	960
30	815	960	1,030	1,480	-	868	960	1,150	2,520	2,750	1,830	960
31	895	-	995	1,150	-	868	-	1,150	-	3,050	1,680	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	36,583	1,980	815	1,180	72,560
November.....	40,606	2,420	868	1,354	80,540
December.....	33,587	1,400	868	1,083	66,620
Calendar year 1947.....	838,479	15,400	815	2,297	1,663,000
January.....	38,088	1,780	895	1,229	75,550
February.....	40,103	2,520	928	1,383	79,540
March.....	33,887	1,670	868	1,093	67,210
April.....	31,717	1,530	840	1,057	62,910
May.....	50,400	4,010	1,110	1,626	99,970
June.....	56,370	2,570	1,230	1,879	111,800
July.....	63,310	3,050	1,580	2,042	125,600
August.....	68,020	3,530	1,880	2,194	134,900
September.....	42,926	2,420	840	1,431	85,140
Water year 1947-48.....	535,597	4,010	815	1,463	1,062,000

a No gage-height record; discharge computed on basis of estimated gage heights.



## Colorado River at Columbus, Tex.

Location.- Water-stage recorder, lat. 29°42'20", long. 96°32'05", at bridge on U. S. Highway 90 at eastern edge of Columbus, Colorado County, 340 feet downstream from Texas & New Orleans Railroad bridge and 2.6 miles downstream from Cummins Creek. Datum of gage is 155.52 feet above mean sea level, datum of 1929.

Drainage area.- 40,840 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- January to December 1903 (gage heights and discharge measurements only), January 1904 to December 1911, May 1916 to November 1930, May 1939 to September 1948.

September 1930 to June 1939 at site near Eagle Lake, 23 miles downstream. U. S. Weather Bureau has collected gage-height records in this vicinity since 1903.

Average discharge.- 30 years (1904-11, 1916-30, 1939-48), 3,267 second-feet.

Extremes.- Maximum discharge during year, 10,200 second-feet May 26 (gage height, 9.94 feet); minimum, 756 second-feet Dec. 29.

1903-11, 1916-30, 1939-48: Maximum discharge, 152,000 second-feet July 1, 1940 (gage height, 36.2 feet); minimum observed, about 80 second-feet Sept. 9, 10, 1910.

Maximum stage known, 41.6 feet, present datum, in July 1869 and on Dec. 6, 1913, from information by local resident. River divided each time and left Columbus on an island.

Data on other floods as follows: June 18, 1935, observed stage, 38.5 feet, present datum, furnished by U. S. Weather Bureau (discharge, 190,000 second-feet, computed on basis of records for station near Eagle Lake, 23 miles downstream); July 29, 1938, observed stage, 38.4 feet, present datum, furnished by U. S. Weather Bureau (discharge, 175,000 second-feet, computed on basis of records for station near Eagle Lake).

Remarks.- Records good. Diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	838	952	912	852	1,120	1,750	890	952	1,380	2,800	2,990	1,650
2	815	1,200	912	1,050	1,050	1,240	928	1,120	1,420	2,280	2,720	1,460
3	822	1,180	898	1,200	1,080	984	1,080	1,330	1,600	2,110	2,580	1,850
4	838	1,080	944	1,080	1,020	1,060	1,240	1,290	1,800	1,850	1,850	2,150
5	936	920	1,330	882	1,460	1,290	1,080	1,160	1,750	1,800	1,750	2,160
6	1,080	890	1,510	806	1,800	1,160	960	1,290	1,800	1,850	1,850	2,060
7	1,200	815	1,330	778	1,600	1,200	890	1,380	1,900	1,750	1,900	1,850
8	928	1,060	1,330	765	1,950	1,750	892	1,240	1,850	1,560	1,900	1,420
9	860	1,240	1,380	845	2,440	1,310	976	1,460	1,750	1,750	1,850	1,290
10	1,200	1,420	1,120	1,200	1,900	1,200	1,420	1,380	1,750	1,750	1,900	1,160
11	1,600	1,160	976	1,380	1,240	1,060	1,700	1,290	2,000	1,750	1,850	1,800
12	1,460	968	984	1,420	1,290	1,120	1,420	1,330	2,440	1,800	1,800	2,220
13	1,380	890	1,560	1,120	2,220	1,420	1,240	1,460	2,220	1,850	2,220	1,460
14	1,200	1,030	1,600	875	2,600	1,460	1,020	2,060	2,060	1,750	2,220	1,120
15	920	1,010	2,650	928	2,000	1,420	920	1,560	1,800	1,650	3,470	968
16	860	1,510	1,800	1,290	1,380	1,120	1,160	1,120	1,650	1,750	3,230	905
17	1,460	1,890	1,200	1,460	1,060	992	1,080	1,120	1,600	2,280	2,600	875
18	1,750	3,230	1,080	1,420	984	936	890	1,380	1,700	2,600	1,950	984
19	1,950	1,240	1,030	1,750	928	1,040	960	1,330	1,800	2,600	1,900	1,020
20	2,160	1,700	1,040	1,330	1,030	1,240	1,000	1,560	2,220	2,330	2,160	912
21	1,600	2,160	992	1,020	1,240	1,330	808	1,950	2,380	1,950	2,380	1,060
22	1,120	2,160	936	1,010	2,330	1,420	763	1,950	2,060	1,750	2,330	1,060
23	920	2,380	968	1,330	1,700	1,120	905	1,330	1,700	2,060	2,380	1,010
24	1,200	2,380	860	1,120	1,380	1,030	1,200	1,240	1,650	2,220	2,380	1,460
25	1,420	1,900	815	992	1,120	968	1,290	2,360	1,700	2,160	2,110	1,850
26	1,380	1,330	936	1,290	1,060	936	1,380	6,880	1,800	2,220	1,950	2,110
27	1,750	1,120	1,000	1,290	1,240	936	1,330	5,780	1,900	2,060	2,380	1,900
28	1,330	1,240	808	1,120	1,380	944	1,240	4,560	1,800	1,700	2,000	1,600
29	1,080	1,160	756	1,200	1,650	976	952	3,050	1,900	1,850	1,800	1,160
30	928	1,000	785	1,330	-	984	936	1,950	2,680	2,330	1,850	1,000
31	830	-	898	1,330	-	928	-	1,380	-	2,770	1,750	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	37,815	2,160	815	1,220	75,000
November.....	42,195	3,230	815	1,406	83,690
December.....	35,340	2,650	756	1,140	70,100
Calendar year 1947.....	892,164	18,400	756	2,444	1,769,000
January.....	35,483	1,750	763	1,144	70,340
February.....	43,222	2,600	928	1,490	85,730
March.....	36,554	1,750	928	1,178	72,440
April.....	32,540	1,700	763	1,085	64,540
May.....	59,242	6,880	952	1,911	117,500
June.....	56,060	2,680	1,380	1,869	111,260
July.....	62,930	2,800	1,560	2,030	124,800
August.....	68,810	3,470	1,750	2,220	136,900
September.....	43,574	2,220	875	1,452	86,430
Water year 1947-48.....	553,715	6,880	756	1,513	1,098,000



## Colorado River at Wharton, Tex.

Location.- Wire-weight gage, lat. 29°18'30", long. 96°06'15", at bridge on U. S. Highway 59 in Wharton, Wharton County, 1,000 feet downstream from Texas & New Orleans Railroad bridge and 12 miles upstream from Jones Creek. Datum of gage is 65.42 feet above mean sea level, datum of 1929.

Drainage area.- 41,150 square miles, of which 11,900 square miles (revised) is probably noncontributing.

Records available.- July 1916 to September 1925, July and August 1938 (flood discharge measurements only), October 1938 to September 1948. June to November 1901, May to September, 1902, daily records published in U. S. Department of Agriculture, Office of Experiment Stations, Bulletin Nos. 119 and 133. U. S. Weather Bureau has collected gage-height records in this vicinity since 1935.

Average discharge.- 15 years (1919-21, 1922-25, 1938-48), 3,408 second-feet.

Extremes.- Maximum discharge during year, 7,800 second-feet May 27 (gage height, 8.40 feet, from graph based on gage readings); minimum observed, 484 second-feet June 4.

1919-25, 1938-48: Maximum discharge observed, 100,000 second-feet July 3, 1940 (gage height, 35.99 feet); no flow Aug. 6, 1925 (result of pumping).

Maximum stage known, 38.9 feet, present datum, Dec. 8, 1913, from information by local residents; below Wharton floodwater combined with floodwater of Brazos River. Flood of about July 12, 1869, reached about same height. Flood of June 20, 1935, reached a stage of 38.2 feet, present datum (discharge, 159,000 second-feet, from rating curve extended above 145,000 second-feet) furnished by U. S. Weather Bureau. Flood of July 30, 1938, reached a stage of 37.4 feet, present datum, observed by Geological Survey engineers (discharge, 145,000 second-feet).

Remarks.- Records good. Gage read twice daily. Diversions above station for irrigation and municipal supply. Regulation same as that for Colorado River at Austin. Records of chemical analyses and water temperatures for the water year 1948 are given in Water-Supply Paper 1133.

Cooperation.- Gage-height record collected in cooperation with U. S. Weather Bureau.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1,000	970	1,110	1,080	al,220	1,740	970	910	1,000	1,140	1,370	1,400
2	940	910	1,080	1,080	al,180	2,100	940	790	625	2,100	1,330	970
3	940	1,140	1,040	1,110	1,290	1,630	910	940	535	1,480	1,520	790
4	940	1,180	1,110	1,230	al,330	1,290	940	1,080	502	1,820	1,630	790
5	1,000	1,110	1,110	1,370	1,290	1,180	1,220	1,140	575	1,630	1,220	1,180
6	1,000	1,000	1,290	1,140	1,480	1,330	1,140	1,000	605	1,400	860	1,180
7	1,140	910	1,630	1,080	1,940	1,290	1,000	1,000	585	1,370	910	1,180
8	1,280	850	1,440	1,040	1,780	2,020	880	1,180	864	1,260	910	1,080
9	1,080	1,000	1,400	1,000	al,700	1,900	880	1,080	790	1,080	880	820
10	940	1,040	1,480	1,000	2,340	al,520	880	1,220	714	970	820	820
11	970	1,440	1,330	1,180	2,180	al,260	1,110	910	692	1,400	880	1,220
12	1,370	1,220	1,220	1,520	al,630	al,140	1,700	970	820	1,080	880	1,400
13	1,440	1,080	1,440	1,630	al,900	al,180	1,440	970	1,220	970	790	2,100
14	1,400	1,040	1,580	1,480	al,450	al,480	1,260	940	1,290	1,000	850	1,630
15	1,330	1,000	1,860	1,180	al,520	1,480	1,140	1,180	1,220	910	1,630	1,180
16	1,110	1,080	2,520	1,110	2,260	1,480	910	1,180	1,000	820	2,020	970
17	970	1,320	2,180	1,480	1,740	1,260	1,040	748	850	820	2,020	778
18	1,140	2,100	1,560	1,560	1,400	1,110	1,080	550	778	1,080	1,670	719
19	1,630	2,840	1,330	1,700	1,260	1,000	820	790	748	1,440	1,110	696
20	1,700	1,480	1,260	2,020	1,180	1,040	692	820	784	1,630	910	820
21	1,900	1,400	1,220	1,780	1,220	1,140	664	670	970	1,480	970	642
22	1,780	2,020	1,180	1,400	1,370	1,260	642	742	1,220	970	1,040	590
23	1,290	2,020	2,140	al,260	2,430	1,330	697	1,040	1,110	790	1,180	719
24	1,110	2,180	1,140	al,140	2,100	1,180	540	653	850	880	1,180	642
25	1,040	2,180	1,110	al,140	1,700	1,040	658	502	766	1,180	1,260	697
26	1,400	1,940	1,040	al,370	1,480	1,000	1,140	1,130	730	1,220	1,260	1,080
27	1,260	1,590	1,080	al,260	1,330	940	1,370	6,330	736	1,140	1,000	1,590
28	1,480	1,220	1,180	al,140	1,370	940	1,260	5,160	880	1,110	1,400	1,740
29	1,480	1,260	1,080	al,370	1,590	940	1,220	3,910	880	820	1,330	1,330
30	1,220	1,260	1,000	al,440	-	940	1,000	2,870	1,000	742	1,040	1,330
31	1,080	-	1,000	al,400	-	970	-	1,980	-	880	1,220	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	38,340	1,900	940	1,237	76,050
November.....	41,780	2,840	850	1,393	82,870
December.....	41,120	2,520	1,000	1,326	81,560
Calendar year 1947 .....	841,388	17,700	750	2,305	1,669,000
January.....	40,750	2,020	1,000	1,315	80,830
February.....	48,640	2,520	1,180	1,677	96,480
March.....	40,110	2,100	940	1,294	79,560
April.....	30,143	1,700	540	1,005	59,790
May.....	44,385	6,330	502	1,432	88,040
June.....	25,150	1,290	502	858	49,880
July.....	36,612	2,100	742	1,181	72,620
August.....	37,110	2,020	790	1,187	73,610
September.....	32,073	2,100	590	1,069	63,620
Water year 1947-48.....	456,213	6,330	502	1,246	904,900

a No gage-height record; discharge computed on basis of estimated gage-height record and record for station at Columbus.

## Colorado River near Bay City, Tex.

Location.- Water-stage recorder, lat. 28°58'26", long. 96°00'44", 6,310 feet downstream from Bridge on State Highway 35, 7,100 feet downstream from Texas & New Orleans Railroad bridge, 2.8 miles west of Bay City, Matagorda County, and 32.6 miles upstream from mouth at Matagorda Bay. Datum of gage is at mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 41,420 square miles, of which 11,900 square miles is probably noncontributing.

Records available.- July 2-6, 1940 (in Water-Supply Paper 1046), April to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1946.

Extremes.- Maximum discharge during period, 6,390 second-feet May 28 (gage height, 22.73 feet); minimum daily, 16 second-feet June 5.

Flood of July 4, 1940, reached a stage of 48.2 feet, present datum (discharge, 83,300 second-feet), at State Highway 35 bridge, observed by Corps of Engineers (stage, 46.6 feet adjusted to present site).

Maximum stage known, about 56.1 feet Dec. 10, 1913. Flood of July 1869 probably reached about same stage. Data on other floods as follows: May 8, 1922, stage 55.4 feet; June 1929, stage 55.0 feet; June 22, 1935, stage 54.6 feet; Oct. 5, 1936, stage 53.4 feet; Aug. 2, 1938, stage 53.4 feet; Nov. 27, 1940, stage 47.6 feet. All above flood data from information by Texas & New Orleans Railroad and adjusted to present site.

Remarks.- Records good. Many diversions above gage for municipal and irrigation uses. Regulation same as that for Colorado River at Austin.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							-	736	1,220	434	f341	810
2							-	605	408	844	885	838
3							-	596	151	1,280	f838	728
4							-	474	42	1,150	838	582
5							-	586	f16	1,150	865	560
6							-	a690	f23	1,060	528	615
7							-	a782	50	925	301	675
8							-	838	44	838	316	789
9							-	865	104	755	275	990
10							-	665	260	591	251	1,060
11							-	755	f234	514	247	1,060
12							-	645	157	564	247	1,360
13							-	755	f308	582	261	1,740
14							-	755	700	478	237	2,060
15							-	695	782	452	221	1,580
16							-	838	716	361	933	1,180
17							-	676	546	297	1,420	925
18							-	228	398	290	1,320	738
19							-	132	279	f603	990	695
20							307	296	254	f938	555	591
21							227	243	241	f958	340	568
22							151	96	352	708	f478	447
23							52	222	555	352	f615	f394
24							72	407	524	208	680	f492
25							211	f86	297	251	738	434
26							780	f44	168	344	782	550
27							1,120	f2,050	143	424	838	1,090
28							1,180	6,060	168	537	f782	1,540
29							1,320	4,220	320	424	1,060	1,460
30							925	3,220	316	214	958	1,320
31							-	2,020	-	154	810	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....					
November.....					
December.....					
Calendar year.....					
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April 20-30.....	6,345	1,320	52	577	12,590
May.....	31,282	6,060	44	1,009	62,050
June.....	9,776	1,220	16	326	19,390
July.....	18,580	1,280	154	599	36,850
August.....	19,750	1,420	221	637	39,170
September.....	27,851	2,060	394	928	55,240
The period.....	-	-	-	-	225,300

a No gage-height record; discharge computed on basis of estimated gage-height record.

f Computed on basis of partly estimated gage-height record.

Note.- Discharge Apr. 20 to May 5 computed from graph based on gage readings.

## COLORADO RIVER BASIN

Bull Creek near Ira, Tex.

Location.- Water-stage recorder, lat. 32°35', long. 101°05', 267 feet upstream from county road crossing, 1.5 miles upstream from Colorado River, 5.5 miles upstream from Chimney Creek, 5.8 miles west of Ira, Scurry County, and 6.9 miles northwest of Cuthbert.

Drainage area.- 388 square miles (contributing area).

Records available.- October 1947 to September 1948.

Extremes.- Maximum discharge during year, 4,940 second-feet July 6; maximum gage height, 11.70 feet July 6 (backwater from Colorado River); no flow at times.  
Flood of Sept. 7, 1932, reached a stage of 22.1 feet, present site and datum (adjusted to present site from floodmark 1,100 feet downstream, on basis of slope of flood of May 1947 at gage height 15.72 feet). Flood of June 1939 was probably about 1 foot higher, from information by local resident.

Remarks.- Records good. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0.1	0.1	0.1	0.2		0	2,230	1.4	43	0
2	0	0	.1	.1	.1	.1		0	1,530	.6	12	0
3	0	0	85	.1	.1	.1		0	368	.4	2.0	0
4	0	0	143	.1	.1	.1		0	24	.3	.6	0
5	0	0	15	.1	.1	.1		0	6.0	2,270	.2	0
6	0	0	2.8	.1	.1	.1		0	2.8	3,840	.1	0
7	0	0	1.4	.1	.1	.1		0	1.5	1,220	.1	0
8	0	0	.6	.1	.1	.1		0	1.0	.81	0	0
9	0	0	.3	.1	0	.1		0	.8	18	0	0
10	0	0	.2	.1	0	.1		0	.5	6.0	0	0
11	0	0	.2	.1	0	.1		0	.4	2.5	0	0
12	0	0	.2	.1	0	.1		0	.3	1.5	0	0
13	0	0	.2	.1	0	.1		0	.3	1.0	0	0
14	0	.2	.2	.1	0	.1		0	.2	.8	0	0
15	0	.2	.2	.1	0	.1		0	.1	.6	0	0
16	0	.1	.2	0	0	.1		464	.1	.5	0	0
17	0	.4	.1	0	.1	.1		3.0	.1	.5	0	0
18	0	8.2	.1	0	.1	0		.5	.1	.3	0	0
19	0	1.7	.1	0	0	0		.2	0	.2	0	0
20	0	.8	.1	0	0	0		.1	0	.2	0	0
21	0	.3	.1	0	0	0		0	0	.2	0	0
22	0	.2	.1	0	0	0		0	0	.2	0	61
23	0	.2	.1	0	0	0		0	0	2.1	0	10
24	0	.2	.1	0	0	0		0	0	21	0	1.7
25	13	.2	.1	0	0	0		620	0	9.0	0	.6
26	.3	.2	.1	0	.1	0		34	0	2.2	0	.3
27	.1	.2	.1	.1	.1	0		46	0	1.0	0	.2
28	.1	.1	.1	0	.5	0		4.2	793	.5	0	.1
29	.1	.2	.1	0	.3	0		41.4	37	.3	0	.1
30	0	.1	.1	0	-	0		4.5	3.8	.2	0	.1
31	0	-	.1	.1	-	0		18	-	2.4	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	13.6	13	0	0.44	27
November.....	13.5	8.2	0	.45	27
December.....	251.2	143	.1	8.10	498
Calendar year .....	-	-	-	-	-
January.....	1.7	.1	0	.05	3.4
February.....	1.9	.5	0	.07	3.8
March.....	1.8	.2	0	.06	3.6
April.....	0	0	0	0	0
May.....	1,191.9	620	0	38.4	2,360
June.....	5,000.0	2,230	0	167	9,920
July.....	7,484.9	3,840	.2	241	14,850
August.....	58.0	43	0	1.87	115
September.....	74.1	61	0	2.47	147
Water year 1947-48 .....	14,092.6	3,840	0	38.5	27,950

Peak discharge (base, 500 sec.-ft.).- May 16 (4 a.m.) 1,800 sec.-ft.; June 1 (3 p.m.) 3,200 sec.-ft.; June 2 (4 p.m.) 2,330 sec.-ft.; July 5 (6 p.m.) 4,320 sec.-ft.; July 6 (12 m.) 4,940 sec.-ft.  
A no gage-height record; discharge computed on basis of estimated gage heights.

## COLORADO RIVER BASIN

141

## Morgan Creek near Colorado City, Tex.

Location. - Water-stage recorder, lat. 32°24', long. 100°56', at bridge on U. S. Highway 80, about 1 mile upstream from Texas & Pacific Railway bridge, 5 miles west of Colorado City, Mitchell County, 5 miles east of Westbrook, and 5½ miles downstream from Cherry Creek. Datum of gage is 2,046.61 feet above mean sea level datum of 1929. Prior to Mar. 24, 1948, staff gage at site 227 feet downstream at same datum.

Drainage area. - 236 square miles (contributing area).

Records available. - April 1947 to September 1948.

Extremes. - 1947: Maximum discharge during period April to September, 3,170 second-feet

May 11 (gage height, 13.94 feet, from floodmarks); no flow at times.

1947-48: Maximum discharge during water year, 7,910 second-feet July 6 (gage height, 20.44 feet); no flow at times.

Maximum stage known since 1932, 24.2 feet June 19 or 20, 1939, from information by local resident.

Remarks. - Records good July 1 to Sept. 30, 1948; others fair except those for Mar. 24 to June 30, 1948, which are poor. Staff gage read once or twice daily, oftener during high stages. No diversion above station. Records of chemical analysis for the period April to September 1947 and the water year 1948 are given in Water-Supply Papers 1102 and 1133, respectively.

## Discharge, in second-feet, 1947-48

1947											
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Sept.
1								0	0.1	0	0
2								0	.1	0	0
3								0	.1	0	0
4								0	.1	0	0
5								0	.1	0	0
6								0	.1	0	0
7								0	.1	0	0
8								0	.1	0	0
9								0	.1	0	0
10								834	.1	0	28
11								1,920	0	142	24
12								712	0	25	16
13								41	0	1.5	52
14								14	0	.2	12
15								4.5	0	.1	3.0
16								573	0	0	.8
17								293	0	0	.3
18								37	0	0	.1
19								4.5	0	0	0
20								1.6	0	0	0
21								1.2	0	0	0
22								1.0	0	0	0
23								.5	0	0	0
24								.4	20	0	0
25								.2	2.6	0	0
26								.2	.4	0	0
27								.8	.1	0	0
28								.3	.1	0	0
29								.2	0	0	2.2
30							0	.2	0	0	.5
31							-	.1	-	0	-

Peak discharge (base, 300 sec.-ft.) - May 11 (6 a.m.) 3,170 sec.-ft.; May 16 (8 p.m.) 1,030 sec.-ft.; July 11 (7 a.m.) 435 sec.-ft.

## COLORADO RIVER BASIN

Discharge, in second-feet, of Morgan Creek near Colorado City, Tex., 1947-48--Continued

1947-48

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.1	0	0.1	0	0.6	0	0	77	0	181	0.7
2	0	.1	0	.1	0	.5	0	0	21	0	12	.3
3	0	0	1.4	.1	.1	.4	0	0	1.4	0	.6	.1
4	0	0	395	.1	.1	.2	0	0	.1	0	.3	.1
5	0	0	67	.1	.1	.2	0	0	.1	684	.3	0
6	0	0	8.4	.1	.1	.2	0	0	0	6,590	.2	0
7	3.2	0	1.4	.1	.1	.2	0	0	0	2,520	.2	0
8	0	0	1.3	.1	.1	.1	0	0	0	126	.1	0
9	0	0	.6	.1	0	.1	0	0	0	18	.1	0
10	0	0	.4	.1	0	.1	0	0	0	5.5	0	0
11	0	0	.3	0	0	.1	0	0	.9	2.4	0	0
12	0	0	.2	0	0	.1	0	0	.2	1.0	0	0
13	0	0	.2	0	0	.1	0	0	3.6	.7	0	0
14	0	0	.1	0	0	.1	0	0	.9	.5	0	0
15	0	0	.1	0	0	0	0	0	.1	.5	0	0
16	0	0	.2	0	0	0	0	0	0	.4	0	0
17	0	3.4	.1	0	0	0	0	0	0	.3	0	0
18	0	57	.1	0	0	0	0	0	0	.3	0	0
19	0	42	.1	0	0	.1	0	0	0	.2	0	0
20	0	11	.1	0	0	.1	0	0	0	.2	0	0
21	0	3.0	.1	0	0	.1	0	0	.7	.2	0	0
22	0	1.5	.1	0	0	.1	8.1	0	.3	5.8	0	86
23	0	1.0	0	0	0	0	.1	2.5	0	31	0	19
24	0	.8	0	0	0	0	0	.1	0	62	0	1.0
25	435	.6	0	0	0	0	0	7.6	0	4.5	0	.4
26	245	.4	0	0	288	0	0	.1	0	.7	0	.2
27	27	.3	0	0	511	0	0	.1	0	3.1	0	0
28	6.5	.2	0	0	20	0	0	0	0	21	0	0
29	2.4	.2	0	0	2.0	0	0	8.7	0	1.8	0	0
30	.9	.1	0	0	0	0	0	5.5	0	.5	28	0
31	.4	-	0	0	-	0	-	25	-	.3	8.0	-

Peak discharge (base, 300 sec.-ft.) - Oct. 25 (9 a.m.) 1,170 sec.-ft.; Dec. 4 (9 a.m.) 670 sec.-ft.; Feb. 26 (10 p.m.) 1,570 sec.-ft.; July 6 (12:30 p.m.) 7,910 sec.-ft.; Aug. 1 (6 a.m.) 481 sec.-ft.

Note - No gage-height record Jan. 3-22, 24-27, Feb. 1, 2, 12, 13, Mar. 8, 10, 12, 14, 17, 22, Aug. 1-3; discharge interpolated except for Aug. 1-3, which was computed from graph based on flood-mark and 1 wire-weight gage reading.

## Monthly discharge, in second-feet, 1947-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
May 1947	4,439.9	1,920	0	.143	8,810
June	24.2	20	0	.81	48
July	168.8	142	0	5.45	335
August	2.7	2.2	0	.09	5.4
September	136.2	52	0	4.54	270
The period	-	-	-	-	9,470
October 1947	720.4	435	0	23.2	1,430
November	121.7	57	0	4.06	241
December	477.2	395	0	15.4	947
Calendar year	-	-	-	-	-
January 1948	1.0	.1	0	.03	2.0
February	821.6	511	0	28.3	1,630
March	3.4	.6	0	.11	6.7
April	8.2	8.1	0	.27	16
May	49.6	25	0	1.60	98
June	106.3	77	0	3.54	211
July	10,080.9	6,590	0	325	20,000
August	231.0	181	0	7.45	458
September	107.9	86	0	3.60	214
Water year 1947-48	12,729.2	6,590	0	34.8	25,250

## Champlin Creek near Colorado City, Tex.

Location.- Staff gage, lat. 32°19', long. 100°49', 600 feet downstream from South Fork, 5 miles southeast of Colorado City, Mitchell County, and 5½ miles upstream from mouth.

Drainage area.- 158 square miles.

Records available.- October 1947 to September 1948.

Extremes.- Maximum discharge during year, 10,200 second-feet Oct. 25 (gage height, 10.40 feet, from floodmarks), from rating curve extended above 2,400 second-feet on basis of slope-area determinations at gage heights, 10.40 and 8.88 feet; minimum observed, 0.2 second-foot at times.

Maximum stage known since 1898, about 18.5 feet July 7 or 8, 1945, from floodmarks on left bank opposite gage.

Remarks.- Records good. Gage read twice daily, oftener during high stages. No diversion above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.50	0	0.80	8.5	1.4	86	2.8	595
.60	.2	.85	12	1.6	130	3.2	830
.65	.6	.90	17	1.8	180	4.0	1,420
.70	2.0	1.0	27	2.0	241	5.0	2,340
.75	4.6	1.2	53	2.4	395	6.0	3,440

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.9	0.5	1.4	2.0	*3.0	2.0	0.9	1,120	0.2	6.4	0.4
2	.3	1.2	.5	1.4	1.4	2.0	2.0	.6	19	.2	.4	.4
3	.3	.9	1.2	1.4	1.4	1.7	2.0	.5	6.9	.2	.2	.4
4	.2	.5	1.2	1.4	1.4	1.7	2.0	.3	3.0	.2	.2	.5
5	.2	d.5	5.8	1.4	1.7	1.7	2.0	.2	1.7	425	.2	.2
6	.2	d.5	2.0	1.4	1.4	1.4	2.0	.2	1.4	455	.2	.2
7	.2	.5	2.0	1.4	1.4	1.4	2.0	.4	1.4	110	.2	.2
8	.2	.5	1.4	1.4	1.4	1.4	2.0	.4	1.2	28	.2	.2
9	.2	.5	1.2	1.4	1.4	1.4	2.0	.4	.6	2.0	.2	.2
10	.2	.5	.9	1.4	1.4	1.4	2.0	.4	.5	1.4	.2	.2
11	.2	.5	.9	1.4	1.4	b1.7	2.0	.4	.5	4.6	.2	.2
12	.2	.5	.9	1.4	b1.6	2.0	2.0	.4	.5	1.2	.2	.2
13	.2	.9	.5	1.4	1.7	2.0	2.0	.3	.4	.6	.2	.2
14	.2	.6	.5	1.4	1.4	2.0	2.0	.3	.4	.4	.2	.2
15	.2	.5	.9	1.4	1.4	1.7	2.0	.2	.4	.3	.2	.2
16	.2	.5	.9	1.4	1.4	1.4	2.0	.2	.4	.3	.2	.2
17	.2	2.5	.5	1.4	1.4	1.4	2.0	.2	.4	.3	.2	.2
18	.2	3.6	.5	1.4	1.4	1.4	1.7	.2	.4	.2	.2	.2
19	.2	1.4	.5	1.4	1.4	2.0	1.4	.2	.4	.2	.2	.2
20	.2	.9	.5	1.4	1.4	2.6	1.4	.2	.4	.2	.2	.2
21	.2	.9	.5	1.4	1.4	123	1.4	.2	.4	.2	.2	18
22	.2	.9	.5	1.4	1.4	11	1.4	.2	.3	.2	.2	1.4
23	.2	.9	.5	*1.4	1.4	3.6	1.4	.2	.2	253	.2	.2
24	.3	.9	.5	1.4	1.4	2.0	1.4	403	.2	37	.2	.2
25	3,380	.9	.6	1.4	2.0	2.0	1.4	314	.2	a2.0	.2	.2
26	36	.9	.6	1.4	108	2.0	1.4	10	.2	18	.2	.2
27	7.7	.9	.9	b1.5	*274	2.0	1.4	2.5	.2	6.6	.2	.2
28	4.1	.6	1.2	b1.6	*10	2.0	1.2	1.4	.2	9.1	.2	.2
29	2.0	.6	1.2	b1.8	4.1	2.0	1.2	191	.2	1.4	18	.2
30	1.7	.5	1.2	b1.9	-	2.0	.9	1,510	.2	.3	17	.2
31	1.2	-	1.4	2.0	-	2.0	-	17	-	.3	1.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,437.7	3,380	0.2	111	6,820
November.....	26.4	3.6	.5	.98	52
December.....	61.0	19	.5	1.97	121
Calendar year.....	-	-	-	-	-
January.....	45.2	2.0	1.4	1.46	90
February.....	433.1	274	1.4	14.9	859
March.....	188.9	123	1.4	6.09	375
April.....	51.6	2.0	.9	1.72	102
May.....	2,456.4	1,510	.2	79.2	4,870
June.....	1,162.2	1,120	.2	38.7	2,310
July.....	1,358.6	455	.2	43.8	2,690
August.....	48.7	18	.2	1.57	97
September.....	25.7	18	.2	.86	51
Water year 1947-48.....	9,295.5	3,380	.2	25.4	18,440

Peak discharge (base, 2,000 sec.-ft.)- Oct. 25 (10:30 a.m.) 10,200 sec.-ft.; May 24 (4:00 a.m.) 2,140 sec.-ft.; May 30 (2:00 a.m.) 7,560 sec.-ft.; June 1 (7:00 a.m.) 7,400 sec.-ft.; July 5 (11:00 p.m.) 2,340 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and estimated gage height.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed on basis of discharge measurement of Nov. 4 and weather records.

## Elm Creek at Ballinger, Tex.

Location.- Water-stage recorder upstream from spillway of masonry dam, lat. 31°45'00", long. 99°56'50", in Ballinger, Runnels County, and 1½ miles upstream from mouth. Datum of gage is 1,617.72 feet above mean sea level, datum of 1929.

Drainage area.- 458 square miles.

Records available.- April 1932 to September 1948.

Average discharge.- 16 years, 52.5 second-feet.

Extremes.- Maximum discharge during year, 4,330 second-feet Oct. 25 (gage height, 6.20 feet); no flow at times.

1932-48: Maximum discharge, 29,200 second-feet May 14, 1946 (gage height, 10.84 feet), from rating curve extended above 15,000 second-feet; no flow at times.

Remarks.- Records fair. Stage-discharge relation during period of low flow affected by wind action and occasional accumulation of drift on dam. Low flow affected by diversion of Ballinger city pumping plant.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	15	0	1.0	0	0.6	0	0.1	41	0	63	0
2	0	11	0	11	0	0	0	0	1.5	0	40	0
3	0	7.0	80	11	0	0	0	0	.8	48	11	0
4	0	4.5	640	15	0	0	0	0	0	1.0	1.5	0
5	0	4.5	119	15	0	0	0	0	0	44	0	0
6	0	.2	61	15	0	0	0	0	0	280	0	0
7	0	.1	282	15	0	0	0	0	0	0	0	0
8	0	a.1	180	15	0	0	0	0	0	4.5	0	0
9	252	a.2	88	15	0	0	0	0	0	.6	0	2.5
10	20	a.4	55	15	0	0	0	0	160	114	0	.1
11	4.5	a.1	37	15	0	0	0	0	1.5	4.5	0	0
12	.4	a0	20	15	0	0	0	0	.2	.6	0	0
13	0	a0	20	15	0	0	0	0	0	4.5	0	0
14	0	a0	11	15	0	0	0	0	0	1.0	0	0
15	0	a0	11	15	0	0	0	0	0	.6	0	0
16	4.4	a0	11	1.5	0	0	0	0	0	.2	0	0
17	4.5	a0	11	2.5	0	0	0	0	0	0	0	0
18	.6	a0	11	1.5	0	0	0	0	0	0	0	0
19	0	a0	11	1.5	0	0	0	0	0	0	0	0
20	0	.2	11	1.5	0	0	0	0	0	0	0	0
21	0	.2	11	.6	0	0	0	0	0	0	0	0
22	0	0	7.0	.1	0	0	0	0	0	0	0	0
23	0	0	11	0	0	0	0	0	0	0	0	0
24	0	0	11	0	0	0	0	42	0	0	0	0
25	1420	0	11	0	0	0	401	50	0	0	0	0
26	1,740	0	11	0	0	0	61	15	284	0	0	0
27	684	0	11	0	0	0	15	45	1.5	64	0	0
28	244	.1	15	0	7.0	0	7.0	11	.2	1.5	0	0
29	119	.2	11	0	1.5	0	1.5	2.5	0	.2	0	0
30	67	.2	11	0	-	0	.6	.6	0	0	0	0
31	31	-	1.7	0	-	0	-	.2	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	4,571.4	1,740	0	147	9,070
November.....	44.0	15	0	1.47	87
December.....	1,770.7	640	0	57.1	3,510
Calendar year 1947.....	9,092.7	1,740	0	24.9	18,040
January.....	212.2	15	0	6.85	421
February.....	8.5	7.0	0	.29	17
March.....	.6	0	0	.02	1.2
April.....	486.1	401	0	16.2	964
May.....	176.4	60	0	5.69	350
June.....	490.5	284	0	16.4	973
July.....	647.2	280	0	20.9	1,280
August.....	115.5	63	0	37.3	229
September.....	2.6	2.5	0	.09	5.2
Water year 1947-48.....	8,525.7	1,740	0	23.3	16,910

Peak discharge (base, 2,100 sec.-ft.)- Oct. 25 (6 p.m.) 4,330 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage and weather records.



## South Concho River at Christoval, Tex.

Location.- Water-stage recorder and concrete control, lat. 31°13', long. 100°30', at Panhandle & Santa Fe Railway bridge at Christoval, Tom Green County. Datum of gage is 2,010.22 feet above mean sea level, datum of 1929.

Drainage area.- 434 square miles.

Records available.- February 1930 to September 1948.

Average discharge.- 18 years, 44.2 second-feet.

Extremes.- Maximum discharge during year, 1,400 second-feet May 26 (gage height, 4.34 feet, from graph based on partial recorder record); minimum, 1.6 second-feet Mar. 18, 19.

1930-48: Maximum discharge, 100,000 second-feet July 23, 1938 (gage height, 21.95 feet, from floodmarks), from rating curve extended above 9,000 second-feet on basis of slope-area determination at gage-height 20.5 feet; minimum, that of Mar. 18, 19, 1948.

Revisions.- The maximum discharge for the water year 1943 has been revised to 138 second-feet May 23, 1943 (gage height, 2.47 feet), superseding figures published in Water-Supply Paper 978.

Flood of Aug. 6, 1906, reached a stage about 1.1 feet higher than flood of July 23, 1938, at a point 0.5 mile downstream from gage, from information by local residents.

Remarks.- Records excellent except those above 25 second-feet, which are good. Low flow materially affected by diversion 600 feet above station to South Concho Irrigation Co.'s canal (see p. 150).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.7	4.9	3.7	7.5	9.5	4.9	4.9	4.3	8.5	2.6	5.7	4.3
2	3.7	4.9	3.7	8.5	9.5	5.7	4.9	4.3	8.5	2.6	4.9	3.7
3	3.7	4.9	3.7	8.5	9.5	8.5	4.9	4.3	7.5	3.1	4.9	3.7
4	3.7	4.9	3.7	8.5	9.5	6.5	4.9	4.3	7.5	4.3	3.7	3.7
5	3.7	4.9	3.7	9.5	9.5	7.5	4.9	4.3	8.5	3.7	4.3	3.1
6	3.7	4.9	3.7	8.5	9.5	7.5	6.5	3.7	7.5	30	4.3	2.2
7	3.7	4.3	3.7	8.5	9.5	4.9	7.5	4.3	6.5	176	4.3	3.1
8	3.7	4.3	3.7	8.5	8.5	6.5	7.5	4.3	6.5	12	3.7	3.1
9	3.7	4.3	3.7	8.5	8.5	7.5	7.5	4.3	6.5	8.5	3.7	4.3
10	4.3	4.9	3.7	7.5	8.5	7.5	7.5	4.3	5.7	7.5	3.7	4.3
11	4.3	4.9	3.7	7.5	8.5	7.5	6.5	5.7	8.5	8.5	3.7	3.7
12	4.3	4.9	4.3	7.5	8.5	7.5	6.5	4.9	7.5	8.5	3.1	3.7
13	4.3	4.3	4.3	7.5	8.5	7.5	6.5	4.9	5.7	8.5	3.1	3.7
14	4.3	4.9	4.3	7.5	7.5	7.5	7.5	4.9	6.5	8.5	3.1	3.7
15	4.3	4.3	4.3	6.5	7.5	9.5	7.5	4.3	6.5	8.5	3.1	4.3
16	6.5	4.9	4.3	6.5	7.5	11	8.5	3.7	5.7	7.5	3.7	4.3
17	4.9	5.7	4.3	6.5	7.5	7.5	7.5	3.7	4.9	7.5	3.7	3.7
18	4.3	5.7	3.7	6.5	7.5	4.9	5.7	4.3	4.9	7.5	3.7	4.3
19	4.3	5.7	3.7	7.5	4.3	1.8	4.9	4.3	4.3	7.5	3.7	4.3
20	4.3	5.7	3.7	7.5	4.9	2.2	5.2	4.3	3.1	7.5	3.7	4.9
21	4.3	5.7	3.7	7.5	6.5	2.2	4.9	4.3	2.6	6.5	4.3	4.9
22	4.3	5.7	3.7	7.5	6.5	2.2	4.9	4.3	2.6	6.5	4.3	140
23	4.9	5.7	3.7	7.5	6.5	2.6	5.7	4.3	2.6	6.5	4.3	66
24	4.9	5.7	3.7	8.5	6.5	2.6	5.7	4.3	3.1	6.5	4.9	14
25	4.9	4.3	3.7	8.5	7.5	2.6	7.5	4.3	3.7	5.7	4.9	11
26	4.9	3.7	4.9	8.5	7.5	3.7	5.7	f336	5.7	5.7	4.9	7.5
27	4.9	3.7	6.5	8.5	7.5	3.7	4.9	46	3.1	5.7	4.9	7.5
28	5.7	3.7	7.5	8.5	6.5	3.7	4.3	9.5	2.6	4.9	4.9	6.5
29	5.7	3.7	7.5	8.5	7.5	4.3	4.3	8.5	2.6	4.3	5.7	7.5
30	5.7	3.7	8.5	8.5	-	3.7	4.3	8.5	2.6	4.3	4.9	6.5
31	5.7	-	8.5	8.5	-	4.3	-	8.5	-	4.9	4.9	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	139.3	6.5	3.7	4.49	278
November.....	143.8	5.7	3.7	4.79	285
December.....	139.5	8.5	3.7	4.50	277
Calendar year 1947.....	4,410.9	327	3.7	12.1	8,760
January.....	245.5	9.5	6.5	7.92	487
February.....	226.7	9.5	4.3	7.82	450
March.....	167.5	11.7	1.8	5.40	332
April.....	179.5	8.5	4.3	5.98	356
May.....	525.9	336	3.7	17.0	1,040
June.....	162.0	8.5	2.6	5.40	321
July.....	391.8	176	2.6	12.6	777
August.....	130.7	5.7	3.1	4.22	259
September.....	347.5	140	2.2	11.6	689
Water year 1947-48.....	2,799.7	336	1.8	7.65	5,550

Peak discharge (base, 160 sec.-ft.)- May 26 (9:30 a.m.) 1,400 sec.-ft.; July 6 (11:30 p.m.) 554 sec.-ft.; Sept. 22 (5:30 p.m.) 774 sec.-ft.  
f Computed on basis of partly estimated gage-height record.

## Lake Nasworthy near San Angelo, Tex.

Location.- Water-stage recorder, lat. 31°23'15", long. 100°28'40", 250 feet upstream from Nasworthy Dam on South Concho River, half a mile downstream from Middle Concho River, and 6 miles southwest of San Angelo, Tom Green County. Datum of gage is 1,840.0 feet above mean sea level, datum of 1929.

Drainage area.- 2,659 square miles, of which 152 square miles is probably noncontributing.

Records available.- March 1930 to September 1948.

Extremes.- Maximum contents during year, 14,040 acre-feet Sept. 22 (gage height, 32.35 feet); minimum, 2,900 acre-feet Nov. 15-17 (gage height, 21.45 feet).  
1930-48: Maximum contents, 26,900 acre-feet Sept. 15, 1936 (gage height, 38.36 feet); minimum contents since lake filled, 594 acre-feet Oct. 14, 1936 (gage height, 12.6 feet).

Remarks.- Lake is formed by 4,900-foot earthen dam (contains 2 emergency spillways, 300 and 800 feet in length) and 438-foot concrete service spillway, with a bank of 15 taintor gates. Dam completed and storage began Mar. 28, 1930. Total capacity, 13,720 acre-feet (gage height, 32.2 feet, top of flashboards which were added to taintor gates in June 1948). Usable capacity, 13,720 acre-feet between gage heights -4.0 feet (bottom of two 36-inch gates) and 32.2 feet (top of flashboards on taintor gates). Figures of contents shown herein represent total contents of lake, and are unadjusted for siltation. A siltation survey made by the Soil Conservation Service of the U. S. Department of Agriculture indicates a 10 percent capacity loss from siltation in 8.2 years (1930-39). Water used for San Angelo municipal supply.

Monthly gage height and contents, water year October 1947 to September 1948

Date	Gage height (feet)†	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30.....	22.7	3,550	-
Oct. 31.....	21.8	3,100	-450
Nov. 30.....	21.7	3,050	-50
Dec. 31.....	23.6	4,080	+1,010
Calendar year 1947..	-	-	-3,920
Jan. 31.....	24.1	4,380	+320
Feb. 29.....	25.9	5,910	+1,530
Mar. 31.....	25.1	5,190	-720
Apr. 30.....	24.8	4,940	-250
May 31.....	29.5	9,900	+4,960
June 30.....	28.5	8,750	-1,150
July 31.....	28.5	8,750	0
Aug. 31.....	25.6	5,840	-3,110
Sept. 30.....	31.8	13,080	+7,440
Water year 1947-48	-	-	+9,530

† Gage height at 12 p.m.

## South Concho River at San Angelo, Tex.

Location.- Water-stage recorder above spillway of San Angelo waterworks concrete dam, lat.  $31^{\circ}26'45''$ , long.  $100^{\circ}25'30''$ , at Lone Wolf Bridge on county road, half a mile south of San Angelo, Tom Green County, 1 mile upstream from confluence with North Concho River, and 7,470 feet downstream from bridge on U. S. Highways 87 and 277. Datum of gage is 1,802.94 feet above mean sea level, datum of 1929.

Drainage area.- 2,687 square miles, of which 152 square miles is probably noncontributing.

Records available.- October 1931 to September 1948.

Average discharge.- 17 years, 134 second-feet.

Extremes.- Maximum discharge during year, 30,400 second-feet July 6 (gage height, 9.52 feet); no flow at times.

1931-48: Maximum discharge, 111,000 second-feet Sept. 17, 1936 (gage height, 23.4 feet, of which about 2.4 feet was caused by backwater from North Concho River), by slope-area method; no flow at times.

Maximum stage known, 29.7 feet Aug. 6, 1906 (not affected by backwater), from information by local residents.

Remarks.- Records good. Diversions above station for irrigation, municipal supply, and power. Flow partly regulated by Lake Nasworthy (see preceding page).

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

1.78	0	2.3	54	2.8	555	4.2	4,120
1.9	1.0	2.4	98	3.0	885	4.6	5,580
2.0	4.0	2.5	183	3.2	1,290	5.0	7,200
2.1	15	2.6	285	3.4	1,740	5.2	8,100
2.2	31	2.7	412	3.8	2,880		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0		0	0	0	1.4	0	2.1	144	0	4.0	0
2	0		0	0	0	.5	0	2.2	233	0	3.9	0
3	0		0	0	0	0	0	.5	37	0	.4	0
4	0		0	0	0	0	.9	0	6.1	1.7	0	.1
5	0		0	0	0	0	3.5	0	6.1	12	0	3.0
6	.6		0	0	0	0	2.4	0	1.4	7,770	1.0	3.2
7	1.4		0	0	0	0	1.2	0	0	6,930	.7	.2
8	.5		0	0	2.3	0	2.4	0	0	1,140	0	0
9	5.3	1	0	0	9.0	0	2.5	0	0	309	0	3.7
10	4.0		0	0	4.6	1.8	1.4	0	0	309	0	4.0
11	2.1		0	0	2.1	3.5	0	4.2	0	173	0	2.7
12	1.0		0	0	1.6	2.1	0	6.1	0	73	0	3.1
13	.3		0	0	1.8	.7	0	3.5	0	54	0	2.2
14	0		0	0	2.0	0	0	2.1	.1	37	0	.2
15	0		0	0	.5	0	0	.8	0	30	0	0
16	0		0	0	.1	0	0	0	0	9.7	0	0
17	0		0	0	0	0	0	0	0	3.5	0	0
18	0		0	0	0	8.8	0	0	0	4.6	0	0
19	0		0	0	0	4.9	.1	0	0	2.7	.1	0
20	0		0	0	0	0	0	0	0	.3	0	0
21	0		0	0	0	0	0	0	0	0	0	59
22	0		0	0	0	0	0	0	0	0	0	986
23	0		0	0	0	0	.5	0	.6	0	0	264
24	0		.1	0	0	.1	2.4	0	1.5	.4	0	116
25	0		1.2	0	0	1.5	7.8	0	.2	2.1	0	13
26	0		1.6	.1	0	.3	3.5	43	.3	1.6	0	13
27	0		1.0	.1	.4	.3	1.2	39	4.1	0	0	12
28	0		.6	.1	1.4	1.2	.1	43	1.3	0	0	10
29	0		.2	.1	1.2	1.7	0	51	0	0	0	7.8
30	0		0	0	-	.5	0	51	0	0	0	7.8
31	0		0	0	-	.2	-	40	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	15.2	5.3	0	0.49	30
November.....	0	0	0	0	0
December.....	4.8	1.6	0	.15	9.5
Calendar year 1947 .....	6,846.9	744	0	18.8	13,580
January.....	.4	.1	0	.01	.8
February.....	27.0	9.0	0	.93	54
March.....	29.5	8.8	0	.85	59
April.....	29.9	7.8	0	1.00	59
May.....	288.5	51	0	9.31	572
June.....	435.7	233	0	14.5	854
July.....	16,863.6	7,770	0	544	33,450
August.....	10.1	4.0	0	.33	20
September.....	1,511.0	986	0	50.4	3,000
Water year 1947-48 .....	19,215.7	7,770	0	52.5	38,120

Peak discharge (base, 6,100 sec.-ft.)- July 6 (10 p.m.) 30,400 sec.-ft.

## Concho River near San Angelo, Tex.

Location.- Water-stage recorder, lat. 31°27'10", long. 100°24'40", half a mile downstream from confluence of North Concho and South Concho Rivers and 1½ miles southeast of San Angelo, Tom Green County. Datum of gage is 1,776.8 feet above mean sea level, datum of 1929.

Drainage area.- 4,492 square miles, of which 275 square miles is probably noncontributing.

Records available.- September 1915 to September 1948.

Average discharge.- 33 years, 181 second-feet.

Extremes.- Maximum discharge during year, 47,500 second-feet July 6 (gage height, 30.00 feet, from floodmark), minimum, 0.8 second-foot June 23.  
1915-48: Maximum discharge, 230,000 second-feet Sept. 17, 1936 (gage height, 46.6 feet, from floodmarks), by slope-area method; no flow Nov. 29, 1921.  
Maximum stage known, 47.5 feet Aug. 6, 1906 (discharge, about 246,000 second-feet), from information by local residents.

Remarks.- Records good. Many diversions above station for irrigation and municipal supply. Flow partly regulated by Lake Nasworthy on South Concho River (see p. 146).

Revisions (water years).- W 568: 1915-22.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.5	1.6	1.9	1.5	3.2	17	4.8	3.6	482	6.8	11	1.8
2	1.6	2.1	1.5	3.2	11	4.8	3.6	382	5.8	35	1.5	1.5
3	1.4	1.8	4.0	1.5	3.2	8.6	4.4	2.8	67	6.0	20	1.6
4	1.3	1.5	1.4	1.6	2.8	7.8	4.0	3.2	22	11	12	1.9
5	1.5	1.4	3.3	1.8	1.9	6.8	6.0	2.3	27	819	9.7	3.2
6	1.5	1.5	11	1.8	1.8	6.4	5.2	1.8	11	16,400	9.2	5.8
7	2.8	1.6	8.2	1.9	1.6	5.6	3.6	1.8	4.8	30,000	48.0	1.5
8	54	1.3	4.0	2.1	2.1	6.0	5.2	1.9	6.0	2,900	46.8	1.6
9	92	1.3	6.0	2.1	11	5.6	6.0	2.1	4.8	872	45.6	6.0
10	12	1.4	4.0	1.9	11	6.8	4.4	1.9	3.6	537	4.4	8.6
11	6.4	1.5	2.6	2.1	4.8	10	2.8	348	2.6	327	4.0	6.4
12	4.0	1.3	1.9	1.9	3.6	8.6	1.9	18	2.1	152	3.6	4.4
13	2.8	1.5	1.6	1.9	2.6	6.0	1.8	9.2	2.3	117	2.8	4.8
14	2.1	1.6	1.8	2.1	4.0	3.6	1.9	6.4	4.4	63	2.8	1.8
15	2.6	1.2	2.3	1.9	1.8	4.8	1.9	4.0	2.8	67	2.3	1.6
16	2.1	1.3	1.6	1.9	1.5	4.4	1.8	2.6	1.9	40	2.1	1.5
17	1.8	7.0	1.5	2.1	1.9	3.6	1.6	2.1	1.5	27	2.1	1.4
18	1.6	5.2	1.6	2.3	1.9	9.5	1.8	1.9	1.3	25	2.3	41.5
19	1.5	2.8	1.6	2.3	2.1	11	1.8	1.9	1.3	21	2.6	1.6
20	1.5	2.1	1.6	2.8	1.6	3.2	1.6	1.9	1.0	17	2.3	1.8
21	1.5	1.8	1.6	3.2	1.4	2.3	1.5	1.8	1.1	14	1.9	28
22	1.5	2.3	1.6	2.3	1.4	6.3	3.1	1.6	1.0	11	2.1	1,590
23	1.6	2.1	1.5	2.3	1.4	72	2.8	1.5	1.0	14	1.9	1,090
24	1.8	1.6	1.5	2.8	1.6	32	13	1.6	1.6	11	1.8	349
25	1.6	1.5	1.6	2.6	1.6	19	59	7.3	1.4	11	1.9	80
26	3.6	1.5	2.3	2.6	7.1	13	11	757	1,590	11	1.8	45
27	2.3	1.5	2.1	2.8	416	9.7	8.2	77	329	9.7	1.9	29
28	1.9	1.4	1.6	2.6	63	7.3	6.4	61	85	10	1.8	23
29	1.9	2.3	1.6	2.8	26	9.2	5.6	67	32	8.6	2.1	17
30	1.9	4.4	1.5	2.6	-	7.8	4.8	60	18	47.8	2.3	14
31	1.6	-	1.5	2.8	-	5.2	-	52	-	47.3	2.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	217.2	92	1.3	7.01	431
November.....	80.9	7.0	1.2	2.03	121
December.....	124.7	33	1.5	4.02	247
Calendar year 1947.....	17,663.8	6,290	1.1	48.4	35,000
January.....	88.4	3.2	1.5	2.21	136
February.....	587.1	416	1.4	20.2	1,160
March.....	330.1	72	2.3	10.6	655
April.....	182.7	59	1.5	6.09	362
May.....	1,508.8	757	1.5	48.7	2,990
June.....	3,091.5	1,590	1.0	103	6,130
July.....	52,348.8	30,000	5.6	1,689	103,800
August.....	170.2	35	1.8	5.49	338
September.....	3,325.1	1,590	1.4	111	6,600
Water year 1947/48.....	62,015.5	30,000	1.0	169	123,000

Peak discharge (base, 5,700 sec.-ft.)- July 6 (10 p.m.) 47,500 sec.-ft.; Sept. 22 (10 p.m.) 6,340 sec.-ft.

a No gage-height record; discharge interpolated.

d Doubtful gage-height record; discharge interpolated, or computed on basis of estimated gage heights.

Note.- Discharge computed on basis of partly estimated gage-height record July 6, 7.

## COLORADO RIVER BASIN

149

## Concho River near Paint Rock, Tex.

Location.- Water-stage recorder above spillway of masonry dam, lat. 31°31', long. 99°55', at bridge on U. S. Highway 83, a quarter of a mile north of Paint Rock, Concho County. Datum of gage is 1,574.43 feet above mean sea level, datum of 1929.

Drainage area.- 5,538 square miles, of which 275 square miles is probably noncontributing.

Records available.- September 1915 to September 1948.

Average discharge.- 33 years, 237 second-feet.

Extremes.- Maximum discharge during year, 40,600 second-feet July 7 (gage height, 27.37 feet); no flow Oct. 1-8, Sept. 17.

1915-48: Maximum discharge, 301,000 second-feet Sept. 17, 1936 (gage height, 43.4 feet, from floodmarks), by slope-area method; no flow at times.

Remarks.- Records good except those above 5,000 second-feet, which are fair. Many diversions above station for irrigation and municipal supply. Flow partly regulated by Lake Nasworthy on South Concho River (see p. 146).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	5.6	3.1	6.5	7.3	7.6	5.6	11	257	58	14	0.4
2	0	3.6	4.2	6.5	9.0	44	4.2	7.3	545	33	14	.3
3	0	2.5	4.8	6.5	9.0	30	4.2	5.6	316	265	14	.2
4	0	2.5	6.5	6.5	8.2	26	3.6	4.2	140	265	12	.2
5	0	2.5	12	6.5	7.3	17	3.1	3.6	82	1,160	26	.1
6	0	1.9	14	6.5	8.2	17	1.9	1.9	47	10,300	22	.1
7	0	1.7	63	6.5	7.3	15	1.9	1.5	37	33,100	14	.1
8	0	1.7	68	6.5	7.3	15	1.7	1.0	30	12,500	8.2	.1
9	200	1.2	35	7.3	6.5	14	1.2	.7	21	865	5.6	.7
10	184	1.2	24	6.5	5.6	12	.8	.8	22	598	7.3	.4
11	68	.8	19	6.5	5.6	9.0	.7	954	9.0	598	4.8	.2
12	35	.8	15	6.5	5.6	8.2	.5	316	7.3	376	3.6	.1
13	21	1.2	12	5.6	8.2	8.2	.4	93	5.6	304	2.5	.1
14	12	1.5	11	5.6	12	9.0	.4	47	4.2	186	1.9	.1
15	7.3	2.5	14	5.6	11	12	.4	30	2.5	136	1.7	.1
16	5.6	1.9	11	5.6	9.0	12	.4	21	1.5	108	1.2	.1
17	4.8	2.5	9.0	4.8	8.2	9.0	.3	12	1.2	90	.7	0
18	3.6	3.6	8.2	4.8	8.2	8.2	.3	9.0	.7	68	.7	.1
19	3.1	5.6	8.2	4.8	8.2	6.5	.2	6.5	.6	52	.7	.2
20	1.9	8.2	9.0	6.5	7.3	4.8	.2	5.6	.4	47	.6	.3
21	1.7	5.6	8.2	7.3	6.5	4.2	.2	4.2	.3	39	.6	.4
22	1.7	8.2	7.3	8.2	5.6	6.5	.2	3.1	.2	35	.5	28
23	1.5	8.2	7.3	8.2	4.8	5.6	.4	1.9	.2	35	.5	1,410
24	1.5	6.5	7.3	7.3	4.8	6.5	12	21	.1	30	.4	586
25	12	6.5	7.3	7.3	5.6	8.2	268	99	.1	24	.2	258
26	8.1	5.6	8.2	7.3	6.5	30	66	569	162	26	.2	116
27	1.9	4.2	7.3	7.3	12	22	62	429	1,260	33	.2	82
28	211	4.2	8.2	4.8	239	21	33	149	261	19	.1	52
29	243	4.2	7.3	4.8	124	15	21	155	140	17	.1	37
30	33	3.6	7.3	5.6	-	12	15	106	82	15	.3	26
31	12	-	7.3	7.3	-	6.5	-	79	-	12	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,073.7	243	0	34.6	2,130
November.....	109.8	8.2	.8	3.66	218
December.....	434.0	68	3.1	14.0	861
Calendar year 1947.....	31,896.3	5,920	0	27.4	63,260
January.....	197.5	8.2	4.8	6.37	392
February.....	567.8	239	4.8	19.6	1,130
March.....	490.4	76	4.2	15.8	973
April.....	509.8	268	.2	17.0	1,010
May.....	3,147.9	954	.7	102	6,240
June.....	3,436.9	1,260	.1	115	6,820
July.....	61,382	33,100	12	1,980	121,700
August.....	159.0	26	.1	5.13	315
September.....	2,597.3	1,410	0	86.6	5,150
Water year 1947-48.....	74,106.1	33,100	0	202	146,900

Peak discharge (base, 4,600 sec.-ft.) - May 11 (6 a.m.) 5,830 sec.-ft.; July 7 (9 p.m.) 40,600 sec.-ft.

## COLORADO RIVER BASIN

South Concho Irrigation Co.'s canal at Christoval, Tex.

Location.- Water-stage recorder, lat. 31°13', long. 100°30', at Christoval, Tom Green County, 85 feet downstream from point of diversion and 100 feet downstream from bridge on U. S. Highway 277. Datum of gage is 2,017.0 feet above mean sea level, datum of 1929.

Records available.- November 1939 to September 1948. (November 1921, February 1930 to September 1939, miscellaneous discharge measurements only.)

Extremes.- Maximum daily diversion for irrigation during year (excluding flood flow), 12 second-feet July 18-28; minimum daily, 5.6 second-feet Feb. 5-7, 9, 11-13.  
1939-48: Maximum daily diversion for irrigation (excluding flood flow), 21 second-feet June 27, 28, 1941, Sept. 18, 21, 1942; minimum daily, 2.7 second-feet Dec. 12, 1941.

Remarks.- Records fair. No diversion above station. Canal diverts water for irrigation from right bank of South Concho River 600 feet above station at Christoval. Water Service Report to the State Board of Water Engineers indicates 1,200 acres irrigated during current year.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	11	9.4	10.1	622
November.....	11	10	10.6	633
December.....	10	6.6	9.36	575
Calendar year 1947.....	12	4.2	9.27	6,710
January.....	7.1	5.8	6.46	397
February.....	8.9	5.6	6.01	346
March.....	9.6	5.8	7.63	469
April.....	10	7.6	9.02	537
May.....	8.7	5.8	7.18	441
June.....	9.4	7.9	8.73	519
July.....	12	8.9	10.9	672
August.....	11	8.7	9.43	580
September.....	11	6.2	8.84	526
Water year 1947-48.....	12	5.6	8.70	6,320

Note.- Stage affected by flood runoff May 26-28, July 6-8; discharge used for irrigation interpolated.

## Middle Concho River near Tankersly, Tex.

Location.- Water-stage recorder and masonry control, lat. 31°22'35", long. 100°36'50", at Twelvemile Bridge, 3 miles northeast of Tankersly, Tom Green County, and 9½ miles upstream from Spring Creek. Datum of gage is 1,919.5 feet above mean sea level, datum of 1923.

Drainage area.- 1,280 square miles, of which 152 square miles is probably noncontributing.

Records available.- February 1930 to September 1948.

Average discharge.- 18 years, 43.8 second-feet.

Extremes.- Maximum discharge during year, 30,500 second-feet July 6 (gage height, 23.73 feet, from rating curve extended above 11,000 second-feet on basis of computed flow over Nasworthy Dam, 12 miles downstream, corrected for inflow and storage for flood of Sept. 26, 1936; no flow at times.

1930-48: Maximum discharge, 35,900 second-feet Sept. 26, 1946 (gage height, 24.30 feet, from floodmark), from rating curve extended above 11,000 second-feet as noted above; no flow at times.

Maximum stage known, about 27.2 feet in April 1922, from information by State Highway Department.

Remarks.- Records good. Small diversions for irrigation above station affect low flow.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used July 6-8, Sept. 26-30)

1.91	0	2.5	8.4	3.4	89	4.6	525	9.0	2,270
2.0	.9	2.6	11.2	3.6	141	5.0	685	11	3,400
2.1	1.9	2.8	19.0	3.8	200	6.0	1,050	13	4,700
2.3	4.6	3.0	31	4.0	265	7.0	1,380	15	6,100
2.4	6.3	3.2	52	4.3	365	8.0	1,770	16	6,900

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0		0	22		0	21	2.9		0
2			0		0	9.0		0	2.9	1.5		0
3			406		0	4.5		0	1.3	.6		0
4			116		0	2.4		0	.4	.4		0
5			14		0	3.1		0	5.2	55		0
6			3.1		0	1.6		0	2.2	6,700		0
7			1.1		0	0		0	.9	5,330		0
8			0		0	.3		0	0	1,210		0
9			0		0	.7		0	0	312		97
10			0		0	.5		0	0	110		83
11			0		0	0		4.8	0	52		20
12			0		0	0		.2	0	31		6.8
13			0		0	0		0	0	23		.7
14			0		0	0		0	0	15		.7
15			0		0	0		0	0	11		0
16			0		0	0		0	0	7.6		0
17			0		0	6		0	0	5.8		0
18			0		0	0		0	0	4.3		0
19			0		0	0		0	0	3.2		0
20			0		0	0		0	0	2.4		0
21			0		0	0		0	0	1.8		770
22			0		0	0		0	0	1.4		2,620
23			0		0	0		0	0	1.1		132
24			0		0	0		0	0	.6		30
25			0		0	0		0	0	.5		15
26			0		0	0		1,510	396	.3		7.4
27			0		356	136		274	0	0		4.3
28			0		199	0		47	35	0		2.8
29			0		49	20		12	0	0		1.7
30			0		0	0		9.4	5.8	0		1.0
31			0		-	0		4.7	-	0		-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	540.2	406	0	17.4	1,070
Calendar year 1947.....	4,134.5	1,050	0	11.3	8,200
January.....	0	0	0	0	0
February.....	604	356	0	20.8	1,200
March.....	44.1	22	0	1.42	87
April.....	0	0	0	0	0
May.....	1,732.1	1,510	0	55.9	3,440
June.....	756.7	396	0	25.2	1,500
July.....	13,883.6	6,700	0	448	27,540
August.....	0	0	0	0	0
September.....	3,794.1	2,620	0	126	7,530
Water year 1947-48.....	21,354.8	6,700	0	58.3	42,370

Peak discharge (base, 1,700 sec.-ft.).- Dec. 3 (3:30 p.m.) 2,820 sec.-ft.; May 26 (8:30 a.m.) 5,680 sec.-ft.; July 6 (5 p.m.) 30,500 sec.-ft.; Sept. 22 (5:30 a.m.) 7,010 sec.-ft.



## Spring Creek near Tankersly, Tex.

Location.- Water-stage recorder and concrete control, lat. 31°21'30", long. 100°32'05", 2½ miles upstream from mouth and 6½ miles east of Tankersly, Tom Green County. Datum of gage is 1,874.6 feet above mean sea level, datum of 1929.

Drainage area.- 734 square miles.

Records available.- February 1930 to September 1948.

Average discharge.- 18 years, 37.2 second-feet.

Extremes.- Maximum discharge during year, 14,800 second-feet July 6 (gage height, 16.83 feet); no flow at times.

1930-48: Maximum discharge, 26,900 second-feet Aug. 23, 1942 (gage height, 21.37 feet), from rating curve extended above 18,000 second-feet; no flow at times.

Maximum stage known, about 26.0 feet in 1882, from information by local residents.

Remarks.- Records fair. Several small diversions above station for irrigation.

Revisions (water year).- W 928: 1936.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	2.8	0.8	1.7	9.1	0.1	0.3	0
2					0	2.6	.8	1.5	8.8	.1	.3	0
3					0	2.3	.8	1.2	5.3	.1	.3	0
4					0	2.2	.9	1.0	3.2	.5	.2	0
5					0	2.2	.9	.9	5.3	1.8	.2	0
6					0	2.1	.9	.7	2.8	2,460	.2	0
7					0	2.2	.8	.7	1.6	598	.3	0
8					0	2.6	.8	.7	1.2	74	.3	0
9					0	2.1	.8	.8	1.1	29	.3	0
10					0	2.0	.7	.8	1.0	12	.3	0
11					.3	2.0	.8	.8	1.1	7.4	.3	0
12					1.1	2.0	.6	21	.8	4.8	.3	0
13					.6	2.0	.5	6.8	.9	3.5	.2	0
14					.4	1.7	.5	2.8	.5	3.1	.1	0
15					.8	1.6	.5	2.0	.5	2.3	.1	0
16					.8	1.6	.5	1.7	.4	2.0	.1	0
17					1.0	1.6	.4	1.6	.4	1.6	.1	0
18					1.1	1.6	.3	1.4	.4	1.5	.1	0
19					1.5	1.6	.3	1.3	.4	1.2	.1	0
20					1.0	1.5	.3	1.2	.4	1.1	.1	0
21					1.2	1.4	.3	1.1	.1	1.1	.1	350
22					1.3	1.1	.3	1.1	.1	1.1	.1	1,840
23					1.4	1.2	.4	1.1	.1	.9	.2	112
24					1.5	1.2	.3	.8	.1	1.0	.1	30
25					1.7	1.2	251	.8	.1	.9	0	14
26					2.0	1.1	73	1,330	1.4	.7	0	5.4
27					20	1.1	12	200	.3	.5	0	2.9
28					11	1.0	4.1	52	.1	.4	0	2.0
29					4.2	.9	2.3	19	.1	.4	0	1.6
30					-	.8	2.0	12	.1	.4	0	1.4
31					-	.7	-	10	-	.4	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947 .....	1,210.4	56	0	3.32	2,400
January.....	0	0	0	0	0
February.....	52.7	20	0	1.82	105
March.....	52.0	2.8	.7	1.68	103
April.....	358.4	251	.3	11.9	711
May.....	1,678.5	1,330	.7	54.1	3,330
June.....	47.7	9.1	.1	1.59	95
July.....	3,211.7	2,460	.1	104	6,370
August.....	4.7	.3	0	.15	.3
September.....	2,359.3	1,840	0	78.6	4,690
Water year 1947-48.....	7,765.0	2,460	0	21.2	15,400

Peak discharge (base, 300 sec.-ft.).- Apr. 25 (1 p.m.) 637 sec.-ft.; May 26 (7 a.m.) 4,250 sec.-ft.; July 6 (8 p.m.) 14,800 sec.-ft.; Sept. 22 (6 a.m.) 4,560 sec.-ft.

## Dove Creek near Knickerbocker, Tex.

Location.- Water-stage recorder, lat.  $31^{\circ}12'$ , long.  $100^{\circ}41'$ , in Irion County, upstream from Knickerbocker-Rawls ranch road crossing, a quarter of a mile downstream from Stilson diversion dam, three-quarters of a mile upstream from Kepler Creek, 2 miles downstream from Dove Creek Spring, and 7 miles southwest of Knickerbocker, Tom Green County.

Records available.- November 1944 to September 1948.

Extremes.- Maximum gage height during year, 6.85 feet May 26 (discharge not determined); no flow at times.  
1944-48: Maximum gage height 7.08 feet July 6, 1945 (discharge not determined); no flow at times.

Remarks.- Records fair except those for periods of no gage-height record, which are poor. As the primary purpose of this station is to measure low or spring flow, discharge not computed for flows greater than about 15 second-feet. Diversions for irrigation above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	2.3	0	0	3.4	3.1	2.0	1.6	0.8	1.7	2.4	0.9
2	1.3	2.0	0	0	.1	.1	.1	.1	.7	.4	.2	.1
3	1.4	2.1	.1	0	.1	.1	.1	.1	.7	.6	.3	.1
4	1.4	2.0	.1	0	.1	.1	.1	.1	.8	.6	.3	.1
5	1.5	1.9	.1	0	.1	.1	0	.1	.6	.4	.3	.1
6	1.5	1.9	.1	0	.1	.1	.1	.1	.6	(e)	.3	.1
7	1.6	1.8	.1	0	.1	.1	.1	.1	.6	(e)	.2	.1
8	1.6	1.7	.1	0	.1	.1	0	.1	.5	.2	.3	.1
9	1.6	1.7	.1	0	.1	.1	.1	.1	.5	.2	.3	0
10	1.7	1.8	.1	0	.1	.1	.1	.1	.4	.2	.2	0
11	1.7	1.6	0	0	.1	.1	.1	(e)	.4	.1	.3	.1
12	1.8	1.7	0	0	.1	.1	.1	.1	.2	.1	.2	.1
13	1.8	1.7	0	0	.1	.1	.1	.1	.4	.1	.2	.1
14	1.9	1.7	0	.2	.1	.1	.1	.1	.4	3.0	.3	.1
15	1.9	1.7	0	5.9	4.3	4.0	3.2	6.6	6.8	11	.3	.8
16	1.9	1.6	0	6.4	7.2	6.9	6.2	8.2	7.4	11	7.2	6.2
17	2.0	2.1	0	6.7	7.4	6.9	6.4	8.5	7.2	11	7.2	6.2
18	2.0	1.7	0	6.7	7.4	7.2	6.4	8.5	7.2	10	7.2	6.4
19	2.1	1.5	0	6.4	7.2	6.9	6.9	8.5	7.2	11	6.9	6.4
20	2.1	1.4	0	6.7	7.4	6.7	8.6	8.2	7.2	11	6.9	6.4
21	2.2	1.3	0	6.7	7.2	6.7	6.4	7.9	7.2	11	6.9	(e)
22	2.2	1.3	0	6.9	6.9	6.7	6.9	7.9	7.2	10	6.9	(e)
23	2.2	1.4	0	6.7	6.9	6.7	6.4	7.9	7.2	10	6.9	11
24	2.3	1.3	0	6.7	6.9	6.7	(e)	7.9	6.9	10	6.7	7.2
25	2.3	1.2	0	6.7	6.9	6.7	(e)	(e)	7.4	9.8	7.2	7.4
26	2.7	1.2	0	6.7	8.9	6.7	7.2	(e)	9.2	9.6	6.9	7.7
27	2.5	1.1	0	6.7	7.2	6.7	7.2	12	6.9	9.8	6.7	7.7
28	2.9	.1	0	6.7	7.4	6.7	7.2	9.3	6.4	9.6	6.7	7.9
29	2.9	0	0	6.7	7.4	6.7	7.4	9.6	6.7	9.6	6.7	8.2
30	2.3	0	0	6.7	-	6.7	7.7	9.8	6.7	7.3	6.7	8.2
31	2.3	0	0	6.7	-	6.7	-	3.0	-	9.6	6.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	60.1	2.7	1.3	1.94	119
November	44.8	2.3	0	1.49	89
December	.8	.1	0	.03	1.6
Calendar year 1947	717.1	-	0	1.96	1,420
January	112.9	6.9	0	3.64	224
February	111.3	8.9	.1	3.84	221
March	116.7	7.2	.1	3.76	231
April	-	-	0	-	-
May	-	-	.1	-	-
June	122.4	9.2	.2	4.08	243
July	-	-	.1	-	-
August	116.5	7.2	.2	3.76	231
September	-	-	0	-	-
Water year	-	-	-	-	-

e Stage above limits of rating; discharge not determined.

Note.- No gage-height record Oct. 2-21, Jan. 26 to Feb. 2; discharge computed on basis of recorded range in stage, weather records, and information by local residents.

## Dove Creek Spring near Knickerbocker, Tex.

Location.- Staff gage, lat.  $31^{\circ}11'$ , long.  $100^{\circ}44'$ , at W. G. Rawls ranch house, 200 feet downstream from spring, 300 feet upstream from confluence with Dove Creek,  $1\frac{1}{2}$  miles upstream from Stilson Dam, and about  $8\frac{1}{2}$  miles southwest of Knickerbocker, Tom Green County.

Records available.- April 1944 to September 1948 (discharge measurements only).

Extremes.- Maximum discharge measured during year, 9.85 second-feet Sept. 28; minimum measured, 6.37 second-feet Apr. 20.

1944-48: Maximum discharge measured, 17.2 second-feet Aug. 23, 1944; minimum measured, that of Apr. 20, 1948.

Remarks.- Discharge measurements represent total flow of springs. Flow emerges from limestone outcrop at left bank of draw that extends upstream for about 1 mile, and responds to rainfall on Edwards Plateau. Water used for irrigation below station.

Discharge measurements, in second-feet, of Dove Creek Spring near Knickerbocker, Tex., 1947-48

Date	Discharge	Date	Discharge	Date	Discharge
Oct. 22	7.43	Apr. 20	6.37	Aug. 27	7.84
Dec. 12	7.30	May 7	7.80	Sept. 28	9.85
Feb. 3	6.70	June 12	9.67		
Mar. 15	6.68	July 20	9.82		

North Concho River at Sterling City, Tex.

Location.- Water-stage recorder and concrete control, lat. 31°50', long. 100°59', at county highway bridge, 0.3 mile south of Sterling City, Sterling County, and 4 miles upstream from Sterling Creek. Datum of gage is 2,242.4 feet above mean sea level, datum of 1929.

Drainage area.- 690 square miles, of which 75 square miles is probably noncontributing.

Records available.- September 1939 to September 1948.

Extremes.- Maximum discharge during year, 26,000 second-feet July 6 (gage height, 23.70 feet), from rating curve extended above 2,800 second-feet on basis of slope-area determination at gage height 23.52 feet; no flow at times.

1939-48: Maximum discharge, that of July 6, 1948; no flow at times.

Maximum stage known prior to 1939, 22.4 feet May 6, 1891, from information by local residents.

Remarks.- Records good. Small diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0				0	0.5	0.1	0	0	0.3	0.8	0
2	0				0	.3	0	0	0	0	.8	0
3	0				0	.2	.1	0	0	0	.7	0
4	0				0	.2	.1	0	0	0	.6	0
5	0				0	.1	0	0	0	192	.6	0
6	0				0	.2	0	0	0	12,700	.6	0
7	0				0	.2	0	0	0	3,060	.4	0
8	0				0	.3	0	0	0	121	.2	0
9	0				0	.3	0	0	0	20	0	0
10	0				0	.2	0	0	0	9.8	.1	0
11	0				0	.2	0	0	0	6.3	.1	0
12	0				0	.2	0	0	0	4.5	0	0
13	0				0	.2	0	0	0	3.2	0	0
14	0				0	.2	0	0	0	2.8	0	0
15	0				0	.1	0	0	0	2.1	0	0
16	0				0	.2	0	0	0	1.6	0	0
17	0				0	.2	0	0	0	1.3	0	0
18	0				0	.3	0	0	0	1.0	0	0
19	0				0	.3	0	0	0	1.0	0	0
20	0				0	.1	0	0	0	.8	0	0
21	0				0	258	0	0	0	.6	0	35
22	0				0	18	0	0	0	.5	0	356
23	0				0	3.7	0	0	0	.5	0	111
24	0				0	2.2	0	0	0	26	0	7.6
25	24				0	.8	0	0	174	14	0	2.2
26	8.0				0	.6	0	37	799	5.4	0	1.4
27	.5				29	.5	0	11	37	1.9	0	.4
28	0				4.4	.4	0	2.8	8.6	1.0	0	.1
29	0				.9	.4	0	.3	1.8	.9	0	0
30	0				-	.3	0	0	.6	.2	0	0
31	0				-	.1	-	0	-	.7	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	32.5	24	0	1.05	64
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947 .....	1,479.9	655	0	4.05	2,930
January.....	0	0	0	0	0
February.....	34.3	29	0	1.18	68
March.....	289.5	258	.1	9.34	574
April.....	.3	.1	0	.01	.6
May.....	51.1	37	0	1.65	101
June.....	1,021.0	799	0	34.0	2,030
July.....	16,179.7	12,700	0	522	32,090
August.....	4.9	.8	0	.16	9.7
September.....	513.7	356	0	17.1	1,020
Water year 1947-48 .....	18,127.0	12,700	0	49.5	35,960

Peak discharge (base, 300 sec.-ft.)- Mar. 21 (10:45 a.m.) 884 sec.-ft.; June 26 (1:45 a.m.) 3,120 sec.-ft.; June 26 (7:30 p.m.) 309 sec.-ft.; July 6 (10:30 a.m.) 26,000 sec.-ft.; Sept. 21 (11:30 p.m.) 485 sec.-ft.; Sept. 22 (5:30 p.m.) 1,070 sec.-ft.

## North Concho River near Carlsbad, Tex.

Location.- Water-stage recorder above spillway of State Sanatorium Dam, lat. 31°36', long. 100°40', 2 miles upstream from Carlsbad, Tom Green County. Datum of gage is 2,000.8 feet above mean sea level, datum of 1929.

Drainage area.- 1,529 square miles, of which 123 square miles is probably noncontributing.

Records available.- March 1924 to September 1948.

Average discharge.- 24 years, 52.2 second-feet.

Extremes.- Maximum discharge during year, 47,800 second-feet July 6 (gage height, 14.14 feet), from rating curve extended above 5,000 second-feet on basis of slope-area determinations at gage heights 11.5, 14.45, and 16.0 feet; no flow Oct. 1 to Dec. 2, 1924-48; Maximum discharge, 94,600 second-feet Sept. 26, 1936 (gage height, 16.0 feet, from highest floodmarks known), by slope-area method; no flow at times.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Diversions by pumping above station affect low flow (combined capacity of pumps, 40 second-feet); low flow also partly regulated by small reservoir above station.

Revisions (water year).- W 748: 1930(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	3.2	3.4	5.0	4.5	1.5	87	4.4	3.3	0.1
2			0	3.6	3.4	4.8	4.6	1.5	17	2.5	5.0	.1
3			120	3.6	3.5	4.6	4.6	1.5	4.5	1.7	3.3	.1
4			42	4.2	3.6	4.4	4.6	1.4	1.8	1.7	2.2	.1
5			3.8	4.2	3.3	4.1	4.6	1.0	1.2	159	1.7	.1
6			.9	5.4	3.3	3.6	4.6	.7	.8	17900	1.7	.1
7			14	6.1	3.3	3.9	4.7	.6	.6	17900	1.7	.1
8			3.0	5.4	3.3	3.4	4.7	.5	.4	793	1.5	.1
9			.9	6.2	3.3	4.5	4.7	.4	.3	113	1.5	.1
10			.5	6.2	3.3	3.4	4.7	.3	.1	70	1.4	.1
11			.4	6.9	3.3	2.1	4.7	.3	.1	42	1.2	.1
12			.3	6.2	3.3	2.1	4.8	.3	.1	27	1.0	.1
13			.4	5.6	3.3	2.1	4.8	.4	.5	20	.8	.1
14			.3	6.3	3.6	2.1	4.8	.4	.4	16	.6	.1
15			.6	6.3	3.6	2.1	5.4	.4	.2	12	.6	.1
16			.9	5.6	3.3	2.1	5.4	.2	.1	9.8	.6	.1
17			1.2	5.1	3.6	2.1	4.9	.1	.1	7.9	.5	.1
18			1.9	5.1	3.3	2.1	4.9	.1	.1	7.1	.5	.1
19			1.6	5.7	3.3	2.1	4.9	.1	.1	5.6	.4	.1
20			1.7	5.1	3.0	2.1	4.9	.1	.1	4.9	.4	.1
21			1.9	3.3	3.0	2.1	4.9	.1	.1	4.9	.3	.1
22			2.2	3.0	3.0	153	5.6	.1	.1	3.8	.3	338
23			4.5	2.7	3.0	26	14	.1	.1	3.8	.3	145
24			5.1	3.0	3.0	11	8.6	.1	.1	3.2	.2	43
25			3.4	3.0	3.0	6.4	4.4	.1	.1	2.8	.2	19
26			2.6	3.1	16	5.7	3.5	.1	1,320	2.4	.2	8.9
27			3.4	3.1	98	5.0	3.8	.1	114	4.3	.2	5.2
28			4.0	3.2	13	5.1	3.8	.1	30	4.3	.2	4.4
29			3.5	3.2	6.4	4.5	3.4	.1	11	2.8	.2	3.8
30			3.5	3.3	-	3.4	2.2	.1	7.2	2.5	.2	3.3
31			3.1	3.3	-	4.0	-	.1	-	2.2	.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	231.6	120	0	7.47	459
Calendar year 1947.....	10,393.0	6,960	0	28.5	20,610
January.....	140.2	6.9	2.7	4.52	278
February.....	215.7	98	3.0	7.44	428
March.....	288.9	153	2.1	9.32	573
April.....	150.0	14	2.2	5.00	298
May.....	12.8	1.5	.1	.41	25
June.....	1,598.2	1,320	.1	53.3	3,170
July.....	37,034.6	17,900	1.7	1,195	73,460
August.....	32.4	5.0	.2	1.05	64
September.....	572.7	338	.1	19.1	1,140
Water year 1947-48.....	40,277.1	17,900	0	110	79,900

Peak discharge (base, 1,400 sec.-ft.)- June 26 (7 a.m.) 3,230 sec.-ft.; July 6 (11:45 p.m.)

47,800 sec.-ft.  
Note. No gage-height record Jan. 25 to Feb. 3, Sept. 2-23, 30; discharge interpolated, or computed on basis of records for stations at Sterling City and San Angelo. Stage below crest of control May 18-31, June 16-25 and Aug. 25 to Sept. 1; flow is estimated seepage under dam.

## North Concho River at San Angelo, Tex.

Location.- Water-stage recorder above concrete dam, lat.  $31^{\circ}27'56''$ , long.  $100^{\circ}28'51''$ , at Sixth Street Bridge in San Angelo, Tom Green County, 34 miles upstream from confluence with South Concho River. Datum of gage is 1,813.4 feet above mean sea level, datum of 1929. Former gage at site 1.6 miles downstream at datum 13.02 feet lower.

Drainage area.- 1,795 square miles, of which 123 square miles is probably noncontributing.

Records available.- October 1915 to September 1931, July 1947 to September 1948.

Average discharge.- 14 years (1916-27, 1929-31, 1947-48), 59.6 second-feet.

Extremes.- 1947: Maximum discharge during period July to September, 8.0 second-feet

Aug. 21 (gage height, 2.07 feet); no flow most of time.

1947-48: Maximum discharge during water year, 33,700 second-feet July 7 (gage

height, 18.30 feet); no flow at times.

1915-31, 1947-48: Maximum discharge, about 47,000 second-feet June 13, 1930 (gage

height, 22.52 feet, site and datum then in use); no flow at times.

Flood of Sept. 17, 1936, reached a stage of 34.6 feet, from floodmarks (discharge,

184,000 second-feet, by slope-area method).

Remarks.- Records good. Diversions above station for irrigation.

Revisions (water years).- W 568: 1916-22.

## Discharge, in second-feet, 1947-48

1947-48												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0		0		0	9.5	1.2	0.2	227	3.8	4.8	0
2	0		0		0	6.4	1.2	.1	55	5.3	36	0
3	0		0		0	5.3	.9	0	11	4.4	15	0
4	0		28		0	4.1	.7	0	7.1	19	8.0	0
5	0		20		0	1.9	.7	0	16	648	6.4	0
6	0		5.8		0	1.7	.5	0	3.4	11,500	5.3	0
7	0		1.7		0	1.5	.3	0	2.2	21,900	3.0	0
8	38		1.0		0	1.5	.2	0	1.1	1,630	1.9	0
9	20		.8		0	1.5	0	0	.9	227	1.5	0
10	.8		.5		0	1.5	0	0	.6	110	1.4	0
11	.2		.3		0	1.4	0	245	.4	94	.9	0
12	0		.2		0	1.5	0	2.8	1.6	71	.7	0
13	0		.1		0	1.1	0	.8	4.2	52	.5	0
14	0		.1		0	.6	0	.4	1.0	36	.5	0
15	0		.1		0	.4	0	.2	.4	28	.4	0
16	0		.1		0	.3	0	.1	.1	22	.4	0
17	0		0		0	.2	0	0	0	32	.4	.2
18	0		0		0	.1	0	0	0	17	.4	.4
19	0		0		0	.1	0	0	0	13	.3	.5
20	0		0		0	.4	0	0	0	11	.2	.5
21	0		0		0	.7	0	0	0	11	.2	73
22	0		.1		0	29	0	0	0	5.3	.2	416
23	0		0		0	71	0	0	0	8.0	.1	572
24	0		0		0	25	0	0	0	7.1	.1	150
25	0		0		0	15	30	0	0	7.1	0	63
26	0		0		18	9.5	1.8	650	1,400	6.4	0	28
27	0		0		363	6.4	2.3	19	479	8.0	0	15
28	0		0		48	4.4	1.6	5.3	76	7.1	0	8.0
29	0		0		15	2.3	.9	1.4	25	5.3	0	6.4
30	0		0		-	1.6	.5	.5	12	4.8	0	5.3
31	0		0		-	1.4	-	.4	-	4.8	0	-

Peak discharge (base 900 sec.-ft.)- Feb. 27 (12:30 a.m.) 924 sec.-ft.; May 11 (5 a.m.) 1,530 sec.-ft.; May 26 (8:30 a.m.) 5,270 sec.-ft.; June 1 (12 m.) 1,270 sec.-ft.; June 26 (1 p.m.) 3,060 sec.-ft.; July 7 (8:30 a.m.) 33,700 sec.-ft.; Sept. 22 (11:45 p.m.) 1,410 sec.-ft.

Monthly discharge, in second-feet, 1947-48

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
July 21-31, 1947.....	0	0	0	0	0
August.....	3.9	3.1	0	.13	7.7
September.....	0	0	0	0	0
The period.....					7.7
October 1947.....	59.0	38	0	1.90	117
November.....	0	0	0	0	0
December.....	58.8	28	0	1.90	117
January 1948.....	0	0	0	0	0
February.....	444	363	0	15.3	881
March.....	207.5	71	.1	6.69	412
April.....	42.8	30	0	1.43	85
May.....	926.2	650	0	29.9	1,840
June.....	2,324.0	1,400	0	77.5	4,610
July.....	36,498.4	21,900	3.8	1,177	72,390
August.....	86.6	36	0	2.86	176
September.....	1,338.3	572	0	44.6	2,650
Water year 1947-48.....	41,987.6	21,900	0	115	83,280

## Brownwood Reservoir near Brownwood, Tex.

Location.- Water-stage recorder, lat. 31°50', long. 99°00', at outlet structure for irrigation canal, just upstream from right end of dam on Pecan Bayou, a quarter of a mile downstream from Jim Ned Creek, and 8 miles north of Brownwood, Brown County. Datum of gage is 0.5 foot below mean sea level, datum of 1929. Prior to May 13, 1948, staff gages at or near present site and to same datum, except water-stage recorder Nov. 21, 1944, to July 22, 1946.

Drainage area.- 1,535 square miles.

Records available.- July 1933 to May 1941, November 1944 to September 1948.

Extremes.- 1947-48: Maximum contents observed during year, 135,100 acre-feet Jan. 14, 16 (gage height, 1,423.1 feet); minimum observed, 106,900 acre-feet Dec. 5 (gage height, 1,418.5 feet).

1933-41, 1944-48: Maximum contents observed 185,400 acre-feet Sept. 10, 1935 (gage height, 1,429.4 feet); minimum observed, 11,900 acre-feet July 15, 1934 (gage height, 1,389.5 feet).

Remarks.- Reservoir first filled during flood of July 3, 4, 1932. Dam completed in 1933 and operation began July 1933. Total capacity, 149,600 acre-feet (gage height, 1,425.1 feet, crest of emergency spillway). Reservoir is formed by earthen-fill dam, 1,580 feet long. Uncontrolled emergency spillway consisting of broad-crested weir 476 feet long located 800 feet to left of dam. Reservoir can be drained by two 12-foot (horseshoe-shaped) reinforced concrete conduits with bottom of invert at gage height 1,330.0 feet. Water for irrigation, municipal, and industrial use can be withdrawn through a 6-foot circular concrete conduit with bottom at gage height 1,406.0 feet. Water used for irrigation, municipal, and industrial supply for city of Brownwood.

Cooperation.- Record of daily gage height furnished by Brown County Water Improvement District. Capacity table furnished by Corps of Engineers.

Capacity table (gage height, in feet, and contents, in acre-feet)  
(Prepared by Corps of Engineers from soundings by Soil Conservation  
Service to gage height 1,425.5 feet; above from plane table  
survey by Corps of Engineers)

1,340	4	1,365	920	1,390	12,500	1,415	88,600
1,345	20	1,370	1,700	1,395	20,200	1,420	115,200
1,350	60	1,375	2,900	1,400	31,500	1,425.1 (Spillway crest)	149,600
1,355	165	1,380	4,600	1,405	46,000	1,430	191,000
1,360	420	1,385	7,500	1,410	65,000		

Gage height and contents on days indicated, 1933-41, 1944-48

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
July 1, 1933.....	1,408.3	57,800	-
July 31.....	1,406.5	51,000	-6,800
Aug. 31.....	1,406.0	49,300	-1,700
Sept. 30.....	*1,405.5	47,600	-1,700
Water year.....	-	-	-
Oct. 1, 1933.....	1,405.5	47,600	-
Oct. 31.....	1,404.8	45,400	-2,200
Nov. 30.....	1,404.5	44,400	-1,000
Dec. 31.....	1,404.4	44,100	-300
Calendar year.....	-	-	-
Jan. 31, 1934.....	1,404.4	44,100	0
Feb. 28.....	1,404.2	43,500	-600
Mar. 31.....	1,406.1	49,600	+6,100
Apr. 30.....	1,410.6	68,600	+19,000
May 31.....	1,412.5	76,400	+7,800
June 30.....	1,409.9	64,600	-11,800
July 15.....	1,389.5	11,900	-
Aug. 31.....	-	-	-
Sept. 30.....	-	-	-
Water year.....	-	-	-
Jan. 31, 1935.....	-	-	-
Feb. 12.....	1,392.8	16,400	-
Apr. 1.....	1,392.2	15,500	-
Apr. 30.....	1,404.9	45,700	-
May 31.....	1,421.8	126,300	+80,600
June 30.....	1,424.6	147,300	+21,000
July 31.....	1,422.4	130,300	-17,000
Aug. 31.....	1,419.9	114,600	-15,700
Sept. 30.....	1,424.1	142,200	+27,600
Water year.....	-	-	-

\* Reading of Oct. 1.

Gage height and contents on days indicated of Brownwood Reservoir near Brownwood, Tex., 1933-41,  
1944-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Sept. 30, 1935.....	1,424.1	142,200	-
Oct. 31.....	1,422.3	129,600	-12,600
Nov. 30.....	1,419.2	110,700	-18,900
Dec. 31.....	1,418.2	105,300	-5,400
Calendar year.....	-	-	-
Jan. 31, 1936.....	1,418.0	104,200	-1,100
Feb. 29.....	1,417.9	103,700	-500
Mar. 31.....	1,417.5	101,600	-2,100
Apr. 30.....	1,418.9	109,100	+7,500
May 31.....	1,421.1	121,800	+12,700
June 30.....	1,421.7	125,700	+3,900
July 31.....	1,423.2	135,800	+10,100
Aug. 31.....	1,421.6	125,000	-10,800
Sept. 30.....	*1,426.8	162,800	+37,800
Water year 1935-36.....	-	-	+20,600
Oct. 1, 1936.....	1,426.8	162,800	-
Oct. 31.....	1,424.6	145,900	-16,900
Nov. 30.....	1,422.1	128,300	-17,600
Dec. 31.....	1,420.1	115,800	-12,500
Calendar year 1936.....	-	-	+10,500
Jan. 31, 1937.....	1,418.6	107,400	-8,400
Feb. 28.....	1,418.2	105,300	-2,100
Mar. 31.....	1,418.2	105,300	0
Apr. 30.....	1,418.0	104,200	-1,100
May 31.....	1,417.5	101,600	-2,600
June 30.....	1,420.9	120,600	+19,000
Aug. 1.....	1,420.8	120,300	-300
Aug. 31.....	1,419.8	114,100	-5,900
Sept. 30.....	1,419.5	112,400	-1,700
Water year 1936-37.....	-	-	-50,400
Sept. 30, 1937.....	1,419.5	112,400	-
Oct. 31.....	1,419.7	113,500	+1,100
Nov. 30.....	1,419.4	111,800	-1,700
Dec. 31.....	1,419.8	114,100	+2,300
Calendar year 1937.....	-	-	-1,700
Jan. 31, 1938.....	1,420.0	115,200	+1,100
Feb. 28.....	1,419.8	114,100	-1,100
Mar. 31.....	1,419.9	114,600	+500
Apr. 30.....	1,419.9	114,600	0
May 31.....	1,417.9	103,700	-10,900
June 30.....	1,419.4	111,800	+8,100
July 31.....	1,425.2	150,300	+38,500
Aug. 31.....	1,423.0	134,400	-15,900
Sept. 30.....	1,420.6	118,800	-15,600
Water year 1937-38.....	-	-	+6,400
Sept. 30, 1938.....	1,420.6	118,800	-
Oct. 31.....	1,420.9	120,600	+1,800
Nov. 30.....	1,420.6	118,800	-1,800
Dec. 31.....	1,420.4	117,600	-1,200
Calendar year 1938.....	-	-	+3,500
Jan. 31, 1939.....	1,421.6	125,000	+7,400
Feb. 28.....	1,421.4	123,800	-1,200
Mar. 31.....	1,421.1	121,800	-2,000
Apr. 30.....	1,421.1	121,800	0
May 31.....	1,425.8	154,500	+33,100
June 30.....	1,424.9	148,100	-6,800
July 31.....	1,422.8	133,000	-15,100
Aug. 31.....	1,422.9	133,700	+700
Sept. 30.....	1,419.9	114,600	-19,100
Water year 1938-39.....	-	-	-4,200
Sept. 30, 1939.....	1,419.9	114,600	-
Oct. 31.....	1,419.3	111,500	-3,300
Nov. 30.....	1,419.0	109,600	-1,700
Dec. 31.....	1,418.8	108,500	-1,100
Calendar year 1939.....	-	-	-9,100
Jan. 31, 1940.....	1,418.5	106,900	-1,600
Feb. 29.....	1,418.5	106,900	0
Mar. 1.....	1,418.5	106,900	-
Apr. 8.....	1,422.4	130,300	-
May 31.....	-	-	-
June 17.....	1,425.3	151,100	-
July 31.....	-	-	-
Aug. 18.....	1,426.6	161,200	-
Sept. 25.....	1,422.2	129,000	-
Water year.....	-	-	-

\* Reading of Oct. 1.



Gage height and contents on days indicated of Brownwood Reservoir near Brownwood, Tex., 1933-41,  
1944-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Jan. 31, 1941.....	-	-	-
Feb. 23.....	1,425.5	152,600	-
Mar. 31.....	-	-	-
Apr. 29.....	1,427.5	168,600	-
May 25.....	1,426.0	156,400	-
The period.....	-	-	-
Sept. 30, 1944.....	-	-	-
Oct. 31.....	-	-	-
Nov. 30.....	1,422.8	133,000	-
Dec. 31.....	1,422.3	129,600	-3,400
Calendar year.....	-	-	-
Jan. 31, 1945.....	1,424.7	146,600	+17,000
Feb. 18.....	1,424.1	142,200	-
Mar. 20.....	1,424.7	146,600	-
Apr. 30.....	-	-	-
May 31.....	1,422.8	133,000	-
June 30.....	1,423.2	135,800	+2,800
July 17.....	1,425.1	149,600	-
Aug. 31.....	-	-	-
Sept. 30.....	-	-	-
Water year.....	-	-	-
Oct. 29, 1945.....	1,422.2	129,000	-
Nov. 30.....	1,421.6	125,000	-
Dec. 31.....	1,421.1	121,800	-3,200
Calendar year 1945.....	-	-	-7,800
Jan. 31, 1946.....	1,421.2	122,500	+700
Feb. 28.....	1,421.3	123,100	+600
Mar. 31.....	1,422.0	127,600	+4,500
Apr. 30.....	1,422.1	129,300	+700
May 3.....	1,422.2	129,000	-
June 30.....	-	-	-
July 22.....	1,421.9	127,000	-
Aug. 31.....	-	-	-
Sept. 30.....	-	-	-
Water year.....	-	-	-
Sept. 30, 1946.....	-	-	-
Oct. 31.....	-	-	-
Nov. 4.....	1,425.3	151,100	-
Jan. 1, 1947.....	1,423.5	138,000	-
Calendar year.....	-	-	-
Jan. 25, 1947.....	1,424.5	145,200	-
Feb. 28.....	-	-	-
Mar. 15.....	1,422.0	127,600	-
Apr. 30.....	-	-	-
May 17.....	1,422.5	131,000	-
June 30.....	-	-	-
July 31.....	-	-	-
Aug. 31.....	-	-	-
Sept. 30.....	-	-	-
Water year.....	-	-	-
Sept. 30, 1947.....	-	-	-
Oct. 16.....	1,418.8	108,500	-
Nov. 30.....	-	133,000	-
Dec. 31.....	-	-	-
Calendar year.....	-	-	-
Jan. 31, 1948.....	1,422.0	127,600	-5,400
Feb. 28.....	1,421.9	127,000	-600
Mar. 31.....	1,421.5	124,400	-2,600
Apr. 30.....	1,421.6	124,400	0
May 31.....	†1,421.2	122,500	-1,900
June 30.....	†1,421.4	123,800	+1,300
July 31.....	†1,421.7	125,700	+1,900
Aug. 31.....	†1,420.8	120,000	-5,700
Sept. 30.....	†1,420.9	120,600	+600
Water year.....	-	-	-

\* Estimated.

† Gage height at 12 p.m.

## Pecan Bayou at Brownwood, Tex.

Location.- Water-stage recorder above spillway of city dam, lat. 31°44'10" N., long. 98°58'30" W., at Gulf, Colorado & Santa Fe Railway bridge, 1 mile north of Brownwood, Brown County, 6 miles downstream from Salt Creek, and 10 miles downstream from Brownwood Reservoir. Datum of gage is 1,318.58 feet above mean sea level, datum of 1929.

Drainage area.- 1,614 square miles.

Records available.- May 1917 to June 1918, October 1923 to September 1948.

Average discharge.- 23 years (1924-28, 1929-48), 190 second-feet.

Extremes.- Maximum discharge during year, 1,710 second-feet Dec. 7 (gage height, 3.12 feet); no flow Oct. 1 to Dec. 6.

1917-18, 1923-48: Maximum discharge, 52,700 second-feet Oct. 14, 1930 (gage height, 16.92 feet), from rating curve extended above 38,000 second-feet; no flow at times.

Maximum stage known, 21.7 feet in September 1900, from information by Gulf, Colorado & Santa Fe Railway Co. Flood of July 3, 1932, probably the greatest known, reached a discharge of about 235,000 second-feet as it entered Brownwood Reservoir (computed from rate of change of contents in reservoir; data furnished by engineers of Brown County Water Improvement District No. 1).

Remarks.- Records poor. Stage-discharge relation for low flows affected by occasional accumulation of drift on dam. Flow regulated by Brownwood Reservoir (see preceding page). Water is diverted at Brownwood Reservoir, 10 miles upstream, for irrigation and for municipal supply of City of Brownwood. Irrigation canal completed Apr. 9, 1939. According to records furnished the State Board of Water Engineers by the Brown County Water Improvement District No. 1, 4,200 acres were irrigated during the year.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	11	1.9	2.0	0.7	0.7	0.5	158	0.4	0.3
2				1.1	2.5	1.3	.7	.6	.5	80	.4	.5
3			0	.6	2.5	1.1	.7	.6	.5	7.8	.4	.3
4			0	.6	2.0	1.1	.7	.6	.5	6.4	.4	.3
5			0	.3	2.0	1.1	.7	.7	.5	5.1	.3	.3
6			0	.6	2.0	1.6	.7	.6	.5	4.1	.3	.3
7			419	.4	2.0	2.0	.6	.6	.5	3.2	.3	.2
8			3.7	.6	2.0	1.1	.6	.6	.5	2.3	.3	.47
9			.9	.6	2.6	1.1	.6	.6	.5	1.7	.3	170
10			.4	.6	4.4	1.3	.7	6.5	.5	1.3	.3	3.0
11			.1	.8	3.5	1.1	.6	99	.5	1.0	.3	.4
12			0	1.1	2.6	1.1	.6	6.8	.5	.6	.3	.2
13			0	.4	2.6	1.6	.6	1.5	.5	.5	.3	.2
14			0	.3	2.6	1.3	16	1.0	.5	.4	.3	.2
15			1.3	.4	2.6	1.3	121	.7	.5	.4	.3	.2
16			2.9	.4	3.5	1.3	125	.6	.5	.4	.3	.2
17			1.0	.3	2.6	.9	117	.5	.5	.4	.3	.2
18			.7	.3	3.5	.9	10	.6	.5	.4	.3	.2
19			.5	.7	2.0	1.1	1.5	.6	.5	.4	.3	.2
20			.5	.9	1.3	1.1	1.2	.6	.5	.4	.3	.2
21			.3	.9	1.1	1.3	1.0	.5	.5	.4	100	.2
22			.3	1.2	.9	1.1	.8	.6	.5	.4	134	.2
23			.3	1.0	1.3	.9	1.2	.5	.5	.4	134	.2
24			.3	.6	1.3	.9	1.2	.5	.5	.4	87	.2
25			.3	.6	4.4	.9	4.3	.5	.5	.4	3.1	.2
26			.7	.8	4.4	.9	2.5	2.7	346	.4	.7	.2
27			1.4	.9	20	.9	1.5	7.2	254	.4	.7	.2
28			2.0	1.1	5.4	.8	1.0	.6	158	.4	.3	.2
29			2.0	1.1	2.6	.8	.8	.5	158	.4	.3	.2
30			.7	1.8	-	.8	.7	.5	158	.4	.3	.2
31			2.0	1.9	-	.7	-	.5	-	.4	.3	-
Month						Second-foot-days		Maximum	Minimum	Mean	Runoff in acre-feet	
October.....						0		0	0	0	0	
November.....						0		0	0	0	0	
December.....						441.3		419	0	14.2	875	
Calendar year 1947 .....						6,222.3		419	0	17.0	12,340	
January.....						33.9		11	.3	1.09	67	
February.....						92.1		20	.9	3.18	183	
March.....						35.4		2.0	.7	1.14	70	
April.....						415.2		125	.6	13.8	824	
May.....						138.6		99	.5	4.47	275	
June.....						1,086.5		346	.5	36.2	2,160	
July.....						279.2		158	.4	9.01	554	
August.....						467.1		134	.3	15.1	926	
September.....						226.4		170	.2	7.55	449	
Water year 1947-48.....						3,215.7		419	0	8.79	6,380	

Note.- No gage-height record June 26 to July 25; discharge computed on basis of partial record June 26 and record of water released from Brownwood Reservoir.

COLORADO RIVER BASIN

161

Hords Creek Reservoir near Valera, Tex.

Location.- Water-stage recorder and wire-weight gage, lat. 31°51'00", long. 99°33'35", at Hords Creek dam on Hords Creek, 5.3 miles northwest of Valera, Coleman County, and 8.8 miles west of Coleman. Datum of gage is at mean sea level, datum of 1929.

Drainage area.- 48 square miles.

Records available.- April to September 1948.

Extremes.- Maximum contents observed during period, 1,470 acre-feet July 31 to Aug. 3 (elevation, 1,875.1 feet).

Remarks.- Reservoir is formed by a rolled-fill earthen type dam 6,284 feet long; gates closed Apr. 7, 1948; dam completed June 10, 1948. Reservoir is operated for flood control and municipal supply for city of Coleman.

Outlet works consist of three concrete conduits, two of which are controlled by Pekdul slide gates at elevation 1,856.0 feet. The third conduit (service spillway) is uncontrolled. In addition, there is a 500-foot emergency earthen spillway located to the right of the dam. Capacity, 25,310 acre-feet at elevation 1,920.0 feet (top of emergency spillway) and 8,635 acre-feet at elevation 1,900.0 feet (top of service spillway). Water can be withdrawn for municipal use down to elevation 1,876.5 feet. Dead storage is negligible.

Capacity table (elevation in feet, and capacity, in acre-feet)  
(Prepared by Corps of Engineers from plane table survey)

1,850	0	1,857	42	1,868	563	1,890	4,630	1,925	32,480
1,851	1.0	1,858	62	1,870	776	1,894	5,990	1,930	41,480
1,852	3.0	1,859	88	1,872	1,030	1,899	8,140	1,935	52,630
1,853	6.0	1,860	118	1,874	1,310	1,904	10,900	1,940	66,020
1,854	11	1,862	194	1,878	1,940	1,910	15,150		
1,855	18	1,864	286	1,882	2,650	1,915	19,650		
1,856	27	1,866	401	1,886	3,530	1,920	25,310		

Monthly elevation and contents April to September 1948

Date	Elevation (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Jan. 31.....	-	-	-
Feb. 29.....	-	-	-
Mar. 31.....	-	-	-
Apr. 30.....	(a)	190	+190
May 31.....	(a)	167	-23
June 30.....	1,861.4	170	+3
July 31.....	1,875.1	1,470	+1,300
Aug. 31.....	1,874.2	1,340	-130
Sept. 30.....	1,873.6	1,250	-90
The period 1948.....	-	-	+1,250

a No gage-height record; contents interpolated.  
Note.- Elevations at various times during day.

## San Saba River at Menard, Tex.

Location.- Water-stage recorder, lat. 30°55', long. 99°47', at bridge on U. S. Highway 83 in Menard, Menard County, 0.7 mile downstream from Las Moras Creek. Datum of gage is 1,863.05 feet above mean sea level, datum of 1929.

Drainage area.- 1,151 square miles.

Records available.- September 1915 to September 1948.

Average discharge.- 33 years, 71.0 second-feet.

Extremes.- Maximum discharge during year, 2,390 second-feet Sept. 9; maximum gage height, 8.15 feet Aug. 1; no flow Aug. 14-28.

1915-48: Maximum discharge, 117,000 second-feet July 23, 1938 (gage height, 22.2 feet, present site and datum, from floodmark), from rating curve extended above 60,000 second-feet on basis of slope-area determinations at gage heights 21.0 and 22.2 feet; no flow at times caused by diversions to Noyes Canal.

Maximum stage known, 23.3 feet June 5 or 6, 1899, present site and datum, from information by local residents.

Remarks.- Records good. Low flow during irrigation season regulated by diversions to Noyes Canal, 4 miles above Menard. About 4,300 acres above and 7,700 acres below gage have been declared irrigated (see records for Noyes Canal at Menard).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8	6.6	7.9	9.5	10	32	7.0	7.0	3.4	16	174	.6
2	8.8	6.3	7.9	9.9	10	30	6.3	1.7	15	16	.7	
3	8.5	6.3	8.5	9.5	11	30	5.4	2.2	18	1.7	.9	
4	8.2	5.7	10	9.5	12	30	5.4	6.3	2.4	18	1.3	1.3
5	8.2	3.8	13	9.5	12	30	5.4	6.0	2.2	20	1.4	1.6
6		5.1	11	9.9	11	32	6.6	5.7	2.4	20	.8	1.0
7	7.9	5.7	18	9.9	12	31	7.3	5.7	2.0	22	.8	.8
8	7.9	5.1	17	11	12	32	6.3	5.7	1.8	22	.9	1.1
9	11	5.4	14	11	11	30	6.0	5.4	1.9	19	.7	736
10	7.6	6.0	12	11	11	30	5.7	4.8	3.8	17	.5	95
11	7.6	6.6	11	10	10	30	5.1	5.1	3.8	15	.5	32
12	7.6	6.6	10	11	10	31	5.1	6.6	3.2	16	.4	16
13	7.0	6.3	10	11	10	31	6.3	7.0	2.6	15	.4	10
14	6.6	7.6	10	10	9.9	31	4.3	7.3	1.9	7.3	0	10
15	6.6	8.2	10	10	11	32	4.0	7.0	1.5	5.4	0	18
16	6.6	7.9	10	10	31	32	3.6	6.6	1.9	2.2	0	19
17	6.6	8.5	10	11	32	26	5.5	6.3	2.8	2.0	0	18
18	7.0	9.5	10	11	32	8.5	6.0	6.3	2.8	3.4	0	18
19	7.3	9.9	10	9.9	31	5.1	5.3	5.1	2.2	3.6	0	19
20	7.3	9.2	9.9	10	30	4.8	66.0	3.0	1.9	3.4	0	20
21	7.3	8.2	9.2	11	28	6.3	6.0	8.4	1.8	3.2	0	21
22	7.3	8.5	9.2	11	31	5.4	7.8	15	1.2	1.9	0	43
23	5.7	8.5	9.2	10	30	4.3	9.5	13	1.1	1.0	0	113
24	4.8	7.9	9.2	9.9	30	4.8	10	4.3	12	.9	0	43
25	6.3	7.9	9.2	9.9	32	5.1	21	2.6	7.3	1.3	0	25
26	7.0	7.3	9.2	10	35	5.7	14	5.4	8.2	1.4	0	19
27	7.9	7.6	9.5	10	38	7.3	10	5.4	15	1.4	0	16
28	7.9	7.3	9.2	10	35	7.3	8.8	4.0	25	1.0	0	16
29	7.6	7.3	9.5	9.9	32	6.3	8.5	3.2	19	.7	.2	14
30	7.0	7.3	8.5	10	-	4.6	7.3	3.0	15	.7	.3	13
31	7.0	-	8.8	10	-	5.7	-	3.4	-	.2	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	229.9	11	4.8	7.42	456
November.....	214.1	9.9	3.8	7.14	425
December.....	320.9	18	7.9	10.4	636
Calendar year 1947 .....	7,036.3	1,280	3.2	19.3	13,950
January.....	316.3	11	9.5	10.2	627
February.....	609.9	38	9.9	21.0	1,210
March.....	601.2	32	4.3	19.4	1,190
April.....	214.7	21	3.6	7.16	426
May.....	167.2	15	2.6	6.04	371
June.....	154.0	25	1.1	5.13	305
July.....	274.0	22	.2	8.84	543
August.....	200.3	174	0	6.46	397
September.....	1,342.0	736	.6	44.7	2,660
Water year 1947-48 .....	4,664.5	736	0	12.7	9,250

Peak discharge (base, 670 sec.-ft.)- Aug. 1 (5:30 p.m.) 2,240 sec.-ft.; Sept. 9 (7:15 a.m.) 2,390 sec.-ft.

d Doubtful gage-height record; discharge computed on basis of records for Noyes Canal.

## San Saba River at San Saba, Tex.

Location.- Water-stage recorder, lat. 31°12'10", long. 98°42'15", at bridge on San Saba-Chadwick Mill Highway, three-quarters of a mile northeast of San Saba, San Saba County, and 15 miles upstream from mouth. Datum of gage is 1,153.3 feet above mean sea level, datum of 1929.

Drainage area.- 3,046 square miles.

Records available.- August 1930 to September 1948. December 1904 to December 1906 and September 1915 to August 1930 at site 4½ miles upstream.

Average discharge.- 33 years (1915-48), 270 second-feet.

Extremes.- Maximum discharge during year, 4,660 second-feet May 11 (gage height, 19.99 feet); minimum, 17 second-feet June 23 (gage height, 3.00 feet).

1904-6, 1915-48: Maximum discharge, 203,000 second-feet July 23, 1938 (gage height, 45.18 feet, from floodmarks at highest stage known), by slope-area method; no flow Aug. 9, 10, 1918, July 17-20, 31, 1930.

Maximum stage known prior to 1938, 42.6 feet June 6, 1899, from information by local resident.

Remarks.- Records good. Diversions above station for irrigation and municipal uses affect low flow.

Revision (water years).- W 458: 1915, 1916, W 718: 1922.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	25	51	66	63	83	37	55	241	58	60	23
2	25	25	52	67	64	78	37	52	130	58	1,360	23
3	24	25	60	63	66	75	37	46	83	68	286	22
4	24	27	72	60	66	73	38	44	60	105	106	22
5	24	30	66	59	66	69	39	43	49	323	63	22
6	24	30	64	61	64	68	39	281	41	170	56	22
7	24	30	322	63	63	70	40	82	37	87	54	21
8	24	28	352	61	62	68	39	46	34	89	63	20
9	26	29	276	59	60	67	37	38	32	79	37	634
10	26	32	164	56	58	66	37	35	30	67	33	1,200
11	32	33	119	55	59	65	36	2,760	30	114	30	452
12	31	34	95	54	60	65	47	1,530	26	382	28	252
13	38	34	86	52	60	65	47	258	25	155	25	183
14	32	39	78	52	60	64	39	151	25	91	24	118
15	29	49	77	52	59	65	38	105	25	61	23	89
16	28	52	76	53	60	63	36	82	23	50	23	70
17	29	48	72	52	61	61	34	67	22	43	23	60
18	37	47	69	52	61	60	34	59	22	38	23	52
19	31	48	68	52	62	61	34	54	22	34	23	50
20	28	48	68	53	60	59	33	50	22	33	23	44
21	26	48	66	55	56	58	33	46	22	30	23	42
22	25	49	65	57	58	76	33	44	20	28	22	43
23	27	59	62	56	61	64	94	42	19	26	22	498
24	27	65	64	56	63	57	47	41	23	25	22	317
25	26	64	64	54	377	52	280	39	118	25	22	136
26	26	53	64	55	124	50	202	43	1,270	23	25	111
27	27	50	64	58	115	46	176	42	297	23	32	95
28	27	49	65	58	105	43	112	39	175	23	30	76
29	28	51	65	55	88	42	76	38	116	23	25	62
30	27	51	65	60	-	42	62	38	78	22	23	53
31	27	-	68	60	-	39	-	699	-	22	23	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	875	51	24	28.2	1,740
November.....	1,252	65	25	41.7	2,480
December.....	2,999	352	51	96.7	5,950
Calendar year 1947 .....	30,173	1,550	22	82.7	59,860
January.....	1,766	67	52	57.0	3,500
February.....	2,281	377	56	78.7	4,520
March.....	1,914	83	39	61.7	3,800
April.....	1,873	280	33	62.4	3,720
May.....	6,949	2,760	35	224	13,780
June.....	3,117	1,270	19	104	6,180
July.....	2,375	382	22	76.6	4,710
August.....	2,632	1,360	22	84.9	5,220
September.....	4,794	1,200	20	160	9,510
Water year 1947-48 .....	32,827	2,760	19	89.7	65,110

Peak discharge (base, 4,500 sec.-ft.)- May 11 (9 p.m.) 4,660 sec.-ft.

## COLORADO RIVER BASIN

## Noyes Canal at Menard, Tex.

Location.- Water-stage recorder, lat. 30°55', long. 99°47', at intersection of Canal and Gay Streets in Menard, Menard County, 4½ miles downstream from head gates. Datum of gage is 1,878.1 feet above mean sea level, datum of 1929.

Records available.- March 1924 to September 1948.

Average discharge.- 24 years (1924-48), 14.8 second-feet.

Extremes.- Maximum daily discharge during year, 22 second-feet Feb. 3; maximum gage height, 3.70 feet Apr. 24 (affected by local runoff); no flow at times.

1924-48: Maximum daily discharge (exclusive of times canal submerged by waters of San Saba River), 50 second-feet Apr. 15, 1925 (probably affected by local runoff between point of diversion and station); no flow at times.

Remarks.- Records good. Discharge represents flow diverted from San Saba River not including local runoff between point of diversion and station. Canal diverts water from right bank of San Saba River 4 miles above Menard for irrigation near Menard; 10 acres irrigated from canal above station.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	15	10	12.7	781
November.....	19	14	16.7	992
December.....	21	17	18.6	1,140
Calendar year 1947.....	28	0	15.8	11,420
January.....	20	16	18.7	1,150
February.....	22	0	9.90	569
March.....	19	0	6.64	408
April.....	18	14	16.4	974
May.....	16	.8	12.2	749
June.....	14	0	9.29	552
July.....	14	0	5.03	309
August.....	14	5.8	9.14	562
September.....	15	0	5.90	351
Water year 1947-48.....	22	0	11.8	8,540

## Brady Creek at Brady, Tex.

Location.- Water-stage recorder, lat. 31°08'15", long. 99°19'55", just upstream from bridge on North Bridge Street in Brady, McCulloch County, and 0.4 mile downstream from Live Oak Creek. Datum of gage is 1,646.50 feet above mean sea level, datum of 1929.

Drainage area.- 575 square miles.

Records available.- May 1939 to September 1948.

Extremes.- Maximum discharge during year, 6,110 second-feet May 30 (gage height, 12.80 feet); no flow at times.

1939-48: Maximum discharge, 13,900 second-feet Apr. 27, 1941 (gage height, 16.81 feet), from rating curve extended above 8,000 second-feet; no flow at times.

Maximum stage known, 29.1 feet July 23, 1938, present site and datum (discharge at site 5 miles downstream, 86,000 second-feet, by slope-area method).

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			0	0.2	0	0.2	0	0	10	0.1	13	0
2			0	.2	0	.2	0	0	2.9	0	19	0
3			0	.2	0	.1	0	0	.8	1.1	1.6	0
4			0	.1	0	.1	0	0	.2	.8	.4	0
5			0	.1	0	.1	0	0	.1	.3	.2	0
6			0	.1	0	.1	0	0	a.1	32	.1	0
7			324	.1	0	.1	0	0	a.1	1.8	.1	0
8			17	.1	0	.2	0	0	a0	.4	0	0
9			3.2	.1	0	.2	0	0	a0	.3	0	27
10			1.0	.1	0	.2	0	0	a0	.2	0	1.5
11			.3	.1	0	.2	0	.1	a0	.1	0	.2
12			.2	.1	0	.1	0	.1	a0	.1	0	.1
13			.2	.1	0	.1	0	0	a0	.1	0	.1
14			.2	.1	0	.1	0	0	a0	.1	0	0
15			.2	.1	0	.1	0	0	0	0	0	0
16			.2	.1	0	.1	0	0	0	0	0	0
17			.1	.1	0	.1	0	0	0	0	0	0
18			.2	.1	0	.1	0	0	0	0	0	0
19			.2	.1	0	.1	0	0	0	0	0	0
20			.2	.1	0	.1	0	0	0	0	0	0
21			.2	0	0	.1	0	0	0	0	0	0
22			.2	0	0	.1	0	0	0	0	0	0
23			.2	0	0	.1	0	0	0	0	0	0
24			.3	0	0	.1	0	0	.2	0	0	0
25			.3	0	.4	.1	1.5	0	3.6	0	0	0
26			.3	0	.3	.1	.2	0	.4	0	0	0
27			.3	0	.2	.1	.1	0	.2	0	0	0
28			.4	0	.4	.1	0	0	.1	0	0	0
29			.3	0	.2	.1	0	0	.1	0	0	0
30			.2	0	-	0	0	1,250	.1	0	0	0
31			.2	0	-	0	-	.44	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	350.1	324	0	11.3	694
Calendar year 1947.....	1,756.5	715	0	4.81	3,480
January.....	2.3	.2	0	.07	4.6
February.....	1.5	.4	0	.05	3.0
March.....	3.5	.2	0	.11	6.9
April.....	1.8	1.5	0	.06	3.6
May.....	1,294.2	1,250	0	41.7	2,570
June.....	18.9	10	0	.63	37
July.....	37.4	32	0	1.21	74
August.....	34.4	19	0	1.11	68
September.....	28.9	27	0	.96	57
Water year 1947-48.....	1,773.0	1,250	0	4.84	3,520

Peak discharge (base, 2,400 sec.-ft.)- May 30 (5 a.m.) 6,110 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage and engineer's notes.



## North Llano River near Junction, Tex.

Location.- Water-stage recorder, lat. 30°30', long. 99°47', about 1,000 feet upstream from remains of old Wilson Dam, 3 miles northwest of Junction, Kimble County, and 4 miles upstream from confluence with South Llano River. Datum of gage is 1,699.9 feet above mean sea level, datum of 1929.

Drainage area.- 914 square miles.

Records available.- September 1915 to September 1948.

Average discharge.- 33 years, 71.6 second-feet.

Extremes.- Maximum discharge during year, 38,300 second-feet June 24 (gage height, 16.77 feet); minimum, 1.8 second-feet June 16-18, 21-23.  
1915-48: Maximum discharge, 94,800 second-feet Sept. 16, 1936 (gage height, 29.2 feet, present site, based on gage-height relation curve), by slope-area method; no flow at times.

Remarks.- Records good except those above 4,000 second-feet, which are fair. Diversions for irrigation materially reduce low flow.

Revisions (water years).- W 568: 1915, 1918-20, 1922, W 763: 1923(M).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.3	8.2	13	16	13	14	8.8	13	12	117	45	15
2	2.3	8.2	13	16	14	13	8.8	11	10	109	39	14
3	2.0	8.2	14	17	14	12	8.8	11	9.5	101	34	14
4	2.0	8.2	15	17	13	13	9.5	9.5	8.2	94	30	13
5	2.1	8.2	15	16	13	13	9.5	8.2	7.2	922	28	13
6	2.1	8.2	15	16	13	13	9.5	7.7	7.2	752	26	12
7	2.5	8.2	16	16	13	13	8.8	7.2	6.8	532	27	12
8	2.8	8.2	22	17	13	13	8.8	7.2	5.4	266	25	56
9	2.8	8.8	26	17	13	14	8.8	7.2	4.6	173	24	834
10	2.5	8.8	22	17	13	14	8.8	6.8	3.8	131	24	74
11	2.5	8.8	21	17	12	13	8.8	110	3.8	145	23	46
12	2.8	9.8	20	17	13	13	8.2	245	3.5	107	21	36
13	2.5	10	18	17	13	14	9.5	71	3.3	96	21	30
14	2.1	11	18	16	13	14	8.8	44	2.8	87	20	26
15	2.5	11	20	16	13	13	9.5	34	2.1	78	19	24
16	2.5	11	20	15	13	13	9.5	26	2.1	72	19	24
17	2.3	13	18	15	12	12	9.5	23	1.8	68	19	24
18	2.3	14	17	15	12	12	9.5	18	2.1	62	19	24
19	2.3	14	18	15	12	12	8.8	17	2.1	57	18	23
20	2.3	14	17	15	12	11	8.2	15	2.1	54	18	22
21	2.1	14	17	15	11	15	8.2	12	2.0	50	17	20
22	2.1	15	17	15	12	15	9.4	11	1.8	48	16	47
23	2.3	15	17	14	12	11	14	10	2.0	46	16	98
24	2.3	14	17	14	13	11	12	9.5	12,500	42	15	54
25	2.8	13	17	14	13	11	47	35	5,930	41	15	41
26	41	13	17	14	14	10	24	46	2,310	39	15	33
27	21	13	17	14	16	9.5	20	26	941	37	15	30
28	14	13	17	14	15	9.5	17	21	284	36	14	28
29	11	13	17	14	15	9.5	15	17	186	34	14	27
30	9.5	13	16	14	-	8.8	14	15	145	32	15	26
31	8.2	-	16	14	-	8.8	-	13	-	30	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	163.8	41	2.0	5.28	325
November.....	334.8	15	8.2	11.2	664
December.....	545	26	13	17.6	1,080
Calendar year 1947.....	9,382.5	1,210	2.0	25.7	16,610
January.....	479	17	14	15.5	950
February.....	378	16	11	13.0	750
March.....	378.1	15	8.8	12.2	750
April.....	361.0	47	8.2	12.0	716
May.....	907.3	245	6.8	29.3	1,800
June.....	22,402.2	12,500	1.8	747	44,430
July.....	4,458	922	3.0	144	8,840
August.....	669	45	14	21.6	1,330
September.....	1,740	834	12	58.0	3,450
Water year 1947-48.....	32,816.2	12,500	1.8	89.7	65,080

Peak discharge (base, 1,200 sec.-ft.)- June 24 (9 p.m.) 38,300 sec.-ft.; June 26 (10 a.m.) 3,920 sec.-ft.; July 5 (3:30 p.m.) 2,200 sec.-ft.; Sept. 9 (4:30 a.m.) 5,220 sec.-ft.

## Llano River near Junction, Tex.

Location.- Water-stage recorder, lat. 30°30', long. 99°44', 250 feet north of old Kerrville-Junction road, about half a mile downstream from point where slough diverts flood-water from main channel, 3 miles east of Junction, Kimble County, 4 miles downstream from confluence of North Llano and South Llano Rivers and 4½ miles upstream from Johnson Fork. Datum of gage is 1,630.32 feet above mean sea level, datum of 1929. An auxiliary water-stage recorder at site 5,335 feet upstream at datum 6.00 feet higher, is used in computing discharge of major floods.

Drainage area.- 1,762 square miles.

Records available.- September 1915 to September 1948.

Average discharge.- 33 years, 215 second-feet.

Extremes.- Maximum discharge during year, 122,000 second-feet June 24 (gage height, 29.50 feet, auxiliary gage); minimum, 26 second-feet June 21-23.

1915-48: Maximum discharge, 319,000 second-feet June 14, 1935 (gage height, 43.3 feet, present site and datum, from floodmarks; 41.4 feet, auxiliary gage, from floodmarks), by slope-area method; minimum, 13 second-feet Aug. 23-28, 1918.

Remarks.- Records good. Small diversions above station for irrigation. Discharge June 24-29, July 5, 6 computed from auxiliary water-stage recorder.

Revisions.- W 568: 1915, 1916, 1918-20, 1922, drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	34	42	53	57	59	57	47	40	61	568	186	91
2	33	42	53	57	59	57	47	40	59	463	188	88
3	33	42	53	57	61	57	47	40	55	415	170	88
4	34	44	55	57	63	57	47	39	51	370	161	88
5	34	44	55	57	63	57	47	39	47	13,500	157	85
6	34	44	55	57	63	57	45	38	45	14,160	148	85
7	34	45	61	57	63	55	45	38	44	1,440	144	82
8	35	45	66	57	63	55	45	36	40	784	140	94
9	38	45	68	57	63	55	44	36	36	530	135	1,040
10	36	45	63	57	61	57	44	35	36	444	131	140
11	36	47	61	55	61	55	42	99	35	846	127	144
12	36	47	59	55	61	55	47	460	35	456	127	119
13	36	49	57	55	57	55	45	224	35	392	123	112
14	36	51	57	55	57	55	45	161	34	360	115	108
15	36	51	59	53	57	55	47	131	33	338	115	104
16	35	51	57	53	57	53	45	115	31	312	112	104
17	35	57	59	55	57	51	44	104	30	297	108	101
18	36	59	57	55	57	53	40	91	29	277	104	101
19	36	59	57	57	57	51	39	85	29	262	101	101
20	36	57	59	57	57	51	38	79	29	253	101	98
21	36	55	59	57	57	55	38	74	28	243	98	94
22	36	57	59	57	57	55	39	68	28	233	98	249
23	36	57	57	57	57	51	42	63	28	206	94	384
24	38	57	57	57	57	49	42	61	27,600	215	94	215
25	38	55	57	57	57	49	69	66	45,100	206	94	170
26	53	57	57	59	59	51	51	113	9,680	197	94	148
27	47	55	57	59	61	51	49	88	14,990	192	94	140
28	45	57	57	59	63	47	47	82	1,290	188	91	131
29	44	57	57	59	63	47	44	76	2,440	193	91	127
30	44	57	57	59	63	45	42	71	1,040	174	91	123
31	42	-	57	59	-	45	-	66	-	168	91	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,162	53	33	37.5	2,300
November.....	1,530	59	42	51.0	3,030
December.....	1,797	68	53	58.0	3,560
Calendar year 1947.....	25,547	996	33	70.0	50,660
January.....	1,759	59	53	56.7	3,490
February.....	1,727	63	57	59.6	3,430
March.....	1,843	57	45	53.0	3,260
April.....	1,348	69	38	44.9	2,670
May.....	2,758	460	35	89.0	5,470
June.....	93,018	45,100	28	3,101	184,600
July.....	28,670	13,500	166	925	56,870
August.....	3,723	198	91	120	7,380
September.....	4,754	1,040	82	158	9,430
Water year 1947-48.....	143,889	45,100	28	393	285,400

Peak discharge (base, 2,100 sec.-ft.)- June 24 (10:30 p.m.) 122,000 sec.-ft.; June 29 (9:30 a.m.) 4,300 sec.-ft.; July 5 (12 m.) 36,800 sec.-ft.; Sept. 9 (5:30 a.m.) 4,500 sec.-ft.  
 f Computed on basis of partly estimated gage-height record.

## Llano River at Llano, Tex.

Location.- Water-stage recorder, lat. 30°45', long. 98°40', in Llano, Llano County, 0.4 mile downstream from bridge on State Highway 16 and 7 miles upstream from Little Llano River. Datum of gage is 970.0 feet above mean sea level, datum of 1929.

Drainage area.- 4,000 square miles.

Records available.- September 1939 to September 1948.

Extremes.- Maximum discharge during year, 108,000 second-feet June 25 (gage height, 22.90 feet, from floodmark); minimum daily, 10 second-feet June 22, 23.

1939-48: Maximum discharge, that of June 25, 1948; minimum daily, 3.0 second-feet Aug. 21-29, 1946.

Maximum stage known, 41.5 feet June 14, 1935, from information by local resident.

Remarks.- Records fair except those for June 19-24, which are poor. Low flow regulated by power plant half a mile upstream. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	42	66	81	80	136	58	76	79	1,540	177	56
2	22	35	58	70	92	100	50	61	71	1,020	323	82
3	22	45	56	70	92	89	46	46	52	1,020	279	82
4	28	35	74	70	100	74	50	48	54	1,120	223	74
5	17	31	65	72	98	82	54	52	46	1,020	202	64
6	32	38	71	78	92	70	50	35	43	15,900	193	73
7	23	38	76	72	94	77	52	35	46	4,310	164	66
8	24	30	78	71	92	68	50	40	34	2,070	152	72
9	27	38	84	72	99	78	52	24	31	1,230	147	285
10	32	37	106	67	80	70	52	37	g20	950	140	1,350
11	50	38	103	78	87	76	44	688	40	1,080	128	629
12	50	38	121	70	88	70	48	1,930	29	1,080	128	356
13	48	44	86	75	77	73	48	682	34	950	124	214
14	28	49	57	70	88	68	55	484	41	642	107	168
15	17	49	88	76	84	72	42	387	g18	542	105	130
16	29	54	84	66	79	68	72	271	g16	482	102	112
17	33	54	88	70	82	71	46	201	g16	397	104	100
18	26	64	74	66	81	62	46	155	31	361	100	100
19	30	58	79	80	83	73	51	114	g13	327	95	102
20	22	72	67	64	62	60	42	98	g11	293	92	90
21	26	78	73	81	88	76	42	94	g11	281	80	66
22	28	98	68	74	84	79	41	83	g10	265	86	91
23	28	81	68	82	78	82	65	g10	257	84	432	
24	33	94	74	76	80	141	86	64	g12	249	80	736
25	31	103	68	80	760	125	323	54	54,900	245	64	436
26	20	80	70	76	291	87	749	76	13,100	229	454	280
27	32	76	68	80	218	80	407	231	14,400	216	163	204
28	29	78	67	72	145	62	233	199	4,250	206	96	164
29	33	60	80	75	122	60	122	169	1,770	196	82	150
30	34	68	69	72	-	68	88	110	2,560	189	86	128
31	35	-	70	81	-	60	-	84	-	185	80	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	917	50	17	29.6	1,820
November.....	1,703	103	30	56.8	3,380
December.....	2,356	121	56	76.0	4,670
Calendar year 1947 .....	64,209	5,410	14	176	127,400
January.....	2,282	82	64	73.6	4,530
February.....	3,600	760	62	124	7,140
March.....	2,453	141	60	79.1	4,870
April.....	3,183	749	41	106	6,310
May.....	6,693	1,930	24	216	13,280
June.....	91,748	54,900	10	3,058	162,000
July.....	38,611	15,900	185	1,252	76,980
August.....	4,470	454	80	144	8,870
September.....	6,898	1,350	58	230	13,680
Water year 1947-48 .....	165,114	54,900	10	451	327,500

Peak discharge (base; 8,500 sec.-ft.).- June 25 (10 a.m.) 108,000 sec.-ft.; July 6 (3:30 a.m.) 30,700 sec.-ft.

a No gage-height record; discharge computed on basis of records for station near Junction.

d Doubtful gage-height record; discharge computed as explained in footnote a.

g Computed from graph based on gage readings.

Note.- For periods Oct. 1 to Feb. 25, Feb. 28 to Apr. 25, Apr. 29 to May 11, May 18 to June 9, June 11-14, 18, power-plant regulation above station caused stage to fall below intakes of each day; discharge computed on basis of partly estimated gage-height record.

COLORADO RIVER BASIN  
Pedernales River near Johnson City, Tex.

169

Location.- Water-stage recorder, lat. 30°18', long. 98°24', at bridge on U. S. Highway 281, 1.5 miles north of Johnson City, Blanco County, and 1.9 miles downstream from Buffalo Creek. Datum of gage is 1,096.6 feet above mean sea level, unadjusted.

Drainage area.- 947 square miles.

Records available.- May 1939 to September 1948.

Extremes.- Maximum discharge during year, 8,380 second-feet Apr. 13 (gage height, 8.78 feet); minimum, 0.8 second-foot Aug. 24 (gage height, 1.96 feet).

1939-48.- Maximum discharge, 104,000 second-feet Aug. 30, 1944 (gage height, 26.10 feet, from recorder at upstream side of right bridge pier, affected by draw-down; maximum gage height, 27.6 feet, from floodmark on staff gage 50 feet upstream and 300 feet to right of recorder), from rating curve extended above 42,000 second-feet by logarithmic plotting; minimum discharge, that of Aug. 24, 1948.

Maximum stage known, about 33 feet in July 1869, from information by local residents.

Remarks.- Records excellent. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.9	9.8	18	21	26	42	24	40	12	13	32	2.7
2	8.9	9.4	18	23	35	38	26	35	11	41	129	2.2
3	8.9	9.8	20	23	36	35	24	32	10	68	59	2.1
4	8.9	9.8	343	23	38	32	23	28	9.8	173	23	2.1
5	8.9	9.8	81	23	36	30	21	25	8.9	145	12	2.0
6	9.4	10	36	21	40	30	21	28	8.0	188	9.4	1.5
7	9.4	9.8	28	21	43	30	21	28	7.4	58	7.7	1.4
8	9.4	10	26	23	42	30	20	20	6.8	48	6.2	1.3
9	10	10	26	23	38	33	19	19	6.5	29	5.0	2.6
10	10	11	25	21	36	35	25	18	6.5	31	4.0	5.3
11	11	12	23	23	33	43	25	1,210	6.8	251	3.6	11
12	10	13	21	23	30	36	20	423	7.4	407	3.0	9.4
13	11	15	20	21	33	33	2,800	185	5.9	158	2.8	7.1
14	11	18	23	21	29	33	392	88	6.5	70	2.4	5.3
15	10	17	43	21	29	30	158	59	8.9	42	1.8	4.8
16	9.8	16	42	21	28	29	91	43	7.4	29	1.6	4.4
17	9.4	18	35	20	26	28	64	35	6.2	20	1.4	4.6
18	9.4	23	30	20	28	26	50	29	5.0	17	1.4	5.6
19	9.4	24	28	25	26	26	42	30	4.4	14	1.2	4.8
20	8.9	26	26	26	25	26	35	23	3.8	12	1.1	4.4
21	8.9	21	25	26	24	26	32	19	3.4	11	1.0	4.8
22	8.9	29	24	25	25	49	29	18	3.2	10	.9	48
23	11	35	23	23	25	29	36	16	3.0	8.9	.9	220
24	11	35	23	23	28	26	40	15	345	8.0	.9	55
25	10	30	21	23	30	25	358	14	168	7.4	1.3	19
26	11	24	21	23	39	24	370	13	149	6.8	1.4	11
27	11	20	21	25	62	23	156	21	71	6.2	1.5	8.0
28	11	19	21	21	50	30	85	23	36	5.6	1.8	6.2
29	11	18	23	26	47	40	59	16	23	5.0	3.0	5.0
30	11	18	23	24	-	30	47	14	16	4.6	4.2	4.6
31	11	-	24	24	-	25	-	12	-	4.2	5.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	308.4	11	8.9	9.95	612
November.....	530.4	35	9.4	17.7	1,050
December.....	1,161	343	18	37.5	2,300
Calendar year 1947.....	46,494.1	3,010	7.7	127	92,230
January.....	703	26	20	22.7	1,390
February.....	986	62	24	34.0	1,960
March.....	972	49	23	31.4	1,930
April.....	5,110	2,800	19	170	10,140
May.....	2,547	1,210	12	82.2	5,050
June.....	964.8	345	3.0	32.2	1,910
July.....	1,871.7	407	4.2	60.4	3,710
August.....	327.9	129	.9	10.6	650
September.....	466.2	220	1.3	15.5	925
Water year 1947-48.....	15,948.4	2,800	.9	43.6	31,630

Peak discharge (base, 9,800 sec.-ft.).- No peak above base.

Barton Springs at Austin, Tex.

Location.- Lat. 30°16', long. 97°46'. Springs issue from channel and along banks of Barton Creek for a distance of 1,000 feet in Zilker Park at Austin, Travis County. The main spring is near right bank of creek 500 feet upstream from concrete dam forming swimming pool, 1,800 feet upstream from bridge on Austin-Bee Cave Highway, and 0.6 mile upstream from mouth of Barton Creek.

Records available.- October 1918 to September 1926 and October 1940 to September 1948. November 1944 to September 1918, October 1926 to September 1940, discharge published as miscellaneous measurements. Daily discharge record of Barton Creek at Austin, published for period April 1917 to September 1918, closely represents flow of Barton Springs. Summary of all discharge measurements prior to October 1937 is contained in Water-Supply Paper 850.

Extremes.- Maximum discharge measured during year, 48.2 second-feet Oct. 19; minimum measured, 19.1 second-feet Aug. 14.

1894-1948.- Maximum discharge measured, 166 second-feet May 10, 1941; minimum measured, 12.1 second-feet Feb. 26, 1918.

Remarks.- Discharge measurements represent total flow of springs including Old Mill Spring which is on right bank and about 1,000 feet downstream from main spring. Springs emerge from Edwards limestone in Balcones fault zone and respond to rainfall on Edwards Plateau. Water used for recreational purposes.

Discharge measurements, in second-feet, of Barton Creek and determination of discharge of Barton Springs at Austin, Tex., water year October 1947 to September 1948

Date	Barton Creek below springs	Barton Creek above springs	Barton Springs	Date	Barton Creek below springs	Barton Creek above springs	Barton Springs
Oct. 19	48.2	0	48.2	June 12	19.3	0	19.3
Nov. 16	29.1	0	29.1	July 15	24.7	0	24.7
Dec. 18	27.0	0	27.0	Aug. 14	19.1	0	19.1
Jan. 13	26.5	0	26.5	Sept. 4	22.8	0	22.8
Mar. 3	23.3	0	23.3	25	23.5	0	23.5
Apr. 28	21.4	0	21.4				

Dry Creek at Buescher Lake, near Smithville, Tex.

Location.- Water-stage recorder above concrete spillway of dam, lat. 30°03', long. 97°09', in Bastrop-Buescher State Park, 1.9 miles upstream from mouth and 2.2 miles north of Smithville, Bastrop County. Datum of gage is 327.9 feet above mean sea level, datum of 1929.

Drainage area.- 1.48 square miles (area above dam).

Records available.- October 1939 to September 1948.

Extremes.- Maximum 20-minute inflow during year, 86 second-feet May 25; maximum gage height, 18.58 feet Oct. 1; no inflow most of time.  
1939-48: Maximum inflow, 1,870 second-feet June 30, 1940 (gage height, 24.82 feet); maximum gage height, 24.96 feet June 30, 1940 (outflow, 1,670 second-feet, based on spillway rating); no flow most of time.

Remarks.- Records good. Records given herein represent flow into Buescher Lake. No runoff except during and immediately following precipitation. Discharge below gage height 22.27 feet (spillway crest) determined from change in contents of lake; that above gage height 22.27 feet determined by algebraic summation of flow over spillway (computed from spillway curve) and change in contents of lake (computed from capacity curve and reduced to equivalent second-feet). There was no flow over spillway during year. No adjustments made for evaporation or seepage losses. Capacity of lake, 255 acre-feet. No diversion above station or from lake.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	.1	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	.5	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	.2	0	0	.2	0	0	0	0
7	0	0	0	0	.2	0	0	0	0	0	0	0
8	0	0	0	0	.1	0	0	0	0	0	0	.1
9	.2	0	0	0	0	0	0	0	0	0	0	.1
10	0	0	0	0	0	0	0	0	0	.3	0	0
11	0	0	0	0	0	0	0	.5	0	.2	0	0
12	0	0	.2	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	.4	0	0	0	0	0	0	0	0	0
15	0	0	.2	0	0	0	0	0	0	0	0	0
16	0	0	0	.5	0	0	0	0	0	0	0	0
17	0	.3	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	.3	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	.6	0	0	0	0	0	0	0
22	0	0	0	0	0	.2	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	.7	2.8	0	0	.2	0
26	0	0	0	.2	0	0	0	1.7	.2	0	0	0
27	0	0	0	0	.2	0	0	.1	0	0	0	0
28	0	0	0	0	0	0	0	0	.5	0	0	0
29	0	0	0	0	0	0	0	0	.1	0	0	0
30	0	0	0	0	0	0	0	0	.1	0	0	0
31	0	-	.3	0	0	0	-	0	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0.2	0.2	0	0.01	0.4
November.....	.3	.3	0	.01	.6
December.....	1.1	.4	0	.04	2.2
Calendar year 1947.....	129.9	65	0	.36	258
January.....	.7	.5	0	.02	1.4
February.....	1.4	.6	0	.05	2.8
March.....	.2	.2	0	.01	.4
April.....	.7	.7	0	.02	1.4
May.....	5.6	2.8	0	.18	11
June.....	.9	.5	0	.03	1.8
July.....	1.0	.5	0	.03	2.0
August.....	.2	.2	0	.01	.4
September.....	.2	.1	0	.01	.4
Water year 1947-48.....	12.5	2.8	0	.03	25

Peak discharge (base, 70 sec.-ft.) - May 25 (10:15 p.m.) 86 sec.-ft.

## Lavaca River at Hallettsville, Tex.

Location.- Wire-weight gage for low stages and water-stage recorder for high stages, lat. 29°25', long. 96°57', at bridge on U. S. Highway 77 in Hallettsville, Lavaca County, and 0.4 mile upstream from Texas & New Orleans Railroad bridge. Datum of gage is 186.7 feet above mean sea level, datum of 1929.

Drainage area.- 101 square miles.

Records available.- July 1939 to September 1948.

Extremes.- Maximum discharge during year, 3,650 second-feet May 27 (gage height, 18.45 feet); minimum, 0.3 second-foot Aug. 18-26.  
1939-48: Maximum discharge, 93,100 second-feet June 30, 1940 (gage height, 40.60 feet, from floodmarks of highest flood known), by slope-area method; minimum, that of Aug. 18-26, 1948.  
Maximum stage known prior to 1940, 32.8 feet July 16, 1936, from information by local resident.

Remarks.- Records good. Wire-weight gage read twice daily, oftener during high stages and used for computing discharges below about 100 second-feet. No known diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.3	3.0	2.8	7.7	5.3	9.5	5.0	3.8	7.7	25	0.9	0.6
2	1.3	2.8	3.4	6.4	26	8.9	4.8	3.8	6.9	7.1	.9	.5
3	1.3	2.8	4.0	5.0	124	8.3	4.6	3.6	6.2	4.4	.9	.4
4	1.3	2.8	9.3	4.6	30	8.6	5.0	3.6	6.0	21	.8	.4
5	1.4	2.8	17	4.4	17	11	5.3	3.6	4.8	13	.6	.4
6	1.4	2.8	5.7	4.4	12	10	5.5	4.2	4.4	3.8	.6	.4
7	1.5	2.8	4.2	4.4	9.5	9.8	5.0	3.6	4.0	1.8	.6	.4
8	1.3	2.6	4.2	4.4	14	17	4.8	3.2	3.4	7.2	.6	.5
9	1.3	2.8	4.6	4.2	27	57	4.6	3.2	2.4	16	.5	1.4
10	1.3	3.8	4.4	4.2	12	32	4.4	3.2	2.2	2.4	.5	3.6
11	1.3	4.0	4.8	4.2	11	14	4.4	13	2.0	9.0	.5	3.2
12	1.3	3.6	11	5.3	9.5	10	3.8	15	2.0	5.7	.5	2.5
13	1.3	3.2	20	6.0	8.3	9.8	4.6	4.8	1.6	2.6	.4	1.9
14	1.2	3.0	22	5.3	6.9	9.8	6.4	3.8	1.6	1.0	.4	12.1
15	1.2	2.8	132	4.4	6.2	9.8	5.3	3.2	1.4	.8	.4	19
16	1.2	2.6	47	4.0	6.2	8.6	4.6	2.8	1.6	.8	.4	1.9
17	1.2	160	16	4.6	6.0	7.4	4.2	2.5	1.6	.8	.4	2.0
18	1.3	69	9.5	10	6.0	7.4	4.2	2.4	1.4	.8	.4	3.8
19	1.4	13	7.4	9.8	6.0	7.1	4.2	3.2	1.3	.8	.4	8.3
20	1.8	6.4	5.7	15	5.7	6.9	4.2	2.6	1.3	.6	.3	4.6
21	1.6	5.7	5.0	8.0	127	6.6	4.4	2.4	1.3	.8	.3	2.2
22	1.6	11	4.6	6.2	124	7.1	4.6	2.4	1.3	.5	.3	1.3
23	1.4	6.4	4.6	5.5	24	6.6	8.7	2.4	1.3	.5	.3	.9
24	1.6	4.8	4.6	5.3	18	6.2	5.7	2.2	1.6	.8	.3	.8
25	1.4	4.0	4.6	5.5	16	5.7	25	878	1.6	.6	.3	.6
26	1.4	3.8	4.6	6.0	15	6.0	12	343	1.6	.6	.35	.6
27	1.8	3.6	4.4	7.7	17	5.5	6.9	1,200	1.6	.6	.95	.6
28	1.9	3.4	4.6	6.2	16	5.0	6.0	62	1.4	.5	1.6	.5
29	2.8	3.2	4.8	5.7	10	4.8	5.0	26	2.2	.5	.9	.5
30	3.0	2.8	4.8	5.0	-	4.8	4.4	14	11	.5	.6	.5
31	3.0	-	5.3	5.0	-	5.0	-	12	-	.6	.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	47.9	3.0	1.2	1.55	95
November.....	345.3	160	2.6	11.5	685
December.....	386.9	132	2.8	12.5	767
Calendar year 1947 .....	9,732.0	1,340	1.1	26.7	19,320
January.....	184.4	15	4.0	5.95	366
February.....	715.6	127	5.3	24.7	1,420
March.....	326.2	57	4.8	10.5	647
April.....	177.6	25	3.8	5.92	352
May.....	2,633.5	1,200	2.2	85.0	5,220
June.....	88.7	11	1.3	2.96	176
July.....	130.7	25	.5	4.22	259
August.....	60.7	35	.3	1.96	120
September.....	66.4	19	.4	2.21	132
Water year 1947-48 .....	5,163.9	1,200	.3	14.1	10,240

Peak discharge (base, 3,100 sec.-ft.,) - May 27 (4:30 a.m.) 3,650 sec.-ft.  
 † Doubtful gage-height record; discharge computed on basis of weather records and records for nearby stations.

## Lavaca River near Edna, Tex.

Location.- Wire-weight gage, lat. 28°58', long. 96°42', at bridge on U. S. Highway 59, 550 feet upstream from Texas & New Orleans Railroad bridge and 2.8 miles southwest of Edna, Jackson County. Datum of gage is 13.88 feet above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.- 887 square miles.

Records available.- August 1938 to September 1948.

Average discharge.- 10 years (1938-48), 345 second-feet.

Extremes.- Maximum discharge during year, 15,200 second-feet May 27 (gage height, 24.69 feet, from floodmark); minimum observed, 5.5 second-feet Aug. 18.

1938-48: Maximum discharge, 73,000 second-feet July 1, 1940 (gage height, 32.51 feet); minimum observed, 5.2 second-feet July 10, 1939.

Maximum stage known, 33.8 feet May 25, 1936, from information by local resident (discharge, 83,400 second-feet).

Remarks.- Records good. Gage read twice daily, oftener during high stages. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	17	25	31	38	214	43	28	221	72	14	17
2	16	16	24	29	254	113	41	26	175	67	14	14
3	16	17	26	31	857	74	39	25	144	176	12	11
4	16	17	28	38	603	59	39	21	124	158	12	11
5	16	17	35	33	407	106	40	20	110	71	12	11
6	16	17	34	32	249	107	41	21	98	175	11	11
7	18	17	39	31	162	80	40	20	89	129	12	11
8	18	17	34	31	157	192	39	17	82	65	10	11
9	18	17	29	31	146	1,180	38	22	78	48	9.5	18
10	20	18	28	31	98	1,040	37	22	72	41	10	21
11	18	21	29	31	100	374	36	47	84	38	9.5	21
12	18	21	35	34	78	165	36	53	71	36	9.5	20
13	19	21	90	120	65	110	36	35	78	38	8.1	18
14	18	23	72	40	57	89	34	36	63	38	10	22
15	18	21	114	37	51	80	33	31	57	35	9.0	22
16	18	21	97	40	48	74	34	23	53	31	10	23
17	18	22	140	68	44	65	34	23	49	29	8.4	29
18	18	44	64	41	41	57	33	19	47	29	6.4	27
19	15	278	47	68	40	55	29	23	43	24	8.4	93
20	17	87	38	404	40	53	29	20	41	21	8.4	41
21	15	45	36	166	40	52	25	15	40	20	6.4	27
22	15	40	34	105	290	51	26	18	40	18	7.2	23
23	18	34	33	71	560	55	26	22	39	18	9.0	17
24	17	31	31	51	195	52	28	18	36	18	8.1	14
25	16	29	31	44	119	49	67	2,070	38	16	16	12
26	16	34	31	41	91	48	182	11,800	41	16	16	10
27	18	29	30	44	81	47	75	12,400	39	16	23	8.1
28	18	26	31	42	80	45	46	7,840	36	15	22	7.7
29	18	26	31	42	191	44	36	1,800	36	16	22	7.2
30	18	25	31	42	-	44	33	455	38	14	16	7.2
31	18	-	31	38	-	44	-	301	-	14	17	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	533	20	15	17.2	1,060
November.....	1,048	278	16	34.9	2,080
December.....	1,378	140	24	44.5	2,730
Calendar year 1947 .....	60,079	4,290	12	165	119,200
January.....	1,887	404	29	60.9	3,740
February.....	5,182	857	38	179	10,280
March.....	4,818	1,180	44	155	9,560
April.....	1,275	182	25	42.5	2,530
May.....	36,871	12,400	15	1,189	73,130
June.....	2,164	221	36	72.1	4,290
July.....	1,500	176	14	46.4	2,980
August.....	360.9	23	6.4	11.6	716
September.....	585.2	93	7.2	19.5	1,160
Water year 1947-48 .....	57,602.1	12,400	6.4	157	114,300

Peak discharge (base, 4,100 sec.-ft.)- May 27 (1 a.m.) 15,200 sec.-ft.



## Lavaca River seepage investigations

A series of discharge measurements was made Nov. 4, 1947, and Aug. 5, 1948, on Lavaca River between Dr. R. E. Lee's pump, about 3½ miles northwest of Edna, and Koop Brother's pump, about 6½ miles southeast of Edna. Discharge measurements were made of Lavaca River at upper and lower ends of river reach, and at three intervening points. In addition, the quantity of water being diverted from river by each of three pumps was measured. These were all known diversions from this reach of the river at the time the investigation was made. There was no inflow into the reach. The investigations were made during periods of constant stage of river as indicated at gaging station near Edna which is within the reach. The determinations of gain or loss represent normal conditions.

Discharge measurements of Lavaca River, Texas, between pumping plants of Dr. Lee and Koop Bros. near Edna, Tex., 1947-48

Date	Stream or Diversion	Location	Distance below initial point (miles)	Discharge in second-feet			
				Main stream	Diver-sion	Gain or loss in section	Total gain or loss
1947 Nov. 4	Lavaca River...	½ mile below county bridge, about 3½ miles northwest of Edna, Jackson County, Tex. and 150 feet above Dr. Lee's pump.	0	15.6	-	-	-
4	Dr. Lee's pump	3½ miles northwest of Edna, Tex.	0	-	0	-	-
4	Lavaca River...	At regular gaging station on bridge on U. S. Highway 59, 2.8 miles southwest of Edna, Tex.	3	17.6	-	+2.0	+2.0
4	.....do.....	100 feet above Babb's pump and about 3 miles southwest of Edna, Tex.	4.1	17.4	-	-.2	+1.8
4	Babb's pump....	About 3 miles southwest of Edna, Tex.	4.1	-	0	-	-
4	Lavaca River...	300 feet below old county bridge and about 4 miles southwest of Edna, Tex.	6.5	19.4	-	+2.0	+3.8
4	.....do.....	50 feet above Koop Bros. pump and about 6½ miles south of Edna, Tex.	9.5	21.3	-	+1.9	+5.7
4	Koop Bros. pump	About 6½ miles south of Edna, Tex.	9.5	-	0	-	-
1948 Aug. 5	Lavaca River...	½ mile below county bridge, about 3½ miles northwest of Edna, Jackson County, Tex., and 150 feet above Dr. Lee's pump.	0	17.7	-	-	-
5	Dr. Lee's pump	3½ miles northwest of Edna, Tex.	0	-	6.48	-	-
5	Lavaca River...	At regular gaging station on bridge on U. S. Highway 59, 2.8 miles southwest of Edna, Tex.	3	12.7	-	+1.5	+1.5
5	Lavaca River...	30 feet above Babb's pump and about 3 miles southwest of Edna, Tex.	4.1	13.1	-	+.4	+1.9
5	Babb's pump....	About 3 miles southwest of Edna, Tex.	4.1	-	10.5	-	-
5	Lavaca River...	300 feet below old county bridge and about 4 miles southwest of Edna, Tex.	6.5	4.34	-	+1.7	+5.6
6	.....do.....	100 feet above Koop Bros. pump and 6½ miles south of Edna, Tex.	9.5	5.20	-	+.9	+4.5
5	Koop Bros. pump	About 6½ miles south of Edna, Tex.	9.5	-	6.49	-	-

Note.- Discharge measurements made during periods of constant stage. Measurements in November were made when no pumps were operating and none had been operated during the preceding week. Measurements in August were made while all pumps were operating at a constant rate of speed and had been for several days preceding the measurements.

## Navidad River near Ganado, Tex.

Location.- Wire-weight gage, lat. 29°02', long. 96°33', at bridge on U. S. Highway 59, 100 feet upstream from Texas & New Orleans Railroad bridge, a quarter of a mile downstream from Sandy Creek, and 2½ miles southwest of Ganado, Jackson County. Datum of gage is 13.62 feet above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.- 1,116 square miles.

Records available.- May 1939 to September 1948.

Extremes.- Maximum discharge during year, 9,500 second-feet May 27 (gage height, 27.10 feet); minimum observed, 2.2 second-feet Aug. 13, 14, 24.

1939-48: Maximum discharge, 64,500 second-feet July 2, Nov. 26, 1940; maximum gage height, 36.54 feet July 2, 1940, from floodmark; minimum discharge observed, that of Aug. 13, 14, 24, 1948.

Maximum stage known, 39.8 feet May 27, 1936, from information by engineers of Texas & New Orleans Railroad (discharge, 94,000 second-feet, from rating curve extended above 60,000 second-feet).

Remarks.- Records good. Gage read twice daily, oftener during high stages. No large diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	12	22	30	56	1,960	40	41	210	482	4.0	82
2	17	12	22	29	438	1,010	39	34	131	454	2.4	91
3	12	12	24	30	2,680	800	38	30	85	350	3.3	104
4	62	13	25	33	2,480	501	38	27	65	321	2.9	84
5	35	13	43	36	1,820	501	38	19	58	285	2.4	82
6	32	13	234	33	940	520	38	14	50	267	3.3	79
7	22	12	312	30	580	303	38	14	43	183	4.0	77
8	20	12	204	27	444	326	38	15	37	278	4.0	104
9	27	13	115	26	620	2,390	37	14	33	210	3.3	330
10	20	12	69	28	425	2,570	37	9.5	30	293	3.3	330
11	17	13	102	31	368	1,070	35	11	29	190	3.3	454
12	16	18	157	30	368	501	33	69	34	85	2.8	520
13	14	19	560	153	294	250	27	58	97	62	2.4	340
14	13	20	580	183	118	171	18	40	58	48	2.4	186
15	10	19	786	100	93	120	19	30	35	57	2.6	149
16	4.6	18	700	94	78	102	49	18	29	39	3.3	120
17	4.0	36	742	303	68	85	44	12	23	22	3.6	189
18	3.3	330	378	267	61	73	35	16	24	35	4.0	218
19	12	472	210	698	55	63	30	21	28	41	2.9	168
20	9.0	160	114	2,210	53	57	29	102	19	37	3.3	128
21	17	77	82	1,340	106	53	27	87	16	31	2.4	93
22	13	59	64	700	568	52	27	61	13	26	2.9	85
23	12	49	54	378	1,180	50	27	52	12	27	2.9	53
24	12	38	46	189	720	51	19	17	13	21	2.2	44
25	11	34	39	123	454	50	45	496	11	13	4.0	50
26	12	38	33	92	330	47	520	5,480	11	11	7.0	44
27	14	30	32	85	242	45	387	8,960	10	9.0	33	52
28	12	25	34	80	218	42	258	7,100	12	6.5	78	40
29	12	24	32	77	483	41	92	2,260	12	7.5	108	35
30	11	23	31	70	-	40	51	860	21	4.3	78	33
31	13	-	31	61	-	40	-	358	-	2.9	69	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	509.9	62	3.3	16.4	1,010
November.....	1,626	472	12	54.2	3,230
December.....	5,877	786	22	190	11,660
Calendar year 1947.....	105,090.9	5,400	3.3	288	208,400
January.....	7,566	2,210	26	244	15,010
February.....	16,140	2,680	53	557	32,010
March.....	13,684	2,570	40	441	27,140
April.....	2,153	520	18	71.8	4,270
May.....	26,105.5	8,960	9.5	842	51,780
June.....	1,247	210	10	41.6	2,470
July.....	3,877.2	482	2.9	125	7,690
August.....	450.7	108	2.2	14.5	894
September.....	4,344	520	33	145	8,620
Water year 1947-48.....	83,580.3	8,960	2.2	228	165,800

Peak discharge (base, 6,600 sec.-ft.)- May 27 (11 p.m.) 9,500 sec.-ft.

## Guadalupe River at Hunt, Tex.

Location. - Water-stage recorder and concrete control, lat. 30°03', long. 99°19', at bridge on State Highway 39, half a mile downstream from confluence of North and South Forks, 0.6 mile east of Hunt, Kerr County. Datum of gage is 1,722.7 feet above mean sea level, datum of 1929.

Drainage area. - About 370 square miles.

Records available. - October 1941 to September 1948.

Extremes. - Maximum discharge during year, 179 second-feet July 5 (gage height, 2.08 feet); minimum, 6.9 second-feet June 17.

1941-48: Maximum gage height and discharge not determined; minimum discharge, that of June 17, 1948.

Maximum stage known, 36.6 feet July 2, 1932, from information by local resident.

Remarks. - Records excellent. Discharge not computed above 600 second-feet. About 60 acres above station are irrigated.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	26	34	36	33	39	35	30	17	44	24	17
2	28	26	34	34	39	36	34	27	19	34	34	17
3	29	26	35	34	38	34	34	28	19	32	31	19
4	29	27	39	33	35	33	34	30	19	52	27	19
5	28	27	38	32	35	33	34	29	18	112	24	17
6	28	27	39	33	36	33	35	28	18	63	21	16
7	28	27	39	34	36	33	35	25	18	57	21	16
8	28	27	41	34	34	33	34	28	18	46	20	16
9	30	28	39	34	33	48	38	32	17	40	19	49
10	30	29	38	33	32	48	35	29	17	32	19	39
11	28	30	36	33	31	39	33	59	20	35	18	29
12	28	30	36	34	30	38	33	70	22	40	17	25
13	28	32	36	33	30	36	36	63	19	39	17	22
14	29	35	38	32	30	35	53	55	24	33	17	22
15	28	34	41	31	29	35	40	48	22	31	17	21
16	41	32	39	31	33	35	36	42	16	29	16	21
17	30	38	38	31	34	34	34	38	11	26	16	22
18	29	44	36	31	36	34	33	34	10	24	15	23
19	33	40	36	32	31	35	32	32	12	22	15	22
20	31	36	36	34	30	34	31	31	13	22	15	22
21	30	36	36	33	29	35	26	30	13	22	15	22
22	29	44	36	33	28	35	24	29	13	21	15	23
23	29	45	36	32	30	33	53	27	16	21	15	45
24	30	40	36	32	42	33	41	26	64	21	15	39
25	30	36	35	32	79	33	58	27	57	21	15	29
26	30	36	35	32	52	45	52	30	44	20	17	25
27	30	35	35	32	49	41	40	27	39	20	20	23
28	30	34	35	30	43	38	35	25	34	21	19	22
29	30	33	35	31	39	35	33	24	33	22	18	22
30	30	33	36	32	-	34	31	21	34	20	18	34
31	28	-	38	32	-	34	-	19	-	19	17	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	917	41	28	29.6	1,820
November.....	993	45	26	33.1	1,970
December.....	1,140	41	34	36.8	2,260
Calendar year .....	-	-	-	-	-
January.....	1,010	36	30	32.6	2,000
February.....	1,056	39	28	36.4	2,090
March.....	1,121	48	33	36.2	2,220
April.....	1,142	76	24	38.1	2,270
May.....	1,043	70	19	33.6	2,070
June.....	696	64	10	25.2	1,380
July.....	1,041	112	19	33.6	2,060
August.....	587	34	15	18.9	1,150
September.....	738	49	16	24.6	1,460
Water year 1947-48 .....	11,484	112	10	31.4	22,760

Peak discharge. - No discharge published above 600 sec.-ft.

## Guadalupe River at Comfort, Tex.

Location.- Water-stage recorder, lat. 29°58', long. 98°54', at bridge on U. S. Highway 87, a quarter of a mile downstream from Cypress Creek and half a mile east of Comfort, Kendall County. Datum of gage is 1,372.0 feet above mean sea level, datum of 1929.

Drainage area.- About 990 square miles.

Records available.- May 1939 to September 1948. December 1917 to August 1924 at site 5 miles upstream, and August 1924 to September 1932 at site 4 miles upstream. Records published as Guadalupe River near Comfort (records equivalent during flood runoff originating above upper site and during extremely low flow, at which times Cypress Creek contributes no appreciable flow).

Extremes.- Maximum discharge during year, 1,390 second-feet July 12 (gage height, 7.04 feet); minimum, 13 second-feet Aug. 24-28.

1917-32, 1939-48: Maximum discharge, 182,000 second-feet July 1, 1932 (gage height, 38.4 feet, present site and datum, from floodmarks, from data furnished by Texas Highway Department), by slope-area method (flood originated above Cypress Creek drainage); minimum observed, 0.4 second-foot Aug. 2, 1918, at site then in use.

Flood of July 16, 1900, reached about same stage as that of July 1, 1932.

Remarks.- Records good. Several small diversions above station for irrigation. Slight regulation at low flow by power plants above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	43	48	66	67	65	104	60	73	32	44	25	15
2	40	43	66	64	75	93	58	67	28	45	112	14
3	38	43	69	64	80	86	57	64	26	108	93	14
4	37	43	132	62	80	82	58	57	25	81	53	14
5	37	43	78	61	80	79	58	52	23	58	39	14
6	37	44	71	61	97	78	59	50	23	137	30	14
7	37	44	71	61	97	75	60	46	22	123	26	14
8	35	41	70	62	88	75	57	46	21	88	20	14
9	50	42	88	62	83	75	56	44	20	71	18	47
10	51	44	70	62	78	91	56	41	20	111	18	32
11	44	49	67	62	75	97	56	62	25	237	16	47
12	41	51	65	65	72	89	54	270	23	246	16	49
13	43	52	64	66	70	80	67	165	21	124	15	37
14	42	59	64	62	67	76	163	121	23	73	16	33
15	42	58	75	60	66	73	127	100	22	65	16	52
16	40	58	78	60	65	72	97	86	20	53	16	43
17	41	70	75	59	65	70	79	75	20	46	15	33
18	47	82	71	62	67	68	68	67	20	42	15	32
19	47	76	67	67	71	67	61	59	19	40	14	31
20	44	75	66	68	71	66	56	53	18	37	14	29
21	42	71	65	70	65	68	51	52	18	33	14	27
22	43	76	64	68	62	65	51	46	18	30	14	27
23	43	85	62	67	64	64	72	43	18	25	14	93
24	43	90	61	62	65	64	102	38	504	24	13	37
25	42	82	61	61	79	62	221	71	201	24	13	34
26	44	76	62	62	187	62	177	51	210	23	13	44
27	45	72	61	64	170	84	134	36	91	23	13	35
28	46	68	61	64	141	85	106	37	72	23	13	31
29	46	66	61	62	119	75	86	42	62	23	14	28
30	46	65	61	62	-	67	78	38	49	22	16	27
31	50	-	65	62	-	61	-	35	-	22	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,328	51	35	42.8	2,630
November.....	1,816	90	41	75.3	3,860
December.....	2,137	132	61	68.9	4,240
Calendar year 1947.....	64,484	7,750	35	177	127,900
January.....	1,961	70	59	63.3	3,890
February.....	2,464	187	62	85.0	4,890
March.....	1,350	104	61	75.3	4,860
April.....	2,485	221	51	82.8	4,930
May.....	2,087	270	35	67.3	4,140
June.....	1,894	504	18	56.5	3,360
July.....	2,101	246	22	67.8	4,170
August.....	740	112	13	23.9	1,470
September.....	961	93	14	32.0	1,910
Water year 1947-48.....	22,124	504	13	60.4	43,890

Peak discharge (base, 3,900 sec.-ft.).- No peak above base.

GUADALUPE RIVER BASIN

177

Guadalupe River near Spring Branch, Tex.

Location.- Water-stage recorder, lat. 29°51'40", long. 98°23'00", at bridge on county Highway 4 miles southeast of Spring Branch, Comal County, and 6 miles downstream from Curry Creek. Datum of gage is 948.13 feet above mean sea level, datum of 1929.

Drainage area.- 1,432 square miles.

Records available.- June 1922 to September 1948.

Average discharge.- 26 years, 289 second-feet.

Extremes.- Maximum discharge during year, 7,770 second-feet June 24 (gage height, 12.47 feet); minimum, 12 second-feet Aug. 24 (gage height, 1.81 feet).  
1922-48: Maximum discharge, 121,000 second-feet July 3, 1932 (gage height, 42.10 feet), from rating curve extended above 70,000 second-feet; minimum, 2.2 second-feet July 11, 1939, from rating curve extended below 15 second-feet.  
Maximum stage known, between 45 and 50 feet in 1900, from information by local residents.

Remarks.- Records good. Small diversions above station for irrigation. Slight regulation at low flow by power plants above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	50	60	87	85	84	119	82	89	44	85	34	21
2	50	58	87	84	91	109	77	82	39	76	48	20
3	52	58	89	85	94	101	76	79	36	84	65	21
4	53	60	91	85	96	96	74	74	34	95	76	21
5	53	57	113	85	98	92	74	70	32	151	71	26
6	54	57	109	85	98	89	74	70	30	107	57	19
7	54	57	100	84	100	87	74	65	28	85	52	18
8	56	57	94	84	109	87	74	61	24	115	45	17
9	56	60	92	85	103	87	75	61	23	98	42	23
10	54	61	92	85	100	87	71	61	21	84	38	26
11	57	63	91	84	98	85	70	112	24	76	34	44
12	61	64	89	85	94	92	70	95	33	168	32	48
13	57	67	89	84	91	96	106	124	23	484	30	40
14	54	71	89	82	87	94	115	151	26	176	28	47
15	54	71	98	82	87	91	89	113	22	92	25	44
16	54	73	94	84	85	87	117	98	20	79	25	42
17	54	77	96	82	84	84	100	87	18	71	23	43
18	53	85	96	81	84	84	89	79	20	64	22	49
19	53	96	94	82	84	82	81	71	19	58	21	45
20	53	92	92	84	85	82	74	65	16	54	20	43
21	56	91	91	85	89	81	71	60	15	52	19	40
22	54	94	89	85	85	89	67	57	16	50	17	40
23	54	92	87	87	84	85	70	56	15	48	15	106
24	56	94	87	85	84	81	71	53	2,740	47	13	73
25	56	98	85	85	87	81	87	50	649	44	24	61
26	57	101	84	85	91	81	186	49	249	43	26	48
27	57	98	84	84	123	79	156	89	236	40	22	39
28	58	94	84	82	148	77	125	60	190	38	68	40
29	60	91	84	82	134	87	107	47	241	37	42	40
30	60	89	84	82	-	91	96	44	111	36	28	39
31	60	-	85	82	-	85	-	45	-	34	22	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,710	61	50	55.2	3,390
November.....	2,286	101	57	76.2	4,530
December.....	2,826	113	84	91.2	5,610
Calendar year 1947.....	113,424	5,660	48	311	225,000
January.....	2,601	87	81	83.9	5,160
February.....	2,777	148	84	95.8	5,510
March.....	2,748	119	77	86.6	5,450
April.....	2,676	166	67	89.2	5,310
May.....	2,317	151	44	74.7	4,800
June.....	4,994	2,740	15	166	9,910
July.....	2,771	484	34	89.4	5,500
August.....	1,084	76	13	35.0	2,150
September.....	1,177	106	17	39.2	2,530
Water year 1947-48.....	29,967	2,740	13	81.9	59,450

Peak discharge (base, 4,000 sec.-ft.)- June 24 (2:30 p.m.) 7,770 sec.-ft.  
No gage-height record; discharge computed on basis of estimated gage height.

## Guadalupe River above Comal River, at New Braunfels, Tex.

Location.- Water-stage recorder and concrete control, lat. 29°42'55", long. 98°06'40", at New Braunfels, Comal County, 1.1 miles upstream from Comal River. Datum of gage is 586.6 feet above mean sea level, datum of 1929.

Drainage area.- 1,666 square miles.

Records available.- December 1927 to September 1948. March 1898 to December 1899 and January 1915 to December 1927 at site 1 mile downstream from Comal River.

Average discharge.- 20 years (1928-48), 414 second-feet.

Extremes.- Maximum discharge during year, 6,910 second-feet June 25 (gage height, 7.14 feet); minimum, 20 second-feet Sept. 7 (gage height, 0.91 foot).

1927-48: Maximum discharge, 101,000 second-feet June 15, 1935 (gage height, 32.95 feet); minimum, 9.6 second-feet July 9-11, 1939.

Maximum stage known, 38 feet in 1869 and in December 1913, from information by local residents.

Remarks.- Records excellent. Small diversions above station for irrigation. Some regulation at low flow by small power plants above station.

Revisions (water year).- W 898: 1935.

Rating tables, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

Oct. 1 to May 12

May 13 to Sept. 30

1.4	70	2.0	186	0.9	19	1.6	100	2.4	415	3.5	1,690
1.6	95	2.2	280	1.0	28	1.8	136	2.6	580	4.0	2,420
1.8	128	2.4	415	1.2	49	2.0	190	2.8	773		
				1.4	72	2.2	280	3.0	995		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	76	102	101	98	173	95	102	56	194	38	49
2	76	74	101	98	110	153	91	94	51	143	38	37
3	76	74	102	96	117	133	86	88	50	125	37	31
4	77	74	101	95	117	121	85	80	50	115	36	26
5	78	74	100	98	115	114	82	75	48	121	52	24
6	78	75	101	98	115	107	82	80	44	185	66	22
7	77	72	146	95	114	104	81	72	41	158	70	21
8	78	72	136	96	114	104	80	70	40	131	59	22
9	81	72	114	96	114	104	78	70	37	129	51	24
10	83	75	107	96	123	104	76	63	37	141	46	33
11	82	76	104	96	114	100	75	290	35	129	42	34
12	80	77	102	96	110	98	74	391	34	122	39	29
13	80	80	101	96	107	98	72	213	32	305	36	25
14	87	91	104	94	102	104	71	138	30	447	33	30
15	83	87	123	92	101	110	108	205	31	238	32	46
16	81	87	117	94	100	106	108	172	34	143	30	41
17	81	92	112	92	98	100	103	143	31	108	28	45
18	80	96	107	92	96	98	112	123	28	96	27	48
19	78	98	110	96	96	96	100	110	28	85	26	46
20	76	106	112	98	95	95	90	100	25	73	24	47
21	75	112	108	98	101	95	83	86	24	67	23	50
22	75	110	107	98	102	101	77	81	23	62	23	46
23	77	107	104	98	98	95	77	75	23	58	22	45
24	77	107	102	96	98	98	74	71	23	53	22	47
25	76	106	101	98	100	92	90	68	2,320	51	23	87
26	76	110	100	101	101	90	94	67	575	48	29	76
27	77	115	98	101	108	85	124	65	293	46	25	61
28	78	115	98	96	114	86	173	62	299	44	23	56
29	78	108	100	95	179	83	140	87	1,090	41	22	47
30	78	106	100	94	-	83	117	77	326	40	21	42
31	78	-	101	95	-	94	-	64	-	37	45	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,432	87	75	78.5	4,820
November.....	2,724	115	72	90.8	5,400
December.....	3,321	146	98	107	6,590
Calendar year 1947 .....	151,121	4,030	72	414	299,700
January.....	2,985	101	92	95.3	5,920
February.....	3,155	179	95	109	6,260
March.....	3,224	173	83	104	6,390
April.....	2,798	173	71	93.3	5,550
May.....	3,484	391	62	112	6,910
June.....	5,758	2,320	23	192	11,420
July.....	3,735	447	37	120	7,410
August.....	1,088	70	21	35.1	2,160
September.....	1,237	87	21	41.2	2,450
Water year 1947-48 .....	35,341	2,320	21	98.2	71,280

Peak discharge (base, 3,100 sec.-ft.)- June 25 (2:30 a.m.) 6,910 sec.-ft.

GUADALUPE RIVER BASIN

179

Guadalupe River at Victoria, Tex.

Location.- Water-stage recorder, lat. 28°47', long. 97°01', at bridge on U. S. Highway 59 in Victoria, Victoria County, 1,300 feet upstream from Texas & New Orleans Railroad bridge and 10 miles upstream from Coleta Creek. Datum of gage is 29.23 feet above mean sea level, datum of 1929.

Drainage area.- 5,311 square miles.

Records available.- November 1934 to September 1948. Gage-height records collected in this vicinity since 1904 are contained in reports of U. S. Weather Bureau.

Average discharge.- 13 years (1935-48), 1,886 second-feet.

Extremes.- Maximum discharge during year, 6,970 second-feet May 28 (gage height, 17.50 feet); minimum, 232 second-feet Aug. 18; minimum daily, 275 second-feet Aug. 18.  
1934-48: Maximum discharge, 179,000 second-feet July 3, 1936 (gage height, 31.22 feet); minimum daily, that of Aug. 18, 1948.

Remarks.- Records good. Many small diversions above station do not materially affect flow. Low flow partly regulated by power plants above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	565	598	631	664	664	763	657	533	906	1,080	366	414
2	582	614	614	614	910	763	610	579	764	1,570	400	400
3	582	664	680	664	1,110	763	673	548	706	1,900	360	347
4	548	763	648	730	1,040	780	564	533	673	1,280	373	414
5	565	377	664	648	1,000	796	594	533	673	1,080	322	347
6	565	468	680	730	969	796	533	503	579	940	400	342
7	565	516	714	598	847	697	518	533	533	906	400	322
8	614	598	648	664	830	714	579	473	503	1,010	386	360
9	598	548	631	697	796	969	594	444	503	872	386	429
10	582	614	697	680	796	1,140	594	518	503	641	386	400
11	596	598	763	631	697	1,320	518	503	594	594	400	414
12	582	598	780	697	763	1,110	564	1,120	488	533	360	468
13	598	614	730	697	714	872	579	3,040	414	738	373	564
14	565	598	746	648	614	754	473	2,170	414	754	340	373
15	548	565	730	680	648	804	533	1,870	458	673	360	347
16	565	648	864	631	697	673	518	1,250	386	754	373	429
17	598	631	1,140	664	697	689	503	838	444	754	340	400
18	614	648	1,000	697	664	722	458	722	444	754	275	400
19	582	847	864	714	648	689	488	855	386	564	327	386
20	598	882	714	780	714	771	503	788	400	548	347	373
21	532	780	664	664	746	673	548	821	360	548	344	386
22	565	714	680	714	730	689	503	804	373	548	315	414
23	631	697	746	664	1,250	689	503	706	400	533	322	473
24	648	648	598	614	1,210	689	533	641	373	518	324	414
25	582	697	648	714	969	689	548	738	360	414	400	414
26	548	648	697	631	847	641	594	1,270	373	473	334	400
27	548	598	614	631	882	657	533	3,900	695	518	804	386
28	598	664	631	680	664	641	579	6,710	1,010	332	1,610	386
29	582	664	730	680	780	610	610	4,910	1,220	429	2,290	327
30	631	631	730	648	-	626	564	3,540	906	429	2,170	330
31	598	-	631	582	-	626	-	1,430	-	386	776	-
Month						Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet		
October.....						18,077	648	532	583	35,860		
November.....						19,130	882	377	638	37,940		
December.....						22,307	1,140	598	720	44,250		
Calendar year 1947.....						556,071	9,940	377	1,523	1,103,000		
January.....						20,750	780	582	669	41,160		
February.....						23,896	1,250	614	824	47,400		
March.....						23,815	1,320	610	768	47,240		
April.....						16,568	673	458	552	32,860		
May.....						43,822	6,710	444	1,414	86,920		
June.....						16,830	1,220	360	561	33,380		
July.....						23,073	1,900	332	744	45,760		
August.....						16,963	2,290	275	548	33,690		
September.....						11,859	564	322	395	23,520		
Water year 1947-48.....						257,110	6,710	275	702	510,000		

Peak discharge (base, 7,800 sec.-ft.)- No peak above base.



## Johnson Creek near Ingram, Tex.

Location.- Water-stage recorder, lat. 30°05', long. 99°16', 1.3 miles upstream from Henderson Branch, 3 miles northwest of Ingram, Kerr County, 4.5 miles upstream from mouth, and 9.5 miles northwest of Kerrville. Datum of gage is 1,721.3 feet above mean sea level, datum of 1929.

Drainage area.- About 150 square miles.

Records available.- September 1941 to September 1948.

Extremes.- Maximum discharge during year, 540 second-feet May 11 (gage height, 3.52 feet), from rating curve extended above 310 second-feet on basis of slope-area determinations at gage heights 9.67 and 11.76 feet; minimum, 3.0 second-feet June 5, 6. 1941-48: Maximum discharge, 16,200 second-feet June 23, 1947 (gage height, 11.76 feet), from rating curve extended as noted above; minimum, 2.6 second-feet Aug. 19, 20, 1946.

Maximum stage known since 1852, about 35 feet July 2, 1933, from information by local resident; discharge, 138,000 second-feet by slope-area method at point half a mile downstream from State Fish Hatchery and about 6 or 7 miles upstream from gage. Flood of June 14, 1935, reached a stage of about 31 or 32 feet, from information by local resident.

Remarks.- Records good. Small diversion above station for irrigation.

Revisions (water years).- W 1058: 1942-45.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.2	8.7	11	11	11	11	9.7	12	8.7	7.4	7.4	8.7
2	9.2	9.7	12	10	12	11	9.2	11	7.8	7.8	4.0	8.2
3	9.7	10	12	9.7	12	10	9.2	11	8.2	8.7	17	8.2
4	9.7	10	12	11	11	10	10	11	7.0	10	13	8.2
5	9.7	9.2	11	10	11	9.7	9.7	11	3.9	23	13	8.2
6	9.7	9.2	12	11	12	9.7	9.2	11	5.1	14	12	8.7
7	9.7	9.2	12	11	13	9.7	9.2	9.2	7.0	13	11	7.8
8	9.2	8.7	12	11	12	10	8.7	9.2	7.0	11	11	8.2
9	9.7	9.7	12	11	11	12	8.7	7.0	9.7	10	13	13
10	9.7	10	12	11	11	11	9.2	9.7	8.2	26	10	14
11	9.7	10	11	11	11	9.7	8.7	141	11	38	9.7	13
12	9.2	10	11	11	9.7	9.2	8.7	34	8.7	14	8.7	15
13	8.7	11	11	11	8.7	9.7	45	18	7.8	12	8.7	67
14	8.7	12	13	11	9.2	9.7	18	16	7.4	11	8.7	28
15	8.7	11	13	11	9.7	10	13	13	7.0	10	8.7	14
16	8.2	11	13	14	9.7	9.7	12	12	5.8	9.7	8.7	18
17	8.2	13	12	13	9.7	9.2	11	12	5.8	9.2	7.8	13
18	8.2	13	12	12	9.7	9.2	10	11	6.2	8.7	7.4	11
19	8.2	11	11	12	9.7	8.7	11	10	5.8	6.7	8.2	10
20	7.8	11	11	12	9.2	8.7	9.7	9.7	5.4	8.7	8.2	8.7
21	8.7	11	10	12	9.7	9.2	9.7	8.7	5.4	8.2	7.8	7.8
22	8.7	13	11	11	9.2	11	10	8.2	5.4	8.2	7.4	7.0
23	9.2	13	11	11	9.7	10	28	8.7	6.2	8.2	7.8	9.2
24	9.2	12	11	11	11	9.7	16	8.2	27	7.8	8.2	6.6
25	9.2	11	11	12	46	9.7	27	8.7	16	7.8	8.7	5.4
26	8.7	12	10	11	17	16	18	12	12	7.8	9.2	4.8
27	9.2	10	10	11	16	12	18	14	11	7.4	10	4.2
28	9.2	11	10	10	12	10	14	10	9.2	7.8	9.7	4.2
29	9.2	11	10	11	11	9.2	13	9.7	8.2	7.4	8.2	4.2
30	9.2	11	12	11	-	9.7	12	9.7	7.8	7.4	8.2	4.2
31	8.7	-	12	11	-	9.7	-	9.2	-	7.4	9.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	280.3	9.7	7.8	9.04	556
November.....	322.4	13	8.7	10.7	639
December.....	354	13	10	11.4	702
Calendar year 1947.....	9,123.5	1,410	5.1	25.0	18,120
January.....	348.7	14	9.7	11.2	688
February.....	353.9	46	8.7	12.2	702
March.....	314.1	15	8.7	10.1	523
April.....	403.6	45	8.7	13.5	801
May.....	488.6	141	8.2	15.8	959
June.....	249.0	27	3.9	8.30	494
July.....	346.0	38	7.4	11.2	686
August.....	390.2	74	7.4	12.6	774
September.....	348.5	67	4.2	11.6	691
Water year 1947-48.....	4,197.3	141	3.9	11.5	8,320

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

## Comal River at New Braunfels, Tex.

Location.- Water-stage recorder, lat. 29°42'05", long. 98°07'10", 200 feet upstream from San Antonio Street viaduct in New Braunfels, Comal County, and 1.1 miles upstream from mouth. Datum of gage is 582.80 feet above mean sea level, datum of 1929.

Drainage area.- 94 square miles. Ordinary flow of river comes from springs; drainage area of stream not applicable.

Records available.- December 1927 to September 1948. 1882 to November 1927 (discharge measurements only).

Average discharge.- 16 years (1932-48), 341 second-feet.

Extremes.- Maximum daily discharge during year, 319 second-feet Oct. 1, 13; maximum gage height, 5.40 feet June 25 (backwater from Guadalupe River); minimum daily discharge, 251 second-feet Aug. 7, 23, 24.

1927-48: Maximum gage height, 30.71 feet June 15, 1935, from floodmarks (backwater from Guadalupe River; discharge not determined); minimum discharge, about 142 second-feet Dec. 11, 1928 (gage height, 2.12 feet); minimum daily, 245 second-feet July 17, 20, 1939.

Maximum stage known, 35.4 feet December 1913, from floodmarks (probably some backwater from Guadalupe River).

Remarks.- Records excellent. Flow partly regulated by steam power plant half a mile above station. Entire flow of river from Comal Springs, about 1 mile above station, except during periods of local rain. Springs emerge from the Edwards limestone in the Balcones fault zone.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used July 1 to Sept. 30)

2.5	241
2.6	265
2.7	291
2.8	319

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	319	305	311	308	308	302	305	291	278	273	268	258
2	316	308	311	305	308	297	299	291	283	278	265	255
3	313	308	308	305	305	291	302	294	281	270	260	255
4	316	311	308	305	305	291	299	294	281	268	250	255
5	316	305	308	305	302	294	299	294	275	268	258	253
6	313	308	311	305	302	291	299	294	273	268	258	253
7	311	308	311	305	302	291	302	291	275	270	251	253
8	311	305	311	302	305	294	299	288	273	270	253	253
9	316	305	311	302	305	291	299	288	278	270	255	255
10	316	308	308	299	305	294	299	288	278	273	253	258
11	316	308	308	299	302	291	297	288	278	268	255	258
12	313	308	308	302	308	294	297	288	273	268	255	260
13	319	308	305	299	311	297	297	288	275	270	255	258
14	313	308	311	299	311	294	294	288	278	265	253	262
15	313	311	308	299	308	294	294	288	281	265	253	262
16	311	311	305	299	308	287	284	286	281	268	258	260
17	308	311	305	299	308	287	294	283	278	268	255	260
18	305	311	308	299	313	297	294	281	278	268	255	260
19	308	311	306	302	311	297	294	281	275	265	255	262
20	311	308	311	305	313	302	294	281	275	268	260	260
21	311	311	311	305	313	302	291	281	278	268	253	260
22	308	313	313	305	313	302	288	278	275	265	253	262
23	311	311	308	308	313	302	291	278	278	262	251	262
24	311	311	313	311	311	299	291	278	275	260	251	260
25	311	311	311	308	313	299	299	278	e278	260	255	260
26	308	311	308	313	311	299	297	278	278	262	262	260
27	311	311	308	311	311	299	291	278	275	260	268	255
28	311	311	308	311	311	305	291	278	281	260	265	258
29	311	308	308	308	308	297	291	275	285	260	265	258
30	308	308	308	313	-	302	291	278	278	260	265	258
31	308	-	305	308	-	305	-	275	-	258	258	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	9,673	319	305	312	19,190
November.....	9,272	313	305	309	18,390
December.....	9,576	313	305	309	18,990
Calendar year 1947.....	130,025	823	305	356	257,900
January.....	9,444	313	299	305	18,730
February.....	8,944	313	302	308	17,740
March.....	9,207	305	291	297	18,260
April.....	8,872	305	288	296	17,600
May.....	8,820	294	275	285	17,490
June.....	8,325	283	273	278	16,510
July.....	8,271	286	258	267	16,410
August.....	7,981	268	251	257	15,830
September.....	7,743	262	253	258	15,360
Water year 1947-48.....	106,129	319	251	290	210,500

Peak discharge (base, 1,100 sec.-ft.)- No peak above base.

c Stage-discharge relation affected by backwater from Guadalupe River.

## San Marcos River at Luling, Tex.

Location.- Water-stage recorder, lat. 29°39'55", long. 97°39'05", 390 feet downstream from Bridge on State Highway 80, 1 mile south of Luling, Caldwell County, and 8 miles upstream from Plum Creek. Datum of gage is 322.0 feet above mean sea level, datum of 1929.

Drainage area.- 833 square miles.

Records available.- April 1939 to September 1948.

Extremes.- Maximum discharge during year, 1,170 second-feet May 12 (gage height, 10.00 feet); minimum, 36 second-feet Jan. 9, Apr. 20; minimum daily, 66 second-feet Aug. 22, 1939-48: Maximum discharge, 29,500 second-feet July 5, 1942 (gage height, 32.93 feet); minimum, 7.7 second-feet May 21, 1943; minimum daily, 55 second-feet Oct. 15, 1939.

Maximum stage known, 40.4 feet in 1869 and 1870, from information by engineers of State Highway Department.

Remarks.- Records good except those for periods of rapidly changing stage, which are fair. Flow regulated by power plant 800 feet above station. Discharge is mostly from large springs near San Marcos. No large diversion above station.

Revisions (water year).- W 958: 1940.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	149	158	128	133	144	137	131	123	119	190	88	87
2	146	121	134	128	157	143	122	120	116	132	120	82
3	153	135	144	129	170	133	126	126	117	126	113	79
4	155	128	139	135	131	137	128	117	115	131	97	87
5	150	131	141	132	170	135	125	111	117	123	102	74
6	139	132	132	133	140	135	129	129	104	119	101	89
7	147	154	137	133	145	128	122	158	119	119	91	88
8	138	129	147	132	145	134	126	116	116	111	83	92
9	147	128	151	131	141	133	115	119	111	108	91	114
10	146	144	132	135	138	137	120	116	110	98	97	119
11	150	131	139	127	140	139	115	395	101	152	97	91
12	145	125	139	138	135	135	119	542	88	104	97	108
13	137	141	139	133	138	133	119	578	92	107	87	102
14	146	141	139	134	135	134	119	258	98	107	89	98
15	149	135	183	135	133	135	110	218	95	109	84	87
16	141	138	137	126	137	138	123	216	114	105	92	90
17	137	149	158	140	135	133	94	153	107	86	91	91
18	147	135	121	135	131	131	119	133	92	100	91	92
19	149	146	158	132	139	143	88	234	97	102	91	92
20	143	125	141	138	134	144	76	164	107	98	83	92
21	147	141	125	137	135	137	100	111	93	86	86	100
22	135	144	150	134	149	141	106	120	104	89	86	92
23	141	140	121	137	138	128	107	127	107	95	71	94
24	139	132	133	134	140	133	108	126	104	102	94	87
25	152	135	131	143	143	117	141	121	108	105	95	94
26	126	139	134	138	140	140	149	239	108	102	94	86
27	146	132	134	113	140	128	111	546	108	106	93	88
28	146	134	134	127	138	128	125	183	93	102	98	88
29	170	132	134	137	139	134	115	128	106	101	90	91
30	176	133	131	139	-	128	119	121	219	97	85	93
31	167	-	131	133	-	131	-	123	-	98	91	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	4,559	176	126	147	9,040
November.....	4,086	158	121	136	8,050
December.....	4,297	183	121	139	8,520
Calendar year 1947.....	126,086	4,770	121	345	250,100
January.....	4,131	143	113	133	8,190
February.....	4,100	170	131	141	8,130
March.....	4,182	144	117	134	8,250
April.....	3,503	149	76	117	6,950
May.....	6,070	578	111	196	12,040
June.....	3,285	219	88	110	6,520
July.....	3,410	190	86	110	6,760
August.....	2,848	120	66	91.9	5,650
September.....	2,767	119	74	92.2	5,490
Water year 1947-48.....	47,198	578	66	129	93,610

Peak discharge (base, 6,300 sec.-ft.)- No peak above base.

## Blanco River at Wimberly, Tex.

Location.- Water-stage recorder, lat. 29°59', long. 98°04', 800 feet downstream from Cypress Creek, 1,200 feet upstream from bridge on State Highway 12, and a quarter of a mile south of Wimberly, Hays County. Datum of gage is 802.2 feet above mean sea level, datum of 1929.

Drainage area.- 378 square miles.

Records available.- August 1924 to September 1926, June 1928 to September 1948.

Average discharge.- 22 years, 113 second-feet.

Extremes.- Maximum discharge during year, 2,850 second-feet May 11 (gage height, 4.20 feet); minimum, 7.2 second-feet Aug. 17-21, Sept. 26, 27.

1924-26, 1928-48: Maximum discharge, 113,000 second-feet May 28, 1929 (gage height, 31.10 feet, from floodmarks), by slope-area method; minimum, 2.9 second-feet Oct. 5, 6, 1940.

Remarks.- Records excellent. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	18	18	18	22	17	17	15	14	22	12	11
2	20	18	20	18	27	15	17	15	12	27	15	11
3	22	20	20	18	27	15	17	15	12	36	15	11
4	20	20	22	20	23	15	17	18	12	27	14	11
5	20	20	20	18	23	15	17	15	12	23	12	9.6
6	20	20	20	20	22	14	17	18	12	22	11	9.6
7	18	20	20	20	20	14	17	15	12	18	11	9.6
8	23	20	23	20	20	15	17	14	12	17	9.6	9.6
9	27	20	22	20	18	17	17	14	14	17	9.6	14
10	23	22	22	20	18	15	15	14	14	17	9.6	15
11	22	22	20	20	18	17	14	1,050	14	18	8.4	14
12	22	22	20	20	18	15	14	319	12	85	8.4	12
13	22	22	20	20	18	15	20	82	12	36	8.4	11
14	22	23	23	20	18	15	15	44	11	20	8.4	9.6
15	22	22	31	18	18	15	15	29	11	20	9.6	9.6
16	22	20	23	20	18	15	17	25	11	18	8.4	9.6
17	22	23	22	18	18	15	17	23	11	17	8.4	11
18	22	23	20	18	18	15	15	22	11	18	7.2	11
19	22	22	20	22	18	15	14	27	9.6	17	7.2	11
20	20	22	20	22	20	15	14	25	9.6	15	7.2	9.6
21	20	22	20	20	27	15	15	22	9.6	14	9.6	9.6
22	20	22	20	18	20	18	18	20	9.6	14	9.6	9.6
23	20	22	20	18	18	17	20	18	9.6	12	8.4	9.6
24	20	20	20	18	20	17	15	18	11	12	8.4	9.6
25	20	20	20	18	20	17	25	18	12	12	28	9.6
26	20	20	20	22	20	17	17	18	14	12	17	8.4
27	22	18	20	20	22	17	14	15	11	11	19	7.2
28	22	18	20	18	18	17	15	15	126	11	12	8.4
29	22	20	18	18	15	17	17	15	217	9.6	14	8.4
30	22	18	18	18	-	17	15	15	31	8.4	14	8.4
31	22	-	20	18	-	17	-	15	-	8.4	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	661	27	18	21.3	1,310
November.....	619	23	18	20.6	1,230
December.....	642	31	18	20.7	1,270
Calendar year 1947.....	35,980	852	18	98.6	71,360
January.....	596	22	18	19.2	1,180
February.....	582	27	15	20.1	1,150
March.....	490	18	14	15.6	972
April.....	494	25	14	16.5	980
May.....	1,988	1,050	14	64.1	3,940
June.....	689.0	217	9.6	23.0	1,370
July.....	614.4	85	8.4	19.8	1,220
August.....	352.4	28	7.2	11.4	699
September.....	308.6	15	7.2	10.3	612
Water year 1947-48.....	8,036.4	1,050	7.2	22.0	15,930

Peak discharge (base, 1,800 sec.-ft.)- May 11 (11 a.m.) 2,850 sec.-ft.; June 28 (10 p.m.) 1,860 sec.-ft.

## Plum Creek near Luling, Tex.

Location.- Water-stage recorder, lat. 29°42', long. 97°37', at county highway bridge 1 mile downstream from West Fork Plum Creek, 2 miles upstream from Texas & New Orleans Railroad bridge, 3 miles northeast of Luling, Caldwell County. Datum of gage is 326.6 feet above mean sea level, datum of 1929.

Drainage area.- 356 square miles.

Records available.- March 1930 to September 1948.

Average discharge.- 18 years, 102 second-feet.

Extremes.- Maximum discharge during year, 1,380 second-feet May 27 (gage height, 11.88 feet); minimum, 0.5 second-foot Sept. 28.

1930-48: Maximum discharge, 78,500 second-feet July 1, 1936 (gage height, 25.7 feet, from floodmarks), from rating curve extended above 54,000 second-feet; minimum, that of Sept. 28, 1948.

Flood in December 1913 reached about same stage as that of July 1, 1936, from information by local residents.

Remarks.- Records good. Slight regulation at low flow by oil-field operation above station. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.7	5.9	7.4	9.1	12	12	7.4	8.0	7.7	20	2.4	1.3
2	7.7	5.4	7.4	9.1	15	12	7.4	8.0	6.8	8.4	7.7	1.1
3	7.4	5.4	8.0	9.1	20	11	7.1	8.0	5.6	9.8	11	1.1
4	7.4	5.9	9.1	9.1	18	11	7.1	8.0	5.4	8.6	4.1	1.0
5	7.4	5.9	10	9.1	15	11	7.4	7.7	5.2	5.9	2.9	1.0
6	7.1	6.2	9.1	9.7	14	10	7.1	8.0	4.9	5.6	2.7	1.0
7	7.1	5.9	8.6	9.7	14	10	7.4	11	4.9	4.5	2.6	1.0
8	7.4	5.9	13	9.7	13	10	7.4	8.3	4.9	4.1	2.6	.9
9	7.4	5.9	9.7	10	12	10	7.4	7.4	4.7	3.6	2.6	2.0
10	7.4	6.2	8.0	11	11	10	7.1	6.5	4.3	7.4	2.6	5.9
11	7.1	6.2	7.4	11	11	9.7	7.1	29	7.3	36	2.4	4.1
12	7.1	6.5	7.4	11	11	9.1	7.1	237	18	5.4	2.4	2.4
13	7.1	6.5	8.0	11	11	9.1	6.8	30	7.4	4.5	2.4	1.7
14	6.8	7.1	8.0	10	11	9.1	6.5	14	5.2	3.8	1.7	1.5
15	6.5	7.1	15	9.7	11	8.6	7.1	8.3	4.5	3.8	1.7	1.5
16	6.5	6.8	14	11	11	8.6	6.8	7.1	4.7	3.8	1.6	1.3
17	6.5	6.8	8.6	11	11	9.1	6.8	6.8	4.5	3.6	1.6	1.5
18	6.5	10	8.0	11	11	10	6.8	5.6	4.1	3.2	1.7	1.6
19	6.5	9.1	8.3	11	11	9.7	6.8	81	3.4	3.2	1.5	1.6
20	6.2	7.7	8.0	12	12	9.7	6.8	53	3.1	3.2	1.2	1.9
21	6.5	7.7	8.0	12	16	9.7	7.4	16	2.9	3.2	1.2	1.7
22	7.1	7.7	8.0	12	17	11	7.7	7.7	3.1	3.1	1.1	1.5
23	7.4	8.0	8.0	11	12	10	7.7	5.2	2.9	3.1	1.1	1.3
24	7.4	7.4	8.0	11	11	8.6	8.6	4.9	2.9	3.1	1.2	1.2
25	7.4	7.4	8.0	11	11	8.3	13	4.9	2.9	3.1	1.2	1.2
26	7.4	7.4	8.0	11	11	8.0	23	422	3.4	3.1	1.3	1.0
27	6.8	7.7	8.0	13	11	8.0	11	972	7.2	2.7	2.4	.9
28	6.8	7.4	8.0	15	14	7.7	7.7	336	5.2	2.6	1.6	.7
29	6.8	7.4	8.0	14	12	7.4	7.1	24	159	2.4	5.5	.6
30	6.8	7.4	8.6	12	-	7.4	6.5	15	108	2.2	2.0	.6
31	6.8	-	9.1	12	-	7.4	-	9.1	-	2.2	1.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	218.0	7.7	6.2	7.03	432
November.....	207.9	10	5.4	6.93	412
December.....	272.7	15	7.4	8.80	541
Calendar year 1947.....	40,009.5	10,600	5.2	110	79,360
January.....	358.3	15	9.1	10.9	671
February.....	370	20	11	12.8	734
March.....	293.2	12	7.4	9.46	582
April.....	241.1	23	6.5	8.04	478
May.....	2,369.5	972	4.9	76.4	4,700
June.....	414.1	159	2.9	13.8	821
July.....	179.0	36	2.2	5.77	355
August.....	93.9	16	1.1	3.03	186
September.....	46.1	5.9	.6	1.54	91
Water year 1947-48.....	5,043.8	972	.6	13.8	10,000

Peak discharge (base, 2,600 sec.-ft.).- No peak above base.

GUADALUPE RIVER BASIN

185

Coleto Creek near Victoria, Tex.

Location.- Water-stage recorder, lat. 28°43', long. 97°08', at bridge on U. S. Highway 59, 100 feet upstream from Texas & New Orleans Railroad bridge, 1.1 miles downstream from Perdido Creek, and 9.4 miles southwest of Victoria, Victoria County. Datum of gage is 49.2 feet above mean sea level, datum of 1929.

Drainage area.- 514 square miles.

Records available.- June 1939 to September 1948.

Extremes.- Maximum discharge during year, 4,260 second-feet May 24 (gage height, 8.78 feet); no flow Aug. 15, 16.

1939-48: Maximum discharge, 89,000 second-feet Oct. 16, 1946 (gage height, 31.64 feet, from floodmark, by slope-area method); no flow at times.

Maximum stage known prior to October 1946, 27.2 feet July 1, 1936, at railroad bridge 100 feet below gage, from information by railroad company.

Remarks.- Records good. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	3.0	5.6	7.4	9.6	14	9.9	9.6	18	37	0.6	1.6
2	2.4	2.2	5.6	7.4	9.5	12	10	8.3	15	44	.7	1.5
3	2.4	2.4	5.9	7.4	16.5	12	9.6	7.4	15	42	.7	1.4
4	2.4	2.4	8.4	7.1	59	11	9.3	6.5	12	47	.6	1.0
5	2.8	2.4	12	7.1	39	16	9.6	6.2	11	34	.6	1.0
6	2.6	2.6	11	6.8	26	28	9.6	5.1	9.3	16	1.2	.9
7	2.4	1.8	9.6	7.1	21	18	8.9	5.1	8.0	11	.8	1.5
8	2.2	1.8	7.7	7.1	20	32	8.9	5.3	7.4	8.9	.6	1.0
9	2.4	1.8	7.4	7.1	20	54	8.6	5.3	6.5	7.1	.4	3.0
10	3.0	2.6	6.5	6.8	17	48	8.3	5.3	6.8	5.9	.3	5.1
11	2.8	6.6	6.8	6.8	15	24	8.6	8.1	8.2	4.6	.3	5.6
12	2.6	6.8	8.0	6.8	14	18	8.3	15	5.1	3.8	.3	4.0
13	3.0	5.9	15	8.3	13	15	7.7	14	4.6	3.5	.3	2.8
14	2.6	8.0	14	8.0	12	14	7.7	31	3.5	3.0	.2	2.2
15	2.4	6.2	30	7.4	12	15	7.1	15	3.3	2.4	.1	1.6
16	2.2	5.3	20	7.1	11	13	7.1	9.6	2.8	2.0	.4	1.6
17	2.2	5.1	15	8.3	11	12	6.5	7.4	2.6	3.8	3.5	2.6
18	2.2	5.6	13	7.1	12	12	6.2	6.2	2.2	2.2	1.8	3.5
19	3.0	5.1	11	12	12	12	6.2	8.0	1.8	1.8	1.0	3.0
20	3.3	5.1	9.9	24	10	12	6.2	22	1.6	1.6	.8	2.4
21	2.6	5.3	8.9	19	13	12	6.2	8.3	1.6	1.6	.6	1.8
22	2.2	8.6	8.6	13	19	11	6.2	5.6	1.6	1.2	.5	1.5
23	2.2	9.6	7.7	10	29	10	8.3	4.6	1.5	1.0	.5	1.4
24	2.2	7.4	7.1	9.6	24	10	8.9	77.4	1.4	1.0	3.8	1.2
25	2.2	6.5	6.8	8.9	20	10	16	46.5	1.4	.9	9.8	1.2
26	2.2	8.6	6.8	9.6	18	11	16	278	1.2	.8	7.4	.8
27	2.2	8.6	6.8	11	16	9.6	13	239	1.2	.7	4.8	.6
28	2.2	7.1	6.8	9.9	16	8.9	17	75	1.2	.6	3.3	.5
29	4.8	6.5	7.1	9.9	14	9.3	13	42	1.0	.5	2.8	.6
30	5.6	5.9	7.4	9.9	-	9.3	11	30	3.4	.5	2.4	.7
31	4.3	-	8.3	9.6	-	9.3	-	23	-	.5	2.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	83.8	5.6	2.2	2.70	168
November.....	156.4	9.6	1.6	5.21	310
December.....	304.7	30	5.6	9.83	604
Calendar year 1947.....	20,645.9	5,340	1.6	56.6	40,960
January.....	287.5	24	6.8	9.27	570
February.....	762.6	165	9.6	26.3	1,510
March.....	502.4	54	8.9	16.2	996
April.....	279.9	17	6.2	9.33	555
May.....	2,142.9	774	4.6	69.1	4,250
June.....	158.0	18	1.0	8.27	313
July.....	289.7	47	.5	9.35	575
August.....	53.1	9.8	.1	1.71	105
September.....	57.1	5.6	.5	1.90	113
Water year 1947-48.....	5,078.1	774	.1	13.9	10,070

Peak discharge (base, 2,600 sec.-ft.)- May 24 (6 p.m.) 4,260 sec.-ft.

## San Antonio River at San Antonio, Tex.

Location.- Water-stage recorder, lat. 29°24'35", long. 98°29'40", at South Alamo Street Bridge in San Antonio, Bexar County, 2.1 miles upstream from San Pedro Creek. Datum of gage is 612.3 feet above mean sea level, datum of 1929.

Drainage area.- 42 square miles. Normal flow of river comes from springs; drainage area of stream not applicable.

Records available.- January 1915 to November 1929, February 1939 to September 1948.

Estimated monthly ground-water discharge contained in Water-Supply Paper 773-B.

Average discharge.- 23 years (1915-29, 1939-48), 71.1 second-feet.

Extremes.- Maximum discharge during year, 2,840 second-feet Aug. 26 (gage height, 10.60 feet); minimum, 3.9 second-feet June 16; minimum daily, 14 second-feet Apr. 16, June 17, 18, 20.

1915-29, 1939-48: Maximum discharge, 15,300 second-feet Sept. 10, 1921 (gage height, 20.14 feet, from floodmark), by slope-area method; no flow at times because of regulation.

Flood of July 5, 1819, equaled or exceeded that of Sept. 10, 1921.

Remarks.- Records good. Flood flow regulated by Olmos flood-control reservoir (capacity, 15,500 acre-feet) about 8½ miles above station. Dam completed in 1926. Normal flow of river comes from springs located about 8 miles above station. Springs emerge from Edwards limestone formation in Balcones fault zone. Diurnal fluctuation caused by industrial pumping from wells (depleting the underground reservoir) above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	24	24	24	40	28	25	26	20	21	24	24
2	26	24	24	24	40	25	26	26	21	25	26	24
3	26	25	26	25	28	25	26	29	19	111	25	28
4	26	24	24	24	23	26	24	30	18	53	26	31
5	25	22	24	25	28	25	25	32	18	21	26	28
6	27	24	24	25	26	26	33	32	19	24	27	29
7	27	22	24	24	27	26	27	21	18	23	26	31
8	26	24	38	25	26	27	24	25	19	23	25	46
9	27	24	24	25	26	30	19	38	18	23	28	64
10	27	26	24	26	26	27	19	31	19	22	28	21
11	27	24	23	25	26	25	26	87	20	26	29	21
12	25	24	24	27	25	24	16	31	17	22	28	18
13	28	26	25	24	25	25	21	18	15	23	27	19
14	28	27	41	24	25	25	22	21	15	24	27	20
15	27	26	37	24	25	27	28	24	15	24	26	20
16	27	25	23	24	30	26	14	24	15	24	29	19
17	27	38	24	23	29	25	17	23	14	24	28	21
18	27	22	24	23	24	26	18	20	14	22	28	23
19	25	24	25	26	26	26	20	21	15	24	28	20
20	25	24	24	24	25	26	21	21	14	24	28	20
21	25	25	24	23	45	25	21	21	15	24	26	20
22	24	26	25	24	22	32	26	20	15	24	24	29
23	24	24	24	23	28	25	34	22	15	24	26	15
24	24	24	23	23	28	25	22	20	17	24	30	20
25	25	26	23	24	32	25	46	25	55	23	39	20
26	24	26	24	27	27	25	23	27	27	25	807	17
27	26	23	24	24	33	26	22	23	21	25	51	17
28	26	24	24	25	28	24	23	23	29	24	27	17
29	29	24	24	24	26	31	24	22	27	24	27	20
30	25	23	25	24	-	22	25	20	21	24	27	17
31	25	-	25	24	-	25	-	18	-	24	26	-
Month							Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet	
October.....							806	29	24	26.0	1,600	
November.....							744	38	22	24.8	1,480	
December.....							791	41	23	25.5	1,570	
Calendar year 1947.....							23,754	166	22	65.1	47,120	
January.....							758	28	23	24.5	1,500	
February.....							819	45	22	28.2	1,620	
March.....							805	32	22	26.0	1,600	
April.....							717	46	14	23.9	1,420	
May.....							821	67	18	26.5	1,630	
June.....							585	55	14	19.5	1,160	
July.....							848	111	21	27.4	1,680	
August.....							1,649	807	24	53.2	3,270	
September.....							719	64	15	24.0	1,430	
Water year 1947-48.....							10,062	807	14	27.5	19,960	



## San Antonio River near Falls City, Tex.

Location.- Water-stage recorder, lat. 28°57'05", long. 98°03'55", at county road bridge 0.9 mile upstream from Scared Dog Creek and 3.6 miles southwest of Falls City, Karnes County. Datum of gage is 285.5 feet above mean sea level, datum of 1929.

Drainage area.- 2,071 square miles.

Records available.- April 1925 to September 1948.

Average discharge.- 23 years, 328 second-feet.

Extremes.- Maximum discharge during year, 10,900 second-feet Aug. 26 (gage height, 13.88 feet); minimum, 66 second-feet Aug. 16, 21.

1925-48: Maximum discharge, 47,400 second-feet Sept. 29, 1946 (gage height, 33.80 feet, from floodmark); minimum, 36 second-feet May 11, 12, 1928.

Maximum stage known, that of Sept. 29, 1946. Flood of October 1913 reached a stage of 28.36 feet, from information by local residents.

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

Flow partly regulated by Medina Lake and Olmos flood-control reservoir (combined capacity, 269,500 acre-feet). Storage began in Medina Lake in 1913, and Olmos Dam was completed in 1926. Water diverted above station from Medina River for irrigation in vicinity of Devine and Lytle, and some water diverted for irrigation near San Antonio. Water used industrially in San Antonio.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.9	44	2.0	515	4.0	2,260
1.1	109	2.3	705	5.0	3,500
1.3	179	2.6	925	5.5	3,820
1.5	257	3.0	1,270		
1.7	348	3.5	1,760		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	175	194	225	225	225	206	202	179	116	1,330	92	165
2	179	190	221	225	225	198	194	183	119	501	89	154
3	183	187	229	225	253	194	187	187	119	409	96	243
4	187	190	225	221	343	202	183	175	112	590	106	133
5	194	190	229	217	329	206	172	172	112	775	99	136
6	194	187	249	209	292	202	168	165	112	627	89	133
7	198	175	249	213	275	202	172	161	106	426	89	126
8	187	187	245	209	261	202	187	172	106	501	79	133
9	187	213	241	209	253	206	168	154	106	245	83	136
10	190	229	257	209	249	229	161	126	92	221	79	229
11	194	237	253	202	253	237	157	136	86	401	89	552
12	190	217	233	209	249	233	157	172	79	194	79	404
13	179	198	225	209	249	229	172	320	96	168	83	253
14	179	194	229	209	249	221	179	288	96	306	76	198
15	175	209	253	202	249	202	172	202	96	206	73	198
16	175	213	261	209	241	198	165	165	102	165	73	175
17	183	679	393	213	202	198	161	154	89	157	79	165
18	179	318	301	209	190	198	147	140	89	147	89	150
19	190	233	245	209	194	187	136	136	83	116	76	161
20	198	221	241	221	190	183	136	123	89	112	73	154
21	138	217	226	233	202	194	140	119	83	129	70	165
22	190	217	225	245	261	194	119	86	119	129	73	165
23	175	225	225	233	315	209	154	116	96	112	76	154
24	172	233	225	221	263	245	150	96	92	106	76	143
25	168	237	225	225	237	198	225	102	92	102	92	143
26	172	225	225	245	233	179	261	140	96	102	3,480	133
27	183	221	221	233	241	179	378	123	123	106	972	129
28	190	217	229	241	237	194	292	172	288	112	2,260	126
29	190	217	229	241	229	190	241	136	252	102	1,450	136
30	187	233	225	229	-	183	202	119	870	96	332	129
31	194	-	229	233	-	202	-	116	-	96	202	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	5,735	198	168	185	11,380
November.....	6,903	679	175	230	13,690
December.....	7,491	393	221	242	14,860
Calendar year 1947.....	111,493	1,800	168	305	221,200
January.....	6,833	245	202	220	13,550
February.....	7,209	343	190	249	14,300
March.....	6,300	245	179	203	12,500
April.....	5,573	378	136	186	11,050
May.....	4,868	320	96	157	9,690
June.....	4,083	670	79	136	8,100
July.....	6,589	1,330	96	277	17,040
August.....	10,774	3,480	70	348	21,370
September.....	5,321	552	126	177	10,550
Water year 1947-48.....	79,679	3,480	70	218	158,000

Peak discharge (base, 1,800 sec.-ft.)- Aug. 26 (12 m.) 10,900 sec.-ft.; Aug. 28 (6 p.m.) 2,410 sec.-ft.

Note.- No gage-height record Nov. 17 to Dec. 7, Apr. 2-15; discharge computed on basis of recorded range in stage and wire-weight gage readings at location 6 miles downstream.

## San Antonio River at Goliad, Tex.

Location.- Water-stage recorder, lat. 28°39', long. 97°23', at bridge on State Highway 29, 1.3 miles southeast of courthouse in Goliad, Goliad County, and 10 miles upstream from Manahulla Creek. Datum of gage is 91.1 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 3,918 square miles.

Records available.- June 1924 to March 1929, February 1939 to September 1948.

Average discharge.- 13 years (1924-28, 1939-48), 588 second-feet.

Extremes.- Maximum discharge during year, 10,200 second-feet Aug. 28 (gage height, 29.41 feet); minimum, 97 second-feet Aug. 23, 24 (gage height, 2.73 feet).  
1924-29, 1939-48: Maximum discharge, 33,800 second-feet July 9, 1942 (gage height, 44.9 feet); minimum observed, 44 second-feet for several periods in 1927.  
Floods of October 1913 and June 15, 1935, reached about the same stage as that of July 9, 1942.

Remarks.- Records good except those for period when loop curve was used, which are fair. Water diverted above station from Medina River for irrigation in vicinity of Devine and Lytle and some water diverted for irrigation near San Antonio. Water used industrially in San Antonio.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	205	231	249	263	272	281	227	290	175	425	130	434
2	211	229	263	263	281	281	245	243	162	1,130	141	317
3	225	236	241	263	290	250	250	214	157	1,440	125	254
4	220	234	254	263	281	236	236	209	157	944	128	216
5	220	231	263	263	299	240	231	211	160	668	123	193
6	225	231	263	264	389	252	227	202	150	744	130	171
7	232	238	272	254	389	252	227	195	144	962	130	159
8	232	234	281	247	353	249	214	189	148	687	120	159
9	236	225	281	250	326	252	229	184	142	506	121	163
10	236	223	290	252	308	281	234	186	141	389	111	744
11	229	263	290	245	299	344	229	189	137	326	111	488
12	232	290	299	250	299	290	213	226	132	344	110	380
13	236	290	308	243	290	290	208	220	128	452	113	524
14	232	299	290	241	290	281	195	308	118	398	113	407
15	227	263	290	247	290	272	182	371	120	263	108	290
16	216	254	299	252	299	272	193	362	125	344	108	223
17	220	254	326	240	299	247	189	281	121	263	105	231
18	214	272	317	245	281	238	189	214	123	205	105	697
19	225	590	425	272	249	240	189	196	170	196	105	495
20	220	479	362	263	232	240	175	180	110	187	111	281
21	229	281	299	254	240	229	162	169	110	159	110	220
22	236	272	281	263	249	223	155	162	111	144	101	193
23	236	281	272	272	288	231	160	151	111	155	98	191
24	231	263	281	362	231	177	159	108	160	98	191	191
25	214	254	263	281	371	243	182	578	118	144	103	178
26	211	272	263	263	344	281	418	1,020	120	135	110	168
27	209	281	263	272	299	245	538	1,110	114	128	e2,450	193
28	211	263	263	290	281	220	326	425	114	126	e9,070	186
29	222	250	263	272	281	216	407	254	125	128	e6,460	180
30	236	254	263	281	-	240	553	249	294	137	e1,820	150
31	236	-	263	290	-	240	-	216	-	130	e895	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	6,966	238	205	225	13,820
November.....	8,237	590	223	275	16,340
December.....	8,819	425	241	284	17,490
Calendar year 1947 .....	160,026	3,550	204	438	317,400
January.....	8,089	290	240	261	16,040
February.....	8,731	369	232	301	17,320
March.....	7,887	344	216	254	15,640
April.....	7,157	538	155	239	14,200
May.....	9,565	1,110	151	309	18,970
June.....	14,095	294	108	136	8,120
July.....	12,359	1,440	126	399	24,510
August.....	23,663	9,070	98	783	46,930
September.....	8,636	744	150	288	17,130
Water year 1947-48 .....	114,204	9,070	98	312	228,500

Peak discharge (base, 2,200 sec.-ft.)- Aug. 28 (11 p.m.) 10,200 sec.-ft.  
e Discharge computed from loop curve.

## Medina Lake near San Antonio, Tex.

Location.- Staff gage, lat. 29°32', long. 98°56', at Medina Dam on Medina River, 4 miles upstream from Medina diversion dam, 13 miles north of Castroville, and about 28 miles west of San Antonio, Bexar County.

Drainage area.- 587 square miles.

Records available.- May 1913 to September 1948.

Extremes.- 1947-48: Maximum contents observed during water year, 46,520 acre-feet Oct. 1 (gage height, 1,011.2 feet); minimum observed, 780 acre-feet about Apr. 11 (gage height, 944.0 feet).  
1913-48: Maximum contents observed, 288,800 acre-feet Sept. 16, 1919 (gage height, 1,078.0 feet); minimum observed since reservoir filled, that of about Apr. 11, 1948.

Remarks.- Lake is formed by concrete gravity-type dam. Dam completed and storage began May 7, 1913. Spillway section is natural rock with a 3-foot-wide cut-off wall located near right end of dam.

Total capacity, 254,000 acre-feet (gage height, 1,072.0 feet, top of spillway section). Water for irrigation is supplied by three 60-inch pipes equipped with vertical lift gates, at gage height 966.5 feet (capacity, 4,780 acre-feet). Reservoir can be emptied by two 30-inch sluice pipes equipped with vertical lift gates, at gage height 920.0 feet. Gage read once daily if stage is changing materially; otherwise readings are intermittent. Time of reading gage varies. Water used for irrigation of lands in the Bexar, Medina, Atascosa Counties Water Control and Improvement District No. 1, which has a permit from the State Board of Water Engineers to divert 300,000 acre-feet of water to irrigate 150,000 acres. No power is developed.

Cooperation.- Gage-height records and capacity table furnished by Bexar, Medina, Atascosa Counties Water Control and Improvement District No. 1.

Capacity table. (gage height, in feet, and contents in acre-feet)  
(Based on capacity curve prepared from topographic survey of  
reservoir by Medina Valley Irrigation Co.)

920	0	980	12,220	1,040	114,580
930	115	990	19,120	1,050	150,000
940	500	1,000	30,140	1,060	192,000
950	1,200	1,010	44,330	1,070	242,400
960	5,030	1,020	62,580	1,080	300,330
970	5,720	1,030	85,860		

Monthly gage height and contents, 1913-48

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Apr. 30, 1913.....	-	0	-
May 31.....	962.96	3,850	+3,850
June 30.....	980.70	12,700	+8,850
July 31.....	981.44	13,180	+480
Aug. 31.....	981.44	13,180	0
Sept. 30.....	988.29	17,950	+4,770
The period.....	-	-	+17,950
Oct. 31, 1913.....	1,016.61	56,380	+38,430
Nov. 30.....	1,023.85	71,430	+15,050
Dec. 31.....	1,049.27	147,500	+76,070
Calendar year 1913.....	-	-	+147,500
Jan. 31, 1914.....	1,050.43	151,600	+4,100
Feb. 28.....	1,050.56	152,500	+900
Mar. 31.....	1,049.39	147,800	-4,700
Apr. 30.....	1,052.00	158,400	+10,600
May 31.....	1,066.46	224,800	+66,400
June 30.....	1,069.46	239,900	+15,100
July 31.....	1,068.72	238,900	-4,000
Aug. 31.....	1,069.26	238,900	+3,000
Sept. 30.....	1,068.00	232,300	-6,600
Water year 1913-14.....	-	-	+214,350
Oct. 31, 1914.....	1,066.58	225,300	-7,000
Nov. 30.....	1,065.71	220,700	-4,600
Dec. 31.....	1,064.72	215,700	-5,000
Calendar year 1914.....	-	-	+68,200
Jan. 31, 1915.....	1,063.79	211,200	-4,500
Feb. 28.....	1,063.18	208,100	-3,100
Mar. 31.....	1,062.56	205,100	-3,000
Apr. 30.....	1,072.66	258,100	+53,000
May 31.....	1,072.68	258,100	0
June 30.....	1,071.34	250,000	-8,100
July 31.....	1,069.41	238,400	-10,600
Aug. 31.....	1,068.38	234,400	-5,000
Sept. 30.....	1,068.18	233,400	-1,000
Water year 1914-15.....	-	-	+1,100

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1915.....	1,066.93	226,600	-6,600
Nov. 30.....	1,065.44	219,200	-7,600
Dec. 31.....	1,064.45	214,200	-5,000
Calendar year 1915.....	-	-	-1,500
Jan. 31, 1916.....	1,063.65	210,200	-4,000
Feb. 29.....	1,062.57	205,100	-5,100
Mar. 31.....	1,060.86	196,500	-8,600
Apr. 30.....	1,067.00	227,300	+30,800
May 31.....	1,071.65	251,700	+24,400
June 30.....	1,070.10	243,000	-8,700
July 31.....	1,069.86	241,900	-1,100
Aug. 31.....	1,068.98	237,400	-4,500
Sept. 30.....	1,067.65	230,500	-7,100
Water year 1915-16.....	-	-	-3,100
Oct. 31, 1916.....	1,066.75	226,300	-4,000
Nov. 30.....	1,065.60	220,200	-6,100
Dec. 31.....	1,064.22	213,200	-7,000
Calendar year 1916.....	-	-	-1,000
Jan. 31, 1917.....	1,063.22	208,100	-5,100
Feb. 28.....	1,062.22	203,100	-5,000
Mar. 31.....	1,060.11	192,500	-10,600
Apr. 30.....	1,068.33	184,900	-7,600
May 31.....	1,057.68	182,300	-2,600
June 30.....	1,055.48	173,100	-9,200
July 31.....	1,053.19	163,400	-9,700
Aug. 31.....	1,050.58	152,500	-10,900
Sept. 30.....	1,048.77	145,700	-6,800
Water year 1916-17.....	-	-	-84,600
Oct. 31, 1917.....	1,046.30	136,800	-8,900
Nov. 30.....	1,045.16	132,900	-3,900
Dec. 31.....	1,042.97	125,100	-7,800
Calendar year 1917.....	-	-	-86,100
Jan. 31, 1918.....	1,041.38	119,500	-5,600
Feb. 28.....	1,040.28	115,600	-3,900
Mar. 31.....	1,037.25	106,500	-9,100
Apr. 30.....	1,038.32	109,600	+3,100
May 31.....	1,036.43	104,200	-5,400
June 30.....	1,032.52	93,020	-11,180
July 31.....	1,027.84	80,740	-12,280
Aug. 31.....	1,023.80	70,960	-9,780
Sept. 30.....	1,020.56	63,980	-6,980
Water year 1917-18.....	-	-	-81,720
Oct. 31, 1918.....	1,020.80	64,440	+460
Nov. 30.....	1,019.58	61,850	-2,590
Dec. 31.....	1,023.87	71,660	+9,810
Calendar year 1918.....	-	-	-53,440
Jan. 31, 1919.....	1,025.39	75,150	+3,490
Feb. 28.....	1,026.18	77,010	+1,860
Mar. 31.....	1,026.62	77,940	+930
Apr. 30.....	1,027.75	80,740	+2,800
May 31.....	1,029.74	85,160	+4,420
June 30.....	1,032.33	92,450	+7,290
July 31.....	1,040.78	117,400	+24,950
Aug. 31.....	1,065.10	217,700	+100,300
Sept. 30.....	1,073.09	260,400	+42,700
Water year 1918-19.....	-	-	+196,420
Oct. 31, 1919.....	1,072.97	259,800	-600
Nov. 30.....	1,072.39	256,300	-3,500
Dec. 31.....	1,072.29	255,700	-600
Calendar year 1919.....	-	-	+184,040
Jan. 31, 1920.....	1,072.46	256,900	+1,200
Feb. 29.....	1,072.30	255,700	-1,200
Mar. 31.....	1,072.25	255,200	-500
Apr. 30.....	1,071.86	253,400	-1,800
May 31.....	1,072.00	254,000	+600
June 30.....	1,071.31	250,000	-4,000
July 31.....	1,069.45	239,400	-10,600
Aug. 31.....	1,068.42	234,400	-5,000
Sept. 30.....	1,066.75	226,300	-8,100
Water year 1919-20.....	-	-	-34,100

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1920.....	1,066.22	216,200	-8,100
Nov. 30.....	1,064.72	215,700	-2,500
Dec. 31.....	1,063.81	211,200	-4,500
Calendar year 1920.....	-	-	-44,500
Jan. 31, 1921.....	1,063.11	207,600	-3,600
Feb. 28.....	1,062.13	202,600	-5,000
Mar. 31.....	1,061.87	201,600	-1,000
Apr. 30.....	1,061.58	200,100	-1,500
May 31.....	1,060.38	194,000	-6,100
June 30.....	1,065.15	218,200	+24,200
July 31.....	1,062.94	206,600	-11,600
Aug. 31.....	1,060.54	194,500	-12,100
Sept. 30.....	1,062.21	203,100	+8,600
Water year 1920-21.....	-	-	-23,200
Oct. 31, 1921.....	1,060.92	196,500	-6,600
Nov. 30.....	1,059.66	190,700	-5,800
Dec. 31.....	1,058.62	186,100	-4,600
Calendar year 1921.....	-	-	-25,100
Jan. 31, 1922.....	1,057.61	181,900	-4,200
Feb. 28.....	1,056.87	178,100	-3,800
Mar. 31.....	1,055.53	173,100	-5,000
Apr. 30.....	1,059.05	187,600	+14,700
May 31.....	1,061.78	201,100	+13,500
June 30.....	1,061.14	197,500	-3,600
July 31.....	1,058.86	187,400	-10,100
Aug. 31.....	1,056.68	178,100	-9,300
Sept. 30.....	1,054.51	168,900	-9,200
Water year 1921-22.....	-	-	-34,200
Oct. 31, 1922.....	1,052.70	161,300	-7,600
Nov. 30.....	1,051.63	156,700	-4,600
Dec. 31.....	1,050.08	150,400	-6,300
Calendar year 1922.....	-	-	-35,700
Jan. 31, 1923.....	1,048.57	145,000	-5,400
Feb. 28.....	1,048.75	145,700	+700
Mar. 31.....	1,048.43	144,300	-1,400
Apr. 30.....	1,050.49	152,100	+7,800
May 31.....	1,049.48	148,200	-3,900
June 30.....	1,046.41	137,200	-11,000
July 31.....	1,043.54	126,900	-10,300
Aug. 31.....	1,040.89	117,700	-9,200
Sept. 30.....	1,042.73	124,100	+6,400
Water year 1922-23.....	-	-	-44,800
Oct. 31, 1923.....	1,043.10	125,500	+1,400
Nov. 30.....	1,046.93	139,000	+13,500
Dec. 31.....	1,052.14	158,800	+19,800
Calendar year 1923.....	-	-	+8,400
Jan. 31, 1924.....	1,053.58	165,100	+6,300
Feb. 29.....	1,054.94	170,600	+5,500
Mar. 31.....	1,058.01	183,600	+13,000
Apr. 30.....	1,060.84	196,000	+12,400
May 31.....	1,062.62	205,100	+9,100
June 30.....	1,063.88	211,700	+6,600
July 31.....	1,062.17	203,100	-8,600
Aug. 31.....	1,059.75	191,200	-11,900
Sept. 30.....	1,058.33	184,900	-6,300
Water year 1923-24.....	-	-	+60,800
Oct. 31, 1924.....	1,056.46	177,300	-7,600
Nov. 30.....	1,055.29	172,200	-5,100
Dec. 31.....	1,054.04	166,800	-5,400
Calendar year 1924.....	-	-	+8,000
Jan. 31, 1925.....	1,052.64	160,900	-5,900
Feb. 28.....	1,051.16	155,000	-5,900
Mar. 31.....	1,048.81	145,700	-9,300
Apr. 30.....	1,046.39	137,200	-8,500
May 31.....	1,045.82	135,100	-2,100
June 30.....	1,041.70	120,500	-14,600
July 31.....	1,037.90	108,500	-12,000
Aug. 31.....	1,036.80	105,300	-3,200
Sept. 30.....	1,035.45	101,300	-4,000
Water year 1924-25.....	-	-	-83,600

## GUADALUPE RIVER BASIN

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1925.....	1,037.08	106,200	+4,900
Nov. 30.....	1,037.76	108,200	+2,000
Dec. 31.....	1,036.28	103,900	-4,300
Calendar year 1925.....	-	-	-62,900
Jan. 31, 1926.....	1,035.71	102,200	-1,700
Feb. 28.....	1,034.37	98,470	-3,730
Mar. 31.....	1,034.05	97,320	-1,150
Apr. 30.....	1,042.65	123,700	+26,380
May 31.....	1,045.50	134,000	+10,300
June 30.....	1,045.12	132,600	-1,400
July 31.....	1,044.75	131,500	-1,100
Aug. 31.....	1,042.78	124,100	-7,400
Sept. 30.....	1,040.68	117,000	-7,100
Water year 1925-26.....	-	-	+15,700
Oct. 31, 1926.....	1,039.22	112,200	-4,800
Nov. 30.....	1,038.47	110,200	-2,000
Dec. 31.....	1,037.98	108,600	-1,400
Calendar year 1926.....	-	-	+4,900
Jan. 31, 1927.....	1,037.00	105,900	-2,900
Feb. 28.....	1,038.50	110,200	+4,300
Mar. 31.....	1,041.25	118,800	+8,600
Apr. 30.....	1,044.00	128,700	+9,900
May 31.....	1,043.50	126,900	-1,800
June 30.....	1,043.50	126,900	0
July 31.....	1,043.00	125,100	-1,800
Aug. 31.....	1,041.00	118,100	-7,000
Sept. 30.....	1,038.00	108,800	-9,300
Water year 1926-27.....	-	-	-8,200
Oct. 31, 1927.....	1,036.00	103,100	-5,700
Nov. 30.....	1,034.00	97,320	-5,780
Dec. 31.....	1,032.50	93,020	-4,300
Calendar year 1927.....	-	-	-15,780
Jan. 31, 1928.....	1,030.50	87,290	-5,730
Feb. 29.....	1,030.00	85,860	-1,430
Mar. 31.....	1,029.50	84,700	-1,160
Apr. 30.....	1,028.50	82,370	-2,330
May 31.....	1,026.50	77,710	-4,660
June 30.....	1,026.00	76,550	-1,160
July 31.....	1,023.00	69,560	-6,990
Aug. 31.....	1,020.25	63,050	-6,510
Sept. 30.....	1,017.00	57,100	-5,950
Water year 1927-28.....	-	-	-51,700
Oct. 31, 1928.....	1,014.00	51,630	-5,470
Nov. 30.....	1,011.50	47,070	-4,560
Dec. 31.....	1,009.00	42,910	-4,160
Calendar year 1928.....	-	-	-50,110
Jan. 31, 1929.....	1,007.00	40,070	-2,840
Feb. 28.....	1,005.00	37,240	-2,830
Mar. 31.....	1,002.25	33,260	-3,980
Apr. 30.....	999.75	29,920	-3,340
May 31.....	999.50	29,590	-350
June 30.....	1,011.00	45,160	+16,570
July 31.....	1,013.75	51,260	+6,100
Aug. 31.....	1,011.75	47,620	-3,640
Sept. 30.....	1,007.50	40,780	-6,840
Water year 1928-29.....	-	-	-16,320
Oct. 31, 1929.....	1,003.25	34,680	-6,100
Nov. 30.....	999.50	29,590	-5,090
Dec. 31.....	996.25	25,950	-3,640
Calendar year 1929.....	-	-	-16,960
Jan. 31, 1930.....	993.92	23,420	-2,530
Feb. 28.....	991.18	20,440	-2,980
Mar. 31.....	987.40	17,330	-3,110
Apr. 30.....	982.57	14,010	-3,320
May 31.....	992.50	21,860	+7,870
June 30.....	994.44	23,970	+2,090
July 31.....	988.23	17,880	-6,090
Aug. 31.....	977.86	10,860	-7,020
Sept. 30.....	963.27	3,930	-6,930
Water year 1929-30.....	-	-	-36,850

## GUADALUPE RIVER BASIN

193

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1930.....	991.95	21,320	+17,390
Nov. 30.....	993.35	22,870	+1,550
Dec. 31.....	995.12	24,740	+1,870
Calendar year 1930.....	-	-	-1,210
Jan. 31, 1931.....	1,001.90	32,840	+8,100
Feb. 28.....	1,012.10	48,160	+15,320
Mar. 31.....	1,020.00	62,580	+14,420
Apr. 30.....	1,026.50	77,710	+15,130
May 31.....	1,041.65	120,200	+42,490
June 30.....	1,041.78	120,900	+700
July 31.....	1,043.57	127,300	+6,400
Aug. 31.....	1,041.89	121,300	-6,000
Sept. 30.....	1,039.11	111,900	-9,400
Water year 1930-31.....	-	-	+107,970
Oct. 31, 1931.....	1,036.55	104,800	-7,100
Nov. 30.....	1,034.56	99,040	-5,760
Dec. 31.....	1,034.05	97,610	-1,430
Calendar year 1931.....	-	-	+72,870
Jan. 31, 1932.....	1,033.85	97,040	-570
Feb. 29.....	1,034.02	97,320	+280
Mar. 31.....	1,034.54	99,900	+2,580
Apr. 30.....	1,035.30	101,000	+1,100
May 31.....	1,035.53	101,600	+600
June 30.....	1,035.03	94,460	-7,140
July 31.....	1,059.62	190,300	+95,840
Aug. 31.....	1,058.75	187,000	-3,300
Sept. 30.....	1,065.10	217,700	+30,700
Water year 1931-32.....	-	-	+105,800
Oct. 31, 1932.....	1,066.35	224,300	+6,600
Nov. 30.....	1,065.94	221,800	-2,500
Dec. 31.....	1,065.90	221,600	0
Calendar year 1932.....	-	-	+124,150
Jan. 31, 1933.....	1,067.54	229,800	+8,000
Feb. 28.....	1,068.07	232,800	+3,000
Mar. 31.....	1,068.16	233,400	+600
Apr. 30.....	1,067.49	229,800	-3,600
May 31.....	1,066.24	225,300	-4,500
June 30.....	1,064.64	215,200	-9,100
July 31.....	1,062.13	202,600	-12,600
Aug. 31.....	1,059.93	191,600	-11,000
Sept. 30.....	1,057.90	183,200	-8,400
Water year 1932-33.....	-	-	-34,500
Oct. 31, 1933.....	1,055.60	173,500	-9,700
Nov. 30.....	1,053.55	165,100	-8,400
Dec. 31.....	1,051.66	157,100	-8,000
Calendar year 1933.....	-	-	-64,700
Jan. 31, 1934.....	1,051.12	154,600	-2,500
Feb. 28.....	1,050.31	151,200	-3,400
Mar. 31.....	1,049.22	147,100	-4,100
Apr. 30.....	1,049.65	148,500	+1,400
May 31.....	1,047.42	140,700	-7,800
June 30.....	1,043.72	127,600	-13,100
July 31.....	1,041.48	119,800	-7,800
Aug. 31.....	1,037.82	108,200	-11,600
Sept. 30.....	1,034.63	99,040	-9,160
Water year 1933-34.....	-	-	-84,160
Oct. 31, 1934.....	1,031.90	99,310	+270
Nov. 30.....	1,029.51	84,700	-14,610
Dec. 31.....	1,028.18	81,670	-3,030
Calendar year 1934.....	-	-	-75,430
Jan. 31, 1935.....	1,027.38	79,810	-1,860
Feb. 28.....	1,027.42	79,810	0
Mar. 31.....	1,024.10	72,120	-7,690
Apr. 30.....	1,023.70	71,190	-930
May 31.....	1,036.30	103,900	+32,710
June 30.....	1,065.52	219,700	+115,800
July 31.....	1,071.00	248,200	+28,500
Aug. 31.....	1,070.30	244,200	-4,000
Sept. 30.....	1,072.48	256,900	+12,700
Water year 1934-35.....	-	-	+157,860



## GUADALUPE RIVER BASIN

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1935.....	1,072.07	254,600	-2,300
Nov. 30.....	1,071.72	252,300	-2,300
Dec. 31.....	1,072.09	254,600	+2,300
Calendar year 1935.....	-	-	+172,930
Jan. 31, 1936.....	1,071.98	254,000	-600
Feb. 29.....	1,071.78	252,900	-1,100
Mar. 31.....	1,071.65	251,700	-1,200
Apr. 30.....	1,070.84	247,100	-4,600
May 31.....	1,072.36	256,300	+9,200
June 30.....	1,076.25	278,300	+22,000
July 31.....	1,071.92	253,400	-24,900
Aug. 31.....	1,070.65	245,900	-7,500
Sept. 30.....	1,073.20	261,000	+15,100
Water year 1935-36.....	-	-	+4,100
Oct. 31, 1936.....	1,072.30	255,700	-5,300
Nov. 30.....	1,072.09	254,600	-1,100
Dec. 31.....	1,072.05	254,000	-600
Calendar year 1936.....	-	-	-600
Jan. 31, 1937.....	1,072.02	254,000	0
Feb. 28.....	1,071.86	253,400	-600
Mar. 31.....	1,072.04	254,000	+600
Apr. 30.....	1,071.80	252,900	-1,100
May 31.....	1,069.88	241,900	-11,000
June 30.....	1,071.70	252,300	+10,400
July 31.....	1,070.42	244,700	-7,600
Aug. 31.....	1,067.81	231,300	-13,400
Sept. 30.....	1,065.40	219,200	-12,100
Water year 1936-37.....	-	-	-41,800
Oct. 31, 1937.....	1,063.58	210,200	-9,000
Nov. 30.....	1,061.70	200,600	-9,600
Dec. 31.....	1,061.10	197,500	-3,100
Calendar year 1937.....	-	-	-56,500
Jan. 31, 1938.....	1,062.30	203,600	+6,100
Feb. 28.....	1,062.60	205,100	+1,500
Mar. 31.....	1,062.40	204,100	-1,000
Apr. 30.....	1,062.92	206,600	+2,500
May 31.....	1,063.14	207,600	+1,000
June 30.....	1,060.79	196,000	-11,600
July 31.....	1,058.10	184,000	-12,000
Aug. 31.....	1,054.79	170,100	-13,900
Sept. 30.....	1,052.77	161,700	-8,400
Water year 1937-38.....	-	-	-57,500
Oct. 31, 1938.....	1,048.40	144,300	-17,400
Nov. 30.....	1,045.80	135,100	-9,200
Dec. 31.....	1,044.00	128,700	-6,400
Calendar year 1938.....	-	-	-68,800
Jan. 31, 1939.....	1,043.50	126,900	-1,800
Feb. 28.....	1,042.34	122,700	-4,200
Mar. 31.....	1,039.91	114,200	-8,500
Apr. 30.....	1,035.80	102,500	-11,700
May 31.....	1,031.03	88,730	-13,770
June 30.....	1,026.53	77,710	-11,020
July 31.....	1,027.18	79,340	+1,630
Aug. 31.....	1,023.60	70,960	-8,380
Sept. 30.....	1,018.60	60,020	-10,940
Water year 1938-39.....	-	-	-101,680
Oct. 31, 1939.....	1,018.25	59,300	-720
Nov. 30.....	1,015.50	54,370	-4,930
Dec. 31.....	1,012.85	49,440	-4,930
Calendar year 1939.....	-	-	-79,260
Jan. 31, 1940.....	1,010.10	44,510	-4,930
Feb. 29.....	1,010.70	45,610	+1,100
Mar. 31.....	1,004.60	36,670	-8,940
Apr. 30.....	1,005.10	37,380	+710
May 31.....	1,003.18	34,880	-2,700
June 30.....	999.65	29,700	-4,980
July 31.....	995.50	25,620	-4,080
Aug. 31.....	985.50	16,020	-9,600
Sept. 30.....	972.10	7,080	-8,940
Water year 1939-40.....	-	-	-52,940

## GUADALUPE RIVER BASIN

195

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1940.....	953.10	1,770	-5,410
Nov. 30.....	970.32	5,920	+4,150
Dec. 31.....	995.65	25,290	+19,370
Calendar year 1940.....	-	-	-24,150
Jan. 31, 1941.....	995.35	25,070	-220
Feb. 28.....	1,019.60	61,850	+36,780
Mar. 31.....	1,029.30	84,230	+22,380
Apr. 30.....	1,039.38	112,800	+28,570
May 31.....	1,050.90	153,700	+40,900
June 30.....	1,051.55	166,700	+13,000
July 31.....	1,049.75	149,200	-17,500
Aug. 31.....	1,048.65	145,000	-4,200
Sept. 30.....	1,047.75	142,200	-2,800
Water year 1940-41.....	-	-	+135,120
Oct. 31, 1941.....	1,047.85	142,200	0
Nov. 30.....	1,046.62	137,900	-4,300
Dec. 31.....	1,045.65	135,100	-2,800
Calendar year 1941.....	-	-	+109,810
Jan. 31, 1942.....	1,044.30	129,800	-5,300
Feb. 28.....	1,043.28	126,200	-3,600
Mar. 31.....	1,041.00	118,100	-8,100
Apr. 30.....	1,040.50	116,300	-1,800
May 31.....	1,044.48	130,500	+14,200
June 30.....	1,041.00	118,100	-12,400
July 31.....	1,039.85	113,900	-4,200
Aug. 31.....	1,036.30	103,900	-10,000
Sept. 30.....	1,036.90	105,600	+1,700
Water year 1941-42.....	-	-	-36,600
Oct. 31, 1942.....	1,046.05	135,800	+30,200
Nov. 30.....	1,046.58	137,900	+2,100
Dec. 31.....	1,046.10	136,100	-1,800
Calendar year 1942.....	-	-	+1,000
Jan. 31, 1943.....	1,045.30	133,300	-2,800
Feb. 28.....	1,043.52	126,900	-6,400
Mar. 31.....	1,041.55	120,200	-6,700
Apr. 30.....	1,040.45	115,900	-4,300
May 31.....	-	-	-
June 30.....	1,040.95	118,100	+2,200
July 31.....	1,038.50	110,200	-7,900
Aug. 31.....	1,033.50	95,890	-14,310
Sept. 30.....	1,031.50	90,160	-5,730
Water year 1942-43.....	-	-	-15,440
Oct. 31, 1943.....	1,028.65	82,600	-7,560
Nov. 30.....	1,026.05	76,550	-6,050
Dec. 31.....	1,024.70	73,520	-3,030
Calendar year 1943.....	-	-	-62,580
Jan. 31, 1944.....	1,024.15	72,360	-1,160
Feb. 29.....	1,025.50	75,380	+3,020
Mar. 31.....	1,029.60	84,930	+9,550
Apr. 30.....	1,028.80	83,070	-1,860
May 31.....	1,036.95	105,900	+22,830
June 30.....	1,038.00	108,800	+2,900
July 31.....	1,034.20	97,900	-10,900
Aug. 31.....	1,031.50	90,160	-7,740
Sept. 30.....	1,030.40	87,010	-3,150
Water year 1943-44.....	-	-	-3,150
Oct. 31, 1944.....	1,027.70	80,510	-6,500
Nov. 30.....	1,025.60	75,620	-4,890
Dec. 31.....	1,026.80	78,410	+2,790
Calendar year 1944.....	-	-	+4,890
Jan. 31, 1945.....	1,032.90	94,170	+15,760
Feb. 28.....	1,037.00	105,900	+11,730
Mar. 31.....	1,039.80	113,900	+8,000
Apr. 30.....	1,042.50	123,400	+9,500
May 31.....	1,045.00	132,200	+8,800
June 30.....	1,037.60	107,600	-24,600
July 31.....	1,033.00	94,460	-13,140
Aug. 31.....	1,027.00	78,880	-15,580
Sept. 30.....	1,027.90	80,970	+2,090
Water year 1944-45.....	-	-	-6,040

## GUADALUPE RIVER BASIN

Monthly gage height and contents of Medina Lake near San Antonio, Tex.,  
1913-48--Continued

Date	Gage height (feet)	Contents (acre-feet)	Change in contents during month (acre-feet)
Oct. 31, 1945.....	1,031.40	89,870	+8,900
Nov. 30.....	1,029.40	84,460	-5,410
Dec. 31.....	1,028.60	82,600	-1,860
Calendar year 1945.....	-	-	+4,190
Jan. 31, 1946.....	1,027.45	79,810	-2,790
Feb. 28.....	1,027.65	80,270	+460
Mar. 31.....	1,025.40	75,150	-5,120
Apr. 30.....	1,023.00	69,560	-5,590
May 31.....	1,028.40	82,140	+12,580
June 30.....	1,027.50	80,040	-2,100
July 31.....	1,022.00	67,240	-12,800
Aug. 31.....	1,017.60	58,200	-9,040
Sept. 30.....	1,021.00	64,910	+6,710
Water year 1945-46.....	-	-	-16,060
Oct. 31, 1946.....	1,028.10	81,440	+16,530
Nov. 30.....	1,028.90	83,300	+1,860
Dec. 31.....	1,029.60	84,930	+1,630
Calendar year 1946.....	-	-	+2,330
Jan. 31, 1947.....	1,034.20	97,900	+12,870
Feb. 28.....	1,036.50	104,500	+6,600
Mar. 31.....	1,036.90	105,600	+1,100
Apr. 30.....	1,035.50	101,600	-4,000
May 31.....	1,033.70	96,460	-5,140
June 30.....	1,030.10	86,150	-10,310
July 31.....	1,024.40	72,820	-13,330
Aug. 31.....	1,018.90	60,570	-12,250
Sept. 30.....	1,011.40	46,880	-13,690
Water year 1946-47.....	-	-	-18,030
Oct. 31, 1947.....	999.6	29,700	-17,180
Nov. 30.....	992.0	21,320	-8,380
Dec. 31.....	984.9	15,600	-5,720
Calendar year 1947.....	-	-	-69,330
Jan. 31, 1948.....	975.4	9,230	-6,370
Feb. 29.....	969.3	5,530	-3,700
Mar. 31.....	956.0	2,310	-3,220
Apr. 30.....	955.5	2,220	-90
May 31.....	958.6	2,790	+570
June 30.....	981.5	13,260	+10,470
July 31.....	975.5	9,300	-3,960
Aug. 31.....	951.0	1,380	-7,920
Sept. 30.....	955.1	2,140	+760
Water year 1947-48.....	-	-	-44,740

## Medina River near San Antonio, Tex.

Location.- Water-stage recorder, lat. 29°15', long. 98°28', at bridge on U. S. Highway 281, 5.2 miles upstream from mouth and 9 miles south of San Antonio, Bexar County.

Drainage area.- 1,225 square miles (587 square miles in above dam forming Medina Lake).

Records available.- July 1939 to September 1948. October 1929 to December 1930, records below about 50 second-feet, at Losoya, 1.5 miles downstream, in connection with seepage investigation.

Extremes.- Maximum discharge during year, 2,050 second-feet Aug. 27 (gage height, 14.58 feet); minimum, 5.9 second-feet Sept. 6, 7.

1939-48: Maximum discharge, 31,800 second-feet Aug. 29, 1946; maximum gage height, 41.57 feet Sept. 27, 1946 (backwater from San Antonio River); minimum discharge, that of Sept. 6, 7, 1948.

Maximum stage known, about 55 feet in 1912 (prior to construction of Medina Dam, 60 miles upstream), from information by State Highway Department.

Remarks.- Records good except those for periods of no gage-height record, which are fair. Flow partly regulated by Medina Lake (capacity, 254,000 acre-feet) and diversion dam reservoir (capacity, 4,500 acre-feet). Storage began in Medina Lake in 1913. About 5,000 acres are irrigated by water released from Medina Lake above station. A considerable part of low flow is sewage from San Antonio which is released from Mitchell Lake a few miles above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	89	95	87	89	64	99	90	39	f67	15	13
2	76	83	98	89	152	62	95	f65	39	f56	13	11
3	75	80	106	86	162	64	87	64	38	438	13	11
4	79	80	106	84	152	57	66	66	38	221	13	10
5	83	77	102	85	144	57	97	61	38	132	13	8.9
6	80	96	106	85	134	59	97	71	28	125	13	8.0
7	86	130	111	82	130	69	90	45	18	114	13	7.4
8	87	148	112	83	123	96	86	30	15	88	13	10
9	86	144	109	84	121	102	82	30	15	68	12	42
10	79	112	102	85	123	105	74	44	15	a32	13	163
11	80	82	100	86	123	102	55	77	15	a32	14	117
12	76	79	90	86	126	94	88	117	13	228	13	64
13	76	82	94	83	124	68	78	81	11	80	15	62
14	80	89	96	92	113	68	75	59	11	a34	17	46
15	84	89	209	92	70	70	60	41	13	a32	15	20
16	86	89	193	88	68	63	46	26	14	a30	14	19
17	88	88	122	82	68	f58	43	30	14	a28	21	28
18	86	106	115	88	68	f67	42	24	13	a26	16	26
19	86	117	112	93	67	90	50	23	15	a24	15	20
20	85	110	106	101	68	91	57	23	13	a22	15	19
21	81	104	98	98	111	94	52	22	13	a20	15	20
22	78	105	96	94	157	136	57	21	13	a18	13	20
23	77	106	95	106	113	72	100	21	11	18	13	21
24	78	98	95	134	107	65	128	20	24	18	14	20
25	78	101	95	111	108	82	169	19	28	17	15	19
26	78	102	101	117	108	104	175	44	28	16	365	17
27	80	100	98	113	89	90	139	29	20	16	1,060	15
28	82	96	94	87	71	68	98	23	14	18	159	17
29	88	97	93	95	66	98	71	26	912	15	29	16
30	99	97	91	81	-	100	86	20	302	16	20	17
31	96	-	91	81	-	101	-	28	-	16	17	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,548	99	75	82.2	5,050
November.....	2,976	148	77	99.2	5,900
December.....	3,331	209	90	107	6,610
Calendar year 1947.....	35,712	209	75	97.8	70,840
January.....	2,858	134	81	92.2	5,670
February.....	3,153	162	66	109	6,250
March.....	2,516	136	57	81.2	4,990
April.....	2,521	175	42	84.0	5,000
May.....	1,340	117	19	43.2	2,660
June.....	1,778	912	11	59.3	3,530
July.....	2,065	438	15	66.6	4,100
August.....	2,006	1,060	12	64.7	3,980
September.....	867.3	163	7.4	29.6	1,760
Water year 1947-48.....	27,979.3	1,080	7.4	76.4	55,500

Peak discharge (base, 1,500 sec.-ft.)- June 27 (5 a.m.) 2,050 sec.-ft.  
 a No gage-height record; discharge computed on basis of discharge measurement made Aug. 22 and weather records.

f Computed on basis of partly estimated gage-height record.

## Cibolo Creek near Bulverde, Tex.

Location.- Water-stage recorder, lat. 29°43'35", long. 98°25'40", at William Classen ranch house, 1.8 miles downstream from bridge on U. S. Highway 281, 2 miles southeast of Bulverde, Comal County, and 4.7 miles upstream from Dripping Springs Creek.

Drainage area.- 198 square miles.

Records available.- April 1946 to September 1948.

Extremes.- No flow during year.

1946-48: Maximum gage height, 12.50 feet, from floodmark, Sept. 27, 1946 (discharge not determined); no flow most of time.

Remarks.- No flow since Feb. 2, 1947. The purpose of the station is to determine the streamflow losses during periods of medium and low flow. There are no surface diversions, but much of surface flow enters sink holes and caverns in Glen Rose limestone above station. Figures for calendar year 1947 are as follows: total second-foot days, 513.5; maximum daily discharge, 91 second-feet; minimum daily, no flow; mean, 1.41 second-feet; runoff, 1,020 acre-feet.

## Cibolo Creek above Bracken, Tex.

Location.- Water-stage recorder, lat. 29°40'30", long. 98°23'00", 0.1 mile downstream from West Fork Creek and 5.8 miles northwest of Bracken, Comal County.

Drainage area.- 251 square miles.

Records available.- March 1946 to September 1948.

Extremes.- Maximum discharge during year, 468 second-feet May 11 (gage height, 4.35 feet); no flow most of time.

1946-48: Maximum gage height, 11.04 feet, from floodmark, Sept. 27, 1946 (discharge not determined); no flow most of time.

Remarks.- Records good. Discharge not computed above 500 second-feet. The purpose of the station is to determine the stream-flow losses during periods of medium and low flow. There are no surface diversions, but much of the surface flow enters sink holes and caverns in Glen Rose limestone above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								0				
2								0				
3								0				
4								0				
5								0				
6								0				
7								0				
8								0				
9								0				
10								0				
11								75				
12								84				
13								0				
14								0				
15								0				
16								0				
17								0				
18								0				
19								0				
20								0				
21								0				
22								0				
23								0				
24								0				
25								0				
26								0				
27								0				
28								0				
29								0				
30								0				
31								0				
Month	Second-foot-days					Maximum		Minimum	Mean	Runoff in acre-feet		
October.....	0					0		0	0	0		
November.....	0					0		0	0	0		
December.....	0					0		0	0	0		
Calendar year 1947 .....	474.5					63		0	1.30	941		
January.....	0					0		0	0	0		
February.....	0					0		0	0	0		
March.....	0					0		0	0	0		
April.....	0					0		0	0	0		
May.....	83.4					75		0	2.69	165		
June.....	0					0		0	0	0		
July.....	0					0		0	0	0		
August.....	0					0		0	0	0		
September.....	0					0		0	0	0		
Water year 1947-48 .....	83.4					75		0	.23	165		

## Cibolo Creek at Selma, Tex.

Location.- Water-stage recorder, lat. 29°35'35", long. 98°18'40", 0.6 mile downstream from Missouri-Kansas-Texas Railroad bridge and 0.8 mile upstream from bridge on U. S. Highway 81 at Selma, Bexar County. Datum of gage is 728.34 feet above mean sea level, datum of 1929.

Drainage area.- 280 square miles.

Records available.- March 1946 to September 1948.

Extremes.- Maximum discharge during year, 37 second-feet July 5 (gage height, 3.37 feet); no flow most of time.

1946-48: Maximum discharge, 7,240 second-feet Sept. 27, 1946 (gage height, 10.48 feet); no flow most of time.

Maximum stage known, about 26 feet in 1889, from information by local resident.

Flood of 1913 was probably about 2 feet lower than that of 1889.

Remarks.- Records good. There are no surface diversions, but part of flow of Cibolo Creek enters the Edwards limestone in the Balcones fault zone which crosses basin between this station and station above Bracken.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										0		
2										0		
3										0		
4										.2		
5										3.2		
6										0		
7										0		
8										0		
9										0		
10										0		
11										0		
12										0		
13										0		
14										0		
15										0		
16										0		
17										0		
18										0		
19										0		
20										0		
21										0		
22										0		
23										0		
24										0		
25										0		
26										0		
27										0		
28										0		
29										0		
30										0		
31										0		
Month	Second-foot-days					Maximum	Minimum	Mean	Runoff in acre-feet			
October.....	0					0	0	0	0			
November.....	0					0	0	0	0			
December.....	0					0	0	0	0			
Calendar year 1947.....	4.5					2.4	0	.01	8.9			
January.....	0					0	0	0	0			
February.....	0					0	0	0	0			
March.....	0					0	0	0	0			
April.....	0					0	0	0	0			
May.....	0					0	0	0	0			
June.....	0					0	0	0	0			
July.....	3.4					3.2	0	.11	6.7			
August.....	0					0	0	0	0			
September.....	0					0	0	0	0			
Water year 1947-48.....	3.4					3.2	0	.01	6.7			

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

## Cibolo Creek near Falls City, Tex.

Location.- Water-stage recorder, lat. 29°01', long. 97°56', at bridge on State Highway 123, 5.5 miles northeast of Falls City, Karnes County, and 9 miles upstream from mouth.  
Datum of gage is 264.3 feet above mean sea level, datum of 1929, Houston supplementary adjustment of 1943.

Drainage area.- 831 square miles.

Records available.- November 1930 to September 1948.

Average discharge.- 17 years (1931-48), 130 second-feet.

Extremes.- Maximum discharge during year, 11,500 second-feet Aug. 26 (gage height, 23.43 feet); minimum, 4.0 second-feet Aug. 22 (gage height, 0.86 foot).  
1930-48: Maximum discharge, 33,600 second-feet July 6, 1942 (gage height, 34.45 feet); minimum, that of Aug. 22, 1948.  
Flood in October 1913 reached a stage about half a foot higher than that of July 6, 1942.

Remarks.- Records good. There are no surface diversions, but much of the surface flow of Cibolo Creek enters sink holes and caverns in Glen Rose limestone and in Edwards limestone in the Balcones fault zone which crosses the basin between station above Bracken and station at Selma.

Revisions (water years).- W 733: 1931. W 1058: 1935.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	16	16	17	20	24	24	19	16	18	193	9.3	14
2	16	16	17	22	29	24	16	16	18	310	17	12
3	15	16	19	22	29	22	19	16	16	177	7.8	12
4	15	16	20	21	29	22	19	16	16	52	7.3	11
5	16	15	19	21	32	27	20	14	14	113	7.3	11
6	16	17	19	21	30	24	20	14	14	109	6.8	11
7	16	16	19	21	29	23	19	16	14	55	6.8	11
8	16	16	20	21	29	22	19	15	14	32	6.8	276
9	15	17	24	22	27	22	18	13	27	6.3	196	
10	15	17	21	22	25	22	17	19	13	22	6.3	51
11	16	17	20	22	23	22	17	83	13	47	6.3	21
12	14	17	22	22	22	22	17	40	14	35	6.3	12
13	15	17	24	21	22	22	18	43	13	15	6.3	8.8
14	16	19	27	20	22	22	17	35	13	13	6.3	8.8
15	16	18	34	20	22	22	17	24	12	11	6.3	8.8
16	16	19	29	21	22	22	17	20	11	9.8	6.8	8.3
17	14	62	25	20	22	22	16	18	11	9.8	6.8	8.3
18	14	38	27	20	22	21	16	16	9.8	11	6.8	8.8
19	17	20	24	22	23	20	16	16	9.3	10	6.3	9.8
20	16	19	24	22	23	20	14	14	10	9.8	5.8	10
21	14	19	22	22	40	20	13	13	10	9.8	5.3	9.3
22	14	17	20	22	52	20	15	12	10	9.8	4.4	8.3
23	16	17	22	23	28	19	16	12	11	8.8	4.8	8.3
24	16	19	22	22	24	19	16	32	11	8.8	20	8.3
25	15	19	22	22	24	19	26	1,120	11	7.8	17	41
26	15	18	22	24	24	20	27	193	10	7.8	4,410	16
27	16	19	22	25	22	20	22	60	9.8	8.3	206	9.8
28	17	19	22	24	22	20	24	35	24	7.3	106	8.8
29	17	19	22	23	24	19	20	24	40	7.3	47	9.3
30	17	19	22	23	-	19	17	21	197	7.3	26	9.3
31	17	-	22	22	-	19	-	19	-	7.3	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	483	17	14	15.6	958
November.....	593	62	15	19.8	1,180
December.....	691	34	17	22.3	1,370
Calendar year 1947.....	23,410	3,620	14	64.1	46,450
January.....	675	25	20	21.8	1,340
February.....	766	52	22	26.4	1,520
March.....	661	27	19	21.3	1,310
April.....	549	27	13	18.3	1,090
May.....	2,039	1,120	12	84.8	3,980
June.....	597.9	197	9.3	19.9	1,130
July.....	1,351.7	310	7.3	43.6	2,680
August.....	5,008.2	4,410	4.4	162	9,930
September.....	838.0	276	8.3	27.9	1,660
Water year 1947-48.....	14,222.8	4,410	4.4	38.9	28,210

Peak discharge (base, 4,400 sec.-ft.)- Aug. 26 (9 a.m.) 11,500 sec.-ft.  
Note.- No gage-height record Mar. 5-20; discharge computed on basis of recorded range in stage, weather records, and discharge measurement made Mar. 20.



## MISSION RIVER BASIN

201

## Mission River at Refugio, Tex.

Location.- Wire-weight gage, lat. 28°17', long. 97°17', at bridge on U. S. Highway 77, 500 feet upstream from Missouri Pacific Railroad bridge and a quarter of a mile southwest of Refugio County. Datum of gage is 1.7 feet above mean sea level, datum of 1929.

Drainage area.- 643 square miles.

Records available.- July 1939 to September 1948.

Extremes.- Maximum discharge during year, 342 second-feet July 1 (gage height, 6.40 feet, from graph based on gage readings); minimum observed, 1.2 second-feet Sept. 7, 8, 1939-48: Maximum discharge, 41,700 second-feet July 7, 1942 (gage height, 33.3 feet); minimum observed, 0.7 second-foot Oct. 7, 9, 1940, Aug. 18-20, Sept. 5, 1945. Maximum stage known prior to 1942, 32.3 feet in August 1914 and on May 17, 1938, from information by local residents.

Remarks.- Records fair except those for periods of no gage-height record, which are poor. Gage read twice daily, oftener during floods. No large diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.3	5.4	6.1	3.8	8.3	13	6.5	3.8	3.5	200	2.1	1.8
2	6.3	5.4	6.3	3.7	8.7	13	6.3	4.0	2.9	128	2.6	1.3
3	6.3	5.0	6.3	3.8	9.0	12	5.0	3.8	2.7	56	2.3	1.3
4	6.7	5.0	6.7	3.7	9.2	11	5.4	3.8	2.6	105	2.1	1.3
5	6.3	5.4	7.1	3.3	9.2	20	5.4	4.0	2.4	81	2.4	1.3
6	6.3	6.1	7.1	3.5	9.7	29	4.8	4.0	2.4	34	2.4	1.3
7	6.7	6.7	7.6	5.6	10	20	5.0	3.8	2.4	14	2.3	1.2
8	6.3	7.1	7.6	6.9	13	70	4.2	4.4	2.4	9.0	2.3	1.6
9	6.1	7.1	8.0	8.9	14	94	5.0	2.9	2.9	10	2.3	1.6
10	6.3	7.1	9.0	6.9	12	68	5.0	5.0	2.7	6.1	2.3	8.6
11	6.3	6.9	9.7	7.1	11	35	4.8	7.6	2.9	4.4	2.4	4.4
12	6.3	6.9	11	7.4	11	16	4.4	10	3.7	4.0	2.1	20
13	5.6	7.8	15	7.6	10	11	4.8	6.9	2.4	3.8	1.8	9.4
14	5.6	7.8	44	8.3	10	10	4.6	6.1	3.1	3.5	1.8	4.4
15	5.6	7.4	46	8.3	10	9.0	4.6	4.4	3.1	3.1	1.8	2.7
16	6.1	7.8	44	9.0	9.7	9.0	4.6	4.2	2.4	2.7	2.1	3.1
17	5.8	8.3	38	10	9.4	9.0	4.6	4.2	1.9	3.1	1.8	2.6
18	5.6	8.0	31	18	9.2	9.0	4.2	4.0	1.8	4.8	1.8	2.4
19	5.2	7.8	25	25	9.0	8.3	4.4	4.6	1.8	6.7	1.8	2.4
20	5.4	8.3	19	27	8.7	8.3	4.6	5.2	1.5	3.3	1.8	2.3
21	5.2	8.7	16	22	8.5	8.0	5.0	4.6	1.8	2.9	1.8	2.1
22	5.2	8.0	11	13	39	7.6	7.1	4.4	1.9	2.1	1.9	2.4
23	4.8	7.6	8.3	8.3	34	7.6	12	4.8	1.8	2.6	1.9	2.3
24	5.2	7.1	7.1	5.8	21	7.6	7.1	5.6	1.8	2.3	1.9	2.6
25	5.4	7.1	6.3	6.1	17	7.4	22	18	2.7	2.3	2.3	2.6
26	5.4	6.7	5.8	6.5	18	7.1	12	18	3.1	2.3	2.1	2.4
27	5.4	6.7	5.6	6.5	16	7.1	11	12	2.1	2.4	2.3	2.1
28	5.8	6.3	5.0	6.5	15	6.9	6.3	11	2.4	1.9	1.8	2.1
29	5.8	6.3	4.8	6.7	14	6.9	5.4	9.2	2.6	2.3	2.3	1.6
30	5.8	6.3	4.4	7.6	-	6.7	4.4	6.1	4.0	2.3	1.9	1.6
31	5.4	-	4.0	7.6	-	6.7	-	4.2	-	2.3	1.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	180.7	6.7	4.8	5.83	358
November.....	209.1	8.7	5.0	6.94	413
December.....	432.6	46	4.0	14.0	858
Calendar year 1947 .....	23,855.9	8,170	4.0	65.4	47,310
January.....	272.4	27	3.3	6.79	540
February.....	381.6	39	8.3	15.2	787
March.....	654.2	94	6.7	17.9	1,100
April.....	190.5	22	4.2	6.35	378
May.....	196.5	18	3.8	6.34	390
June.....	75.5	4.0	1.5	2.52	150
July.....	720.2	200	1.9	23.2	1,430
August.....	64.3	2.6	1.8	2.07	128
September.....	99.9	20	1.2	3.33	198
Water year 1947-48 .....	3,376.7	200	1.2	9.23	6,700

Peak discharge (base, 2,500 sec.-ft.).- No peak above base.

Note.- No gage-height record Jan. 6, Feb. 8-10, Feb. 13 to Mar. 6, July 22; discharge interpolated, or computed on basis of discharge measurements made Feb. 11, 12 and weather records.

## NUECES RIVER BASIN

Nueces River at Laguna, Tex.

Location.- Water-stage recorder, lat. 29°25'45", long. 99°59'50", half a mile downstream from Sycamore Creek and 1 mile northeast of Laguna, Uvalde County. Datum of gage is 1,119.72 feet above mean sea level, datum of 1929.

Drainage area.- 764 square miles.

Records available.- October 1923 to September 1948.

Average discharge.- 25 years, 140 second-feet.

Extremes.- Maximum discharge during year, 10,300 second-feet July 5 (gage height, 9.52 feet); minimum, 19 second-feet Sept. 17-21.

1923-48: Maximum discharge, 222,000 second-feet July 13, 1939 (gage height, 26.40 feet), from rating curve extended above 40,000 second-feet on basis of float measurement (110,000 second-feet) and slope-area determination (213,000 second-feet); minimum, 7.8 second-feet Nov. 3-15, 18, 1934.

Flood of Sept. 21, 1923, reached a stage of 26.5 feet (discharge, 226,000 second-feet, based on rating curve mentioned above). Flood of June 1913 reached a stage 2 or 3 feet higher than that of Sept. 21, 1923, from information by local resident.

Remarks.- Records good except those for July 8-26, which are poor. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	33	32	33	41	44	46	42	51	29	145	44	26
2	33	32	33	41	48	48	42	48	28	141	44	27
3	32	32	33	41	46	48	42	48	27	134	44	26
4	32	32	33	41	46	48	42	44	28	124	42	26
5	32	32	34	41	46	48	41	44	30	2,420	42	26
6	32	30	34	41	46	48	41	41	30	1,690	41	25
7	30	30	34	41	46	48	41	39	30	598	39	24
8	30	30	34	41	46	48	41	39	28	368	39	24
9	30	30	34	41	46	48	41	37	27	253	37	24
10	30	30	36	41	46	48	41	36	28	226	36	24
11	30	30	36	41	46	46	41	53	30	208	34	20
12	30	30	36	41	48	48	39	46	28	145	33	20
13	30	30	36	41	48	48	39	44	28	124	32	20
14	30	30	37	41	46	48	39	42	27	107	32	20
15	30	30	39	41	48	48	39	39	26	101	32	20
16	30	30	39	41	48	48	39	39	26	95	33	20
17	30	34	39	41	48	46	37	39	25	86	33	19
18	30	33	39	41	48	46	37	34	24	83	32	19
19	32	32	39	41	48	46	34	34	22	80	30	19
20	32	32	39	41	48	44	34	34	22	72	30	19
21	32	32	39	42	48	44	34	33	22	70	29	20
22	32	32	39	42	48	44	36	33	20	67	29	30
23	30	32	39	42	48	44	41	33	22	62	29	26
24	29	32	39	42	48	44	36	42	25	58	29	24
25	28	32	39	42	48	44	44	36	22	56	30	22
26	29	32	39	42	48	44	39	36	194	55	29	22
27	29	32	39	42	53	42	48	34	168	53	29	22
28	30	33	39	42	48	42	55	33	171	51	29	22
29	34	33	39	42	46	42	55	32	141	48	28	22
30	38	33	39	41	-	42	53	30	134	44	28	22
31	32	-	41	41	-	42	-	29	-	42	28	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	956	34	28	30.8	1,900
November.....	944	34	30	31.5	1,870
December.....	1,148	41	33	37.0	2,280
Calendar year 1947.....	33,257	586	28	91.1	65,970
January.....	1,280	42	41	41.3	2,540
February.....	1,375	53	44	47.4	2,730
March.....	1,420	48	42	45.8	2,820
April.....	1,232	55	34	41.1	2,440
May.....	1,205	53	29	38.9	2,390
June.....	1,462	194	20	48.7	2,900
July.....	7,808	2,420	42	252	15,490
August.....	1,046	44	28	33.7	2,070
September.....	682	30	19	22.7	1,350
Water year 1947-48.....	20,558	2,420	19	56.2	40,780

Peak discharge (base, 1,200 sec.-ft.)- July 5 (4:30 p.m.) 10,300 sec.-ft.

Nueces River below Uvalde, Tex.

Location.- Water-stage recorder, lat. 29°08', long. 99°54', on Smyth Ranch, 4 miles upstream from bridge on U. S. Highway 83, 9 miles southwest of Uvalde, Uvalde County, and 15 miles downstream from West Nueces River. Datum of gage is 796.1 feet above mean sea level, datum of 1929.

Drainage area.- 1,947 square miles.

Records available.- April 1939 to September 1948.

Extremes.- Maximum discharge during year, 23,600 second-feet June 25 (gage height, 11.44 feet); minimum, 4.4 second-feet June 17-23.  
1939-48: Maximum discharge, 89,000 second-feet July 13, 1939 (gage height, 19.25 feet), from rating curve extended on basis of peak discharge at former station 5 miles upstream; minimum, 4.0 second-feet Apr. 14, 1946.  
Maximum stage known, 40.4 feet June 14, 1935, from floodmarks (discharge at former station 5 miles upstream, 616,000 second-feet, by slope-area method).

Remarks.- Records good. Part of flow of Nueces River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	15	14	12	12	12	9.8	7.2	5.6	48	21	13
2	18	15	14	13	13	11	9.5	7.0	5.4	45	20	14
3	18	15	14	13	12	11	9.3	7.0	5.4	32	20	14
4	17	15	14	13	12	11	9.8	6.8	5.4	27	20	13
5	16	14	13	13	12	11	9.8	7.0	5.2	23	19	12
6	16	14	13	13	12	11	9.8	6.8	5.1	1,710	18	12
7	16	14	13	13	12	11	9.3	6.8	4.9	692	18	12
8	15	14	13	13	12	12	9.0	6.8	4.9	323	18	12
9	15	14	13	13	12	11	9.0	7.0	4.9	194	18	21
10	15	14	13	13	12	11	9.3	6.8	4.8	111	18	17
11	15	14	13	13	12	10	9.3	16	4.8	93	17	14
12	15	14	13	13	11	11	9.3	12	4.8	125	17	13
13	15	14	13	12	12	11	9.0	8.2	4.8	65	17	13
14	15	14	13	12	12	11	9.0	7.0	4.8	44	16	13
15	15	13	14	13	12	11	9.0	7.0	4.6	37	16	13
16	15	13	14	13	12	11	8.8	7.0	4.6	33	24	12
17	15	14	14	12	12	10	8.8	7.0	4.6	29	37	12
18	15	14	14	12	12	11	8.2	7.0	4.5	28	22	12
19	15	14	14	12	12	10	8.2	6.8	4.4	27	19	12
20	15	15	14	12	12	11	8.2	6.8	4.4	25	18	12
21	15	15	14	12	12	11	8.2	6.8	4.4	25	17	11
22	15	15	14	12	12	10	8.2	6.6	4.4	26	16	11
23	15	14	14	12	12	10	9.0	6.4	5.1	25	16	12
24	15	14	14	12	12	11	8.5	9.8	9.5	24	16	11
25	15	14	14	12	12	11	13	7.7	18,550	23	15	11
26	15	14	14	12	12	11	8.5	19	2,290	24	15	11
27	15	14	14	12	12	10	7.5	8.0	352	23	14	10
28	15	14	14	12	12	11	7.2	6.6	291	22	14	10
29	29	14	14	12	12	10	7.2	6.4	64	22	14	10
30	17	14	13	12	-	10	7.2	6.4	48	22	14	10
31	16	-	13	12	-	10	-	6.2	-	21	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	496	29	15	16.0	984
November.....	437	24	13	14.6	867
December.....	422	14	13	13.6	837
Calendar year 1947 .....	7,586	176	13	20.8	15,050
January.....	385	13	12	12.4	764
February.....	348	13	11	12.0	690
March.....	334	12	10	10.8	662
April.....	266.9	13	7.2	8.90	529
May.....	243.7	19	6.2	7.86	483
June.....	11,716.2	8,550	4.4	391	23,240
July.....	3,968	1,710	21	128	7,870
August.....	558	37	14	18.0	1,110
September.....	373	21	10	12.4	740
Water year 1947-48 .....	19,547.8	8,550	4.4	53.4	38,780

Peak discharge (base, 1,000 sec.-ft.).- June 25 (2:30 p.m.) 23,600 sec.-ft.; July 6 (6:30 a.m.) 3,320 sec.-ft.

f Computed on basis of partly estimated gage-height record.

## Nueces River near Asherton, Tex.

Location.- Water-stage recorder, lat. 28°30', long. 99°42', at bridge on county road between Asherton and Brundage, 1.2 miles downstream from El Moro Creek and 5.5 miles northeast of Asherton, Dimmit County. Datum of gage is 470.9 feet above mean sea level, datum of 1929.

Drainage area.- 4,082 square miles.

Records available.- October 1939 to September 1948.

Extremes.- Maximum discharge during year, 5,830 second-feet June 26 (gage height, 25.86 feet); no flow at times.

1939-48: Maximum discharge, 24,000 second-feet (revised) Sept. 2, 1944 (gage height, 30.40 feet, corrected); no flow at times.

Maximum stage known, about 33 feet June 17, 1935, present site and datum, based on relation determined from levels to floodmarks of the June 17, 1935, and the Sept. 2, 1944, floods at farmhouse on left bank, 0.8 mile upstream from gage.

Revisions.- The maximum discharge and gage height for the water year 1944 have been revised to 24,000 second-feet Sept. 2, 1944 (gage height, 30.40 feet), superseding figures published in Water-Supply Papers 1008 and 1038.

Remarks.- Records good except those for period Aug. 30 to Sept. 30, which are fair. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones Fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Flow partly regulated by several small reservoirs above station. Diversions above station for irrigation.

Revisions.- Revised figures of discharge, in second-feet, for the high-water period in August and September 1944, superseding those published in Water-Supply Paper 1008 are given herewith:

Aug. 28 .....	13,400	Sept. 2 .....	22,900
29 .....	16,400	3 .....	16,400
31 .....	10,800	4 .....	9,650
Sept. 1 .....	16,400		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
August.....	52,110	16,400	0	1,681	103,400
September.....	74,396.1	22,900	0	2,480	147,600
Water year 1943-44.....	149,960.0	22,900	0	410	297,500
Calendar year 1944.....	149,318.7	22,900	0	408	296,200

Peak discharge.- Aug. 29, 1944 (12:30 a.m.) 21,800 sec.-ft; Sept. 2, 1944 (7 a.m.) 24,000 sec.-ft.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

1.4	0	2.2	16	5.0	182	15.0	1,960
1.5	.1	2.4	24	6.0	272	17.0	2,480
1.6	.4	2.6	33	7.0	386	19.0	3,020
1.7	1.5	2.8	42	8.0	528	21.0	3,600
1.8	3.0	3.0	52	9.0	690	23.5	4,460
1.9	5.6	3.3	68	11.0	1,060		
2.0	9.2	4.0	110	13.0	1,480		

## NEUCES RIVER BASIN

205

Discharge, in second-feet, of Nueces River near Asherton, Tex., water year  
October 1947 to October 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	18						0	0	443		0
2	0	11						0	0	174		0
3	0	3.0						0	0	247		0
4	0	1.2						0	0	721		0
5	0	.3						0	0	612		0
6	0	.2						0	0	325		0
7	0	.1						0	0	262		0
8	0	0						0	0	578		0
9	0	0						0	0	582		53
10	0	0						0	0	274		2,080
11	0	0						0	0	155		1,560
12	0	0						0	0	101		405
13	0	0						0	0	196		159
14	0	0						0	0	558		89
15	0	0						0	0	359		100
16	0	0						0	0	169		52
17	0	0						0	0	101		248
18	0	0						0	0	65		762
19	0	0						0	0	140		398
20	0	0						0	0	122		165
21	0	0						0	0	10		98
22	0	0						0	0	4.2		60
23	0	0						0	0	2.1		35
24	0	0						0	252	.8		22
25	0	0						3.9	13,560	.3		9.9
26	0	0						103	14,440	.1		3.5
27	0	0						16	1,780	0		1.4
28	0	0						2.7	2,990	0		.4
29	3.7	0						.8	2,300	0		.1
30	9.8	0						.3	959	0		0
31	1.8	-						.1	-	0		-
Month						Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet		
October						15.3	9.8	0	0.49	30		
November						33.8	18	0	1.13	67		
December						0	0	0	0	0		
Calendar year 1947						18,256.7	2,740	0	50.0	36,220		
January						0	0	0	0	0		
February						0	0	0	0	0		
March						0	0	0	0	0		
April						0	0	0	0	0		
May						126.8	103	0	4.09	252		
June						16,281	4,440	0	543	32,290		
July						6,001.5	721	0	194	11,900		
August						0	0	0	0	0		
September						6,301.3	2,080	0	210	12,500		
Water year 1947-48						28,759.7	4,440	0	78.6	57,040		

Peak discharge (base, 3,000 sec.-ft.) - June 26 (2 a.m.) 5,830 sec.-ft.; June 28 (4:30 a.m.) 3,130 sec.-ft.

f Computed on basis of partly estimated gage-height record.

Note. - Gage-height record faulty Aug. 30 to Sept. 30; discharge computed on basis of available fragments of gage-height record, weather records, and records for stations near Uvalde and at Cotulla.

## NUECES RIVER BASIN

Nueces River at Cotulla, Tex.

Location.- Wire-weight gage, lat. 28°26', long. 99°16', at bridge on U. S. Highway 81 at Cotulla, La Salle County, a third of a mile upstream from International-Great Northern Railroad bridge. Datum of gage is 368.08 feet above mean sea level, datum of 1929.

Drainage area.- 5,260 square miles.

Records available.- October 1923 to September 1948. July 1915 to June 1918 at site 4 miles upstream. U. S. Weather Bureau has collected gage heights in this vicinity during 1914-17 and since 1922.

Average discharge.- 25 years, 312 second-feet.

Extremes.- Maximum discharge during year, 4,470 second-feet June 27 (gage height, 14.15 feet); no flow at times.

1923-48: Maximum discharge, 82,600 second-feet June 18, 1935 (gage height, 32.4 feet, from floodmarks), by slope-area method; no flow at times.

Remarks.- Records good. Gage read once daily. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Low-water flow partly regulated by small storage reservoirs above station; most of it is diverted above station by pumping.

Cooperation.- Gage-height record furnished by U. S. Weather Bureau.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									0	3,330		0
2									0	2,820		0
3									0	1,580		0
4									0	465		0
5									0	784		0
6									0	1,400		0
7									0	1,460		0
8									0	946		0
9									0	525		0
10									0	619		0
11									0	591		0
12									0	153		0
13									0	328		14
14									0	365		918
15									0	482		1,400
16									0	815		1,370
17									0	733		549
18									0	252		161
19									0	16		96
20									0	0		82
21									0	0		46
22									0	37		125
23									0	19		485
24									0	14		266
25									0	9.3		130
26									0	4.7		88
27									2,660	1.4		64
28									3,930	.5		32
29									3,220	0		21
30									3,330	0		17
31									-	0		-
Month						Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet		
October.....						0	0	0	0	0		
November.....						0	0	0	0	0		
December.....						0	0	0	0	0		
Calendar year 1947 .....						34,833.0	7,800	0	95.4	69,080		
January.....						0	0	0	0	0		
February.....						0	0	0	0	0		
March.....						0	0	0	0	0		
April.....						0	0	0	0	0		
May.....						0	0	0	0	0		
June.....						13,140	3,930	0	438	26,080		
July.....						17,749.9	3,330	0	573	35,210		
August.....						0	0	0	0	0		
September.....						5,864	1,400	0	195	11,630		
Water year 1947-48 .....						36,753.9	3,930	0	100	72,900		

Peak discharge (base, 3,200 sec.-ft.)- June 27 (2 p.m.) 4,470 sec.-ft.

NUECES RIVER BASIN

207

Nueces River near Tilden, Tex.

Location.- Water-stage recorder, lat. 28°18', long. 98°34', at bridge on State Highway 173, 2 miles upstream from Cow Creek and 10.5 miles south of Tilden, McMullen County. Datum of gage is 183.3 feet above mean sea level, datum of 1929 (levels by State Highway Department).

Drainage area.- 8,192 square miles.

Records available.- November 1942 to September 1948.

Extremes.- Maximum discharge during year, 2,430 second-feet July 8 (gage height, 16.07 feet); no flow at times.  
1943-48: Maximum discharge, 57,500 second-feet Oct. 11, 1946 (gage height, 26.46 feet), from rating curve extended above 30,000 second-feet; no flow at times.

Remarks.- Records good. Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Diversions for irrigation above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	8.5	18	0.6	0.8	0.9	0.2	6.8	20	852	4.2	0.4
2	0	81	13	.5	1.0	.8	.2	3.3	8.0	1,360	3.1	.2
3	0	108	8.9	.5	.9	.7	0	1.1	3.6	1,520	1.8	0
4	0	59	6.8	.5	.9	.6	0	.6	1.3	1,440	1.1	0
5	0	21	4.8	.5	1.0	58	0	.5	.9	1,520	.8	0
6	0	9.9	3.7	.5	1.0	24	0	.4	.8	1,810	.6	0
7	0	6.1	3.0	.5	1.0	11	0	.5	.5	2,180	.4	0
8	0	3.6	2.3	.5	1.0	39	0	.5	.4	2,360	.3	0
9	0	2.6	1.9	.5	11.2	27	0	.4	.2	2,180	.2	36
10	0	1.8	1.7	.5	11.2	11	0	.3	0	1,700	.1	2.4
11	0	1.6	1.6	.5	1.1	5.7	0	.1	0	1,340	0	7.0
12	0	1.1	1.7	.5	1.3	3.6	0	0	0	1,280	0	20
13	0	1.0	2.7	.5	2.3	2.8	0	0	0	1,420	0	13
14	0	.9	3.9	.4	2.0	2.0	0	61	0	1,250	0	8.7
15	0	.8	14	.4	1.7	1.6	0	87	0	527	0	4.5
16	0	.8	7.1	.5	1.5	1.0	0	19	0	334	0	2.1
17	0	.8	11	.5	1.4	.9	0	15	0	322	0	139
18	0	3.9	17	.5	1.2	.8	0	7.2	0	370	0	458
19	26	3.1	12	.6	1.1	.8	0	3.0	0	512	0	624
20	39	132	6.6	.6	1.0	.8	0	1.5	0	624	0	740
21	3.8	244	4.5	.6	1.5	.7	0	.8	0	494	0	520
22	1.7	109	3.6	.6	1.4	.6	0	.4	0	200	0	136
23	1.0	50	2.7	.6	1.0	.6	0	.3	0	108	0	78
24	.9	300	2.0	.6	.9	.6	0	.1	0	63	0	132
25	.8	610	1.5	.7	1.1	.6	0	.1	0	35	0	388
26	.7	527	1.0	.7	1.2	.6	0	0	0	21	10	554
27	.6	145	.9	.7	1.2	.6	0	48	0	16	.3	403
28	.6	54	.8	.7	1.1	.6	6.9	279	0	13	.3	188
29	4.6	38	.8	.6	1.0	.6	35	444	0	9.7	1.4	100
30	8.1	24	.7	.6	-	.5	14	368	48	7.6	5.8	54
31	4.4	-	.6	.6	-	.2	-	74	-	5.9	1.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	92.2	39	0	2.97	183
November.....	2,546.3	610	.8	84.9	5,050
December.....	160.8	18	.6	5.19	319
Calendar year 1947.....	109,528.5	13,300	0	300	217,300
January.....	17.1	.7	.4	.55	34
February.....	35.0	2.3	.8	1.21	69
March.....	199.2	58	.2	6.43	395
April.....	56.3	35	0	1.88	112
May.....	1,422.9	444	0	45.9	2,820
June.....	83.7	48	0	2.79	166
July.....	25,854.2	2,360	5.9	834	51,280
August.....	21.8	5.8	0	.70	43
September.....	4,608.3	740	0	154	9,140
Water year 1947-48.....	35,097.8	2,360	0	95.9	69,610

Peak discharge (base, 3,600 sec.-ft.)- No peak above base.

† Computed on basis of partly estimated gage-height record.



## Nueces River near Three Rivers, Tex.

Location.- Water-stage recorder, lat. 28°26'10", long. 98°11'10", 100 feet downstream from San Antonio, Uvalde & Gulf (Missouri Pacific) Railroad bridge, half a mile downstream from Frio River, and 2 miles southeast of Three Rivers, Live Oak County. Datum of gage is 101.16 feet above mean sea level, datum of 1929.

Drainage area.- 15,600 square miles.

Records available.- July 1915 to September 1948. U. S. Weather Bureau has collected gage-height records in this vicinity since 1922.

Average discharge.- 31 years (1915-18, 1920-48), 824 second-feet.

Extremes.- Maximum discharge during year, 5,950 second-feet July 3 (gage height, 22.70 feet); no flow at times.  
1915-48: Maximum discharge observed, 85,000 second-feet Sept. 18, 1919 (gage height, 46.0 feet), from rating curve extended above 55,000 second-feet; no flow at times.

Remarks.- Records good. Part of flow of Nueces and Frio Rivers and their headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Diversions above station for irrigation.

Revisions (water years).- W 548: 1920, 1921.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.2	2.5	49	15	16	28	9.7	10	90	2,280	9.0	23
2	2.3	2.5	40	13	20	25	9.7	6.7	40	3,460	20	14
3	2.1	25	54	12	31	21	8.6	11	20	5,740	17	9.7
4	2.2	103	29	12	38	20	8.6	9.4	10	4,870	5.4	6.7
5	2.9	76	23	11	38	21	7.9	6.2	5.8	3,250	3.8	5.0
6	2.8	46	20	11	34	25	8.3	4.4	3.7	2,680	3.3	4.0
7	2.8	26	17	12	30	53	7.6	3.1	2.2	2,560	2.2	3.6
8	2.8	14	15	12	27	40	7.2	2.5	1.5	2,560	0.6	3.1
9	2.5	10	13	12	23	43	7.0	2.2	1.0	2,470	0	32
10	2.2	7.6	13	12	21	59	6.5	1.9	.9	2,350	0	94
11	2.2	9.0	14	12	20	41	5.8	2.2	1.1	1,970	0	63
12	2.1	7.0	14	12	20	33	5.0	3.1	1.5	1,990	0	34
13	2.3	6.7	24	12	18	28	4.6	15	2.8	2,620	0	18
14	2.2	6.7	33	10	16	24	3.7	26	2.3	2,320	0	28
15	1.9	5.3	50	10	16	21	3.8	12	1.0	1,630	0	20
16	1.6	4.8	103	10	16	20	4.2	47	.5	692	0	12
17	1.5	6.3	87	9.4	16	18	4.0	47	.4	410	0	12
18	1.5	460	55	9.0	16	18	3.5	20	.2	400	0	73
19	1.5	667	45	14	15	17	3.5	16	.2	430	0	382
20	1.4	103	46	14	16	16	3.3	9.0	.2	588	0	588
21	40	92	38	14	19	15	3.1	5.3	.1	706	0	730
22	38	232	33	15	32	13	3.3	3.1	.1	430	0	442
23	16	167	30	16	60	12	4.0	2.2	0	192	0	136
24	8.3	92	26	14	85	10	4.4	1.6	.1	119	0	82
25	5.3	271	22	14	58	11	5.8	1.8	.2	81	0	122
26	3.8	610	19	16	41	11	11	15	.1	55	76	311
27	3.7	500	18	16	34	10	35	17	0	38	1,700	470
28	2.9	152	16	15	30	9.7	54	6.4	0	30	1,810	316
29	2.9	84	16	16	28	9.4	38	202	64	22	226	153
30	3.5	63	15	16	-	9.4	21	355	1,060	16	58	99
31	3.3	-	16	16	-	9.4	-	294	-	12	38	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	170.7	40	1.4	5.51	339
November.....	3,851.4	667	2.5	128	7,640
December.....	973	103	13	31.4	1,930
Calendar year 1947.....	152,481.4	9,800	1.4	418	302,400
January.....	402.4	16	9.0	13.0	798
February.....	834	85	15	28.8	1,650
March.....	690.9	59	9.4	22.3	1,370
April.....	302.1	54	3.1	10.1	599
May.....	1,156.1	355	1.6	37.4	2,300
June.....	1,309.9	1,060	0	43.7	2,600
July.....	46,741	5,740	12	1,508	92,710
August.....	3,969.3	1,810	0	128	7,870
September.....	4,286.0	730	3.1	143	8,500
Water year 1947-48.....	64,688.8	5,740	0	177	128,300

Peak discharge (base, 6,000 sec.-ft.)- No peak above base.  
Note.- Discharge for July 17-22, Aug. 7-25 computed from graph based on daily staff-gage readings furnished by U. S. Weather Bureau.

## Nueces River near Mathis, Tex.

Location.—Water-stage recorder, lat. 28°02', long. 97°52', at bridge on U. S. Highway 59, 200 feet downstream from Texas & New Orleans Railroad bridge, 0.8 mile downstream from Lake Corpus Christi Dam, and 4 miles southwest of Mathis, San Patricio County. Datum of gage is 27.53 feet above mean sea level, datum of 1929.

Drainage area.—16,660 square miles.

Records available.—August 1939 to September 1948.

Extremes.—Maximum discharge during year, 3,830 second-feet July 5 (gage height, 18.29 feet); minimum daily, 17 second-feet Dec. 17.

1939-48: Maximum discharge, 49,400 second-feet July 12, 1942 (gage height, 37.38 feet); minimum, 3.7 second-feet Aug. 15, 1940; minimum daily, 6.8 second-feet Aug. 15, 1940.

Maximum stage known, 39.9 feet in September 1919 at railroad bridge 200 feet upstream, from floodmark identified by Texas & New Orleans Railroad.

Remarks.—Records good. Flow partly regulated by Lake Corpus Christi. (Original capacity at spillway crest, about 64,000 acre-feet, as determined by Texas State Board of Water Engineers, computed from Geological Survey advance topographic sheets, scale 1:48,000, contour interval, 10 feet; the U. S. Soil Conservation Service in connection with siltation survey determined original capacity to have been 54,000 acre-feet in 1942, and capacity in 1948 to be 39,400 acre-feet, indicating a loss of 14,600 acre-feet by siltation). Part of flow of Nueces River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Diversions for irrigation above station. Records of chemical analyses and water temperatures for water year 1948 are given in Water-Supply Paper 1133.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used Apr. 15  
to July 4, July 25 to Sept. 30)

2.3	14	3.0	55	5.0	301	10.0	1,690
2.4	18	3.5	94	6.0	501	12.0	2,340
2.6	28	4.0	143	7.0	750	14.0	3,000
2.8	41	4.5	213	8.0	1,050	16.0	3,720

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	70	a19	32	33	30	32	39	43	34	39	64
2	88	71	23	27	33	30	32	54	31	35	38	52
3	88	72	69	25	33	30	32	35	30	36	36	44
4	91	72	52	24	32	30	32	44	51	840	36	42
5	87	71	32	22	31	33	33	48	71	3,500	50	41
6	86	70	36	22	30	32	38	33	62	3,650	62	39
7	87	72	28	22	29	32	33	32	32	2,970	40	39
8	86	73	27	37	29	32	31	33	32	2,800	39	42
9	86	73	26	78	28	32	67	34	31	2,500	39	42
10	87	72	24	74	28	30	30	50	32	2,410	39	216
11	87	74	44	75	28	31	29	71	31	2,270	39	256
12	85	72	32	28	31	27	35	45	45	2,110	49	184
13	85	73	22	54	29	31	28	33	60	2,010	65	85
14	84	73	20	58	32	31	34	32	41	2,400	36	64
15	84	71	a19	50	32	31	55	32	54	2,370	35	56
16	83	72	a18	35	31	31	55	32	47	1,850	38	50
17	83	72	a17	35	31	31	55	33	32	1,180	40	41
18	84	74	a18	35	31	32	56	47	40	698	40	40
19	84	74	88	36	31	32	56	45	40	457	39	38
20	82	75	66	35	30	28	36	33	40	348	40	49
21	81	74	32	35	30	25	38	32	42	368	39	183
22	83	76	32	35	30	24	37	31	72	446	51	416
23	82	73	31	35	31	26	54	33	g77	457	74	468
24	77	71	30	35	30	27	57	39	g45	283	57	330
25	76	64	30	35	30	46	58	f29	g29	169	40	182
26	76	56	30	36	30	39	34	41	30	104	39	147
27	77	29	29	35	30	31	33	33	35	77	41	171
28	78	28	29	35	30	31	33	33	45	54	40	247
29	76	20	29	35	30	31	32	32	48	44	49	256
30	76	a20	29	35	-	32	33	61	44	41	80	182
31	74	-	35	33	-	32	-	58	-	39	78	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,572	91	74	83.0	5,100
November.....	1,957	76	20	65.2	3,880
December.....	1,012	88	17	32.6	2,010
Calendar year 1947.....	163,144	11,200	17	447	323,600
January.....	1,231	78	22	39.7	2,440
February.....	880	33	28	30.3	1,750
March.....	962	46	24	31.0	1,910
April.....	1,120	67	27	37.3	2,220
May.....	1,217	71	29	39.3	2,410
June.....	1,312	77	29	43.7	2,600
July.....	36,390	3,650	34	1,174	72,180
August.....	1,425	80	35	46.0	2,830
September.....	4,046	468	38	135	8,030
Water year 1947-48.....	54,124	3,650	17	148	107,400

a No gage-height record; discharge computed on basis of estimated gage-height record.

f Computed on basis of partly estimated gage-height record.

g Computed from graph based on gage readings.

## Nueces River seepage investigation

A series of discharge measurements was made Apr. 20-22, 1948, on the Nueces River and its tributaries, Texas, between the gaging station near Mathis and a point 25½ miles downstream, to determine the seepage gains or losses between the gaging station near Mathis and the city of Corpus Christi Water Works Plant at Calallen. The gates on Mathis Dam were not changed for several days preceding or during the investigation, thereby maintaining a constant stage of the river. All tributaries were investigated for inflow but none was found.

Discharge measurements of Nueces River and tributaries, Texas, between gaging station near Mathis and Corpus Christi Water Works Plant at Calallen, 1948

Date	Stream or Diversion	Location	Approximate distance (miles) below initial point	Main stream	Tributary	Gain or loss in section	Total gain or loss
Apr. 20	Nueces River near Mathis, Tex.	Regular gaging station...	0	35.3	-	-	-
20	Nueces River.....	4.1 miles south southwest of Mathis.	1.0	30.6	-	-4.7	-4.7
20	....do.....	4.1 miles south of Mathis	2.6	35.0	-	+4.4	-
20	Arroyo (name not known).	At confluence with Nueces River; 4.0 miles south southeast of Mathis.	4.5	-	0	-	-
20	Arroyo Nombre de Dios.	At confluence with Nueces River; 4.3 miles south southeast of Mathis.	4.9	-	0	-	-
20	Nueces River.....	4.4 miles south southeast of Mathis.	5.0	33.2	-	-1.8	-2.1
20	....do.....	5.7 miles north northwest of San Patricio.	7.0	33.0	-	-2	-2.3
21	....do.....	2.7 miles north northwest of San Patricio.	8.9	33.4	-	+4	-1.9
21	....do.....	2.2 miles north northwest of San Patricio.	10.9	35.8	-	+2.4	+5
21	Javelin Creek at confluence with Nueces River.	2.4 miles west northwest of San Patricio.	11.7	-	0	-	-
21	Sandy Hollow at confluence with Nueces River.	2.5 miles west northwest of San Patricio.	12.0	-	0	-	-
21	Nueces River.....	2.3 miles west northwest of San Patricio.	13.4	34.0	-	-1.8	-1.3
21	....do.....	2.4 miles southwest of San Patricio.	15.7	35.9	-	+1.9	+6
22	....do.....	1.7 miles south of San Patricio.	18.1	36.5	-	+6	+1.2
22	....do.....	2.5 miles south southeast of San Patricio.	19.9	38.0	-	+1.5	+2.7
22	Dismers Slough...	4.7 miles south southeast of San Patricio.	23.5	-	0	-	-
22	Nueces River.....	4.7 miles south southeast of San Patricio.	23.6	35.6	-	-2.4	+3
22	....do.....	6.2 miles southeast of San Patricio.	25.5	34.6	-	-1.0	-7

Note. Last measurement made is 10 miles upstream from Corpus Christi Water Works Plant. Pool conditions prevented additional discharge measurements. There was no inflow between point of last measurement and water works plant.

## Nueces River at Calallen, Tex.

Location.- Staff gage, lat. 27°52'40", long. 97°37'35", at old pump house of city of Corpus Christi, half a mile northwest of Calallen, Nueces County, and half a mile upstream from tidewater and breakwater dam. Datum of gage is 1.12 feet above mean sea level, datum of 1929.

Drainage area.- 16,920 square miles.

Records available.- August 1915 to September 1946 (1918-48 gage heights only).

Extremes.- Maximum gage height observed during year, 6.62 feet July 7; minimum observed, 1.66 feet May 31.

1915-48: Maximum gage height observed, 13.58 feet July 13, 1942; no flow Aug. 23-29, 1918 (only period of no flow known).

Remarks.- Discharge not computed. Gage read twice daily.

Cooperation.- Gage readings furnished by city of Corpus Christi.

Gage height, in feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.54	3.54	2.88	3.06	3.27	3.21	3.00	2.62	2.39	3.53	3.60	3.75
2	3.52	3.57	2.82	3.04	3.38	3.22	2.94	2.54	2.67	3.54	3.54	3.68
3	3.52	3.49	2.69	2.87	3.36	3.07	3.00	2.47	2.91	3.45	3.42	3.67
4	3.59	3.44	2.85	2.89	3.32	3.01	3.02	2.62	2.45	3.45	3.21	3.55
5	3.67	3.45	3.44	2.87	3.36	3.26	2.96	2.73	1.94	5.12	2.95	3.59
6	3.56	3.40	3.32	2.65	3.32	3.54	2.76	2.63	2.48	6.12	2.80	3.59
7	3.57	3.40	3.36	2.73	3.20	3.47	2.47	2.75	3.43	6.59	3.16	3.57
8	3.53	3.43	3.29	2.66	3.19	3.44	2.41	2.54	3.46	6.55	3.46	3.50
9	3.55	3.46	3.19	2.38	3.28	3.43	2.20	2.44	3.50	6.36	3.42	3.71
10	3.54	3.49	2.90	3.26	3.26	3.28	2.21	2.25	3.25	6.30	3.29	3.66
11	3.57	3.60	2.86	3.57	3.01	3.20	3.12	1.89	2.85	6.27	3.00	4.09
12	3.64	3.60	2.80	3.58	2.91	3.14	3.12	2.76	2.39	6.19	2.84	4.18
13	3.64	3.72	3.53	3.61	2.94	3.15	2.90	3.35	2.11	6.04	2.62	4.01
14	3.67	3.69	3.38	3.55	2.78	3.15	2.65	3.22	2.18	6.00	2.50	3.85
15	3.65	3.65	3.36	3.41	2.76	3.19	2.43	2.94	2.44	6.17	3.25	3.76
16	3.59	3.63	3.16	3.43	3.00	3.12	2.39	2.76	2.37	6.21	3.24	3.75
17	3.63	3.64	3.10	3.23	3.04	3.25	2.82	2.57	2.48	5.93	3.29	3.72
18	3.60	3.67	2.77	3.22	3.13	3.11	3.16	2.21	2.59	5.46	3.30	3.63
19	3.64	3.61	2.67	3.36	3.01	3.14	2.97	2.03	2.40	4.92	3.16	3.63
20	3.66	3.61	2.98	3.28	3.07	3.02	2.82	2.35	2.40	4.54	3.02	3.59
21	3.57	3.61	3.70	3.28	3.14	3.03	2.63	2.57	2.43	4.37	2.76	3.60
22	3.54	3.78	3.44	3.29	3.26	3.01	2.53	2.49	2.13	4.38	2.43	3.65
23	3.55	3.92	3.07	3.27	3.30	2.80	2.54	2.20	2.11	4.48	2.32	4.33
24	3.61	3.70	3.03	3.34	3.32	2.56	2.70	3.26	2.92	4.48	2.36	4.46
25	3.57	3.59	3.02	3.37	3.24	2.34	3.27	3.53	3.57	4.29	3.07	4.27
26	3.62	3.70	3.03	3.37	3.22	2.46	3.45	3.56	3.40	4.03	3.42	4.10
27	3.62	3.58	3.02	3.27	3.18	2.95	3.25	3.40	3.06	3.84	3.32	3.95
28	3.51	3.44	2.94	3.24	3.27	3.14	3.08	3.23	2.92	3.77	3.33	3.99
29	3.55	3.26	3.01	3.13	3.23	3.15	2.86	2.56	2.73	3.69	3.60	4.11
30	3.54	3.21	2.98	3.07	-	2.99	2.71	1.75	3.29	3.62	3.59	4.17
31	3.51	-	3.11	2.98	-	2.92	-	1.75	-	3.58	3.73	-

## NUECES RIVER BASIN

West Nueces River near Brackettville, Tex.

Location.- Water-stage recorder, lat. 29°28'55", long. 100°14'20", at Bruce Ranch, 11 miles upstream from Liveoak Creek and 15.8 miles northeast of Brackettville, Kinney County. Datum of gage is 1,326.8 feet above mean sea level, datum of 1929.

Drainage area.- 700 square miles.

Records available.- September 1939 to September 1948.

Extremes.- Maximum discharge during year, 51,000 second-feet June 25 (gage height, 20.95 feet, from floodmark), by slope-area method; no flow most of time.

1939-48: Maximum discharge, that of June 25, 1948; no flow most of time.

Maximum stage known, 48.0 feet June 14, 1935, from floodmark, at site 0.6 mile above gage (discharge at a point 33 miles upstream from gage and 2½ miles below Kickapoo Creek, 580,000 second-feet, by slope-area method; a second determination 24 miles below gage and 8 miles north of Cline, 536,000 second-feet, by slope-area method).

Remarks.- Records fair. In ordinary years most of runoff from basin is lost by seepage into Edwards limestone above station. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									0	5.2		
2									0	4.3		
3									0	3.7		
4									0	3.2		
5									0	3.0		
6									0	2.3		
7									0	1.7		
8									0	1.2		
9									0	.9		
10									0	.7		
11									0	.6		
12									0	.5		
13									0	.5		
14									0	.4		
15									0	.4		
16									0	.2		
17									0	.2		
18									0	.1		
19									0	0		
20									0	0		
21									0	0		
22									0	0		
23									0	0		
24									612	0		
25									11,500	0		
26									571	0		
27									118	0		
28									38	0		
29									13	0		
30									7.2	0		
31									-	0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947 .....	1,242.5	242	0	3.40	2,470
January.....	0	0	0	0	0
February.....	0	0	0	0	0
March.....	0	0	0	0	0
April.....	0	0	0	0	0
May.....	0	0	0	0	0
June.....	12,859.2	11,500	0	429	25,510
July.....	29.1	5.2	0	.94	58
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48 .....	12,888.3	11,500	0	35.2	25,570
Peak discharge (base, 1,000 sec.-ft.):- June 24 (6 p.m.) 4,960 sec.-ft.; June 25 (2 a.m.) 51,000 sec.-ft.					

## Frio River at Concan, Tex.

Location.- Water-stage recorder, lat. 29°29', long. 99°42', half a mile southeast of Concan Post office, Uvalde County, and 15 miles upstream from Dry Frio River. Datum of gage is 1,203.71 feet above mean sea level, datum of 1929.

Drainage area.- 485 square miles.

Records available.- October 1923 to September 1948.

Average discharge.- 23 years (1924-29, 1930-48), 104 second-feet.

Extremes.- Maximum discharge during year 195 second-feet June 11; maximum gage height, 2.34 feet June 25; minimum discharge, 7.5 second-feet Sept. 8.

1923-48: Maximum discharge, 162,000 second-feet July 1, 1932 (gage height, 34.44 feet, from floodmarks), by slope-area method; minimum, that of Sept. 8, 1948.

Remarks.- Records excellent. Part of flow of Frio River enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde and below station. Most of low flow enters this formation. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	32	43	41	43	44	37	30	34	26	20	9.6
2	31	32	43	41	43	43	37	29	31	32	22	8.9
3	31	32	43	41	46	43	37	27	30	53	20	8.9
4	31	32	44	41	44	45	37	26	29	40	18	8.9
5	31	32	44	41	44	43	37	25	26	32	18	8.9
6	31	32	46	41	44	45	37	24	24	30	18	8.9
7	31	31	48	41	43	46	37	23	23	30	18	8.2
8	31	31	48	41	43	46	35	23	23	30	17	11
9	31	31	46	41	43	43	35	23	22	29	16	30
10	31	32	46	41	41	43	34	23	23	27	15	20
11	31	32	46	41	41	41	34	31	68	27	14	16
12	30	32	46	41	41	41	34	32	29	32	13	15
13	30	34	44	40	40	40	32	30	25	31	13	14
14	30	37	46	38	40	40	32	29	23	30	13	13
15	30	35	48	38	40	40	31	27	23	29	12	13
16	30	35	44	40	40	38	31	26	22	27	12	13
17	30	40	44	40	40	38	30	25	20	29	12	13
18	30	43	44	40	41	38	30	24	19	27	12	13
19	37	40	44	41	41	38	29	23	18	27	11	13
20	32	40	44	41	40	38	29	23	17	26	11	14
21	31	41	43	41	40	38	29	23	17	26	9.6	14
22	30	46	43	40	40	37	29	23	17	25	9.6	16
23	30	44	41	40	41	37	32	22	20	26	9.6	18
24	31	43	41	40	41	37	32	29	70	25	10	18
25	31	43	41	40	43	38	46	29	116	24	11	18
26	31	43	41	41	44	37	40	26	67	23	12	17
27	31	43	41	41	53	35	35	44	38	23	13	15
28	31	43	41	41	46	37	32	46	30	22	13	14
29	37	43	40	41	44	37	31	41	27	22	12	15
30	35	43	41	40	-	37	30	40	26	20	10	15
31	34	-	43	40	-	37	-	35	-	20	9.6	-
Month							Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet	
October.....							972	37	30	31.4	1,930	
November.....							1,117	46	31	37.2	2,220	
December.....							1,357	48	40	43.8	2,590	
Calendar year 1947.....							28,931	1,030	30	79.3	57,390	
January.....							1,255	41	38	40.5	2,490	
February.....							1,246	53	40	43.0	2,470	
March.....							1,230	44	35	39.7	2,440	
April.....							1,011	46	29	33.7	2,010	
May.....							881	46	22	28.4	1,750	
June.....							957	116	17	31.9	1,900	
July.....							870	53	20	28.1	1,730	
August.....							424.4	22	9.6	13.7	842	
September.....							420.3	30	8.2	14.0	834	
Water year 1947-48.....							11,740.7	116	8.2	32.1	23,310	

Peak discharge (base, 750 sec.-ft.)- No peak above base.

## Frio River near Derby, Tex.

Location.- Water-stage recorder and concrete control, lat. 28°44'10", long. 99°08'45", at bridge on U. S. Highway 81, 150 feet upstream from International-Great Northern Railroad bridge, 750 feet downstream from Leona River, and 2.4 miles south of Derby, Frio County. Datum of gage is 449.3 feet above mean sea level, datum of 1929.

Drainage area.- 3,493 square miles.

Records available.- August 1915 to September 1948.

Average discharge.- 33 years, 150 second-feet.

Extremes.- Maximum discharge during year, 9,200 second-feet June 28 (gage height, 10.83 feet); no flow at times.

1915-48: Maximum discharge, 230,000 second-feet July 4, 1932 (gage height, 29.60 feet, present site, from floodmarks at former site), by slope-area method; no flow at times.

Remarks.- Records fair. Part of flow of Frio River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Diversions above station for irrigation.

Revisions (water years).- W 568: 1915, 1916, 1918-22, drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									0	f86		0
2									0	37		0
3									0	f743		0
4									0	f165		0
5									0	37		0
6									0	59		0
7									0	23		0
8									0	a7.0		0
9									0	a1.4		0
10									0	a.3		0
11									0	a.1		30
12									0	0		32
13									0	0		35
14									0	0		25
15									0	0		6.2
16									0	0		1.0
17									0	0		.5
18									0	0		.2
19									0	0		.2
20									0	0		0
21									0	0		0
22									0	0		0
23									0	0		0
24									0	0		0
25									281	0		0
26									908	0		0
27									4,420	0		0
28									5,690	0		0
29									722	0		0
30									232	0		0
31									-	0		-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947.....	10,313.1	2,620	0	28.3	20,460
January.....	0	0	0	0	0
February.....	0	0	0	0	0
March.....	0	0	0	0	0
April.....	0	0	0	0	0
May.....	0	0	0	0	0
June.....	12,253	5,690	0	408	24,300
July.....	1,138.8	743	0	36.7	2,260
August.....	0	0	0	0	0
September.....	130.1	35	0	4.34	258
Water year 1947-48.....	13,521.9	5,690	0	36.9	26,820

Peak discharge (base, 1,100 sec.-ft.)- June 28 (1:30 a.m.) 9,200 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage.

f Computed on basis of partly estimated gage-height record.



## Frio River at Calliham, Tex.

Location.- Water-stage recorder and concrete control, lat. 28°29'30", long. 98°20'45", at bridge on Calliham-Whitsett highway, 1 mile north of Calliham, McMullen County, and 9.7 miles downstream from San Miguel Creek. Datum of gage is 153.47 feet above mean sea level, datum of 1929.

Drainage area.- 5,491 square miles.

Records available.- October 1924 to April 1926, April 1932 to September 1948.

Average discharge.- 17 years (1924-25, 1932-48), 274 second-feet.

Extremes.- Maximum discharge during year, 4,760 second-feet July 2 (gage height, 19.18 feet); no flow at times.

1924-26, 1932-48: Maximum discharge, 109,000 second-feet July 6, 1932 (gage height, 39.20 feet, from floodmarks), by slope-area method; no flow at times.

Remarks.- Records good. Part of flow of Frio River and its headwater tributaries enters Edwards limestone in Balcones fault zone which crosses basin just north of Uvalde. At low stages most of headwater flow enters this formation. Diversions above station for irrigation.

Revision.- W 788: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0	3.8	1.2	3.0	4.8	0.7	0	0	1,410	0.7	0
2		0	2.8	1.1	4.0	4.0	.5	0	0	3,780	.6	0
3		0	2.2	.9	5.0	3.0	.3	0	0	3,030	.4	0
4		0	1.8	.8	5.4	2.5	.3	0	0	1,140	.3	0
5		0	1.5	.7	5.8	2.5	.2	0	0	900	.1	0
6		0	1.3	.7	5.8	2.5	.2	0	0	856	.1	0
7		0	1.2	.6	5.8	2.4	.1	0	0	774	0	0
8		0	1.2	.6	5.0	2.2	0	0	0	430	0	0
9		0	1.2	.5	4.5	2.2	0	0	0	178	0	0
10		0	1.1	.6	4.0	2.4	0	0	0	93	0	2.1
11		0	1.1	.7	3.5	3.0	0	0	0	55	0	3.0
12		0	1.2	.8	3.2	2.5	0	0	0	34	0	1.6
13		0	3.0	.8	3.0	2.0	0	0	0	296	0	1.1
14		0	5.8	.8	3.0	1.6	0	0	0	434	0	.8
15		0	11	.8	2.8	1.3	0	0	0	107	0	.7
16		0	30	.8	2.5	1.2	0	0	0	42	0	.5
17		5.2	17	.8	2.4	1.1	0	0	0	42	0	.3
18		239	8.8	.8	2.4	1.1	0	0	0	28	0	.8
19		72	6.7	1.1	2.4	1.0	0	0	0	18	0	.5
20		27	5.0	1.2	2.2	1.0	0	0	0	10	0	0
21		19	4.2	1.3	2.4	.9	0	0	0	6.7	0	0
22		14	4.0	1.7	3.5	.8	0	0	0	4.5	0	0
23		22	3.5	3.0	23	.7	0	0	0	3.0	0	0
24		24	2.5	2.8	19	.7	0	0	0	2.4	0	0
25		11	2.2	2.4	11	.6	0	0	0	2.1	0	0
26		7.1	2.0	2.2	7.1	.6	0	1.5	0	1.7	0	0
27		9.6	1.7	2.5	5.4	.6	0	.5	0	1.2	0	0
28		14	1.5	2.5	6.3	.5	0	0	0	1.0	0	0
29		7.1	1.3	2.5	5.8	.4	0	0	170	.9	0	0
30		5.0	1.2	2.5	-	.4	0	0	642	.8	0	0
31		-	1.1	2.5	-	.4	-	0	-	.8	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	476	239	0	15.9	944
December.....	132.7	30	1.1	4.28	263
Calendar year 1947 .....	19,771.6	1,480	0	54.2	39,220
January.....	42.2	3.0	.5	1.38	84
February.....	159.2	23	2.2	5.49	316
March.....	50.9	4.8	.4	1.64	101
April.....	2.3	.7	0	.08	4.8
May.....	2.0	1.5	0	.06	4.0
June.....	812	642	0	27.1	1,610
July.....	13,682.1	3,780	.8	441	27,140
August.....	2.2	3.7	0	.07	4.4
September.....	11.4	3.0	0	.38	23
Water year 1947-48 .....	15,373	3,780	0	42.0	30,490

Peak discharge (base, 4,000 sec.-ft.)- July 2 (9:30 p.m.) 4,760 sec.-ft.

Note.- No gage-height record Sept. 10-30; discharge computed on basis of recorded range in stage, weather records, and records for nearby stations.

## Sabinal River near Sabinal, Tex.

Location.- Water-stage recorder, lat. 29°30', long. 99°29', 470 feet upstream from low-water road crossing on Sabinal-Utopia road, 3.5 miles downstream from Onion Creek, and 12 miles north of Sabinal, Uvalde County. Datum of gage is 1,131.2 feet above mean sea level, datum of 1929.

Drainage area.- 206 square miles.

Records available.- October 1942 to September 1948.

Extremes.- Maximum discharge during year, 282 second-feet Sept. 4 (gage height, 2.26 feet); no flow at times.

1942-48: Maximum discharge, 9,800 second-feet June 24, 1947 (gage height, 9.60 feet); no flow at times.

Flood of July 2, 1932, reached a stage of about 29.9 feet, from information by local residents; discharge, 72,000 second-feet, by slope-area method, at Sabinal, 12 miles downstream from gage.

Remarks.- Records good except those when flow was leakage through control, which are fair. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.4	1.0	1.7	4.9	5.6	9.7	4.9	1.0	ae.0.2	1.4		0
2	2.4	.6	2.0	4.2	8.6	8.6	4.9	1.0	ae.1	1.7		0
3	2.4	.5	2.0	4.2	7.0	8.6	4.9	1.0	ae.1	8.1		0
4	2.4	.4	1.7	4.2	6.3	8.6	4.9	.8	0	4.9		39
5	2.4	e.3	1.4	4.2	6.3	8.6	4.9	.8	0	2.9		24
6	2.0	e.2	1.7	4.2	5.6	8.6	4.9	.8	0	1.4		1.4
7	2.0	e.4	2.0	4.2	5.6	8.6	4.9	.7	0	1.2		e.2
8	1.7	e.2	2.4	4.2	5.6	8.6	4.9	.6	0	1.0		ae.2
9	1.7	e.2	2.4	4.2	5.6	8.6	4.9	.7	0	e.6		e.2
10	2.0	e.6	2.4	4.2	6.3	8.6	4.2	.7	0	e.3		23
11	2.0	.8	2.4	4.2	6.3	7.8	4.2	1.2	0	e.3		4.2
12	1.4	1.0	2.4	4.2	6.3	7.8	4.2	2.0	0	3.7		1.4
13	1.4	1.0	2.4	4.2	6.3	7.8	3.5	1.4	0	14		.6
14	1.2	1.0	2.9	4.2	6.3	8.6	3.5	1.0	0	11		e.2
15	1.0	1.0	5.6	4.2	6.3	8.6	2.9	.8	0	6.3		ae.2
16	1.0	1.0	4.9	4.2	7.0	7.8	2.9	.6	0	3.5		ae.1
17	1.0	3.3	4.2	4.2	7.0	7.8	2.9	.4	0	2.9		ae.1
18	1.0	2.9	4.2	4.2	7.0	7.8	2.4	e.4	0	2.4		e.2.7
19	.8	2.0	4.2	4.9	7.0	6.3	2.4	ae.3	0	1.7		1.2
20	.7	1.7	4.2	4.9	6.3	6.3	2.4	ae.2	0	1.4		1.0
21	.5	1.7	4.2	4.9	6.3	6.3	2.4	ae.2	0	1.2		e.2
22	.4	1.7	4.2	4.9	6.3	5.6	2.4	ae.1	0	1.0		e.5.8
23	.4	1.7	4.2	4.2	6.3	5.6	4.2	ae.1	0	1.0		16
24	.3	1.7	4.2	4.2	7.0	6.3	2.9	ae.0	36	.8		5.6
25	.3	1.7	4.2	4.2	7.8	6.3	4.9	ae.0	24	.5		2.4
26	.4	1.7	4.2	4.9	7.8	6.3	2.9	2.0	54	e.3		1.4
27	.4	1.4	4.2	4.9	12	5.6	1.7	3.5	14	e.2		.8
28	.4	1.4	4.2	4.9	9.7	5.6	1.0	1.2	6.3	ae.2		e.3
29	1.2	1.4	4.2	4.9	8.6	5.6	1.0	.7	3.5	ae.1		ae.2
30	1.0	1.7	4.2	4.9	-	5.6	1.0	e.4	2.0	ae.1		ae.1
31	1.0	-	4.9	4.9	-	4.9	-	ae.3	-	ae.1		-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	39.2	2.4	0.3	1.26	78
November.....	36.2	3.5	.2	1.21	72
December.....	104.0	5.6	1.4	3.35	206
Calendar year 1947.....	8,364.3	1,120	.2	22.9	16,590
January.....	137.9	4.9	4.2	4.45	274
February.....	200.1	12	5.6	6.90	397
March.....	227.4	9.7	4.9	7.34	451
April.....	104.0	4.9	1.0	3.47	206
May.....	24.9	3.5	0	.80	49
June.....	140.2	54	0	4.67	278
July.....	75.2	14	.1	2.46	151
August.....	0	0	0	0	0
September.....	175.3	43	0	5.84	348
Water year 1947-48.....	1,265.4	54	0	3.46	2,510

Peak discharge (base, 4,000 sec.-ft.).- No peak above base.

a No gage-height record; water below intakes; discharge computed on basis of engineer's notes.

e Discharge, wholly or in part, leakage through control.

## Leona River spring flow near Uvalde, Tex.

Location.- Water-stage recorder, lat. 29°09', long. 99°44', at old road crossing on White's ranch 3½ miles downstream from Cooks slough and 4.6 miles southeast of Uvalde, Uvalde County. Datum of gage is 838.4 feet above mean sea level, datum of 1929.

Records available.- January 1939 to September 1948. Occasional discharge measurements since 1925 in connection with seepage investigations.

Extremes.- Maximum daily spring discharge during year, 15 second-feet Nov. 18 to Dec. 8, Dec. 15, 16; maximum gage height, 3.63 feet July 12; no flow Aug. 10 to Sept. 8. 1939-48: Maximum daily spring discharge, 33 second-feet Feb. 15-18, 1942; maximum gage height, 13.63 feet Aug. 30, 1944, from floodmark; no flow Aug. 10 to Sept. 8, 1948.

Remarks.- Records good. Discharge represents flow from several springs that enter river above station and below Uvalde. Surface runoff from precipitation is excluded. A few small diversions by pumping from river channel above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	13	13	15	14	12	10	6.8	4.6	2.3	e0.6	0.4	0
2	13	13	15	14	12	10	6.8	4.6	2.2	e.6	.4	0
3	13	13	15	14	12	10	6.5	4.4	2.0	e.7	.5	0
4	13	14	15	13	12	10	6.8	4.2	1.9	e.7	.4	e0
5	13	13	15	13	12	10	6.8	3.8	1.8	e.8	.3	0
6	13	13	15	13	11	9.8	6.8	3.6	1.6	e.8	.3	0
7	13	13	15	12	11	9.8	6.5	3.6	1.4	.9	.2	0
8	13	13	15	12	11	9.8	6.2	3.4	1.3	.8	.1	0
9	13	13	14	12	11	9.8	5.9	3.4	1.1	.9	.1	e.1
10	13	14	14	12	11	8.8	5.6	3.4	1.0	.9	0	e.1
11	12	e14	14	12	11	8.3	5.9	e3.4	.9	.9	0	e.2
12	12	14	14	12	11	8.3	5.9	e3.4	.9	e1.0	0	e.2
13	12	14	14	12	11	8.3	5.4	3.4	.8	e1.1	0	.3
14	12	14	e14	12	11	8.3	5.4	3.4	.9	e1.1	0	.4
15	12	14	15	12	11	8.8	5.2	3.4	.8	e1.2	0	.4
16	12	14	15	12	11	8.8	5.2	3.4	.6	1.3	0	.4
17	12	e14	14	11	11	8.3	5.0	3.3	.5	1.1	0	.4
18	12	e15	14	12	11	8.3	5.0	3.1	.4	.9	0	.4
19	12	15	14	12	11	7.9	5.0	3.0	.3	.9	0	.4
20	12	15	14	12	11	7.9	4.8	2.8	.2	.9	0	.4
21	12	15	14	11	11	7.9	4.4	2.7	.2	.9	0	.4
22	12	15	14	11	11	7.9	e4.5	2.7	e.3	.8	0	.4
23	12	15	13	11	11	7.5	e4.6	2.6	e.3	.7	0	.4
24	12	15	13	11	11	7.1	e4.6	e2.6	e.4	.7	0	.5
25	12	15	13	11	11	7.1	e4.7	e2.6	e.4	.7	0	.5
26	12	15	13	12	11	7.1	4.8	e2.6	.5	.6	0	.4
27	12	15	13	12	e10	7.1	4.8	2.6	.5	.6	0	.2
28	12	15	13	11	10	6.8	4.6	2.4	.5	.5	0	.2
29	e12	15	13	12	10	7.1	4.6	2.4	.5	.5	0	.2
30	13	15	13	12	-	7.1	4.6	2.4	.5	.4	0	.1
31	13	-	13	12	-	7.1	-	2.4	-	.4	e0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	384	13	12	12.4	762
November.....	425	15	13	14.2	845
December.....	435	15	13	14.0	863
Calendar year 1947 .....	4,522.1	18	7.1	12.4	8,970
January.....	374	14	11	12.1	742
February.....	321	12	10	11.1	637
March.....	261	10	6.8	8.42	518
April.....	183.7	6.8	4.4	5.46	325
May.....	99.6	4.6	2.4	3.21	198
June.....	27.0	2.3	.2	.90	54
July.....	25.0	1.3	.4	.81	50
August.....	2.7	.5	0	.09	5.4
September.....	7.0	.5	0	.23	14
Water year 1947-48 .....	2,525.0	15	0	6.90	5,010

e Gage height not representative of average spring flow for day; discharge interpolated.

## Atascosa River at Whitsett, Tex.

Location.- Water-stage recorder and artificial control, lat. 28°37'20", long. 98°17'05", 0.9 mile west of Whitsett, Live Oak County, and 4 miles downstream from La Parita Creek. Datum of gage is 159.0 feet above mean sea level, datum of 1929. From May 21 to June 28, wire-weight gage at site 1,566 feet downstream at same datum.

Drainage area.- 1,171 square miles.

Records available.- September 1924 to May 1926, May 1932 to September 1948.

Average discharge.- 17 years (1924-25, 1932-48), 149 second-feet.

Extremes.- Maximum discharge during year, 2,650 second-feet Aug. 27 (gage height, 18.93 feet); no flow at times.

1924-26, 1932-48: Maximum discharge, 39,300 second-feet July 7, 1942 (gage height, 38.3 feet, from floodmark), from rating curve extended above 12,000 second-feet on basis of slope-area determination at gage height 38.0 feet; no flow at times.

Remarks.- Records good except those for periods of doubtful gage-height record and those for periods of rapidly changing stage, which are fair. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.9	3.7	8.9	11	13	16	12	8.4	1.5	646	4.0	13
2	2.0	3.6	9.2	10	16	15	11	7.2	1.0	348	3.8	8.8
3	2.1	3.5	8.6	11	22	14	10	6.2	.8	979	3.6	6.9
4	2.0	3.1	8.4	10	24	14	10	5.3	.6	796	3.1	5.4
5	2.4	2.9	8.4	11	21	14	10	4.6	.5	588	3.0	4.5
6	2.3	2.8	8.4	11	18	14	10	3.7	.2	102	2.6	3.6
7	1.8	2.9	8.6	11	16	14	9.8	2.7	0	79	2.2	2.8
8	1.7	2.6	8.6	11	15	17	9.5	2.1	0	96	1.8	2.4
9	d1.8	2.7	8.9	11	14	19	8.9	2.5	0	42	1.5	3.0
10	d1.8	3.0	9.8	11	14	15	8.4	2.6	0	25	1.1	3.4
11	1.9	4.4	9.5	11	14	14	7.6	3.8	0	144	.9	1.9
12	d1.9	3.7	10	11	13	13	6.9	14	.1	1,070	.7	12
13	d1.9	4.3	17	10	13	13	6.7	26	.1	577	.5	8.8
14	d1.9	4.8	17	9.8	13	13	6.7	13	0	206	.2	7.2
15	1.9	4.8	62	9.8	13	13	6.4	7.9	.4	71	0	5.2
16	1.9	4.9	50	9.8	12	13	5.7	5.7	.3	40	0	4.7
17	2.0	150	27	9.8	12	13	5.5	4.4	.1	27	0	4.5
18	2.5	685	18	10	12	13	5.5	3.0	0	21	0	6.0
19	f2.2	85	15	11	12	13	5.1	2.6	0	18	0	11
20	f35	26	13	12	13	12	5.3	2.3	0	15	0	12
21	16	16	13	12	14	12	5.8	2.3	0	13	0	11
22	7.2	17	12	13	4.6	12	4.8	1.8	0	11	0	5.7
23	4.8	11	12	13	56	11	5.2	1.3	0	10	0	4.2
24	4.0	9.8	11	12	12	12	5.3	2.0	0	9.1	0	3.6
25	3.6	9.2	11	12	24	11	10	1.3	0	8.1	0	3.0
26	3.3	10	11	12	20	12	32	3.0	0	7.2	26	2.6
27	3.1	9.2	10	12	18	11	46	5.8	0	6.8	1,540	2.4
28	3.0	8.9	11	12	17	11	38	8.2	0	6.0	911	1.9
29	3.6	8.9	11	12	17	11	20	3.8	213	4.9	69	1.8
30	3.7	8.6	11	13	-	10	12	2.6	1,170	4.7	36	1.5
31	3.7	-	11	13	-	11	-	1.9	-	4.5	20	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	128.9	35	1.7	4.16	256
November.....	1,112.1	685	2.6	37.1	2,210
December.....	450.3	62	8.4	14.5	893
Calendar year 1947 .....	19,758.4	3,070	-	54.1	39,200
January.....	348.2	13	9.8	11.2	691
February.....	552	56	12	19.0	1,090
March.....	406	19	10	13.1	805
April.....	341.1	46	4.8	11.4	677
May.....	182.0	26	1.3	5.23	321
June.....	1,388.6	1,170	0	46.3	2,750
July.....	5,965.1	1,070	4.5	192	11,830
August.....	2,631.0	1,540	0	84.9	5,220
September.....	212.5	34	1.5	7.08	421
Water year 1947-48 .....	13,697.8	1,540	0	37.4	27,160

Peak discharge (base, 1,500 sec.-ft.)- June 30 (6:30 p.m.), 1,530 sec.-ft.; Aug. 27 (11 p.m.), 2,650 sec.-ft.

d Doubtful gage-height record; discharge computed on basis of estimated gage-height record.

f Computed on basis of partly estimated gage-height record.

Note.- Discharge May 21 to June 28 computed from graph based on once-daily readings of wire-weight gage 1,566 feet downstream from recorder.

## Rio Grande at Thirtymile Bridge, near Creede, Colo.

Location.- Water-stage recorder, lat. 37°44', long. 107°16', in sec. 13, T. 40 N., R. 4 W., 500 feet upstream from Squaw Creek, three-quarters of a mile downstream from Rio Grande Reservoir, and 20 miles southwest of Creede.

Drainage area.- 163 square miles.

Records available.- June 1909 to September 1913 and October 1933 to September 1948 in reports of Geological Survey. June 1909 to September 1948 in reports of State engineer.

Average discharge.- 35 years (1910-23, 1926-48), 231 second-feet.

Extremes.- Maximum discharge during year, 2,670 second-feet June 11 (gage height, 5.01 feet); minimum daily, 2.5 second-feet Oct. 17-20.

1909-48: Maximum discharge, 7,500 second-feet June 28, 1927 (gage height, 7.03 feet); minimum daily, 0.6 second-foot at times when reservoir was about empty and gates were closed.

Remarks.- Records excellent above 200 second-feet and good below except those for Oct. 15 to Apr. 24, which are poor. Flow regulated by Rio Grande Reservoir (capacity, 51,110 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	174	4.0	4.0	4.0	4.0	4.0	4.0	21	2,040	1,160	629	89
2	152	4.0	4.0	4.0	4.0	4.0	4.0	22	1,750	872	616	76
3	143	4.0	4.0	4.0	4.0	4.0	4.0	23	1,920	996	635	85
4	143	4.0	4.0	4.0	4.0	4.0	4.0	24	2,150	1,000	704	61
5	143	4.0	4.0	4.0	4.0	4.0	4.0	25	2,380	1,040	678	61
6	123	4.0	4.0	4.0	4.0	4.0	4.0	26	2,390	820	598	61
7	115	4.0	4.0	4.0	4.0	4.0	4.0	28	2,350	1,020	568	61
8	100	4.0	4.0	4.0	4.0	4.0	4.0	29	1,860	1,180	568	61
9	98	4.0	4.0	4.0	4.0	4.0	4.0	29	1,820	896	562	55
10	96	4.0	4.0	4.0	4.0	4.0	4.0	52	2,280	1,010	544	55
11	96	4.0	4.0	4.0	4.0	4.0	4.0	527	2,500	987	487	54
12	106	4.0	4.0	4.0	4.0	4.0	4.0	568	2,430	1,010	419	54
13	137	4.0	4.0	4.0	4.0	4.0	4.0	521	2,220	1,120	368	54
14	71	4.0	4.0	4.0	4.0	4.0	4.0	558	1,760	1,020	364	54
15	2.8	4.0	4.0	4.0	4.0	4.0	4.0	183	339	980	373	54
16	2.6	4.0	4.0	4.0	4.0	4.0	4.0	32	610	1,070	404	54
17	2.5	4.0	4.0	4.0	4.0	4.0	4.0	34	1,610	1,030	443	54
18	2.5	4.0	4.0	4.0	4.0	4.0	4.0	43	1,610	912	438	58
19	2.5	4.0	4.0	4.0	4.0	4.0	4.0	842	1,290	936	476	68
20	2.5	4.0	4.0	4.0	4.0	4.0	4.0	2,190	865	1,070	527	68
21	2.6	4.0	4.0	4.0	4.0	4.0	4.0	2,330	1,010	858	492	68
22	2.7	4.0	4.0	4.0	4.0	4.0	4.0	2,330	960	722	424	68
23	2.8	4.0	4.0	4.0	4.0	4.0	4.0	2,310	685	685	395	68
24	2.9	4.0	4.0	4.0	4.0	4.0	4.0	2,140	604	798	360	62
25	3.0	4.0	4.0	4.0	4.0	4.0	170	1,910	562	835	335	43
26	3.0	4.0	4.0	4.0	4.0	4.0	237	1,670	660	850	147	44
27	3.4	4.0	4.0	4.0	4.0	4.0	123	1,180	952	678	88	61
28	3.6	4.0	4.0	4.0	4.0	4.0	34	978	847	616	89	73
29	3.8	4.0	4.0	4.0	4.0	4.0	20	969	850	672	96	92
30	3.8	4.0	4.0	4.0	4.0	4.0	20	1,380	1,100	791	97	104
31	3.8	-	4.0	4.0	-	4.0	-	1,910	-	716	92	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,745.8	174	2.5	56.3	3,460
November.....	120.0	4.0	4.0	4.00	238
December.....	124.0	4.0	4.0	4.00	246
Calendar year 1947.....	90,112.3	1,370	1.4	247	178,700
January.....	124.0	4.0	4.0	4.00	246
February.....	116.0	4.0	4.0	4.00	230
March.....	124.0	4.0	4.0	4.00	246
April.....	700.0	237	4.0	23.3	1,390
May.....	24,864	2,330	21	862	49,320
June.....	44,204	2,500	339	1,473	87,680
July.....	28,330	1,180	616	914	56,190
August.....	13,016	704	88	420	25,820
September.....	1,900	104	43	63.3	3,770
Water year 1947-48.....	115,367.8	2,500	2.5	315	228,800

Note.- No gage-height record Nov. 2 to Apr. 24 (stage-discharge relation affected by ice during part of period); discharge computed on basis of leakage through closed reservoirs gates.

## Rio Grande at Wason, below Creede, Colo.

Location.- Water-stage recorder, lat. 37°49', long. 106°53', in NE $\frac{1}{4}$  sec. 8, T. 41 N., R. 1 E., at Wason,  $\frac{1}{2}$  miles downstream from Willow Creek and 3 miles southeast of Creede.

Drainage area.- 705 square miles.

Records available.- April 1907 to September 1913 and October 1933 to September 1948 in reports of Geological Survey. April 1907 to September 1948 in reports of State engineer.

Average discharge.- 41 years, 635 second-feet.

Extremes.- Maximum discharge during year, 6,500 second-feet June 4 (gage height, 5.68 feet); minimum daily, 80 second-feet Jan. 28.

1907-48: Maximum discharge, 9,750 second-feet June 28, 1927 (gage height, 7.65 feet); minimum not determined.

Remarks.- Records excellent except those for period of ice effect, which are fair. Diversions above station for irrigation. Flow regulated by three reservoirs (total capacity, 122,900 acre-feet).

Rating tables, water year 1947-48, except period of ice effect (gage height, in feet, and discharge, in second-feet)

Oct. 1 to May 18

May 19 to Sept. 30

0.4	71	1.4	415	0.9	232	1.8	690	3.6	2,550
.6	114	1.8	667	1.2	351	2.2	1,000	4.6	4,530
.8	171	2.6	1,360	1.5	501	3.0	1,760	5.7	6,540
1.1	280	3.0	1,760						

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	432	229	153	120	105	114	133	868	4,240	2,020	1,260	448
2	415	226	141	98	105	128	147	842	4,060	1,960	1,200	379
3	580	218	141	100	107	130	168	801	5,600	1,770	1,180	560
4	365	194	139	105	105	117	178	842	5,780	1,950	1,240	347
5	356	197	125	*105	100	130	188	930	5,620	1,860	1,310	338
6	352	178	135	108	98	144	194	1,000	5,240	1,670	1,240	334
7	324	150	140	110	96	150	197	1,150	5,120	1,650	1,310	321
8	312	194	125	115	93	153	215	1,130	4,560	1,910	1,340	292
9	292	178	130	120	88	150	268	974	4,250	1,620	1,310	264
10	288	181	120	125	94	122	312	801	4,790	1,540	1,200	288
11	312	*153	115	122	96	150	360	982	5,340	1,580	1,070	304
12	375	178	125	110	88	138	320	1,160	5,220	1,480	1,030	308
13	405	181	135	100	90	144	284	1,120	4,860	1,620	966	300
14	722	165	145	105	93	105	320	1,380	4,250	1,550	1,010	308
15	459	158	155	110	94	122	448	1,520	2,880	1,480	966	308
16	375	174	150	110	95	133	605	1,360	2,080	1,520	974	300
17	365	184	*149	100	*96	107	761	1,580	3,270	1,590	992	288
18	356	171	150	105	105	107	912	1,710	3,360	1,530	966	245
19	347	184	150	102	115	119	817	3,910	2,930	1,570	974	272
20	342	174	145	100	112	102	834	5,200	2,080	1,770	1,040	284
21	352	136	150	105	110	107	860	5,660	1,980	1,620	1,100	288
22	352	162	145	105	108	109	801	5,800	2,130	1,430	1,040	284
23	324	174	145	100	105	*114	706	5,480	1,620	1,340	1,010	284
24	308	159	150	105	110	119	572	4,960	1,420	1,410	915	239
25	280	201	152	98	120	117	495	4,180	1,410	1,460	798	232
26	264	201	155	92	128	125	646	3,600	1,420	1,480	690	268
27	272	171	156	88	128	119	585	2,900	1,790	1,330	501	268
28	256	168	158	80	117	122	566	2,600	1,590	1,330	423	300
29	248	168	152	90	114	133	690	2,660	1,500	1,420	453	296
30	264	168	142	98	-	138	777	3,260	2,000	1,480	438	284
31	229	-	150	105	-	141	-	4,060	-	1,440	469	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	10,723	722	229	346	21,270
November.....	5,355	229	136	178	10,620
December.....	4,402	158	115	142	8,750
Calendar year 1947.....	224,030	2,830	58	614	444,300
January.....	3,234	125	80	104	6,410
February.....	3,015	128	88	104	5,980
March.....	3,909	153	102	126	7,750
April.....	14,359	912	133	479	28,460
May.....	74,440	5,800	801	2,401	147,600
June.....	102,370	5,780	1,410	3,412	203,000
July.....	49,400	2,020	1,330	1,594	97,980
August.....	30,415	1,340	423	981	60,330
September.....	9,049	448	232	302	17,950
Water year 1947-48.....	310,671	5,800	80	849	616,100

Peak discharge (base, 2,300 sec.-ft.)- May 22 (3:15 a.m.) 6,410 sec.-ft.; June 4 (12:15 a.m.) 6,500 sec.-ft.; June 15 (5:30 a.m.) 5,580 sec.-ft.; June 18 (5 a.m.) 3,650 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 6 to Feb. 25 (no gage-height record Jan. 28 to Feb. 17; discharge computed on basis of 1 discharge measurement and weather records).

## Rio Grande near Del Norte, Colo.

Location.- Water-stage recorder, lat. 37°41', long. 106°28', in NW<sup>1</sup>/<sub>4</sub> sec. 29, T. 40 N., R. 5 E., 5 miles upstream from Pinos Creek and 6 miles west of Del Norte. Datum of gage is 7,982.21 feet above mean sea level, datum of 1929.

Drainage area.- 1,320 square miles.

Records available.- July 1889 to November 1906 (at site 4 miles downstream), April 1908 to September 1913 and October 1933 to September 1948 in reports of Geological Survey. July 1889 to September 1906 and April 1908 to September 1948 in reports of State engineer. May to September 1907 (at site 4 miles downstream), unpublished, in files of State engineer.

Average discharge.- 59 years (1889-1948), 959 second-feet.

Extremes.- Maximum discharge during year, 8,840 second-feet May 22 (gage height, 5.81 feet); minimum daily, 135 second-feet Jan. 28.

1889-1948: Maximum discharge, 18,000 second-feet Oct. 5, 1911 (gage height, 6.80 feet), from rating curve extended above 6,000 second-feet; minimum daily, 88 second-feet Dec. 20, 1945.

Remarks.- Records excellent except those for May 20 to June 15, which are good, and those for period of ice effect or no gage-height record, which are fair. Small diversions above station for irrigation. Flow regulated by three main reservoirs (total capacity, 122,900 acre-feet) and several smaller ones.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	618	410	270	225	190	218	285	2,050	5,990	2,720	1,450	547
2	810	410	*260	190	192	214	332	1,890	5,990	2,770	1,330	491
3	575	410	255	195	*198	210	434	1,810	7,490	2,450	1,300	452
4	540	368	230	200	195	200	533	1,840	7,850	2,550	1,340	424
5	533	362	210	*202	190	210	540	2,160	7,510	2,430	1,490	428
6	519	350	235	202	185	*204	554	2,340	7,180	2,340	1,430	422
7	498	240	255	205	182	200	554	2,640	7,250	2,190	1,460	404
8	484	302	220	220	180	220	589	2,700	6,970	2,390	1,320	380
9	458	326	230	230	172	210	706	2,270	6,870	2,160	1,450	362
10	440	314	218	240	180	200	916	1,770	7,100	1,950	1,340	362
11	464	285	200	235	190	200	971	1,640	7,460	1,980	1,220	374
12	589	296	210	200	175	205	842	1,810	7,410	1,900	1,180	386
13	603	*326	225	180	a180	a220	682	1,730	7,000	2,080	1,100	374
14	1,000	308	245	190	a190	a250	754	2,290	6,380	2,000	1,150	368
15	872	250	265	195	a194	a230	993	2,000	5,440	1,940	1,110	368
16	690	280	260	200	a195	a230	1,320	3,230	3,820	1,890	1,050	362
17	658	320	*255	178	*198	a240	1,550	3,640	4,540	1,970	1,100	356
18	642	302	255	190	215	a240	1,890	3,900	4,760	1,900	1,080	358
19	634	302	260	185	230	a235	1,800	6,020	4,490	2,020	1,100	314
20	610	280	250	*180	228	a225	1,860	7,620	3,680	2,180	1,140	350
21	626	260	255	190	222	a200	1,940	8,290	3,290	2,000	1,200	344
22	642	250	252	190	*220	a190	1,810	8,290	3,380	1,730	1,170	358
23	596	270	250	180	218	*a192	1,640	7,800	2,720	1,590	1,140	332
24	575	270	252	185	215	210	1,270	7,250	2,300	1,640	1,070	308
25	512	290	255	170	225	235	1,040	6,470	2,240	1,710	971	285
26	484	290	260	160	238	230	1,110	5,700	2,220	1,710	872	326
27	484	296	265	145	248	240	1,100	5,140	2,610	1,590	682	338
28	470	250	270	155	235	240	1,170	4,710	2,590	1,460	561	374
29	464	255	265	155	220	280	1,570	4,800	2,080	1,590	533	374
30	484	265	260	170	-	308	1,840	5,260	2,590	1,590	533	380
31	446	-	240	185	-	314	-	5,860	-	1,600	561	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	17,800	1,000	440	574	35,310
November.....	9,137	410	240	305	18,120
December.....	7,622	270	200	246	15,120
Calendar year 1947 .....	322,550	3,970	120	884	659,800
January.....	5,906	240	135	191	11,710
February.....	5,900	248	172	203	11,700
March.....	7,000	314	190	226	13,880
April.....	32,595	1,940	285	1,086	64,650
May.....	125,920	8,290	1,640	4,062	249,800
June.....	151,000	7,850	2,080	5,035	299,500
July.....	62,020	2,770	1,460	2,001	123,000
August.....	34,633	1,520	533	1,117	68,690
September.....	11,271	547	285	376	22,360
Water year 1947-48 .....	470,804	8,290	135	1,286	933,800

Peak discharge (base, 3,200 sec.-ft.) - May 22 (4:30 a.m.) 8,840 sec.-ft.; June 4 (3 a.m.) 7,850 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record (stage-discharge relation affected by ice during part of periods); discharge computed on basis of 1 discharge measurement, weather records, and records for San Juan River at Pagosa Springs.

Note.- Stage-discharge relation affected by ice Nov. 25, 29, Dec. 6 to Feb. 12, Feb. 17 to Mar. 12.



## Rio Grande near Monte Vista, Colo.

Location.- Water-stage recorder, lat. 37°37', long. 106°09', at west line of sec. 18, T. 39 N., R. 8 E., 2 miles north of Monte Vista. Datum of gage is 7,654.54 feet above mean sea level, datum of 1929.

Drainage area.- 1,590 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. May 1926 to September 1948 in reports of State engineer (no winter records in earlier years).

Average discharge.- 15 years (1933-48), 362 second-feet.

Extremes.- Maximum discharge during year, 7,100 second-feet May 22 (gage height, 7.37 feet); minimum daily, 23 second-feet Oct. 8.

1926-48: Maximum discharge, 18,500 second-feet June 30, 1927 (gage height, 7.85 feet); minimum daily, 4 second-feet Apr. 18, 1926.

Remarks.- Records excellent except those below 100 second-feet and those for May 23-31, which are good, and those for period of ice effect, which are fair. Diversions above station for irrigation. Flow regulated by three main reservoirs (total capacity, 122,900 acre-feet) and several smaller ones.

Revisions.- W 928: Drainage area.

Rating tables, water year 1947-48, except period of ice effect  
(gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used May 26 to June 2, Sept. 18-30)

Oct. 1 to May 29

May 30 to Sept. 30

0.1	15	1.2	258	4.5	2,500	0.6	57	2.1	429	5.4	5,210
.2	28	1.7	436	5.8	4,420	.9	106	2.6	655	6.3	4,430
.3	43	2.5	795	7.4	7,150	1.2	169	3.2	1,040	7.1	5,740
.5	78	3.2	1,170			1.8	289	4.3	1,980		
.8	146	3.7	1,600								

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	151	78	274	240	198	250	394	1,150	4,740	910	135	94
2	144	280	*293	220	195	240	406	1,060	4,640	984	154	83
3	120	300	280	205	*196	225	440	895	5,010	785	145	75
4	95	287	274	215	200	220	444	719	5,740	785	147	101
5	74	261	237	220	200	220	409	805	5,640	711	183	99
6	60	274	234	213	198	225	464	885	5,400	634	147	94
7	32	252	240	225	194	220	506	1,090	5,130	500	110	87
8	23	214	260	240	190	230	368	1,240	4,820	512	147	90
9	38	304	250	250	180	235	485	1,030	4,360	401	110	92
10	34	284	240	255	195	220	612	576	4,310	314	97	94
11	30	293	230	250	200	218	747	324	4,500	398	101	83
12	53	314	240	*220	200	230	761	448	4,720	408	92	94
13	115	338	255	205	190	245	580	440	4,800	535	78	88
14	246	342	265	200	200	260	566	733	4,240	855	60	80
15	549	314	275	210	205	265	676	1,120	3,520	530	70	82
16	284	284	280	215	210	260	950	1,530	2,050	418	60	83
17	225	342	270	205	215	260	1,140	1,850	2,050	448	70	87
18	206	328	275	200	220	268	1,530	2,020	2,360	422	80	83
19	180	310	270	205	240	249	1,540	3,220	2,020	448	112	75
20	156	293	265	195	250	258	1,500	5,460	1,730	582	94	78
21	134	271	270	205	240	277	1,600	6,320	1,120	587	108	76
22	149	261	275	205	240	274	1,440	6,770	1,140	381	114	70
23	141	277	260	195	235	*249	1,260	6,790	853	284	110	68
24	113	274	265	190	230	264	930	6,470	844	256	88	82
25	93	280	270	195	245	297	621	6,200	618	310	78	59
26	62	314	270	180	255	317	566	5,580	508	329	90	60
27	38	307	275	165	265	304	562	4,850	650	266	85	82
28	43	307	275	150	270	335	428	4,150	925	167	67	87
29	31	274	280	145	265	360	639	3,860	876	139	63	87
30	64	264	270	160	-	428	955	4,020	729	154	80	73
31	46	-	255	180	-	417	-	4,460	-	158	92	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,709	549	23	120	7,360
November.....	8,521	342	78	284	16,900
December.....	8,172	293	230	264	16,210
Calendar year 1947.....	104,996.0	1,280	5.0	288	208,200
January.....	6,360	255	145	205	12,610
February.....	6,331	270	180	218	12,560
March.....	8,320	428	218	268	16,500
April.....	23,549	1,600	368	785	46,710
May.....	86,065	6,790	324	2,776	170,700
June.....	89,671	5,740	508	2,989	177,900
July.....	14,431	984	139	466	28,620
August.....	3,175	183	60	102	6,300
September.....	2,466	101	59	82.2	4,890
Water year 1947-48.....	260,770	6,790	23	712	517,300

Peak discharge (base, 3,000 sec.-ft.)- May 22 (6:45 p.m.) 7,100 sec.-ft.; June 4 (7:15 p.m.) 5,950 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 8 to Mar. 17 (no gage-height record Feb. 11-14).

## Rio Grande at Alamosa, Colo.

Location.- Water-stage recorder, lat. 37°29', long. 105°53', in SE $\frac{1}{4}$  sec. 4, T. 37 N., R. 10 E., a quarter of a mile northwest of Alamosa and 7 miles upstream from Alamosa Creek. Datum of gage is 7,532.66 feet above mean sea level; datum of 1929.

Drainage area.- 1,710 square miles.

Records available.- May 1912 to September 1913 and October 1933 to September 1948 in reports of Geological Survey. May 1912 to September 1948 in reports of State engineer.

Average discharge.- 36 years, 319 second-feet.

Extremes.- Maximum discharge during year, 5,160 second-feet June 5; maximum gage height, 9.97 feet May 23; minimum daily discharge, 15 second-feet Oct. 9, 11, Sept. 8-18, 1912-48; Maximum discharge, 14,000 second-feet July 1, 1927; maximum gage height, that of May 23, 1948; minimum daily discharge, 2 second-feet Oct. 24-29, 1933.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Many diversions above station for irrigation. During irrigation season, low-water flow is water returned from irrigated lands above station.

Revisions.- W 928: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	25	29	321	240	205	270	488	542	3,300	290	49	16
2	24	31	*338	220	210	260	480	731	3,580	386	53	16
3	23	117	351	220	210	245	496	673	3,600	457	56	16
4	22	176	321	225	208	235	516	524	3,980	333	49	16
5	21	168	280	230	200	245	516	594	4,810	333	49	16
6	21	141	285	235	200	250	493	427	4,980	272	63	16
7	19	129	264	240	195	265	553	418	4,690	227	78	16
8	16	184	251	250	190	280	545	584	4,320	143	64	15
9	14	238	253	260	190	275	*466	639	3,940	131	49	15
10	16	253	243	270	205	270	553	444	3,520	92	37	15
11	15	253	235	260	210	280	670	205	3,400	67	48	15
12	16	280	240	230	205	290	776	106	3,570	57	37	15
13	17	316	255	225	205	320	756	71	3,710	51	33	15
14	18	332	265	225	*218	340	539	52	3,630	53	32	15
15	39	325	275	230	220	330	483	94	3,320	84	30	15
16	170	310	280	220	230	325	548	409	2,800	51	29	15
17	108	318	270	210	245	330	804	679	1,790	43	27	15
18	78	343	275	210	255	355	988	868	1,680	38	26	15
19	63	343	270	205	260	390	1,210	1,050	1,720	34	25	16
20	55	336	265	*200	265	385	1,240	1,420	1,480	31	21	16
21	48	304	265	210	260	b390	1,260	2,570	1,110	56	20	16
22	43	262	275	212	255	b413	1,320	3,890	808	74	20	16
23	33	276	265	210	250	*b404	1,200	4,670	788	45	20	16
24	24	289	260	205	250	b404	1,020	4,760	582	32	20	17
25	24	304	270	200	260	b406	651	4,670	586	28	20	18
26	22	318	275	195	275	b411	441	4,550	314	31	22	18
27	24	349	280	175	285	429	409	4,000	246	31	22	18
28	27	349	285	170	280	425	359	3,490	287	30	19	18
29	26	340	290	175	275	451	268	3,080	395	27	18	18
30	29	310	275	180	-	483	305	2,880	239	28	18	19
31	26	-	260	200	-	524	-	2,950	-	39	18	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,107	170	15	35.7	2,200
November.....	7,723	349	29	257	15,320
December.....	8,537	351	23	275	16,930
Calendar year 1947 .....	43,950	480	10	120	87,180
January.....	6,737	270	170	217	13,360
February.....	6,716	285	190	232	13,320
March.....	10,680	524	255	345	21,180
April.....	20,353	1,320	268	678	40,370
May.....	51,810	4,760	52	1,671	102,800
June.....	72,935	4,960	239	2,431	144,700
July.....	3,594	457	27	116	7,130
August.....	1,072	78	18	34.6	2,130
September.....	483	19	15	16.1	958
Water year 1947-48 .....	191,747	4,960	15	524	380,400

Peak discharge (base, 2,500 sec.-ft.)- May 23 (8 p.m.) 4,820 sec.-ft.; June 5 (6:30 p.m.) 5,160 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Dec. 5, 6, Dec. 11 to Mar. 20 (stage-discharge relation affected by ice during part of periods); discharge computed on basis of 2 discharge measurements, weather records, and records for station near Monte Vista.

Rio Grande above mouth of Trinchera Creek, near La Sauses, Colo.

Location.- Water-stage recorder, lat. 39°19', long. 105°45', in sec. 35, T. 36 N., R. 11 E., a quarter of a mile upstream from Trinchera Creek and 5 miles north of La Sauses. Drainage area.- 5,740 square miles (includes 2,940 square miles in closed basin).

Records available.- May 1936 to September 1948.

Average discharge.- 12 years, 333 second-feet.

Extremes.- Maximum discharge during year, 5,070 second-feet May 26, June 6 (gage height, 9.38 feet); minimum daily, 30 second-feet Sept. 22-25.

1936-48: Maximum discharge, that of May 26, June 6, 1948: minimum daily, 0.4 second-foot July 4, 1940.

Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. Storage and several diversions above station for irrigation. During irrigation season, low flow is water returned from irrigated lands above station.

Rating tables, water year 1947-48, except periods of ice effect  
(gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used Aug. 18-29)

Oct. 1 to Dec. 31

Jan. 1 to Sept. 30

1.5	77	0.8	29	2.4	280	7.	2,790
1.8	116	.9	36	3.0	439	8.6	4,030
2.3	212	1.2	64	3.8	700	9.4	5,100
2.8	332	1.5	102	4.9	1,160		
3.1	422	1.8	153	6.1	1,800		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	99	116	295	265	190	280	685	776	3,180	491	60	42
2	102	114	300	*248	*195	275	670	980	3,480	566	57	40
3	106	123	290	240	210	270	650	1,090	3,970	606	55	39
4	114	208	280	255	208	255	670	1,010	4,030	620	51	38
5	112	255	270	270	205	*262	700	848	4,230	553	51	36
6	106	241	275	275	205	280	670	752	4,890	553	51	35
7	99	291	290	280	202	295	*675	748	5,030	488	51	34
8	94	327	285	285	200	315	712	768	4,950	402	63	33
9	87	346	280	290	195	310	844	888	4,720	347	72	34
10	82	*340	260	300	210	305	623	900	4,420	231	70	33
11	86	338	255	310	225	320	740	708	3,980	170	59	32
12	81	352	255	275	220	340	828	570	3,750	140	53	32
13	81	390	265	265	220	370	896	503	3,810	122	53	32
14	93	400	270	270	225	420	832	433	3,890	90	51	32
15	98	403	280	275	235	400	896	390	3,830	81	48	32
16	149	396	*275	280	*240	410	704	475	3,550	71	52	31
17	241	381	270	265	280	440	808	808	2,970	63	54	32
18	202	381	270	270	270	470	988	.992	1,910	63	45	33
19	180	387	280	*250	275	500	1,150	1,180	1,700	65	43	32
20	162	378	285	230	285	490	1,320	1,400	1,640	68	43	32
21	149	354	290	240	280	480	1,420	1,790	1,460	85	42	32
22	146	330	290	245	280	*487	1,500	2,240	1,200	79	50	30
23	137	320	295	238	275	500	1,550	2,920	1,060	72	47	30
24	128	320	300	240	270	560	1,470	4,550	976	69	40	30
25	121	325	310	230	265	680	1,280	5,020	792	59	37	30
26	125	335	320	210	280	650	1,010	5,060	864	52	36	34
27	128	318	325	190	295	840	892	4,930	590	48	38	35
28	132	300	320	180	290	820	848	4,640	519	54	42	36
29	128	295	310	182	280	820	736	4,130	637	52	65	35
30	125	295	300	185	-	640	675	3,530	573	79	48	38
31	123	-	280	187	-	660	-	3,140	-	96	43	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,818	241	81	123	7,570
November.....	9,359	403	114	312	18,560
December.....	8,670	325	285	286	17,590
Calendar year 1947.....	68,611	625	33	188	136,100
January.....	7,725	310	180	249	15,320
February.....	6,990	295	190	241	13,860
March.....	13,554	680	255	437	26,880
April.....	27,042	1,550	901	901	53,440
May.....	58,169	5,060	390	1,876	115,400
June.....	82,391	5,030	519	2,746	163,400
July.....	6,535	620	48	211	12,960
August.....	1,568	72	36	50.6	3,110
September.....	1,014	42	30	33.8	2,010
Water year 1947-48.....	227,035	5,060	30	620	450,300

Peak discharge (base, 3,000 sec.-ft.).- May 26 (8 p.m.) 5,070 sec.-ft.; June 6 (6:15 p.m.) 5,070 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Nov. 7 to Dec. 15. No gage-height record Dec. 16 to Apr. 6 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 7 discharge measurements and weather records.

## Rio Grande near Lobatos, Colo.

Location.- Water-stage recorder, lat. 37°05', long. 105°45', in sec. 22, T. 33 N., R. 11 E., 6 miles north of Colorado-New Mexico State line, 7 miles downstream from Culebra Creek, and 10 miles east of Lobatos. Datum of gage is 7,426.79 feet above mean sea level, datum of 1929.

Drainage area.- 7,700 square miles (includes 2,940 square miles in closed basin).

Records available.- June 1899 to September 1913 and October 1933 to September 1948 in reports of Geological Survey. June 1899 to September 1948 in reports of State engineer.

Average discharge.- 49 years (1899-1948), 727 second-feet.

Extremes.- Maximum discharge during year, 8,600 second-feet June 7 (gage height, 7.46 feet); minimum daily, 33 second-feet Sept. 8, 9, 12-17.  
1899-1948: Maximum daily discharge, 13,100 second-feet June 8, 1905, from rating curve extended above 8,000 second-feet; minimum daily, 5.0 second-feet Aug. 4, 1940.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation. Flow regulated by many reservoirs on headwaters. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	138	160	*310	320	240	355	878	1,930	5,000	578	77	44
2	131	155	315	*310	*243	350	824	2,280	5,540	578	62	40
3	135	155	310	295	250	340	798	2,300	6,010	623	60	40
4	142	197	305	305	248	335	815	2,190	6,440	649	57	40
5	142	305	290	315	243	*350	824	1,860	6,800	584	62	40
6	131	335	305	315	243	360	798	1,830	7,740	565	62	40
7	127	234	310	320	240	390	783	1,950	8,510	505	69	35
8	127	257	300	330	238	415	815	2,120	8,170	470	72	33
9	119	317	295	335	230	410	806	2,190	7,360	363	85	33
10	112	424	280	350	265	400	780	1,880	6,770	303	85	35
11	108	404	270	365	290	410	860	1,400	6,080	216	82	35
12	108	*404	280	340	264	430	1,080	1,100	5,890	181	69	33
13	98	430	290	295	272	490	1,150	925	5,760	148	69	33
14	131	465	300	300	290	525	1,090	791	5,800	127	67	33
15	138	440	320	315	295	470	934	906	5,450	102	60	33
16	151	425	*315	325	*304	490	934	1,280	4,900	90	53	33
17	257	444	315	310	320	520	1,170	1,990	4,200	80	57	33
18	281	465	310	330	335	820	1,560	2,440	3,040	72	57	35
19	251	472	305	*310	350	830	2,020	2,820	2,300	74	46	40
20	224	440	310	280	385	810	2,370	3,240	2,380	80	46	40
21	218	400	315	300	360	600	2,540	3,770	2,260	82	49	35
22	208	350	310	310	355	*617	2,840	4,380	1,880	99	51	40
23	183	340	315	300	355	640	3,080	4,950	1,580	90	57	38
24	174	340	320	310	350	817	2,830	6,660	1,410	87	55	35
25	164	345	340	300	340	925	2,300	8,000	1,070	82	49	38
26	169	355	350	275	360	869	1,740	8,040	815	69	44	40
27	174	340	350	250	385	815	1,430	7,510	686	62	40	49
28	174	325	345	220	380	798	1,300	6,620	597	57	38	51
29	178	310	340	225	365	791	1,340	5,830	623	60	44	53
30	164	310	335	235	-	833	1,620	5,170	700	55	62	53
31	164	-	325	240	-	851	-	4,800	-	99	51	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	5,021	281	98	162	9,950
November.....	10,343	472	155	345	20,520
December.....	9,680	350	270	312	19,200
Calendar year 1947.....	116,082	1,910	31	318	230,300
January.....	9,330	365	220	301	18,510
February.....	8,775	385	230	303	17,400
March.....	17,446	925	335	563	24,600
April.....	42,289	3,080	760	1,410	83,880
May.....	102,132	8,040	791	3,327	204,600
June.....	125,561	8,510	597	4,185	249,000
July.....	7,230	649	55	233	14,340
August.....	1,837	85	38	59.3	3,640
September.....	1,160	53	33	38.7	2,300
Water year 1947-48.....	341,804	8,510	33	934	678,000

Peak discharge (base, 5,000 sec.-ft.).- May 25 (1:15 p.m.) 8,190 sec.-ft.; June 7 (7 a.m.) 8,600 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Nov. 15, 16, Nov. 20 to Mar. 24 (no gage-height record Dec. 14, 15, Jan. 1 to Feb. 29; discharge computed on basis of 4 discharge measurements, weather records, and records for station near Taos, N. Mex.).

## Rio Grande near Cerro, N. Mex.

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

Records available.- May to September 1948.

Extremes.- Maximum discharge during period, 9,140 second-feet June 7 (gage height, 15.40 feet); minimum daily, 88 second-feet Sept. 14, 16.

Remarks.- Records excellent above 500 second-feet; good below except those for periods of no gage-height record, which are fair. Diversions above station for irrigation.

Rating table, May 1 to Sept. 30, 1948 (gage height, in feet, and discharge, in second-feet)

1.5	80	3.8	349	9.0	2,400
1.7	94	4.7	520	10.5	3,530
2.0	117	5.6	765	12.3	5,250
2.5	166	6.6	1,130	14.5	7,890
3.1	241	7.7	1,640	15.5	9,290

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								a2,000	5,250	720	130	103
2								a2,300	5,800	a650	130	98
3								a2,500	6,260	675	114	94
4								a2,400	6,740	690	111	93
5								2,150	7,110	690	111	91
6								2,150	8,020	a640	109	90
7								2,150	9,000	595	107	90
8								2,210	8,860	520	112	90
9								2,400	8,020	460	112	89
10								2,210	7,370	a390	122	90
11								1,790	6,620	a330	126	92
12								1,340	6,020	a280	122	92
13								1,090	6,020	a230	117	90
14								900	6,140	a190	115	88
15								865	5,910	157	112	89
16								1,090	5,360	a140	107	88
17								1,640	4,740	a120	102	89
18								2,270	3,620	a110	100	90
19								2,680	2,610	a100	105	90
20								3,130	2,610	e110	101	93
21								3,710	2,540	122	97	93
22								4,440	2,210	126	100	92
23								4,940	1,850	135	100	91
24								6,380	1,690	130	104	91
25								8,300	1,390	130	106	90
26								8,860	1,070	126	102	91
27								8,580	848	122	97	93
28								7,500	720	117	95	94
29								6,620	645	126	94	98
30								5,800	780	122	92	101
31								5,360	-	107	110	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....					
November.....					
December.....					
Calendar year .....					
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	-	-	-	-	-
May.....	109,755	8,860	865	3,540	217,700
June.....	135,823	9,000	645	4,527	269,400
July.....	9,150	720	100	295	15,170
August.....	3,362	130	92	108	6,870
September.....	2,763	103	88	92.1	5,480
The period .....	-	-	-	-	517,400

a No gage-height record; discharge computed on basis of records for stations near Lobos, Colo., and near Taos, N. Mex.

e Gage reading not representative of mean for day; discharge computed as explained in footnote a.

Rio Grande below Taos Junction Bridge, near Taos, N. Mex.

Location.- Water-stage recorder, lat. 36°19'00", long. 105°45'30", in N $\frac{1}{2}$  sec. 15, T. 24 N., R. 11 E., 2 miles downstream from Taos Creek and bridge on Taos-Taos Junction highway and 12 miles southwest of Taos.

Drainage area.- 9,730 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

Records available.- October 1930 to September 1948 in reports of Geological Survey. July 1925 to December 1931 in reports of State engineer.

Average discharge.- 23 years (1925-48), 868 second-feet.

Extremes.- Maximum discharge during year, 9,730 second-feet June 7 (gage height, 9.18 feet); minimum daily, 238 second-feet Sept. 14-19, 1930-48; Maximum discharge, that of June 7, 1948; maximum gage height, 9.41 feet May 17, 1941; minimum daily discharge, 140 second-feet (estimated) Aug. 21, 1931.

Remarks.- Records good. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	332	354	a620	504	a480	785	1,080	2,240	5,720	1,060	280	275
2	326	354	a640	504	a470	721	1,090	2,600	6,390	897	332	260
3	321	348	a700	518	a480	713	1,050	2,840	7,110	888	305	256
4	316	348	a660	518	a490	688	1,030	2,760	7,610	942	290	251
5	321	348	623	525	a510	567	1,050	2,460	7,860	978	348	246
6	332	419	581	532	a500	574	1,070	2,310	8,640	897	338	242
7	326	470	581	532	511	660	1,050	2,310	9,730	853	321	242
8	321	401	525	539	504	668	1,050	2,460	9,450	785	310	242
9	316	365	525	553	497	645	1,080	2,530	8,910	787	315	242
10	316	464	532	553	518	645	1,090	2,530	8,120	638	305	242
11	305	539	497	560	497	630	1,070	2,240	7,360	588	310	242
12	295	539	497	560	a490	574	1,200	1,790	6,870	470	316	242
13	295	539	497	546	a470	638	1,400	1,470	6,630	407	316	242
14	326	595	477	539	a460	675	1,430	1,240	6,630	365	305	238
15	343	630	511	525	a480	698	1,370	1,140	6,630	343	300	238
16	338	623	497	532	a480	682	1,230	1,340	5,930	328	290	238
17	338	630	511	525	a490	769	1,250	1,800	5,370	316	280	238
18	365	638	504	532	a500	888	1,520	2,460	4,340	316	275	238
19	444	645	504	511	504	888	1,970	2,840	3,170	355	275	238
20	419	668	497	484	539	969	2,380	3,340	3,000	537	280	242
21	407	623	504	490	539	978	2,760	4,250	3,000	354	280	242
22	389	546	497	504	574	942	3,080	5,050	2,680	348	280	242
23	377	484	497	511	645	969	3,260	5,700	2,310	348	280	242
24	371	511	497	511	690	1,140	3,340	6,630	2,100	354	275	242
25	354	539	504	504	675	1,320	2,920	8,640	1,810	348	265	242
26	348	a580	504	518	638	1,190	2,380	9,180	1,490	348	275	251
27	338	a620	504	490	690	1,160	2,970	9,180	1,240	332	265	246
28	343	a500	511	a420	721	1,090	1,740	8,390	1,110	316	256	246
29	343	a660	518	a430	737	1,090	1,710	7,360	987	295	256	246
30	348	a640	546	a480	-	1,080	1,920	6,390	1,030	280	251	251
31	348	-	560	a490	-	1,070	-	5,930	-	285	251	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	10,661	444	295	344	21,150
November.....	15,770	668	348	526	51,280
December.....	16,621	700	477	536	32,970
Calendar year 1947.....	216,063	3,260	251	592	428,600
January.....	15,940	560	420	514	31,620
February.....	15,778	737	460	544	31,300
March.....	25,086	1,320	567	841	51,740
April.....	50,540	3,340	1,030	1,685	100,200
May.....	121,390	9,180	1,140	3,916	240,800
June.....	153,227	9,730	987	5,108	303,900
July.....	16,306	1,060	280	526	32,340
August.....	9,046	348	251	292	17,940
September.....	7,344	275	238	245	14,570
Water year 1947-48.....	458,710	9,730	238	1,253	909,800

Peak discharge (base, 1,300 sec.-ft.)- Mar. 25 (3 a.m.) 1,510 sec.-ft.; Apr. 23 (6 p.m.) 3,420 sec.-ft.; May 27 (11 a.m.) 9,180 sec.-ft.; June 7 (3 p.m.) 9,730 sec.-ft.; July 19 (11:55 p.m.) 1,320 sec.-ft.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for station at Embudo.

## Rio Grande at Embudo, N. Mex.

Location.- Water-stage recorder, lat. 36°12'20", long. 105°57'40", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub> sec. 23, T. 23 N., R. 9 E., a quarter of a mile downstream from bridge at Embudo and 2½ miles downstream from Embudo Creek.

Drainage area.- 10,400 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valle, Colo.).

Records available.- January 1889 to December 1903, September 1912 to September 1916 and October 1930 to September 1948 in reports of Geological Survey. January 1889 to December 1903 and September 1912 to December 1931 in reports of State engineer.

Average discharge.- 48 years (1889-93, 1894-1903, 1912-16, 1917-48), 1,068 second-feet.

Extremes.- Maximum discharge during year, 10,200 second-feet May 27; maximum gage height, 12.43 feet June 7; minimum daily discharge, 237 second-feet Sept. 7-10.

1889-1903, 1912-48: Maximum discharge, 15,900 second-feet June 19, 1903 (gage height, 15.8 feet); minimum daily, 35 second-feet Dec. 31, 1903.

Remarks.- Records good. Diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	350	392	856	540	545	872	1,080	2,740	6,270	1,160	303	277
2	346	392	868	520	530	764	1,120	3,120	6,720	1,020	350	265
3	343	392	782	535	560	734	1,080	3,360	7,340	950	344	257
4	343	385	716	535	560	716	1,080	3,240	7,980	985	316	241
5	343	382	716	545	570	600	1,120	3,010	8,140	1,020	538	241
6	354	432	630	555	565	e620	1,160	2,790	8,820	985	450	241
7	354	488	610	555	575	a680	1,160	2,790	9,870	915	398	237
8	346	456	565	565	570	a690	1,160	3,010	9,870	859	380	237
9	340	410	555	575	535	a670	1,200	3,120	9,160	815	370	237
10	336	464	555	575	575	656	1,240	3,120	8,310	726	348	237
11	336	585	530	585	565	635	1,280	2,740	7,660	666	348	241
12	329	590	525	580	530	625	1,370	2,190	7,020	588	348	241
13	326	590	510	560	488	a660	1,550	1,740	6,870	520	348	241
14	406	640	496	550	530	e710	1,600	1,460	6,870	470	326	241
15	416	686	545	555	560	a720	1,600	1,320	6,720	420	312	241
16	396	674	535	560	550	a750	1,500	1,500	6,120	406	298	245
17	388	680	530	550	560	830	1,600	1,990	5,560	384	285	245
18	399	710	535	570	560	1,040	1,840	2,790	4,500	370	281	245
19	492	680	535	550	590	970	2,350	3,360	3,320	393	290	245
20	472	698	535	520	640	1,040	2,900	4,200	3,210	534	290	249
21	448	656	540	525	662	1,040	3,240	4,970	3,100	388	294	249
22	428	565	530	555	692	1,000	3,600	5,660	2,890	364	25	249
23	416	540	515	565	782	1,000	3,960	6,260	2,530	375	285	249
24	410	525	520	570	800	1,160	3,960	7,190	2,230	388	290	249
25	402	570	520	565	740	1,420	3,480	8,990	2,000	375	294	261
26	396	610	530	570	688	1,240	2,900	9,630	1,730	384	290	294
27	388	680	530	535	716	1,200	2,400	10,000	1,480	366	285	294
28	388	704	535	452	776	1,160	2,140	9,330	1,320	339	269	294
29	388	740	540	444	770	1,160	2,090	8,310	1,160	321	265	294
30	392	686	565	550	-	1,120	2,300	7,180	1,120	312	261	265
31	392	-	580	550	-	1,080	-	6,420	-	303	265	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	11,863	492	326	383	23,530
November.....	17,002	740	382	567	33,720
December.....	17,634	762	496	569	34,980
Calendar year 1947.....	238,365	3,960	255	653	472,800
January.....	16,961	585	444	547	33,640
February.....	17,772	800	488	613	35,250
March.....	27,562	1,420	600	889	54,670
April.....	59,060	3,960	1,080	1,969	117,100
May.....	137,590	10,000	1,320	4,438	272,900
June.....	159,880	9,870	1,120	5,329	317,100
July.....	16,116	1,160	303	584	35,930
August.....	9,986	538	261	322	19,810
September.....	7,602	294	237	253	15,080
Water year 1947-48.....	501,028	10,000	237	1,369	993,700

Peak discharge (base, 2,000 sec.-ft.)- Apr. 23 (10 p.m.) 4,080 sec.-ft.; May 3 (7 p.m.) 3,480 sec.-ft.; May 27 (6 a.m.) 10,200 sec.-ft.; June 7 (8 p.m.) 10,000 sec.-ft.

a No gage-height record; discharge computed on basis of records for stations below Taos Junction bridge and at Otowi bridge.

e Gage-height record not representative of mean for day; discharge computed as explained in footnote a.



## Rio Grande at Otowi Bridge, near San Ildefonso, N. Mex.

Location.- Water-stage recorder, lat. 35°52'25", long. 106°08'35", in San Ildefonso Pueblo Grant, 250 feet (revised) downstream from new highway bridge, 1½ miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Rio Pojoaque, and 7 miles west of Pojoaque. Datum of gage is 5,488.48 feet above mean sea level, datum of 1929.

Drainage area.- 14,300 square miles (includes 2,940 square miles in closed basin in Northern part of San Luis Valley, Colo.).

Records available.- February 1895 to December 1905, June 1909 to December 1914, and October 1930 to September 1948 in reports of Geological Survey. February 1895 to December 1905 and June 1909 to December 1931 in reports of State engineer.

Average discharge.- 21 years (1927-47), 1,564 second-feet.

Extremes.- Maximum discharge during year, 12,400 second-feet May 28 (gage height, 9.34 feet); minimum daily, 240 second-feet Sept. 21, 22.

1930-48: Maximum discharge, 22,500 second-feet May 16, 1941; maximum gage height, 13.70 feet May 14, 1941; minimum daily discharge, 128 second-feet June 21, 1934.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Flow partly regulated by El Vado Reservoir (see p.240). Diversions above station for irrigation. Records of chemical analyses and suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	333	810	1,940	693	590	1,130	1,390	3,890	7,260	1,420	1,120	756
2	330	830	1,940	612	570	1,000	1,340	3,850	7,730	1,240	1,080	780
3	326	950	2,060	628	601	893	1,390	4,090	8,460	1,080	953	738
4	316	1,780	1,940	628	645	914	1,440	3,930	8,970	1,120	686	805
5	319	1,780	1,890	6530	663	772	1,440	3,850	9,490	1,120	1,030	1,240
6	830	1,780	1,840	634	645	645	1,580	3,540	9,760	1,120	1,170	1,240
7	879	1,890	1,780	675	687	772	1,830	3,540	10,900	1,010	883	1,160
8	907	1,940	1,730	675	669	810	1,630	3,540	11,800	981	877	680
9	900	1,890	1,680	687	618	804	1,730	3,610	10,900	890	844	652
10	893	1,890	1,630	693	634	810	1,940	3,540	9,950	818	738	609
11	724	1,940	1,630	693	657	753	2,230	3,310	8,980	744	721	469
12	476	2,000	1,580	693	580	759	2,290	2,740	8,290	674	726	a370
13	432	2,000	1,480	663	515	747	2,290	2,230	7,630	553	738	310
14	1,530	2,000	1,480	640	580	791	2,290	2,000	7,630	483	726	271
15	942	2,060	1,300	640	601	844	2,740	1,840	7,420	419	a680	271
16	623	2,060	1,130	628	618	872	2,950	2,000	7,000	355	a660	274
17	506	2,060	1,030	628	640	886	3,160	2,350	6,200	1,210	a630	274
18	476	2,060	623	623	1,170	1,170	3,540	3,090	5,260	960	a600	256
19	525	2,060	a700	645	729	1,210	4,010	3,890	4,130	1,120	a570	244
20	550	2,060	a680	580	798	1,210	4,430	4,520	3,660	1,240	544	244
21	510	2,060	a680	565	956	1,170	4,790	5,160	3,500	1,120	544	a240
22	647	1,940	640	623	1,090	1,130	4,880	5,750	3,360	974	544	a240
23	798	1,940	628	651	1,179	1,130	5,160	6,370	3,210	793	1,280	a250
24	817	1,840	601	663	1,260	1,300	4,970	6,810	3,000	781	1,080	259
25	817	1,890	623	663	1,050	1,580	4,430	8,460	2,730	805	877	262
26	817	1,890	645	663	1,030	1,530	3,770	10,600	2,240	844	850	284
27	819	1,940	645	618	1,040	1,440	3,310	11,800	1,960	793	857	303
28	810	2,000	645	500	1,040	1,390	2,950	11,800	1,760	744	812	344
29	810	2,060	663	486	1,050	1,440	3,020	10,300	1,510	726	799	306
30	824	2,000	699	575	-	1,440	3,380	8,710	1,380	686	781	293
31	810	-	735	634	-	1,440	-	7,490	-	1,030	781	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	21,286	1,530	316	687	42,220
November.....	55,400	2,060	810	1,847	109,900
December.....	37,371	2,060	601	1,206	74,120
Calendar year 1947.....	385,062	4,970	316	1,055	753,700
January.....	19,629	693	486	633	38,930
February.....	22,339	1,260	515	770	44,310
March.....	32,782	1,580	645	1,057	65,020
April.....	86,100	5,160	1,340	2,870	170,800
May.....	158,200	11,800	1,840	5,103	313,600
June.....	186,070	11,800	1,380	6,202	369,100
July.....	27,863	1,420	365	899	55,270
August.....	25,161	1,280	544	812	49,910
September.....	14,394	1,240	240	480	28,550
Water year 1947-48.....	686,595	11,800	240	1,876	1,362,000

Peak discharge (base, 5,200 sec.-ft.)- Apr. 23 (11 a.m.) 5,350 sec.-ft.; May 28 (3 a.m.) 12,400 sec.-ft.; June 8 (7:30 a.m.) 12,100 sec.-ft.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for main stem and tributary stations above and below.

## Rio Grande at Cochiti, N. Mex.

Location.- Water-stage recorder, lat. 35°37'10", long. 106°19'10", in NE¼ sec. 17, T. 16 N., R. 6 E., at highway bridge 1½ miles northeast of Cochiti, 4 miles north of Pena Blanca, and 8 miles upstream from Galisteo Creek. Datum of gage is 5,224.70 feet above mean sea level, datum of 1929.

Drainage area.- 14,600 square miles (Included 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

Records available.- October 1930 to September 1948 in reports of Geological Survey. January 1925 to December 1931 in reports of State engineer.

Average discharge.- 23 years (1925-48), 1,560 second-feet.

Extremes.- Maximum discharge during year, 12,400 second-feet June 8; maximum gage height, 8.29 feet May 27; minimum daily discharge, 128 second-feet Sept. 22. 1930-48: Maximum discharge, 23,400 second-feet May 15, 1941 (gage height, 10.93 feet); minimum daily, 1 second-foot Aug. 10-12, 1934.

Remarks.- Records fair. Diversion above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	225	847	1,910	730	700	1,300	1,320	3,810	7,440	1,110	921	570
2	242	847	1,910	652	670	1,210	1,310	3,930	8,090	1,070	892	641
3	286	859	2,030	629	607	1,320	1,320	4,180	8,780	912	854	719
4	286	1,680	1,990	652	571	1,010	1,410	4,050	9,280	960	585	719
5	210	1,780	1,920	650	690	957	1,420	3,930	9,820	921	773	950
6	418	1,840	1,920	643	652	814	1,470	3,580	9,800	883	1,190	1,100
7	720	2,030	1,860	607	690	856	1,520	3,470	10,500	827	902	1,070
8	836	2,140	1,790	680	710	913	1,540	3,470	11,600	764	756	683
9	902	2,100	1,760	680	652	957	1,680	3,470	10,900	692	710	555
10	979	2,010	1,730	720	652	935	1,960	3,360	9,800	683	578	601
11	946	2,030	1,640	*720	690	858	2,300	3,260	8,590	633	548	578
12	508	1,990	*1,540	740	a600	803	2,330	2,560	8,420	532	585	295
13	328	1,990	a1,500	730	a500	781	2,330	2,150	7,760	428	683	194
14	1,180	2,060	a1,450	710	a550	803	2,260	1,820	7,600	352	683	158
15	990	2,100	a1,400	700	a600	913	2,670	1,710	7,600	336	562	152
16	553	2,190	a1,200	680	a650	924	2,850	1,810	7,120	358	489	211
17	474	2,190	a1,100	680	690	968	2,950	2,230	6,200	811	440	295
18	442	2,210	a800	670	700	1,140	3,260	2,850	5,340	818	410	275
19	382	2,150	a730	700	730	1,320	3,700	3,580	4,380	854	440	189
20	375	2,120	a700	*643	957	1,270	4,050	4,300	3,720	930	503	134
21	347	2,060	*670	625	968	1,320	4,550	4,810	3,360	970	503	131
22	389	1,990	661	643	1,160	1,240	4,680	5,620	3,260	902	410	128
23	700	1,960	652	b670	1,200	1,140	5,200	6,200	3,150	791	804	169
24	836	1,870	652	b880	1,420	1,240	5,070	6,500	2,950	755	990	248
25	858	1,890	589	b680	1,300	1,580	4,810	8,090	2,670	674	701	257
26	814	1,960	616	b670	1,300	1,650	3,930	10,200	2,160	657	692	206
27	720	1,960	690	b600	1,230	1,530	3,580	11,300	1,900	625	773	152
28	661	2,030	661	517	1,200	1,420	3,150	11,300	1,600	562	755	194
29	661	2,030	625	*466	1,210	1,310	2,950	9,800	1,320	593	633	190
30	720	2,010	598	490	-	1,320	3,470	8,420	1,120	649	601	231
31	825	-	730	616	-	1,340	-	7,600	-	836	609	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	18,793	1,180	210	666	37,280
November.....	56,922	2,210	847	1,697	112,300
December.....	38,024	2,030	589	1,227	75,420
Calendar year 1947.....	369,332	5,340	210	1,012	732,600
January.....	20,269	740	466	654	40,200
February.....	24,249	1,420	500	836	48,100
March.....	34,832	1,650	781	1,124	69,090
April.....	85,040	5,200	1,310	2,835	168,700
May.....	153,360	11,300	1,710	4,947	304,200
June.....	186,010	11,600	1,120	6,200	368,900
July.....	22,908	1,110	336	739	45,440
August.....	20,974	1,190	410	677	41,600
September.....	11,995	1,100	128	400	23,790
Water year 1947-48.....	673,376	11,600	128	1,840	1,336,000

Peak discharge (base, 4,500 sec.-ft.) - Apr. 23 (3 p.m.) 5,340 sec.-ft.; May 27 (11:30 p.m.) 12,000 sec.-ft.; June 8 (10 a.m.) 12,400 sec.-ft.; June 19 (4 p.m.) 7,760 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations near San Ildefonso and at San Felipe.

b Stage-discharge relation affected by ice.

## Rio Grande at San Felipe, N. Mex.

Location.- Water-stage recorder, lat. 35°26'30", long. 106°26'30", in NW1SW1 sec. 17, T. 14 N., R. 5 E., at highway bridge in San Felipe Grant, 2,000 feet downstream from Tonque Arroyo, half a mile upstream from San Felipe Pueblo, and 12 miles northeast of Bernalillo. Datum of gage is 5,110.38 feet above mean sea level, datum of 1929. Datum was 0.59 foot lower from May 16, 1945, to Sept. 30, 1946.

Drainage area.- 16,100 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

Records available.- October 1930 to September 1948 in reports of Geological Survey. January 1926 to December 1931 (revised) in reports of State engineer.

Average discharge.- 22 years (1926-48), 1,666 second-feet.

Extremes.- Maximum discharge during year, 12,500 second-feet June 8; maximum gage height, 9.78 feet Jan. 30 (ice jam); minimum daily discharge, 154 second-feet Sept. 22. 1930-48: Maximum discharge, 42,100 second-feet Aug. 21, 1935, from rating curve extended above 15,000 second-feet by logarithmic plotting; maximum gage height, 11.13 feet June 26, 1937; minimum daily discharge, 34 second-feet July 7, 1934.

Remarks.- Records fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	290	833	1,940	b600	b600	1,100	1,320	3,710	8,820	1,400	1,010	826
2	280	824	1,950	b560	b700	1,130	1,250	3,920	7,410	1,290	970	642
3	363	815	2,100	596	b650	1,040	1,300	4,140	8,160	1,050	950	779
4	340	1,300	2,100	634	b600	1,020	1,350	4,140	8,760	1,200	730	762
5	301	1,720	2,020	666	b720	970	1,390	3,820	9,800	1,080	1,340	900
6	389	1,950	1,950	*706	b580	960	1,540	3,410	9,800	1,020	1,260	1,210
7	797	1,950	1,920	698	b700	935	1,670	3,220	10,200	950	1,050	1,200
8	833	1,950	1,860	688	b660	870	1,620	3,410	11,700	890	890	940
9	880	1,920	1,800	722	b700	920	1,660	3,410	11,300	815	870	626
10	940	1,940	1,730	754	*b670	910	1,950	3,310	10,200	746	730	762
11	890	2,020	1,730	746	b600	860	2,260	3,120	8,460	788	626	722
12	575	2,100	1,660	788	b500	815	2,420	2,680	8,160	642	642	512
13	464	2,100	1,570	738	b400	788	2,260	2,180	7,560	554	770	334
14	849	2,100	1,520	696	b500	842	2,020	1,920	7,560	470	746	a250
15	873	2,100	1,450	698	b600	860	2,260	1,840	7,860	405	666	220
16	874	2,180	1,280	*698	b700	880	2,590	1,890	7,410	418	a500	212
17	582	2,100	1,200	b680	*860	990	2,680	2,180	6,250	566	a500	345
18	491	2,100	960	b660	746	1,140	3,030	2,590	5,450	970	464	306
19	418	2,100	730	b640	806	1,360	3,410	3,310	4,620	851	438	270
20	477	2,100	714	*658	910	1,300	3,820	4,030	4,100	1,030	547	176
21	431	2,100	*674	618	940	1,290	4,480	4,710	a3,500	1,080	512	168
22	450	1,950	690	626	1,160	1,260	4,830	5,320	a3,300	950	457	154
23	682	2,020	666	626	1,240	1,150	5,320	5,840	a3,200	870	603	164
24	754	1,890	666	650	1,350	1,240	5,200	6,390	2,850	770	1,070	260
25	824	1,840	674	610	1,340	1,520	4,710	7,560	2,680	754	714	495
26	806	1,860	690	582	1,200	1,610	3,920	9,800	2,500	722	674	368
27	797	1,900	722	b500	1,080	1,490	3,510	10,900	2,180	714	797	220
28	788	2,020	722	b400	1,060	1,410	3,220	11,700	a2,000	682	779	245
29	806	2,020	706	b350	1,040	1,330	3,030	10,200	a1,500	610	714	285
30	824	2,020	b700	b400	-	1,390	3,310	8,460	a1,400	714	642	255
31	890	-	b650	b500	-	1,380	-	7,260	-	738	658	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	19,758	940	280	637	39,190
November.....	55,822	2,180	815	1,861	110,700
December.....	39,744	2,100	650	1,282	78,830
Calendar year 1947.....	380,891	5,320	250	1,044	755,500
January.....	19,500	788	350	629	38,680
February.....	23,712	1,350	400	818	47,030
March.....	34,640	1,610	788	1,117	68,710
April.....	83,330	5,320	1,250	2,778	165,300
May.....	150,370	11,700	1,840	4,851	298,300
June.....	186,690	11,700	1,400	6,223	370,300
July.....	25,629	1,400	405	827	50,830
August.....	23,419	1,340	438	755	46,450
September.....	14,408	1,210	154	480	28,580
Water year 1947-48.....	677,022	11,700	154	1,850	1,343,000

Peak discharge (base, 5,000 sec.-ft.)- Apr. 23 (6:20 p.m.) 5,580 sec.-ft.; May 28 (9 a.m.) 12,100 sec.-ft.; June 8 (5 p.m.) 12,500 sec.-ft.; June 19 (8 p.m.) 6,960 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations at Cochiti and near Bernalillo.

b Stage-discharge relation affected by ice.

## Rio Grande near Bernalillo, N. Mex.

Location.- Water-stage recorder, lat. 35°17'05", long. 106°35'45", in Alameda Grant, 2 miles northwest of Sandia Pueblo, 3 miles southwest of Bernalillo, Sandoval County, 3.5 miles downstream from State Highway 44, and 8.5 miles downstream from Jemez Creek.

Records available.- May 1941 to September 1948.

Extremes.- Maximum discharge during year, 13,300 second-feet May 28 (gage height, 5.26 feet); minimum daily, 48 second-feet Sept. 23.

1941-48: Maximum discharge, 25,400 second-feet May 16, 1941; maximum gage height, 6.83 feet Sept. 20, 1941; minimum daily discharge, 20 second-feet July 25-27, Sept. 14, 26, 27, 1946.

Remarks.- Records fair. Diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	654	1,760	b620	654	1,050	1,350	3,410	6,870	760	828	261
2	49	646	1,850	*b580	710	1,250	1,440	4,100	7,650	910	819	261
3	65	750	1,850	b600	750	1,180	1,410	4,050	8,370	595	432	372
4	65	1,120	2,090	b660	760	990	1,690	3,800	9,150	942	378	327
5	198	1,660	1,980	*710	780	832	1,660	3,900	8,050	638	842	620
6	220	1,410	1,980	720	793	760	1,690	3,320	9,150	595	720	1,010
7	288	1,600	2,020	690	672	690	1,720	3,500	9,750	572	654	595
8	395	1,920	1,880	653	720	793	1,520	3,600	11,000	499	819	527
9	499	1,880	1,760	654	750	793	1,600	4,300	10,400	439	760	285
10	572	1,880	1,660	750	646	974	2,060	3,850	9,450	378	420	290
11	580	1,950	1,520	720	572	819	2,750	3,410	8,310	772	355	256
12	557	1,980	1,410	720	378	700	2,870	2,420	8,130	638	338	491
13	311	2,090	1,490	663	401	838	2,390	2,060	7,770	271	389	306
14	740	1,820	1,410	629	378	638	2,620	1,660	7,290	242	395	103
15	1,190	1,760	1,380	646	557	663	2,660	1,720	7,530	158	710	71
16	478	2,020	1,160	629	672	646	3,040	2,060	7,110	158	595	67
17	378	2,060	1,120	549	806	700	3,130	1,880	6,270	141	242	77
18	355	1,920	884	638	942	806	3,750	2,620	5,320	805	191	91
19	445	2,230	720	638	780	1,090	3,800	2,960	4,780	770	195	220
20	420	2,230	730	580	871	1,440	4,350	4,560	4,940	595	238	161
21	285	1,760	690	612	990	1,300	4,450	4,720	3,270	690	233	56
22	252	1,630	646	612	1,160	1,040	5,220	5,000	3,090	595	465	49
23	378	1,760	680	604	1,090	958	4,830	6,510	3,090	549	465	48
24	505	1,920	672	629	1,410	1,020	5,270	6,390	2,830	372	633	52
25	492	1,790	710	565	1,300	1,230	5,380	7,470	2,540	622	519	75
26	478	1,850	700	426	1,160	1,160	3,800	10,100	1,950	646	296	915
27	492	1,950	654	338	1,230	1,120	3,500	11,000	2,460	327	360	252
28	492	1,950	620	311	1,210	1,250	3,000	12,400	1,440	285	372	135
29	426	2,090	638	372	1,280	1,210	3,040	11,000	1,490	252	672	111
30	445	1,790	690	322	-	1,300	3,130	9,150	974	290	587	110
31	505	-	*663	534	-	1,300	-	7,590	-	280	266	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	12,613	1,190	49	407	25,020
November.....	52,070	2,230	646	1,736	103,300
December.....	38,017	2,090	620	1,226	75,410
Calendar year 1947.....	312,854	5,190	45	857	620,600
January.....	18,384	750	311	593	36,460
February.....	24,422	1,410	378	842	48,440
March.....	30,340	1,440	638	979	60,180
April.....	89,120	5,380	1,350	2,971	176,800
May.....	154,310	12,400	1,660	4,978	306,100
June.....	181,224	11,000	974	6,041	359,500
July.....	15,786	942	141	509	31,210
August.....	15,188	842	131	490	30,120
September.....	8,194	1,010	48	273	16,250
Water year 1947-48.....	639,668	12,400	48	1,748	1,289,000

Peak discharge (base, 5,000 sec.-ft.)- Apr. 25 (7:20 a.m.) 8,040 sec.-ft.; May 28 (7:30 a.m.) 13,300 sec.-ft.; June 8 (7:45 p.m.) 11,700 sec.-ft.; June 20 (12:15 a.m.) 8,550 sec.-ft.

\* Winter discharge measurement made on this day.

a Incomplete gage-height record; discharge computed on basis of available recorder trace, weather records, and records for main stem and tributary stations above and below.

b Stage-discharge relation affected by ice.

## Rio Grande at Albuquerque, N. Mex.

Location.- Water-stage recorder, lat. 35°05'20", long. 106°40'45", in SE<sup>1</sup> sec. 13, T. 10 N., R. 2 E. (projected), at bridge on U. S. Highway 66, at Albuquerque, in Albuquerque Grant. Datum of gage is 4,946.04 feet above mean sea level, datum of 1929.

Records available.- January 1942 to September 1948.

Extremes.- Maximum discharge during year, 13,100 second-feet May 28 (gage height, 6.61 feet); minimum daily, 44 second-feet Oct. 3.

1942-48: Maximum discharge, 25,000 second-feet Apr. 24, 1942, from rating curve extended above 13,900 second-feet by logarithmic plotting; maximum gage height, that of May 28, 1948; minimum daily discharge, 25 second-feet Aug. 2, 3, 1946.

Remarks.- Records fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	105	817	1,950	690	518	1,160	1,160	3,540	7,580	700	238	370
2	49	886	2,000	622	700	1,340	1,090	4,350	7,950	650	510	132
3	44	862	1,880	526	740	1,160	1,140	3,860	8,240	622	640	105
4	49	965	1,800	550	806	1,090	1,400	4,250	8,720	751	518	118
5	46	1,540	1,900	640	828	983	1,200	3,950	9,040	510	510	138
6	60	1,710	1,950	700	*946	817	1,270	3,900	9,690	421	940	352
7	188	1,830	2,100	670	710	690	1,350	3,340	10,000	382	730	631
8	559	1,900	2,050	660	710	795	1,370	2,980	11,300	346	577	550
9	358	1,830	1,950	680	*690	839	1,560	3,950	11,900	300	510	209
10	421	1,820	1,640	631	640	922	1,640	3,180*	10,200	240	463	115
11	442	1,830	1,540	650	740	850	2,610	2,940	9,360	240	486	110
12	518	1,800	1,820	690	*497	700	2,610	3,180	8,160	449	196	118
13	247	2,000	1,580	680	352	622	2,250	2,370	7,440	486	165	130
14	655	1,980	1,440	670	*b400	660	2,050	1,760	6,740	305	165	156
15	1,480	1,900	1,390	631	b500	640	2,220	1,760	7,020	125	240	101
16	448	2,050	1,320	631	*b600	700	2,660	2,020	6,950	105	340	73
17	255	2,160	1,160	631	b900	660	2,820	1,460	6,810	101	435	75
18	196	1,980	983	595	*1,040	710	3,660	1,880	5,580	209	238	79
19	204	2,050	773	613	874	1,010	3,460	2,740	4,200	478	110	83
20	245	1,780	773	670	946	1,180	3,780	3,460	5,740	442	105	75
21	435	1,780	740	586	934	1,250	4,200	4,450	2,700	478	112	110
22	324	1,980	740	559	1,130	1,020	5,050	5,150	2,700	478	130	73
23	171	1,830	730	622	1,400	1,070	5,250	6,180	2,740	358	147	65
24	463	1,950	773	622	1,480	1,140	5,460	5,940	2,580	275	300	60
25	435	1,690	700	640	1,500	1,190	5,460	6,740	2,250	260	458	58
26	435	1,710	670	660	1,300	1,250	4,500	9,040	2,000	435	153	497
27	370	1,900	751	526	1,160	1,160	3,620	10,100	2,610	518	135	115
28	376	1,850	740	*310	1,120	1,250	3,460	12,100	1,320	330	172	132
29	310	1,900	730	340	1,120	1,054	2,900	10,900	1,070	147	220	108
30	320	1,800	720	b340	-	896	2,980	9,280	850	125	352	92
31	442	-	710	*376	-	1,140	-	7,580	-	135	494	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	10,650	1,480	44	344	21,120
November.....	52,088	2,160	817	1,736	103,300
December.....	39,803	2,100	670	1,284	78,950
Calendar year 1947.....	287,521	5,000	44	788	570,300
January.....	18,411	700	310	594	36,520
February.....	25,281	1,500	352	872	50,140
March.....	30,044	1,340	622	969	59,590
April.....	84,380	5,460	1,090	2,813	167,400
May.....	148,330	12,100	1,460	4,785	294,200
June.....	185,420	11,900	850	6,114	363,800
July.....	11,401	751	101	368	22,610
August.....	10,786	940	105	348	21,390
September.....	5,030	631	58	168	9,980
Water year 1947-48.....	619,624	12,100	44	1,693	1,229,000

Peak discharge (base, 4,000 sec.-ft.).- Apr. 24 (3 a.m.) 6,000 sec.-ft.; May 3 (11:40 p.m.) 6,300 sec.-ft.; May 28 (6 a.m.) 13,100 sec.-ft.; June 9 (5 a.m.) 12,700 sec.-ft.; June 20 (4 a.m.) 9,690 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## Rio Grande near Belen, N. Mex.

Location.- Water-stage recorder, lat. 34°39'10", long. 106°44'10", in Tome Claim, at bridge on State Highway 52, 2 miles east of Belen, Valencia County.

Records available.- January 1942 to September 1948.

Extremes.- Maximum discharge during year, 12,800 second-feet May 29 (gage height, 4.91 feet); minimum daily, 76 second-feet Sept. 5, 6.

1942-48: Maximum discharge, 23,100 second-feet Apr. 24, 1942 (gage height, 5.05 feet), from rating curve extended above 12,500 second-feet by logarithmic plotting; minimum daily, 40 second-feet Oct. 5, 1946.

Remarks.- Records good below 1,000 second-feet, fair above. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	378	1,850	b800	554	1,230	1,280	2,650	7,500	502	90	112
2	83	755	1,980	*788	733	1,230	1,160	3,820	7,770	390	87	96
3	83	862	2,070	722	955	1,300	1,160	2,840	8,100	348	85	85
4	83	1,060	1,950	628	1,020	1,140	1,340	3,250	8,320	411	87	79
5	90	1,670	2,040	691	*940	1,080	1,060	2,840	8,480	418	90	76
6	94	1,820	1,920	755	875	970	1,110	3,060	8,980	315	109	76
7	87	1,690	1,980	700	1,040	914	1,090	2,910	8,920	207	142	87
8	92	1,740	1,980	637	914	776	1,190	2,600	10,000	181	167	188
9	105	1,850	1,790	655	888	955	1,190	3,140	11,000	207	211	122
10	115	1,950	1,670	722	836	985	1,320	2,370	11,000	181	188	118
11	145	1,950	1,580	722	744	955	1,980	2,460	9,560	184	184	108
12	203	2,040	1,480	673	b600	788	2,210	2,400	8,540	199	184	105
13	377	2,100	1,460	722	b450	799	2,400	2,040	8,480	219	188	94
14	295	1,850	1,320	755	554	766	2,010	1,550	7,080	203	195	85
15	1,030	1,870	1,260	711	637	673	2,240	1,320	6,350	170	211	81
16	760	1,980	1,240	691	*777	722	2,560	1,950	6,600	148	139	83
17	390	1,920	1,110	700	623	673	2,560	1,240	6,590	145	125	79
18	325	1,980	1,040	744	940	691	3,540	1,210	5,350	145	120	78
19	671	1,980	862	766	940	682	3,180	2,280	4,320	148	108	78
20	195	2,120	810	755	888	1,000	3,680	2,910	4,870	178	94	78
21	164	1,980	810	682	1,060	940	3,780	3,410	3,150	188	85	78
22	160	1,820	*777	646	1,020	1,060	4,460	3,820	2,460	192	85	78
23	130	1,980	744	619	1,230	1,040	4,840	5,150	2,240	227	87	78
24	128	1,920	722	646	1,420	970	5,400	5,300	2,210	215	85	78
25	181	1,900	744	646	1,690	1,000	5,300	6,250	2,240	170	87	78
26	157	1,980	777	664	1,600	1,260	4,280	9,040	2,010	151	94	81
27	164	1,850	788	578	1,440	1,420	3,410	10,400	2,400	139	101	166
28	151	1,770	744	372	1,300	1,210	3,020	11,500	1,320	122	103	92
29	145	1,870	722	248	1,230	1,160	2,660	12,400	646	108	108	87
30	151	1,950	755	360	-	1,190	2,370	10,900	602	98	181	83
31	139	-	b850	432	-	1,560	-	8,320	-	96	136	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	6,578	1,030	83	212	13,050
November.....	52,585	2,120	378	1,753	104,300
December.....	39,825	2,070	722	1,285	78,990
Calendar year 1947 .....	250,471	4,910	73	696	496,805
January.....	20,230	800	248	653	40,130
February.....	28,098	1,690	450	969	55,730
March.....	30,939	1,420	673	998	61,370
April.....	77,560	5,400	1,060	2,585	153,800
May.....	135,130	12,400	1,210	4,359	268,000
June.....	176,878	11,000	602	5,899	351,000
July.....	6,605	502	96	213	13,100
August.....	3,956	211	85	128	7,850
September.....	2,807	188	76	93F	5,570
Water year 1947-48 .....	581,291	12,400	76	1,588	1,153,000

Peak discharge (base, 4,000 sec.-ft.)- Apr. 24 (9:30 a.m.) 6,100 sec.-ft.; May 4 (10 a.m.) 4,190 sec.-ft.; May 29 (9 a.m.) 12,800 sec.-ft.; June 10 (7:30 a.m.) 11,900 sec.-ft.; June 20 (1 p.m.) 7,330 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## Rio Grande near Bernardo, N. Mex.

Location.—Water-stage recorder, lat. 34°25'00", long. 106°47'50", in W<sup>1</sup>N<sup>1</sup> sec. 12, T. 2 N., R. 1 E. (projected), at bridge on U. S. Highway 60, 2½ miles east of Bernardo and 3½ miles upstream from Rio Puerco. Datum of gage is 4,723.95 feet above mean sea level, datum of 1929. Auxiliary water-stage recorders on San Francisco riverside drain and Bernardo interior drain, each at different datum, used during periods of overflow or levee breaks.

Drainage area.—19,230 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.)

Records available.—June 1936 to January 1939, October 1941 to September 1948.

Extremes.—Maximum daily discharge during year, 11,700 second-feet May 29 (sum of 3 channels); minimum daily, 29 second-feet Sept. 14.  
1936-39, 1941-48: Maximum discharge not determined, probably occurred Apr. 25, 1942; maximum daily discharge, 19,600 second-feet Apr. 25, 1942; maximum gage height, 6.90 feet Apr. 25, 1942; minimum daily discharge, 8 second-feet Aug. 21, Sept. 29, 1946.

Remarks.—Records fair except those for periods of ice effect or no gage-height record, and those above 1,500 second-feet, which are poor. Records represent total discharge of river and are a summation of the discharge in the channels that carry river water. No river water in auxiliary channels this year prior to May 28. Many diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	192	1,870	780	b500	1,190	1,480	2,510	7,560	a550	50	90
2	59	705	2,040	750	*795	1,120	1,280	3,500	7,380	516	44	55
3	50	840	2,010	692	1,000	1,400	1,080	3,450	8,330	457	44	38
4	43	855	2,080	655	929	1,140	1,280	3,500	8,570	446	67	39
5	41	1,450	2,010	668	892	1,120	1,210	3,600	8,110	480	82	42
6	44	2,010	2,010	720	840	1,020	984	3,450	8,350	422	73	69
7	57	1,650	1,940	668	840	874	1,170	3,080	9,140	325	159	65
8	56	1,740	1,900	692	795	692	1,350	2,950	9,830	268	201	47
9	74	1,840	1,850	705	*825	810	1,380	3,450	11,600	240	255	154
10	122	1,940	1,480	705	840	984	1,400	3,220	11,200	220	240	84
11	136	1,840	1,480	735	b800	1,060	1,620	2,830	9,670	200	192	58
12	160	1,870	1,560	780	b700	840	2,350	2,950	8,020	182	173	59
13	210	2,190	a1,350	810	b500	825	2,550	2,230	8,040	195	187	36
14	220	1,900	a1,300	825	430	780	2,120	1,500	6,880	204	151	29
15	371	1,980	1,500	692	517	780	a2,100	1,230	6,560	190	148	30
16	1,100	1,900	1,590	668	*605	720	a2,000	1,530	6,800	133	144	50
17	421	2,120	1,230	642	655	720	2,270	1,280	6,530	106	163	56
18	348	2,150	1,140	720	855	692	3,060	966	5,850	126	133	52
19	268	1,800	855	735	948	855	3,260	1,770	4,910	122	120	31
20	286	2,040	705	720	810	1,120	2,910	2,590	4,720	104	91	34
21	215	1,870	705	735	825	1,280	3,260	3,310	3,520	187	75	32
22	172	2,150	892	680	948	1,250	4,320	3,850	2,600	173	80	31
23	172	2,150	825	630	929	874	4,260	4,980	2,480	185	65	55
24	156	2,080	735	668	1,710	874	4,920	4,860	2,340	198	57	59
25	172	2,040	765	705	2,010	855	5,800	5,450	2,100	217	41	34
26	286	2,010	705	668	2,010	1,170	4,560	6,980	1,860	157	35	46
27	245	2,040	765	a500	1,560	1,480	3,450	10,200	2,100	112	39	84
28	180	1,980	750	*310	1,560	1,530	3,360	10,600	1,670	160	56	220
29	160	2,040	692	310	1,020	1,350	2,390	11,700	a900	109	79	104
30	146	2,120	795	*b350	-	948	2,250	10,500	a600	68	110	95
31	96	-	825	b400	-	1,170	-	8,260	-	57	170	-
Month						Second-foot-days		Maximum	Minimum	Mean	Runoff in acre-feet	
October						6,137		1,100	41	198	12,170	
November						53,492		2,190	192	1,783	108,100	
December						40,154		2,080	692	1,295	79,640	
Calendar year 1947						248,059		4,800	17	680	492,100	
January						20,418		825	310	659	40,500	
February						27,648		2,010	430	953	54,840	
March						31,523		1,530	692	1,017	62,520	
April						75,424		5,800	984	2,514	149,600	
May						132,276		11,700	966	4,267	262,400	
June						178,220		11,600	600	5,941	353,500	
July						7,109		550	57	229	14,100	
August						3,524		255	35	114	6,990	
September						1,878		220	29	62.6	3,720	
Water year 1947-48						577,803		11,700	29	1,579	1,146,000	

\* Winter discharge measurement made on this day.  
a Incomplete gage-height record; discharge computed on basis of available recorder trace, weather records, and records for main stem and tributary stations above and below.  
b Stage-discharge relation affected by ice.



## Rio Grande at San Acacia, N. Mex.

Location.- Water-stage recorder, lat. 34°15'20", long. 106°53'30", in NE $\frac{1}{4}$  sec. 1, T. 1 S., R. 1 W., 0.2 mile downstream from San Acacia diversion dam, half a mile east of San Acacia, and 2 miles downstream from Rio Salado. Datum of gage is 4,660.16 feet above mean sea level, datum of 1929.

Drainage area.- 26,770 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

Records available.- April 1936 to September 1948 in reports of Geological Survey. February to December 1925 and January 1926 to September 1927 (gage heights and discharge measurements only) in reports of State engineer. January 1941 to December 1948 in reports of Rio Grande Compact Commission.

Average discharge.- 12 years (1936-48), 1,469 second-feet.

Extremes.- Maximum discharge during year, 11,000 second-feet May 28 (gage height, 6.25 feet); minimum daily, 1 second-foot Aug. 2, 3, 5, 6, Sept. 11, 14, 17, 18, 21-25. 1936-48: Maximum discharge, 27,400 second-feet Aug. 5, 1936 (gage height, 8.35 feet, datum of gage, 4,662.56 feet), from rating curve extended above 18,000 second-feet by logarithmic plotting; no flow June 22 to July 7, 1946.

Remarks.- Records good between 100 and 1,000 second-feet, others fair, except those for periods of no gage-height record, which are poor. Diversions above station for irrigation. Records of chemical analyses, water temperatures, and suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8	100	1,810	884	a350	1,060	1,250	2,350	8,760	555	a30	6
2	9	545	1,810	884	a1,100	1,330	1,180	3,270	7,670	407	1	4
3	8	884	1,930	826	896	1,160	1,020	3,650	7,320	338	1	4
4	9	815	1,820	716	981	1,300	1,260	3,020	8,390	346	2	3
5	8	981	1,960	684	1,110	1,160	1,440	3,340	8,580	353	1	2
6	8	1,660	1,840	781	884	1,150	920	2,840	7,850	338	1	2
7	7	1,770	1,770	815	884	1,010	1,020	2,840	8,760	283	792	2
8	7	1,910	1,760	770	694	872	969	2,670	9,340	191	a500	2
9	4	1,960	1,580	781	716	804	1,210	3,270	9,730	127	368	2
10	11	1,910	1,610	736	736	896	1,180	3,240	10,300	102	231	2
11	60	1,770	1,510	726	705	837	1,440	2,630	9,530	74	106	1
12	77	1,840	1,470	792	674	957	2,350	2,650	8,390	70	90	2
13	123	1,860	a1,300	781	674	884	2,090	2,020	7,670	37	74	2
14	244	1,950	a1,200	770	527	860	2,220	1,510	7,320	52	208	1
15	221	1,880	1,410	781	603	642	1,950	1,330	6,490	47	131	2
16	1,320	1,950	1,540	781	613	705	1,880	1,330	6,650	42	32	2
17	571	1,950	1,450	792	804	694	2,350	1,420	6,330	37	23	1
18	393	1,860	1,260	747	920	574	2,330	860	5,400	37	12	1
19	289	1,810	1,060	736	1,060	726	3,340	1,230	4,650	37	10	14
20	244	1,980	781	770	920	637	2,990	2,180	3,900	52	71	66
21	244	2,020	747	684	826	1,260	2,690	2,860	4,020	69	11	1
22	186	1,930	736	726	908	1,220	3,650	3,410	2,820	60	8	1
23	170	1,890	736	663	994	1,180	4,020	4,420	2,450	52	8	1
24	165	1,860	726	684	1,360	920	4,420	5,260	2,470	126	7	1
25	151	1,820	716	642	1,510	736	4,970	5,260	2,090	a110	3	1
26	214	1,660	747	694	1,710	860	4,650	6,980	1,760	217	2	432
27	226	1,720	726	736	1,440	1,230	3,510	9,140	1,530	54	3	705
28	175	1,740	747	a600	1,350	1,350	2,800	9,530	1,720	42	3	514
29	131	1,880	736	a250	1,220	1,300	2,630	10,300	945	23	3	98
30	94	1,820	694	a280	-	1,020	2,090	10,700	603	13	7	32
31	119	-	770	a300	-	1,120	-	9,140	-	53	7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	5,486	1,320	4	177	10,880
November.....	49,785	2,020	180	1,660	98,750
December.....	38,952	1,960	684	1,257	77,260
Calendar year 1947.....	253,119	4,830	2	693	502,000
January.....	21,812	884	250	704	43,260
February.....	27,169	1,710	350	937	53,890
March.....	30,754	1,350	642	992	61,000
April.....	69,819	4,970	920	2,327	138,500
May.....	124,650	10,700	860	4,021	247,200
June.....	173,358	10,300	603	5,778	343,800
July.....	4,324	555	13	139	8,580
August.....	2,746	792	1	68.6	5,450
September.....	1,907	705	1	63.6	3,780
Water year 1947-48.....	550,742	10,700	1	1,505	1,092,000

Peak discharge (base, 5,800 sec.-ft.)- May 28 (1 p.m.) 11,000 sec.-ft.; June 5 (1 a.m.) 9,930 sec.-ft.; June 10 (5 p.m.) 10,500 sec.-ft.

No gage-height record; discharge computed on basis of available recorder trace, discharge measurements, weather records, and records for station at San Marcial.

## Rio Grande at San Marcial, N. Mex.

Location.— Water-stage recorder, lat. 33°40'50", long. 106°59'15", in Pedro Armendaris Grant 33, at Atchison, Topeka & Santa Fe Railway bridge, 1.1 miles downstream from San Marcial, Socorro County. Datum of gage is 4,455.38 feet above mean sea level (levels by International Boundary Commission).

Drainage area.— 27,700 square miles (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

Records available.— January 1895 to September 1948 in reports of Geological Survey. January 1931 to December 1946 in Water Bulletins of International Boundary Commission. Prior to January 1922 at site 0.3 mile upstream; January 1922 to February 1932 at highway bridge half a mile northeast of San Marcial and 1.8 miles above present site.

Average discharge.— 52 years (1896-1948), 1,510 second-feet.

Extremes.— Maximum discharge during year, 11,700 second-feet May 31; maximum gage height, 16.80 feet June 12; no flow Oct. 8-10.

1895-1947: Maximum discharge, about 50,000 second-feet Oct. 11, 1904; no flow at times.

Remarks.— Records good except those for periods of no gage-height record, which are poor. Diversions above station for irrigation. Records of chemical analyses and suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a23	57	1,720	650	154	1,200	983	2,250	11,000	660	37	11
2	24	70	1,720	770	215	1,280	1,110	2,250	8,920	478	36	7
3	a21	392	1,810	710	340	1,180	1,090	2,790	7,720	320	48	6
4	a18	487	1,840	828	886	1,260	934	3,360	8,000	280	34	7
5	14	495	1,860	720	1,890	1,180	946	3,140	7,720	236	33	6
6	a10	592	1,860	622	1,450	1,130	1,070	3,110	8,000	236	27	4
7	a8	986	1,860	700	1,100	1,050	946	2,990	8,000	232	31	5
8	0	1,080	1,790	680	910	910	839	2,730	8,600	196	116	6
9	0	1,420	1,660	710	970	784	886	2,620	8,600	148	208	5
10	a0	1,490	1,620	690	806	680	1,010	2,820	9,230	114	250	4
11	a1	1,490	1,590	670	762	773	1,010	3,140	10,200	83	200	5
12	3	1,640	1,450	670	478	817	1,050	2,730	10,600	62	139	6
13	4	1,680	1,100	660	275	828	1,590	2,550	9,560	47	127	6
14	38	1,640	718	660	305	720	2,150	2,170	8,300	46	99	6
15	158	1,740	620	680	526	700	2,080	1,570	7,430	41	204	6
16	180	1,740	674	700	862	660	1,850	1,300	6,530	37	125	3
17	652	1,770	1,180	680	700	631	1,770	1,160	6,380	33	66	2
18	309	1,770	1,420	640	650	640	1,970	1,280	5,950	35	66	2
19	245	1,660	1,300	640	773	730	2,250	784	5,110	36	47	2
20	220	1,720	1,420	640	850	710	2,870	886	4,110	36	34	1
21	222	1,700	1,300	670	874	740	2,820	1,660	3,860	36	32	2
22	147	1,660	958	690	720	1,010	2,990	2,370	3,620	35	31	2
23	140	1,900	776	650	690	1,170	3,680	2,960	2,650	43	29	4
24	134	1,950	685	622	795	1,100	4,180	3,620	2,320	52	27	5
25	114	1,840	696	550	1,100	828	4,790	4,750	2,060	56	25	4
26	87	1,770	685	550	1,680	751	5,370	5,540	1,890	68	24	8
27	123	1,740	620	442	1,930	795	5,110	6,380	1,730	92	23	39
28	128	1,620	630	414	1,660	1,060	3,860	7,720	1,730	139	19	245
29	89	1,790	620	168	1,420	1,200	3,140	8,920	1,440	86	17	220
30	97	1,740	602	139	-	1,100	2,620	10,200	850	79	16	90
31	76	-	641	130	-	1,090	-	11,000	-	47	15	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,282	652	0	106	6,510
November.....	41,829	1,950	57	1,394	82,970
December.....	37,605	1,900	602	1,213	74,590
Calendar year 1947 .....	218,637	5,170	0	599	433,700
January.....	18,645	828	130	601	36,980
February.....	25,772	1,950	154	889	51,120
March.....	29,607	1,260	631	923	56,740
April.....	66,964	5,370	839	2,232	132,800
May.....	110,750	11,000	784	3,573	219,700
June.....	182,110	11,000	850	6,070	361,200
July.....	4,089	660	33	132	8,110
August.....	2,185	250	15	70.5	4,330
September.....	719	245	1	24.0	1,430
Water year 1947-48 .....	522,557	11,000	0	1,428	1,036,000

Peak discharge (base, 4,000 sec.-ft.).— Apr. 26 (4:30 p.m.) 5,500 sec.-ft.; May 31 (12:30 p.m.) 11,700 sec.-ft.; June 12 (3 p.m.) 11,000 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for stations at San Acacia and near Bernardo.

## Rio Grande below Elephant Butte Dam, N. Mex.

Location.- Water-stage recorder, lat. 33°09'05", long. 107°12'10", in N $\frac{1}{2}$  sec. 25, T. 13 S., R. 4 W. (projected), 3,800 feet downstream from Elephant Butte Dam in Pedro Armendaris Grant.

Records available.- October 1916 to September 1948.

Average discharge.- 32 years, 1,193 second-feet.

Extremes.- Maximum daily discharge during year, 1,900 second-feet Mar. 24, Apr. 8, 13; minimum daily, 81 second-feet Nov. 9.  
1916-48: Maximum daily discharge, 8,220 second-feet May 22, 1942; no flow at times.

Remarks.- Records good. Many diversions above station for irrigation. Flow regulated by Elephant Butte Reservoir (capacity, 2,197,600 acre-feet, see p.

Cooperation.- Records furnished by Bureau of Reclamation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	200	122	155	94	925	1,170	1,820	1,560	1,500	1,420	1,280	1,780
2	205	112	126	119	1,180	1,250	1,760	1,290	1,550	1,460	1,280	1,250
3	202	138	136	112	1,320	1,270	1,760	1,520	1,650	1,500	1,260	1,260
4	198	137	130	211	1,370	1,160	1,600	1,440	1,610	1,210	1,180	1,240
5	191	152	128	152	1,340	1,230	1,720	1,670	1,580	1,160	1,160	901
6	195	141	104	139	1,340	1,120	1,780	1,620	1,350	1,440	1,210	1,050
7	201	120	206	141	1,290	975	1,790	1,590	1,490	1,540	1,340	1,240
8	203	108	149	158	1,110	1,140	1,900	1,520	1,440	1,540	1,590	1,200
9	207	81	146	135	1,270	1,420	1,820	1,230	1,430	1,570	1,230	948
10	201	105	147	103	1,380	1,510	1,860	1,480	1,400	1,600	1,380	805
11	194	97	141	95	1,580	1,610	1,720	1,630	1,360	1,280	1,280	678
12	187	119	259	289	1,310	1,620	1,780	1,650	1,240	1,660	1,320	361
13	228	124	111	987	1,300	1,900	1,900	1,680	1,050	1,740	1,310	688
14	197	111	88	1,020	1,240	1,000	1,870	1,650	1,190	1,670	1,160	597
15	200	101	152	825	1,100	1,170	1,770	1,580	1,300	1,680	890	552
16	201	93	179	858	1,290	1,310	1,750	1,320	1,120	1,740	1,100	603
17	191	180	164	1,150	1,350	1,340	1,740	1,480	1,450	1,630	1,300	594
18	198	299	177	705	1,430	1,350	1,640	1,700	1,460	1,380	1,380	471
19	177	401	183	1,060	1,330	1,090	1,680	1,750	1,340	1,590	1,430	510
20	220	129	178	1,050	1,360	1,300	1,740	1,700	1,140	1,720	1,510	491
21	205	130	159	1,000	1,320	1,320	1,690	1,750	1,440	1,720	1,650	568
22	190	133	208	1,080	1,110	1,590	1,740	1,600	1,490	1,740	1,060	480
23	205	156	183	1,200	1,300	1,850	1,630	986	1,570	1,690	1,660	494
24	241	130	113	1,040	1,400	1,900	1,660	1,620	1,640	1,520	1,790	418
25	571	147	92	848	1,580	1,700	1,350	1,620	1,860	920	1,780	434
26	205	150	120	1,020	1,420	1,670	1,510	1,650	1,650	1,640	1,790	323
27	112	108	143	1,150	1,320	1,670	1,680	1,690	1,570	1,710	1,810	313
28	140	120	86	1,290	1,450	897	1,700	1,670	1,500	1,620	1,860	453
29	123	116	150	1,160	1,080	1,640	1,680	1,610	1,520	1,700	1,810	454
30	141	89	138	1,170	-	1,740	1,650	1,320	1,400	1,690	1,800	457
31	128	-	144	1,220	-	1,700	-	1,650	-	1,630	1,880	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	6,257	571	112	202	12,410
November.....	4,248	401	81	142	8,430
December.....	4,597	259	86	148	9,120
Calendar year 1947 .....	281,389	1,570	81	771	556,100
January.....	21,579	1,290	94	696	42,800
February.....	37,595	1,580	925	1,296	74,370
March.....	43,012	1,900	897	1,387	85,310
April.....	51,670	1,900	1,350	1,722	102,500
May.....	48,206	1,750	986	1,555	95,620
June.....	43,090	1,660	1,050	1,436	85,470
July.....	48,110	1,740	920	1,552	95,420
August.....	44,480	1,680	890	1,435	86,320
September.....	21,643	1,780	313	721	42,930
Water year 1947-48 .....	374,487	1,900	81	1,023	742,800

## Rio Grande below Caballo Dam, N. Mex.

Location.- Water-stage recorder, lat. 32°53'05", long. 107°17'30", in NE¼SW¼ sec. 30, T. 18 S., R. 4 W., 600 feet upstream from Bojarsquez Bridge, 4,200 feet downstream from Caballo Dam, 1 1/3 miles upstream from Percha diversion dam, 3 miles northeast of Arrey, and 5 miles south of Caballo. Datum of gage is 4,140.9 feet above mean sea level.

Records available.- January 1938 to September 1948.

Extremes.- Maximum daily discharge during year, 3,030 second-feet June 24; minimum daily, 1.4 second-feet Jan. 26.

1938-48: Maximum daily discharge, 7,650 second-feet May 20, 1942; minimum daily, 1.3 second-feet Nov. 18-21, Dec. 12-27, 1940.

Remarks.- Records good. Considerable diversion above station for irrigation. Bonita ditch, which diverts directly from dam (flow not included in river discharge), carried acre-feet as follows: October to February, 0; March, 195; April, 136; May, 156; June, 306; July, 388; August, 245; September, 310; total, 1,736. Flow regulated by Caballo Reservoir (capacity, 345,900 acre-feet) and Elephant Butte Reservoir (capacity, 2,197,600 acre-feet, survey of 1946).

Cooperation.- Records furnished by Bureau of Reclamation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.0	1.8	1.8	1.9	2.1	2.4	2,680	1,440	1,120	2,690	2,480	1,950
2	1.9	1.8	1.8	1.9	2.2	2.4	2,630	1,530	968	2,380	2,330	1,900
3	1.6	1.8	1.8	1.9	2.3	2.4	2,540	1,520	613	2,500	2,150	1,890
4	1.7	1.8	1.8	1.8	2.4	2.7	2,570	1,490	704	2,510	2,080	1,920
5	1.8	1.8	1.8	1.8	2.5	2.7	2,710	1,290	1,120	2,470	2,070	1,960
6	1.9	1.8	1.8	1.9	2.6	2.8	2,850	1,190	1,250	2,480	2,170	1,970
7	1.9	1.8	1.8	2.0	2.5	2.8	2,760	1,080	1,270	2,310	2,560	1,960
8	1.9	1.8	1.8	2.0	2.4	2.9	2,660	1,060	1,200	2,470	2,810	1,630
9	1.9	1.8	1.8	2.1	2.3	3.2	2,600	1,110	1,130	2,450	2,830	1,120
10	1.8	2.0	1.8	2.1	2.3	3.5	2,620	1,050	1,060	2,650	2,770	1,100
11	1.8	2.0	1.8	2.0	2.3	3.7	2,640	1,020	1,020	2,850	2,770	1,150
12	1.8	1.7	1.8	2.0	2.3	4.0	2,570	1,070	1,210	2,840	2,670	1,150
13	1.8	1.6	1.8	2.0	2.4	4.0	2,350	1,230	1,270	2,820	2,570	1,120
14	1.8	1.8	1.8	2.0	2.6	4.0	2,060	1,360	1,240	2,720	2,480	1,090
15	1.8	1.7	1.8	2.1	2.6	501	2,010	1,450	1,370	2,700	2,460	1,080
16	1.8	1.7	1.8	2.1	2.6	972	1,890	1,510	1,840	2,690	2,410	1,050
17	1.8	1.6	1.8	2.0	2.5	817	1,790	1,470	2,170	2,750	2,230	1,030
18	1.7	1.7	1.9	2.0	2.3	899	1,760	1,470	2,370	2,580	1,950	350
19	1.7	1.8	1.9	1.9	2.1	1,060	1,780	1,460	2,840	2,710	1,900	5.2
20	1.6	1.8	2.0	1.8	2.0	1,450	1,820	1,360	2,990	2,720	1,870	4.3
21	1.8	1.9	2.0	1.8	2.0	1,500	1,740	1,410	2,820	2,650	1,980	4.0
22	1.8	1.9	2.0	1.8	2.1	1,870	1,650	1,420	2,820	2,510	2,160	3.4
23	1.7	1.9	2.0	1.8	2.1	1,980	1,530	1,420	2,790	2,420	2,210	3.3
24	1.7	1.9	2.1	1.7	2.2	2,600	1,320	1,410	3,030	2,200	2,260	3.0
25	1.6	1.9	2.1	1.5	2.2	2,470	1,230	1,290	2,950	2,020	2,420	2.8
26	1.8	1.8	2.1	1.4	2.2	2,480	1,170	1,100	2,850	2,260	2,540	2.7
27	1.9	1.8	2.0	1.5	2.3	2,520	1,120	1,020	2,850	2,190	2,460	2.4
28	2.0	1.8	2.0	1.6	2.3	2,520	1,050	978	2,830	1,660	2,510	2.5
29	1.9	1.8	1.9	1.7	2.4	2,640	1,090	1,080	2,820	1,690	2,590	2.5
30	1.9	1.8	1.9	1.8	-	2,650	1,250	1,140	2,750	1,990	2,350	2.6
31	1.8	-	1.9	2.0	-	2,660	-	1,100	-	2,390	2,050	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	55.9	2.0	1.6	1.80	111
November.....	54.1	2.0	1.6	1.80	107
December.....	58.4	2.1	1.8	1.88	116
Calendar year 1947.....	365,481.6	2,810	1.6	1,001	724,900
January.....	57.9	2.1	1.4	1.87	115
February.....	67.1	2.6	2.0	2.31	133
March.....	31,192.5	2,660	2.4	1,006	61,870
April.....	60,440	2,850	1,050	2,015	119,900
May.....	39,518	1,530	978	1,275	78,380
June.....	57,265	3,030	613	1,909	113,600
July.....	76,670	2,850	1,660	2,473	152,100
August.....	73,060	2,830	1,870	2,357	144,900
September.....	25,458.7	1,970	2.4	849	50,500
Water year 1947-48.....	363,897.6	3,030	1.4	994	721,800

## Reservoirs in Rio Grande Basin

Elephant Butte Reservoir. - Water-stage recorder, lat. 33°09'15", long. 107°11'30", at dam on Rio Grande in NW¼ sec. 30, T. 13 S., R. 3 W. (surveys by Bureau of Reclamation), 1 mile west of Elephant Butte, N. Mex., and 4 miles northeast of Hot Springs. Datum of gage is 43.3 feet above mean sea level. Records available, January 1940 to September 1948. Maximum daily contents during year, 752,000 acre-feet June 25-30; maximum gage height, 4,349.22 feet June 27; minimum daily contents, 309,800 acre-feet Oct. 26 to Nov. 7; minimum gage height, 4,313.08 feet Nov. 5. Maximum daily contents during period 1940-48, 2,303,000 acre-feet June 16-18, 1942 (gage height, 4,409.19 feet); minimum daily, 298,500 acre-feet Aug. 22, 1947 (gage height, 4,311.91 feet).

Reservoir is formed by concrete dam; storage began Jan. 6, 1915; dam completed May 13, 1916. Capacity, 2,197,600 acre-feet between gage heights 4,231.5 feet (sill of lower outlet gate) and 4,407.0 feet (spillway crest). No dead storage, survey of 1946. Figures given herein represent usable contents. Water is used for power development and irrigation on Rio Grande project of Bureau of Reclamation. Contents given herein are computed from mean daily gage heights. Gage-height record and capacity table furnished by Bureau of Reclamation.

Caballo Reservoir. - Water-stage recorder, lat. 32°53'45", long. 107°17'30", at dam on Rio Grande, in SE¼SW¼ sec. 19, T. 16 S., R. 4 W., 0.5 mile downstream from mouth of Apache Canyon, 0.9 mile upstream from Bojarsquez Bridge, 2 miles upstream from Percha diversion dam, 3.5 miles northeast of Arrey, and 4.5 miles south of Caballo, N. Mex. Datum of gage is 43.3 feet above mean sea level. Records available, February 1938 to September 1948. Maximum daily contents during year, 188,400 acre-feet Mar. 19, 20 (gage height, 4,165.65 feet); minimum daily, 11,200 acre-feet Sept. 18 (gage height, 4,125.18 feet). Maximum daily contents during period 1938-48, 347,000 acre-feet Mar. 4, 1942 (gage height, 4,182.06 feet); minimum daily, 118 acre-feet Oct. 14, 1938 (gage height, 4,108.1 feet).

Reservoir is formed by earth-fill dam; storage began Feb. 8, 1938; dam completed Sept. 19, 1938. Capacity, 345,900 acre-feet between gage heights 4,104 feet (bottom of tunnel entrance to gates) and 4,182 feet (gage height above which spillway gates operate automatically). No dead storage. 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. Gage-height record and capacity table furnished by Bureau of Reclamation.

Carson Reservoir. - Water-stage recorder, lat. 36°25', long. 105°50', in NW¼ sec. 12, T. 25 N., R. 10 E., on Aguaje de la Petaca, 4½ miles northwest of Carson, Taos County, N. Mex. Records available, January 1940 to September 1948. Maximum daily contents during year, 1,760 acre-feet Apr. 17 (gage height, 29.1 feet); no storage for extended periods. Maximum contents during period 1940-48, 3,620 acre-feet May 6, 1941 (gage height, 38.5 feet); no storage for extended periods.

Reservoir is formed by earth-fill dam, rip-rap faced, completed in 1935. Capacity, 5,684 acre-feet between gage heights 8.0 feet (sill of outlet gate) and 45 feet (crest of spillway). Dead storage negligible. Water used for irrigation in Carson Irrigation District near Carson, N. Mex. Gage heights and contents at 12 p.m.

El Vado Reservoir. - Water-stage recorder (records stages above spillway floor only) and inclined staff-gage, lat. 36°35'45", long. 106°43'55", at left end of dam on Rio Chama, in SE¼ sec. 4, T. 27 N., R. 2 E. (projected), 2 miles downstream from old town of El Vado and 13 miles southwest of Tierra Amarilla, N. Mex. Datum of gage is 9.565 feet above mean sea level, datum of 1929. Records available, January 1935 to September 1948. Maximum daily contents during year, 204,900 acre-feet June 4, 5 (gage height, 6,904.2 feet); minimum daily, 5,430 acre-feet Dec. 17-27 (gage height, 6,777.4 feet). Maximum daily contents and gage height during period 1935-48, those of June 4, 5, 1948; minimum daily, 56 acre-feet Jan. 1, 1935.

Reservoir is formed by rock-fill dam, steel-faced; storage began in January 1935. Capacity, 197,500 acre-feet between gage heights 6,740.0 feet (bottom of trash rack) and 6,902.0 feet (top of spillway gate). Dead storage unknown. Prior to Jan. 1, 1947, figures represent usable contents computed from capacity table furnished by Middle Rio Grande Conservancy District in 1940; after Jan. 1, 1947, figures represent usable contents computed from capacity table based on survey of 1944 by Corps of Engineers. Water is used for irrigation by Middle Rio Grande Conservancy District. Gage read daily about 7:30 a.m. Continuous recorder registers gage heights above 6,879.3 feet (floor of spillway). Contents given herein are those at 7:30 a.m. Staff-gage readings furnished by Middle Rio Grande Conservancy District.

McClure Reservoir. - Water-stage recorder, lat. 35°41'15", long. 105°50'10", in NE¼SW¼ sec. 24, T. 17 N., R. 10 E., at McClure Dam on Santa Fe Creek, 2½ miles upstream from Nichols Reservoir and 6 miles east of Santa Fe, N. Mex. Datum of gage is 7,768.32 above mean sea level and 166.1 feet above Public Service Co. of New Mexico assumed datum. Records available, October 1947 to September 1948. Maximum daily contents during year, 2,670 acre-feet June 21 to July 2 (gage height, 97.2 feet); minimum daily, 29 acre-feet Oct. 13, 14; minimum gage height, 21.4 feet Oct. 13.

Reservoir is formed by earth-fill dam. Capacity, 2,614 acre-feet between gage heights -0.4 foot (bottom of lowest sluice gate) and 96.4 feet (crest of spillway). Dead storage negligible. Figures given herein represent total contents at 12 p.m. Water is used for municipal consumption of city of Santa Fe. Capacity table computed from rating table furnished by Public Service Co. of New Mexico.

## Reservoirs in Rio Grande Basin--Continued

Nichols Reservoir. - Water-stage recorder, lat. 35°41'20", long. 105°52'40", at dam on Santa Fe Creek, in ENE 1/4 sec. 21, T. 17 N., R. 10 E., three-quarters of a mile upstream from lower storage reservoir, 2 1/2 miles downstream from upper storage reservoir of Public Service Co. of New Mexico, and 3 1/2 miles east of Santa Fe, N. Mex. Datum of gage is 7,313.2 feet above mean sea level, datum of 1929. Records available, December 1942 to September 1948. Maximum daily contents during year, 776 acre-feet June 8 (gage height, 170.0 feet); minimum daily, 16 acre-feet Feb. 1-19, but may have been less during period Jan. 13 to Feb. 16. Maximum daily contents 1943-48, 880 acre-feet May 30 to June 1, 1947 (gage height, 171.6 feet); minimum daily, 16 acre-feet 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-feet between gage heights 121.2 feet (bottom of lower operational gate) and 171.0 feet (top of flashboards in spillway). Dead storage, 14 acre-feet. Figures given herein represent total contents. Water is used for municipal consumption of city of Santa Fe. Contents given herein are those for 12 p.m. Capacity table computed from survey furnished by Public Service Co. of New Mexico.

Alamogordo Reservoir. - Water-stage recorder, lat. 34°36'30", long. 104°23'10", in SW 1/4 sec. 34, T. 5 N., R. 24 E., at dam on Pecos River, 5 miles northeast of Guadalupe, 12 miles northwest of Fort Sumner, N. Mex. Datum of gage is at mean sea level, Bureau of Reclamation datum. Drainage area, 4,390 square miles (contributing area). Records available, January 1939 to September 1948. Maximum daily contents during year, 89,410 acre-feet July 10-12 (elevation, 4,245.00 feet); minimum daily, 1,570 acre-feet Apr. 26 (elevation, 4,205.00 feet). Maximum daily contents during period 1939-48, 149,400 acre-feet Apr. 19, 20, 1942 (elevation, 4,275.30 feet); minimum daily, 1,570 acre-feet July 28, 1946, Apr. 26, 1948 (elevation, 4,205.00 feet).

Reservoir is formed by Alamogordo Dam; completed and storage began in 1938. Total capacity, 132,200 acre-feet between elevations 4,200.0 feet (sill of outlet gates) and 4,275.0 feet (top of spillway gates) above mean sea level. Dead storage, 284 acre-feet. Figures given herein represent usable contents. Contents computed from elevations at 8 a.m. Elevation record furnished by Bureau of Reclamation. Figures represent total contents computed from capacity table based on survey of March 1944 by Corps of Engineers.

Lake McMillan. - Staff gage, lat. 32°35'45", long. 104°20'55", in SE 1/4 sec. 2, T. 20 S., R. 26 E., at dam on Pecos River; 3 miles southeast of Lakewood, N. Mex. Datum of gage is 3,241.6 feet above mean sea level, Bureau of Reclamation datum. Drainage area, 16,990 square miles (contributing area). Records available, January 1939 to September 1948. Maximum daily contents during year, 22,950 acre-feet June 9-11 (gage height, 22.85 feet); no storage for extended periods. Maximum daily contents during period 1939-48, 68,500 acre-feet Sept. 26, 1941 (gage height, 29.95 feet); no storage at times in 1944-48.

Lake is formed by McMillan Dam, completed and storage began in 1906. Capacity, 38,660 acre-feet between gage heights 0.0 foot (sill of outlet gate) and 26.1 feet (crest of spillway 1). No dead storage. Figures given herein represent usable contents. Water is used for irrigation on Carlsbad project of Bureau of Reclamation. Contents computed from daily readings at 6 a.m. Gage-height record and capacity table furnished by Bureau of Reclamation.

Lake Avalon. - Staff gage, lat. 32°29'25", long. 104°15'00", in SW 1/4 sec. 12, T. 21 S., R. 28 E., at dam on Pecos River, 5 miles north of Carlsbad, N. Mex. Datum of gage is 3,157.0 feet above mean sea level, Bureau of Reclamation datum. Drainage area, 18,070 square miles (contributing area). Records available, January 1939 to September 1948. Maximum daily contents during year, 6,150 acre-feet June 1 (gage height, 20.55 feet); minimum daily, 58 acre-feet May 23 (gage height, 7.60 feet). Maximum daily contents during period 1939-48, 11,000 acre-feet May 22, 1941 (gage height, 25.0 feet); no storage at times when natural flow was passing through reservoir.

Lake is formed by Avalon Dam; storage began in 1906. Capacity, 6,600 acre-feet between gage heights 0.0 foot (sill of outlet gates) and 21.0 feet (crest of spillway 1). No dead storage. Figures given herein represent usable contents and are computed from once-daily staff readings at 6 a.m. Water is used for irrigation on Carlsbad project of Bureau of Reclamation who furnishes gage-height record and contents table.

Red Bluff Reservoir. - Staff gage, 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 Orta, Reeves County, Tex. Datum of gage is 0.30 foot below mean sea level, datum of 1929. Subtract 0.30 foot from elevations given herein to obtain elevation above mean sea level, datum of 1929. Contributing drainage area, 20,720 square miles. Records available, February 1937 to September 1948. Maximum contents observed during year, 58,600 acre-feet June 4 (elevation, 2,806.6 feet); minimum observed, 11,080 acre-feet May 13 (elevation, 2,781.4 feet). Maximum contents observed during period 1937-48, 352,000 acre-feet Sept. 27, 28, 1941 (elevation, 2,846.2 feet, observed on staff gage at service spillway, affected by variable draw-down due to flow through taintor gates); minimum observed, that of May 13, 1948.

Reservoir is formed by earth-fill dam, rock-faced; storage began in 1936; dam completed early in 1937. Capacity, 307,000 acre-feet between elevations 2,764.0 feet (penstock intake sill) and 2,842.0 feet (top of taintor gates). Dead storage, 3,000 acre-feet. 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. Elevation record and capacity curve furnished by Red Bluff Water Power Control District.

## RIO GRANDE BASIN

Monthly gage height and contents, of reservoirs in Rio Grande Basin, water year  
October 1947 to September 1948--Continued

Date	Elephant Butte Reservoir			Caballo Reservoir		
	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)
Sept. 30.....	4,313.85	316,900	-	4,126.28	12,980	-
Oct. 31.....	4,313.12	309,800	-7,100	4,133.74	28,780	+15,800
Nov. 30.....	4,318.81	366,300	+56,500	4,137.99	40,270	+11,490
Dec. 31.....	4,325.11	435,400	+69,100	4,141.58	51,410	+11,140
Calendar year 1947...	-	-	-141,900	-	-	-153,090
Jan. 31.....	4,325.12	435,400	0	4,150.59	68,450	+37,040
Feb. 29.....	4,323.51	417,200	-18,200	4,161.20	154,200	+65,750
Mar. 31.....	4,321.51	395,100	-22,100	4,163.74	173,600	+19,400
Apr. 30.....	4,322.79	409,400	+14,300	4,160.89	161,900	-21,700
May 31.....	4,329.73	484,600	+75,200	4,162.31	162,600	+10,700
June 30.....	4,349.19	762,000	+277,400	4,158.10	132,500	-30,100
July 31.....	4,343.39	673,600	-88,400	4,148.47	77,270	-55,230
Aug. 31.....	4,337.34	588,700	-84,900	4,132.79	26,500	-50,770
Sept. 30.....	4,333.89	543,000	-45,700	4,131.61	23,700	-2,800
Water year 1947-48...	-	-	+226,100	-	-	+10,720

Date	Carson Reservoir			El Vado Reservoir		
	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)
Sept. 30.....	-	0	-	6,871.9	115,300	-
Oct. 31.....	-	0	0	6,867.1	105,200	-10,100
Nov. 30.....	-	0	0	6,820.9	36,290	-68,910
Dec. 31.....	-	0	0	6,777.5	5,480	-30,810
Calendar year 1947...	-	0	0	-	-	+14,520
Jan. 31.....	-	0	0	6,778.3	5,820	+340
Feb. 29.....	9.8	24	+24	-	87,140	+1,320
Mar. 31.....	16.4	315	+299	6,803.5	20,750	+15,610
Apr. 30.....	20.8	695	+382	6,861.4	94,200	+73,450
May 31.....	-	0	-695	6,903.1	201,200	+107,000
June 30.....	-	0	0	6,902.6	199,500	-1,700
July 31.....	-	0	0	6,896.9	181,500	-18,000
Aug. 31.....	-	0	0	6,888.0	155,400	-26,100
Sept. 30.....	-	0	0	6,883.3	142,700	-12,700
Water year 1947-48...	-	-	0	-	-	+27,400

Date	McClure Reservoir			Nichols Reservoir		
	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)
Sept. 30.....	-	187	-	147.5	240	-
Oct. 31.....	29.0	76	-111	143.9	186	-52
Nov. 30.....	34.0	124	+48	-	854	-134
Dec. 31.....	37.5	167	+43	123.9	22	-32
Calendar year 1947...	-	-	-	-	-	-651
Jan. 31.....	37.6	168	+1	-	17	-5
Feb. 29.....	38.6	181	+15	123.9	22	+5
Mar. 31.....	42.7	250	+67	139.6	135	+113
Apr. 30.....	69.3	1,030	+780	163.2	577	+442
May 31.....	93.5	2,410	+1,380	166.3	664	+87
June 30.....	97.2	2,670	+260	168.9	743	+79
July 31.....	96.3	2,610	-60	160.9	515	-228
Aug. 31.....	92.8	2,360	-250	160.5	504	-11
Sept. 30.....	86.1	1,920	-440	162.0	571	+67
Water year 1947-48...	-	-	+1,733	-	-	+331

\* Obtained by using 20,000 A. F. (from revised table) for Dec. 31, 1946.

a No gage-height record; contents estimated or based on contents for adjacent days.

g From graph based on once daily staff gage reading by employee of Public Service Co. of N. Mex.



## RIO GRANDE BASIN

243

Monthly gage height and contents, of reservoirs in Rio Grande Basin, water year  
October 1947 to September 1948--Continued

Date	Alamogordo Reservoir			Lake McMillan		
	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)
Sept. 30.....	4,218.10	8,610	-	0.0	0	-
Oct. 31.....	4,219.10	9,280	+670	0.0	0	0
Nov. 30.....	4,225.00	13,820	+4,540	15.0	866	+866
Dec. 31.....	4,231.65	20,410	+6,590	16.4	2,760	+1,894
Calendar year 1947...	-	-	-18,370	-	-	-6,150
Jan. 31.....	4,236.20	25,900	+5,490	16.5	2,950	+190
Feb. 29.....	4,240.50	31,930	+6,030	16.6	3,140	+190
Mar. 31.....	4,243.60	36,940	+5,010	15.5	1,390	-1,750
Apr. 30.....	4,207.00	2,380	-34,560	17.6	5,370	+3,980
May 31.....	4,227.90	16,490	+14,110	13.5	143	-5,227
June 30.....	4,243.55	36,860	+20,370	21.1	16,150	+16,007
July 31.....	4,224.50	13,380	-23,480	18.0	6,890	-9,760
Aug. 31.....	4,216.15	7,360	-6,020	17.2	4,430	-1,960
Sept. 30.....	4,214.90	6,590	-770	0.0	0	-4,430
Water year 1947-48...	-	-	-2,020	-	-	0

Date	Lake Avalon			Red Bluff Reservoir		
	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)	Elevation or gage height (feet)	Contents (acre- feet)	Change in contents during month (acre-feet)
Sept. 30.....	11.75	430	-	2,784.2	13,400	-
Oct. 31.....	10.85	288	-142	2,787.4	17,020	+3,620
Nov. 30.....	13.25	838	+550	2,790.5	21,100	+4,080
Dec. 31.....	14.95	1,670	+832	2,793.5	25,750	+4,650
Calendar year 1947...	-	-	-3,760	-	-	-37,050
Jan. 31.....	17.05	3,100	+1,430	2,795.9	30,110	+4,360
Feb. 29.....	19.20	4,880	+1,780	2,798.0	34,400	+4,290
Mar. 31.....	19.70	5,340	+460	-	356,380	+1,980
Apr. 30.....	14.35	1,330	-4,010	2,785.8	15,080	-21,300
May 31.....	17.75	3,650	+2,320	2,786.7	16,140	+1,060
June 30.....	17.00	3,060	-590	2,797.3	22,930	+16,790
July 31.....	14.30	1,300	-1,760	2,790.5	21,100	-11,830
Aug. 31.....	15.00	1,700	+400	2,784.5	13,700	-7,400
Sept. 30.....	16.95	3,020	+1,320	2,787.1	16,620	+2,920
Water year 1947-48...	-	-	+2,600	-	-	+3,230

a No gage-height record; contents estimated or based on contents for adjacent days.

## RIO GRANDE BASIN

## Transmountain diversions from Colorado River Basin to Rio Grande Basin

The following seven ditches, which are equipped with water-stage recorders, divert water from tributaries of Colorado River to tributaries of the Rio Grande in Colorado. Records furnished by State engineer.

Piedra Pass ditch diverts water from Piedra River to a tributary of the Rio Grande in sec. 4, T. 38 N., R. 1 W.

Tabor ditch diverts water from tributaries of Cebolla Creek through Spring Creek Pass to tributary of Clear Creek in sec. 2, T. 42 N., R. 3 W.

Squaw Pass ditch diverts water from tributaries of Williams Creek through Squaw Pass to tributary of Rio Grande in sec. 13, T. 39 N., R. 3 W.

Treasure Pass ditch diverts water from Wolf Creek through Wolf Creek Pass to tributary of South Fork Rio Grande.

Fuchs ditch diverts water from North Fork Los Pinos River through Weminuche Creek Pass to Weminuche Creek (tributary of Rio Grande) in sec. 33, T. 40 N., R. 5 W.

Raber-Lohr ditch diverts water from Rincon La Vaca Creek (tributary to Los Pinos River) through Weminuche Pass to Weminuche Creek (tributary of Rio Grande) in sec. 33, T. 40 N., R. 5 W.

Tarbell ditch diverts water from tributary of Cochetopa Creek to tributary of Saguache Creek in about sec. 17, T. 43 N., R. 2 E.

Inflow from transmountain diversions, in acre-feet,  
water year October 1947 to September 1948

Month	Piedra Pass ditch	Tabor ditch	Squaw Pass ditch	Treasure Pass ditch	Fuchs ditch	Raber- Lohr ditch	Tarbell ditch	Total
October.....	0	0	0	0	0	0	0	0
November.....	0	0	0	0	0	0	0	0
December.....	0	0	0	0	0	0	0	0
January.....	0	0	0	0	0	0	0	0
February.....	0	0	0	0	0	0	0	0
March.....	0	0	0	0	0	0	0	0
April.....	0	0	0	0	0	0	0	0
May.....	0	0	0	0	0	0	0	0
June.....	0	0	0	0	0	36	0	36
July.....	0	138	97	29	181	704	0	1,150
August.....	0	25	48	0	96	565	0	734
September.....	0	0	0	0	42	288	0	330
Water year 1947-48.....	0	163	145	29	319	1,590	0	2,250

## Clear Creek below Continental Reservoir, Colo.

Location.- Water-stage recorder and Parshall flume, lat. 37°53', long. 107°11', in sec. 22, T. 42 N., R. 3 W., 1,000 feet downstream from Continental Reservoir and 15 miles west of Creede.

Drainage area.- 51.7 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. May 1929 to September 1948 in reports of State engineer.

Average discharge.- 19 years, 32.8 second-feet.

Extremes.- Maximum discharge during year, 329 second-feet July 21 (gage height, 3.68 feet, from recorded range in stage); minimum daily, 2.0 second-feet Nov. 19 to May 2, 1929-48; Maximum discharge, that of July 21, 1948; no flow June 22, 23, 1935.

Remarks.- Records good above 50 second-feet and fair below except those for Mar. 18 to May 2, which are poor. Flow regulated by Continental Reservoir (capacity, 26,700 acre-feet).

Revisions.- W 1008: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	19	22	2.0	2.0	2.0	2.0	2.0	2.0	81	73	274	14
2	19	25	2.0	2.0	2.0	2.0	2.0	2.0	90	74	262	14
3	17	26	2.0	2.0	2.0	2.0	2.0	32	50	76	256	14
4	20	27	2.0	2.0	2.0	2.0	2.0	50	11	70	250	16
5	20	26	2.0	2.0	2.0	2.0	2.0	50	12	66	258	15
6	19	25	2.0	2.0	2.0	2.0	2.0	51	12	71	273	16
7	19	25	2.0	2.0	2.0	2.0	2.0	50	12	74	295	16
8	19	25	2.0	2.0	2.0	2.0	2.0	43	13	61	295	15
9	20	25	2.0	2.0	2.0	2.0	2.0	40	29	48	293	14
10	20	26	2.0	2.0	2.0	2.0	2.0	41	55	43	287	14
11	22	27	2.0	2.0	2.0	2.0	2.0	40	68	40	266	15
12	22	27	2.0	2.0	2.0	2.0	2.0	40	73	77	266	14
13	20	27	2.0	2.0	2.0	2.0	2.0	40	74	109	266	12
14	20	27	2.0	2.0	2.0	2.0	2.0	40	73	168	266	9.0
15	20	27	2.0	2.0	2.0	2.0	2.0	40	136	223	263	9.4
16	20	27	2.0	2.0	2.0	2.0	2.0	24	170	295	263	9.0
17	20	27	2.0	2.0	2.0	2.0	2.0	23	172	310	274	9.8
18	20	14	2.0	2.0	2.0	2.0	2.0	22	165	310	286	11
19	20	2.0	2.0	2.0	2.0	2.0	2.0	28	147	315	289	10
20	20	2.0	2.0	2.0	2.0	2.0	2.0	38	130	315	286	9.0
21	19	2.0	2.0	2.0	2.0	2.0	2.0	103	125	320	275	9.4
22	19	2.0	2.0	2.0	2.0	2.0	2.0	225	127	320	260	11
23	19	2.0	2.0	2.0	2.0	2.0	2.0	237	107	320	253	10
24	19	2.0	2.0	2.0	2.0	2.0	2.0	237	81	320	241	10
25	19	2.0	2.0	2.0	2.0	2.0	2.0	249	71	320	101	12
26	19	2.0	2.0	2.0	2.0	2.0	2.0	238	73	300	19	11
27	19	2.0	2.0	2.0	2.0	2.0	2.0	232	73	282	15	9.4
28	19	2.0	2.0	2.0	2.0	2.0	2.0	218	74	305	16	9.4
29	19	2.0	2.0	2.0	2.0	2.0	2.0	218	73	304	14	11
30	19	2.0	2.0	2.0	-	2.0	2.0	154	76	307	14	9.4
31	19	-	2.0	2.0	-	2.0	-	59	-	287	14	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	605	22	17	19.5	1,200
November.....	479.0	27	2.0	16.0	950
December.....	62.0	2.0	2.0	2.00	123
Calendar year 1947 .....	14,936.9	281	-	40.9	29,540
January.....	62.0	2.0	2.0	2.00	123
February.....	58.0	2.0	2.0	2.00	115
March.....	62.0	2.0	2.0	2.00	123
April.....	60.0	2.0	2.0	2.00	119
May.....	2,856.0	239	2.0	92.1	5,660
June.....	2,453	172	11	81.8	4,870
July.....	6,193	320	40	200	12,280
August.....	6,690	295	14	216	13,270
September.....	359.2	16	9.0	12.0	712
Water year 1947-48 .....	19,939.2	320	2.0	54.5	39,540

Note.- No gage-height record Oct. 14-29, Nov. 12 to May 2, May 12-15, July 16-26; discharge computed on basis of gate openings at Continental Reservoir and recorded range in stage.

## RIO GRANDE BASIN

Goose Creek near Wagon Wheel Gap, Colo.

Location.- Water-stage recorder, lat. 37°41', long. 106°50', in NW<sup>1</sup>/<sub>4</sub> sec. 26, T. 40 N., R. 1 E., 1½ miles downstream from Roaring Fork and 6 miles south of Wagon Wheel Gap.

Drainage area.- 53.6 square miles.

Records available.- October 1939 to September 1948 (no winter records 1942-47). October 1924 to July 1926 at site 1 mile upstream.

Extremes.- Maximum discharge during year, 887 second-feet June 3 (gage height, 2.59 feet); minimum daily not determined, occurred during period of no gage-height record. 1924-26, 1939-48: Maximum discharge, that of June 3, 1948; maximum gage height, 2.99 feet June 23, 1941; minimum daily discharge recorded, 7.8 second-feet Apr. 1, 5, 6, 1945.

Remarks.- Records good except those for period of no gage-height record, which are poor. Lake Humphreys (capacity, 842 acre-feet) has slight effect on flow.

Revisions.- W 1008: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	45	36					32	162	450	217	54	27
2	41	36					35	153	540	221	57	26
3	40	34					42	159	730	198	58	26
4	38	30					43	175	629	191	61	26
5	37	31					44	187	516	202	64	26
6	36	28					44	478	478	191	57	26
7	34	23					45	221	435	181	54	26
8	34	37					46	198	435	168	54	26
9	34	36					51	162	469	153	49	26
10	33	37					56	134	507	145	44	26
11	38	36					64	104	587	136	45	26
12	46	37					60	98	587	126	45	26
13	61	37					54	108	556	121	44	26
14	79	35					66	156	516	111	43	25
15	67	30					79	214	442	109	38	25
16	64	32	18	15	14	20	90	255	412	100	35	25
17	62	31					112	278	398	98	34	25
18	61	30					139	324	364	94	35	25
19	61	29					132	710	364	109	36	25
20	62	25					143	618	298	109	35	25
21	65	26					150	618	278	94	32	25
22	62	25					132	565	242	87	35	25
23	56	24					104	525	198	89	39	25
24	54	25					82	435	181	96	34	25
25	47	27					68	482	178	102	36	25
26	45	25					64	360	187	87	33	25
27	44	26					72	355	217	76	30	25
28	41	25					94	350	184	72	29	25
29	40	24					131	430	191	69	27	25
30	41	22					153	460	206	62	27	25
31	37	-					-	500	-	58	29	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,507	79	33	48.6	2,990
November.....	899	37	22	30.0	1,780
December.....	558	-	-	18	1,110
Calendar year .....	-	-	-	-	-
January.....	465	-	-	15	922
February.....	406	-	-	14	805
March.....	620	-	-	20	1,230
April.....	2,427	153	32	80.9	4,810
May.....	9,618	710	98	310	19,080
June.....	11,775	730	178	392	23,360
July.....	3,870	221	58	125	7,660
August.....	1,293	64	27	41.7	2,560
September.....	764	27	25	25.5	1,520
Water year 1947-48 .....	34,202	730	-	93.4	67,850

Peak discharge (base, 200 sec.-ft.)- May 6 (8 p.m.) 283 sec.-ft.; May 20 (9 p.m.) 822 sec.-ft.; June 3 (5 p.m.) 887 sec.-ft.; June 11 (11 p.m.) 698 sec.-ft.

Note.- No gage-height record Oct. 30, 31, Nov. 8 to Apr. 27, May 26 to June 3; discharge computed on basis of weather records and records for South Fork Rio Grande at South Fork.

## South Fork Rio Grande at South Fork, Colo.

Location.- Water-stage recorder, lat. 37°40', long. 106°39', in sec. 4, T. 39 N., R. 3 E., 1½ miles upstream from mouth and 1½ miles southwest of village of South Fork. Datum of gage is 8,221.79 feet above mean sea level, datum of 1929.

Drainage area.- 216 square miles.

Records available.- August 1910 to September 1913 and May 1936 to September 1948 in reports of Geological Survey. August 1910 to September 1922 and May 1936 to September 1948 in reports of State engineer. Records for 1910-22 at site 1 mile downstream.

Average discharge.- 24 years (1910-22, 1936-48), 233 second-feet.

Extremes.- Maximum discharge during year, 3,080 second-feet June 3 (gage height, 6.50 feet), from rating curve extended above 1,800 second-feet; minimum daily, 27 second-feet Jan. 28.

1910-22, 1936-48: Maximum discharge, 8,000 second-feet Oct. 5, 1911 (gage height, 9.7 feet, from floodmarks, present site and datum), from rating curve extended above 1,500 second-feet; minimum daily, 20 second-feet Jan. 1, 2, 8, 17, 23-25, 1915, Dec. 20, 1937.

Remarks.- Records excellent except those for periods of ice effect or no gage-height record, which are fair. A few small diversions above station for irrigation and several small storage reservoirs.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	94	100	60	42	36	42	90	682	1,270	614	112	56
2	91	98	*55	37	37	41	114	624	1,710	578	112	55
3	85	97	51	38	38	40	136	606	2,503	542	112	51
4	80	*84	48	38	38	38	142	614	2,220	532	110	50
5	79	79	47	*59	37	42	148	700	1,850	498	180	47
6	74	80	47	40	35	41	150	765	1,680	474	146	44
7	70	51	50	41	35	40	158	856	1,850	456	127	42
8	66	94	56	43	34	45	*187	845	1,620	414	127	43
9	66	88	45	45	34	44	204	710	1,680	372	112	50
10	66	92	50	47	35	44	255	578	1,710	359	98	51
11	94	86	47	42	36	48	287	498	1,820	314	86	18
12	120	91	45	38	36	51	228	450	1,750	375	92	48
13	124	91	48	36	34	55	210	450	1,620	418	100	43
14	221	84	52	37	36	60	*244	582	1,420	384	90	41
15	182	69	58	38	38	58	322	810	1,290	351	80	34
16	182	79	57	38	39	60	397	972	1,200	322	73	34
17	175	76	56	34	*41	61	492	1,150	1,120	290	73	38
18	171	73	56	36	42	60	558	1,300	1,030	277	80	36
19	164	73	57	35	44	59	554	1,810	1,030	285	88	41
20	160	62	55	34	44	58	610	1,900	894	270	80	44
21	164	66	56	37	43	57	619	2,240	815	208	72	40
22	165	67	57	36	43	56	594	2,350	735	175	82	38
23	148	66	55	35	42	*56	512	2,120	624	167	82	38
24	144	70	54	34	41	59	400	1,850	554	180	74	40
25	129	84	55	33	44	73	333	1,660	530	182	86	38
26	115	72	55	32	47	72	322	1,360	550	158	78	66
27	120	79	55	30	48	77	336	1,270	598	142	70	55
28	119	72	56	27	44	81	450	1,230	568	134	67	60
29	114	69	53	28	43	86	606	1,340	554	131	67	52
30	115	67	50	32	-	94	678	1,420	624	122	64	57
31	103	-	45	36	-	97	-	1,470	-	112	62	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,800	221	66	123	7,540
November.....	2,359	100	51	78.6	4,680
December.....	1,629	60	45	52.5	3,250
Calendar year 1947.....	64,222	839	21	176	127,400
January.....	1,138	47	27	36.7	2,260
February.....	1,144	48	34	39.4	2,270
March.....	1,796	97	39	57.9	3,560
April.....	10,336	678	90	345	20,500
May.....	35,192	2,350	450	1,135	69,800
June.....	37,214	2,500	530	1,240	73,810
July.....	9,796	614	112	316	19,430
August.....	2,882	160	62	93.0	5,720
September.....	1,380	66	34	46.0	2,740
Water year 1947-48.....	108,666	2,500	27	297	215,500

Peak discharge (base, 900 sec.-ft.)- May 21 (9:15 p.m.) 2,880 sec.-ft.; June 3 (9:15 p.m.) 3,080 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Nov. 8 to Apr. 11 (no gage-height record Dec. 2 to Apr. 8; discharge computed on basis of 5 discharge measurements, weather records, and records for Rio Grande near Del Norte).

## RIO GRANDE BASIN

Pinos Creek near Del Norte, Colo.

Location.- Water-stage recorder and 12-foot Parshall flume, lat. 37°35' (revised), long. 106°27' (revised), in sec. 29, T. 39 N., R. 5 E., just downstream from Bennett Creek and 8 miles southwest of Del Norte.

Drainage area.- 53 square miles.

Records available.- May 1936 to September 1948 in reports of Geological Survey. May 1919 to September 1924 and May 1936 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 340 second-feet May 21 (gage height, 3.03 feet); minimum not determined, occurred during period of no record.  
1919-24, 1936-48: Maximum daily discharge, 2,400 second-feet June 3, 1922; minimum daily recorded, 3.6 second-feet Oct. 27, 1939, Nov. 9, 1944 (discharge measurement).

Remarks.- Records good except those below 25 second-feet and those for May 20 to June 15, which are fair. One small diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	12					a18	140	172	64	16	8.0
2	12	13					*20	129	196	57	16	8.6
3	11	13					27	121	247	52	18	7.6
4	10	b12					25	117	230	51	18	7.2
5	10	b11					24	134	209	51	19	7.2
6	9.8	b10					27	141	202	50	18	6.8
7	9.8	b9.8					27	160	200	45	18	6.8
8	9.8	9.2					29	150	193	41	20	6.4
9	9.2	9.2					32	133	198	38	16	7.2
10	8.0	12					40	111	201	36	15	6.4
11	9.8	9.8					37	97	219	35	14	6.4
12	13	9.8					25	98	210	34	16	6.4
13	14						27	101	196	32	15	6.0
14	24						33	129	175	29	13	6.0
15	20						45	154	162	29	13	5.6
16	20						62	168	144	29	12	5.6
17	20						86	183	134	29	13	6.4
18	18						104	205	124	29	15	6.4
19	18						101	235	137	32	14	5.2
20	18						107	249	130	32	12	4.8
21	18						103	273	116	29	12	4.8
22	17						95	268	112	27	12	4.4
23	15						72	237	98	32	11	4.4
24	16						55	223	90	27	11	4.4
25	13						45	214	84	27	10	4.8
26	16						45	197	81	26	8.6	8.6
27	15						53	183	74	22	8.0	7.2
28	14						87	170	69	21	6.8	8.0
29	a13						124	a172	68	20	7.2	6.8
30	*14						139	a175	70	19	7.2	6.8
31	12						-	a180	-	18	7.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	439.4	24	8.0	14.2	872
November 1-12.....	130.8	13	9.2	10.9	259
December.....	-	-	-	-	-
Calendar year.....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	1,715	139	18	57.2	3,400
May.....	5,237	273	88	169	10,390
June.....	4,541	247	68	151	9,010
July.....	1,063	64	18	34.3	2,110
August.....	412.4	20	6.8	13.3	818
September.....	191.2	8.6	4.4	6.37	379
Water year.....	-	-	-	-	-

Peak discharge (base, 120 sec.-ft.)- Apr. 18 (4:30 p.m.) 154 sec.-ft.; Apr. 30 (8:30 p.m.) 167 sec.-ft.; May 7 (7 p.m.) 190 sec.-ft.; May 21 (7:30 p.m.) 340 sec.-ft.; June 3 (8 p.m.) 287 sec.-ft.; June 11 (6 p.m.) 254 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of records for South Fork Rio Grande at South Fork.

b Stage-discharge relation affected by ice.

# RIO GRANDE BASIN

249

Rock Creek near Monte Vista, Colo.

Location.- Water-stage recorder and 8-foot Parshall flume, lat. 37°29', long. 106°16', in SE<sup>1</sup>/<sub>4</sub> sec. 36, T. 38 N., R. 6 E., 3 miles downstream from North Fork and 9 miles southwest of Monte Vista.

Drainage area.- 33.6 square miles.

Records available.- May 1935 to September 1948 in reports of Geological Survey. April 1919 to September 1924 and May 1935 to September 1948 in reports of State engineer. (No winter records.)

Extremes.- Maximum discharge during year, 131 second-feet May 20 (gage height, 2.30 feet); minimum daily recorded, 2.3 second-feet Sept. 16, 17, 1919-24, 1935-48; Maximum discharge, 178 second-feet May 15, 1944 (gage height, 2.88 feet); minimum daily recorded, 1.6 second-feet Oct. 27-31, 1921.

Remarks.- Records good except those below 5 second-feet and those for period of no gage-height record, which are fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.1	5.3					a13	60	74	21	7.0	3.5
2	6.1	4.7					a14	54	77	20	8.0	3.2
3	6.1	4.7					a15	49	89	20	7.0	3.5
4	6.1	4.2					a14	44	81	18	7.0	3.5
5	6.1	4.7					a14	47	74	17	7.7	3.0
6	5.8	4.7					a15	54	69	18	6.7	3.0
7	5.8	-					a16	64	66	17	6.4	3.2
8	5.6	-					a17	65	84	15	7.7	3.2
9	5.6	-					19	49	63	14	6.4	3.5
10	5.6	-					22	38	61	13	5.3	3.5
11	6.1	-					22	35	60	13	5.6	3.0
12	7.7	-					17	29	60	12	6.1	3.2
13	7.7	-					15	26	56	12	5.8	3.0
14	11	-					18	38	51	12	5.3	2.8
15	7.7	-					26	55	45	11	5.0	2.6
16	7.0	-					35	70	43	11	5.0	2.3
17	6.4	-					41	74	41	11	4.4	2.3
18	6.1	-					48	81	39	13	4.7	3.2
19	6.1	-					48	94	41	15	5.0	3.0
20	6.4	-					50	95	38	12	4.2	3.2
21	6.1	-					47	94	36	10	4.2	3.0
22	6.1	-					41	88	36	9.5	5.0	2.8
23	5.6	-					38	75	30	9.9	4.4	2.8
24	5.8	-					30	67	27	9.5	3.9	2.8
25	5.3	-					24	72	25	8.8	4.2	2.8
26	5.0	-					24	69	23	8.4	3.9	4.4
27	6.1	-					25	70	23	8.0	3.7	3.5
28	5.8	-					36	74	21	7.7	3.7	3.2
29	5.8	-					51	77	20	7.3	3.7	3.2
30	6.1	-					61	77	20	6.7	3.7	3.5
31	5.3	-					-	79	-	6.4	3.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	194.1	11	5.0	6.26	385
November 1-6.....	28.3	5.3	4.2	4.72	56
December.....	-	-	-	-	-
Calendar year.....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	856	61	13	28.5	1,700
May.....	1,961	95	26	63.3	3,890
June.....	1,453	89	20	48.4	2,880
July.....	387.2	21	6.4	12.5	768
August.....	164.2	8.0	3.5	5.30	326
September.....	94.0	4.4	2.3	3.13	186
Water year.....	-	-	-	-	-

Peak discharge (base, 40 sec.-ft.)- Apr. 18 (6 p.m.) 67 sec.-ft.; Apr. 30 (8 p.m.) 74 sec.-ft.; May 7 (8:15 p.m.) 75 sec.-ft.; May 20 (8:45 p.m.) 131 sec.-ft.; June 3 (8:15 p.m.) 108 sec.-ft. a No gage-height record; discharge computed on basis of weather records and records for stations on nearby streams.



## RIO GRANDE BASIN

Closed Basin in San Luis Valley, Colo.

Kerber Creek at Ashley Ranch, near Villa Grove, Colo.

Location.- Water-stage recorder, lat. 38°15', long. 106°08', in sec. 7, T. 46 N., R. 8 E., at Ashley Ranch, 10 miles west of Villa Grove.

Drainage area.- 38 square miles.

Records available.- May 1936 to September 1948 in reports of Geological Survey. June 1923 to September 1926 and May 1936 to September 1948 in reports of State engineer. (No winter records some years.)

Extremes.- Maximum discharge during year, 165 second-feet May 20 (gage height, 2.93 feet); minimum daily recorded, 2.4 second-feet Sept. 7, 13-15, 22-24, 1923-26, 1936-48; Maximum discharge, 407 second-feet May 14, 1941, from rating curve extended above 150 second-feet; maximum gage height, 5.04 feet May 11, 1947; minimum daily discharge recorded, 1.2 second-feet Aug. 14, 16, 17, 1940, Oct. 4, 1944.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	5.3					5.7	55	91	16	5.8	2.9
2	3.0	5.3					5.7	49	94	16	5.8	2.7
3	3.0	4.1					5.7	45	105	16	6.4	2.7
4	3.1	4.4					6.2	44	99	15	7.0	2.7
5	3.1	5.8					7.0	43	94	15	7.4	2.9
6	3.1	(*)					7.2	42	88	15	6.1	2.9
7	3.1						7.4	44	84	14	5.8	2.4
8	3.2						7.5	50	75	15	6.4	2.7
9	3.2						10	47	73	15	5.8	2.7
10	3.2						13	47	74	13	5.6	2.6
11	3.8						12	46	77	12	5.3	2.5
12	7.8						11	41	64	11	5.1	2.5
13	7.4						11	40	55	11	4.4	2.4
14	14						15	41	48	9.9	4.0	2.4
15	7.8						*25	49	42	9.4	3.3	2.4
16	6.5		3.8	3.2	3.4	4.4	29	68	40	8.3	3.0	2.7
17	5.6						33	75	38	8.3	2.5	2.9
18	5.3	4.5					33	92	36	7.7	3.7	3.2
19	5.3						25	122	26	7.4	5.6	3.8
20	5.3						35	128	31	7.0	5.1	3.2
21	5.0						39	153	34	6.7	4.2	2.7
22	5.3						*36	150	28	6.4	4.4	2.4
23	5.0						32	139	22	7.0	3.3	2.4
24	5.0						30	137	18	8.0	3.5	2.4
25	4.7						28	129	18	8.0	5.3	3.5
26	5.8						27	103	19	7.0	4.2	4.9
27	5.3						30	94	17	6.7	3.5	5.3
28	5.0						34	92	18	6.7	2.9	6.3
29	*5.0						42	92	18	7.4	2.9	4.6
30	4.1						54	95	15	6.7	3.0	6.3
31	5.0						-	94	-	5.8	2.9	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	155.2	14	3.0	5.01	308
November.....	135.4	-	-	4.51	269
December.....	117.8	-	-	3.8	234
Calendar year.....	-	-	-	-	-
January.....	99.2	-	-	3.2	197
February.....	98.6	-	-	3.4	195
March.....	136.4	-	-	4.4	271
April.....	656.4	54	5.7	21.9	1,300
May.....	2,456	153	40	79.2	4,870
June.....	1,549	105	15	51.6	3,070
July.....	318.4	16	5.8	10.3	632
August.....	144.2	7.4	2.5	4.65	285
September.....	96.0	6.3	2.4	3.20	190
Water year 1947-48.....	5,962.6	153	-	16.3	11,820

Peak discharge (base, 70 sec.-ft.).- May 20 (12:45 a.m.) 165 sec.-ft.; June 3 (2:15 a.m.) 117 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Nov. 6 to Apr. 21 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 2 discharge measurements and weather records.

Closed basin in San Luis Valley, Colo.

Saguache Creek near Saguache, Colo.

Location.- Water-stage recorder, lat. 36°09', long. 106°19', in sec. 11, T. 45 N., R. 6 E., 10 miles northwest of Saguache.

Drainage area.- 595 square miles.

Records available.- August 1910 to September 1912 and October 1933 to September 1948 in reports of Geological Survey. August 1910 to September 1912 and June 1914 to September 1948 in reports of State engineer. (No winter records some years.)

Average discharge.- 31 years (1910-12, 1914-36, 1940-42, 1943-48), 80.3 second-feet.

Extremes.- Maximum discharge during year, 458 second-feet Apr. 19; maximum gage height, 2.28 feet May 20; minimum daily discharge recorded, 11 second-feet Sept. 18.  
1910-12, 1941-48: Maximum discharge, 746 second-feet June 15, 1921 (gage height, 3.45 feet, datum then in use); minimum daily, that of Sept. 18, 1948.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	51	(*)	28	29	34	62	195	328	184	62	46
2	71	52					69	162	338	177	62	44
3	68	51					88	149	348	168	62	42
4	68	41					98	138	370	163	64	39
5	68	43					106	149	388	159	68	35
6	64	*41					112	142	342	152	71	32
7	61	23					108	155	335	154	65	30
8	59	48					104	162	342	144	68	28
9	54	b46					129	144	330	134	66	24
10	49	49					162	127	335	125	61	23
11	51	47					177	135	342	116	59	23
12	75	48					157	127	358	113	57	23
13	75	48					114	118	338	103	57	22
14	108	45					114	138	305	94	59	22
15	108	37					146	160	289	90	55	22
16	86	43	35	28	29	204	173	274	86	50	23	
17	80	42	242			186	257	85	50	23		
18	84	40	293			197	245	88	52	11		
19	82	40	308			250	236	108	65	12		
20	82	33	236			330	236	99	65	19		
21	80	35	238			378	229	93	57	16		
22	80	36	204			398	232	88	59	15		
23	80	35	177			398	215	78	54	15		
24	66	37	144			390	197	32	55	14		
25	64	48	108			412	188	30	61	14		
26	59	44	-	-	-	71	112	370	193	91	65	16
27	57	47				72	112	320	190	78	55	24
28	61	43				67	138	320	186	76	50	26
29	57	40				77	179	313	173	76	47	25
30	59	38				*90	211	310	173	68	46	24
31	52	-				75	-	310	-	64	47	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,183	108	49	70.4	4,350
November.....	1,271	52	23	42.4	2,520
December.....	1,085	-	-	35	2,150
Calendar year 1947.....	27,275	253	-	74.7	54,080
January.....	868	-	-	28	1,720
February.....	841	-	-	29	1,570
March.....	1,302	-	-	42.0	2,580
April.....	4,653	308	62	155	9,230
May.....	7,256	412	118	234	14,380
June.....	8,512	388	173	277	16,490
July.....	3,426	184	64	111	6,800
August.....	1,814	71	48	58.5	3,600
September.....	732	46	11	24.4	1,450
Water year 1947-48.....	33,743	412	11	92.2	66,930

Peak discharge (base, 140 sec.-ft.)- Apr. 19 (1:30 p.m.) 458 sec.-ft.; Apr. 30 (6:15 p.m.) 284 sec.-ft.; May 22 (2 p.m.) 445 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Nov. 10 to Mar. 29 (stage-discharge relation affected by ice during most of period), May 13, June 4, Aug. 28, 29; discharge computed on basis of discharge measurement made on Dec. 8, weather records, and records for stations on nearby streams.

## RIO GRANDE BASIN

Closed basin in San Luis Valley, Colo.

North Crestone Creek near Crestone, Colo.

Location.- Water-stage recorder, lat. 38°01', long. 105°41', in sec. 5, T. 43 N., R. 12 E., 1 1/2 miles upstream from Crestone and 3 miles upstream from South Crestone Creek.

Drainage area.- 10.7 square miles.

Records available.- May 1936 to September 1948 (no winter records 1936-47).

Extremes.- Maximum discharge during year, 133 second-feet June 3 (gage height, 1.90 feet); minimum daily discharge not determined (occurred during period of no gage-height record).

1936-48: Maximum discharge, 735 second-feet Aug. 6, 1936 (gage height, 4.33 feet), by slope-area method; minimum daily recorded, 0.4 second-foot Apr. 3, 1945.

Remarks.- Records good above 20 second-feet and fair below except those for Nov. 24 to Mar. 29, which are poor. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	10					2.8	24	69	46	9.4	6.9
2	8.6	9.7					2.8	19	84	47	9.4	6.4
3	8.6	9.1					2.8	a17	117	45	8.9	6.2
4	8.3	8.8					3.0	a20	101	43	9.4	5.5
5	7.7	8.0					3.5	a25	88	46	16	5.0
6	7.7	*7.7					3.5	a30	83	45	14	4.6
7	7.4	b7.6					3.6	a33	84	38	11	4.8
8	7.4	b7.4					3.6	a27	83	32	11	4.8
9	6.6	7.4					4.1	a22	83	32	10	4.8
10	6.4	6.6					5.0	19	77	28	10	4.6
11	6.6	b6.2					4.8	16	86	26	9.6	3.8
12	7.4	6.4					4.6	14	98	24	9.6	3.5
13	8.0	6.0					4.6	14	88	21	9.4	3.3
14	11	5.7					5.0	25	74	19	8.9	3.3
15	12	6.4					7.3	47	73	18	8.0	3.1
16	12	5.7					11	56	66	16	7.8	3.3
17	13	5.7					14	63	66	15	7.6	3.1
18	14	5.5					14	70	65	14	7.6	3.0
19	17	5.5					13	77	63	15	7.8	3.1
20	19	5.7					16	88	62	15	7.6	3.0
21	21	6.0					19	95	56	15	7.3	2.5
22	22	5.5					18	94	46	13	10	2.4
23	20	5.3					14	89	38	13	8.9	2.4
24	19	5.6					11	76	34	13	8.5	2.4
25	17	5.8					9.6	67	37	13	11	2.8
26	16	5.4					8.5	61	42	12	9.6	4.6
27	16	5.3					8.5	58	43	12	8.9	4.6
28	14	5.1					9.4	62	39	11	8.5	4.6
29	14	4.9					13	65	39	10	8.0	4.3
30	12	4.9					*3.3	24	74	41	9.8	7.8
31	11	-					2.5	-	70	-	9.4	7.8

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	380.3	22	6.4	12.3	754
November.....	194.6	10	4.9	6.49	386
December.....	108.5	-	-	3.5	215
Calendar year .....	-	-	-	-	-
January.....	77.5	-	-	2.5	156
February.....	89.6	-	-	2.4	138
March.....	81.2	-	-	2.62	161
April.....	264.0	24	2.8	8.80	524
May.....	1,517	95	14	48.9	3,010
June.....	2,026	117	34	67.5	4,020
July.....	716.2	47	9.4	23.1	1,420
August.....	289.3	16	7.3	9.33	574
September.....	121.9	6.9	2.4	4.06	242
Water year 1947-48 .....	5,846.1	117	-	16.0	11,600

Peak discharge (base, 60 sec.-ft.)- May 21 (6 p.m.) 121 sec.-ft.; June 3 (6 p.m.) 133 sec.-ft.; June 11 (8 p.m.) 108 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of records for stations on nearby streams.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Nov. 24 to Mar. 29 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 1 discharge measurement and weather records.

# RIO GRANDE BASIN

253

Closed basin in San Luis Valley, Colo.

Carnero Creek near La Garita, Colo.

Location.- Water-stage recorder, lat. 37°52', long. 106°20', in sec. 26, T. 42 N., R. 6 E., 3 miles northwest of La Garita.

Drainage area.- 117 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey.  
April 1919 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 239 second-foot Apr. 10 (gage height, 2.07 feet), from rating curve extended above 100 second-feet; minimum daily, 1.3 second-foot Sept. 14-16.  
1919-48: Maximum discharge, 1,600 second-foot July 21, 1945 (gage height, 5.75 feet), from rating curve extended above 170 second-feet; minimum daily, 0.3 second-foot Aug. 9, 10, 1946.

Remarks.- Records good above 50 second-feet and fair below except those for period of ice effect or no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	9.5					21	85	58	15	3.4	2.1
2		9.5					23	70	63	15	3.6	1.9
3	10	8.6					26	64	71	15	3.6	1.8
4	9.5	9.0					33	56	59	14	3.8	1.6
5	9.0	9.0					36	59	58	13	5.3	1.4
6	8.6	8.2					38	59	48	13	8.3	1.4
7	8.6	5.0					37	68	45	14	6.8	1.4
8	8.6	8.6					35	68	44	12	11	1.4
9	8.2	8.2					46	61	42	9.8	9.2	1.4
10	7.8	8.0					79	55	38	8.3	6.8	1.6
11	7.8	8.0					85	52	40	7.7	5.6	1.5
12	12	8.4					55	50	40	7.4	5.9	1.5
13	15	8.4					36	47	34	6.5	6.5	1.4
14	22	7.5					52	50	29	5.6	6.5	1.3
15	21	7.2					87	64	25	5.3	5.0	1.3
16	16	8.0	6.4	5.5	6.8	10	103	74	24	5.0	4.0	1.3
17	15	7.6					112	80	22	5.6	3.6	1.6
18	14	7.2					103	79	20	6.8	3.6	1.6
19	13	7.0					87	92	20	9.8	4.6	1.7
20	12	6.2					74	104	22	8.0	4.6	1.6
21	12	6.3					76	95	21	8.0	3.6	1.4
22	12	6.5					71	87	21	7.1	3.2	1.4
23	12	6.2					68	76	21	5.9	2.7	1.5
24	12	6.7					49	71	20	6.8	2.5	1.6
25	10	8.2					39	87	19	8.3	3.4	1.7
26	11	7.6					41	84	18	7.7	3.2	2.3
27	11	8.2					46	76	18	4.8	2.9	2.7
28	10	7.2					58	79	19	4.6	2.3	2.9
29	*10	6.6					88	73	15	4.8	2.1	2.7
30	10	6.1					92	64	14	4.2	2.0	2.6
31	10	-					-	63	-	3.8	2.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	359.1	22	7.8	11.6	712
November.....	229.3	9.5	5.0	7.64	455
December.....	198.4	-	6.4	-	394
Calendar year .....	-	-	-	-	-
January.....	170.5	-	-	5.5	358
February.....	197.2	-	-	6.8	391
March.....	310	-	-	10	635
April.....	1,796	112	21	59.9	3,560
May.....	2,192	104	47	70.7	4,350
June.....	968	71	14	32.9	1,960
July.....	262.8	15	3.8	8.48	521
August.....	141.7	11	2.0	4.57	281
September.....	51.6	2.9	1.3	1.72	102
Water year 1947-48 .....	6,896.6	112	1.3	18.8	13,680

Peak discharge (base, 110 sec.-ft.)- Apr. 10 (8:30 p.m.) 239 sec.-ft.; Apr. 15 (9 p.m.) 232 sec.-ft.; Apr. 30 (2 a.m.) 137 sec.-ft.; May 20 (6 a.m.) 128 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.  
Note.- No gage-height record Nov. 7, Nov. 11 to Apr. 8 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 1 discharge measurement and weather records.

Closed basin in San Luis Valley, Colo.

La Garita Creek near La Garita, Colo.

Location.- Water-stage recorder, lat. 37°49', long. 106°18', in sec. 10, T. 41 N., R. 6 E., 4 miles southwest of La Garita.

Drainage area.- 61 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey.

April 1919 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 158 second-feet May 21 (gage height, 1.35 feet), from rating curve extended above 100 second-feet; minimum daily recorded, 2.5 second-feet Sept. 14-16, 22, 23.

1919-48: Maximum discharge, 457 second-feet May 16, 1941 (gage height, 5.11 feet), from rating curve extended above 220 second-feet; minimum daily, 0.7 second-foot Aug. 29, 1940.

Remarks.- Records good above 10 second-feet and fair below except those for periods of no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.0	7.5					7.2	65	66	19	9.5	5.0
2	8.5	8.0					8.4	56	74	22	10	5.0
3	8.0	7.0					10	47	88	22	10	4.2
4	7.5	8.0					12	51	80	19	12	4.2
5	7.0	7.5					13	59	75	17	12	4.2
6	7.5	7.5					14	65	72	17	12	3.9
7	7.5	4.1					12	79	70	17	12	3.9
8	8.0	7.3					12	77	69	15	14	3.9
9	8.0	6.8					16	61	68	14	11	3.9
10	7.5	7.2					28	43	63	13	9.0	3.9
11	7.5	6.8					30	43	75	12	7.5	3.6
12	12	7.2					20	41	63	12	8.5	3.6
13	13	7.2					16	48	53	9.0	10	3.2
14	22	6.7					21	68	47	8.0	7.5	2.5
15	17	5.6					33	82	40	8.0	6.5	2.5
16	17	6.4	5.0	4.5	4.6	6.0	49	96	35	8.5	5.3	2.5
17	16	6.2					59	93	33	8.0	4.2	2.8
18	16	5.9					66	94	33	9.5	10	2.8
19	13	5.9					56	120	30	16	8.5	3.2
20	12	5.0					59	115	31	14	10	2.8
21	11	5.2					54	107	28	14	9.0	2.8
22	11	5.4					47	99	28	13	7.5	2.5
23	10	5.2					45	91	28	12	7.0	2.5
24	10	5.6					32	86	25	15	6.0	2.8
25	7.5	7.0					28	85	22	13	7.5	2.8
26	8.0	6.6					30	79	21	14	7.5	5.0
27	8.5	7.0					31	79	21	11	6.0	4.6
28	8.5	6.2					44	80	21	10	6.0	5.6
29	8.5	5.5					63	78	18	10	5.6	3.9
30	8.5	5.0					68	73	18	9.5	5.6	3.9
31	7.0	-					-	69	-	9.5	5.3	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	322.5	22	7.0	10.4	640
November.....	192.5	8.0	4.1	6.42	382
December.....	155.0	-	-	5.0	307
Calendar year.....	-	-	-	-	-
January.....	139.5	-	-	4.5	277
February.....	133.4	-	-	4.6	265
March.....	186.0	-	-	6.0	369
April.....	982.6	66	7.2	32.8	1,950
May.....	2,325	120	41	75.0	4,610
June.....	1,395	88	18	46.5	2,770
July.....	411.0	22	8.0	13.3	815
August.....	262.5	14	4.2	8.47	521
September.....	108.0	5.6	2.5	3.60	214
Water year 1947-48.....	6,613.0	120	-	18.1	13,120

Peak discharge (base, 80 sec.-ft.)- Apr. 30 (10 p.m.) 109 sec.-ft.; May 21 (12:30 a.m.) 158 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- No gage-height record Nov. 7 to Apr. 8 (stage-discharge relation affected by ice during most of period), May 28 to June 3: discharge computed on basis of 1 discharge measurement, weather records, and records for stations on nearby streams.

## RIO GRANDE BASIN

Alamosa Creek above Terrace Reservoir, Colo.

Location.- Water-stage recorder, lat. 37°23', long. 106°21', in sec. 8, T. 36 N., R. 6 E., 3 miles upstream from Terrace Reservoir Dam and 15 miles northwest of Capulin.

Drainage area.- 107 square miles.

Records available.- September 1911 to June 1912 and October 1934 to September 1948 in reports of Geological Survey. April 1915 to October 1919, October 1923 to September 1927, and October 1934 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 1,650 second-feet June 3 (gage height, 4.09 feet), from rating curve extended above 1,060 second-feet; minimum not determined, occurred during period of no gage-height record.  
1911-12, 1915-19, 1923-27, 1934-48: Maximum discharge, 5,200 second-feet Oct. 5, 1911 (gage height, 11.0 feet, datum then in use, from floodmark), computed by weir formula; minimum not determined.

Remarks.- Records excellent above 100 second-feet and good below except those for periods of ice effect or no gage-height record, which are fair. No diversions above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	42					16	420	784	346	57	23
2	58	43					30	390	749	507	57	21
3	54	40					42	370	1,190	279	54	20
4	50	33					44	365	1,180	271	50	19
5	45	32					45	450	1,000	267	87	18
6	43	29					45	515	912	252	73	18
7	42	19					46	605	864	245	62	18
8	40	38	(*)				48	557	826	220	68	18
9	39	36					54	420	928	194	66	16
10	37	*32					64	311	904	181	54	16
11	43	32					80	230	944	169	50	16
12	58	34					70	223	944	158	60	16
13	58	37					*62	234	826	143	61	15
14	89	35					92	370	707	133	48	14
15	72	32					143	593	629	122	44	14
16	72	33	20	16	16.5	20	210	756	587	115	40	14
17	72	34					260	840	557	108	37	14
18	74	34					311	928	510	110	39	15
19	74	b34					315	1,100	551	125	40	14
20	73	b27					346	1,080	498	138	34	14
21	78	b28					370	1,220	430	110	32	14
22	76	b29					333	1,220	360	92	36	12
23	66	b28					283	1,050	307	69	34	12
24	64	b30					203	819	264	87	33	12
25	57	b36					163	654	256	87	34	12
26	51	b32					149	527	283	83	32	18
27	52	b34					166	498	311	74	28	18
28	51	b31					241	515	291	70	26	18
29	51	b29					356	687	291	68	24	16
30	48	b28					405	826	351	62	24	16
31	44	-					-	888	-	58	24	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,790	89	37	57.7	3,550
November.....	981	43	19	32.7	1,950
December.....	620	-	-	20	1,230
Calendar year 1947.....	39,575	680	-	108	78,500
January.....	495	-	-	16	984
February.....	478.5	-	-	16.5	949
March.....	620	-	-	20	1,230
April.....	4,992	405	16	166	9,900
May.....	19,681	1,220	223	635	39,040
June.....	19,234	1,190	256	641	38,150
July.....	4,763	346	58	154	9,450
August.....	1,408	87	24	45.4	2,790
September.....	477	23	12	15.9	946
Water year 1947-48.....	55,540.5	1,220	-	152	110,200

Peak discharge (base, 670 sec.-ft.)- May 22 (12:30 a.m.) 1,580 sec.-ft.; June 3 (10 p.m.) 1,650 sec.-ft.; June 10 (11:30 p.m.) 1,180 sec.-ft.; June 19 (10:30 p.m.) 763 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Oct. 24-28, Dec. 1 to Mar. 31 (stage-discharge relation affected by ice during most of period), Apr. 2-4, 6-12; discharge computed on basis of 1 discharge measurement, weather records, and records for stations on nearby streams.

## Alamosa Creek below Terrace Reservoir, Colo.

Location.- Water-stage recorder, lat. 37°21', long. 106°17', in sec. 23, T. 36 N., R. 6 E., half a mile downstream from Terrace Reservoir and 11 miles northwest of Capulin.

Drainage area.- 116 square miles.

Records available.- April 1909 to June 1912 and October 1933 to September 1948 in reports of Geological Survey. April 1909 to November 1912, April to October 1915, February 1917 to October 1920 and April 1922 to September 1948 in reports of State engineer.

Average discharge.- 30 years (1909-10, 1915-18, 1922-48), 121 second-feet.

Extremes.- Maximum discharge during year, 1,420 second-feet June 14 (gage height, 5.77 feet), from rating curve extended above 820 second-feet; minimum daily, 14 second-feet Dec. 31 to Feb. 29.

1909-12, 1915, 1917-20, 1922-48: Maximum daily discharge, 1,450 second-feet June 16-18, 1917; minimum daily, 0.2 second-foot Nov. 13, 1942.

Remarks.- Records excellent except those for periods of no gage-height record, which are good. Flow regulated by Terrace Reservoir (capacity, 17,700 acre-feet). No diversion above station.

Rating tables, water year 1947-48 (gage height, in feet,  
and discharge, in second-feet)  
(Shifting-control method used June 14 to July 25)

Oct. 1 to June 9

June 10 to Sept. 30

2.0	14	2.4	59	3.4	335	2.1	13	2.6	58	3.4	270
2.1	23	2.5	76	4.0	555	2.2	19	2.7	73	3.9	480
2.2	33	2.6	96	4.7	860	2.3	26	2.8	91	4.8	910
2.3	45	2.9	173	5.8	1,440	2.5	45	3.1	166		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	55	17	14	14	15	17	290	756	422	139	86
2	53	55	17	14	14	15	17	300	724	422	144	86
3	53	32	17	14	14	15	17	365	1,020	408	152	82
4	53	19	17	14	14	15	17	365	1,090	322	156	60
5	53	19	16	14	14	15	17	370	955	322	134	60
6	53	19	16	14	14	15	17	380	875	330	134	58
7	53	18	16	14	14	15	17	468	865	330	134	52
8	53	18	16	14	14	15	17	468	774	330	139	60
9	53	18	16	14	14	15	17	472	845	326	169	48
10	53	17	16	14	14	15	17	450	860	294	166	37
11	53	16	16	14	14	15	17	293	870	286	142	36
12	53	16	16	14	14	15	17	293	905	286	139	35
13	53	16	16	14	14	15	17	293	855	286	136	32
14	53	16	16	14	14	15	18	293	750	278	132	36
15	53	16	16	14	14	15	19	297	670	278	134	26
16	53	16	16	14	14	16	19	310	588	270	158	26
17	55	16	16	14	14	16	20	487	556	248	158	17
18	55	16	16	14	14	16	20	511	538	241	155	16
19	55	16	16	14	14	16	20	659	502	252	126	16
20	55	17	16	14	14	16	74	667	538	252	119	16
21	55	17	16	14	14	16	162	765	494	252	82	20
22	55	17	16	14	14	16	218	940	466	252	82	15
23	55	17	16	14	14	16	287	940	453	248	80	15
24	55	17	16	14	14	16	287	885	440	205	75	15
25	55	17	16	14	14	16	284	729	330	202	82	15
26	55	17	16	14	14	16	284	595	326	142	80	16
27	55	17	16	14	14	16	284	527	322	169	86	20
28	55	17	16	14	14	16	284	527	322	172	80	20
29	55	17	16	14	14	16	287	527	326	172	78	15
30	55	17	15	14	-	16	287	527	362	166	78	15
31	55	-	14	14	-	16	-	684	-	136	84	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,673	55	53	54.0	3,320
November.....	601	55	16	20.0	1,190
December.....	497	17	14	16.0	986
Calendar year 1947	38,278	663	11	105	75,930
January.....	434	14	14	14.0	861
February.....	406	14	14	14.0	805
March.....	481	16	15	15.5	954
April.....	3,075	287	17	102	6,100
May.....	15,879	940	290	506	31,100
June.....	19,377	1,090	322	646	39,430
July.....	8,299	422	136	268	16,460
August.....	3,733	169	75	120	7,400
September.....	1,051	86	15	35.0	2,080
Water year 1947-48	55,306	1,090	14	151	109,700

Note.- No gage-height record Dec. 3-7, 9-14, Dec. 16 to Apr. 12; discharge computed on basis of discharge measurement made Jan. 12 and gate openings at Terrace Reservoir.



## La Jara Creek at Gallegos Ranch, near Capulin, Colo.

Location.- Water-stage recorder, lat. 37°09', long. 106°13', in NE $\frac{1}{4}$  sec. 32, T. 34 N., R. 7 E., 2 miles upstream from former station (published as La Jara Creek near Capulin), 2 $\frac{1}{2}$  miles upstream from Canyon Del Rancho, 11 miles southwest of Capulin, and 11 $\frac{1}{2}$  miles downstream from La Jara Reservoir.

Drainage area.- 79 square miles.

Records available.- May 1936 to September 1948 (no winter records).

Extremes.- Maximum discharge during year, 319 second-feet Apr. 20 (gage height, 4.03 feet), from rating curve extended above 190 second-feet; minimum daily recorded, 5.6 second-feet Sept. 24, 25.

1936-48: Maximum discharge, 653 second-feet Apr. 15, 1937 (gage height, 5.94 feet), from rating curve extended above 220 second-feet; minimum daily recorded, 3.5 second-feet Nov. 28, 1936.

Remarks.- Records good except those below 10 second-feet and those for periods of ice effect or no gage-height record, which are fair. Small diversions above station for irrigation. Flow regulated by La Jara Reservoir (capacity, 14,040 acre-feet).

Revisions.- W 878: Drainage area.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.8	30					a12	144	67	14	38	26
2	7.8						a13	117	45	12	39	27
3	7.8	29					a15	113	40	12	38	27
4	7.4	13					a16	108	31	12	38	26
5	7.4	10					a15	109	26	12	39	26
6	7.8	9.0					a17	112	24	11	38	26
7	7.8	7.8					18	127	23	11	34	25
8	8.2	11					17	105	24	9.4	34	26
9	8.2	11					18	74	21	9.4	31	21
10	8.2	*8.2					25	60	19	9.4	31	20
11	11	6.6					76	54	18	9.4	21	19
12	12	7.4					25	48	19	9.4	18	19
13	9.8	12					25	44	16	8.9	17	19
14	15	12					29	53	14	22	26	19
15	13	8.2					48	62	12	38	26	19
16	10	9.8					76	66	12	38	22	19
17	9.8	16					124	59	12	59	20	26
18	9.4	10					146	56	12	39	29	26
19	9.0	15					161	54	13	43	31	26
20	9.0	13					190	54	18	42	29	26
21	9.4	10					189	46	16	44	29	26
22	10	11					181	38	18	42	29	21
23	9.8	14					132	32	17	38	28	7.2
24	10	13					81	38	14	33	18	5.6
25	9.8	16					62	123	13	30	12	5.6
26	9.8	14					63	99	13	25	8.0	8.9
27	29	14					76	84	12	23	7.2	6.8
28	31	12					114	67	14	24	6.8	7.2
29	31	12					149	53	14	29	6.4	7.2
30	31	11					157	42	14	31	6.4	7.2
31	30	-					-	38	-	37	25	-
Month						Second-foot-days	Maximum	Minimum	Mean		Runoff in acre-feet	
October.....						397.2	31	7.4	12.8		788	
November.....						395.0	30	6.6	13.2		783	
December.....						-	-	-	-		-	
Calendar year .....						-	-	-	-		-	
January.....						-	-	-	-		-	
February.....						-	-	-	-		-	
March.....						-	-	-	-		-	
April.....						2,230	190	12	74.3		4,420	
May.....						2,276	144	32	73.4		4,510	
June.....						611	67	12	20.4		1,210	
July.....						756.9	44	8.9	24.4		1,500	
August.....						776.8	39	6.4	25.1		1,540	
September.....						570.7	27	5.6	19.0		1,130	
Water year .....						-	-	-	-		-	

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations on nearby streams.

Note.- Stage-discharge relation affected by ice Nov. 7-30.

Trinchera Creek above Turners Ranch, near Fort Garland, Colo.

Location.- Water-stage recorder, lat. 37°22', long. 105°19', in sec. 2, T. 31 S., R. 71 W., just upstream from Turners Ranch and 7 miles southeast of Fort Garland.

Drainage area.- 45 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. April 1923 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 160 second-feet June 2 (gage height, 3.36 feet); minimum not determined, occurred during period of no gage-height record.

1923-48: Maximum discharge, 689 second-feet May 27, 1942, from rating curve extended above 240 second-feet; maximum gage height, 3.47 feet May 15, 1944; minimum daily discharge recorded, 3.0 second-feet Oct. 3, 1942.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	13					12	53	140	44	20	10
2	10	13					14	52	143	42	18	9.8
3	10	13					14	53	140	41	19	9.8
4	10	13					13	52	143	40	20	9.5
5	10	12					14	53	135	39	22	9.2
6	9.7	11					14	54	128	39	20	8.9
7	9.7	*12					15	60	125	38	19	8.6
8	9.7						16	65	122	35	19	8.9
9	9.7						15	63	120	34	17	9.8
10	10						16	57	118	33	16	9.2
11	10						17	53	113	32	16	8.9
12	12						16	49	109	30	17	7.7
13	12						14	47	102	30	17	7.7
14	19						16	50	94	29	17	7.7
15	17						20	60	90	28	16	8.0
16	16		8.5	6.5	7.5	9.0	*24	74	84	28	15	9.2
17	16						30	81	81	27	15	9.2
18	15						33	94	73	27	15	8.9
19	15	10					37	104	75	28	15	8.9
20	14						42	118	72	27	14	8.6
21	16						43	128	68	25	14	8.6
22	17						40	130	66	24	15	8.3
23	15						38	132	63	24	14	8.5
24	15						38	130	56	23	13	8.3
25	14						32	125	54	22	13	9.2
26	14						30	120	52	22	12	10
27	12						29	122	50	22	12	11
28	13						31	130	52	22	12	10
29	13						40	135	49	21	11	10
30	13						54	138	46	20	11	11
31	13						-	143	-	19	11	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	401.8	19	9.7	13.0	797
November.....	317	13	-	10.6	629
December.....	263.5	-	-	8.5	523
Calendar year .....	-	-	-	-	-
January.....	201.5	-	-	6.5	400
February.....	217.6	-	-	7.5	431
March.....	279.0	-	-	9.0	553
April.....	767	54	12	25.6	1,520
May.....	2,725	143	47	87.9	5,400
June.....	2,763	143	46	92.1	5,480
July.....	915	44	19	29.6	1,810
August.....	485	22	11	15.6	962
September.....	273.2	11	7.7	9.11	542
Water year 1947-48 .....	9,608.5	143	-	26.3	19,050

Peak discharge (base, 50 sec.-ft.).- May 8 (3:45 p.m.) 76 sec.-ft.; May 24 (5:30 a.m.) 143 sec.-ft.; June 2 (9 p.m.) 130 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- No gage-height record Oct. 27-31, Nov. 7 to Apr. 15 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 1 discharge measurement, weather records, and records for stations on nearby streams.

## RIO GRANDE BASIN

259

Trinchera Creek above Mountain Home Reservoir, near Fort Garland, Colo.

Location.- Water-stage recorder upstream from rating flume, lat. 37°24', long. 105°32', in sec. 31, T. 30 S., R. 71 W., 1 1/2 miles upstream from Mountain Home Reservoir Dam and 4 miles southeast of Fort Garland.

Drainage area.- 61 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. May 1933 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 150 second-feet June 4 (gage height, 1.50 feet), from rating curve extended above 110 second-feet; minimum daily, 1.2 second-feet Sept. 6-8, 21, 22.  
1923-48: Maximum discharge, 421 second-feet May 11, 1947 (gage height, 3.02 feet), from rating curve extended above 110 second-feet; minimum not determined.

Remarks.- Records good above 50 second-feet and fair below except those for period of no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	12					11	49	125	23	9.4	3.8
2	11	12					13	48	120	22	9.4	2.4
3	11	12					13	50	136	22	8.2	2.7
4	11	12					12	47	134	23	8.8	2.7
5	10	11					13	50	127	22	12	1.5
6	10	10					13	48	122	20	11	1.2
7	10	(*)					14	50	115	19	9.4	1.2
8	10						15	56	102	16	11	1.2
9	9.4		(*)				14	63	93	13	9.4	3.0
10	9.4						15	56	87	14	8.2	5.0
11	10						16	53	88	13	7.6	6.2
12	11						16	49	82	12	7.0	5.8
13	11			(*)			13	45	72	12	7.6	6.2
14	15						14	46	66	11	7.6	4.6
15	16						15	52	59	9.4	7.6	5.8
16	14		6.8	5.0	6.8	9.0	22	66	51	10	7.0	5.8
17	13						23	78	45	10	6.2	3.4
18	12	6.5					25	92	42	9.4	6.2	2.1
19	12				(*)		26	106	43	11	6.6	1.5
20	12						28	122	47	10	6.6	1.5
21	11						34	131	42	9.4	6.2	1.2
22	12						33	118	42	9.4	6.6	1.2
23	12						32	120	36	9.4	6.6	1.5
24	11						32	131	33	10	5.8	1.5
25	11						28	129	31	9.4	5.8	1.8
26	11						27	122	30	9.4	6.6	3.4
27	11						26	115	29	8.8	5.8	5.8
28	12						26	118	29	8.8	5.4	3.0
29	12					*12	32	121	27	12	5.0	3.8
30	12					12	40	129	26	11	4.6	4.6
31	12					11	-	132	-	11	4.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	356.8	16	9.4	11.5	708
November.....	225.0	12	-	7.50	446
December.....	210.8	-	-	6.8	418
Calendar year 1947.....	12,354.3	388	-	33.8	24,510
January.....	155.0	-	-	5.0	307
February.....	197.2	-	-	6.8	391
March.....	287.0	-	-	9.26	569
April.....	641	40	11	21.4	1,270
May.....	2,590	132	45	83.5	5,140
June.....	2,083	136	26	69.4	4,130
July.....	410.4	23	8.8	13.2	814
August.....	229.4	12	4.2	7.40	455
September.....	95.4	6.2	1.2	3.18	189
Water year 1947-48.....	7,481.0	136	1.2	20.4	14,840

Peak discharge (base, 40 sec.-ft.)- May 9 (3 a.m.) 68 sec.-ft.; June 4 (1 a.m.) 150 sec.-ft.  
\* Winter discharge measurement made on this day.  
Note.- No gage-height record Nov. 7 to Mar. 28 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 4 discharge measurements and weather records.

Trinchera Creek below Smith Reservoir, near Blanca, Colo.

Location.- Water-stage recorder, lat. 37°23', long. 105°35', in sec. 5, T. 31 S., R. 73 W., 1 mile downstream from Smith Reservoir and 5 miles southwest of Blanca.

Drainage area.- 396 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey.

October 1929 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 183 second-feet May 29 (gage height, 2.64 feet); minimum daily, 0.3 second-foot Aug. 15, 20-24, Aug. 27 to Sept. 30.

1929-48: Maximum daily discharge, 1,340 second-feet May 11, 1942; minimum daily recorded, 0.1 second-foot at times in 1937, 1938, 1945, and 1947.

Remarks.- Records good above 10 second-feet and fair below. Diversions above station for irrigation. Flow regulated by Smith Reservoir (capacity, 5,335 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.6	0.6	1.0	0.9	1.2	38	50	130	157	16	0.6	0.3
2	.6	.6	1.0	.9	1.2	31	48	146	154	16	.6	.3
3	.6	.6	1.0	.9	1.2	27	51	147	158	17	.6	.3
4	.6	.6	1.0	.9	1.2	24	52	136	157	17	.6	.3
5	.6	.6	1.0	.9	1.2	24	51	125	138	17	.5	.3
6	.6	.8	1.0	.9	1.2	24	50	109	134	17	.5	.3
7	.5	.8	1.0	.9	1.2	25	51	105	124	18	.5	.3
8	.5	.8	1.0	.9	1.2	25	51	100	104	18	.5	.3
9	.5	.8	*1.0	.9	1.2	26	80	111	95	12	.5	.3
10	.6	.8	1.0	.9	1.2	25	62	124	73	1.1	.5	.3
11	.7	.8	1.0	.9	1.3	24	66	127	61	1.2	.5	.3
12	.7	.8	1.0	.9	1.3	22	74	124	56	1.2	.8	.3
13	.7	.8	1.0	.9	1.3	23	72	111	60	1.2	.6	.3
14	.7	.8	1.0	.9	*1.3	24	71	91	64	1.1	.5	.3
15	.5	.8	1.0	.9	1.3	26	61	73	50	1.0	.3	.3
16	.5	.9	1.0	.9	1.3	28	59	77	32	1.0	.4	.3
17	.5	.9	1.0	.9	1.3	29	62	83	20	1.0	.4	.3
18	.5	.9	1.0	.9	1.3	31	82	94	15	1.0	.5	.3
19	.5	.9	1.0	.9	1.3	33	110	105	14	.9	.5	.3
20	.5	.9	1.0	.9	*55	33	128	118	15	.9	.3	.3
21	.5	.9	1.0	1.0	1.27	34	145	130	19	.8	.3	.3
22	.4	.9	1.0	1.0	90	33	159	133	20	.8	.3	.3
23	.4	.9	1.0	1.0	66	34	162	135	19	.8	.3	.3
24	.4	.9	1.0	1.0	53	39	163	127	18	.8	.3	.3
25	.4	.9	1.0	1.0	45	45	153	141	18	.8	.4	.3
26	.5	.9	1.0	1.1	39	46	142	157	17	.8	.4	.3
27	.5	.9	1.0	1.1	36	45	127	171	16	.8	.3	.3
28	.5	.9	1.0	1.1	36	47	114	173	16	.8	.3	.3
29	.5	.9	1.0	1.1	37	49	105	178	16	.8	.3	.3
30	.5	.9	1.0	1.1	-	52	112	179	16	.8	.3	.3
31	.5	-	1.0	1.1	-	53	-	166	-	.7	.3	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	16.6	0.7	0.4	0.54	33
November.....	24.5	.9	.6	.82	49
December.....	31.0	1.0	1.0	1.00	61
Calendar year 1947.....	6,249.2	296	1	17.1	12,400
January.....	29.6	1.1	.9	.95	59
February.....	607.7	127	1.2	21.0	1,210
March.....	1,019	53	22	32.9	2,020
April.....	2,693	163	48	89.8	5,340
May.....	3,926	179	73	127	7,790
June.....	1,854	158	14	61.8	3,680
July.....	1,668.3	18	.7	5.43	334
August.....	13.7	.8	.3	.44	27
September.....	9.0	.3	.3	.30	16
Water year 1947-48.....	10,392.4	179	.3	28.4	20,620

\* Winter discharge measurement made on this day.

Note.- No gage-height record Nov. 15 to Feb. 19 (stage-discharge relation affected by ice during part of period); discharge computed on basis of 3 discharge measurements and gate openings at Smith Reservoir.

# RIO GRANDE BASIN

261

Sangre de Cristo Creek near Fort Garland, Colo.

Location.- Water-stage recorder, lat. 37°26', long. 105°24', in sec. 23, T. 30 S., R. 72 W., 1½ miles east of Fort Garland and 4 miles upstream from Ute Creek.

Drainage area.- 187 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. March to October 1916 and May 1923 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 309 second-feet May 25 (gage height, 6.24 feet); minimum daily, 0.1 second-foot Sept. 7, 15, 23, 24.  
1916, 1923-48: Maximum discharge, 1,520 second-feet Aug. 31, 1936, by slope-area method; maximum gage height, 7.65 feet May 10, 1942, from floodmarks; no flow at times during 1934-36, 1939-40, 1943, 1946.

Remarks.- Records good except those for period of ice effect or no gage-height record, which are poor. A few diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.4	12					24	255	194	33	8.2	2.1
2	9.0	11					25	230	162	30	9.6	1.6
3	9.0	11					32	211	158	28	8.7	1.8
4	9.0	11					39	182	135	28	11	1.8
5	9.0	(b)					36	173	122	28	13	1.0
6	9.0	(*)				11	43	162	112	32	14	.4
7	9.4						46	162	109	28	11	.1
8	9.4						46	175	108	25	11	.7
9	9.4		(*)				52	171	96	22	9.2	1.8
10	9.4						64	160	87	21	7.8	2.4
11	9.4						80	158	81	22	6.4	2.4
12	10						57	149	81	19	6.4	1.8
13	12						44	128	71	18	7.3	1.3
14	14						43	115	65	16	7.3	.4
15	16						52	122	61	16	6.4	.1
16	14		11.5	11	11	12	82	138	57	16	6.4	.4
17	12	9.0					121	153	53	15	6.0	.7
18	12						159	184	49	14	6.0	.4
19	12						183	168	53	13	9.6	.4
20	11				(*)		190	164	82	13	8.7	.4
21	*11						201	158	60	13	6.4	.7
22	11						194	149	59	14	6.0	.7
23	12						181	138	56	14	8.0	.1
24	11						179	162	48	14	5.2	.1
25	11					18	142	241	43	12	5.6	.7
26	11						142	273	41	12	4.7	2.1
27	11						143	294	39	11	3.9	4.3
28	11						149	291	42	10	3.0	4.3
29	11					*28	175	250	43	9.2	2.4	4.3
30	11						35	241	204	37	8.7	3.9
31	11						31	-	-	8.7	2.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	336.4	16	9.0	10.9	667
November.....	279.0	-	-	9.30	553
December.....	356.5	-	-	11.5	707
Calendar year 1947.....	15,510.0	394	-	42.5	30,750
January.....	341	-	-	11	676
February.....	319	-	-	11	633
March.....	488	35	-	15.1	928
April.....	3,165	241	24	106	6,280
May.....	5,668	294	115	183	11,280
June.....	2,404	194	37	80.1	4,770
July.....	563.6	33	8.7	18.2	1,120
August.....	221.7	14	2.1	7.15	440
September.....	43.2	4.3	.1	1.44	86
Water year 1947-48.....	14,183.4	294	.1	38.8	28,140

Peak discharge (base, 75 sec.-ft.)- Apr. 21 (4 a.m.) 232 sec.-ft.; May 1 (5 a.m.) 282 sec.-ft.; May 25 (4:30 p.m.) 309 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Nov. 7 to Mar. 28 (stage-discharge relation affected by ice during most of period), July 16-19; discharge computed on basis of 3 discharge measurements and weather records.

## Ute Creek near Fort Garland, Colo.

Location.- Water-stage recorder upstream from rating flume, lat. 37°28', long. 105°24', in sec. 2, T. 30 S., R. 72 W., 2½ miles north of Fort Garland and 6 miles upstream from mouth.

Drainage area.- 32 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. March to October 1916 and May 1923 to September 1948 in reports of State engineer. (No winter records some years.)

Extremes.- Maximum discharge during year, 171 second-feet June 20 (gage height, 2.72 feet); minimum daily recorded, 2.8 second-feet Sept. 24. 1916, 1923-48: Maximum daily discharge, 630 second-feet May 15, 1941; minimum daily, 1.5 second-feet Sept. 23, 1944.

Remarks.- Records excellent above 10 second-feet and good below except those for period of no gage-height record, which are poor. A few diversions above station for irrigation.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used Oct. 1-3, Oct. 16 to Nov. 14)

0.4	1.5	0.7	12	1.6	69
.5	4.0	.8	17	2.3	127
.6	7.5	1.2	41	2.8	181

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	9.3					13	71	103	59	17	6.8
2	12	7.5					14	68	107	58	16	6.4
3	12	5.4					16	63	141	54	15	6.4
4	11	5.4					16	56	134	54	14	6.1
5	11	6.1					16	54	122	54	72	5.8
6		8.8	6.8				18	54	121	48	53	5.4
7		7.2	*7.5				18	59	123	48	33	5.4
8		6.4	10				18	66	124	47	27	5.8
9		5.8	9.3				19	68	122	44	24	6.1
10		6.1	9.8				24	63	111	43	22	6.1
11		6.4	8.4				25	61	112	42	19	6.1
12		8.4	8.4				22	52	116	42	19	6.1
13		12	9.8				19	46	116	38	18	5.4
14		14	8.4				19	43	104	34	16	5.8
15		14	7.9				22	52	95	35	15	5.8
16		12	8.7				31	68	89	32	14	5.4
17		12	8.4				39	89	82	30	13	5.4
18		12	8.2				45	103	79	30	13	5.0
19		11	8.2				50	106	91	29	14	4.7
20		11	7.0				52	109	116	31	12	4.0
21		10	7.3				58	128	92	30	12	3.5
22		12	7.7				58	131	69	25	22	3.2
23		11	7.5				51	123	60	25	20	3.0
24		11	8.2				47	125	54	25	18	2.8
25		11	9.4				40	108	49	24	16	3.5
26		10	8.6				39	91	54	22	13	4.4
27		9.8	9.4				37	84	57	22	12	5.0
28		9.8	8.7				39	84	53	20	9.8	7.2
29		9.8	8.1				48	85	53	19	8.8	6.8
30		9.3	7.6				65	67	56	18	8.4	8.4
31		9.3	-				-	99	-	18	8.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	320.1	14	5.8	10.3	635
November.....	243.0	10	5.4	8.10	482
December.....	217.0	-	-	7.0	430
Calendar year .....	-	-	-	-	-
January.....	167.4	-	-	5.4	332
February.....	165.6	-	-	6.4	368
March.....	272.8	-	-	8.8	541
April.....	978	65	13	32.6	1,940
May.....	2,474	131	43	79.8	4,910
June.....	2,797	141	49	95.2	5,550
July.....	1,098	59	18	35.4	2,180
August.....	592.4	72	8.4	19.1	1,180
September.....	161.8	8.4	2.8	5.39	321
Water year 1947-48 .....	9,507.1	141	2.8	26.0	18,870

Peak discharge (base, 80 sec.-ft.)- May 22 (1 a.m.) 144 sec.-ft.; June 3 (12 p.m.) 150 sec.-ft.; June 20 (1 a.m.) 171 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- No gage-height record Nov. 15 to Mar. 31 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 1 discharge measurement, weather records, and records for stations on nearby streams.

## RIO GRANDE BASIN

Conejos River at Platoro, Colo.

Location.- Water-stage recorder, lat. 37°21'00", long. 106°31'30", in sec. 22, T. 36 N., R. 4 E., half a mile east of Platoro and 5 miles downstream from Adams Fork.

Drainage area.- 44.4 square miles.

Records available.- April 1937 to September 1948 (no winter records).

Extremes.- Maximum discharge during year, 1,300 second-feet June 3 (gage height, 3.26 feet); from rating curve extended above 680 second-feet; minimum daily recorded, 7.0 second-feet Sept. 15, 16.

1937-48: Maximum discharge, 1,310 second-feet June 25, 1941, from rating curve extended above 850 second-feet; maximum gage height, that of June 3, 1948; minimum daily discharge recorded, 3.5 second-feet Oct. 20, 1943.

Remarks.- Records excellent above 50 second-feet and good below except those for periods of ice effect or no gage-height record, which are fair. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	*37						a205	576	382	47	16
2	48	36						a198	688	346	44	14
3	44	34						a190	998	320	44	13
4	41	33						a180	920	311	44	12
5	37	34						a280	829	289	133	11
6	36	34						360	803	264	83	11
7	34	b30						400	754	260	65	10
8	33	b35						346	772	232	67	9.4
9	30	b45						244	822	200	55	8.8
10	30	38						180	822	180	48	8.8
11	41	b36						145	898	170	47	9.7
12	49	b34						127	959	154	58	8.8
13	52	31						160	829	142	47	7.9
14	75	b33						268	718	127	41	7.9
15	66	b32						400	654	119	36	7.0
16	68	34						500	593	111	35	7.0
17	68	25						549	576	100	31	7.9
18	75	b33						637	544	105	30	7.9
19	77	17						750	538	127	31	7.9
20	77	9.7						784	470	125	28	7.9
21	82	b10						855	425	98	26	7.9
22	77	b12						868	328	83	38	7.9
23	66	b15						742	260	77	38	7.9
24	62	b14						593	240	73	30	7.9
25	54	19						475	252	79	33	9.7
26	51	19						378	306	71	27	19
27	48	19						351	333	67	22	17
28	48	b17						387	324	63	21	17
29	44	16						544	338	59	19	13
30	43	18						637	374	55	17	14
31	37	-						688	-	50	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,645	82	30	53.1	3,260
November.....	799.7	45	9.7	26.7	1,590
December.....	-	-	-	-	-
Calendar year .....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	-	-	-	-	-
May.....	13,431	868	127	433	26,640
June.....	17,933	998	240	598	35,570
July.....	4,839	362	50	156	9,600
August.....	1,301	133	16	42.0	2,580
September.....	315.2	19	7.0	10.5	625
Water year .....	-	-	-	-	-

Peak discharge (base, 830 sec.-ft.)- May 21 (4 p.m.) 1,140 sec.-ft.; June 3 (8 p.m.) 1,300 sec.-ft.; June 12 (8 p.m.) 1,200 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for station near Mogote.

b Stage-discharge relation affected by ice.

905771 O - 50 - 18



## Conejos River near Mogote, Colo.

Location.- Water-stage recorder, lat. 37°03', long. 106°11', in SW<sup>1</sup>/<sub>4</sub> sec. 34, T. 33 N., R. 7 E., three-quarters of a mile downstream from Fox Creek and 5<sup>1</sup>/<sub>2</sub> miles west of Mogote.

Drainage area.- 282 square miles.

Records available.- September 1899 to March 1900, April 1903 to September 1913, and October 1933 to September 1948 in reports of Geological Survey. September 1899 to March 1900 and April 1903 to September 1948 in reports of State engineer.

Average discharge.- 46 years (1902-48), 371 second-feet.

Extremes.- Maximum discharge during year, 3,530 second-feet June 4 (gage height, 5.22 feet); minimum daily, 32 second-feet Jan. 28.  
1899-1900, 1903-48: Maximum discharge, 3,000 second-feet Oct. 5, 1911 (gage height, 8.50 feet, site and datum then in use), from rating curve extended above 3,500 second-feet; minimum, 18 second-feet (discharge measurement) Dec. 19, 1939.

Remarks.- Records good except those for period of ice effect, which are fair. No diversion or regulation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	139	110	*77	50	47	56	*105	1,170	2,210	882	142	53
2	126	105	75	47	*46	45	108	1,100	2,180	822	137	53
3	123	99	64	*50	55	52	126	1,080	2,970	697	129	53
4	110	91	62	52	53	50	142	1,040	3,050	675	126	51
5	102	83	54	53	50	*47	129	1,170	2,640	668	192	46
6	96	81	58	54	52	55	139	1,290	2,460	609	246	44
7	94	60	57	55	43	57	149	1,490	2,380	603	182	43
8	88	67	54	58	40	57	166	1,450	2,120	554	182	42
9	84	64	59	61	37	64	198	1,170	2,250	492	158	43
10	83	88	47	62	38	63	261	926	2,310	447	135	49
11	96	67	48	64	40	63	326	814	2,320	419	120	46
12	139	66	49	56	36	52	255	712	2,360	398	126	45
13	136	77	48	46	40	56	225	737	2,190	365	126	42
14	213	70	52	49	43	60	247	1,060	1,850	334	112	41
15	202	57	54	50	46	57	326	1,580	1,660	316	102	40
16	205	63	*57	52	*48	50	462	1,870	1,530	296	97	39
17	182	77	55	44	53	54	572	1,970	1,400	279	89	41
18	175	62	57	54	57	52	704	2,040	1,360	270	88	41
19	175	69	57	*54	60	48	728	2,350	1,370	334	95	40
20	169	56	57	52	62	52	839	2,490	1,380	331	86	41
21	175	47	59	54	60	43	917	2,780	1,190	296	78	39
22	179	59	57	54	57	*44	980	2,910	1,020	255	83	38
23	156	72	57	49	62	49	822	2,780	805	240	92	39
24	149	66	56	52	59	56	610	2,430	696	229	86	38
25	129	91	58	49	56	66	476	2,190	680	235	83	40
26	123	83	56	46	59	69	434	1,720	728	249	82	77
27	123	83	56	37	62	67	476	1,540	830	208	71	73
28	123	72	56	32	60	83	688	1,450	805	184	65	70
29	119	72	57	40	60	94	962	1,730	805	174	62	64
30	123	66	58	43	-	123	1,100	2,010	839	160	58	56
31	113	-	56	44	-	108	-	2,350	-	146	56	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	4,249	213	83	137	8,430
November.....	2,243	110	47	74.8	4,450
December.....	1,767	77	47	57.0	3,500
Calendar year 1947 .....	110,633	1,940	41	303	219,400
January.....	1,563	64	32	50.4	3,100
February.....	1,481	62	36	51.1	2,940
March.....	1,892	123	43	61.0	3,750
April.....	13,662	1,100	105	455	27,100
May.....	51,399	2,910	712	1,658	101,900
June.....	50,288	3,050	680	1,675	99,740
July.....	12,167	862	146	392	24,130
August.....	3,486	246	56	112	6,910
September.....	1,427	77	38	47.6	2,830
Water year 1947-48 .....	145,624	3,050	32	398	288,800

Peak discharge (base, 1,700 sec.-ft.)- May 22 (5 a.m.) 3,260 sec.-ft.; June 4 (6:15 a.m.) 3,530 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Dec. 6 to Mar. 29.

## Conejos River near La Sauses, Colo.

Location.- Two water-stage recorders (two channels), lat. 37°23', long. 105°45', in sec. 2, T. 35 N., R. 11 E., half a mile upstream from mouth and 2 miles north of La Sauses. Datum of gage (north channel) is 7,495.02 feet above mean sea level (Colorado State Highway Department bench mark).

Drainage area.- 887 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. March 1921 to September 1948 in reports of State engineer.

Average discharge.- 27 years, 236 second-feet.

Extremes.- Maximum discharge during year, 2,430 second-feet June 5; no flow July 30 to Aug. 6, Aug. 11, 16-18, Aug. 30 to Sept. 1.  
1921-48: Maximum discharge, 3,890 second-feet May 15, 1941; no flow at times in 1934 and 1948.

Remarks.- Records good except those for periods of ice effect or no gage-height record which are fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	27	45	*53	59	55	150	188	1,330	1,680	93	0	0
2	27	49	53	*61	*57	120	172	1,340	1,810	76	0	.4
3	27	48	61	61	93	115	163	1,180	1,780	63	0	.6
4	26	49	70	61	64	103	176	1,050	2,150	56	0	.8
5	21	52	73	60	62	*93	173	1,040	2,380	55	0	.9
6	20	52	71	60	58	88	161	1,170	2,290	48	0	.9
7	20	52	70	61	54	87	153	1,290	2,090	42	.2	.9
8	23	53	65	66	52	87	145	1,410	1,930	24	.3	1.1
9	24	54	65	66	50	86	147	1,240	1,650	5.8	.3	1.5
10	24	54	63	66	52	84	158	850	1,600	2.6	.1	1.7
11	21	54	66	68	a55	88	224	591	1,520	1.8	0	1.5
12	21	54	60	70	a51	83	321	480	1,540	1.7	.3	1.5
13	21	54	63	65	a51	83	259	596	1,530	2.2	.6	1.5
14	24	48	62	62	a58	89	212	487	1,380	2.2	.3	1.3
15	28	45	56	58	a65	87	208	729	1,080	.8	.1	1.1
16	45	44	*60	59	*70	90	307	1,080	799	.8	0	1.2
17	36	44	60	57	77	97	453	1,340	608	.8	0	1.7
18	39	42	60	56	80	130	675	1,430	474	.8	0	2.1
19	37	44	60	*58	84	134	886	1,600	339	.8	.1	2.1
20	40	48	58	47	86	150	1,030	1,880	482	.6	.2	2.4
21	46	48	56	42	87	151	1,280	2,060	496	.5	.2	2.3
22	48	48	56	47	87	135	1,490	2,220	464	.5	.4	2.7
23	38	50	54	51	93	150	1,510	2,260	415	.4	.4	3.2
24	42	50	55	52	100	203	1,130	2,270	300	.4	.5	2.9
25	43	46	56	50	98	254	687	2,150	231	.8	.5	3.0
26	47	46	54	46	97	221	438	2,200	176	1.0	.4	4.9
27	44	47	53	41	101	205	326	1,710	130	1.0	.4	5.0
28	41	47	53	33	116	194	378	1,460	138	.4	.4	5.1
29	43	53	53	42	137	208	645	1,330	132	.1	.1	4.9
30	43	53	56	50	-	228	1,090	1,360	126	0	0	5.1
31	45	-	59	54	-	216	-	1,460	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,031	48	20	33.3	2,040
November.....	1,471	54	42	49.0	2,920
December.....	1,854	73	53	59.8	3,680
Calendar year 1947.....	42,764.5	1,440	1.5	117	84,840
January.....	1,729	70	33	55.8	3,430
February.....	2,160	137	50	74.5	4,280
March.....	4,211	254	83	136	9,350
April.....	15,195	1,510	145	506	30,120
May.....	42,413	2,270	396	1,368	84,120
June.....	31,720	2,380	126	1,057	62,920
July.....	482.0	93	0	15.5	956
August.....	5.8	.6	0	.19	12
September.....	64.3	5.1	0	2.14	128
Water year 1947-48.....	102,326.1	2,380	0	280	203,000

Peak discharge (base, 2,000 sec.-ft.).- May 24 (10 a.m.) 2,340 sec.-ft.; June 5 (1:45 p.m.) 2,430 sec.-ft.

\* Winter discharge measurement made on this day.  
a No gage-height record on main channel (stage-discharge relation affected by ice during period); discharge computed on basis of 1 discharge measurement, weather records, and records for stations on nearby streams.

Note.- Stage-discharge relation affected by ice Dec. 13, 14, 19 on secondary channel and Jan. 17 to Feb. 10 on main channel. No gage-height record on secondary channel Jan. 1 to Feb. 18, Mar. 4, 5 (stage-discharge relation affected by ice during most of periods); discharge computed on basis of 5 discharge measurements, weather records, and records for station on main channel.

## RIO GRANDE BASIN

San Antonio River at Ortiz, Colo.

Location.- Water-stage recorder, lat. 37°00', long. 106°02', in New Mexico, in sec. 19, T. 32 N., R. 9 E., a quarter of a mile south of Colorado-New Mexico State line, half a mile south of Ortiz, and half a mile upstream from Los Pinos Creek.

Drainage area.- 110 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. January to October 1915, May 1919 to October 1920, and October 1924 to September 1948 in reports of State engineer. (No winter records prior to 1941.)

Extremes.- Maximum discharge during year, 395 second-feet Apr. 30 (gage height, 3.04 feet); no flow Oct. 2, July 13 to Aug. 4, Aug. 7-11, Aug. 15 to Sept. 24.  
1915, 1919-20, 1924-48: Maximum discharge, 1,750 second-feet Apr. 15, 1937 (gage height, 5.38 feet), from rating curve extended above 1,100 second-feet; no flow at times in most years.

Remarks.- Records fair except those for periods of ice effect or no gage-height record, which are poor. A few small diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	2.7	(*)				8	309	65	2.0	0	0
2	0	2.7		(*)			8	259	46	2.0	0	0
3	.3	*2.7					9	250	49	2.4	0	0
4	.8	2.9					11	228	36	1.8	0	0
5	.9	2.5					10	242	30	1.3	.1	0
6	.9						13	242	26	.9	.2	0
7	.6						19	245	24	.8	0	0
8	1.3	2.9					26	218	24	.5	0	0
9	1.5						45	150	21	.2	0	0
10	1.5						70	113	19	.1	0	0
11	.6						120	106	16	.1	0	0
12	.2	(*)					*111	95	18	.1	1.0	0
13	1.1						101	93	14	0	.2	0
14	4.9						93	131	11	0	.1	0
15	13						161	129	9.6	0	0	0
16	7.6		2.2	1.0	1.5 (*)	2.5	239	126	7.9	0	0	0
17	5.8						262	104	6.4	0	0	0
18	4.4						279	93	4.9	0	0	0
19	3.8						276	84	5.2	0	0	0
20	3.5						279	75	27	0	0	0
21	2.9	2.8					315	62	11	0	0	0
22	3.5						352	48	12	0	0	0
23	5.2						321	37	17	0	0	0
24	3.8						220	33	8.5	0	0	0
25	3.5						153	82	5.8	0	0	.1
26	2.9						116	90	4.1	0	0	.2
27	2.9						104	75	3.5	0	0	.2
28	3.2						142	64	3.5	0	0	.2
29	2.9						279	54	4.1	0	0	.2
30	3.2						324	41	5.2	0	0	.1
31	3.8						-	38	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	90.8	13	0	2.93	180
November.....	84.0	-	-	2.80	167
December.....	68.2	-	-	2.2	135
Calendar year 1947 .....	8,420.9	333	-	23.1	16,710
January.....	31.0	-	-	1.0	61
February.....	43.5	-	-	1.5	86
March.....	77.5	-	-	2.5	134
April.....	4,466	352	8	149	8,860
May.....	3,916	309	33	126	7,770
June.....	534.7	65	3.5	17.8	1,060
July.....	12.2	2.4	0	.39	24
August.....	1.6	1.0	0	.05	3.2
September.....	1.0	.2	0	.03	2.0
Water year 1947-48 .....	9,326.5	352	0	25.5	18,500

Peak discharge (base, 330 sec.-ft.)- Apr. 22 (2 a.m.) 392 sec.-ft.; Apr. 30 (2:15 a.m.) 395 sec.-ft.; May 5 (1 p.m.) 349 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- Stage-discharge relation affected by ice Nov. 6-11. No gage-height record Nov. 12 to Apr. 11 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 4 discharge measurements and weather records.

San Antonio River at mouth, near Manassa, Colo.

Location.- Water-stage recorder, lat 37°11', long. 105°53', in sec. 21, T. 34 N., R. 10 E., 1 mile upstream from mouth and 2½ miles east of Manassa.

Drainage area.- 348 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. April 1923 to September 1948 in reports of State engineer.

Average discharge.- 25 years, 98.5 second-feet.

Extremes.- Maximum discharge during year, 1,160 second-feet May 21 (gage height, 5.68 feet); no flow Oct. 1-24, Aug. 18, Aug. 21 to Sept. 30.

1923-48: Maximum discharge, 2,620 second-feet May 14, 1941 (gage height, 6.26 feet), from rating curve extended above 2,200 second-feet; no flow at times in most years.

Remarks.- Records excellent above 20 second-feet and fair below except those for period of no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.9					3.0	960	732	48	0.5	
2	0	1.4			(*)		2.9	856	678	45	.5	
3	0	1.7					2.8	819	756	45	.5	
4	0	1.4					2.9	770	940	41	.5	
5	0	.6					2.9	876	896	37	.8	
6	0	.5					2.8	944	763	29	.7	
7	0	.4					*2.7	1,000	687	18	.6	
8	0	.5					2.5	1,010	610	14	.6	
9	0	.5					3.8	812	518	10	.4	
10	0	.5					24	592	492	6.7	.4	
11	0	.5					76	495	448	2.5	.3	
12	0	*.4					100	408	455	2.2	.4	
13	0	.4					67	347	420	1.9	.4	
14	0	.4					57	480	342	1.7	.4	
15	0	.4					80	624	272	1.5	.3	
16	0	.4	0.4 (*)	0.6	2.5	10	168	756	207	1.5	.2	
17	0	.4					254	774	150	1.4	.1	
18	0	.4					335	749	122	1.4	0	
19	0	.4		(*)			432	840	102	1.4	.1	
20	0	.4					538	990	192	1.5	.1	
21	0	.4					690	1,080	177	1.2	0	
22	0	.4				(*)	816	1,020	168	1.2	0	
23	0	.4					826	944	158	.9	0	
24	0	.4					582	836	120	.9	0	
25	.1	.4					410	960	88	1.2	0	
26	.3	.4					338	928	68	.9	0	
27	.3	.4					316	660	64	.8	0	
28	.4	.4					368	588	77	.8	0	
29	.4	.4					595	558	79	.6	0	
30	.5	.4					860	538	66	.5	0	
31	.7	-					-	550	-	.5	0	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2.7	0.7	0	0.09	5.4
November.....	16.5	1.7	.4	.55	33
December.....	12.4	-	-	.4	25
Calendar year 1947 .....	20,997.9	936	0	57.5	41,650
January.....	18.6	-	-	.6	37
February.....	72.5	-	-	2.5	144
March.....	310	-	-	10	615
April.....	7,958.3	860	2.5	265	15,790
May.....	23,764	1,080	347	767	47,140
June.....	10,847	940	64	362	21,510
July.....	321.2	49	.5	10.4	637
August.....	7.8	.8	0	.25	15
September.....	0	0	0	0	0
Water year 1947-48 .....	43,321.0	1,080	0	118	85,950

Peak discharge (base, 500 sec.-ft.)- Apr. 23 (10 a.m.) 924 sec.-ft.; May 1 (12:30 p.m.) 1,100 sec.-ft.; May 7 (2 p.m.) 1,140 sec.-ft.; May 21 (2 p.m.) 1,160 sec.-ft.; June 4 (1 p.m.) 995 sec.-ft.

\* Winter discharge measurement made on this day.

Note.- No gage-height record Nov. 13 to Apr. 6 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 4 discharge measurements and weather records.

## Los Pinos River near Ortiz, Colo.

Location.- Water-stage recorder, lat. 36°58', long. 106°03', in New Mexico, in N<sup>1</sup>/<sub>2</sub> sec. 34, T. 32 N., R. 8 E., 1 mile south of Colorado-New Mexico State line, 2 miles southwest of Ortiz, and 2½ miles upstream from mouth.

Drainage area.- 167 square miles.

Records available.- October 1933 to September 1948 in reports of Geological Survey. January 1914 to November 1920 and October 1924 to September 1948 in reports of State engineer. (No winter records most years.)

Extremes.- Maximum discharge during year, 1,660 second-feet May 20 (gage height, 4.67 feet); from rating curve extended above 1,000 second-feet; minimum daily recorded, 10 second-feet Sept. 23, 24.

1914-20, 1924-48: Maximum discharge, 3,160 second-feet May 12, 1941 (gage height, 5.77 feet); from rating curve extended above 1,600 second-feet; minimum observed, 4.0 second-feet Dec. 17, 1945 (discharge measurement), but may have been less during period of no gage-height record.

Remarks.- Records excellent above 75 second-feet and good below except those for period of ice effect or no gage-height record, which are fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	35	31	(*)				*39	882	655	116	21	12
2	35	29					*42	790	619	103	21	11
3	35	*28		(*)			b50	765	795	96	20	12
4	34	27					b60	810	695	90	21	12
5	28	27					61	942	603	81	40	12
6							63	1,020	547	81	45	11
7	27						71	1,110	531	80	28	11
8	25	b20					74	954	487	66	27	11
9	24						91	671	483	59	24	11
10	23						128	503	483	52	21	15
11	22						168	419	459	49	20	15
12	48	(*)					*135	380	451	46	20	13
13	44	b14					109	459	401	42	21	12
14	54						122	683	352	39	20	11
15	77						168	876	314	37	19	11
16	76		20	15	17	25	250	930	278	32	19	11
17	68				(*)		331	882	254	30	18	11
18	58	b17					471	948	239	31	19	12
19	55						563	1,040	248	43	20	12
20	50						679	1,230	289	37	19	12
21	45						785	1,140	233	30	18	11
22	45						790	942	266	28	18	11
23	45	b19					639	800	215	27	18	10
24	41						427	731	180	28	16	10
25	40						328	825	152	38	16	11
26	36						296	647	140	45	16	20
27	35						328	615	136	52	15	20
28	35	b25					471	575	140	26	13	19
29	34						760	587	136	26	13	18
30	34						894	595	120	24	12	16
31	34	-					-	635	-	23	12	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,268	77	22	40.9	2,520
November.....	617	31	-	20.6	1,220
December.....	620	-	-	20	1,250
Calendar year 1947.....	39,573	1,140	-	108	78,510
January.....	465	-	-	15	922
February.....	493	-	-	17	978
March.....	775	-	-	25	1,540
April.....	9,393	894	39	313	18,630
May.....	24,386	1,230	380	787	48,370
June.....	10,881	795	120	363	21,580
July.....	1,537	116	23	49.6	3,050
August.....	630	45	12	20.3	1,250
September.....	384	20	10	12.8	762
Water year 1947-48.....	51,449	1,230	-	141	102,100

Peak discharge (base, 900 sec.-ft.)- Apr. 21 (9:30 p.m.) 1,010 sec.-ft.; Apr. 30 (10 p.m.) 1,260 sec.-ft.; May 7 (10:30 p.m.) 1,520 sec.-ft.; May 20 (3:15 a.m.) 1,660 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage discharge relation affected by ice.

Note.- No gage-height record Dec. 1 to Apr. 1 (stage-discharge relation affected by ice during most of period); discharge computed on basis of 4 discharge measurements and weather records.

## Culebra Creek at San Luis, Colo.

Location.- Water-stage recorder and 12-foot Parshall flume, lat. 37°11', long. 105°26', in sec. 35, T. 3 N., R. 72 W., Beaubien Grant survey, 1 mile southeast of San Luis and 1½ miles upstream from Rito Seco.

Drainage area.- 220 square miles.

Records available.- January 1910 to December 1911 and October 1933 to September 1948 in reports of Geological Survey. May 1909 to December 1910 and April 1927 to September 1948 in reports of State engineer. 1911-19 (unpublished) in files of State engineer.

Average discharge.- 31 years (1909-19, 1927-48), 65.0 second-feet.

Extremes.- Maximum discharge during year, 310 second-feet June 10 (gage height, 3.05 feet); minimum daily, 11 second-feet Jan. 5.

1909-19, 1927-48: Maximum discharge, 654 second-feet July 1, 1947 (gage height, 5.09 feet), from rating curve extended above 300 second-feet; minimum daily, 5 second-feet Sept. 14-16, 1934.

Remarks.- Records excellent except those for periods of no gage-height record, which are good. Diversions above station for irrigation. Flow regulated by Sanchez Reservoir on Ventero Creek (capacity, 103,000 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	42	36	27	13	a16	37	18	15	73	173	147	93
2	40	34	23	12	a29	34	19	15	92	187	227	65
3	41	40	34	21	29	29	20	26	98	146	215	48
4	37	39	34	17	30	15	18	28	91	41	202	47
5	17	36	34	11	30	17	18	18	80	38	159	41
6	41	36	26	12	29	16	19	17	97	213	121	53
7	41	34	17	20	23	17	32	15	177	275	118	80
8	40	32	34	27	17	15	17	15	216	286	98	99
9	39	18	33	27	27	15	16	15	228	260	148	66
10	38	36	33	24	a27	29	16	17	255	235	157	64
11	38	36	33	14	a27	29	17	21	250	205	129	40
12	29	36	32	27	a35	30	18	19	217	234	110	26
13	26	37	30	29	a44	31	16	17	187	235	102	44
14	41	36	17	29	a35	32	15	16	224	257	79	31
15	38	31	33	29	14	32	15	21	244	278	79	32
16	36	17	32	25	14	31	15	16	258	272	127	30
17	35	35	33	13	14	35	16	17	278	233	124	28
18	34	36	33	12	12	38	15	17	251	187	128	27
19	17	36	33	18	13	38	15	17	217	202	92	27
20	34	29	26	24	13	37	15	18	32	181	72	26
21	32	23	15	26	14	36	16	30	93	157	48	26
22	32	32	16	26	15	36	16	21	107	155	53	26
23	28	18	32	27	17	35	15	23	102	138	82	27
24	26	34	26	27	16	23	20	32	132	155	98	28
25	23	35	15	15	15	20	19	33	169	146	73	29
26	17	35	21	31	15	18	22	25	144	213	72	13
27	18	36	23	32	16	17	18	27	139	240	50	a12
28	41	35	15	a32	24	18	17	25	235	238	38	a13
29	41	27	20	a31	36	21	17	32	234	234	41	a12
30	41	16	27	a30	-	19	17	37	217	228	96	a12
31	40	-	23	a25	-	18	-	88	-	185	96	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,043	42	17	33.6	2,070
November.....	961	40	16	32.0	1,910
December.....	830	34	15	26.8	1,650
Calendar year 1947 .....	22,300.5	299	9.5	61.1	44,250
January.....	706	32	11	22.8	1,400
February.....	646	44	12	22.3	1,280
March.....	618	38	15	26.4	1,620
April.....	527	32	15	17.6	1,050
May.....	753	68	15	23.6	1,450
June.....	5,137	278	32	171	10,190
July.....	6,227	286	38	201	12,350
August.....	3,381	227	38	109	6,710
September.....	1,165	99	12	38.8	2,310
Water year 1947-48 .....	22,174	286	11	60.6	43,990

a No gage-height record; discharge computed on basis of discharge measurement made on Feb. 14 and record of regulation by Sanchez Reservoir furnished by observer.

## Culebra Creek below San Luis, Colo.

Location.- Water-stage recorder, lat. 37°12', long. 105°26', in sec. 27, T. 3 N., R. 72 W., Beaubien Grant survey, 500 feet downstream from bridge on State Highway 159, 600 feet downstream from Rito Seco, and a quarter of a mile southwest of San Luis.

Drainage area.- 255 square miles.

Records available.- August 1938 to September 1948 (no winter records prior to 1941).

Extremes.- Maximum discharge during year, 398 second-feet July 16 (gage height, 3.05 feet); minimum daily, 24 second-feet Jan. 5.  
1938-48: Maximum discharge, 866 second-feet May 30, 1942 (gage height, 4.54 feet), from rating curve extended above 400 second-feet; minimum daily, 13 second-feet Apr. 21, 1946.

Remarks.- Records excellent except those for periods of no gage-height record, which are good. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	47	50	41	26	30	54	35	30	71	166	154	99
2	46	32	36	25	43	49	36	30	81	184	227	73
3	45	53	48	34	43	49	35	42	91	132	216	56
4	42	53	48	30	44	35	35	46	85	51	204	55
5	27	51	48	24	44	37	34	35	71	41	180	50
6	42	50	42	25	43	36	30	32	83	200	122	65
7	44	51	30	32	33	37	47	31	159	274	120	81
8	45	48	46	40	43	35	32	30	189	289	100	105
9	42	38	46	40	43	35	31	30	219	262	154	69
10	44	48	44	37	43	50	32	33	253	236	164	68
11	41	52	46	27	52	58	33	37	250	202	140	46
12	37	53	45	40	52	58	37	34	208	233	118	37
13	34	55	43	42	31	60	31	29	176	230	112	53
14	52	55	30	42	31	59	30	28	216	253	87	38
15	47	50	46	42	31	59	30	34	233	280	80	40
16	45	36	45	38	29	58	32	36	250	280	132	39
17	45	52	46	26	30	60	29	37	271	233	127	39
18	42	51	46	25	30	60	30	33	247	184	132	38
19	29	51	46	31	32	60	30	34	210	197	99	38
20	42	46	39	37	30	62	28	34	45	176	78	37
21	42	38	28	39	32	58	32	41	91	147	52	34
22	44	42	29	39	34	60	32	36	116	147	53	34
23	40	33	45	40	35	60	31	35	103	129	83	37
24	38	51	39	40	34	56	42	40	129	147	99	34
25	36	50	28	28	32	49	36	41	164	143	78	38
26	31	50	34	44	33	44	40	36	143	210	73	27
27	30	51	36	45	34	41	36	37	136	238	56	25
28	51	51	28	45	44	41	31	32	236	236	47	26
29	55	45	33	44	56	42	30	34	233	236	51	25
30	53	32	40	43	-	36	31	38	213	230	101	25
31	52	-	36	38	-	34	-	81	-	179	99	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,310	55	27	42.3	2,600
November.....	1,418	55	32	47.3	2,810
December.....	1,237	48	28	39.9	2,450
Calendar year 1947 .....	26,648	246	18	73.0	52,850
January.....	1,109	45	24	35.8	2,200
February.....	1,101	62	29	38.0	2,180
March.....	1,532	62	34	49.4	3,040
April.....	998	47	28	33.3	1,980
May.....	1,125	81	28	36.3	2,250
June.....	4,972	271	45	166	9,860
July.....	6,145	289	41	198	12,190
August.....	3,519	227	47	114	6,980
September.....	1,431	105	25	47.7	2,840
Water year 1947-48 .....	25,897	289	24	70.8	51,360

Note.- No gage-height record Dec. 12 to Feb. 19, Mar. 4-8, Aug. 5-8, Sept. 29, 30; discharge computed on basis of discharge measurements made Jan. 13, Feb. 14 and records for station at San Luis.



Costilla Creek above reservoir, near Costilla, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 36°54'25", long. 105°15'00", in Sangre de Cristo Grant, 2½ miles by road upstream from Costilla Dam and 17 miles south-east of Costilla, Taos County.

Records available.- April 1937 to September 1948 (irrigation seasons only).

Extremes.- Maximum discharge recorded during year, 132 second-feet May 25 (gage height, 1.40 feet); minimum daily recorded, 1.5 second-feet Nov. 5, Sept. 15.

1937-48: Maximum discharge recorded, 348 second-feet May 11, 1944 (gage height, 1.50 feet); maximum gage height, 1.90 feet May 15, 1938, former site and datum; minimum daily discharge recorded, 1.2 second-feet Nov. 7, 1944.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.5	2.8	b2.2					-	52	11	4.0	2.2
2	3.2	2.8	b2.4					-	46	11	3.8	2.2
3	3.0	2.6	-					-	54	11	4.0	2.2
4	3.0	2.2	-					-	46	11	5.2	1.9
5	3.0	1.5	-					-	37	10	7.5	1.7
6	3.0	1.9	-					-	33	8.8	4.6	1.7
7	3.0	a2.5	-					-	36	8.3	4.0	1.9
8	2.8	a2.5	-					-	31	7.5	4.6	2.0
9	2.8	a2.5	-					-	29	6.3	3.8	2.4
10	2.8	a2.5	-					-	26	6.3	3.3	2.0
11	2.8	a2.5	-					22	31	5.9	3.3	1.9
12	3.2	a2.5	-					21	30	5.6	3.5	1.7
13	3.2	a2.5	-					18	23	5.2	4.0	1.7
14	4.6	a2.5	-					18	20	4.6	6.7	1.7
15	4.3	a2.5	-					20	17	4.6	3.5	1.5
16	4.0	a2.5	-					23	15	4.6	3.0	1.7
17	*3.5	a2.5	-					27	14	4.6	3.0	1.7
18	3.2	a2.5	-					29	12	7.5	3.3	1.7
19	3.2	b2.2	-					33	14	9.3	3.8	1.7
20	3.2	b2.2	-					34	14	9.3	3.8	1.9
21	3.0	b2.2	-					36	14	7.9	3.3	1.7
22	3.2	b2.2	-					37	18	7.5	3.5	1.7
23	3.0	b2.2	-					31	14	5.9	3.3	1.7
24	3.0	b2.2	-					60	11	5.2	3.5	1.7
25	3.0	b2.2	-					79	10	5.9	3.8	2.2
26	2.8	b2.2	-					58	9.8	5.2	2.8	3.0
27	3.0	b2.2	-					66	9.8	4.9	2.8	2.8
28	2.8	b2.2	-					46	12	4.6	2.2	2.8
29	2.8	b2.2	-					a45	18	4.3	2.2	2.4
30	2.8	b2.2	-					a45	12	4.6	2.2	2.6
31	2.6	-	-					a50	-	4.3	2.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	97.3	4.6	2.6	3.14	193
November.....	70.2	2.8	1.5	2.34	139
December.....	-	-	-	-	-
Calendar year.....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	-	-	-	-	-
May 11-31.....	798	79	18	38.0	1,580
June.....	708.6	54	9.8	23.6	1,410
July.....	212.7	11	4.3	6.86	422
August.....	114.3	7.5	2.2	3.69	227
September.....	60.0	3.0	1.5	2.00	119
Water year.....	-	-	-	-	-

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Casas Creek, Santisvean Creek, Latir Creek, and Rio Hondo at Arroyo Hondo.

b Stage-discharge relation affected by ice.

## Costilla Creek below Reservoir, near Costilla, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 36°52'25", long. 105°16'55",  
In Sangre de Cristo Grant, 125 feet downstream from outlet of reservoir at Costilla  
Dam and 18 miles southeast of Costilla, Taos County.

Records available.- April 1937 to September 1948 (irrigation seasons only prior to 1945).

Extremes.- Maximum daily discharge during year, 190 second-feet June 6; minimum daily  
recorded, 0.3 second-foot May 26-31.  
1937-48: Maximum discharge recorded 286 second-feet May 9, 10, 1942 (gage height,  
2.65 feet); no flow at times.

Remarks.- Records fair. Diversions above station for irrigation. Flow regulated by  
Costilla Reservoir (capacity, 15,700 acre-feet).

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.8	2.9						-	23	127	45	78
2	5.8	2.9						-	46	84	109	76
3	5.8	2.9						-	14	68	118	35
4	6.2	2.9						-	98	112	112	15
5	6.2	2.9						-	183	133	94	31
6	6.2	2.9						-	190	126	43	68
7	6.2	2.9						-	160	127	23	74
8	6.2	2.9						-	110	140	41	70
9	6.2	2.6						-	100	62	89	48
10	6.2	2.6						-	106	48	89	25
11	6.2	b2.5						0.5	137	76	94	20
12	6.2	b2.5						.7	144	157	113	24
13	6.2	b2.5						.7	144	188	49	30
14	6.2	b2.5						.5	146	167	17	30
15	6.2	b2.5						.7	93	84	25	30
16	3.2	b2.5						.9	121	32	72	23
17	*2.6	b2.5						.9	132	56	110	14
18	2.6	b2.0						.9	129	140	122	12
19	2.6	-						.9	116	139	104	12
20	2.6	-						.7	121	133	36	12
21	2.6	-						.7	132	127	21	12
22	2.6	-						.7	132	116	32	17
23	2.6	-						.7	132	57	65	27
24	2.6	-						.5	132	29	78	25
25	2.6	-						.5	132	41	78	23
26	2.9	-						.3	129	98	66	23
27	2.9	-						.3	129	106	31	24
28	2.9	-						.3	127	110	17	24
29	2.9	-						.3	132	121	24	16
30	2.9	-						.3	150	59	46	14
31	2.9	-						.3	-	25	65	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	135.8	6.2	2.6	4.38	269
November 1-18.....	47.9	2.9	2.0	2.66	95
December.....	-	-	-	-	-
Calendar year .....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	-	-	-	-	-
May 11-31.....	12.3	.9	.3	.59	24
June.....	3,640	190	14	121	7,220
July.....	3,068	168	25	99.0	6,090
August.....	2,028	122	17	65.4	4,020
September.....	930	76	12	31.0	1,840
Water year .....	-	-	-	-	-

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## Costilla Creek near Costilla, N. Mex.

Location.- Water-stage recorder, lat. 36°56'30", long. 105°30'10", in Sangre de Cristo Grant, 1 mile upstream from diversion dam and 2 miles southeast of Costilla, Taos County.

Records available.- March 1936 to September 1948 (irrigation season only 1936-43).

Extremes.- Maximum daily discharge during year, 304 second-feet June 6; minimum daily, 3.5 second-feet Dec. 10.

1936-48: Maximum discharge, 1,150 second-feet May 11, 1942 (gage height, 5.37 feet, site and datum then in use); minimum daily recorded, 2 second-feet Dec. 30, 1946.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-feet).

Rating table, water year 1947-48, except periods of ice effect  
(gage height, in feet, and discharge, in second-feet)  
(Shifting-control method used June 8 to Sept. 30)

1.1	3.0	2.0	45
1.2	4.7	2.5	107
1.4	9.9	3.0	202
1.6	18	3.4	310

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	11	b5.0	7.6	14	16	12	85	137	165	42	78
2	17	12	b5.0	7.6	15	13	16	82	180	132	101	79
3	*17	14	b5.0	7.6	16	13	21	82	148	102	135	65
4	16	12	b4.5	7.6	16	8.7	24	74	174	96	125	26
5	15	14	4.4	7.6	17	10	25	72	292	148	126	23
6	14	14	b4.3	7.9	17	13	29	72	304	153	79	58
7	15	13	b4.0	7.9	17	12	34	78	298	150	43	72
8	15	15	b3.9	8.2	16	13	37	85	256	159	39	74
9	14	b13	b5.7	8.2	15	14	43	84	198	142	85	66
10	14	b14	3.5	8.7	15	12	49	82	189	77	92	41
11	14	b13	4.0	9.3	14	11	68	86	224	72	92	31
12	15	b12	b2.9	8.4	15	11	59	84	247	153	112	30
13	16	b11	3.8	7.3	17	15	44	68	226	170	92	36
14	24	b10	5.4	7.6	17	15	43	64	212	172	39	36
15	24	b10	5.4	8.2	17	13	52	67	178	137	33	36
16	20	b10	5.2	8.7	17	13	68	77	151	62	55	36
17	16	b10	4.2	8.8	17	14	67	86	172	54	98	26
18	14	b10	4.5	8.7	18	14	75	95	170	138	121	20
19	14	b10	5.2	7.9	17	12	86	104	159	161	123	19
20	14	b10	5.6	b9	18	14	86	118	176	161	76	19
21	13	a9	6.5	b9	16	12	86	120	176	157	39	18
22	14	a9	6.5	*9.0	13	8.4	85	118	191	144	38	17
23	13	a9	7.0	9.0	14	12	86	113	180	106	64	25
24	13	a9	6.5	9.3	13	15	85	137	165	55	85	30
25	12	*b9	6.8	8.7	14	18	a82	182	159	53	88	28
26	12	b9	7.0	9.3	14	10	a78	155	157	96	79	33
27	11	b9	6.8	9.0	15	12	a70	159	157	118	60	34
28	12	b6	6.5	12	14	14	a70	144	161	123	30	35
29	12	b6	6.8	13	17	18	a72	135	161	137	27	30
30	13	b5	7.9	13	-	19	78	121	176	110	42	23
31	13	-	7.6	13	-	18	-	130	-	47	59	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	464	24	11	15.0	920
November.....	318	15	5	10.6	631
December.....	186.4	7.9	3.5	5.37	330
Calendar year 1947 .....	16,055.8	244	3	44.0	31,840
January.....	275.1	13	6.8	8.87	546
February.....	455	16	13	15.7	902
March.....	413.1	19	8.4	15.3	819
April.....	1,731	96	12	57.7	3,430
May.....	3,159	182	64	102	6,270
June.....	5,754	304	137	192	11,410
July.....	3,750	172	47	121	7,440
August.....	2,319	135	27	74.8	4,600
September.....	1,144	79	17	38.1	2,270
Water year 1947-48 .....	19,948.6	304	3.5	54.5	39,570

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records, available recorder trace, and records for station at Garcia, Colo.

b Stage-discharge relation affected by ice.

## Costilla Creek at Garcia, Colo.

Location.- Water-stage recorder, lat. 36°59'40", long. 105°32'00", in Sangre de Cristo Upland, 300 feet upstream from New Mexico-Colorado State line and half a mile south of Garcia.

Records available.- June 1944 to September 1948 (no winter records).

Extremes.- Maximum daily discharge recorded during year, 234 second-feet June 6, 7; no flow at times.

1944-48: Maximum daily discharge recorded, that of June 6, 7, 1948; no flow at times.

Remarks.- Records fair except those for periods of ice effect or no gage-height record, WHICH are poor. Diversions above station for irrigation. Flow regulated by Costilla Reservoir (capacity, 15,700 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		0					-	53	62	20	7.0	0
2		0					-	54	94	17	5.4	0
3		0					-	55	79	15	7.0	1.0
4		0					-	50	83	12	2.6	1.3
5		.5					-	44	179	7.3	2.3	.4
6		0					-	40	234	7.0	1.3	.6
7		0					-	42	234	8.5	3.1	2.0
8		b2					-	45	170	7.7	5.0	8.1
9		b2					-	47	88	7.0	1.4	14
10		b2					-	45	47	7.0	2.3	7.3
11		b2					-	46	a68	7.0	6.6	3.4
12		b2					-	46	a100	5.4	4.2	2.6
13		b1					-	41	a88	5.4	4.5	2.6
14		b1					-	36	a65	28	.5	1.7
15		b1					-	38	a40	a50	0	1.8
16		b1					-	42	a26	a12	0	2.3
17		b1					-	48	a14	a6	3.0	2.0
18		b1					59	51	a16	a5	7.3	1.3
19		b1					69	45	a11	a5	9.9	1.2
20		b1					61	51	a16	a5	3.2	1.0
21		b1					62	51	a15	4.5	0	1.2
22		a1					62	41	a30	4.7	0	.3
23		a1					58	31	a36	3.6	0	1.3
24		a1					55	43	a25	4.2	0	1.7
25		*b1					53	112	a22	7.7	.4	1.7
26		-					50	117	23	4.5	.4	1.2
27		-					45	94	24	3.1	.7	1.0
28		-					41	62	24	4.2	.1	2.1
29		-					43	58	20	4.7	0	1.5
30		-					50	55	27	7.3	0	1.8
31		-					-	58	-	8.9	.1	-
Month		Second-foot-days		Maximum		Minimum		Mean		Runoff in acre-feet		
October.....		0		0		0		0		0		
November 1-25.....		23.5		2		0		.94		47		
December.....		-		-		-		-		-		
Calendar year.....		-		-		-		-		-		
January.....		-		-		-		-		-		
February.....		-		-		-		-		-		
March.....		-		-		-		-		-		
April 18-30.....		708		69		41		54.5		1,400		
May.....		1,641		117		31		52.9		3,250		
June.....		1,960		234		11		65.3		3,890		
July.....		294.7		50		3.1		9.51		585		
August.....		78.3		9.9		0		2.53		155		
September.....		68.4		14		0		2.28		136		
Water year.....		-		-		-		-		-		

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Costilla Creek near Costilla and Acequia Madre and Cerro Canal near Costilla.

b Stage-discharge relation affected by ice.

## Casiás Creek near Costilla, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 36°54'05", long. 105°15'30", In Sangre de Cristo Grant, 200 feet downstream from road crossing, 2.5 miles by road upstream from Costilla Dam, 17 miles southeast of Costilla, Taos County.

Records available.- April 1937 to September 1948 (irrigation seasons only).

Extremes.- Maximum discharge recorded during year, 96 second-feet May 31 (gage height, 1.53 Feet); minimum daily determined, 0.2 second-foot Nov. 3-7, 1937-48; Maximum discharge recorded, 121 second-feet Aug. 10, 1943, maximum gage height recorded, 1.90 feet June 14, 1938 (backwater from Costilla Reservoir); minimum daily determined, that of Nov. 3-7, 1947.

Remarks.- Records good except those for periods of ice effect, which are poor. No diversion above station.

Rating table, water year 1947-48 (gage height, in feet,  
and discharge in second-feet)  
(Shifting-control method used May 11-30)

0.6	0.3	1.0	21	1.4	70
.7	4.4	1.1	30	1.5	90
.8	8.9	1.2	40	1.6	110
.9	14	1.3	53		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	6.6	b0.3						-	72	33	15	6.6
2	6.2	b.3						-	74	33	14	6.2
3	6.2	b.2						-	88	32	14	5.8
4	5.8	b.2						-	78	31	15	5.8
5	5.3	b.2						-	74	31	22	5.3
6	5.8	b.2						-	80	31	16	5.3
7	5.3	b.2						-	82	33	14	5.3
8	5.8	-						-	74	30	15	5.8
9	5.3	-						-	72	28	14	6.6
10	5.3	-						-	72	26	13	5.8
11	5.3	-						25	65	25	13	5.3
12	5.3	-						18	78	24	13	5.3
13	5.3	-						15	68	23	14	4.8
14	6.6	-						14	80	22	13	4.4
15	6.6	-						16	65	20	11	4.0
16	*5.8	-						20	60	22	11	4.4
17	4.8	-						24	57	22	10	5.3
18	4.4	-						28	57	25	12	4.8
19	4.4	-						35	57	25	12	4.8
20	4.0	-						42	57	26	11	4.4
21	4.0	-						49	57	25	11	4.4
22	4.4	-						53	57	24	12	4.4
23	3.6	-						55	51	21	11	4.0
24	4.0	-						70	43	20	11	4.0
25	1.5	-						74	37	23	10	5.3
26	1.1	-						68	34	20	8.4	5.8
27	1.5	-						65	34	18	8.0	4.8
28	1.1	-						55	36	18	7.6	4.8
29	.7	-						53	43	17	7.1	4.4
30	.7	-						55	35	18	6.6	4.8
31	.3	-						72	-	16	6.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	133.0	6.6	0.3	4.29	264
November 1-7 .....	1.6	.3	.2	.23	3.2
December.....	-	-	-	-	-
Calendar year .....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	-	-	-	-	-
May 11-31 .....	906	74	14	43.1	1,800
June.....	1,817	88	34	60.6	3,600
July.....	762	33	16	24.6	1,510
August.....	371.3	22	6.6	12.0	736
September.....	152.7	6.6	4.0	5.09	303
Water year .....	-	-	-	-	-

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

## RIO GRANDE BASIN

Santistevan Creek near Costilla, N. Mex.

Location.- Water-stage recorder and metal Parshall flume, lat.  $36^{\circ}53'05''$ , long.  $105^{\circ}16'50''$ , in Sangre de Cristo Grant, 200 feet upstream from road crossing, 0.9 mile upstream from Costilla Dam, and 16 miles southeast of Costilla, Taos County.

Records available.- April 1937 to September 1948 (irrigation seasons only).

Extremes.- Maximum discharge recorded during year, 12 second-feet June 11 (gage height, 1.29 feet); minimum daily determined, 0.4 second-foot Nov. 1, 4, 6, 7.  
1937-48: Maximum discharge recorded, 18 second-feet Aug. 11, 1941 (gage height, 1.73 feet); minimum daily determined, that of Nov. 1, 4, 6, 7, 1947.

Remarks.- Records good. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.4						-	7.2	3.5	2.2	1.3
2	.7	.5						-	8.0	3.5	2.1	1.3
3	.7	.5						-	8.9	3.4	2.1	1.2
4	.7	.4						-	9.5	3.2	2.2	1.2
5	.7	.5						-	9.8	3.1	2.2	1.2
6	.7	b.4						-	9.9	3.2	2.0	1.2
7	.7	b.4						-	9.9	3.3	2.0	1.2
8	.7	-						-	9.8	3.2	2.0	1.2
9	.6	-						-	9.5	3.2	1.9	1.2
10	.7	-						-	9.5	3.2	1.9	1.2
11	.7	-						1.6	9.7	3.2	1.9	1.2
12	.7	-						1.6	9.4	3.2	1.9	1.2
13	.7	-						1.6	8.9	3.0	2.0	1.2
14	.8	-						1.5	8.6	2.9	1.9	1.2
15	.7	-						1.7	8.4	2.8	1.8	1.2
16	.7	-						1.9	8.0	3.0	1.7	1.2
17	*.7	-						2.2	7.5	3.0	1.7	1.2
18	.7	-						2.2	7.3	3.0	1.9	1.2
19	.7	-						2.6	7.4	3.1	1.7	1.2
20	.7	-						3.3	6.6	2.7	1.6	1.1
21	.7	-						3.7	6.1	3.0	1.6	1.1
22	.7	-						4.1	6.3	2.8	1.6	1.1
23	.6	-						4.4	5.7	2.6	1.5	1.1
24	.6	-						6.0	5.1	2.5	1.6	1.0
25	.5	-						5.8	4.6	2.6	1.4	1.2
26	.5	-						6.0	4.2	2.4	1.4	1.2
27	.5	-						5.9	4.1	2.3	1.3	1.1
28	.6	-						5.9	4.1	2.3	1.3	1.0
29	.6	-						6.0	4.0	2.2	1.3	1.0
30	.6	-						5.9	3.6	2.2	1.3	1.0
31	.5	-						6.6	-	2.2	1.4	-
Month		Second-foot-days		Maximum		Minimum		Mean		Runoff in acre-feet		
October 1947		20.4		0.8		0.5		0.66		40		
November 1-7		3.1		.5		.4		.44		6.1		
December		-		-		-		-		-		
Calendar year		-		-		-		-		-		
January		-		-		-		-		-		
February		-		-		-		-		-		
March		-		-		-		-		-		
April		-		-		-		-		-		
May 11-31		80.5		6.6		1.5		3.83		160		
June		221.6		9.9		3.6		7.39		440		
July		89.8		3.5		2.2		2.90		178		
August		54.4		2.2		1.3		1.75		108		
September		34.9		1.3		1.0		1.16		69		
Water year		-		-		-		-		-		

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## Principal diversions from Costilla Creek, N. Mex. and Colo.

Records of discharge are collected at nine gaging stations on four 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 near Costilla. Records are collected during irrigation seasons only.

Acequia Madre at Costilla, N. Mex.- Lat. 36°58'00", long. 105°30'50", 275 feet downstream from diversion dam. Records available, May 1944 to September 1948. Acequia diverts from right bank of Costilla Creek.

Mesa ditch near Garcia, Colo.- Lat. 36°59'50", long. 105°30'45", 429 feet north of mile-post No. 136+54 on New Mexico-Colorado State line. Records available, June 1944 to September 1948. Ditch diverts from right bank of Acequia Madre for irrigation in Colorado.

Middle ditch at Garcia, Colo.- Lat. 36°59'50", long. 105°31'25", 300 feet north of New Mexico-Colorado State line. Records available, June 1944 to September 1948. Ditch diverts from Acequia Madre for irrigation in Colorado.

Cordillera ditch at Garcia, Colo.- Lat. 36°59'40", long. 105°31'40", 570 feet south of New Mexico-Colorado State line. Records available, June 1944 to September 1948. Ditch diverts from Acequia Madre for irrigation in Colorado.

Cerro Canal at Costilla, N. Mex.- Lat. 36°57'50", long. 105°31'10", 1,400 feet downstream from diversion dam. Records available, April 1944 to September 1948. Canal diverts from left bank of Costilla Creek.

Cerro Canal near Jaroso, Colo.- Lat. 36°59'35", long. 105°34'35". Records available, June 1944 to September 1948. Flow measured is delivered to Colorado and to New Mexico branch of Cerro Canal.

New Mexico Branch Cerro Canal near Jaroso, Colo.- Lat. 36°59'35", long. 105°34'45", 225 feet downstream from head gate. Records available, June 1944 to September 1948. Canal diverts from left bank of Cerro Canal for irrigation in New Mexico.

Alire ditch at Garcia, Colo.- Lat. 36°59'45", long. 105°32'05", 430 feet southeast of mile post No. 137+54 on New Mexico-Colorado State line. Records available, June 1944 to September 1948. Ditch diverts from left bank of Costilla Creek for irrigation in Colorado.

Eastdale No. 1 intake canal near Jaroso, Colo.- Lat. 37°02'40", long. 105°37'00", 1,100 feet downstream from head gate. Records available, June 1944 to September 1948. Canal diverts from right bank of Costilla Creek to Eastdale Reservoir No. 1 for irrigation in Colorado.

Diversions in acre-feet, water year October 1947 to September 1948

Month	Acequia Madre	Mesa ditch	Middle ditch	Cordillera ditch	Cerro Canal at Costilla	Cerro Canal near Jaroso, Colo.	New Mexico Branch Cerro Canal	Alire ditch	Eastdale No. 1 intake
October....	277	67	0	35	558	235	43	0	7.5
November....	270	60	0	all	278	1172	114	66.3	0
December....	-	-	-	-	-	-	-	-	0
January....	-	-	-	-	-	-	-	-	0
February....	-	-	-	-	-	-	-	-	0
March....	-	-	-	-	-	-	-	-	.8
April....	250	40	40	426	1413	2316	223	40	1,130
May....	776	203	0	91	1,460	973	170	0	1,520
June....	1,920	563	6.0	51	4,530	3,140	749	19	868
July....	1,970	715	15	9.7	4,000	2,720	910	66	25
August....	1,470	448	0	27	2,540	1,550	500	40	5.8
September...	869	136	0	25	1,060	738	198	31	5.4
Water year	-	-	-	-	-	-	-	-	3,560

a Nov. 1-17.

b Nov. 1-18.

c Nov. 1-19.

d Apr. 16-30.

e Apr. 17-30.

f Apr. 18-30.



## RIO GRANDE BASIN

Latir Creek near Cerro, N. Mex.

Location.- Water-stage recorder and concrete Parshall flume, lat 36°49'45", long. 105°32'45", in S4SW4 sec. 15, T. 30 N., R. 13 E., at mouth of canyon, 100 feet upstream from heading of Cerro community ditch and 6 miles northeast of Cerro.

Drainage area.- 10 square miles.

Records available.- April 1937 to September 1948 (irrigation seasons only prior to 1946).

Extremes.- Maximum discharge recorded during year, 45 second-feet June 3 (gage height, 1.53 feet); minimum daily, 2.6 second-feet Dec. 25-27, 30, 31, Mar. 5, 6, 8.  
1937-48: Maximum discharge determined, 121 second-feet June 3, 1942, from rating curve extended above 56 second-feet by logarithmic plotting; maximum gage height recorded, 4.2 feet July 19, 1945; (log jam) minimum daily discharge recorded, 0.6 second-foot May 9, 1937.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.5	4.1	3.4	2.8	2.8	2.8	3.8	11	30	16	5.5	4.3
2	5.3	4.3	3.4	3.0	3.0	2.8	4.0	11	34	13	5.5	4.0
3	4.9	4.3	3.6	a3	3.0	2.8	3.8	9.2	40	12	5.7	3.8
4	4.9	4.1	3.4	a3	3.0	2.8	3.6	9.7	a41	12	5.9	3.8
5	4.9	4.0	3.1	a3	3.0	2.6	3.8	11	a38	11	8.2	3.6
6	4.7	3.3	3.1	a3	3.1	2.6	4.0	11	a39	11	6.6	3.6
7	4.7	3.8	3.1	a3	3.1	2.8	a	12	a40	11	6.1	3.6
8	4.5	4.3	3.1	a3	3.1	2.6	3.8	12	a40	10	5.9	3.6
9	4.5	4.5	3.1	a3	3.1	2.8	3.8	9.5	a39	9.2	5.3	3.8
10	4.0	4.5	3.0	a3	3.1	2.8	4.0	8.4	a38	9.2	5.1	3.6
11	4.5	4.5	3.1	a3	3.3	2.8	3.8	8.4	a37	8.7	5.1	3.4
12	4.7	4.5	3.1	a3	3.3	2.8	3.6	7.7	a36	8.2	5.3	3.6
13	4.9	3.8	3.1	a3	3.3	3.0	3.4	8.0	a33	8.0	6.1	3.4
14	5.7	3.6	3.1	a3	3.3	3.0	3.8	11	a3Q	7.5	5.9	3.4
15	5.7	3.4	3.0	a3	3.3	3.0	4.7	34	a27	7.0	5.1	3.4
16	5.1	3.6	3.0	a3	3.3	3.0	5.5	16	a23	6.8	4.9	3.4
17	5.1	3.6	3.0	a3	3.3	3.0	6.8	20	21	7.0	4.7	3.4
18	4.7	3.6	3.0	a3	3.4	3.0	8.7	22	21	6.8	4.7	3.4
19	4.7	3.6	3.0	a3	3.4	3.0	11	23	21	6.0	5.1	3.4
20	4.3	3.6	3.0	a3	3.3	3.0	12	25	20	3.2	4.9	3.3
21	4.3	3.8	3.0	a3	3.3	3.0	10	26	20	7.5	4.7	3.3
22	5.1	3.6	3.0	a3	3.1	3.3	9.2	26	19	7.3	5.7	3.4
23	4.5	3.6	3.0	2.8	3.0	3.4	6.6	22	17	6.8	5.3	3.4
24	4.3	a3.5	2.8	2.8	2.8	3.6	5.3	24	16	6.8	4.9	3.4
25	4.5	3.4	2.6	2.8	2.8	3.6	4.7	21	16	7.7	5.1	4.0
26	4.1	3.4	2.6	2.8	2.8	3.4	4.3	18	15	7.0	4.7	4.1
27	4.7	3.4	2.6	2.8	2.8	3.6	4.5	19	15	6.4	4.5	5.7
28	4.3	3.4	2.8	2.8	2.8	4.0	5.7	20	17	6.4	4.5	4.9
29	4.3	3.4	2.8	2.8	2.8	4.0	9.5	21	15	5.9	4.5	4.3
30	4.5	3.4	2.6	2.8	-	3.8	11	25	15	5.7	4.5	4.1
31	4.1	-	2.6	2.8	-	3.6	-	29	-	5.7	4.3	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	146.2	5.7	4.0	4.72	290
November.....	113.9	4.5	3.3	3.80	226
December.....	93.1	3.6	2.6	3.00	185
Calendar year 1947.....	2,746.1	28	2.3	7.52	5,450
January.....	91.0	3.0	2.8	2.94	180
February.....	89.7	3.4	2.8	3.09	178
March.....	96.3	4.0	2.6	3.11	191
April.....	172.7	12	3.4	5.76	343
May.....	510.9	29	7.7	16.5	1,010
June.....	813	41	15	27.1	1,610
July.....	263.8	16	5.7	8.51	523
August.....	164.3	8.2	4.3	5.30	326
September.....	112.4	5.7	3.3	3.75	223
Water year 1947-48.....	2,687.3	41	2.6	7.29	5,280

Peak discharge (base, 30 sec.-ft.)- May 20 (7:40 p.m.) 37 sec.-ft.; May 31 (7 p.m.) 37 sec.-ft.; June 3 (8 p.m.) 45 sec.-ft.  
a No gage-height record; discharge computed on basis of weather records and records for Rio Hondo at Arroyo Hondo.

Red River near Red River, N. Mex.  
(Formerly published as Rio Colorado near Red River, N. Mex.)

Location.- Water-stage recorder, lat. 36°37'20", long. 105°23'20", in NE $\frac{1}{4}$  sec. 36, T. 28 N., R. 14 E., 100 feet downstream from confluence of Middle and East Forks and 6 miles south of Red River. Datum of gage is 9,394.2 feet above mean sea level (plane-table levels by Division of Water and Power).

Records available.- July 1940 to September 1948 (no winter records prior to 1944).

Extremes.- Maximum discharge during year, 100 second-feet May 22 (gage height, 2.40 feet); minimum daily, 3 second-feet Jan. 28.

1940-48: Maximum discharge recorded, 218 second-feet June 19, 1941, from rating curve extended above 160 second-feet by logarithmic plotting; maximum gage height, 3.19 feet Jan. 16, 1947 (ice jam); minimum daily discharge, that of Jan. 28, 1948.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.5	6.1	5.4	4.5	4	5	8.0	24	75	30	16	9.6
2	7.5	6.1	5.8	4.5	4.5	5	6.5	21	73	27	15	10
3	7.1	6.1	5.8	5	4.5	5	7	20	82	26	15	9.2
4	6.8	5.4	5.4	5.5	4.5	4.5	7	20	88	25	17	8.7
5	6.8	5.4	5.4	5.8	4	4	7.5	20	86	24	34	8.7
6	6.8	4.9	5.8	5.2	4	4.5	8	22	82	23	26	8.3
7	6.8	4.9	5.8	5.2	4	5	8	24	80	27	22	8.3
8	6.8	5.4	5.8	4.6	4	5	8	26	78	33	20	8.3
9	6.8	5.4	5.8	4.3	4	5	8.5	24	78	31	19	8.3
10	6.4	5.8	5.8	4.0	4	5	9	23	77	30	17	8.3
11	6.8	5.4	5.5	3.8	4	5	9.5	22	73	28	17	6.3
12	6.8	5.4	5	4.0	3.5	4.5	11	21	72	27	16	7.9
13	7.5	5.4	4.5	3.8	4	5	12	20	72	26	17	7.9
14	9.2	5.4	4.5	4.3	4.5	5	10	21	70	24	16	7.9
15	8.7	5.4	4.5	4.3	4.5	5	12	28	65	24	15	7.9
16	8.3	5.8	4	4.3	5	5	13	34	60	23	14	7.9
17	7.9	5.4	4	4.5	5	5	14	41	57	22	14	7.9
18	7.5	5.2	4	4.5	5	5	15	50	56	22	14	7.9
19	7.5	5.4	3.5	4.0	5	5	18	56	54	26	14	7.9
20	7.1	5.4	3.5	4.5	5	5	20	65	73	30	13	7.9
21	7.1	5.8	3.5	5.0	5	5	21	77	65	30	13	7.9
22	7.1	5.8	4	4.6	4.5	5	20	90	57	26	14	7.9
23	6.4	5.8	4.5	4.0	5	5.5	18	82	50	23	12	7.5
24	6.4	6.1	5	3.8	5	5.5	17	77	42	22	12	7.9
25	6.4	5.8	5	3.8	5.5	6	16	70	38	24	12	9.6
26	6.1	5.8	5	3.5	5	6	15	62	36	24	11	10
27	6.4	5.8	5	3.5	5	6.5	14	57	36	20	10	9.6
28	6.4	5.4	5	3	5	6.5	16	59	36	20	10	9.2
29	6.4	5.4	5	3.5	5	6.5	18	62	34	19	10	8.7
30	6.4	5.4	5	4	-	6	22	68	32	19	9.6	8.7
31	6.1	-	5	4	-	6	-	77	-	17	9.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	217.8	9.2	6.1	7.03	432
November.....	166.8	6.1	4.9	5.56	331
December.....	151.8	5.8	3.5	4.90	301
Calendar year 1947.....	6,622.7	100	3.5	18.1	13,130
January.....	133.3	5.8	3	4.30	264
February.....	132.0	5.5	3.5	4.55	262
March.....	162.0	6.5	4	5.23	321
April.....	387.0	22	6.0	12.9	768
May.....	1,363	90	20	44.0	2,700
June.....	1,877	88	32	62.6	3,720
July.....	772	33	17	24.9	1,530
August.....	474.2	34	9.6	15.3	941
September.....	254.1	10	7.5	8.47	504
Water year 1947-48.....	6,091.0	90	3	16.6	12,070

Peak discharge (base, 50 sec.-ft.)- May 22 (5:30 p.m.) 100 sec.-ft.; June 4 (5 a.m.) 90 sec.-ft.; June 20 (7 a.m.) 73 sec.-ft.; July 19 (9:30 p.m.) 50 sec.-ft.

Note.- Stage-discharge relation affected by ice Nov. 7, 14, 15, Dec. 7, 8, Dec. 10 to Jan. 4, Jan. 15-15, 17-21, Jan. 26 to Feb. 1 (doubtful gage-height record Dec. 14, 18, 21, 22, Dec. 25 to Jan. 1). No gage-height record Feb. 2 to May 12, July 6, 7; discharge computed on basis of weather records and records for other stations in basin.

Red River near Questa, N. Mex.  
(Formerly published as Rio Colorado near Questa, N. Mex.)

Location.- Water-stage recorder and concrete control, lat. 36°42'10", long. 105°34'00", in SW 1/4 sec. 33, T. 29 N., R. 13 E. (projected), 1 1/2 miles upstream from Cabresto Creek and 2 miles east of Questa. Datum of gage is 7,449.88 feet above mean sea level.

Drainage area.- 112 square miles.

Records available.- October 1912 to August 1915 (fragmentary) and October 1930 to September 1948 in reports of Geological Survey. October 1912 to December 1931 in reports of State engineer.

Average discharge.- 32 years (1915-25, 1926-48), 65.0 second-feet.

Extremes.- Maximum discharge during year, 463 second-feet May 22 (gage height, 1.48 feet); minimum daily, 13 second-feet Dec. 19-21.  
1930-48: Maximum discharge, 886 second-feet May 25, 1942 (gage height, 2.32 feet), from rating curve extended above 450 second-feet by logarithmic plotting; minimum daily, 6.3 second-feet Nov. 24, 25, 1931.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	21	18	21	b18	a17	a18	23	122	310	94	37	19
2	22	17	22	b17	a17	a18	24	112	340	82	35	19
3	21	16	22	b18	a17	a18	26	104	400	79	32	19
4	21	16	21	b19	a17	a17	27	90	390	79	32	20
5	20	15	20	19	a17	a15	28	94	370	74	46	20
6	21	a14	21	19	a17	a14	31	108	330	72	54	20
7	20	17	20	20	a17	a16	31	117	350	70	46	21
8	20	19	20	20	a17	a18	32	127	300	74	42	21
9	20	20	18	20	a16	a18	35	117	291	79	38	21
10	20	19	19	20	a18	a18	40	112	291	82	36	22
11	19	20	18	20	a17	a18	49	100	265	84	34	22
12	20	21	17	20	a15	a16	49	94	282	79	34	22
13	19	20	16	b20	a16	a17	42	84	274	66	35	23
14	26	19	18	b21	a17	a18	43	84	247	58	35	23
15	29	19	16	21	a17	a18	54	94	221	52	34	23
16	27	19	15	22	a18	18	66	122	205	50	32	23
17	26	18	15	21	a18	18	72	132	191	49	31	22
18	25	18	14	21	a18	18	87	153	177	49	31	22
19	24	18	13	20	a18	18	100	165	177	50	31	22
20	24	18	13	*20	a18	19	97	184	265	77	52	22
21	24	18	13	20	a18	19	97	282	212	90	32	22
22	24	18	14	20	a18	20	100	390	198	90	34	21
23	23	18	15	19	*18	21	97	340	171	60	34	21
24	23	19	18	18	a18	22	94	350	142	56	34	21
25	22	19	18	18	a18	22	82	350	127	60	a30	21
26	21	19	18	18	a18	22	77	310	117	62	a25	21
27	21	20	18	17	a18	23	72	291	112	54	a20	21
28	20	20	18	a14	a18	24	72	300	112	52	19	21
29	19	21	18	a16	a18	24	90	282	112	47	18	21
30	19	20	18	a17	-	24	112	282	104	40	19	21
31	18	-	19	a17	-	23	-	291	-	39	19	-

* Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	678	29	18	21.9	1,340
November.....	553	21	14	18.4	1,100
December.....	544	22	13	17.5	1,080
Calendar year 1947.....	19,310	516	13	52.9	38,310
January.....	590	22	14	19.0	1,170
February.....	504	18	15	17.4	1,000
March.....	592	24	14	19.1	1,170
April.....	1,849	112	23	61.6	3,670
May.....	5,743	390	84	185	11,390
June.....	7,063	400	104	235	14,010
July.....	2,059	94	39	66.4	4,080
August.....	1,011	54	18	32.6	2,010
September.....	637	23	19	21.2	1,260
Water year 1947-48.....	21,823	400	13	59.6	43,280

Peak discharge (base, 160 sec.-ft.)- May 22 (6 a.m.) 463 sec.-ft.; June 3 (10:30 a.m.) 432 sec.-ft.; June 20 (10 a.m.) 291 sec.-ft.

\* Winter discharge measurement made on this day.

No gage-height record; discharge computed on basis of available recorder trace, discharge measurement, weather records, and records for station near Red River and other stations with similar drainage conditions.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

Cabresto Creek near Questa, N. Mex.

Location.- Water-stage recorder and 3-foot concrete Parshall flume, lat. 36°43'45", long. 105°33'10", in SE $\frac{1}{4}$  sec. 21, T. 29 N., R. 13 E., a quarter of a mile downstream from Llano ditch heading, 3 miles northeast of Questa, and  $\frac{3}{4}$  miles upstream from mouth.

Records available.- September 1943 to September 1948.

Extremes.- Maximum discharge during year, 78 second-feet May 25 (gage height, 2.67 feet); minimum daily, 2.5 second-feet Dec. 11, 13.

1943-48: Maximum discharge, 135 second-feet May 13, 1945 (gage height, 3.32 feet); minimum daily, 2.4 second-feet Oct. 13, 1945.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Llano ditch (see p.282) diverts water half a mile above station for irrigation. Flow largely regulated by Cabresto Reservoir (capacity, 732 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	5.2	3.8	4	4.9	4.5	4.9	49	40	10	8.2	5.5
2	8.1	5.2	4.0	3.5	4.9	4.4	5.6	48	45	10	8.1	5.3
3	7.8	5.0	4.0	3.5	4.9	4.4	6.2	42	45	11	7.9	5.2
4	7.4	5.0	3.8	4	4.8	3.4	6.6	36	45	11	7.9	5.2
5	7.3	4.5	3.0	4.5	4.5	2.6	6.6	38	40	10	9.6	5.0
6	7.1	4.4	3.7	4	4.5	3.8	7.4	39	35	11	8.4	5.0
7	6.1	3.1	3.6	4	4	4.0	8.1	48	30	11	7.9	5.2
8	6.2	4.0	3.2	4.4	4	4.0	8.8	47	25	11	7.6	5.2
9	6.8	4.8	3.6	4.4	3.5	4.2	9.6	43	22	10	7.4	5.6
10	6.6	4.9	2.9	4.2	4	4.2	11	38	20	10	7.5	7.1
11	6.5	4.5	2.5	4.1	4	4.0	13	35	18	11	7.3	6.0
12	6.5	4.5	3.0	4.1	3	3.5	12	31	16	11	7.3	5.2
13	6.6	4.9	2.5	3.7	4	4.0	11	26	14	11	7.1	4.8
14	7.4	4.8	3.0	4.1	4	4.2	10	27	12	10	7.1	4.4
15	7.1	3.8	3.5	4.4	4	4.2	13	30	12	10	6.8	4.2
16	6.8	4.0	3.5	4.2	4.5	4.1	17	33	11	10	6.4	4.2
17	6.5	3.8	3.5	4.2	4.5	4.1	19	32	11	10	6.0	4.1
18	6.4	3.7	3.5	4.4	4.5	4.4	23	32	12	10	6.0	4.0
19	6.2	3.8	3.5	4.5	4.5	4.4	26	32	12	11	7.0	4.0
20	6.0	4.0	3.5	4.6	4.5	4.4	29	30	12	12	8.1	3.8
21	5.9	3.2	3.5	4.8	4.5	4.1	31	29	10	11	7.1	3.8
22	5.9	4.1	3.5	4.4	4	3.5	31	29	11	11	7.5	3.7
23	5.8	4.1	3.5	4.1	4.5	4.5	30	31	11	10	7.1	3.6
24	5.8	3.8	3.5	4.1	4.5	4.9	28	38	11	10	6.8	3.6
25	5.8	3.8	3.5	4.1	4.5	5.0	26	59	11	11	6.5	3.7
26	5.6	3.8	4	4.2	4.5	4.4	25	50	11	10	6.4	4.2
27	5.5	4.0	4	4.0	4.5	4.5	25	40	11	9.4	6.2	5.0
28	5.3	3.7	4	4.2	4.4	5.2	26	25	11	9.1	5.9	4.8
29	5.2	3.7	4	4.8	4.5	5.6	31	25	11	8.8	5.9	5.2
30	5.2	3.7	4.5	5.0	-	5.6	42	30	10	3.4	5.8	5.0
31	5.2	-	4	5.0	-	5.5	-	35	-	8.2	5.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	198.8	8.2	5.2	6.41	394
November.....	125.6	5.2	3.1	4.19	250
December.....	109.6	4.5	2.5	3.54	217
Calendar year 1947.....	4,143.7	68	2.5	11.4	8,220
January.....	131.5	5.0	3.5	4.24	261
February.....	125.4	4.9	3.5	4.32	249
March.....	135.6	5.6	2.6	4.31	285
April.....	542.8	42	4.9	18.1	1,080
May.....	1,125	59	25	36.3	2,230
June.....	595	45	10	19.5	1,160
July.....	317.9	12	8.2	10.3	631
August.....	220.2	9.6	5.8	7.10	437
September.....	142.6	7.1	3.6	4.75	283
Water year 1947-48.....	3,758.2	59	2.5	10.3	7,469

Note.- No gage-height record Dec. 11 to Jan. 7, Feb. 5-27, May 26 to June 13; discharge computed on basis of weather records and records for nearby stations.

## RIO GRANDE BASIN

Llano ditch near Questa, N. Mex.

Location.- Water-stage recorder and 3-foot Parshall flume, lat. 36°43'45", long. 105°33'00", in SE $\frac{1}{4}$  sec. 21, T. 29 N., R. 13 E., 3 $\frac{1}{4}$  miles northeast of Questa and 3 $\frac{1}{4}$  miles upstream from mouth of Cabresto Creek.

Records available.- September 1943 to September 1948 (irrigation season only).

Extremes.- Maximum daily discharge recorded, 30 second-feet May 24, 30, 31, June 1-3; no flow at times.

1943-48: Maximum daily discharge recorded, 32 second-feet June 7, 11, 16-18, 1945; no flow at times.

Remarks.- Records good except those for periods of no gage-height record which are poor. DITCH diverts water from right bank of Cabresto Creek for irrigation near Questa.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0.6	0	0.04	2.4
November 1-34.....	0	0	0	0
April 8-30.....	5.7	0	1.40	64
May.....	30	4.3	15.6	969
June.....	30	8.4	17.6	1,050
July.....	11	0	3.32	204
August.....	0	0	0	0
September.....	0	0	0	0
Water year .....	-	-	-	-

## RIO GRANDE BASIN

283

Rio Hondo near Valdez, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 36°32'20", long. 105°33'30", in S<sup>1</sup> sec. 28, T. 27 N., R. 13 E. (projected), a quarter of a mile upstream from Forest Service gate, 1½ miles east of Valdez, and 9 miles upstream from mouth.

Records available.- August 1934 to September 1948. October 1930 to September 1934 at site half a mile downstream, below two diversions.

Average discharge.- 14 years (1934-48), 42.8 second-feet.

Extremes.- Maximum discharge during year, 163 second-feet May 22; maximum gage height recorded, 2.70 feet Dec. 15 (backwater from ice); minimum daily discharge, 8 second-feet Jan. 28, Feb. 12.

1934-48: Maximum discharge, 541 second-feet May 13, 1941, from rating curve extended above 300 second-feet by logarithmic plotting; maximum gage height, 5.59 feet (ice jam) Dec. 15, 1936, datum then in use; minimum daily discharge, 3.0 second-feet Jan. 21, 1935.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	14	12	12	10	11	13	64	116	58	32	24
2	16	14	13	11	10	11	13	56	108	54	30	23
3	15	14	13	13	10	10	14	52	128	52	29	23
4	15	14	12	13	10	9	15	47	130	52	30	22
5	15	13	12	15	10	9	15	47	133	50	54	21
6	15	13	12	14	10	9	17	54	128	47	41	22
7	14	b13	12	13.5	10	10	19	64	133	47	38	21
8	14	b12	12	13	10	11	19	69	125	44	37	21
9	15	13	12	12.5	10	11	20	66	125	41	35	21
10	15	13	b12	12	9.2	11	22	56	125	40	34	21
11	15	b13	b11	11.5	10	11	23	47	118	39	35	21
12	15	13	b10	11	8	10	21	42	123	39	37	21
13	15	13	b9	11	9	11	20	39	128	38	38	21
14	18	13	b10	11	10	12	21	41	123	37	36	21
15	18	13	b11	11	11	13	25	54	118	36	34	19
16	16	13	13	11	11	13	30	72	113	35	33	17
17	16	13	12	11	11	13	33	87	108	34	32	17
18	15	13	12.5	10.5	11	13	38	104	104	35	31	16
19	15	13	13	10	11	12.5	44	102	111	40	30	16
20	15	*13	14	10	13	12	45	104	116	47	28	16
21	15	b13	13	11	13	11	45	135	100	41	28	16
22	15	13	13	11	13	9.5	44	152	98	39	31	16
23	15	13	13	11	14	10	41	138	89	36	28	16
24	15	b13	13	11	14	12	38	120	83	35	27	16
25	15	b12	14	11	14	13	34	111	78	37	27	16
26	15	12	14	11	14	12	32	96	74	38	25	19
27	15	12	14	9	13	13	34	100	71	35	25	19
28	15	12	14	8	12	13	36	98	66	35	25	18
29	15	12	14	8.5	12	14	54	98	64	34	24	16
30	15	12	14	9	-	13	69	100	58	34	24	16
31	14	-	14	10	-	13	-	108	-	33	24	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	471	18	14	15.2	934
November.....	387	14	9	12.9	768
December.....	387.5	14	9	12.5	769
Calendar year 1947.....	12,193.5	228	9	33.4	24,200
January.....	347.5	15	8	11.2	689
February.....	323.2	14	8	11.1	641
March.....	356.0	14	9	11.5	706
April.....	896	69	13	29.9	1,780
May.....	2,523	152	39	81.4	5,000
June.....	3,194	133	58	106	6,340
July.....	1,260	56	33	40.6	2,500
August.....	982	54	24	31.7	1,950
September.....	572	24	16	19.1	1,130
Water year 1947-48.....	11,699.2	152	8	32.0	23,210

Peak discharge (base, 70 sec.-ft.)- Apr. 29 (11 p.m.) 72 sec.-ft.; May 8 (3 p.m.) 71 sec.-ft.; May 22 (1 a.m.) 183 sec.-ft.; July 13 (11 p.m.) 90 sec.-ft.; Aug. 5 (9 a.m.) 80 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

Note.- No gage-height record Dec. 16 to Feb. 4, Feb. 12 to Mar. 2, Mar. 4-22, June 14-17; discharge computed on basis of discharge measurements, weather records, and records for nearby stations.

## Rio Hondo at Arroyo Hondo, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 36°31'55", long. 105°41'05", in sec. 32, T. 27 N., R. 12 E., 1 mile downstream from Arroyo Hondo and 1½ miles upstream from mouth.

Records available.- April 1910 to August 1915 (at site 200 yards above mouth, published as Rio Hondo near Arroyo Hondo) and January 1932 to September 1948 in reports of Geological Survey. April 1910 to December 1928 in reports of State engineer.

Average discharge.- 16 years (1932-48), 30.7 second-feet.

Extremes.- Maximum discharge during year, 1,060 second-feet July 19 (gage height, 3.75 feet), from rating curve extended above 200 second-feet by logarithmic plotting; minimum daily, 6.8 second-feet Sept. 22.  
1932-48: Maximum discharge, 2,510 second-feet Aug. 23, 1935 (gage height, 5.45 feet, datum then in use), from rating curve extended above 170 second-feet by logarithmic plotting; minimum daily, 4.0 second-feet July 13-16, 1934.

Remarks.- Records good. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.9	13	14	15	15	18	14	43	73	17	13	8.1
2	8.3	13	15	13	14	16	14	39	71	16	12	7.9
3	8.8	12	15	16	14	16	14	37	84	15	12	8.1
4	8.3	12	14	16	14	15	15	35	87	13	12	8.1
5	8.3	13	14	18	14	b11	15	31	80	14	23	7.6
6	8.3	13	15	17	14	b12	16	36	79	12	21	7.6
7	8.3	10	14	16	14	14	19	33	77	14	16	7.6
8	8.3	10	14	16	13	16	23	31	77	12	16	7.4
9	8.3	11	14	15	12	15	19	30	74	11	15	7.0
10	7.9	12	b13	15	16	15	15	29	71	10	15	7.0
11	7.9	12	b9.5	14	15	14	15	27	67	9.7	15	7.0
12	7.9	13	11	14	b10	13	13	22	66	9.7	15	7.0
13	8.8	13	10	13	b12	16	11	18	59	9.7	15	7.0
14	11	13	13	12	b14	18	12	11	52	9.2	15	7.0
15	9.2	14	14	14	b16	18	14	8.3	46	8.8	15	7.0
16	7.9	15	18	15	16	18	10	12	39	9.2	13	7.2
17	7.9	14	15	13	16	18	11	21	35	8.8	9.5	7.0
18	7.9	14	16	16	16	*17	12	28	31	11	9.0	7.0
19	7.9	14	17	*13	17	15	13	40	36	56	9.0	7.0
20	7.9	14	*16	12	17	15	13	61	47	34	9.2	7.0
21	7.9	14	19	15	16	14	21	76	40	28	9.0	7.0
22	7.4	15	15	16	18	12	25	69	41	25	9.2	6.8
23	7.9	15	15	15	21	14	23	70	38	20	9.2	7.0
24	8.3	*14	14	15	19	15	22	69	34	18	9.0	7.0
25	8.3	15	18	14	19	15	19	77	31	16	9.2	7.9
26	8.3	14	16	14	19	14	18	73	29	16	8.7	7.9
27	8.3	14	16	b12	19	14	18	69	25	15	8.5	7.6
28	7.4	14	16	b11	18	14	20	69	21	15	8.3	7.6
29	7.1	14	17	12	*18	15	36	70	20	14	8.5	7.4
30	7.1	14	17	b14	-	15	44	71	19	13	8.5	7.4
31	8.3	-	17	15	-	15	-	73	-	13	8.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	253.3	11	7.1	8.17	502
November.....	398	15	10	13.3	789
December.....	461.5	19	9.5	14.9	915
Calendar year 1947 .....	7,370.4	135	5.0	20.2	14,620
January.....	446	18	11	14.4	885
February.....	456	21	10	15.7	904
March.....	467	18	11	15.1	926
April.....	534	44	10	17.8	1,060
May.....	1,375.3	77	8.3	44.4	2,730
June.....	1,549	87	19	51.6	3,070
July.....	493.1	56	6.8	15.9	978
August.....	375.9	23	8.1	12.1	746
September.....	220.2	8.1	6.8	7.34	437
Water year 1947-48 .....	7,030.3	87	6.8	19.2	13,940

Peak discharge (base, 90 sec.-ft.)- June 2 (11 p.m.) 148 sec.-ft.; July 19 (8 p.m.) 1,060 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.



## Rio Pueblo de Taos near Taos, N. Mex.

Location.- Water-stage recorder, lat.  $36^{\circ}26'$ , long.  $105^{\circ}30'$ , in sec. 36, T. 26 N., R. 13 E.,  $2\frac{1}{2}$  miles east of Taos Pueblo,  $4\frac{1}{2}$  miles northeast of Taos, and 5 miles upstream from Rio Lucero.

Records available.- February 1940 to September 1948.

Extremes.- Maximum discharge during year, 146 second-feet May 25 (gage height, 2.07 feet); minimum daily, 3.7 second-feet, Nov. 7.  
1940-48: Maximum discharge, 970 second-feet May 14, 1941 (gage height, 3.90 feet, from high-water mark in gage well), from rating curve extended above 290 second-feet by logarithmic plotting; minimum daily, that of Nov. 7, 1947.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.6	5.6	6.3	b5.4	a6.0	7.6	10	108	102	28	10	7.9
2	5.3	5.6	6.3	b5.0	a6.0	*7.2	12	95	106	27	9.9	7.9
3	5.3	6.0	6.9	b5.5	*a6.0	6.9	15	92	104	25	9.5	7.6
4	5.0	5.6	6.6	6.0	*6.3	5.6	19	83	106	24	12	7.6
5	5.0	5.3	5.0	5.6	6.3	b4.5	21	80	106	24	33	7.2
6	5.0	5.3	6.9	5.6	6.3	b5.0	25	86	100	23	25	6.9
7	4.8	3.7	6.3	6.0	6.3	b6.0	26	93	95	22	19	6.9
8	4.6	4.8	5.6	6.0	6.0	6.9	27	102	93	21	17	6.9
9	4.6	5.3	6.3	6.3	b5.0	6.9	29	97	86	19	16	6.9
10	4.6	5.3	6.0	6.3	b5.6	6.6	37	85	83	19	15	7.2
11	4.6	4.8	b5.5	6.3	b5.0	6.9	44	77	78	18	15	6.9
12	4.6	5.0	b5.0	6.0	b4.2	b5.5	38	67	82	17	15	6.9
13	5.0	6.0	b4.5	b5.0	b5.0	6.3	29	62	76	16	15	6.9
14	7.6	5.3	b5.0	b5.5	b5.6	6.9	28	64	71	16	15	6.6
15	9.1	5.0	b5.4	b6.0	b6.0	6.9	37	78	65	15	12	6.6
16	7.6	5.6	b5.8	5.6	6.6	7.2	53	95	60	15	11	6.6
17	6.6	5.6	6.0	b5.0	6.6	7.6	56	106	55	14	11	6.6
18	6.3	5.3	6.6	b5.0	6.9	7.6	67	116	50	15	12	6.3
19	6.0	5.0	6.9	b5.0	7.2	7.6	74	114	49	17	15	6.3
20	6.0	5.3	6.3	b5.2	6.9	8.2	76	125	59	17	11	6.3
21	5.6	4.8	6.6	b5.5	6.9	7.9	78	132	49	15	11	6.0
22	5.6	*6.9	*6.0	5.3	6.9	5.6	76	141	55	15	12	6.3
23	5.6	7.6	5.3	5.0	7.2	9.1	76	136	47	14	11	6.3
24	5.6	7.2	5.3	5.0	7.2	11	70	118	40	13	9.9	6.0
25	5.6	6.6	5.6	5.3	7.2	12	62	134	36	14	9.9	6.3
26	5.6	6.3	5.6	5.3	7.6	11	58	129	33	16	9.1	8.2
27	5.6	6.6	6.0	b5.0	7.6	11	63	120	32	12	8.6	7.9
28	5.6	6.3	6.0	b4.5	6.9	12	65	127	32	12	8.6	7.9
29	5.6	6.6	5.6	b5.0	7.2	14	83	122	32	11	8.2	7.2
30	5.6	6.3	6.0	b5.4	-	13	110	110	31	11	8.2	7.2
31	5.6	-	b5.8	b5.8	-	12	-	108	-	12	8.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	174.8	9.1	4.6	5.64	347
November.....	170.6	7.6	3.7	5.69	338
December.....	183.0	6.9	4.5	5.90	363
Calendar year 1947.....	8,554.0	218	3.7	23.4	16,960
January.....	169.4	6.3	4.5	5.46	336
February.....	184.5	7.6	4.2	6.36	366
March.....	252.5	14	4.5	9.15	501
April.....	1,484	110	10	48.8	2,900
May.....	3,202	141	62	103	6,350
June.....	2,013	106	31	67.1	3,990
July.....	537	28	11	17.3	1,070
August.....	403.1	33	8.2	13.0	800
September.....	208.3	8.2	6.0	6.94	413
Water year 1947-48.....	8,962.2	141	3.7	24.5	17,770

Peak discharge (base, 70 sec.-ft.), Apr. 22 (9 p.m.) 82 sec.-ft.; Apr. 30 (11 p.m.) 114 sec.-ft.; May 8 (12 m.) 104 sec.-ft.; May 25 (10 p.m.) 146 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations on Rio Taos at Los Cordovas and Rio Hondo at Arroyo Hondo.

b Stage-discharge relation affected by ice.

## Rio Taos at Los Cordovas, N. Mex.

Location.- Water-stage recorder, 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, 50 feet downstream from Rio Ranchos de Taos and Arroyo Seco, half a mile northeast of Los Cordovas, and  $\frac{3}{4}$  miles west of Taos.

Drainage area.- 359 square miles.

Records available.- April 1910 to August 1915 and October 1930 to September 1948 in reports of Geological Survey. April 1910 to December 1931 in reports of State engineer.

Average discharge.- 37 years (1910-25, 1926-48), 64.4 second-feet.

Extremes.- Maximum discharge during year, 542 second-feet May 25 (gage height, 3.63 feet); minimum daily, 6.5 second-feet July 14-16.  
1930-48: Maximum discharge, 1,830 second-feet May 14, 1941 (gage height, 5.81 feet), from rating curve extended above 1,300 second-feet by logarithmic plotting; minimum daily, 1.4 second-feet Aug. 5, 10, 1934.

Remarks.- Records good except those for January and February, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.8	13	21	21	b25	42	33	178	332	23	6.8	8.4
2	8.8	13	27	b20	a24	37	34	151	322	21	6.8	7.5
3	9.3	13	32	24	a25	35	37	133	320	18	7.2	8.0
4	9.3	13	30	25	a25	32	40	116	315	16	8.0	8.0
5	9.3	14	26	26	a25	32	44	103	278	15	16	7.5
6	9.3	15	29	25	*25	b28	49	105	225	13	14	7.5
7	9.8	14	29	26	24	32	52	100	202	11	12	8.0
8	10	16	27	28	25	36	54	118	184	9.8	11	8.0
9	11	16	26	28	b22	35	60	118	155	8.4	10	8.4
10	10	16	21	26	b25	35	74	105	133	8.4	11	8.8
11	9.3	16	21	29	b22	32	103	97	123	8.4	11	8.8
12	9.3	16	21	29	b18	30	108	82	123	8.0	12	8.8
13	10	17	20	28	b20	34	81	71	113	7.2	12	8.8
14	15	17	21	27	b24	44	72	57	94	8.5	11	8.8
15	13	16	23	28	b28	*44	81	60	77	6.5	10	8.4
16	13	17	25	29	34	42	103	82	59	6.5	10	8.8
17	13	19	21	27	35	45	113	97	52	6.8	10	9.3
18	12	18	21	27	39	44	119	133	37	8.0	11	8.8
19	12	19	22	26	41	42	142	180	42	9.3	11	8.8
20	12	19	*21	26	45	39	146	341	90	8.4	12	9.3
21	11	18	24	27	45	36	147	407	60	7.5	12	9.3
22	11	17	22	28	51	32	142	419	66	8.4	12	9.3
23	10	19	23	28	*63	36	149	416	62	7.5	12	8.8
24	11	19	22	26	50	37	162	407	50	8.0	11	9.3
25	12	18	23	26	47	37	133	472	42	8.8	11	10
26	12	19	24	25	47	32	114	437	38	10	10	11
27	12	19	24	b23	57	32	110	437	34	8.4	9.8	11
28	13	20	24	b20	53	32	106	428	36	7.5	8.8	11
29	13	21	24	b22	50	35	128	395	31	7.2	8.8	11
30	13	21	26	b20	-	38	182	363	27	8.0	8.8	11
31	13	-	25	b22	-	38	-	338	-	7.5	8.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	345.2	15	8.8	11.1	685
November.....	508	21	13	16.9	1,010
December.....	745	32	20	24.0	1,480
Calendar year 1947 .....	14,785.2	700	3.0	40.5	29,340
January.....	794	29	20	25.6	1,570
February.....	1,012	63	18	34.9	2,010
March.....	1,126	45	28	36.3	2,230
April.....	2,918	182	33	97.3	5,790
May.....	6,948	472	57	224	13,780
June.....	3,722	332	27	124	7,380
July.....	308.0	23	6.5	9.94	611
August.....	325.4	16	6.8	10.5	645
September.....	270.4	11	7.5	9.01	556
Water year 1947-48 .....	19,022	472	6.5	52.0	37,730

Peak discharge (base, 200 sec.-ft.)- May 1 (7 a.m.) 200 sec.-ft.; May 25 (12 m.) 542 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Rio Pueblo de Taos, Rio Lucero, and Rio Hondo at Arroyo Hondo.

b Stage-discharge relation affected by ice.

## Rio Lucero near Arroyo Seco, N. Mex.

Location.- Water-stage recorder and wooden control, lat. 36°30', long. 105°32', in sec. 10, T. 26 N., R. 13 E., in Antoine Leroux Grant, 200 feet upstream from diversion dam for Tenorio and Indian ditches, 2 miles southeast of Arroyo Seco, 4½ miles north of Taos Pueblo, and 7½ miles northeast of Taos.

Records available.- April 1910 to December 1916 (published as Rio Lucero near Taos) and November 1933 to September 1948 in reports of Geological Survey. January 1911 to December 1915 in reports of State engineer.

Average discharge.- 14 years (1934-48), 25.6 second-feet.

Extremes.- Maximum discharge during year, 127 second-feet May 22 (gage height, 2.11 feet); minimum daily, 2.5 second-feet Feb. 12.  
1933-48: Maximum discharge, 300 second-feet May 13, 1941 (gage height, 3.12 feet); minimum daily, that of Feb. 12, 1948.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	7.9	6.5	d5.5	d5.0	d4.0	5.1	7.2	48	32	40	12	11
2	7.9	6.5	d5.5	d4.5	d4.0	*5.1	8.3	42	95	38	12	11
3	7.9	6.9	d5.5	4.7	a4.0	5.1	9.9	40	111	36	11	11
4	7.9	6.9	d5.5	5.1	a4.0	4.7	10	36	114	34	12	11
5	7.6	6.5	d4.5	5.4	a4.0	b4.0	11	38	108	32	22	10
6	7.6	6.1	d5.0	5.1	*d4.0	b4.5	13	42	100	31	19	9.9
7	7.9	b5.0	d5.5	5.1	d3.5	4.7	15	46	100	30	18	9.5
8	7.9	b5.4	d5.0	5.1	d3.5	5.1	16	48	93	29	17	9.9
9	7.9	b5.8	d5.5	5.1	d3.0	5.1	18	44	95	28	17	9.9
10	7.9	5.8	d5.0	4.7	d3.5	5.1	21	38	91	26	16	9.5
11	7.9	b5.4	d4.5	5.1	d3.0	4.7	20	32	89	25	15	9.5
12	7.9	b5.6	d4.5	4.7	d2.5	b4.4	17	27	89	24	15	9.5
13	8.3	5.8	d4.0	4.1	d3.0	d4.8	15	26	86	23	15	9.5
14	9.1	5.1	d4.5	4.4	d3.5	d5.0	16	32	81	22	15	9.1
15	*8.7	b4.8	d5.0	4.7	d3.5	d5.2	22	43	76	21	16	8.7
16	8.3	b5.2	d5.4	4.7	d3.5	d5.4	29	52	70	20	16	8.7
17	7.9	b5.4	a5.8	4.4	d4.0	d5.6	33	62	66	20	16	8.3
18	7.6	b5.2	a6.0	4.4	d4.0	d5.8	38	76	62	20	16	7.9
19	7.6	b5.0	a6.0	4.1	d4.0	d6.0	42	78	63	23	16	7.6
20	7.6	b4.8	a6.0	4.1	d4.5	d6.0	43	84	74	15	15	7.6
21	7.6	b4.5	a6.0	4.1	d4.5	5.4	42	105	62	13	15	7.6
22	7.9	*5.8	*d5.5	4.1	d4.5	4.7	37	116	60	14	16	7.2
23	7.6	d6.0	d5.0	4.1	d5.0	5.4	38	110	57	14	15	7.2
24	7.6	d5.0	d5.0	3.8	d4.5	7.2	30	99	54	13	14	7.2
25	7.6	d5.8	d5.5	3.8	d4.5	7.9	26	99	51	13	14	7.9
26	7.6	d5.5	d5.5	3.8	d4.5	7.2	23	82	48	14	13	8.3
27	7.6	d5.5	d5.5	3.5	d5.0	7.2	25	72	48	13	12	8.3
28	7.2	d5.5	d5.5	d3.0	4.4	7.9	28	69	45	13	12	7.9
29	7.2	d5.5	d5.5	d3.5	4.7	9.1	40	74	44	12	12	7.6
30	6.9	d5.5	d5.5	d4.0	-	8.7	50	83	42	12	11	7.6
31	6.5	-	d5.5	d4.0	-	7.9	-	90	-	12	11	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	240.6	9.1	6.5	7.76	477
November.....	169.3	6.9	4.5	5.64	336
December.....	164.2	6.0	4.0	5.30	326
Calendar year 1947 .....	6,912.7	124	4.0	18.9	13,710
January.....	136.2	5.4	3.0	4.39	270
February.....	114.6	5.0	2.5	3.95	227
March.....	180.0	9.1	4.0	5.81	357
April.....	736.4	50	7.2	24.8	1,480
May.....	1,933	116	26	62.4	3,850
June.....	2,265	114	42	75.5	4,490
July.....	680	40	12	21.9	1,350
August.....	456	22	11	14.7	904
September.....	265.9	11	7.2	8.86	527
Water year 1947-48 .....	7,344.2	116	2.5	20.1	14,550

Peak discharge (base, 70 sec.-ft.)- May 22 (8 p.m.) 127 sec.-ft.; June 3 (7 p.m.) 119 sec.-ft.; June 19 (12 p.m.) 100 sec.-ft.; July 19 (8 p.m.) 85 sec.-ft.

\* Winter discharge measurement made on this day.  
a No gage-height record; discharge computed on basis of weather records and records for Rio Pueblo de Taos near Taos, Rio Taos at Los Cordovas, and Rio Hondo at Arroyo Hondo.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## Principal diversions from Rio Lucero, N. Mex.

Records of discharge are collected for five ditches that divert water from the Rio Lucero below gaging station on that stream near Arroyo Seco. Each of these ditches is equipped with a water-stage recorder for collecting gage-height records. Water diverted by these ditches is used for irrigation in the valley of the Rio Lucero below the gaging station near Arroyo Seco.

Tenorio ditch diverts from right bank in sec. 10, T. 26 N., R. 13 E. (projected), 200 feet downstream from gaging station on Rio Lucero near Arroyo Seco. Records available, June 1935 to September 1948 (irrigation seasons only).

Indian ditch diverts from left bank in sec. 10, T. 26 N., R. 13 E. (projected), 200 feet downstream from gaging station on Rio Lucero near Arroyo Seco. Records available, July 1934 to September 1948 (irrigation seasons only).

Seco ditch diverts from right bank in sec. 10, T. 26 N., R. 13 E. (projected), 600 feet downstream from gaging station on Rio Lucero near Arroyo Seco. Records available, July 1934 to September 1948 (irrigation seasons only except water years 1938-40).

Juan Manuel ditch diverts from right bank in sec. 16, T. 26 N., R. 13 E. (projected). Records available, June 1935 to September 1948 (irrigation seasons only).

Prado ditch diverts from right bank in sec. 21, T. 26 N., R. 13 E. (projected). Records available, May 1934 to September 1948 (irrigation seasons only except water years 1938-40).

Diversions, in acre-feet, water year October 1947 to September 1948

Month	Tenorio ditch	Indian ditch	Seco ditch	Juan Manuel ditch	Prado ditch
October.....	a30.0	a68	a39	a2.6	a28
November.....	-	-	-	-	-
December.....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	-	-	-	-	-
April.....	c36	c11	c228	b38	b207
May.....	216	213	607	451	706
June.....	202	490	853	352	702
July.....	100	456	313	50	374
August.....	82	462	147	6.1	256
September.....	32	257	90	19	77

a Oct. 1-15.

b Apr. 13-30.

c Apr. 14-30.

## Embudo Creek at Dixon, N. Mex.

Location.- Water-stage recorder, lat. 36°12'35", long. 105°54'35", in NW¼ sec. 20, T. 23 N., R. 10 E., at bridge on U. S. Highway 64, 0.5 mile upstream from mouth, three-quarters of a mile east of Embudo, and 1½ miles northwest of Dixon.

Drainage area.- 305 square miles.

Records available.- October 1930 to September 1948 in reports of Geological Survey.  
October 1923 to December 1931 in reports of State engineer.

Average discharge.- 25 years (1923-48), 92.6 second-feet.

Extremes.- Maximum discharge during year, 730 second-feet May 25 (gage height, 5.18 feet); minimum daily, 6.4 second-feet July 18.

1930-48: Maximum discharge, 2,180 second-feet Aug. 22, 1946 (gage height, 7.00 feet); minimum daily, 1 second-foot July 23, 24, 1932.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	9.7	20	35	b16	b50	54	48	460	528	74	9.2	11
2	9.2	19	39	b19	b29	35	57	436	512	67	9.2	11
3	9.7	20	43	b21	27	39	78	420	512	59	20	10
4	9.7	21	41	b23	*28	33	97	385	488	54	17	9.2
5	11	b22	30	b24	28	26	109	382	448	59	196	9.2
6	10	b20	38	b25	*28	38	124	392	424	67	a100	8.3
7	9.7	19	38	b26	27	34	126	410	432	51	a75	7.9
8	9.2	24	31	27	25	35	124	424	440	43	a60	7.9
9	9.2	28	32	31	b24	30	133	402	a410	33	46	8.3
10	9.2	28	25	33	b25	28	157	371	a360	25	39	8.7
11	9.7	26	b22	31	21	24	211	336	a360	19	33	7.9
12	10	28	b24	28	b16	26	217	288	a410	17	35	7.9
13	11	28	b23	23	b18	30	169	252	a370	14	38	8.3
14	67	28	b22	23	b20	33	157	246	a320	11	30	8.3
15	59	28	b25	b25	b21	33	187	264	a250	9.7	22	9.2
16	43	30	30	b22	b23	31	246	332	a220	9.2	16	9.2
17	38	30	b28	b20	25	39	312	360	a190	6.7	10	8.7
18	*33	28	b28	b25	*27	48	368	416	174	6.4	11	7.5
19	31	26	b30	b22	36	42	432	480	171	17	30	7.5
20	30	27	*28	b24	45	48	436	630	246	16	20	7.5
21	27	16	30	*b26	42	43	452	655	187	11	18	7.5
22	26	22	27	b30	42	33	424	630	217	12	16	7.1
23	25	42	b25	34	52	48	432	603	214	11	16	6.7
24	24	34	b24	33	45	62	420	590	176	14	17	7.1
25	24	36	26	28	43	70	350	621	149	14	16	7.9
26	23	36	27	31	51	52	291	580	128	21	16	12
27	23	39	27	15	45	52	312	580	114	16	14	14
28	22	34	b26	b22	42	60	312	590	111	11	13	15
29	22	*34	b25	b25	49	70	382	567	91	12	13	16
30	21	32	b25	*b28	-	70	464	528	83	10	12	16
31	21	-	b24	b29	-	65	-	520	-	9.7	9.7	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	686.3	67	9.2	22.1	1,360
November.....	825	42	16	27.5	1,640
December.....	898	43	22	29.0	1,780
Calendar year 1947.....	18,793.3	563	4.2	51.5	37,290
January.....	791	34	15	25.5	1,570
February.....	934	52	16	32.2	1,850
March.....	1,329	70	24	42.9	2,640
April.....	7,627	464	48	254	15,130
May.....	14,150	655	246	456	28,070
June.....	8,753	528	83	292	17,360
July.....	799.7	74	6.4	25.8	1,590
August.....	979.1	196	9.2	31.6	1,940
September.....	282.8	16	6.7	9.43	561
Water year 1947-48.....	38,054.9	655	6.4	104	75,490

Peak discharge (base, 800 sec.-ft.).- No peak above base.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Red River near Questa and Rio Santa Cruz at Cunditoy.

b Stage-discharge relation affected by ice.

## Rio Chama at Park View, N. Mex.

Location.- Water-stage recorder, lat. 36°44'15", long. 106°34'40", in Tierra Amarilla Grant, at bridge on State Highway 51, just below present mouth (shifts position) of Rio Brazos and half a mile northwest of Park View, Rio Arriba County.

Drainage area.- 405 square miles.

Records available.- November 1912 to September 1916 and October 1930 to September 1948 in reports of Geological Survey. November 1912 to September 1916 and April 1925 to December 1931 in reports of State engineer. Records include flow of Rio Brazos.

Average discharge.- 25 years (1913-15, 1925-48), 374 second-feet.

Extremes.- Maximum discharge during year, 4,300 second-feet May 6 (gage height, 6.40 feet); minimum daily, 10 second-feet Sept. 15.  
1930-48: Maximum discharge, 8,530 second-feet Apr. 16, 1937; maximum gage height, 8.12 feet May 26, 1941, site and datum then in use; minimum daily discharge, 3 second-feet July 6, 7, 1934.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	59	51	a35	b45	84	148	2,500	1,580	196	18	18
2	62	59	53	a35	a45	82	178	2,140	1,530	180	17	18
3	67	62	50	a37	a45	58	236	2,200	1,660	170	17	21
4	56	53	51	a40	a42	b50	263	2,110	1,420	146	21	21
5	48	48	*44	a42	a40	b55	280	2,500	1,280	134	105	17
6	44	51	56	a45	a40	b50	355	3,300	1,190	117	95	14
7	40	31	45	a46	a40	b55	406	3,220	1,160	106	87	15
8	42	42	46	*b48	b40	*58	440	2,620	1,050	91	60	14
9	41	50	50	a50	b40	53	500	1,940	990	78	53	15
10	40	53	43	a50	b40	50	574	1,440	920	66	43	14
11	43	39	b40	a50	b45	b48	598	1,200	948	60	41	14
12	97	46	b35	a50	*b40	b50	586	1,080	948	55	43	12
13	97	47	b35	a47	b37	b50	470	1,200	798	51	49	12
14	190	38	b37	a45	b40	52	470	1,760	686	49	41	11
15	222	32	b40	a42	b43	47	540	2,100	605	45	39	10
16	213	46	b40	a42	b45	47	682	2,120	535	43	37	12
17	186	50	b40	a40	b50	47	808	1,980	462	34	29	15
18	148	41	b42	a40	b55	44	1,030	2,010	420	30	26	15
19	120	47	*b42	a38	b60	48	1,300	2,100	454	55	30	17
20	100	43	b42	a37	b60	48	1,810	2,250	496	41	29	16
21	90	40	b40	a38	b55	44	2,230	2,100	420	39	27	14
22	92	55	b38	*b40	b60	*50	2,440	1,850	535	32	30	12
23	86	51	b40	b42	b60	64	1,860	1,640	471	35	29	12
24	80	48	a40	b40	*b60	92	1,080	1,560	375	39	26	13
25	69	52	a40	b40	b65	112	821	1,700	312	63	26	14
26	61	56	a42	b40	b70	97	790	1,450	293	66	27	34
27	61	64	a45	b37	b70	117	852	1,380	286	45	23	29
28	58	51	a45	b35	b70	163	1,100	1,250	286	35	23	25
29	58	55	a42	b37	69	200	1,940	1,200	265	26	22	23
30	62	48	a40	*b42	-	182	2,500	1,170	228	23	21	22
31	59	-	a38	b45	-	148	-	1,400	-	21	19	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,696	222	40	87.0	5,350
November.....	1,457	84	31	48.6	2,890
December.....	1,333	56	35	43.0	2,640
Calendar year 1947 .....	88,027	3,040	17	241	174,600
January.....	1,295	50	35	41.8	2,570
February.....	1,471	70	37	50.7	2,920
March.....	2,305	200	44	74.4	4,570
April.....	27,285	2,500	148	910	54,120
May.....	58,470	3,300	1,080	1,886	118,000
June.....	22,601	1,660	228	753	44,830
July.....	2,173	196	21	70.1	4,310
August.....	1,123	105	17	36.2	2,230
September.....	497	34	10	16.6	986
Water year 1947-48 .....	122,706	3,300	10	335	243,400

Peak discharge (base, 2,700 sec.-ft.)- Apr. 22 (2 a.m.) 2,720 sec.-ft.; May 5 (1 a.m.) 2,930 sec.-ft.; May 6 (11 p.m.) 4,300 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of discharge measurements, weather records, records for El Vado Reservoir, and records for nearby streams.

b Stage-discharge relation affected by ice.

## Rio Chama below El Vado Dam, N. Mex.

Location.- Water-stage recorder, lat. 36°34'50", long. 106°43'30", in NW¼ sec. 15, T. 27 N., R. 2 E. (projected), 1.5 miles downstream from El Vado Dam, 2.7 miles upstream from Rio Nutrias, and 13 miles southwest of Tierra Amarilla.

Records available.- October 1935 to September 1948 in reports of Geological Survey. October 1913 to November 1916 at site 1.5 miles upstream (records of unregulated flow), published as Rio Chama near El Vado and near Tierra Amarilla in reports of Geological Survey. October 1913 to September 1916 and February 1920 to December 1924 in reports of State engineer.

Average discharge.- 12 years (1936-48), 432 second-feet, subsequent to completion of El Vado Dam.

Extremes.- Maximum discharge during year, 2,140 second-feet May 26 (gage height, 4.60 feet); minimum daily, 3.3 second-feet Jan. 13-16.

1935-48: Maximum discharge, 6,010 second-feet May 17, 1941 (gage height, 6.89 feet); maximum gage height, 9.63 feet May 30, 1937, site and datum then in use; minimum daily discharge, 0.9 second-foot Dec. 30, 1946.

Remarks.- Records good except those for periods of ice effect, which are fair. Diversions above station for irrigation. Flow regulated by El Vado Reservoir (see p. 240).

Discharge, in second-feet, water year October 1947 to September 1948

Continued in second report, water year October 1897 to September 1898												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	15	435	1,140	4.8	4.4	6.5	6.5	13	1,230	173	824	568
2	15	456	1,110	4.8	4.4	6.5	6.5	14	1,490	163	547	556
3	15	1,390	1,100	5.2	4.4	6.0	6.5	14	1,500	153	265	624
4	156	1,390	1,080	5.2	4.4	5.6	7.0	15	1,530	140	390	1,060
5	612	1,400	1,060	4.8	4.0	5.6	7.0	15	1,530	134	385	1,090
6	562	1,400	1,040	4.4	4.0	5.6	7.0	16	1,520	128	280	950
7	568	1,390	1,020	4.4	4.0	5.6	7.0	16	1,500	122	375	452
8	568	1,380	1,000	4.4	4.0	5.6	7.5	16	1,500	116	370	405
9	568	1,370	976	4.0	*4.0	6.0	7.5	18	1,310	107	265	294
10	198	1,360	944	4.0	4.4	5.6	8.1	19	824	102	355	72
11	13	1,360	920	3.6	4.4	5.6	8.1	19	838	100	350	61
12	13	1,350	888	3.6	b4.4	5.6	8.1	19	852	97	350	59
13	15	1,340	859	3.3	b4.4	5.6	213	19	968	92	345	85
14	16	1,330	644	3.3	b4.4	6.0	484	46	1,120	89	345	28
15	13	1,320	479	3.3	b4.4	6.0	425	128	916	295	345	28
16	13	1,320	221	3.3	b4.4	6.5	425	131	616	1,230	340	26
17	13	1,310	5.2	3.6	4.4	8.1	430	104	562	733	335	24
18	13	1,290	4.8	3.6	4.0	7.5	435	32	462	726	335	24
19	13	1,280	4.8	3.6	4.0	7.5	440	34	400	719	326	24
20	92	1,270	4.4	4.0	4.8	6.5	304	36	400	712	326	23
21	396	1,270	4.4	4.4	5.2	6.5	13	36	400	553	448	22
22	435	1,260	4.4	*4.4	5.6	6.5	10	39	572	452	1,120	22
23	435	1,240	4.4	4.4	6.5	7.0	11	40	747	446	818	23
24	435	1,230	4.4	4.4	5.2	7.0	12	40	651	440	634	23
25	440	1,220	4.4	4.8	6.0	6.5	12	290	502	440	628	26
26	440	1,200	4.4	4.8	*5.6	6.5	12	1,530	496	440	616	23
27	435	1,190	4.4	4.4	6.5	6.5	13	1,810	452	435	610	23
28	435	1,170	4.4	b4.8	5.6	6.5	13	1,320	335	435	598	22
29	435	1,160	4.4	b4.8	6.0	7.0	13	828	330	497	592	22
30	435	1,150	4.8	*5.2	-	7.5	13	610	266	852	580	22
31	435	-	4.8	4.8	-	6.5	-	797	-	838	574	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8,207	612	13	265	16,280
November.....	37,231	1,400	435	1,241	73,850
December.....	14,549.4	1,140	4.4	469	28,860
Calendar year 1947 .....	111,695.7	1,400	1.2	306	221,600
January.....	132.4	5.2	3.3	4.27	263
February.....	137.8	6.5	4.0	4.75	273
March.....	197.5	8.1	5.6	6.37	392
April.....	3,364.8	484	8.5	112	6,670
May.....	8,064	1,810	13	260.06	15,990
June.....	25,819	1,530	266	861	51,210
July.....	11,959	1,230	89	386	23,720
August.....	14,991	1,120	326	484	29,730
September.....	6,681	1,090	22	223	13,250
Water year 1947-48 .....	131,333.9	1,810	3.3	359	260,500

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.



## RIO GRANDE BASIN

Rio Chama near Abiquiu, N. Mex.

Location.- Water-stage recorder, lat. 36°13'00", long. 106°15'00", at bridge on State Highway 96 in Juan Jose Lobato Grant, 1½ miles upstream from El Rito Creek, 5 miles downstream from Abiquiu, Rio Arriba County, and 13.5 miles downstream from Abiquiu dam site.

Records available.- January 1942 to September 1948.

Extremes.- Maximum discharge during year, 2,010 second-feet June 7 (gage height, 4.30 feet); minimum daily, 10 second-feet Jan. 28.  
1942-48: Maximum discharge, 6,830 second-feet Apr. 23, 1942 (gage height, 5.80 feet), from rating curve extended above 3,300 second-feet by logarithmic plotting; minimum daily, 1 second-foot June 11, 1947.

Remarks.- Records fair except those for periods of doubtful or no gage-height record and those for periods of ice effect, which are poor. Diversions above and below station for irrigation. Flow regulated by El Vado Reservoir (see p.240). Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a19	434	1,190	b30	b30	84	d65	234	1,080	261	810	600
2	a18	469	1,210	b25	b35	62	d55	230	1,380	158	810	592
3	17	350	1,170	b25	b35	55	49	208	1,420	145	407	592
4	21	1,420	1,140	b30	36	40	204	1,380	136	372	760	
5	43	1,350	1,130	b35	32	34	78	197	1,400	128	462	1,070
6	525	1,330	1,110	b35	*29	29	90	204	1,480	122	434	1,050
7	546	1,350	1,100	36	34	31	102	230	1,540	117	366	734
8	525	1,400	1,070	27	30	30	102	225	1,490	104	497	448
9	504	1,460	1,060	29	28	31	114	204	1,460	97	372	390
10	483	1,460	*1,010	*31	30	32	158	174	992	90	354	392
11	202	1,380	1,020	28	32	31	238	152	852	88	354	134
12	68	1,380	988	26	*b26	35	256	122	841	82	360	86
13	42	1,400	952	24	b25	36	216	100	852	74	354	65
14	584	1,420	929	25	b25	d40	388	84	1,050	67	344	70
15	368	1,390	808	28	b26	d50	632	92	1,060	65	338	47
16	109	1,380	532	25	b28	d70	721	221	733	481	338	31
17	82	1,380	329	29	b30	d80	841	261	553	931	332	26
18	68	1,360	b70	b25	32	d150	976	247	539	730	322	25
19	58	1,350	b45	b25	*37	d130	863	168	420	730	327	25
20	53	1,330	b40	b25	46	d100	863	171	390	685	310	24
21	59	1,320	b34	b25	256	d90	677	161	378	658	310	20
22	372	1,290	b25	*b25	271	d70	441	136	402	462	643	17
23	414	1,310	b25	22	305	d80	434	117	657	414	1,100	17
24	408	1,250	b22	21	189	d90	360	102	721	414	667	17
25	420	1,250	b22	18	a180	d100	316	114	584	427	658	17
26	434	1,280	b25	19	a170	d85	305	694	511	441	640	42
27	434	1,250	b30	a15	d160	d90	327	1,590	511	408	632	115
28	427	1,220	b30	a10	148	d100	266	1,460	427	402	632	55
29	420	1,220	b30	a15	112	d120	230	964	322	390	632	34
30	434	1,190	35	a20	-	d130	238	703	327	552	632	26
31	434	-	35	*a25	-	d100	-	712	-	800	608	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8,591	584	17	277	17,040
November.....	37,953	1,460	434	1,265	75,280
December.....	17,016	1,210	22	549	53,750
Calendar year 1947.....	129,631	1,460	1	355	257,100
January.....	778	36	10	25.1	1,540
February.....	2,417	305	25	83.3	4,790
March.....	2,205	150	29	71.1	4,370
April.....	10,457	976	49	349	20,740
May.....	10,481	1,590	84	338	20,790
June.....	25,752	1,540	322	858	51,080
July.....	10,659	931	65	344	21,140
August.....	15,417	1,100	310	497	30,580
September.....	7,521	1,070	17	251	14,920
Water year 1947-48.....	149,247	1,590	10	408	296,000

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of records for stations below El Vado Dam and near Chamita.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## Rio Chama near Chamita, N. Mex.

Location.- Water-stage recorder, lat. 36°04'20", long. 106°06'40", in NE $\frac{1}{4}$  sec. 8, T. 21 N., R. 8 E., 200 feet downstream from Espanola-Ojo Caliente highway bridge, 2 $\frac{1}{2}$  miles upstream from mouth, and 2 $\frac{1}{2}$  miles northwest of Chamita.

Records available.- October 1912 to June 1915 and October 1930 to September 1948 in reports of Geological Survey. October 1912 to December 1931 in reports of State engineer.

Average discharge.- 34 years (1913-17, 1918-48), 667 second-feet.

Extremes.- Maximum discharge during year, 2,500 second-feet Oct. 14 (gage height, 4.13 feet); minimum daily, 4.7 second-feet Oct. 3.

1930-48: Maximum discharge, 9,910 second-feet May 14, 1941; maximum gage height, 8.11 feet May 16, 1941; no flow at times.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation. Flow regulated by El Vado Reservoir (see p. 240). Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a7	418	1,200	73	b40	165	214	1,160	1,160	150	855	500
2	a8	418	1,130	b55	b45	150	185	1,020	1,510	94	811	500
3	4.7	650	1,140	b55	b50	132	202	1,010	1,660	91	540	490
4	5.5	1,240	1,130	b60	b55	120	292	833	1,650	94	392	621
5	35	1,270	1,090	b70	*b60	112	271	855	1,620	76	520	1,100
6	490	1,330	1,070	b80	b75	97	328	800	1,620	58	481	1,070
7	472	1,320	1,050	b90	85	85	328	800	1,580	54	360	905
8	481	1,330	1,040	b90	88	82	336	756	1,680	45	463	445
9	481	1,320	1,050	91	85	73	436	620	1,550	37	360	376
10	490	1,340	994	*79	88	70	620	500	1,180	29	306	530
11	246	1,340	958	91	108	73	855	472	982	42	299	244
12	97	1,340	910	73	*b50	82	789	376	946	29	320	128
13	79	1,340	a880	70	b60	85	580	328	899	23	299	a73
14	835	1,360	a860	76	b70	85	550	344	1,050	18	285	a75
15	336	1,320	a600	68	b80	88	1,810	384	1,070	15	299	a50
16	a110	1,320	a500	76	b100	104	1,310	500	778	124	299	a35
17	a90	1,340	320	76	b120	112	1,490	500	500	910	308	26
18	a80	1,330	128	b60	*170	160	1,760	510	400	660	271	19
19	a75	1,320	97	b55	155	175	1,740	454	320	723	278	14
20	a70	1,320	76	b55	214	136	1,740	427	271	712	285	12
21	a70	1,280	79	b70	336	128	1,690	400	244	690	285	6.0
22	320	1,240	*68	*b95	384	116	a1,500	344	278	510	443	8.5
23	392	1,230	70	94	392	128	a1,400	292	445	392	1,080	11
24	409	1,250	65	91	463	150	a1,300	278	580	384	696	8.5
25	400	1,250	65	85	299	202	a1,250	360	454	418	570	9.0
26	409	1,230	73	94	238	214	a1,250	868	292	418	580	13
27	409	1,200	79	88	226	185	a1,250	1,950	299	384	580	49
28	409	1,160	82	b50	208	196	a1,200	1,940	278	368	560	58
29	409	1,140	82	b40	180	226	a1,180	1,400	175	376	540	32
30	427	1,150	91	b40	-	257	1,160	1,080	165	443	530	26
31	409	-	88	*b38	-	271	-	922	-	855	530	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8,554.2	835	4.7	276	16,970
November.....	36,096	1,360	418	1,203	71,600
December.....	17,065	1,200	65	550	35,850
Calendar year 1947.....	143,357.2	1,550	3	393	284,400
January.....	2,228	95	38	71.9	4,420
February.....	4,524	463	40	156	8,970
March.....	4,259	271	70	137	8,450
April.....	29,016	1,810	165	367	57,550
May.....	22,483	1,950	278	725	44,590
June.....	25,636	1,680	165	855	50,850
July.....	9,222	910	15	297	18,290
August.....	14,403	1,080	271	465	28,570
September.....	7,432	1,100	6.0	248	14,740
Water year 1947-48.....	180,918.2	1,950	4.7	494	358,800

\* Winter discharge measurement made on this day.  
 a No gage-height record; discharge computed on basis of weather records and records for stations below El Vado Dam and near Abiquiu.  
 b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

Willow Creek near Park View, N. Mex.

Location.- Water-stage recorder, lat. 36°40'20", long. 106°42'10", in Tierra Amarilla Grant, 400 feet upstream from Willow Creek dam site, 0.3 mile downstream from Horse Lake Creek, and 7 miles southwest of Park View, Rio Arriba County.

Records available.- May 1936 to September 1948. (No winter records prior to 1943.)

Extremes.- Maximum discharge during year, 930 second-feet Apr. 5 (gage height, 5.00 feet); no flow at times.

1936-48: Maximum discharge, 4,500 second-feet Apr. 23, 1942 (gage height, 10.49 feet), by slope-area method; no flow at times.

Remarks.- Records fair except those for periods of no gage-height record, which are poor. Diversions above station for irrigation.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	0		a0	18	104	a12	55	0	2	0
2	0	0	0		a0	14	203	a9	19	0	2	0
3	0	0	0		a0	14	416	8	70	0	4	0
4	0	0	1		a0	10	405	8	9	0	4	0
5	0	0	0		a0	8	442	6	4	0	12	0
6	0	0	0		a0	7	330	6	3	0	5	0
7	0	0	0		a0	6	238	5	5	0	4	0
8	0	0	0		a0	7	215	4	4	0	4	0
9	0	0	0		a0	6	232	4	3	0	2	0
10	0	0	0		a0	5	215	4	2	0	2	0
11	0	0	0		a0	5	226	4	2	0	1	0
12	0	0	0		a0	5	264	4	3	0	1	0
13	2	0	0		a0	5	92	4	3	0	1	0
14	129	0	0		a0	7	109	3	3	0	0	0
15	30	0	0		a0	7	161	2	2	0	0	0
16	8	0	0		a0	10	168	2	1	0	0	0
17	3	0	0		a0	13	142	2	1	0	0	0
18	2	0	0		a0	a18	123	2	0	0	0	0
19	1	0	0		a0	a21	86	2	0	0	0	0
20	1	1	0		a0	a24	66	2	1	1	0	0
21	1	0	0		22	a16	54	2	1	2	0	0
22	0	0	0		35	a14	54	1	8	1	1	0
23	0	0	0		46	34	42	1	11	1	1	0
24	0	0	0		23	75	40	1	4	1	2	0
25	0	0	0		42	82	34	2	2	1	1	0
26	0	0	0		67	73	33	2	1	1	1	0
27	0	0	0		87	125	25	4	1	1	1	0
28	0	0	0		53	188	22	7	0	0	0	0
29	0	0	0		26	175	20	5	0	0	0	1
30	0	0	0		-	156	a16	3	0	0	0	1
31	0	-	0		-	101	-	30	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	177	129	0	5.7	351
November.....	2	1	0	.03	2.0
December.....	2	0	0	.1	4.0
Calendar year 1947 .....	2,222	487	0	6.1	4,400
January.....	0	0	0	C	0
February.....	401	87	0	13.8	795
March.....	1,249	188	5	40.3	2,480
April.....	4,577	442	16	153	9,080
May.....	151	30	1	4.9	300
June.....	218	70	0	7.3	432
July.....	8	2	0	.3	16
August.....	51	12	0	1.6	101
September.....	2	1	0	.1	4.0
Water year 1947-48 .....	6,837	442	0	18.7	13,560

Peak discharge (base, 800 sec.-ft.)- Apr. 5 (7:30 p.m.) 930 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for El Rito Creek near El Rito and Rio Ojo Caliente near La Madera.

## El Rito Creek near El Rito, N. Mex.

Location.- Water-stage recorder, lat. 36°23'30", long. 106°14'20", in NW¼ sec. 19, T. 25 N., R. 7 E., three-quarters of a mile upstream from boundary of Carson National Forest and 3 miles northwest of El Rito.

Records available.- May 1931 to September 1948. (No winter records 1937-41.)

Average discharge.- 13 years (1931-37, 1941-48), 18.8 second-feet.

Extremes.- Maximum discharge during year, 233 second-feet May 6 (gage height, 3.06 feet); minimum daily, 0.3 second-foot Sept. 6, 7, 22.

1931-48: Maximum discharge not determined; minimum daily recorded, 0.3 second-foot June 21-23, 1934, June 30, July 1, 11, 1946, Sept. 6, 7, 22, 1948.

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

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	1.1	1.7	2.3	0.7	a2	2.0	b5	137	25	3.8	1.0	0.6
2	1.3	1.7	2.3	.9	a2.5	a2	a7	124	24	3.8	1.0	.6
3	1.2	1.7	2.0	1.0	a2.5	a2	a9	116	22	4.0	1.1	.6
4	1.1	1.6	2.0	1.2	a2	a1	a11	117	18	3.3	2.9	.5
5	1.0	1.3	1.2	a1.5	a2	a1	15	140	15	3.1	5.9	.4
6	.9	1.4	*2.3	a1.5	a2	a1	19	144	14	3.3	2.7	.3
7	.9	.6	1.8	a1.5	a2.5	a2	*24	140	14	3.1	1.7	.3
8	.9	1.3	1.7	a1.5	a2	a2	28	109	14	2.5	2.0	.4
9	.9	1.6	1.2	*b1.6	a2	a1	40	74	12	2.2	1.6	.8
10	.9	1.3	1.4	a1.5	a2.5	a2	63	57	11	2.0	1.2	.7
11	.9	1.0	1.8	a1.5	a3	a2	65	53	12	2.0	1.2	.8
12	1.3	1.1	2.3	1.4	a2	h2.3	53	53	10	1.8	1.3	.6
13	1.6	1.8	2.7	1.0	h1.6	a2	41	73	9.2	1.7	1.6	.5
14	2.9	1.0	1.6	.8	a2	a2	50	96	8.0	1.6	1.2	.6
15	3.5	1.3	1.7	.8	a2.5	a2	81	101	7.4	1.4	1.1	.4
16	2.5	1.4	b2	1.0	a3	a1	101	80	6.7	1.4	1.0	.6
17	2.2	1.7	b1	1.2	a2.5	a2	108	75	6.3	1.4	1.2	.8
18	2.0	1.2	b1	1.1	a2.5	a3	121	77	5.7	4.5	1.2	.7
19	1.8	1.7	b1	1.0	2.3	a2	128	69	6.3	2.3	1.4	.6
20	1.8	1.6	*b1	1.0	2.3	2.9	133	62	6.7	2.0	1.0	.6
21	1.7	1.4	b1	1.1	2.3	2.9	132	50	5.4	1.7	.8	.4
22	1.6	2.3	b1	1.2	2.3	2.7	142	41	8.4	1.7	3.1	.3
23	1.6	2.3	b1	1.3	2.5	3.1	110	34	7.7	1.7	2.2	.6
24	1.6	2.0	b.5	1.6	2.3	4.3	78	37	5.7	1.7	1.4	.4
25	1.6	1.8	b.5	1.8	2.2	*4.3	69	57	5.1	4.0	1.4	.7
26	1.4	2.2	b.5	a2	2.2	b3	94	51	4.5	3.3	1.1	2.3
27	1.4	2.0	1.0	a1.5	2.3	b4	94	48	4.3	1.8	.9	1.8
28	1.4	1.8	1.2	a.5	2.2	b6	100	46	4.3	1.6	.6	1.4
29	1.4	2.2	1.0	*a1.8	2.0	6.7	132	34	4.0	1.4	.6	1.0
30	1.6	1.8	1.0	a2	-	6.7	145	28	3.8	1.2	.6	1.1
31	1.7	-	1.0	a2	-	6.3	-	24	-	1.0	.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	47.7	3.5	0.9	1.54	95
November.....	47.8	2.3	.6	1.59	95
December.....	44.0	2.7	.5	1.42	87
Calendar year 1947.....	4,380.2	139	.4	12.0	8,680
January.....	40.5	2	.5	1.31	80
February.....	66.0	3	1.6	2.28	131
March.....	87.2	6.7	1	2.81	173
April.....	2,198	145	5	73.3	4,360
May.....	2,347	144	24	75.7	4,660
June.....	300.5	23	3.8	10.0	596
July.....	72.3	4.5	1.0	2.33	143
August.....	46.6	5.9	.6	1.50	92
September.....	21.2	2.3	.3	.71	42
Water year 1947-48.....	5,318.8	145	.3	14.5	10,550

Peak discharge (base, 120 sec.-ft.)- Apr. 19 (7 p.m.) 208 sec.-ft.; May 6 (8:30 p.m.) 233 sec.-ft.; May 14 (8:30 p.m.) 181 sec.-ft.

- \* Winter discharge measurement made on this day.
- a No gage-height record; discharge computed on basis of available recorder trace, weather records, and 3 discharge measurements.
- b Stage-discharge relation affected by ice.
- c Computed from staff-gage reading.

## Rio Ojo Caliente at La Madera, N. Mex.

Location.- Water-stage recorder, lat. 36°20'45", long. 106°02'50", in NE $\frac{1}{4}$  sec. 1, T. 24 N., R. 8 E., 2.5 miles south of La Madera, 3 miles downstream from confluence of Rio Vallecitos and Rio Tulas, and 4 miles north of Ojo Caliente.

Records available.- April 1932 to September 1948.

Average discharge.- 16 years, 81.8 second-feet.

Extremes.- Maximum discharge during year, 1,320 second-feet Apr. 22 (gage height, 3.85 feet); minimum daily 2.5 second-feet July 25.

1932-48: Maximum discharge, 2,980 second-feet Apr. 23, 1942, from rating curve extended above 1,300 second-feet by logarithmic plotting; maximum gage height, 7.60 feet, July 15, 1933, site and datum then in use; minimum daily discharge, 1 second-foot at times.

Remarks.- Records fair except those for June 20 to Sept. 30 and those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	10	15	17	12	a14	50	83	810	124	9.3	10	4.2
2	10	15	23	13	a14	39	114	684	117	8.9	5.3	5.3
3	10	15	23	15	a15	32	192	635	121	8.4	4.9	4.9
4	9.3	15	17	15	a15	b30	226	581	105	8.4	4.9	4.9
5	9.3	14	15	15	16	a28	254	608	85	8.0	5.8	4.9
6	8.9	15	19	15	17	b25	279	568	78	8.9	4.7	5.3
7	8.9	13	19	15	18	b26	275	555	81	8.4	4.7	5.8
8	8.4	13	16	15	19	27	301	463	92	6.2	4.2	5.3
9	8.4	15	19	17	16	30	395	342	75	6.7	4.0	5.3
10	8.4	15	12	18	19	30	522	266	60	7.1	3.8	5.3
11	8.0	14	12	18	16	b29	595	271	58	5.8	4.0	4.5
12	8.0	13	13	17	a17	*b27	487	232	62	7.1	3.8	4.5
13	10	15	14	15	*a18	50	347	210	51	8.4	3.6	4.5
14	191	15	15	14	a19	39	358	258	39	6.7	3.8	4.5
15	a40	13	15	14	a20	45	451	280	25	2.9	4.0	4.7
16	a30	13	15	15	a21	42	602	271	18	3.8	4.0	4.7
17	a25	17	15	13	23	52	728	240	12	5.3	3.8	4.7
18	a20	15	15	15	25	55	795	258	10	4.9	3.8	4.7
19	a18	15	15	14	35	55	788	248	9.6	5.3	3.8	4.7
20	a16	20	15	14	47	66	887	236	13	4.2	3.8	4.5
21	a16	13	17	15	55	55	943	206	8.9	4.7	3.6	4.5
22	16	15	15	16	59	52	1,090	186	9.3	4.0	4.2	4.7
23	17	22	15	16	53	74	903	156	20	3.4	4.9	4.0
24	16	15	14	17	41	104	642	149	20	2.9	4.2	3.1
25	16	17	15	15	38	119	475	318	18	2.5	3.8	3.4
26	15	17	15	15	45	85	445	318	15	3.4	3.6	3.6
27	16	19	15	13	47	83	505	244	13	3.4	3.4	4.2
28	16	21	15	b11	*49	106	575	210	12	4.7	3.1	6.2
29	16	17	15	*15	52	140	832	163	11	6.7	3.6	6.7
30	15	16	17	a14	-	159	879	127	10	5.8	3.8	6.2
31	15	-	15	a14	-	125	-	108	-	4.9	3.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	631.6	191	8.0	20.4	1,250
November.....	467	22	13	15.6	926
December.....	492	23	12	15.9	976
Calendar year 1947.....	20,203.9	480	2.3	55.4	40,080
January.....	460	18	11	14.8	912
February.....	843	59	14	29.1	1,670
March.....	1,859	159	25	60.0	3,690
April.....	15,968	1,090	83	532	31,670
May.....	10,192	810	108	329	20,220
June.....	1,372.8	124	8.9	45.8	2,720
July.....	181.1	9.3	2.5	5.84	359
August.....	132.5	10	3.1	4.27	263
September.....	143.8	6.7	3.1	4.79	285
Water year 1947-48.....	32,742.8	1,090	2.5	89.5	64,940

Peak discharge (base, 600 sec.-ft.)- Oct. 14 (8:30 a.m.) 806 sec.-ft.; Apr. 10 (11 p.m.) 871 sec.-ft.; Apr. 22 (11 p.m.) 1,320 sec.-ft.; Apr. 30 (10 p.m.) 1,170 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Rio Chama at Park View and El Rito Creek near El Rito.

b Stage-discharge relation affected by ice.

## Rio Santa Cruz at Cundiyo, N. Mex.

Location.- Water-stage recorder, lat. 35°57'40", long. 105°54'10", in SE¼NW¼ sec. 17, T. 20 N., R. 10 E., 135 feet downstream from highway bridge at confluence of Rio Medio and Rio Frioles and a quarter of a mile northwest of Cundiyo.

Records available.- September 1931 to September 1948 in reports of Geological Survey. September 1915 to December 1931 (published as Rio Medio at Cundiyo and Rio Santa Cruz above Chimayo) in reports of State engineer.

Average discharge.- 31 years (1916-29, 1930-48), 33.9 second-feet.

Extremes.- Maximum discharge during year, 316 second-feet May 19 (gage height, 3.10 feet); minimum daily, 7.6 second-feet Sept. 24.

1931-48: Maximum discharge, 2,610 second-feet Sept. 24, 1931 (gage height, 8.20 feet, datum then in use), from rating curve extended above 170 second-feet by logarithmic plotting; minimum daily, 3 second-feet Feb. 3, 1932, Jan. 21, 1935.

Remarks.- Records good June to September, others fair except those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	8.2	9.8	a10	a8	a11	20	34	112	122	41	14	10
2	8.5	10	a11	a9	a11	b18	37	108	119	39	13	9.6
3	8.5	10	a11	a9	a11	b16	47	110	117	37	11	10
4	8.2	9.8	a10	a10	a10	b15	62	101	114	35	16	10
5	8.0	b9	a10	a10	a10	b12	72	108	106	33	37	10
6	7.7	b8	*b11	a10	a10	b13	72	108	104	31	25	10
7	8.0	b9	b11	a11	a10	b14	70	120	114	30	20	10
8	8.0	b10	b10	a11	a9	b15	72	125	104	30	21	10
9	8.0	b10	b10	a11	a10	a14	82	122	92	28	18	10
10	8.2	b11	b9	a11	a10	a13	92	105	81	27	18	9.2
11	8.0	b11	a8	a10	a9	a12	90	97	87	26	16	8.4
12	8.0	b11	a8	a10	a8	a14	72	89	89	24	18	9.6
13	10	a11	a8	a9	a9	a15	61	86	78	22	20	8.8
14	37	a11	a8	*b8.5	a9	a16	61	90	72	20	16	8.4
15	19	a11	a9	a9	a9	*b14	72	101	63	20	14	8.0
16	16	a11	a10	a8	*b9	15	84	115	61	20	13	8.4
17	14	a10	a10	a8	10	16	103	136	56	20	13	9.2
18	13	a10	a10	a8	11	16	108	157	51	23	13	8.8
19	12	a9	b11	a8	12	17	115	172	51	29	27	8.8
20	12	a9	a11	a9	12	20	112	148	101	27	16	9.2
21	11	a8	a10	a9	b12	17	108	176	60	24	14	8.4
22	11	a9	a10	a10	13	b15	110	200	72	22	14	8.0
23	11	a9	a9	a11	16	18	103	250	72	20	14	8.0
24	11	a9	a9	a11	15	27	90	218	58	20	13	7.6
25	11	a9	a10	a10	15	37	77	162	51	19	15	8.8
26	10	a10	a10	a10	17	*36	76	144	47	21	14	16
27	10	a10	a10	a8	20	33	84	133	51	18	12	12
28	10	a10	a10	a9	19	38	86	122	50	18	11	10
29	10	a11	a10	a9	19	45	108	117	43	18	11	8.2
30	10	a10	a10	a9	-	41	120	112	42	16	11	9.6
31	10	-	a9	a10	-	36	-	109	-	16	10	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	345.3	37	7.7	11.1	685
November.....	295.6	11	8	9.85	586
December.....	303	11	8	9.77	601
Calendar year 1947 .....	5,937.0	125	5.8	16.3	11,780
January.....	293.5	11	8	9.47	582
February.....	346	20	8	11.9	686
March.....	648	45	12	20.9	1,290
April.....	2,480	120	34	82.7	4,920
May.....	4,052	250	86	131	8,040
June.....	2,328	122	42	77.6	4,620
July.....	774	41	16	25.0	1,540
August.....	498	37	10	16.1	998
September.....	284.0	16	7.6	9.47	563
Water year 1947-48 .....	12,647.4	250	7.6	34.6	25,100

Peak discharge (base, 200 sec.-ft.).- Oct. 14 (10 a.m.) 292 sec.-ft.; May 19 (7:30 p.m.) 316 sec.-ft.; May 23 (10 a.m.) 274 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for Embudo Creek at Dixon.

b Stage-discharge relation affected by ice.

## Rio Santa Cruz at Riverside, N. Mex.

Location.- Water-stage recorder, lat. 35°59'15", long. 106°04'05", in SW $\frac{1}{4}$  sec. 2, T. 20 N., R. 8 E., at bridge on U. S. Highway 285, at south edge of Riverside, half a mile upstream from mouth and three-quarters of a mile east of Espanola.

Records available.- January 1942 to September 1948.

Extremes.- Maximum discharge during year, 500 second-feet May 21; maximum gage height, 2.30 feet Feb. 14 (ice jam); no flow at times.

1942-48: Maximum discharge, 643 second-feet Apr. 24, 1942; maximum gage height, 4.85 feet June 7, 1942; no flow at times.

Remarks.- Records poor. Diversions above station for irrigation. Flow partly regulated by Santa Cruz Reservoir (capacity, 4,614 acre-feet, original survey).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a10	0	0	a1	a5	11	10	20	41	0	2	0
2	a5	0	1	a1	a6	10	20	14	29	0	0	0
3	a3	0	4	a2	a6	11	32	58	20	0	1	0
4	a2	0	4	a2	a6	11	27	77	18	1	2	2
5	a1	0	3	a3	*b5	12	44	58	21	1	15	0
6	a0	0	1	a4	b5	12	147	29	25	0	2	0
7	a0	0	1	5	b5	14	102	63	20	1	2	0
8	a0	0	1	2	b5	10	84	50	47	1	7	0
9	a0	4	3	5	b5	11	80	44	18	1	1	0
10	0	1	4	4	b5	10	66	52	4	2	0	0
11	a0	0	2	2	b4	7	80	70	2	1	0	0
12	a0	1	a2	8	b4	6	80	55	15	2	0	3
13	a0	4	a1	*8	b6	9	106	50	9	4	2	2
14	43	2	a2	6	*b8	9	102	39	1	1	0	0
15	a15	1	a2	3	b10	6	74	27	a0	0	0	0
16	a10	1	a2	6	b10	5	70	18	a0	0	0	0
17	6	0	a3	3	b11	4	83	18	a1	1	1	0
18	4	0	a2	3	*12	5	88	134	a0	3	0	0
19	2	0	a2	3	18	7	98	190	a0	15	0	0
20	3	0	1	3	20	4	98	332	a0	9	0	0
21	1	1	a1	4	18	4	88	288	a0	4	0	0
22	0	0	a1	3	18	5	114	276	1	0	0	0
23	0	6	a1	4	18	6	126	201	1	0	0	0
24	0	a4	a1	4	23	6	118	217	1	1	0	0
25	0	3	a1	5	29	9	118	228	2	0	0	0
26	0	1	a2	b4	21	10	63	234	1	0	0	0
27	0	1	a2	a3	12	7	41	212	1	0	4	0
28	0	1	a2	a2	11	5	18	217	1	0	0	0
29	0	0	a2	a2	10	5	16	201	1	0	5	0
30	0	0	a2	a3	-	5	36	152	1	1	1	0
31	0	-	a2	a4	-	5	-	98	-	0	2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	105	43	0	3.4	208
November.....	31	6	0	1.0	61
December.....	58	4	0	1.9	115
Calendar year 1947.....	725	43	0	2.0	1,440
January.....	112	8	1	3.6	222
February.....	316	29	4	10.9	627
March.....	241	15	4	7.8	478
April.....	2,209	147	10	73.8	4,380
May.....	3,720	332	14	120	7,380
June.....	281	41	0	9.4	557
July.....	49	15	0	1.6	97
August.....	47	15	0	1.5	93
September.....	7	3	0	.2	14
Water year 1947-48.....	7,176	332	0	19.6	14,230

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, discharge measurements, and engineer's notes and field estimates.

b Stage-discharge relation affected by ice.



## Nambe Creek near Nambe, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°52', long. 105°57', in sec. 24, T. 19 N., R. 9 E., in Nambe Pueblo Grant, 1,000 feet downstream from diversion dam for Nambe Canal, 2½ miles southeast of Nambe, and 6½ miles upstream from Rio Tesuque.

Records available.- October 1932 to September 1948.

Average discharge.- 16 years, 11.6 second-feet.

Extremes.- Maximum discharge during year, 205 second-feet June 19 (gage height, 4.45 feet); minimum daily, 1.5 second-feet, Sept. 21.

1932-48: Maximum discharge recorded, 878 second-feet Aug. 23, 1935, (gage height, 6.43 feet), from rating curve extended above 65 second-feet by logarithmic plotting; no flow several days in October 1934.

Remarks.- Records good except those for periods of ice effect or doubtful gage-height record, which are poor. Nambe Canal diverts water for irrigation 1,000 feet above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	3.8	3.8	b2.5	b3	3.6	4.1	30	39	15	6.9	1.8
2	3.4	3.9	4.3	b3	b3	b2.5	5.0	30	41	15	5.4	1.8
3	3.4	3.9	4.1	b3	3.0	b2.5	6.2	28	41	15	5.4	2.3
4	3.1	3.9	3.6	b3	3.0	b2.5	7.1	28	39	15	6.1	2.6
5	3.0	3.8	3.1	b3	3.1	b2	8.3	30	36	14	17	3.3
6	2.8	3.4	4.3	3.4	3.0	b2.5	9.0	32	34	13	9.0	3.1
7	2.8	1.8	3.0	3.3	2.7	b3	10	33	38	13	8.3	3.3
8	2.8	3.6	2.1	3.3	b2.5	b3	10	34	36	12	9.6	2.8
9	2.7	4.1	b2	3.3	b3	3.3	11	31	35	11	7.9	2.8
10	2.4	4.5	b2	3.3	2.7	3.3	13	30	33	10	7.1	2.0
11	2.7	3.1	b2.5	3.1	b2.5	3.1	15	27	34	9.6	7.1	1.8
12	2.0	3.3	b2.5	3.0	b2	3.1	14	25	36	8.6	6.9	3.6
13	1.9	*3.6	b3	2.7	b2.5	3.4	13	25	31	7.1	6.6	2.3
14	12	3.0	3.1	b3	b2.5	*3.8	14	29	30	7.1	6.4	2.3
15	6.2	2.7	3.4	*b3	b3	3.6	16	32	27	6.9	6.2	1.8
16	5.0	2.8	3.3	b2.5	3.0	3.6	18	36	25	6.6	5.9	1.6
17	4.5	3.6	3.3	b2.5	3.0	3.8	21	38	24	6.9	5.7	1.7
18	4.1	3.3	*3.1	3.1	3.0	4.1	24	41	23	9.6	8.3	1.7
19	4.5	3.0	3.3	b2.5	*3.1	4.1	24	47	31	8.6	d8	1.7
20	4.5	2.8	3.1	b3	3.1	3.9	25	49	28	9.6	d7	1.6
21	4.5	2.3	3.4	3.1	3.0	3.8	25	51	22	7.9	d7	1.5
22	4.3	b2	3.3	3.1	3.1	3.4	26	50	22	7.9	d6	1.7
23	4.7	b2.5	3.3	3.1	3.3	4.3	25	49	20	7.1	d5	1.6
24	4.5	b3	3.3	3.0	3.3	4.5	23	46	18	6.9	d5	1.7
25	4.1	3.4	3.3	2.8	3.6	5.7	20	41	19	9.3	d5	1.6
26	4.3	3.4	3.4	2.7	3.8	5.2	18	38	18	7.1	d5	2.6
27	4.1	3.6	3.4	b2.5	3.4	5.2	20	34	18	6.2	d4	3.6
28	3.8	3.6	3.4	b2	3.4	5.7	21	33	19	6.6	d5	3.6
29	3.8	3.8	3.4	b2.5	3.4	6.4	27	34	18	6.6	d5	3.4
30	3.9	3.6	3.6	b2.5	-	5.9	29	35	16	6.2	4.5	3.8
31	3.8	-	3.3	2.8	-	5.7	-	34	-	5.7	3.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	122.7	12	1.9	3.96	243
November.....	99.3	4.5	1.8	3.51	197
December.....	100	4.3	2	3.23	198
Calendar year 1947.....	2,173.3	37	1.4	5.95	4,310
January.....	89.6	3.4	2	2.89	178
February.....	87	3.8	2	3.00	173
March.....	120.1	6.4	2	3.87	238
April.....	501.7	29	4.1	16.7	995
May.....	1,100	51	25	35.5	2,180
June.....	851	41	16	28.4	1,690
July.....	281.1	15	5.7	9.39	577
August.....	205.3	17	3.0	6.62	407
September.....	71	3.8	1.5	2.37	141
Water year 1947-48.....	3,638.8	51	1.5	9.94	7,220

Peak discharge (base, 60 sec.-ft.)- Oct. 14 (9 a.m.) 127 sec.-ft.; May 19 (10:30 p.m.) 90 sec.-ft.; June 19 (8 p.m.) 205 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed on basis of weather records and records for Nambe Canal near Nambe, Rio Tesuque near Santa Fe, and Embudo Creek at Dixon.

## Principal diversions from Nambe Creek, N. Mex.

Records of discharge are collected for 11 ditches that divert water from Nambe Creek between Nambe diversion dam, 2½ miles upstream from Nambe, and confluence with Rio Tesuque. Each of these ditches is equipped with a water-stage recorder for collecting gage-height records and each one, except Las Joyas, with a Parshall flume. Water diverted by these ditches is used for irrigation in the valley of Nambe Creek, except that diverted by Jacona ditch, which is used for irrigation on the left bank of Rio Pojoaque below Rio Tesuque.

Nambe Canal diverts from right bank in SE¼ sec. 24, T. 19 N., R. 9 E., 1,000 feet upstream from gaging station on Nambe Creek near Nambe. Records available, May 1932 to September 1948 (except winter periods for water years 1942-46).

Llano Frio ditch diverts from right bank in SW¼ sec. 14, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Llano ditch diverts from right bank in SW¼ sec. 14, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Mocha ditch diverts from right bank in SW¼ sec. 14, T. 19 N., R. 9 E. Records available, May 1936 to September 1948 (irrigation seasons only after 1941).

Comunidad ditch diverts from right bank in NE¼ sec. 14, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Ortiz ditch diverts from right bank in SE¼ sec. 10, T. 19 N., R. 9 E. Small flow diverted between gage and head gate for irrigation of about 5 acres. Records available, February 1936 to September 1948 (irrigation seasons only after 1941).

Canyon ditch diverts from right bank in NW¼ sec. 10, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Acequia Rincon diverts from left bank in SE¼ sec. 9, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Las Joyas ditch diverts from right bank in NW¼ sec. 9, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Barranco Alto ditch diverts from left bank in NW¼ sec. 8, T. 19 N., R. 9 E. Records available, March 1936 to September 1948 (irrigation seasons only after 1941).

Jacona ditch diverts from left bank in NE¼ sec. 7, T. 19 N., R. 9 E. Gaging station is three-quarters of a mile downstream from head and 4½ miles east of San Ildefonso. Records include seepage inflow and, at times, inflow from Rio Tesuque. Records available, January 1940 to September 1948 (irrigation seasons only after 1941). Records not equivalent to those for Jacona ditch near Nambe collected for period April 1936 to December 1939.

Several other ditches divert from Nambe Creek, but no records for them were obtained.

Diversions, in acre-feet, water year October 1947 to September 1948

Month	Nambe Canal	Llano Frio ditch	Llano ditch	Mocha ditch	Comunidad ditch	Ortiz ditch
October.....	43	a0	a14	a0	a9.9	a6.0
November.....	36	-	-	-	-	-
December.....	10	-	-	-	-	-
January.....	7.3	-	-	-	-	-
February.....	7.5	-	-	-	-	-
March.....	20	c22	c6.3	c0	d4.0	d0
April.....	50	176	68	.2	72	42
May.....	106	272	134	19	158	119
June.....	64	207	137	16	126	105
July.....	107	70	111	31	79	77
August.....	53	57	58	14	58	51
September.....	95	5.0	54	18	16	34

Month	Canyon ditch	Acequia Rincon	Las Joyas ditch	Barranco Alto ditch	Jacona ditch
October.....	a4.8	a5.0	b17	b2.8	b8.3
November.....	-	-	-	-	-
December.....	-	-	-	-	-
January.....	-	-	-	-	-
February.....	-	-	-	-	-
March.....	49.3	d0	c0	c0	e0
April.....	72	33	81	9.3	23
May.....	142	131	257	57	148
June.....	106	49	196	31	104
July.....	31	46	104	24	45
August.....	64	34	90	14	24
September.....	12	11	64	27	36

a Oct. 1-6.

b Oct. 1-8.

c Mar. 25-31.

d Mar. 26-31.

e Mar. 24-31.

Rio Tesque above diversions, near Santa Fe, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°44', long. 105°54', in SE $\frac{1}{4}$  sec. 32, T. 18 N., R. 10 E., 1 mile upstream from Rito Tesque and 4 miles northeast of Santa Fe.

Records available.- March 1936 to September 1948 in reports of Geological Survey. May to October 1919 at site 175 feet downstream in reports of State engineer.

Average discharge.- 12 years (1936-48), 3.59 second-feet.

Extremes.- Maximum discharge during year, 181 second-feet June 19 (gage height, 3.41 feet); minimum daily, 0.4 second-foot Sept. 22-24.

1936-48: Maximum discharge, 425 second-feet July 19, 1938 (gage height, 4.2 feet, from floodmarks), from rating curve extended above 10 second-feet by logarithmic plotting on basis of slope-area determination at gage height 4.0 feet; minimum daily, 0.2 second-foot Dec. 11, 1945.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.7	1.0	d0.8	0.7	1.3	2.1	7.7	12	a4	0.9	0.8
2	1.1	.8	a1.0	d.8	.8	1.1	2.1	7.7	12	a4	1.0	.7
3	.7	.8	a1.0	d.8	.8	1.2	2.6	7.4	12	a4	1.1	.7
4	.6	.7	a1.0	d.8	.8	1.1	2.9	7.1	12	a4	1.6	.7
5	.7	.7	a1.0	a.9	.8	.9	3.6	7.4	12	a3	2.7	.7
6	.7	.7	*1.0	a.9	.7	1.3	3.8	7.4	12	a3	1.7	.7
7	.7	.8	a.9	a.9	.7	1.2	4.0	7.7	12	a3	1.6	.7
8	.7	1.0	1.0	a.9	.8	1.2	4.5	8.0	10	a3	1.6	.7
9	.7	1.0	1.0	a1.0	.8	1.2	4.5	8.0	a3	a3	1.1	.8
10	.7	1.0	.9	a1.0	.7	1.2	5.5	7.7	a8.2	a2	1.0	.7
11	.7	.8	b1.0	a1.0	.7	1.3	6.4	7.4	8.4	a2	1.0	.7
12	.7	.7	1.0	a1.0	.7	*b1.3	5.2	6.7	7.4	a2	1.1	.7
13	.7	1.0	1.1	a1.0	.7	1.3	4.9	6.4	6.8	1.7	1.1	.6
14	2.0	.9	b1.0	a1.0	.7	1.3	5.2	6.4	6.8	1.9	1.0	.6
15	1.1	.9	1.0	a1.0	.7	1.3	6.1	7.1	6.4	1.9	.9	.6
16	.9	.9	.9	a1.0	.8	1.3	6.8	7.7	6.1	1.7	.8	.7
17	.8	1.0	.8	*1.0	.8	1.2	7.4	8.0	6.1	2.0	.9	.7
18	.7	.9	d.8	1.0	*.9	1.3	8.0	9.3	4.9	2.4	1.2	.5
19	.8	1.0	d.8	1.0	1.1	1.4	7.7	14	15	2.7	2.0	.5
20	.8	.9	d.8	1.0	1.1	1.6	8.0	11	a10	2.6	1.3	.6
21	.8	b1.2	d.8	1.0	1.0	1.2	8.0	12	a6	2.6	1.2	.5
22	.8	b1.2	d.8	1.0	1.1	1.3	7.7	11	a7	2.3	1.2	.4
23	.8	1.1	d.8	1.0	1.1	1.7	7.4	12	a9	2.1	1.1	.4
24	.8	1.1	d.8	1.0	1.1	2.3	6.8	13	a7	1.9	1.1	.4
25	.8	b1.0	d.8	.9	1.3	2.4	6.1	12	a6	1.7	1.1	.6
26	.8	b1.0	d.9	.8	1.3	2.3	5.5	12	a5	1.7	.9	1.0
27	.8	1.1	d.9	.9	1.3	2.1	5.8	12	a5	1.2	.8	.7
28	.8	1.0	d.9	1.1	1.3	2.6	5.5	12	a5	1.2	.8	.6
29	.8	1.0	d.9	.9	1.4	2.9	6.4	11	a5	1.1	.9	.5
30	.7	1.0	d.9	.9	-	2.6	7.1	11	a4	1.1	.9	.6
31	.8	-	d.9	.8	-	2.3	-	11	-	1.1	.8	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	25.0	2.0	0.5	0.81	50
November	27.6	1.2	.5	.92	55
December	28.3	1.1	.4	.91	56
Calendar year 1947	651	11	.4	1.78	1,290
January	29.1	1.1	.8	.94	58
February	26.7	1.4	.7	.92	53
March	48.7	2.9	.9	1.57	97
April	167.6	8	2.1	5.59	332
May	289.1	14	6.4	9.33	573
June	249.1	15	4	8.30	494
July	71.9	4	1.1	2.32	143
August	56.4	2.7	.8	1.17	72
September	19.1	1.0	.4	.64	38
Water year 1947-48	1,018.6	15	.4	2.78	2,020

Peak discharge (base, 40 sec.-ft.)- May 19 (4 p.m.) 116 sec.-ft.; June 19 (4:30 p.m.) 181 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for Nambe Creek near Nambe and Rio Santa Cruz at Cundiyo.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## RIO GRANDE BASIN

Mitchell ditch near Santa Fe, N. Mex.

Location.- Water-stage recorder and 1-foot rectangular weir, lat. 35°46', long. 105°56', near N<sup>1</sup>/<sub>4</sub> cor. sec. 25, T. 18 N., R. 9 E., at pipe-line outlet 5½ miles north of Santa Fe.

Records available.- June 1936 to September 1948 (not continuous).

Remarks.- Records good. Discharge computed by formula for rectangular weir. Ditch supplied by underground flow from pipe line laid in bed of Rio Tesuque. Water diverted is used for irrigation. No diversion between station and head.

Monthly discharge, in second-feet, 1947-48

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October 1-8.....	0.3	0.2	0.21	3.4
November.....	-	-	-	-
December.....	-	-	-	-
Calendar year.....	-	-	-	-
January.....	-	-	-	-
February.....	-	-	-	-
March 24-31.....	.4	.3	.34	5.4
April.....	.5	0	.31	18
May.....	.8	0	.50	31
June.....	.7	.5	.59	35
July.....	.6	.3	.47	29
August.....	.5	.4	.44	27
September.....	.3	.2	.23	14
Water year.....	-	-	-	-

Well ditch at San Ildefonso, N. Mex.

Location.- Water-stage recorder and 1-foot Parshall flume, lat. 35°54', long. 106°06', in NW<sup>1</sup>/<sub>4</sub> sec. 9, T. 19 N., R. 8 E., 50 feet downstream from head of open ditch and three-quarters of a mile northeast of San Ildefonso.

Records available.- June 1938 to September 1948 (irrigation season only after 1941).

Remarks.- Records good except those for October and May 21 to June 17, which are fair. Ditch supplied by underground flow from pipe line in bed of Rio Pojoaque; water is used for irrigation. No diversions between station and head.

Monthly discharge, in second-feet, 1947-48

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October 1-8.....	0.6	0.2	0.42	6.7
November.....	-	-	-	-
December.....	-	-	-	-
Calendar year.....	-	-	-	-
January.....	-	-	-	-
February.....	-	-	-	-
March 24-31.....	1.2	.6	.76	12
April.....	2.4	.6	1.56	94
May.....	2.3	1.0	1.86	114
June.....	2.6	.1	2.18	130
July.....	2.2	.8	1.56	96
August.....	1.4	1.0	1.22	75
September.....	1.0	.1	.89	53
Water year.....	-	-	-	-

## Santa Fe Creek near Santa Fe, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°41'15", long. 105°50'35", in NE1/4 sec. 23, T. 17 N., R. 10 E., about 0.4 mile downstream from McClure Dam (name changed), and 5½ miles east of Santa Fe. Prior to Oct. 1, 1947, at site 0.3 mile upstream at different datum.

Records available.- May to June 1910 (at site 3 miles downstream), April 1913 to December 1914 (at site 2 miles downstream), and October 1930 to September 1948 in reports of Geological Survey. January 1913 to November 1930 (at site 2 miles downstream) and November 1930 to December 1931 in reports of State engineer.

Average discharge.- 18 years (1930-48), 8.04 second-feet.

Extremes.- Maximum daily discharge during year, 54 second-feet June 7; minimum daily, 0.3 second-foot Oct. 15-23.

1930-48: Maximum discharge, 418 second-feet Apr. 23, 1942 (gage height, 3.51 feet, site and datum then in use), from rating curve extended above 150 second-feet; minimum daily, 0.2 second-foot Dec. 3-14, 16-29, 1943.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Flow regulated by McClure Reservoir (see p. 240). No diversion above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

1.4	0.3	1.8	5.2	2.4	35
1.5	.8	2.0	12	2.6	53
1.6	1.7	2.2	21	2.8	75

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.2	0.4	0.4	1.3	1.2	4.6	9.4	7.2	3.1	6.9	3.9	9.0
2	4.8	.4	.4	1.2	1.2	4.6	9.0	7.2	3.1	6.6	3.7	8.7
3	3.5	.4	.4	1.3	1.2	4.6	9.0	7.2	2.3	6.6	3.7	8.7
4	2.5	.4	.4	1.3	1.2	4.6	9.4	7.4	1.7	6.6	3.9	8.7
5	2.1	.4	.4	1.3	1.2	4.8	10	7.4	1.7	6.6	3.9	8.7
6	2.1	.4	.4	1.5	1.2	4.8	10	7.4	5.5	6.3	3.9	8.7
7	8.0	.4	.4	1.5	1.2	4.7	11	7.7	54	5.8	3.9	8.7
8	14	.4	.4	1.6	1.3	4.6	11	7.7	43	5.2	3.7	8.4
9	13	.4	.4	2.0	1.3	4.6	12	7.7	6.9	5.0	3.7	8.4
10	12	.4	.4	2.0	1.3	4.5	12	8.0	3.7	5.0	3.7	8.4
11	11	.4	.4	*2.0	1.3	4.5	13	8.0	3.7	4.4	3.9	8.4
12	10	.4	.4	1.8	b1.3	4.4	13	8.0	3.7	3.9	22	8.0
13	8.7	.4	.4	1.7	b1.3	4.4	13	8.0	3.7	4.2	3.9	8.4
14	3.7	.4	.4	1.7	1.3	4.3	9.4	8.0	12	3.9	3.9	8.4
15	.3	.4	.4	1.7	1.3	4.2	7.2	8.0	20	3.9	3.9	8.4
16	.3	.4	.4	1.6	1.3	4.2	7.4	8.0	11	3.9	31	8.0
17	.3	.4	.4	1.5	1.4	4.2	7.7	8.0	3.9	3.9	22	8.0
18	.3	.4	.4	1.5	1.4	4.4	8.4	5.8	3.9	3.9	3.1	8.0
19	.3	.4	.4	1.4	2.1	4.6	8.7	3.0	3.7	3.9	2.5	8.0
20	.3	.4	.4	1.4	2.5	4.6	9.4	3.0	4.6	3.9	1.8	8.0
21	.3	.4	.4	1.4	2.7	5.2	9.8	3.1	7.2	3.7	1.8	8.0
22	.3	.4	.4	1.3	2.8	5.2	9.8	3.1	9.0	3.7	1.8	8.0
23	.3	.4	.4	1.9	*3.0	5.5	10	3.1	9.0	3.7	1.8	8.0
24	.4	.4	.4	1.0	1.3	6.0	10	3.1	7.7	3.7	3.3	8.0
25	.4	.4	.4	1.0	1.3	6.6	10	3.1	6.9	3.7	7.2	8.0
26	.4	.4	1.1	1.3	3.9	7.2	10	3.1	6.9	3.7	9.0	8.0
27	.4	.4	1.1	1.2	4.2	7.7	10	3.3	6.3	3.7	9.0	8.0
28	.4	.4	1.2	1.2	4.4	8.0	7.0	3.3	7.2	3.7	9.0	8.0
29	.4	.4	1.2	1.2	4.4	8.7	1.4	3.3	7.4	3.9	9.0	7.7
30	.4	.4	1.2	1.2	-	9.0	4.2	3.3	7.4	3.9	9.0	7.7
31	.4	-	b1.3	1.2	-	9.4	-	3.3	-	3.9	9.0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	106.5	14	0.3	3.44 <sup>a</sup>	211
November.....	12.0	.4	.4	.40	24
December.....	20.1	1.3	.4	.65	40
Calendar year 1947.....	1,478.2	42	.3	4.05	2,930
January.....	45.2	2.0	1.2	1.46	90
February.....	59.5	4.4	1.2	2.05	118
March.....	168.9	9.4	4.2	5.45	335
April.....	282.2	13	1.4	9.41	560
May.....	177.8	8.0	3.0	5.74	353
June.....	270.0	54	1.7	9.00	536
July.....	142.0	6.9	3.7	4.58	292
August.....	187.8	31	1.8	6.06	372
September.....	247.8	9.0	7.7	8.26	492
Water year 1947-48.....	1,719.8	54	.3	4.70	3,410

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed from recorded range in stage.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

Jemez River near Bernalillo, N. Mex.

Location.- Water-stage recorders on right and left banks, lat. 35°23'40", long. 106°32'25", in S $\frac{1}{2}$  sec. 32, T. 14 N., R. 4 E., about 2 miles upstream from mouth and 6.2 miles north of Bernalillo. Datum of gage is 5,120.11 feet above mean sea level, datum of 1929.

Records available.- March 1936 to January 1938, March 1943 to September 1948.

Extremes.- Maximum discharge during year, 3,570 second-feet Sept. 26 (gage height, 3.18 feet), from rating curve extended above 1,000 second-feet by logarithmic plotting; no flow at times.

1936-38, 1943-48: Maximum discharge, 15,300 second-feet Oct. 18, 1944, from rating curve extended above 3,000 second-feet by logarithmic plotting; maximum gage height, 5.62 feet Aug. 29, 1943; no flow at times.

Remarks.- Records poor. Diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	4	a25	a6	23	a40	62	286	309		0	0
2	0	2	a22	a5	d11	30	70	218	237		0	0
3	0	2	a16	a6	d11	30	82	258	132		0	0
4	0	1	11	a7	d13	a28	106	309	62		0	0
5	0	4	4	a8	8	a24	150	300	58		22	0
6	0	6	6	a10	11	22	162	237	49		65	0
7	0	1	3	a11	4	25	168	272	47		0	0
8	0	15	2	a12	8	18	174	244	32		0	0
9	0	10	4	a13	4	15	225	152	30		0	0
10	0	8	a3	a14	4	24	322	138	18		0	0
11	0	6	a4	a12	0	a30	440	178	14		0	0
12	0	7	5	a10	a0	38	400	148	24		0	0
13	0	10	a5	a8	0	29	500	108	20		0	0
14	155	13	a6	a7	0	11	600	90	18		0	0
15	27	a10	a6	6	8	20	798	87	3		0	0
16	20	14	a7	a5	33	29	830	100	0		0	0
17	19	16	a8	a4	35	40	782	79	0		0	0
18	19	a15	a9	a3	20	65	736	68	0		0	0
19	20	a13	10	a2	90	87	665	60	0		0	0
20	9	a11	a10	a6	65	60	610	60	14		0	0
21	6	a9	a9	a12	100	62	430	45	0		0	0
22	4	a7	a9	a18	134	a50	526	49	0		0	0
23	11	a6	a8	20	108	a45	381	41	0		0	0
24	11	a8	8	d18	90	a40	309	70	0		0	0
25	9	a12	a9	d16	84	a35	430	108	0		0	0
26	4	a16	a10	d12	62	33	430	194	0		0	395
27	5	a22	a11	a6	a00	27	272	194	0		0	a15
28	6	25	a12	a2	a70	43	272	161	0		0	17
29	4	22	a12	a3	a60	50	237	138	0		0	15
30	2	24	12	4	-	67	279	111	0		0	17
31	2	-	a8	6	-	67	-	122	-		0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	333	155	0	10.7	660
November.....	319	25	1	10.6	633
December.....	274	25	2	8.8	543
Calendar year 1947.....	9,480	758	0	26.0	18,810
January.....	272	20	2	8.8	540
February.....	1,156	134	0	39.9	2,290
March.....	1,184	87	11	38.2	2,350
April.....	11,449	830	62	382	22,710
May.....	4,623	309	41	149	9,170
June.....	1,067	309	0	35.6	2,120
July.....	0	0	0	0	0
August.....	87	65	0	2.8	173
September.....	459	395	0	15.3	910
Water year 1947-48.....	21,223	830	0	58.0	42,100

Peak discharge (base, 3,000 sec.-ft.)- Apr. 13 (8 a.m.) 2,350 sec.-ft.; Sept. 26 (2 a.m.) 3,570 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for nearby stations on Rio Grande.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## RIO GRANDE BASIN

305

Tijeras Creek near Albuquerque, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°08'40", long. 106°29'40", in SW 1/4 sec. 26, T. 10 N., R. 4 E., at Mann diversion dam and 9 miles east of Albuquerque.

Records available.- April 1943 to September 1948 in reports of Geological Survey. January 1921 to January 1922 in reports of State engineer.

Extremes.- Maximum discharge during year, 294 second-feet Aug. 12 (gage height, 3.45 feet); minimum daily, 0.1 second-foot Sept. 17-24.  
1943-48: Maximum discharge, 6.410 second-feet July 19, 1944 (gage height, 8.75 feet), from rating curve extended above 1,100 second-feet; minimum daily, 0.1 second-foot at times.

Remarks.- Records fair. Several diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.		
1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.4	0.4	0.4	0.4	0.3		
2	.2	.3	.4	.4	.4	.4	.6	.4	.4	.4	.4	.3		
3	.2	.3	.4	.4	.4	.5	.6	.4	.4	.4	.4	.3		
4	.2	.3	.4	.4	.4	.4	.6	.4	.4	.4	.4	.3		
5	.2	.3	.4	.4	.3	.4	.6	.4	.4	.4	.4	.3		
6	.3	.3	.4	.4	.3	.4	.5	.4	.4	.4	.4	.3		
7	.3	.3	.3	.4	.3	.4	.5	.4	.4	.4	.4	.3		
8	.2	.3	.3	.4	.3	.4	.5	.5	.4	.4	.4	.3		
9	.3	.3	.4	.4	.4	.2	.4	.4	.4	.4	.4	.3		
10	.2	.3	.4	.4	.2	.5	.4	.5	.4	.4	.4	.3		
11	.2	.3	.3	.4	.2	.5	.3	.5	.4	.3	.4	.2		
12	.2	.3	.3	.4	.2	.5	.3	.5	.4	.3	20	.2		
13	.3	.3	.3	.4	.3	.5	.3	.5	.4	.3	4.9	.2		
14	8.7	.3	.3	.4	.3	.5	.3	.4	.4	.3	81	.2		
15	8.4	.3	.3	.5	.3	.6	.4	.4	.4	.3	8.4	.2		
16	8.3	.3	.3	.4	.4	.5	.4	.4	.4	.3	.3	.2		
17	8.2	.3	.3	.4	.4	.5	.4	.4	.4	.3	.3	.1		
18	.2	.3	.3	.4	.4	.6	.4	.4	.4	.3	.3	.1		
19	.2	.3	.3	.4	.4	.5	.4	.4	.4	.3	.3	.1		
20	.2	.3	.3	.4	.4	.5	.4	.4	.4	.3	.3	.1		
21	.2	.3	.3	.4	.4	.5	.4	.4	.4	.3	.3	.1		
22	.2	.3	.3	.4	.4	.6	.4	.4	.4	.3	.5	.1		
23	.2	.4	.3	.4	.4	.6	.4	.4	.5	.3	1.6	.1		
24	.2	.4	.3	.4	.4	.6	.4	.4	.4	.3	8.6	.1		
25	.2	.3	.3	.4	.5	.6	.4	.4	.4	.3	8.4	.5		
26	.2	.3	.3	.4	.5	.5	.4	.4	.4	.3	8.3	.2		
27	.2	.3	.4	8.4	.5	.5	.3	.4	.4	.3	.3	.5		
28	.2	.3	.4	8.4	.4	.5	.4	.5	.4	.3	.3	.2		
29	.2	.3	.4	8.3	.4	.5	.3	.4	.4	.3	.3	.2		
30	.2	.3	.4	8.3	-	.5	.4	.4	.4	.4	.3	.2		
31	-	-	.4	.3	-	.6	-	.4	-	.4	.3	-		
Month						Second-foot-days		Maximum		Minimum		Mean	Runoff in acre-feet	
October.....						15.4		8.7		0.2		0.50		31
November.....						9.2		.4		.3		.31		18
December.....						10.5		.4		.3		.34		21
Calendar year 1947.....						203		66		.1		.56		404
January.....						12.2		.5		.3		.39		24
February.....						10.4		.5		.2		.36		21
March.....						15.5		.6		.4		.50		31
April.....						12.7		.6		.3		.42		25
May.....						13.0		.5		.4		.42		26
June.....						12.1		.5		.4		.40		24
July.....						10.5		.4		.3		.34		21
August.....						37.4		20		.3		1.21		74
September.....						13.1		5		.1		.44		26
Water year 1947-48.....						172		20		.1		.47		342

Peak discharge (base, 150 sec.-ft.)- Aug. 12 (7:40 p.m.) 294 sec.-ft.

a No gage-height record; discharge computed on basis of available trace, recorded range in stage, weather records, and engineers' notes.



## RIO GRANDE BASIN

Rio Puerco near Cabezon, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°42'10", long. 107°00'40", in SE<sup>1</sup>/<sub>4</sub> sec. 14, T. 17 N., R. 2 W., 1½ miles downstream from San Luis diversion dam, 2½ miles northeast of San Luis, 7 miles northeast of Cabezon, and 15 miles upstream from Chico Arroyo.

Drainage area.- 360 square miles.

Records available.- February 1943 to September 1948.

Extremes.- Maximum discharge during year, 570 second-feet Feb. 20 (gage height, 3.21 feet); no flow at times.  
1943-48: Maximum discharge, 4,400 second-feet June 28, 1943 (gage height, 10.6 feet), by slope-area method; no flow at times.

Remarks.- Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor. Diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.1	3.6	b0.1	b0.1	5.8	a10	a50	a30	0.1	0	0
2	.2	.1	*2	b.1	*b.1	4.9	a8	a50	a18	.1	0	.1
3	.2	.1	d1	b.1	b.1	3.4	a6	a50	6.8	.1	0	.1
4	.2	.1	d1	b.1	b.1	4.2	a8	a60	4.4	.1	.1	.1
5	.2	.1	d1	*b.1	b.1	a2.5	a12	a70	.9	.1	20	.1
6	.2	.2	d2	b.1	b.1	3.2	8.8	79	a.2	.1	5.9	.1
7	.2	.2	d2	b.1	b.1	4.8	3.2	a80	a1	.1	a.1	.1
8	.2	.2	d2	b.1	b.1	4.5	1.6	a80	91	.1	.1	.1
9	.2	.2	d1	b.1	*b.1	5.7	.8	a50	a1	.1	.1	.1
10	.2	.2	d.5	d.2	b.1	3.6	.8	a30	a.1	.1	.1	.1
11	.2	.2	b.1	d.5	b.1	a2	1.6	a20	a.1	.1	.2	.1
12	.2	*2	b.1	*b.5	b.1	3.0	8.9	a15	a.1	.1	.2	.1
13	.2	.2	b.1	b.1	b.1	7.4	9.9	a10	a.1	.1	.1	.1
14	105	.2	b.1	d.1	b.2	29	8.3	a15	a.1	.1	.1	.1
15	32	.2	*b.1	d.2	b.2	62	11	a10	a.1	.1	.1	.1
16	a4	.2	b.1	d.5	b.2	16	12	a8	.1	.1	.1	.2
17	2.8	.2	b.1	b.5	b.2	22	10	a5	.1	.1	.1	.2
18	1.5	.2	b.1	*b1	d1	69	48	a8	.1	.2	.1	.1
19	1.0	.3	b.1	*a2.5	29	a40	16	.1	.2	.1	.1	.1
20	.4	b.3	b.1	.8	162	70	a40	12	.1	.2	.1	.1
21	.3	b.3	b.1	.8	a100	a50	a60	9.9	.1	.2	.1	.1
22	.1	.3	*b.1	1.2	a40	a30	a80	7.8	.2	.1	.1	.1
23	.1	.2	b.1	b1	a50	a20	a70	5.1	1.4	.1	.1	.1
24	.1	.4	b.1	b2	a40	37	a60	6.3	.4	.2	.1	.1
25	.1	.3	b.1	b1	a30	25	a50	7.4	.1	7.9	.1	74
26	.1	.3	b.1	b.5	a25	7.4	a50	38	.1	1.1	.1	92
27	.1	.4	b.1	b.1	a23	5.1	46	a25	.1	.1	.1	a5
28	.1	.3	b.1	b.1	21	5.4	43	a17	.1	0	.1	a1
29	.1	.8	*b.1	b.1	7.4	5.1	a45	a11	.1	0	.1	a.1
30	.1	1.7	b.1	b.1	-	11	a45	a7	.1	0	.1	a.1
31	.1	-	b.1	b.1	-	15	-	a5	-	0	.1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	150.6	105	0.1	4.86	299
November.....	8.7	1.7	.1	.29	17
December.....	18.2	3.6	.1	.59	36
Calendar year 1947.....	2,085.3	215	0	5.71	4,140
January.....	13.3	2	.1	.43	26
February.....	504	162	.1	17.4	1,000
March.....	563	70	2	18.2	1,120
April.....	797.9	80	.8	26.6	1,580
May.....	869.5	80	5	28.0	1,720
June.....	159.1	91	.1	5.30	316
July.....	12.0	7.9	0	.39	24
August.....	28.7	20	0	.93	57
September.....	174.7	92	0	5.82	347
Water year 1947-48.....	3,299.7	162	0	9.02	6,540

Peak discharge (base, 600 sec.-ft.)- No peak above base.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of discharge measurements, weather records, recorder trace, and records for Rio Puerco at Cabezon and Chico Arroyo near Guadalupe.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## RIO GRANDE BASIN

Rio Puerco at Cabezon, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°37'20", long. 107°07'00", in NW 1/4 sec. 13, T. 16 N., R. 3 W., 0.7 mile southwest of Cabezon and 5 1/2 miles upstream from Chico Arroyo.

Records available.- October 1945 to September 1948.

Extremes.- Maximum discharge during year, 581 second-feet Sept. 25 (gage height, 2.27 feet); from rating curve extended above 80 second-feet on basis of records for station near Cabezon; no flow at times.

1945-46: Maximum discharge, 2,440 second-feet Aug. 2, 1946, from rating curve extended above 80 second-feet on basis of records for station near Cabezon; maximum gage height, 3.55 feet Aug. 9, 1946; no flow at times.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.1	0	1.7	0	0	7.3	25	d52	31			0
2	.5	0	4.9	0	0	6.0	12	d45	46			0
3	.2	0	2.8	0	0	5.6	7.7	a56	34			0
4	0	0	1.0	0	0	4.3	9.3	a66	11			0
5	0	0	1.3	0	0	6.8	16	a74	3.2			0
6	0	0	.9	0	0	4.0	11	81	1.6			0
7	0	0	2.4	0	0	6.0	9.3	89	3.4			0
8	0	0	2.6	a0	0	7.3	9.3	93	53			0
9	0	0	.7	a0	0	8.7	10	104	a1			0
10	0	.1	.7	a0	a0	8.7	10	59	a0			0
11	0	.1	a.4	a1	a0	8.7	13	31	a0			0
12	0	.1	a.5	a2	a0	9.3	22	a0	a0			0
13	0	.1	a.2	a1	a0	11	18	23	a0			0
14	240	.1	a.1	a0	a0	16	14	27	a0			0
15	115	0	h0	a0	a0	25	16	25	a0			0
16	10	.1	a0	a0	a0	23	22	a24	0			.1
17	3.4	.2	a0	a0	a0	25	27	a20	0			a0
18	2.4	.1	a0	a.5	a0	70	49	22	0			0
19	1.6	.2	a0	a1	h18	39	58	36	0			0
20	1.0	.1	a0	a.5	a50	55	65	39	0			0
21	.4	.2	a0	a.5	a150	20	93	36	0			0
22	.3	.3	h0	a.5	a120	13	115	25	0			0
23	.2	.3	a0	a.5	a80	13	126	29	0			0
24	.2	.2	a0	a2.5	a50	29	106	23	0			0
25	.1	.1	a0	a2	a50	27	a80	25	0			108
26	.1	.1	0	b1	55	12	a78	58	0			159
27	.1	.2	0	0	42	9.3	55	55	0			7.3
28	.1	.2	0	0	29	7.7	72	42	0			2.0
29	.1	.3	0	0	12	9.3	76	31	0			.5
30	.1	.9	0	0	-	12	d65	16	0			.4
31	0	-	0	0	-	22	-	10	-			-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	375.9	240	0	12.1	746
November.....	4.0	.9	0	.13	7.9
December.....	20.2	4.9	0	.65	40.0
Calendar year 1947.....	3,356.1	243	0	9.19	6,650
January.....	13.0	2.5	0	.42	26
February.....	656	150	0	22.6	1,300
March.....	521	70	4.0	16.8	1,030
April.....	1,289.6	126	7.7	43.0	2,580
May.....	1,318	104	10	42.5	2,610
June.....	184.2	53	0	6.14	365
July.....	0	0	0	0	0
August.....	0	0	0	0	0
September.....	277.3	159	0	9.24	550
Water year 1947-48.....	4,659.2	240	0	12.7	9,230

Peak discharge (base, 800 sec.-ft.).- No peak above base.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of discharge measurements, available recorder trace, weather records, and records for station near Cabezon.

b Stage-discharge relation affected by ice.

c Doubtful gage-height record; discharge computed as explained in footnote a.

h Computed from staff-gage readings.

## Rio Puerco at Rio Puerco, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 34°47'35", long. 106°59'15", in W<sup>1</sup> sec. 31, T. 7 N., R. 1 W. (projected), in hamlet of Rio Puerco in San Clemente Grant, at Atchison, Topeka & Santa Fe Railway bridge, 7 miles downstream from San Jose River.

Drainage area.- 5,160 square miles.

Records available.- September 1910 to October 1911, August 1912 to December 1914 (records fragmentary, gage heights only prior to March 1913), and March 1934 to September 1948 in reports of Geological Survey. January 1913 to December 1925 and September 1926 to December 1927 in reports of State engineer.

Average discharge.- 23 years (1913-17, 1919-20, 1921-24, 1926-27, 1934-48), 91.9 second-foot.

Extremes.- Maximum discharge during year, 2,130 second-feet June 12 (gage height, 2.14 feet); no flow at times.

1934-48: Maximum discharge, 28,000 second-feet Aug. 21, 1935 (gage height, 7.24 feet), by computation of flow over dam; no flow at times.

Remarks.- Records fair except those for periods of doubtful or no gage-height record and those below 10 second-feet, which are poor. Several diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.4	0.3	0.2	0	a60	h22	22	12	0	0	0
2	0	.3	.4	0	0	42	a35	45	32	0	0	0
3	0	.4	1.8	0	0	26	a20	64	250	0	0	0
4	0	.3	.7	0	0	d18	a12	74	87	0	0	0
5	0	.2	.3	.6	.2	d12	8.0	70	a20	0	13	0
6	0	.3	.3	.6	3.5	d10	4.9	58	a8	0	516	0
7	0	.1	.2	.8	3.9	d8	1.4	d30	a3	0	176	0
8	0	.4	.2	1.8	16	d7	8.8	d40	a20	0	193	0
9	0	.1	.2	1.8	11	d6	10	d40	77	0	91	0
10	0	.3	.1	1.2	8.0	4.9	d5	36	a30	0	17	0
11	0	.2	.1	.5	3.5	2.3	d2	36	53	0	12	0
12	0	.1	0	.4	3.5	.9	.8	34	461	0	10	0
13	0	.3	0	.3	3.1	.3	.7	a20	288	0	7.3	0
14	102	.3	0	.1	2.8	.3	.4	a9	a100	0	28	0
15	309	.2	0	0	2.0	.2	.3	a4	a20	0	13	0
16	112	.2	0	0	.8	13	.2	a2	a5	0	8.0	0
17	a15	.4	.1	0	1.2	36	.2	a0	.3	0	3.5	0
18	a8	.4	.1	0	11	16	.1	a0	0	0	1.6	0
19	a4	.4	0	0	14	42	.1	a0	0	0	.2	0
20	1.8	.4	0	.1	8.0	48	.1	a0	60	34	.1	0
21	1.0	.3	.1	.2	50	36	13	0	a2	a4	0	0
22	.2	.2	.1	.7	91	22	16	0	.3	a6	0	0
23	.3	.3	.2	1.8	78	16	34	.4	.1	a2	8.4	0
24	.4	.2	0	1.4	45	12	54	.2	0	a1	6.6	0
25	.4	.1	0	.3	45	a8	87	27	0	a.1	1.4	0
26	.4	.1	.2	.2	91	a5	70	39	0	.1	.2	736
27	.4	.3	.1	0	135	a2	45	70	0	17	0	343
28	.4	.3	.2	0	141	a1	24	58	0	5.4	0	58
29	.4	.3	.3	0	129	a2	17	16	0	1.6	0	18
30	.4	.3	.6	0	-	a4	16	a8	0	.1	0	13
31	.4	-	.6	0	-	a10	-	a5	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	556.5	309	0	18.0	1,100
November.....	7.8	1.8	0.1	.25	15
December.....	7.2	-	0	.23	14
Calendar year 1947.....	27,329.1	4,440	0	74.9	54,200
January.....	13.0	1.8	0	.42	26
February.....	897.3	141	0	30.9	1,780
March.....	470.9	60	.2	15.2	934
April.....	508.0	87	.1	16.9	1,010
May.....	807.6	74	0	26.1	1,600
June.....	1,528.7	461	0	51.0	3,030
July.....	71.3	34	0	2.30	141
August.....	1,106.3	516	0	35.7	2,190
September.....	1,168	736	0	38.9	2,320
Water year 1947-48.....	7,142.6	736	0	19.5	14,160

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

a No gage-height record; discharge computed on basis of weather records and records for station near Bernardo and other nearby stations.

d Doubtful gage-height record; discharge computed as explained in footnote a.

h Computed from staff-gage reading.

## RIO GRANDE BASIN

Rio Puerco near Bernardo, N. Mex.

Location.- Water-stage recorder, lat. 34°24'30", long. 106°51'10", in NE<sup>1</sup> sec. 8, T. 2 N., R. 1 E., at bridge on U. S. Highway 85, 1.2 miles southwest of Bernardo, 3 miles upstream from mouth, and 16 miles south of Belen.

Records available.- November 1939 to September 1948. September 1910 to August 1914 (fragmentary gage heights only) at site  $\frac{1}{2}$  miles downstream, published as Rio Puerco near La Joya.

Extremes.- Maximum discharge during year, 1,570 second-feet Sept. 26 (gage height, 6.95 feet); no flow for extended periods.

1939-48: Maximum discharge, 18,800 second-feet Sept. 23, 1941, from rating curve extended above 7,800 second-feet by logarithmic plotting; maximum gage height, 10.00 feet July 22, 1944; no flow for extended periods.

Remarks.- Records fair. Many diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0				0	52	1	6	7	0	0	0
2	0				0	32	0	8	10	0	0	0
3	0				0	20	15	25	115	0	0	0
4	0				0	16	11	40	186	0	0	0
5	0				0	8	6	33	39	0	0	0
6	0				0	6	3	27	16	0	23	0
7	0				0	2	3	20	6	0	476	0
8	0				0	2	1	17	2	0	173	0
9	0				0	4	0	28	21	0	171	0
10	0				0	2	7	35	79	0	50	0
11	0				0	0	6	27	21	0	12	0
12	0				0	0	6	15	222	0	10	0
13	0				0	0	4	7	357	0	16	0
14	0				0	0	1	4	168	0	4	0
15	246				0	0	0	1	35	0	17	0
16	215				0	0	0	0	11	0	7	0
17	35				0	0	0	0	3	0	3	0
18	15				0	15	0	0	1	0	1	0
19	8				0	15	1	0	0	0	0	33
20	3				0	9	0	0	0	0	0	0
21	0				0	61	0	0	25	0	0	0
22	0				a5	22	0	0	5	3	0	0
23	0				a40	20	124	0	1	1	0	0
24	0				a30	15	39	0	0	0	0	0
25	0				25	6	68	0	0	0	0	0
26	0				51	3	72	36	0	0	0	267
27	0				52	0	33	32	0	0	0	503
28	0				78	0	18	65	0	0	0	125
29	0				63	0	10	25	0	6	0	54
30	0				-	1	6	19	0	3	0	27
31	0				-	2	-	7	-	1	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	522	246	0	16.8	1,040
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947.....	31,279	4,630	0	85.7	62,050
January.....	0	0	0	0	0
February.....	344	78	0	11.9	682
March.....	313	61	0	10.1	621
April.....	433	124	0	14.4	859
May.....	477	65	0	15.4	946
June.....	1,330	357	0	44.3	2,640
July.....	14	6	0	.5	28
August.....	963	476	0	31.1	1,910
September.....	1,009	503	0	33.6	2,000
Water year 1947-48.....	5,405	503	0	14.8	10,730

Peak discharge (base, 3,200 sec.-ft.) - No peak above base.  
 a No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for station at Rio Puerco.

## RIO GRANDE BASIN

Chico Arroyo near Guadalupe, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 35°35'30", long. 107°11'05", in W<sub>3</sub> sec. 29, T. 16 N., R. 3 W., a quarter of a mile upstream from mouth, 5 miles northwest of Guadalupe, and 8.1 miles by road west of Cabezon.

Drainage area.- 1,390 square miles.

Records available.- November 1943 to September 1948.

Extremes.- Maximum discharge during year, 2,630 second-feet Aug. 5 (gage height, 6.10 feet); no flow at times.

1948-49: Maximum discharge, 12,700 second-feet July 21, 1944, from rating curve extended above 2,500 second-feet by logarithmic plotting; maximum gage height, 12.8 feet Aug. 16, 1947; no flow at times.

Remarks.- Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor. No diversion above station. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.1	0	0.1	0	0.2	38	16	0	a6	0	0	a0
2	2.3	0	0.2	b.1	*.3	28	14	0	a6	0	0	a0
3	.1	0	.1	b.1	.3	28	8.0	0	1.6	0	0	a0
4	0	0	.1	b.1	.3	21	12	0	1.4	0	0	a0
5	0	0	.1	*b.1	.5	17	12	0	0	0	300	a0
6	0	0	.1	.1	.4	22	11	0	a0	0	13	a0
7	0	.1	.1	.1	.3	20	8.8	0	a0	0	87	a0
8	0	0	*.1	.1	.3	15	8.1	0	49	0	28	a0
9	0	0	.1	0	*.5	17	4.0	0	8.8	0	4.8	a0
10	0	0	.1	.1	.3	17	2.6	0	a1	0	1.4	a0
11	0	0	b.1	0	b.3	24	1.6	0	a.1	0	.6	a0
12	0	0	.1	*.9	b.2	40	1.1	0	a10	0	42	a0
13	11	0	40	.5	b.2	35	.9	0	a.3	0	8.8	a0
14	448	0	40	.1	b.3	28	.7	0	a0	0	6.0	a0
15	a18	0	*0	.1	.3	97	.5	0	a0	0	6.7	a0
16	a4	0	d.1	.1	.3	14	.4	0	0	0	a2	a0
17	1.1	.1	d.1	.1	.3	20	.2	0	0	0	a1	a.1
18	.3	.1	.1	.1	.4	26	.1	0	0	0	a0	a0
19	.2	.1	.1	0	*3.2	21	.1	0	0	17	a0	a0
20	.1	.1	.2	.1	66	26	0	0	0	51	a0	a0
21	0	.1	.1	.1	2.3	13	0	0	0	a4	a0	0
22	0	.1	*b0	.1	1.6	6.7	.5	0	0	a1	a1	0
23	0	.1	.1	.1	2.0	2.2	.3	0	.3	a.3	3.2	0
24	0	.1	.1	*b0	2.6	0	.8	0	.6	a.3	a0	0
25	0	.1	.1	.1	5.6	0	a.4	.1	0	13	a0	.1
26	0	.1	0	0	73	0	a0	a17	0	24	a0	14
27	0	.1	0	0	78	0	a0	2.9	0	a3	a0	.3
28	0	.1	0	.1	88	0	0	7.4	0	a0	a0	0
29	0	.1	*0	.1	37	23	0	a.5	0	0	a0	0
30	0	.1	0	0	-	35	0	a.1	0	0	a0	0
31	0	-	.1	.1	-	22	-	a.1	-	0	a0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	487.2	448	0	15.7	966
November.....	1.5	.1	0	.05	3.0
December.....	2.4	.2	0	.08	4.8
Calendar year 1947.....	13,687.4	2,630	0	37.5	27,150
January.....	3.3	.9	0	.11	6.5
February.....	365.0	88	.2	12.6	724
March.....	653.9	97	0	21.1	1,300
April.....	102.1	16	0	3.40	203
May.....	28.1	17	0	.91	56
June.....	87.1	49	0	2.90	173
July.....	113.6	51	0	3.66	225
August.....	485.5	300	0	15.7	963
September.....	14.5	14	0	.48	29
Water year 1947-48.....	2,344.2	448	0	6.40	4,650

Peak discharge (base, 2,300 sec.-ft.)- Aug. 5 (6:10 p.m.) 2,630 sec.-ft.

\* Winter discharge measurement or determination of no flow made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, field estimates, weather records, and records for Rio Puerco at Cabezón and at Rio Puerco.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## Bluewater Creek near Bluewater, N. Mex.

Location.- Water-stage recorder, lat. 35°17'50", long. 108°01'40", in W<sup>1</sup>/<sub>2</sub>SW<sup>1</sup>/<sub>4</sub> sec. 5, T. 12 N., R. 11 W., 2½ miles northwest of Bluewater and 8 miles downstream from storage reservoir of Bluewater-Toltec Irrigation District.

Drainage area.- 235 square miles.

Records available.- May 1912 to December 1914 and October 1930 to September 1948 in reports of Geological Survey. May 1912 to June 1919 and April 1921 to December 1931 in reports of State engineer.

Average discharge.- 18 years (1930-48), 14.1 second-feet (unadjusted).

Extremes.- Maximum daily discharge during year, 50 second-feet May 3-5; minimum daily, 0.5 second-foot Mar. 5.

1930-48: Maximum discharge, 1,010 second-feet Sept. 1, 1936 (gage height, 6.15 feet, site and datum then in use), from rating curve extended above 65 second-feet by logarithmic plotting; no flow Mar. 9, 1931, Feb. 3, 1935, and at times in 1946.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Bluewater-Toltec Reservoir (capacity, 46,000 acre-feet).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	1.0	1.3	b1.5	a1.0	1.4	1.8	41	24	46	24	41
2	.7	1.0	1.4	b1.0	a1.0	1.1	1.8	49	8.8	45	24	35
3	.7	1.0	1.2	b1.5	a1.0	1.2	1.8	50	4.9	4.6	24	30
4	.7	1.0	1.1	b1.5	a1.0	.6	2.0	50	7.4	3.1	24	30
5	.7	1.0	1.1	b2.0	a1.0	.5	2.2	50	13	2.8	24	30
6	.7	1.0	1.2	b1.5	a1.0	.7	2.6	46	21	26	22	28
7	.8	1.0	2.0	b1.0	a1.0	.9	2.8	44	21	39	15	29
8	.8	1.0	1.2	*b.8	a1.0	.7	3.1	43	27	39	4.2	29
9	.8	1.0	*b.9	2.2	a1.0	1.1	3.2	42	29	39	3.5	25
10	.8	1.0	b.8	1.6	a1.0	1.1	3.4	42	30	40	3.4	22
11	.9	1.0	b.7	1.4	a.8	.9	3.7	39	30	40	3.5	22
12	1.8	1.0	b.8	1.0	a.7	.7	4.0	38	30	36	4.0	22
13	1.3	1.0	b.7	.8	a.8	1.0	4.0	38	29	35	3.7	21
14	1.4	1.0	.8	.8	a.9	1.1	4.0	32	29	35	3.7	21
15	1.2	1.0	1.1	.9	a1.0	1.2	4.2	32	29	35	3.7	21
16	1.0	1.0	1.5	1.0	a1.2	1.0	4.6	31	33	35	6.6	22
17	1.0	1.0	1.1	1.0	a1.2	1.3	4.6	32	33	36	7.9	19
18	1.0	1.0	1.2	1.3	a1.5	1.3	4.7	35	32	34	7.9	9.6
19	1.0	1.2	1.5	1.2	a1.5	1.1	4.7	35	32	24	17	3.4
20	1.0	1.3	1.6	1.6	a1.5	1.0	4.7	35	31	17	21	2.4
21	.9	1.0	1.8	1.8	a1.5	1.1	5.1	31	31	13	21	2.2
22	.9	1.2	1.6	2.0	a1.5	1.0	5.1	25	39	11	22	2.0
23	1.0	1.3	1.6	1.6	a1.0	1.1	5.1	25	38	8.4	35	2.0
24	1.0	.9	2.0	1.4	a1.0	1.1	5.3	23	39	8.7	42	1.8
25	1.0	1.2	1.8	1.0	a1.0	1.1	5.1	24	43	4.7	42	1.8
26	1.0	1.1	b1.8	*.9	a1.2	1.0	18	23	42	3.9	42	1.8
27	1.0	1.2	b1.8	.9	a1.2	1.2	26	21	42	5.7	42	2.0
28	1.0	1.2	b1.8	b.6	1.4	1.2	27	17	41	7.4	42	2.2
29	1.0	1.3	b1.8	a.8	1.4	1.4	34	17	41	7.7	42	2.1
30	.9	1.3	b2.0	a.9	-	1.8	42	17	44	11	41	6.1
31	1.0	-	b2.0	a.9	-	2.0	-	19	-	15	41	-
Month							Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet	
October.....							29.7	1.8	0.7	0.96	59	
November.....							32.2	1.3	.9	1.07	64	
December.....							43.2	2.0	.7	1.39	86	
Calendar year 1947.....							346.5	9.8	.3	.95	687	
January.....							38.4	2.2	.6	1.24	76	
February.....							32.3	1.5	.7	1.11	64	
March.....							33.9	2.0	.5	1.09	67	
April.....							240.6	42	1.8	8.02	477	
May.....							1,046	50	17	33.7	2,070	
June.....							894.1	44	4.9	29.8	1,770	
July.....							708	46	2.8	22.8	1,400	
August.....							659.1	42	3.4	21.3	1,310	
September.....							486.4	41	1.8	16.2	965	
Water year 1947-48.....							4,243.9	50	.5	11.6	8,410	

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of recorded range in stage and weather records.

b Stage-discharge relation affected by ice.





# RIO GRANDE BASIN

313

San Jose River at Correo, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 34°58'00", long. 107°10'10", in NE 1/4 sec. 32, T. 9 N., R. 3 W., 0.6 mile upstream from U. S. Highway 66, 0.7 mile northeast of Correo, and 13 miles upstream from mouth.

Records available.- April 1943 to September 1948.

Extremes.- Maximum discharge during year, 2,360 second-feet June 11 (gage height, 5.20 feet), from rating curve extended above 1,700 second-feet by logarithmic plotting; no flow at times.

1943-48: Maximum discharge, 8,010 second-feet May 26, 1944 (gage height, 9.20 feet), from rating curve extended above 1,700 second-feet by logarithmic plotting; no flow at times.

Remarks.- Records fair except those for periods of ice effect or doubtful or no gage-height record, which are poor. Several diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				0	0	12	1.8	0	0.8	0	0	0
2				0	0	8.4	1.3	0	21	0	0	0
3				0	0	6.4	1.6	0	7.7	0	0	0
4				0	0	4.4	1.4	0	0.8	0	8.1	0
5				0	b4	5.5	1.4	0	0	0	25	0
6				0	b6	4.1	.6	0	0	0	319	0
7				0	b8	5.0	.1	0	33	0	42	0
8				0	b10	5.5	0	0	38	0	15	0
9				0	b13	3.4	0	0	18	0	4.4	0
10				0	*12	3.4	0	0	a5	0	0	0
11				0	4.7	2.4	0	0	263	0	0	0
12				0	a1	1.6	0	0	365	0	6.7	0
13				0	a0	3.3	0	0	85	0	5.8	0
14				0	a0	3.3	0	0	34	0	4.7	0
15				0	a0	3.4	0	0	11	0	7.6	0
16				0	a2	1.5	0	0	d4	0	3.1	0
17				0	15	2.4	0	0	0	0	.8	0
18				0	15	3.1	0	0	0	0	0	0
19				0	7.6	3.3	0	0	70	0	0	0
20				0	5.0	2.7	0	0	32	0	0	0
21				a0	4.7	1.6	0	0	a1	5.4	0	0
22				a0	4.1	.9	0	0	0	8.0	0	0
23				a1	3.8	1.6	0	0	0	4.4	34	0
24				a1	3.8	.6	0	0	0	.9	13	0
25				a0	11	1.0	0	.5	0	0	4.6	163
26				a0	29	.9	0	.2	0	0	.3	501
27				a0	33	.9	0	0	0	0	0	112
28				a0	27	.7	0	0	0	0	0	58
29				a0	17	1.1	0	0	0	0	0	28
30				a0	-	2.0	0	0	0	0	0	19
31				a0	-	2.4	-	0	-	0	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October..	0	0	0	0	0
November..	0	0	0	0	0
December..	0	0	0	0	0
Calendar year 1947 .....	5,356.1	621	0	14.7	10,630
January..	2	1	0	.06	4.0
February..	256.7	33	0	8.16	469
March..	98.8	12	.6	3.19	196
April..	8.2	1.8	0	.27	16
May..	.7	.5	0	.02	1.4
June..	1,009.3	365	0	33.6	2,000
July..	18.7	8.0	0	.60	37
August..	494.1	319	0	15.9	980
September..	881	501	0	29.4	1,750
Water year 1947-48 .....	2,749.5	501	0	7.51	5,450

Peak discharge (base, 800 sec.-ft.).- June 11 (8 p.m.) 2,360 sec.-ft.; June 19 (10 p.m.) 885 sec.-ft.; Aug. 6 (12:15 a.m.) 1,100 sec.-ft.; Sept. 26 (12:15 a.m.) 1,630 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for Rio Puerco at Rio Puerco.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## RIO GRANDE BASIN

Rio Salado near San Acacia, N. Mex.

Location.- Water-stage recorder, lat. 34°16'40", long. 106°52'55", in E½ sec. 30, T. 1 N., R. 1 E., 1 mile upstream from mouth, 1.7 miles downstream from bridge on U. S. Highway 85, 2 miles northeast of San Acacia, and 15 miles north of Socorro. Water-stage recorder at railroad bridge, 4,000 feet downstream, and at different datum used Oct. 1 to Dec. 19, 1947.

Records available.- 1940-47 (miscellaneous discharge measurements at nearby sites, records equivalent), October 1947 to September 1948.

Extremes.- Maximum discharge during year, 2,400 second-feet Sept. 26 (gage height, 10.7 feet), from rating curve extended above 580 second-feet by logarithmic plotting; no flow at times.

Remarks.- Records poor. Diversions above station for irrigation. Records of suspended sediment loads for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					a0			0	0	0	3.8	0
2					a0			0	0	0	0	0
3					a0			0	0	0	1.1	0
4					a0			0	1.2	0	9.2	0
5					a.1			0	0	0	a1	0
6					0			0	0	0	.8	0
7					2.6			0	42	0	1.3	0
8					.6			0	a5	0	1.8	0
9					0			0	0	0	a1	0
10					0			0	1.6	0	a.5	0
11					0			0	a1	0	a0	0
12					0			0	.4	0	a0	0
13					0			0	3.1	0	12	0
14					0			0	d.6	0	17	0
15					0			0	.3	0	a1	0
16					0			0	0	0	a0	0
17					0			0	0	0	a0	0
18					0			0	0	0	a0	0
19					0			0	0	0	a0	3.6
20					0			0	0	a0	a0	4.5
21					0			0	0	a20	a0	1.6
22					0			0	0	.6	a0	1.2
23					0			0	0	0	a0	0
24					.4			0	0	.6	a0	0
25					11			0	0	.4	a0	0
26					8.5			0	0	160	a0	351
27					3.9			0	0	10	a0	47
28					2.0			0	0	35	a0	a10
29					0			0	0	a5	a0	a2
30					-			0	0	0	a0	a0
31					-			.1	-	37	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0
Calendar year	-	-	-	-	-
January	0	0	0	0	0
February	29.1	11	0	1.0	58
March	0	0	0	0	0
April	0	0	0	0	0
May	.1	.1	0	.003	.2
June	55.2	42	0	1.84	109
July	268.6	160	0	8.66	533
August	50.5	17	0	1.63	100
September	420.9	351	0	14.0	835
Water year 1947-48	824.4	351	0	2.25	1,640

Peak discharge (base, 800 sec.-ft.).- July 26 (8:15 a.m.) 1,120 sec.-ft.; Sept. 26 (5 a.m.) 2,400 sec.-ft.

a No gage-height record; discharge computed on basis of available recorder trace, discharge measurements, and recorded range in stage.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## Socorro main canal north at San Acacia, N. Mex.

Location.- Water-stage recorder, lat. 34°15'15", long. 106°53'50", in SE¼ sec. 1, T. 1 S., R. 1 E., at San Acacia, half a mile downstream from point of diversion from Rio Grande. Zero of gage is 4,659.74 feet above mean sea level, datum of 1929.

Records available.- April 1936 to September 1948.

Extremes.- Maximum daily discharge during year, 165 second-feet July 14; no flow at times. 1937-48: Maximum daily discharge, 234 second-feet Aug. 26, 1938; no flow at times.

Remarks.- Records fair. Canal diverts water from right bank of Rio Grande for irrigation. Three acequias, together irrigating about 300 acres, divert water from canal above station.

Monthly discharge, in second-feet,  
water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	113	54	80.6	4,960
November.....	23	0	.8	46
December.....	0	0	0	0
Calendar year 1947.....	179	0	82.8	59,960
January.....	10	0	.8	52
February.....	0	0	0	0
March.....	112	0	52.8	3,250
April.....	126	32	102	6,080
May.....	155	0	109	6,680
June.....	143	0	110	6,580
July.....	165	70	133	8,210
August.....	162	37	92.4	5,680
September.....	135	0	67.1	3,990
Water year 1947-48.....	165	0	82.7	45,510

## Socorro main canal south near San Antonio, N. Mex.

Location.- Water-stage recorder, lat. 33°53'30", long. 106°52'00", in NW¼ sec. 8, T. 5 S., R. 1 E., 0.2 mile north of San Antonio School and 1½ miles south of San Antonio.

Records available.- April 1937 to July 1938 at site 1½ miles downstream (published as Socorro main canal south at end near San Antonio) and March to September 1948.

Extremes.- Maximum daily discharge during period, 27 second-feet Apr. 24, May 23; no flow Mar. 18, Aug. 25, 26.  
1937-38, 1948: Maximum daily discharge, 33 second-feet Sept. 11, Oct. 16, 1937; no flow at times.

Remarks.- Records good. Canal diverts water from Socorro riverside drain for irrigation. Lateral diversions above gage.

Monthly discharge, in second-feet, March to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
January.....	-	-	-	-
February.....	-	-	-	-
March 18-31.....	17	0	8.49	236
April.....	27	2.6	12.4	737
May.....	27	4.4	12.3	755
June.....	24	3.9	10.6	628
July.....	12	.2	5.85	359
August.....	14	0	4.77	293
September.....	13	.3	4.47	266
The period.....	-	-	-	3,270

## San Antonio Riverside drain near San Antonio, N. Mex.

Location.- Water-stage recorder, lat. 33°52'10", long. 106°51'30", 300 feet south of northern boundary of Bosque del Apache Grant (Wildlife Refuge), a quarter of a mile upstream from Elmdorf interior drain, 1 mile east of highway and railroad, 2½ miles upstream from mouth, and 3 miles south and ½ mile east of San Antonio.

Records available.- March to September 1948. Station by same name but 50 feet below Elmdorf interior drain published May 1936 to February 1938, records not comparable.

Extremes.- Maximum daily discharge during period, 113 second-feet May 27, 28; minimum daily, 11 second-feet Sept. 8, 9.

Remarks.- Records fair. Diversions below gage. Interior drains and canal wasteways above gage.

Monthly discharge, in second-feet, March to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
January.....	-	-	-	-
February.....	-	-	-	-
March 15-31.....	65	54	59.0	1,990
April.....	81	59	70.6	4,200
May.....	113	65	79.6	4,900
June.....	110	45	74.5	4,430
July.....	67	43	54.3	3,340
August.....	45	16	37.1	2,280
September.....	30	11	18.2	1,080
The period.....	-	-	-	22,220

## San Antonio Riverside drain near San Marcial, N. Mex.

Location.- Water-stage recorder, lat. 33°44'50", long. 106°55'30", in Bosque del Apache Grant (Wildlife Refuge), half a mile upstream from outlet to Rio Grande, 5 miles north-east of San Marcial, and 10 miles south of San Antonio.

Records available.- March to September 1948.

Extremes.- Maximum daily discharge during period, 157 second-feet May 31, June 1; minimum daily, 6.4 second-feet Sept. 15.

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

Monthly discharge, in second-feet, March to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
March 19-31.....	80	67	75.9	1,960
April.....	105	75	86.0	5,120
May.....	157	76	94.2	5,780
June.....	157	72	110	6,530
July.....	76	52	62.6	3,850
August.....	56	25	45.1	2,770
September.....	22	6.4	14.4	859
The period.....	-	-	-	26,880

## Elmendorf Interior drain near San Antonio, N. Mex.

Location.- Water-stage recorder, lat. 33°52'15", long. 106°52'05", in SW $\frac{1}{4}$  sec. 17, T. 5 S., R. 1 E., 550 feet north of north boundary of Bosque del Apache Grant (Wildlife Refuge), 0.3 mile east of highway and railroad, and 3 miles south of San Antonio.

Records available.- July 1936 to January 1938 and March to September 1948.

Extremes.- Maximum daily discharge during period, 11 second-feet Aug. 18; minimum daily, 0.2 second-foot Aug. 29 to Sept. 2.  
1936-38, 1948: Maximum daily discharge not determined in 1936-38; minimum daily discharge, that of Aug. 29 to Sept. 2, 1948.

Remarks.- Records good.

Monthly discharge, in second-feet, March to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
March 11-31.....	6.7	0.3	2.14	89
April.....	3.3	.9	2.03	121
May.....	5.1	1.6	2.74	168
June.....	4.2	1.6	2.61	155
July.....	4.6	.6	1.71	105
August.....	11	.2	3.68	227
September.....	3.7	.2	.73	43
The period.....	-	-	-	908

## Pecos River near Pecos, N. Mex.

Location.- Water-stage recorder, lat. 35°42'25", long. 105°41'00", in NE¼NE¼ sec. 17, T. 17 N., R. 12 E., at bridge on private road, 600 feet upstream from Indian Creek, 2 miles downstream from Holy Ghost Creek, and 11 miles north of Pecos.

Drainage area.- 189 square miles (contributing area).

Records available.- March 1910 to December 1914 (published as Pecos River near Cowles) and October 1930 to September 1948 in reports of Geological Survey. March 1910 to December 1931 (published as Pecos River near Cowles prior to 1926) in reports of State engineer.

Average discharge.- 18 years (1930-48), 108 second-feet.

Extremes.- Maximum discharge during year, 749 second-feet May 19 (gage height, 3.66 feet); minimum daily, 12 second-feet Jan. 27-29.

1930-48: Maximum discharge, 1,960 second-feet May 14, 1941 (gage height, 4.57 feet); minimum daily, 6.1 second-feet Jan. 16, 1934.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	28	*27	20	14	16	28	44	417	474	143	48	37
2	30	26	21	16	16	29	46	587	479	137	48	35
3	30	27	22	18	17	31	54	564	562	124	49	33
4	28	23	21	20	18	29	65	327	522	119	54	32
5	27	22	20	18	19	33	75	350	474	115	115	30
6	27	20	20	18	18	34	83	373	432	107	76	28
7	25	20	20	20	18	34	89	407	514	99	61	28
8	27	18	20	20	18	34	95	427	463	95	61	28
9	25	18	20	18	16	34	110	387	417	85	53	30
10	26	18	20	18	16	42	146	345	402	83	49	29
11	24	20	18	18	20	38	185	309	426	83	47	29
12	27	23	18	16	22	33	163	288	484	76	53	29
13	41	24	18	16	24	35	143	267	407	71	52	28
14	89	24	16	16	25	32	154	288	364	70	47	26
15	58.	*20	16	16	27	30	191	336	327	68	44	25
16	46	21	18	16	25	34	233	a390	300	65	42	27
17	40	21	18	16	25	30	280	453	271	64	44	27
18	37	20	18	16	25	32	345	522	244	71	54	26
19	34	20	18	16	26	32	378	580	252	85	83	26
20	32	20	18	16	25	34	387	702	318	78	53	25
21	32	18	16	18	32	32	373	696	233	75	49	24
22	30	20	16	18	33	36	336	696	244	71	53	24
23	28	21	16	16	32	37	327	658	229	65	47	24
24	29	21	16	16	29	47	292	622	198	60	44	24
25	28	20	16	16	30	*52	240	574	179	65	52	26
26	27	20	16	14	30	46	215	512	166	65	42	39
27	28	21	18	12	29	43	222	490	179	58	39	32
28	27	21	16	12	27	48	240	474	179	57	37	29
29	28	21	16	12	28	55	340	442	163	54	36	27
30	28	21	16	14	-	52	417	432	151	52	35	29
31	26	-	14	14	-	47	-	442	-	52	35	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,012	89	24	32.6	2,010
November.....	636	27	18	21.2	1,260
December.....	554	22	14	17.9	1,100
Calendar year 1947 .....	24,142	640	14	66.1	47,890
January.....	500	20	12	16.1	992
February.....	686	33	16	23.7	1,360
March.....	1,153	55	28	37.2	2,290
April.....	5,268	417	44	209	12,430
May.....	13,967	702	267	450	27,680
June.....	10,053	562	151	335	19,940
July.....	2,510	143	52	81.0	4,980
August.....	1,602	115	35	51.7	3,180
September.....	856	39	24	28.5	1,700
Water year 1947-48 .....	39,787	702	12	109	78,920

Peak discharge (base, 310 sec.-ft.)- Apr. 20 (10 p.m.) 432 sec.-ft.; Apr. 30 (9 p.m.) 484 sec.-ft.; May 19 (11:30 p.m.) 749 sec.-ft.; June 7 (2:30 p.m.) 683 sec.-ft.; June 11 (10:30 p.m.) 722 sec.-ft.; June 20 (2:30 a.m.) 463 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge interpolated.

Note.- Stage-discharge relation affected by ice Nov. 8-12, Nov. 15 to Feb. 20, Mar. 11-13 (no gage-height record Jan. 19-21, Jan. 28 to Feb. 3, Feb. 5-18; discharge computed on basis of weather records, discharge measurements, and records for stations downstream).

## RIO GRANDE BASIN

Pecos River near Anton Chico, N. Mex.

Location.- Water-stage recorder, lat. 35°10'50", long. 105°06'20", in Anton Chico Grant, 2 miles upstream from Canyon Blanco, 2½ miles southeast of Anton Chico, and 10 miles downstream from Tecolote Creek.

Drainage area.- 1,050 square miles (contributing area).

Records available.- April 1910 to December 1914 and October 1930 to September 1948 in reports of Geological Survey. April 1910 to December 1931 in reports of State engineer. During successive periods prior to July 2, 1937, station was at five different sites ranging from a sixth of a mile to 5 miles upstream from present site.

Average discharge.- 18 years (1930-48), 148 second-feet.

Extremes.- Maximum discharge during year, 2,140 second-feet July 7 (gage height, 4.77 feet); minimum daily, 0.7 second-foot Sept. 3, 6-9.  
1930-48: Maximum discharge, 40,300 second-feet June 1, 1937 (gage height, 20.34 feet, present site and datum), by slope-area method; no flow at times.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.8	12	16	b12	b25	42	126	478	445	77	14	a1
2	5.2	9.7	15	*b14	b29	42	101	478	484	72	32	.9
3	5.5	11	18	b16	b31	48	104	440	508	67	55	.7
4	7.1	13	19	12	b29	43	113	410	544	63	149	1.2
5	4.6	12	17	14	30	b40	134	357	478	58	409	1.7
6	2.3	all	17	15	29	b37	159	374	425	173	228	.7
7	2.1	8.6	19	7.4	16	34	180	388	401	334	107	.7
8	2.3	6.7	*22	7.1	17	46	187	406	508	128	76	.7
9	2.5	5.5	18	7.1	*11	*43	201	435	445	63	73	.7
10	2.6	5.2	13	10	19	43	211	430	392	54	a50	19
11	5.5	5.2	14	12	24	62	248	435	383	44	a35	3.7
12	6.3	7.1	12	12	23	61	329	396	440	38	a25	1.8
13	7.4	6.3	b14	11	24	57	314	381	472	22	a20	1.7
14	51	5.5	b10	13	57	56	275	318	378	10	6.6	1.6
15	148	5.7	b11	10	63	50	263	322	322	11	21	1.6
16	90	8.2	b13	*10	54	50	290	378	281	107	78	1.7
17	61	9.3	b12	b9	39	50	345	450	248	118	49	1.6
18	46	9.0	b13	9.0	48	47	415	508	216	95	9.1	1.7
19	38	9.3	b12	b10	44	53	490	568	189	30	10	2.8
20	30	9.7	b12	b11	45	54	496	550	394	31	18	1.7
21	24	10	*12	b12	47	50	496	706	297	28	34	1.8
22	22	11	11	b14	47	55	514	685	208	24	20	1.8
23	23	14	12	b12	42	55	455	692	182	51	50	1.6
24	30	15	12	b15	40	54	445	671	187	45	22	1.4
25	23	15	14	17	41	66	388	643	157	22	9.1	1.4
26	23	15	11	20	a42	99	325	587	118	38	a4	4.7
27	23	17	7.8	9.7	a35	110	275	514	96	109	a2	12
28	15	19	8.2	16	*31	107	278	520	77	72	a1	7.0
29	13	20	10	*b20	40	104	281	466	98	33	a1	3.2
30	13	20	8.6	b22	-	114	383	425	80	22	a1	11
31	13	-	b8	b23	-	129	-	415	-	18	a1	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	742.2	148	2.1	23.9	1,470
November.....	326	20	5.2	10.9	647
December.....	411.6	22	7.8	13.3	816
Calendar year 1947.....	18,143.5	556	.8	49.7	35,990
January.....	402.3	23	7.1	13.0	798
February.....	1,024	63	11	35.3	2,030
March.....	1,901	129	34	61.3	3,770
April.....	8,821	514	101	294	17,500
May.....	14,906	706	318	481	29,570
June.....	9,453	544	77	315	18,750
July.....	2,057	334	10	66.4	4,080
August.....	1,802.8	409	1	51.7	3,180
September.....	92.9	19	.7	3.11	184
Water year 1947-48.....	41,739.8	706	.7	114	82,800

Peak discharge (base, 2,200 sec.-ft.):- No peak above base.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of weather records and records for stations near Pecos and at Santa Rosa.

b Stage-discharge relation affected by ice.

## Pecos River at Santa Rosa, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 34°56'05", long. 104°41'25", in SW1/4 sec. 2, T. 8 N., R. 21 E., at bridge on U. S. Highway 66 at Santa Rosa, 1 mile upstream from Rio Agua Negra Chiquita.

Drainage area.- 2,650 square miles (contributing area).

Records available.- May 1903 to December 1906 (gage heights only), February 1910 to July 1911, September 1912 to December 1914, and October 1930 to September 1948 in reports of Geological Survey. February 1910 to July 1911 and September 1912 to December 1931 in reports of State engineer.

Average discharge.- 29 years (1912-14, 1916-23, 1928-48), 169 second-feet.

Extremes.- Maximum discharge during year, 13,300 second-feet June 3 (gage height, 10.33 feet); minimum daily, 12 second-feet Jan. 28.

1930-48: Maximum discharge, 55,200 second-feet June 2, 1937 (gage height, 25.7 feet), from rating curve extended above 32,000 second-feet by logarithmic plotting; minimum daily, 2.7 second-feet June 25, 1937.

Remarks.- Records good except those above 500 second-feet, which are fair, and those for periods of ice effect, which are poor. Several diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	18	23	22	b18	b22	21	37	191	236	32	40	26
2	21	23	22	*b18	25	21	40	250	296	34	202	26
3	21	22	28	26	29	20	32	250	3,310	35	88	29
4	21	22	26	22	35	18	23	231	658	33	37	28
5	19	22	22	20	31	26	21	183	587	31	209	25
6	20	21	*22	19	33	28	21	135	375	40	650	25
7	19	21	22	*21	26	22	29	163	301	83	195	26
8	21	21	21	21	21	22	48	159	260	469	95	26
9	21	20	23	20	*23	20	64	179	351	218	55	28
10	21	21	21	19	22	17	67	208	265	83	38	28
11	21	21	23	19	20	29	85	191	231	62	34	26
12	21	22	b21	18	21	25	124	222	433	47	34	26
13	28	22	b20	17	b25	23	213	171	535	35	32	28
14	36	23	b20	17	b25	20	183	141	393	35	33	26
15	29	22	21	19	32	18	128	106	240	33	33	26
16	30	23	19	18	26	19	112	85	163	38	40	26
17	47	24	b17	*b17	21	19	141	141	115	32	30	28
18	34	24	19	b16	19	18	213	231	83	48	49	26
19	26	23	21	b16	*18	17	312	280	64	112	31	29
20	24	22	20	b17	17	17	369	589	210	44	26	26
21	22	22	*21	b17	18	16	363	505	824	34	29	26
22	21	22	19	b17	18	17	351	482	280	35	26	26
23	20	24	19	b17	18	17	312	454	138	60	29	25
24	21	22	19	b18	19	17	280	461	78	41	28	24
25	21	23	19	b18	21	16	255	426	58	40	29	25
26	20	23	19	b18	24	15	200	367	41	41	29	26
27	20	23	20	14	21	16	145	728	35	116	29	25
28	20	22	19	b12	18	17	92	498	33	143	28	25
29	21	22	19	b16	18	26	76	296	32	51	29	26
30	21	22	18	*b20	-	26	67	222	32	45	29	26
31	22	-	18	b20	-	31	-	204	-	43	28	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	727	47	18	23.5	1,440
November.....	667	24	20	22.2	1,320
December.....	640	28	17	20.6	1,270
Calendar year 1947 .....	15,507	593	17	42.5	30,750
January.....	565	26	12	18.2	1,120
February.....	664	33	17	22.9	1,320
March.....	636	31	15	20.5	1,260
April.....	4,403	369	21	147	8,730
May.....	8,549	728	85	276	16,960
June.....	10,457	3,310	32	349	20,740
July.....	2,193	469	31	70.7	4,350
August.....	2,264	650	26	73.0	4,490
September.....	790	29	24	26.3	1,570
Water year 1947-48.....	32,555	3,310	12	88.9	64,570

Peak discharge (base, 3,200 sec.-ft.).- May 27 (10:15 p.m.) 4,900 sec.-ft.; June 3 (11 a.m.) 13,300 sec.-ft.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.



## Pecos River near Puerto de Luna, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 34°43', long. 104°32', in sec. 29, T. 6 N., R. 23 E., 10 miles southeast of Puerto de Luna and 14 miles upstream from Alamogordo Dam.

Drainage area.- 3,970 square miles (contributing area).

Records available.- April 1938 to September 1948.

Average discharge.- 10 years, 274 second-feet.

Extremes.- Maximum discharge during year, 9,020 second-feet June 3 (gage height, 5.22 feet); minimum daily, 60 second-feet Jan. 28, 29.  
1938-48: Maximum discharge, 48,600 second-feet Sept. 1, 1942 (gage height, 17.00 feet), from rating curve extended above 7,400 second-feet on basis of flow at Santa Rosa; minimum daily, 50 second-feet June 11-13, 1946.

Remarks.- Records good except those for periods of ice effect or doubtful or no gage-height records, which are poor. Many diversions above station for irrigation. Discharge represents inflow to Alamogordo Reservoir (capacity, 157,000 acre-feet). Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Cooperation.- Gage-height record collected in cooperation with Bureau of Reclamation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	91	103	97	118	118	115	4200	395	94	82	80
2	85	97	112	109	b120	126	106	4240	413	78	85	80
3	88	94	126	109	106	112	103	4240	2,470	75	373	88
4	85	94	136	109	122	118	94	4240	1,320	94	122	80
5	82	97	126	109	146	115	82	4210	735	828	97	80
6	80	103	129	106	140	112	85	195	520	308	557	80
7	82	103	112	106	140	109	72	195	370	150	363	91
8	80	94	109	106	132	115	80	205	294	417	215	85
9	82	97	100	97	122	100	115	225	258	394	154	88
10	85	91	112	106	*115	97	115	252	252	264	166	91
11	85	106	106	106	109	94	115	264	248	154	80	88
12	88	106	94	100	b70	106	140	300	248	136	78	85
13	132	118	100	106	b80	115	200	258	881	106	72	91
14	170	122	97	106	b100	115	230	225	766	82	82	82
15	122	109	94	109	112	100	200	205	321	82	360	91
16	109	112	112	106	115	103	190	162	276	94	100	94
17	106	126	91	*106	112	115	174	174	240	103	100	97
18	136	129	91	106	103	112	182	225	190	106	82	94
19	112	112	94	106	*103	100	4270	264	146	136	109	97
20	106	115	103	112	109	109	4400	307	178	154	85	94
21	103	115	106	115	100	88	4380	418	621	97	70	94
22	97	112	100	112	97	88	4370	426	378	94	75	94
23	100	112	98	122	106	97	4350	450	258	132	72	91
24	97	106	94	126	106	91	4310	460	182	143	75	88
25	103	103	97	118	115	82	276	470	146	118	72	91
26	106	109	91	126	132	91	235	418	115	158	78	85
27	109	103	103	65	132	85	186	370	97	663	72	91
28	106	106	103	a60	122	82	174	859	88	685	78	85
29	100	103	91	a60	109	88	162	370	97	150	68	94
30	100	109	97	*b100	-	91	154	342	91	115	78	91
31	97	-	103	b120	-	97	-	428	-	97	78	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	3,115	170	80	100	6,180
November.....	3,194	129	91	106	6,340
December.....	3,220	136	88	104	6,390
Calendar year 1947.....	43,238	1,030	62	118	85,780
January.....	3,241	126	60	105	6,430
February.....	3,293	146	70	114	6,530
March.....	3,171	126	82	102	6,290
April.....	5,665	400	72	189	11,240
May.....	9,597	859	162	310	19,040
June.....	12,590	2,470	88	420	24,970
July.....	6,307	828	75	203	12,510
August.....	4,118	557	68	133	8,170
September.....	2,560	97	80	88.7	5,280
Water year 1947-48.....	60,171	2,470	60	164	119,400

Peak discharge (base, 3,500 sec.-ft.)- May 28 (2:45 a.m.) 3,540 sec.-ft.; June 3 (4:15 p.m.) 9,020 sec.-ft.; June 13 (11 p.m.) 5,420 sec.-ft.; July 5 (8 p.m.) 7,050 sec.-ft.; July 27 (8:45 p.m.) 3,780 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for station at Santa Rosa.

b Stage-discharge relation affected by ice.

d Doubtful gage-height record; discharge computed as explained in footnote a.

## Pecos River below Alamogordo Dam, N. Mex.

Location.- Water-stage recorder, lat. 34°36'20", long. 104°23'10", in lot 1 sec. 2, T. 4 N., R. 24 E., 1,200 feet downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe. Datum of gage is 4,142.67 feet above mean sea level (Bureau of Reclamation datum).

Drainage area.- 4,390 square miles (contributing area).

Records available.- October 1912 to December 1914, October 1930 to September 1936 (at site 1½ miles upstream), and September 1936 to September 1948 in reports of Geological Survey. October 1912 to December 1931 in reports of State engineer.

Average discharge.- 21 years (1913-16, 1918-25, 1926-37), 264 second-feet (prior to completion of Alamogordo Dam), 11 years (1937-48) 272 second-feet.

Extremes.- Maximum daily discharge during year, 1,390 second-feet July 20; minimum daily, 1.1 second-feet Nov. 6, 15, 17, 20, Jan. 18-20.

1930-48: Maximum discharge, 42,800 second-feet Sept. 1, 1942, by computation of flow over spillway and through outlet gates of Alamogordo Dam by Bureau of Reclamation; maximum gage height, 13.58 feet Sept. 22, 1941, from floodmark; no flow at times.

Remarks.- Records good except those between 150 and 300 second-feet and those below 5 second-feet, which are fair. Diversions above station for irrigation. Flow regulated by Alamogordo Reservoir (see p. 241). Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	95	93	1.4	2.2	1.7	2.4	1.7	91	85	95	1,200	91
2	95	94	1.4	1.9	1.4	2.4	1.7	91	1.7	95	1,140	97
3	96	94	1.6	1.6	1.2	2.2	1.7	93	1.2	95	1,100	94
4	86	93	1.6	1.6	1.4	2.2	1.7	94	18	94	1,060	82
5	81	36	1.6	1.6	1.7	2.2	834	94	52	94	453	82
6	82	1.1	1.6	1.6	1.4	1.9	1,380	95	80	109	98	82
7	82	1.4	1.6	1.4	1.4	1.9	1,340	97	100	92	103	85
8	82	1.4	1.9	1.4	1.2	2.2	1,310	97	93	82	93	100
9	82	1.4	1.9	1.4	1.4	2.4	1,290	98	100	82	93	89
10	82	1.4	1.6	1.4	1.4	2.7	1,260	99	109	91	93	80
11	82	1.4	1.6	1.4	2.4	2.7	1,230	100	100	116	95	80
12	83	1.4	1.6	1.4	2.2	2.7	1,240	101	103	121	95	80
13	84	1.4	1.6	1.4	1.9	2.7	1,240	103	99	123	98	80
14	86	1.4	1.6	1.4	1.9	2.7	1,230	103	102	107	92	82
15	85	1.1	1.6	1.4	1.4	2.2	1,200	93	98	107	87	84
16	78	1.4	1.9	1.4	1.4	2.4	1,150	99	92	98	85	85
17	75	1.1	1.9	1.4	1.4	2.4	1,100	119	95	91	97	85
18	75	1.4	1.9	1.1	1.4	2.4	1,080	111	96	91	107	86
19	76	1.4	1.9	1.1	1.4	2.7	991	111	85	718	107	86
20	76	1.1	1.6	1.1	1.7	1.7	952	108	86	1,390	100	86
21	76	1.4	1.6	1.2	1.9	1.7	636	108	86	1,310	99	86
22	76	1.4	1.6	1.2	2.7	1.4	502	106	97	1,150	106	86
23	76	2.2	1.6	1.2	2.4	1.4	502	98	104	1,310	105	85
24	76	2.6	1.6	1.2	2.2	1.4	510	84	103	1,290	104	85
25	76	2.2	1.6	1.2	2.4	1.4	502	1.2	105	1,280	104	85
26	75	1.6	1.6	1.2	2.4	1.4	247	95	104	1,260	103	85
27	96	1.4	1.6	1.4	2.2	1.4	183	97	104	1,240	109	97
28	100	1.4	1.4	1.7	1.9	1.4	90	91	105	1,280	101	85
29	93	1.4	1.6	1.7	1.9	1.4	91	99	95	1,240	91	71
30	93	1.4	1.9	1.7	-	1.7	91	105	95	1,230	91	71
31	93	-	1.9	1.7	-	1.7	-	103	-	1,210	91	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	2,594	100	75	83.7	5,150
November.....	446.8	94	1.1	14.9	888
December.....	51.4	1.9	1.4	1.66	102
Calendar year 1947 .....	49,351.3	1,450	1.1	135	97,890
January.....	44.6	2.2	1.1	1.44	88
February.....	51.3	2.7	1.2	1.77	102
March.....	63.4	2.7	1.4	2.05	126
April.....	22,167.8	1,380	1.7	739	43,970
May.....	2,984.2	119	1.2	96.3	5,920
June.....	2,573.9	109	1.2	85.8	5,110
July.....	17,691	1,390	82	571	35,090
August.....	7,421.7	1,200	9.7	239	14,720
September.....	2,853	100	71	85.1	5,060
Water year 1947-48 .....	58,643.1	1,390	1.1	160	116,300

## Pecos River near Acme, N. Mex.

Location.- Water-stage recorder, lat. 33°32'10", long. 104°22'40", in NW¼ sec. 14, T. 9 S., R. 25 E., 1 mile southeast of Melena railroad station, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, and 13 miles northeast of Roswell.

Drainage area.- 11,380 square miles (contributing area).

Records available.- July 1937 to September 1948 in reports of Geological Survey. August 1921 to July 1923 in reports of State engineer.

Average discharge.- 11 years (1937-48), 272 second-feet.

Extremes.- Maximum discharge during year, 2,140 second-feet Aug. 2 (gage height, 5.69 feet); no flow at times.

1937-48: Maximum discharge, 45,000 second-feet Sept. 23, 1941 (gage height, 13.71 feet), from rating curve extended above 15,000 second-feet by logarithmic plotting; no flow at times.

Maximum discharge during flood of May 28, 1937, 53,000 second-feet (gage height, 14.82 feet, from floodmarks, site and datum then in use), by slope-area method.

Remarks.- Records good. Diversions above station for irrigation. Flow regulated by Alamogordo Reservoir (see p. 241). Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0	0	0	44	494	0	950	
2					0	0	0	26	612	0	1,540	
3					0	0	0	18	608	0	1,010	
4					0	0	0	14	135	0	1,370	
5					13	0	0	10	58	0	1,140	
6					31	1	0	87	28	0	838	
7					67	0	37	4	17	0	350	
8					47	0	950	2	9	61	164	
9					23	0	1,030	1	4	98	79	
10					*14	1	1,060	0	1	40	42	
11					10	1	1,060	0	0	12	24	
12					*b3	1	1,030	0	0	0	16	
13					2	1	1,050	0	0	0	13	
14					2	1	1,090	0	0	0	10	
15					2	0	978	0	0	0	16	
16					*6	0	992	0	0	0	393	
17					3	0	978	0	0	0	123	
18					12	0	964	0	0	0	64	
19					14	0	912	0	0	0	29	
20					4	0	888	0	0	0	14	
21					2	0	875	0	0	0	7	
22					1	0	925	0	0	707	2	
23					0	0	576	0	0	1,200	0	
24					0	0	294	0	0	1,010	0	
25					0	0	283	0	0	964	0	
26					1	0	300	0	0	1,010	0	
27					1	0	277	8	0	938	0	
28					0	0	277	48	0	875	0	
29					0	0	144	24	0	964	0	
30					-	0	81	7	0	1,010	0	
31					-	0	-	2	-	978	0	

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947 .....	28,029	1,180	0	76.8	55,600
January.....	0	0	0	0	0
February.....	258	67	0	8.9	512
March.....	6	1	0	.2	12
April.....	17,051	1,090	0	568	33,820
May.....	215	48	0	6.9	425
June.....	1,966	612	0	65.5	3,900
July.....	9,867	1,200	0	318	19,570
August.....	8,194	1,540	0	264	16,250
September.....	0	0	0	0	0
Water year 1947-48 .....	37,557	1,540	0	103	74,492

Peak discharge (base, 1,400 sec.-ft.)- June 1 (9 a.m.) 1,480 sec.-ft.; July 23 (12:30 p.m.) 1,610 sec.-ft.; Aug. 2 (5 p.m.) 2,140 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available trace, weather records, and records for station below Alamogordo Dam.

b Stage-discharge relation affected by ice.

## Pecos River near Lake Arthur, N. Mex.

Location.- Water-stage recorder, lat. 32°59'25", long. 104°19'10", on line between secs. 26 and 27, T. 15 S., R. 26 E., 1,100 feet upstream from highway bridge, 3 miles east of Lake Arthur, 10 miles upstream from Cottonwood Creek, and 11 miles northeast of Artesia.

Drainage area.- 14,760 square miles (contributing area).

Records available.- August 1938 to September 1948.

Average discharge.- 10 years (1938-48), 400 second-feet.

Extremes.- Maximum discharge during year, 8,120 second-feet June 3 (gage height, 10.2 feet, from floodmarks); minimum daily, 4 second-feet Apr. 7, 8.

1938-48: Maximum discharge, 49,600 second-feet Sept. 24, 1941 (gage height, 21.90 feet), from rating curve extended above 16,100 second-feet on basis of slope-area determinations at gage height 21.77 feet and logarithmic plotting; no flow Aug. 21, 22, 1947.

Flood of May 30, 1937, reached a stage of 21.77 feet (discharge, 51,500 second-feet, by slope-area method), but may have been exceeded by floods of 1904 and 1919.

Remarks.- Records good except those for periods of ice effect or no gage-height record, which are fair. Diversions above station for irrigation. Flow partly regulated by Alamogordo Reservoir, 150 miles above station (see p. 241).

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	20	43	100	80	87	*70	35	149	163	21	806	11
2	18	48	104	80	85	69	23	117	2,180	17	1,080	a10
3	17	47	111	78	83	68	a12	92	a5,000	19	1,420	a8
4	19	44	124	80	87	70	a6	69	a2,000	35	854	5.0
5	21	42	122	76	111	b72	23	64	973	34	1,340	15
6	28	46	115	75	*124	b78	a8	56	a500	143	1,010	27
7	31	46	109	75	134	76	a4	49	a300	104	756	16
8	32	46	102	75	117	72	a4	43	a200	66	391	18
9	31	48	102	76	102	70	720	54	149	50	202	39
10	33	50	102	74	a125	74	990	47	139	58	139	39
11	35	49	100	74	a100	75	1,030	36	136	87	104	33
12	35	50	100	72	a90	*76	998	42	127	60	63	35
13	46	50	100	70	*a95	62	998	44	119	36	38	34
14	48	59	100	*70	a90	59	1,030	37	113	24	25	28
15	48	74	102	70	a85	63	1,060	43	91	19	33	34
16	44	87	102	72	a80	54	974	46	78	16	97	36
17	41	96	100	70	80	48	958	44	74	13	278	35
18	41	106	98	70	80	46	926	38	69	13	159	34
19	42	104	94	70	82	49	910	28	63	16	104	35
20	40	100	96	75	75	41	894	26	70	10	64	36
21	42	100	96	69	82	40	838	23	64	7.8	44	31
22	42	96	91	69	83	38	838	24	56	12	39	28
23	41	98	72	74	75	35	806	32	46	451	41	29
24	42	98	69	76	74	30	a500	32	37	982	25	24
25	43	100	69	78	74	30	a320	29	40	870	16	21
26	44	98	69	76	80	23	a300	34	37	854	15	19
27	46	98	69	78	83	20	a290	28	35	950	12	27
28	47	100	70	b65	82	23	305	25	32	902	8.7	28
29	44	100	72	*b59	76	31	301	28	24	838	11	30
30	41	98	75	b68	-	22	238	46	26	886	34	37
31	40	-	78	b80	-	19	-	76	-	894	21	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,142	48	17	36.8	2,270
November.....	2,221	106	42	74.0	4,410
December.....	2,913	124	69	94.0	5,780
Calendar year 1947.....	45,127.3	1,130	0	124	89,520
January.....	2,274	80	59	73.4	4,510
February.....	2,621	134	74	90.4	5,200
March.....	1,601	76	19	51.6	3,180
April.....	16,339	1,060	4	545	32,410
May.....	1,501	149	23	48.4	2,980
June.....	12,941	5,000	24	431	25,670
July.....	8,487.8	982	7.6	274	16,840
August.....	9,231.7	1,420	8.7	298	18,310
September.....	802	39	5.0	26.7	1,590
Water year 1947-48.....	62,074.5	5,000	4	170	123,200

Peak discharge (base, 1,500 sec.-ft.)- June 3 (time unknown) 8,120 sec.-ft.; Aug. 2 (9 p.m.) 2,280 sec.-ft.; Aug. 5 (1 p.m.) 1,800 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, recorded range in stage, discharge measurements made on Apr. 27, June 4, weather records, and records for station near Artesia.

b Stage-discharge relation affected by ice.

## Pecos River near Artesia, N. Mex.

Location.- Water-stage recorder, lat. 32°50'05", long. 104°19'25", in W<sup>1</sup>NW<sup>1</sup> sec. 18, T. 17 S., R. 27 E., at bridge on Artesia-Lovington highway, 4.3 miles east of Artesia, 7.0 miles north of mouth of Rio Pecos, and 17 miles north of McMillan Dam.

Drainage area.- 15,300 square miles (contributing area).

Records available.- March 1905 to September 1925, October 1931 to February 1936 (published as Pecos River near Dayton), and February 1936 to September 1948 in reports of Geological Survey. March 1905 to December 1931 in reports of State engineer.

Average discharge.- 12 years (1936-48), 442 second-feet.

Extremes.- Maximum discharge during year, 4,210 second-feet June 3 (gage height, 11.80 feet); minimum daily, 4.0 second-feet Sept. 4.

1905-48: Maximum gage height, 15.9 feet Sept. 18, 1919, site and datum then in use (discharge not determined). Flood of May 30, 1937, reached a gage height of 14.7 feet (discharge, 51,500 second-feet, by slope-area method); no flow Aug. 17-24, 1934, Aug. 14-25, 1946, Aug. 1-22, 1947.

Remarks.- Records good except those above 500 second-feet, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Diversions above station for irrigation. Flow partly regulated by Alamogordo Reservoir (see p. 241). Discharge represents inflow to Lake McMillan, which stores water for irrigation of about 25,000 acres of Carlsbad project. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	39	100	82	b98	73	26	185	364	31	840	12
2	14	41	102	83	97	71	28	140	2,910	26	810	7.5
3	14	46	108	82	97	71	15	118	3,230	25	1,540	5.7
4	12	47	116	81	95	72	9.6	88	5,070	27	1,040	4.0
5	14	44	132	81	118	76	7.0	75	1,460	41	1,180	4.5
6	19	41	129	80	*121	88	11	67	605	74	1,140	8.9
7	20	45	120	80	141	88	4.1	55	368	99	742	13
8	22	47	113	80	131	78	4.1	45	273	80	480	7.8
9	25	47	108	80	125	74	251	48	206	55	228	8.9
10	27	50	108	80	*136	78	800	55	183	47	158	22
11	29	51	108	80	124	80	940	44	170	71	113	24
12	32	51	106	80	95	82	960	39	165	71	76	21
13	37	52	108	79	*b85	80	960	44	155	55	47	27
14	46	57	111	78	b100	70	1,180	40	144	29	29	24
15	47	86	111	79	100	65	1,040	37	156	16	24	21
16	44	76	111	81	94	64	980	41	109	13	34	27
17	40	92	108	81	*94	57	940	49	99	7.0	170	30
18	58	106	105	81	89	54	920	42	94	4.3	218	30
19	37	106	99	81	92	49	900	35	91	4.7	121	27
20	58	105	92	*83	89	49	880	28	88	4.7	74	29
21	37	96	94	83	85	44	880	26	88	4.5	45	29
22	38	100	92	81	84	44	880	19	78	4.5	31	24
23	37	100	83	81	86	39	880	22	70	103	24	20
24	37	104	74	85	81	36	613	32	59	893	21	18
25	40	104	75	86	78	35	342	27	50	960	17	13
26	43	102	75	a85	79	33	330	27	54	900	12	13
27	44	99	75	a78	85	25	293	31	51	920	6.7	15
28	44	102	76	a70	82	21	308	28	46	920	6.2	19
29	45	100	76	*b61	78	25	295	22	34	840	11	22
30	42	100	76	b80	-	24	286	28	29	840	9.2	28
31	40	-	79	b100	-	21	-	733	-	880	18	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,013	47	11	32.7	2,010
November.....	2,216	106	39	73.9	4,400
December.....	3,068	132	74	99.0	6,090
Calendar year 1947 .....	45,898.6	1,120	0	125	90,640
January.....	2,502	100	61	80.7	4,960
February.....	2,863	141	78	98.7	5,680
March.....	1,766	88	21	57.0	3,500
April.....	15,962.8	1,180	4.1	532	31,660
May.....	2,258	733	19	73.2	4,500
June.....	14,477	3,230	29	483	28,710
July.....	8,045.7	960	4.3	260	15,960
August.....	9,245.1	1,540	6.2	298	18,340
September.....	554.3	30	4.0	18.5	1,100
Water year 1947-48 .....	65,980.9	3,230	4.0	175	126,900

Peak discharge (base, 1,200 sec.-ft.)- June 3 (11:30 p.m.), 4,210 sec.-ft.; Aug. 3 (2:30 a.m.)

1,870 sec.-ft.; Aug. 5 (7:30 p.m.) 1,480 sec.-ft.

\* No gage-height record; discharge computed on basis of available recorder trace, weather records, and records for main stem stations above.

b Stage-discharge relation affected by ice.

## RIO GRANDE BASIN

Pecos River below McMillan Dam, N. Mex.

Location.- Water-stage recorder, lat. 32°35'30", long. 104°21'00", in NE $\frac{1}{4}$  sec. 11, T. 20 S., R. 26 E., 700 feet downstream from gages in McMillan Dam and 3 miles south-east from Lakewood.

Drainage area.- 16,900 square miles (contributing area).

Records available.- August 1939 to December 1940, December 1946 to September 1948.

Extremes.- Maximum discharge during year, 720 second-feet Apr. 20 (gage height, 3.75 feet); no flow at times.

1939-40, 1946-48: Maximum discharge, that of Apr. 20, 1948; no flow during many periods.

Remarks.- Records excellent. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p. 241). Many diversions above station for irrigation. Discharge represents water released from Lake McMillan for irrigation on Carlsbad project.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.36	0	0.7	4.8	1.2	41	2.4	250
.4	.2	.8	8.7	1.4	65	2.8	373
.5	.9	.9	14	1.7	110	3.3	545
.6	2.4	1.0	22	2.0	161	3.7	700

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							0	99	0.2	0	100	0
2							0	99	.2	0	102	0
3							0	99	0	0	104	277
4							0	117	0	0	104	379
5							0	171	0	0	104	370
6							0	169	0	0	105	314
7							0	120	0	0	107	153
8							0	92	0	0	107	0
9							0	92	0	55	107	0
10							0	91	0	228	108	.8
11							256	91	0	225	107	0
12							522	91	0	202	107	.1
13							580	91	0	145	107	0
14							640	91	0	140	107	0
15							680	91	0	138	107	.9
16							680	90	0	138	156	0
17							700	90	0	136	163	0
18							700	124	0	131	163	0
19							700	223	0	99	169	0
20							550	218	0	99	147	0
21							171	37	0	99	147	1.4
22							0	9.4	0	97	145	1.1
23							0	6.0	0	97	145	.2
24							269	5.6	0	96	143	0
25							405	5.2	0	96	115	.1
26							368	3.3	0	96	100	0
27							256	0	0	96	72	2.1
28							253	0	0	97	56	1.3
29							229	0	0	97	19	0
30							155	0	0	99	0	0
31							-	.2	-	99	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947 .....	12,423.6	550	0	34.0	24,640
January.....	0	0	0	0	0
February.....	0	0	0	0	0
March.....	0	0	0	0	0
April.....	8,114	700	0	270	16,090
May.....	2,415.7	223	0	77.9	4,790
June.....	.4	.2	0	.01	.8
July.....	2,805	228	0	30.5	5,560
August.....	3,363	183	0	108	6,670
September.....	1,501	379	0	50.0	2,980
Water year 1947-48 .....	18,199.1	700	0	49.7	36,090

Pecos River below Major Johnson Springs, near Carlsbad, N. Mex.

Location.- Water-stage recorder, lat. 32°33'15", long. 104°23'05", in SE $\frac{1}{4}$  sec. 21, T. 20 S., R. 26 E., about 1 $\frac{1}{2}$  miles downstream from upper end of Major Johnson Springs, 1 $\frac{1}{2}$  miles downstream from mouth of Seven Rivers and 15 miles northwest of Carlsbad.

Records available.- January 1947 to September 1948.

Extremes.- Maximum discharge during year, 3,500 second-feet June 1 (gage height, 4.79 feet), from rating curve extended above 630 second-feet on basis of logarithmic plotting; minimum daily, 11 second-feet Oct. 2, 3.

1947-48: Maximum discharge, that of June 1, 1948; minimum daily, that of Oct. 2, 3, 1947.

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. 241). Many diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	a12	15	18	46	60	78	68	161	733	185	226	156
2	11	15	18	46	60	78	60	166	383	185	231	156
3	a11	15	19	48	60	78	57	170	60	185	236	417
4	a12	14	19	48	60	75	54	180	46	185	236	489
5	a13	14	19	48	63	72	54	236	60	185	231	475
6	a13	15	19	51	63	72	51	242	72	296	236	437
7	a13	15	20	51	63	72	48	210	84	195	242	224
8	a12	15	22	51	63	75	46	180	97	200	242	122
9	a12	15	23	51	63	78	44	180	111	206	248	114
10	13	15	24	54	63	81	40	180	122	391	253	108
11	13	15	24	57	63	78	163	180	130	391	253	100
12	14	15	26	57	63	78	454	185	138	377	258	94
13	14	14	27	57	60	78	524	190	148	299	258	84
14	14	14	28	57	60	78	620	190	148	299	258	81
15	13	15	30	60	63	78	652	190	152	293	258	75
16	13	15	30	60	63	75	676	195	161	287	293	72
17	13	15	30	60	66	75	700	195	166	287	329	69
18	14	15	32	60	69	75	708	205	170	287	329	63
19	14	15	34	60	72	75	724	349	175	242	323	63
20	14	15	34	60	72	75	606	323	175	242	293	60
21	14	15	36	60	72	75	252	163	175	236	287	60
22	14	15	38	60	75	72	84	180	180	231	287	57
23	14	15	40	60	78	72	78	180	180	236	287	51
24	14	16	40	60	81	66	236	75	180	220	281	48
25	14	16	42	60	84	66	405	69	190	220	258	46
26	14	16	42	60	84	69	391	66	190	220	248	42
27	14	17	44	60	84	69	287	57	190	220	226	42
28	15	17	44	60	81	69	293	48	190	220	210	40
29	15	18	46	60	81	69	287	44	185	226	185	40
30	15	18	46	60	-	66	220	42	185	226	161	38
31	15	-	46	60	-	66	-	85	-	226	161	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	416	15	11	13.4	825
November.....	459	18	14	15.3	910
December.....	960	46	18	31.0	1,900
Calendar year 1947 .....	41,331	522	11	113	81,970
January.....	1,742	60	46	56.2	3,460
February.....	1,989	84	60	58.6	3,950
March.....	2,283	81	56	73.6	4,530
April.....	8,880	724	40	296	17,610
May.....	4,928	349	42	159	9,770
June.....	5,176	733	46	173	10,270
July.....	7,698	391	185	248	15,270
August.....	7,824	329	161	252	15,520
September.....	3,923	489	58	131	7,780
Water year 1947-48 .....	46,278	733	11	126	91,800

a No gage-height record; discharge computed on basis of discharge measurement made on Oct. 2, weather records, and records for station at dam site 3.



Pecos River at dam site 3, near Carlsbad, N. Mex.

Location.- Water-stage recorder, lat. 32°30'45", long. 104°19'50" in lot 14, sec. 6, T. 21 S., R. 26 E., at dam site 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. Datum of gage is 3,172.31 feet above mean sea level (Bureau of Reclamation datum).

Drainage area.- 17,620 square miles (contributing area).

Records available.- August 1939 to December 1940, August 1944 to September 1948.

Extremes.- Maximum discharge during year, 18,200 second-feet May 31 (gage height, 12.3 feet), from rating curve extended above 2,200 second-feet on basis of logarithmic plotting; minimum daily, 16 second-feet Oct. 11.

1939-40, 1944-48: Maximum discharge, that of May 31, 1948; minimum daily, 16 second-feet; June 18-21, 1946, Oct. 11, 1947.

Remarks.- Records good except those above 400 second-feet, which are fair, and those for periods of ice effect or no gage-height record, which are poor. Flow regulated by Alamogordo Reservoir and Lake McMillan (see p.241). Many diversions above station for irrigation. Discharge represents inflow to Lake Avalon.

Rating table, water year 1947-48, except period of ice effect  
(gage height, in feet, and discharge in second-feet)  
(Shifting-control method used Apr. 11 to May 20, May 31 to July 10,  
Sept. 5-7, 28-30)

0.0	12	0.4	51	1.2	236	2.5	915
.1	18	.6	83	1.4	315	3.0	1,280
.2	27	.8	123	1.7	455	3.5	1,710
.3	38	1.0	172	2.0	605	4.1	2,340

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	17	20	24	52	64	85	68	202	2,320	190	251	175
2	17	20	24	52	66	89	66	196	1,650	193	251	169
3	17	19	26	54	66	87	62	199	1,400	193	255	294
4	17	20	24	54	69	89	57	199	1,455	193	255	465
5	17	20	24	52	69	87	56	274	63	199	259	465
6	18	19	25	56	68	83	52	278	78	429	259	450
7	18	20	25	56	69	85	50	247	94	209	263	433
8	17	21	26	56	69	85	48	193	108	205	266	154
9	17	21	27	57	71	83	46	190	121	205	274	137
10	17	21	29	57	71	83	41	190	134	405	274	130
11	16	21	30	58	73	81	118	187	144	415	274	119
12	17	22	32	58	73	81	136	187	154	415	278	108
13	17	22	34	60	73	81	560	190	182	338	282	100
14	18	21	35	60	73	80	644	193	169	338	282	92
15	17	21	36	62	74	80	678	193	175	338	282	85
16	17	22	38	62	74	81	702	196	181	333	315	81
17	17	23	38	62	74	81	720	202	184	328	374	76
18	17	23	39	62	76	80	732	202	190	328	374	73
19	18	22	41	62	76	78	744	351	190	290	374	68
20	18	22	42	62	80	78	686	346	190	278	338	64
21	18	22	43	62	81	76	303	226	190	274	338	62
22	17	22	44	62	83	76	113	128	193	270	333	58
23	17	22	46	62	85	78	85	110	193	278	333	56
24	18	22	47	62	87	76	198	98	193	266	328	52
25	18	23	48	62	87	74	450	92	196	255	311	51
26	19	22	48	62	87	74	460	1,530	193	255	282	47
27	20	23	50	62	85	74	346	129	193	251	266	47
28	20	23	48	62	87	73	346	62	193	251	236	44
29	20	24	50	63	87	71	346	142	193	251	222	44
30	20	23	51	63	-	66	274	54	190	251	191	43
31	20	-	52	64	-	68	-	1,840	-	261	175	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	551	20	16	17.8	1,090
November.....	647	24	19	21.6	1,280
December.....	1,146	52	24	37.0	2,270
Calendar year 1947.....	42,925	525	16	118	85,140
January.....	1,840	64	52	59.4	3,650
February.....	2,199	87	64	75.8	4,360
March.....	2,463	89	66	79.5	4,890
April.....	9,487	744	41	516	18,820
May.....	8,826	1,840	54	285	17,510
June.....	8,429	2,320	55	281	16,720
July.....	8,675	429	190	280	17,210
August.....	8,785	374	175	283	17,420
September.....	4,242	465	43	141	8,410
Water year 1947-48.....	57,290	2,320	16	157	113,600

Peak discharge (base, 1,700 sec.-ft.)- May 26 (4:15 a.m.) 7,560 sec.-ft.; May 31 (10:30 p.m.)

18,200 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for station below Major Johnson Springs.

b Stage-discharge relation affected by ice.

## Pecos River at Carlsbad, N. Mex.

Location.- Water-stage recorder, lat. 32°24'50", long. 104°13'20", in NW¼SE¼ sec. 6, T. 22 S., R 27 E., at Green Street Bridge in Carlsbad and half a mile upstream from Dark Canyon. Datum of gage is 3,080.38 feet above mean sea level, datum of 1929.

Drainage area.- 18,100 square miles (contributing area).

Records available.- May 1903 to March 1908, May 1914 to September 1925, October 1928 to September 1930, and October 1931 to September 1948 in reports of Geological Survey. June 1903 to December 1906, May 1914 to December 1928, and January 1930 to December 1931 in reports of State engineer.

Average discharge.- 23 years (1914-37), 304 second-feet (prior to completion of Alamogordo Dam); 11 years (1937-48) 302 second-feet.

Extremes.- Maximum discharge during year, 17,800 second-feet June 2 (gage height, 11.28 feet); minimum daily, 31 second-feet Feb. 14.  
11903-8, 1914-48: Maximum discharge, 85,700 second-feet Aug. 7, 1916 (gage height, about 21.0 feet), from rating curve extended above 34,000 second-feet by logarithmic plotting; no flow May 9, 1904.

Remarks.- Records good. Flow regulated by Alamogordo Reservoir, Lake McMillan, Lake Avation, and at low stages by power plant above station. Many diversions above station for irrigation.

## Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	54	46	37	46	48	50	53	5,490	64	64	59
2	51	54	46	44	44	48	48	48	5,530	67	67	56
3	51	56	48	42	44	48	48	56	86	62	64	59
4	46	54	46	46	46	48	48	50	70	59	64	56
5	45	52	45	44	48	46	59	56	67	67	62	44
6	49	56	45	44	44	46	56	56	67	64	62	62
7	49	54	45	42	48	46	53	56	64	64	62	53
8	49	54	45	44	42	46	56	56	64	64	62	53
9	51	56	45	46	46	48	59	50	67	62	59	50
10	48	57	45	42	44	59	59	59	67	64	59	50
11	46	54	45	46	48	42	53	53	233	62	56	48
12	46	54	49	50	50	44	59	53	178	62	56	50
13	46	59	48	46	44	46	56	56	168	62	59	50
14	52	59	42	44	31	46	56	56	163	59	59	50
15	49	51	44	44	35	46	59	59	163	62	56	48
16	48	51	45	44	42	48	56	59	158	59	64	50
17	51	57	44	42	42	48	56	64	169	62	59	56
18	49	57	44	42	44	53	53	62	178	59	59	50
19	46	52	44	44	44	46	56	59	199	64	59	44
20	56	45	42	44	44	48	56	59	258	62	56	53
21	52	51	42	44	46	50	56	62	183	62	59	53
22	52	51	46	46	46	50	59	64	62	62	50	48
23	52	49	45	44	46	48	56	62	56	62	62	50
24	52	52	44	48	50	48	59	67	59	62	59	50
25	54	54	42	42	50	48	56	64	62	59	59	46
26	52	56	44	46	48	53	59	64	62	67	59	53
27	54	48	44	46	48	44	56	64	59	64	59	53
28	54	46	44	48	48	48	53	62	62	64	59	53
29	54	42	44	42	42	50	56	64	67	62	53	53
30	54	44	42	40	-	56	53	59	64	123	62	50
31	54	-	45	44	-	59	-	720	-	79	56	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,563	56	45	50.4	3,100
November.....	1,579	59	42	52.6	3,130
December.....	1,385	49	42	44.7	2,750
Calendar year 1947 .....	27,502	247	42	75.3	54,560
January.....	1,367	50	37	44.1	2,710
February.....	1,300	50	31	44.8	2,580
March.....	1,508	59	42	48.6	2,990
April.....	1,659	59	48	55.3	3,290
May.....	2,472	720	48	79.7	4,900
June.....	14,174	5,530	56	472	28,110
July.....	2,016	123	59	65.0	3,000
August.....	1,845	67	50	59.5	3,650
September.....	1,550	62	44	51.7	3,070
Water year 1947-48 .....	32,418	5,530	31	88.6	64,290

## Pecos River near Malaga, N. Mex.

Location.- Water-stage recorder, lat. 32°12'30", long. 104°01'30", in NW¼ sec. 19, T. 24 S., R. 29 E., 3 miles southeast of Malaga and 3 miles downstream from Black River. Datum of gage is 2,898.68 feet above mean sea level, datum of 1929.

Drainage area.- 19,190 square miles (contributing area).

Records available.- May 1920 to September 1925 and October 1931 to September 1948 in reports of Geological Survey. January 1921 to December 1931 in reports of State engineer.

Average discharge.- 17 years (1920-37), 299 (revised) second-feet (prior to completion of Alamogordo Reservoir). 11 years (1937-48), 378 second-feet.

Extremes.- Maximum discharge during year, 18,900 second-feet June 2 (gage height, 16.10 feet); minimum daily, 15 second-feet Apr. 10-12.

1920-48: Maximum discharge, 63,700 second-feet Sept. 21, 1941, from rating curve extended above 22,500 second-feet by logarithmic plotting; maximum gage height, 32.1 feet from May 22, 1941, floodmark; no flow Aug. 20-22, 1934.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Flow regulated by Alamogordo Reservoir, Lake McMillan, Lake Avalon, and by several small diversion dams that divert for power and irrigation. Many diversions above station for irrigation. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Cooperation.- Gage-height record collected in cooperation with Bureau of Reclamation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	60	75	84	78	68	22	56	7,280	a90	102	46
2	39	55	64	86	78	78	20	55	8,950	a90	75	41
3	40	53	64	80	78	76	17	56	817	a90	62	42
4	40	56	69	78	80	76	17	55	a240	a85	57	40
5	38	61	86	78	84	78	20	80	165	a85	a50	41
6	38	60	82	78	87	78	20	100	152	88	a45	41
7	33	68	80	80	82	78	20	88	144	88	a40	36
8	28	69	80	78	90	81	17	78	131	a80	a40	47
9	27	68	80	80	93	78	16	78	121	52	a35	45
10	26	67	81	78	87	82	15	71	116	61	a35	48
11	25	69	81	80	93	84	15	64	123	60	a35	47
12	25	74	82	78	90	88	15	76	227	59	a35	47
13	25	80	81	76	92	80	16	80	192	51	a35	42
14	31	86	82	78	95	74	16	86	178	51	a35	39
15	25	92	81	76	92	75	16	84	174	55	a35	37
16	25	81	80	80	88	75	16	84	163	55	a35	38
17	30	78	76	78	88	74	16	81	161	48	a40	39
18	31	81	75	76	92	68	17	78	167	a46	a35	37
19	32	86	75	78	90	68	16	75	174	a44	a35	39
20	34	86	75	78	88	46	17	76	196	a46	34	40
21	35	80	75	87	88	39	24	75	222	a45	37	69
22	37	74	78	92	88	37	26	45	174	a44	71	54
23	49	75	78	93	90	33	20	38	105	54	72	49
24	49	75	80	95	88	32	25	41	107	60	80	44
25	48	78	80	93	88	25	44	183	112	60	78	42
26	48	81	81	95	84	23	32	821	114	87	75	41
27	48	86	80	95	78	23	26	114	92	78	80	40
28	49	82	78	93	87	22	38	71	a90	55	81	49
29	54	80	78	93	82	22	57	60	a90	51	87	54
30	54	76	80	90	-	22	57	60	a90	60	84	54
31	54	-	82	82	-	22	-	564	-	114	75	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,156	54	25	37.3	2,290
November.....	2,221	92	53	74.0	4,410
December.....	2,415	86	64	77.9	4,790
Calendar year 1947.....	34,055	294	21	93.3	67,550
January.....	2,586	95	76	83.4	5,130
February.....	2,518	95	78	86.8	4,990
March.....	1,807	88	22	58.3	3,580
April.....	693	57	15	23.1	1,370
May.....	3,570	821	38	115	7,080
June.....	21,087	8,950	90	702	41,790
July.....	2,032	114	44	65.5	4,030
August.....	1,716	102	34	55.4	3,400
September.....	1,328	69	36	44.3	2,630
Water year 1947-48.....	43,109	8,950	15	118	85,490

Peak discharge (base, 1,000 sec.-ft.)- May 26 (12:15 a.m.) 2,780 sec.-ft.; June 2 (12 m.) 18,900 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and records for station at Carlsbad.

## Pecos River at Red Bluff, N. Mex.

Location.- Water-stage recorder, lat. 32°04'40", long. 104°02'20", at Red Bluff, Eddy County, just downstream from Red Bluff Creek and 5 1/2 miles upstream from Delaware River. Datum of gage is 2,850.0 feet above mean sea level, datum of 1929.

Drainage area.- 19,540 square miles (contributing area).

Records available.- October 1937 to September 1948. May 1914 to September 1937 at site 6 miles downstream near Angeles, Tex.; records comparable to combined flow of Pecos River at Red Bluff and Delaware River near Red Bluff.

Average discharge.- 11 years, 384 second-feet.

Extremes.- Maximum discharge during year, 13,100 second-feet June 2 (gage height, 14.31 feet); minimum, 21 second-feet Apr. 11-13 (gage height, 2.75 feet).

1937-48: Maximum discharge, 52,600 second-feet May 24, 1941 (gage height, 28.3 feet), by slope-area method; minimum, 14 second-feet Aug. 19, 1946.

Maximum stage known prior to 1941, 28.0 feet in October 1904, from information by Panhandle & Santa Fe Railway.

Remarks.- Records excellent. Flow regulated to large extent by reservoirs above Carlsbad. Many diversions above station for irrigation. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	53	86	86	89	79	27	55	6,800	82	135	84
2	50	59	82	87	86	77	36	55	7,110	72	96	80
3	51	56	82	87	86	82	35	58	4,470	83	76	50
4	52	53	82	82	87	80	33	56	422	83	82	50
5	53	56	86	80	96	77	31	55	247	76	55	46
6	55	58	89	76	93	80	36	69	193	82	47	45
7	53	58	87	82	95	77	33	86	174	104	44	45
8	46	60	86	82	89	79	36	76	161	100	50	38
9	42	62	86	82	95	80	29	74	142	91	44	50
10	44	62	86	82	98	74	25	77	133	74	46	51
11	46	62	86	82	96	79	24	65	131	74	41	52
12	45	63	86	82	96	80	23	58	182	72	44	53
13	45	68	86	80	95	82	24	68	230	74	59	53
14	45	80	87	82	96	69	25	72	211	65	45	48
15	52	86	87	84	100	69	25	84	196	63	48	45
16	41	86	84	82	98	68	24	82	188	65	82	44
17	36	79	84	82	95	65	25	82	177	74	56	42
18	46	84	82	84	93	63	28	80	174	62	47	45
19	52	82	82	82	93	63	30	79	193	51	48	44
20	53	84	82	82	89	62	27	79	196	47	42	47
21	53	80	80	84	89	58	25	80	243	48	40	51
22	53	76	80	93	91	48	26	80	240	52	44	71
23	52	77	82	96	91	47	34	65	161	52	79	52
24	58	79	82	98	93	39	29	59	122	58	82	45
25	59	79	84	96	91	36	29	77	127	63	89	44
26	50	80	82	98	89	35	45	768	142	68	87	52
27	53	86	84	96	86	29	42	305	129	95	84	52
28	53	87	82	95	84	28	33	124	118	86	86	44
29	56	87	82	98	89	34	31	96	96	62	103	50
30	65	86	79	100	-	31	46	82	82	55	96	62
31	63	-	80	93	-	27	-	332	-	53	91	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,573	65	36	50.7	3,120
November.....	2,168	67	53	72.3	4,300
December.....	2,595	89	79	83.7	5,150
Calendar year 1947.....	35,787	310	17	98.0	70,990
January.....	2,695	100	76	86.9	5,350
February.....	2,668	100	84	92.0	5,290
March.....	1,868	82	27	61.2	3,760
April.....	2,318	48	20	50.6	1,820
May.....	3,478	768	55	112	6,900
June.....	23,190	7,110	82	773	46,000
July.....	2,146	104	47	69.2	4,260
August.....	2,026	135	40	65.4	4,020
September.....	1,515	84	38	50.5	3,000
Water year 1947-48.....	46,870	7,110	23	128	92,970

## Pecos River near Orla, Tex.

Location.- Water-stage recorder, lat. 31°49', long. 103°48', 600 feet upstream from Paso-tex pipe-line crossing, 6 miles southeast of Orla, Reeves County, 11 miles downstream from Salt (Screwbean) Draw, and 14 miles downstream from Red Bluff Dam. Datum of gage is 2,718.0 feet above mean sea level, datum of 1929.

Drainage area.- 21,300 square miles (contributing area).

Records available.- May 1937 to September 1948.

Average discharge.- 11 years, 395 second-feet.

Extremes.- Maximum discharge during year, 1,320 second-feet June 1 (gage height, 3.69 feet); minimum, 0.4 second-foot Oct. 24-26.

1937-48: Maximum discharge, 23,700 second-feet Sept. 29, 1941 (gage height, 20.74 feet); no flow Sept. 9-14, Nov. 4, 1946.

Remarks.- Records excellent. Flow regulated by Red Bluff Reservoir (see p. 241). Occasional runoff from draws between dam and station. Many diversions above station for irrigation. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Revision (water year).- W 928: 1937.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	24	0.6	2.9	6.7	4.0	7.4	5.9	186	336	296	62	54
2	4.9	.6	2.9	8.3	4.0	6.9	6.4	155	38	307	44	6.9
3	2.9	15	3.2	7.8	3.2	6.9	6.4	317	25	356	41	4.4
4	2.4	61	3.6	7.3	3.2	7.4	6.9	347	36	356	54	3.6
5	1.8	63	3.2	6.9	4.0	7.4	6.4	336	347	356	140	2.9
6	1.4	46	2.9	6.9	4.0	7.4	6.4	188	351	360	316	2.9
7	1.2	5.4	3.2	6.4	3.6	7.4	8.0	96	466	351	269	2.6
8	1.1	2.2	2.9	3.6	3.6	7.4	8.0	110	531	347	215	7.1
9	1.0	1.8	2.9	3.6	3.2	7.4	58	110	546	356	164	136
10	.9	1.6	2.9	3.2	3.2	7.4	266	110	610	399	162	59
11	.9	1.6	2.9	3.6	3.2	6.9	364	110	610	254	206	13
12	.8	1.5	3.2	6.9	2.9	6.9	411	110	686	421	441	8.7
13	.7	1.5	3.2	6.9	3.2	6.4	441	108	802	421	491	6.4
14	.6	2.0	3.6	6.9	3.6	6.4	456	54	648	416	374	5.9
15	.6	2.2	4.0	6.9	3.2	6.4	506	53	638	411	346	4.9
16	.6	2.0	4.4	6.9	2.9	5.4	557	51	626	401	220	3.6
17	.6	2.4	4.4	6.9	2.9	5.9	610	51	626	228	196	3.2
18	.5	3.6	4.4	7.4	2.9	5.9	604	32	707	143	193	2.9
19	.5	5.4	4.4	7.4	2.9	6.4	599	25	798	132	170	2.9
20	.6	5.4	4.9	7.4	2.6	5.9	594	26	512	109	122	2.6
21	.6	5.4	12	7.4	2.6	6.4	562	26	599	155	128	2.9
22	.6	5.4	8.0	7.4	2.6	5.9	541	28	666	150	128	2.9
23	.6	5.4	8.0	7.4	2.9	5.9	511	62	616	159	110	6.9
24	.5	5.4	8.0	8.0	2.9	6.4	521	33	610	96	69	4.0
25	.4	4.9	8.0	7.4	2.9	6.9	531	59	594	51	58	2.9
26	.4	4.0	8.0	8.0	3.2	6.4	526	111	633	35	58	2.6
27	.6	3.2	8.0	6.9	4.0	6.4	452	35	501	45	45	2.9
28	.8	2.9	7.4	4.0	5.4	6.4	329	33	496	40	112	3.2
29	.9	2.9	7.4	3.2	6.9	6.9	36	33	371	46	57	3.2
30	1.0	2.9	7.4	4.0	-	6.9	57	35	296	81	40	2.2
31	.8	-	8.7	4.0	-	6.4	-	43	-	63	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	55.2	24	0.4	1.78	109
November.....	267.2	63	.6	8.91	530
December.....	160.9	12	2.9	5.19	319
Calendar year 1947.....	44,977.7	557	.4	123	89,200
January.....	197.6	6.7	3.2	6.37	392
February.....	99.7	6.9	2.6	3.44	198
March.....	206.4	7.4	5.4	6.66	409
April.....	9,886.4	610	5.9	320	19,010
May.....	3,088	347	25	99.0	6,090
June.....	15,321	802	25	511	30,390
July.....	7,337	421	35	237	14,550
August.....	5,047	491	16	163	10,010
September.....	395.3	136	2.2	13.1	780
Water year 1947-48.....	41,739.7	802	.4	114	82,790

a No gage-height record; discharge interpolated.

## Pecos River at Pecos, Tex.

Location.- Water-stage recorder, lat.  $31^{\circ}26'$ , long.  $103^{\circ}28'$ , at bridge on U. S. Highway 80, 195 feet downstream from Texas & Pacific Railway bridge, 1.7 miles east of Pecos, Reeves County, and 11 miles upstream from Toyah Creek. Datum of gage is 2,552.0 feet above mean sea level, datum of 1929.

Drainage area.- 22,100 square miles (contributing area).

Records available.- August 1939 to September 1948. January 1898 to June 1907 at flume of Barstow Irrigation Co. (old Margueretta Canal Co.), 6.4 miles upstream, published as Pecos River near Pecos. April 1914 to August 1915 at site 7 miles downstream, published as Pecos River near Barstow. March 1922 to July 1926 at site about 10 miles upstream, published as Pecos River above Barstow.

Extremes.- Maximum discharge during year, 560 second-feet Sept. 10 (gage height, 7.33 feet); minimum daily, 1.2 second-feet Feb. 29.

1898-1907, 1914-15, 1922-26, 1939-48: Maximum gage height, about 20 feet, present datum, at railroad bridge above gage, Oct. 5, 1904 (discharge not determined); flood of Sept. 30, 1941, reached a stage of 19.68 feet, present datum, at site then in use (discharge, 22,200 second-feet); minimum daily discharge 1939-48, that of Feb. 29, 1948.

Flood of August 1893 reached approximately the same stage as that of Oct. 5, 1904, from information by local residents.

Remarks.- Records good except those for period of no gage-height record, which are poor. Flow regulated to large extent by reservoirs above Orla. Several diversions between Orla and this station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	5.7	4.4	6.2	6.7	6.2	9.0	5.7	37	76	220	12	15
2	5.7	4.4	6.2	6.7	6.2	1.6	6.2	25	270	190	8.0	15
3	5.7	4.4	6.7	6.2	6.2	7.3	6.2	62	28	176	6.2	13
4	5.7	4.4	7.2	5.7	6.2	6.7	5.7	86	18	226	5.2	14
5	5.2	4.0	6.7	5.7	6.2	6.2	5.7	202	14	184	5.0	10
6	5.7	4.0	6.7	5.7	6.2	6.2	5.7	220	54	256	7.2	7.2
7	6.2	4.0	6.7	5.7	6.2	6.2	5.2	149	148	256	22	5.2
8	5.2	4.8	6.2	6.2	6.2	5.7	5.2	72	196	244	67	4.8
9	5.2	4.8	6.2	6.2	6.2	5.7	5.2	37	214	202	60	72
10	5.2	4.8	6.2	6.2	6.2	5.7	5.7	32	208	190	39	308
11	6.2	4.8	6.2	6.2	6.2	5.7	5.2	32	250	226	17	22
12	5.2	4.8	6.2	6.2	6.2	5.7	115	32	250	152	13	13
13	4.8	4.8	6.7	6.2	6.2	5.7	256	31	277	133	79	11
14	4.8	5.2	6.7	6.2	6.7	5.7	304	30	384	110	196	8.8
15	4.8	5.2	6.7	6.2	6.7	5.2	298	27	322	88	149	7.2
16	4.8	5.2	6.7	6.7	6.7	5.2	262	18	298	74	128	6.7
17	4.8	6.2	6.7	6.2	6.7	5.2	292	12	286	60	64	5.7
18	4.8	6.2	6.7	6.2	6.7	5.2	334	10	274	52	33	5.2
19	5.2	6.7	6.7	5.7	6.7	5.2	346	8.8	314	44	22	4.8
20	5.2	7.2	6.7	6.2	6.2	5.7	346	7.7	449	40	17	4.4
21	5.2	7.2	6.7	6.2	6.2	5.2	346	7.2	326	80	13	5.2
22	4.8	7.2	7.2	5.7	6.2	5.2	346	6.2	397	62	11	6.2
23	4.8	7.2	7.2	6.2	5.7	5.7	334	6.2	436	48	9.4	5.7
24	4.8	7.2	7.2	6.2	5.7	5.7	292	4.4	462	38	8.2	5.2
25	4.8	7.2	7.2	6.2	5.7	5.7	304	4.4	449	28	7.2	4.8
26	4.8	7.2	7.2	6.2	6.2	5.7	346	4.4	449	21	5.7	4.8
27	5.2	7.2	6.2	6.2	5.7	5.2	346	4.4	478	18	6.2	4.8
28	5.7	6.7	6.2	6.2	2.0	5.2	322	9.4	436	16	5.7	4.8
29	5.7	6.7	6.2	6.7	1.2	5.2	256	11	397	15	7.7	4.8
30	4.4	6.7	6.2	6.7	-	5.2	118	4.8	334	18	11	4.4
31	4.0	-	6.7	6.2	-	5.2	-	5.7	-	18	9.4	-
Month						Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet		
October.....						160.3	6.2	4.0	5.17	318		
November.....						172.8	8.2	4.0	5.76	343		
December.....						205.2	7.2	6.2	6.62	407		
Calendar year 1947.....						26,196.7	436	4.0	71.8	51,970		
January.....						191.7	6.7	5.7	6.18	380		
February.....						171.6	6.7	1.2	5.92	340		
March.....						174	9.0	1.6	5.61	345		
April.....						5,624.7	346	5.2	187	11,150		
May.....						1,198.6	220	4.4	38.7	2,380		
June.....						8,492	476	14	283	16,840		
July.....						3,487	256	15	112	6,920		
August.....						1,044.1	196	5.0	33.7	2,070		
September.....						603.7	308	4.4	20.1	1,200		
Water year 1947-48.....						21,525.7	476	1.2	58.8	42,700		

Note.- No gage-height record July 14 to Aug. 5; discharge computed on basis of records for station near Orla and diversions between the two stations.

## RIO GRANDE BASIN

Pecos River below Grandfalls, Tex.

Location.— Water-stage recorder, lat. 31°18', long. 102°46', at bridge on State Farm to Market Road 11 between Grandfalls and Imperial, 7.1 miles southeast of Grandfalls, Ward County, and 10 miles downstream from Chacatori Draw. Datum of gage is 2,373.0 feet above mean sea level, datum of 1929 (levels by Corps of Engineers).

Drainage area.— 27,820 square miles (contributing area).

Records available.— August 1939 to September 1948. December 1921 to July 1926 at site about 12 miles downstream, published as Pecos River near Buena Vista.

Extremes.— Maximum discharge during year, 50 second-feet Sept. 12 (gage height, 2.87 feet); minimum daily, 12 second-feet Nov. 8-30.

1921-26, 1939-48: Maximum discharge, 22,000 second-feet Oct. 2, 1941 (gage height, 20.98 feet); minimum daily, 8.0 second-feet July 27, 1925.

Remarks.— Records good. Flow regulated to large extent by reservoirs above Orla. Many diversions between Orla and this station for irrigation. Records of chemical analyses for the water year 1948 are given in Water-Supply Paper 1133.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	14	14	14	30	21	22	17	18	16	19	16	16
2	14	14	29	30	21	21	16	18	16	20	16	15
3	14	14	33	30	21	21	16	18	16	21	16	15
4	14	14	34	30	21	20	16	18	23	21	16	15
5	15	14	33	30	21	20	17	18	18	22	15	15
6	16	13	33	30	21	20	18	17	15	22	15	15
7	15	13	33	30	21	20	18	16	14	22	15	14
8	15	12	33	30	21	20	18	16	14	23	14	14
9	15	12	33	29	21	21	19	16	14	23	14	16
10	15	12	31	27	21	21	19	16	14	24	15	22
11	15	12	31	26	21	21	19	15	14	22	14	23
12	15	12	31	26	21	21	18	15	14	28	15	33
13	15	12	31	23	21	21	18	14	14	35	15	34
14	15	12	32	23	20	21	18	15	14	30	15	23
15	15	12	32	22	20	21	18	15	14	28	15	21
16	15	12	33	22	20	21	17	15	16	26	14	20
17	15	12	33	22	20	21	17	15	17	23	15	19
18	15	12	33	22	20	19	37	15	19	20	15	19
19	15	12	33	21	20	19	37	15	19	18	15	18
20	15	12	33	22	20	19	24	15	20	18	15	18
21	15	12	32	22	20	19	21	15	21	18	15	18
22	15	12	32	22	20	19	22	15	20	18	15	17
23	14	12	32	22	20	19	24	15	20	21	15	17
24	14	12	32	22	20	19	22	15	20	27	15	16
25	14	12	32	21	20	18	20	15	24	22	15	16
26	14	12	31	21	21	18	21	15	20	21	15	15
27	14	12	31	21	21	18	21	16	20	19	15	14
28	15	12	31	21	21	18	20	16	19	18	15	14
29	15	12	31	21	21	18	20	16	18	18	16	13
30	15	12	30	21	-	16	20	16	19	17	16	13
31	14	-	31	21	-	16	-	16	-	16	16	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	456	16	14	14.7	904
November.....	372	14	12	12.4	758
December.....	973	34	14	31.4	1,950
Calendar year 1947 .....	9,886	445	12	27.1	19,610
January.....	760	30	21	24.5	1,510
February.....	597	21	20	20.6	1,180
March.....	608	22	16	19.6	1,220
April.....	608	37	16	20.3	1,210
May.....	490	18	14	15.8	972
June.....	522	24	14	17.4	1,040
July.....	680	35	16	21.9	1,350
August.....	468	16	14	15.1	928
September.....	538	34	13	17.9	1,070
Water year 1947-48 .....	7,072	37	12	19.3	14,040



## Pecos River near Girvin, Tex.

Location.- Water-stage recorder, lat. 31°05', long. 102°22', at bridge on U. S. Highway 87, about half a mile downstream from Panhandle & Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, and 6½ miles downstream from Comanche Creek. Datum of gage is 2,269.7 feet above mean sea level, datum of 1929.

Drainage area.- 29,560 square miles (contributing area).

Records available.- August 1939 to September 1948.

Extremes.- Maximum discharge during year, 259 second-feet May 25 (gage height, 2.59 feet); minimum daily, 20 second-feet Oct. 17, 18, 20, 23, Nov. 8.  
1939-48: Maximum discharge, 20,000 second-feet Oct. 5, 1941 (gage height, 20.49 feet); minimum daily, that of Oct. 17, 18, 20, 23, Nov. 8, 1947.  
Flood of September 1932 reached a stage of 17 feet, from information by local residents.

Remarks.- Records good except those for period of no gage-height record, which are poor. Flow regulated to large extent by reservoirs above Orla. Many diversions above station for irrigation. Some water from drain and two wasteways returns to river between station below Grandfalls and this station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	26	22	38	52	36	37	36	33	31	29	37	21
2	25	21	44	53	37	37	37	32	30	29	43	21
3	25	21	45	53	37	38	38	31	29	30	42	21
4	25	22	56	53	37	36	36	31	28	30	640	21
5	25	22	57	54	37	36	36	30	28	31	38	21
6	24	21	53	54	37	37	33	30	29	31	36	21
7	25	21	50	54	37	37	32	30	29	31	33	21
8	24	20	50	54	36	38	33	30	29	31	31	21
9	25	22	49	53	36	38	34	29	37	32	29	268
10	25	22	48	53	36	38	36	29	32	32	28	30
11	24	24	50	56	33	36	36	29	28	32	27	21
12	24	25	49	53	33	36	34	29	27	32	26	24
13	23	26	48	49	33	37	36	29	26	33	26	23
14	22	29	48	45	33	37	36	28	28	33	25	26
15	23	27	47	42	33	36	36	28	28	35	25	36
16	22	28	48	42	33	33	36	28	37	49	24	42
17	20	29	48	42	33	34	36	28	30	43	24	34
18	20	35	50	42	34	33	36	28	27	37	24	30
19	21	32	52	42	34	33	36	26	25	34	23	29
20	20	31	48	45	34	33	36	26	23	33	23	30
21	21	30	50	42	33	32	52	26	25	32	23	28
22	21	30	49	42	33	33	53	26	27	32	23	28
23	20	30	50	40	37	34	44	26	24	32	23	28
24	21	29	49	39	36	34	38	28	23	32	22	25
25	21	29	50	38	34	36	38	66	24	32	22	25
26	22	27	50	38	37	33	38	82	28	32	22	25
27	21	30	50	37	38	34	37	32	32	40	22	22
28	21	31	50	36	40	34	34	32	31	39	22	22
29	22	32	50	36	40	34	36	32	30	37	22	22
30	22	34	52	37	-	34	36	31	29	36	22	21
31	22	-	50	37	-	34	-	32	-	35	21	-
Month	Second-foot-days		Maximum		Minimum		Mean		Runoff in acre-feet			
October.....	702		26		20		22.6		1,390			
November.....	800		34		20		26.7		1,590			
December.....	1,528		57		38		49.3		3,030			
Calendar year 1947.....	16,585		421		20		45.4		32,860			
January.....	1,413		56		36		45.6		2,800			
February.....	1,027		40		33		35.4		2,040			
March.....	1,092		38		32		35.2		2,170			
April.....	1,115		53		32		37.2		2,210			
May.....	997		82		26		32.2		1,980			
June.....	864		39		23		28.8		1,710			
July.....	1,066		55		29		34.4		2,110			
August.....	848		43		21		27.4		1,680			
September.....	807		68		21		26.9		1,600			
Water year 1947-48.....	12,259		82		20		33.5		24,310			

g Computed from graph based on gage readings.

Note.- No gage-height record June 23 to Aug. 3, Aug. 5 to Sept. 7; discharge computed on basis of weather records and records for stations below Grandfalls and near Sheffield.

## RIO GRANDE BASIN

335

Pecos River near Sheffield, Tex.

Location.- Water-stage recorder, lat. 30°39', long. 101°45', at bridge on U. S. Highway 290, 3½ miles southeast of Sheffield, Pecos County, and 4 miles upstream from Live-oak Creek. Datum of gage is 2,026.3 feet above mean sea level, datum of 1929.

Drainage area.- 31,660 square miles (contributing area).

Records available.- October 1921 to April 1925, October 1939 to September 1948.

Average discharge.- 10 years (1922-24, 1940-48), 290 second-feet.

Extremes.- Maximum discharge during year, 1,450 second-feet Feb. 26; maximum gage height, 5.37 feet Sept. 22; minimum discharge not determined, probably occurred during period of no gage-height record.

1921-25, 1939-48: Maximum discharge, 13,800 second-feet Oct. 8, 1941 (gage height, 16.75 feet); minimum, 15 second-feet Aug. 15, 1923.

Maximum stage known, about 23.5 feet in September 1916, site and datum in use prior to May 1, 1925, from information by local residents.

Remarks.- Records fair. Flow regulated to large extent by reservoirs above Orla. Many diversions between Orla and this station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	36	46	53	71	69	58	52	62	79	81	57	50
2	36	46	54	72	69	58	52	61	78	80	59	57
3	36	47	62	72	69	58	51	61	74	83	54	50
4	37	47	60	72	69	57	51	61	73	94	51	48
5	37	47	59	74	69	57	g51	62	74	93	50	46
6	37	47	60	74	69	57	g52	62	73	107	50	43
7	37	47	63	74	69	57	53	63	72	100	49	42
8	37	48	68	76	69	57	53	63	70	91	45	40
9	37	49	64	77	68	56	53	63	70	74	44	40
10	37	49	64	77	67	56	53	64	70	73	45	42
11	37	50	61	78	66	56	54	267	73	71	44	45
12	37	50	61	78	65	56	54	294	79	68	43	51
13	37	51	61	77	65	56	54	78	83	66	42	49
14	38	51	61	78	65	55	54	66	83	64	42	44
15	38	54	62	77	65	55	54	63	81	64	42	43
16	38	54	62	72	65	55	54	61	87	64	42	42
17	38	59	63	72	65	55	55	62	82	63	42	41
18	38	58	64	70	65	55	55	64	73	61	42	41
19	39	56	64	69	66	54	55	64	73	59	41	46
20	40	56	65	70	66	54	56	66	76	59	40	44
21	40	56	68	71	65	54	57	67	82	59	40	42
22	41	54	68	71	65	54	58	70	82	58	39	270
23	42	54	67	71	64	54	61	71	82	58	39	52
24	44	54	68	72	64	53	63	76	83	58	40	46
25	44	55	68	72	68	53	71	85	80	57	39	42
26	44	54	68	71	331	53	66	234	93	55	39	42
27	45	54	69	70	187	53	64	221	102	54	40	42
28	46	54	69	69	66	53	63	167	91	54	40	39
29	47	53	70	69	59	52	62	116	83	56	41	38
30	47	53	71	69	-	52	62	93	83	48	43	38
31	47	-	72	68	-	52	-	82	-	48	42	-
<hr/>												
Month				Second-foot-days		Maximum		Minimum		Mean		Runoff in acre-feet
October.....				1,234		47		36		39.8		2,450
November.....				1,553		59		46		51.8		3,080
December.....				1,989		72		53		64.2		3,950
Calendar year 1947.....				24,651		1,040		26		67.5		48,910
January.....				2,253		78		68		72.7		4,470
February.....				2,309		331		59		79.6		4,580
March.....				1,705		58		52		55.0		3,380
April.....				1,693		71		51		56.4		3,360
May.....				2,989		294		61		96.4		5,930
June.....				2,384		102		70		79.5		4,730
July.....				2,120		107		48		68.4		4,200
August.....				1,366		59		39		44.1		2,710
September.....				1,555		270		38		51.6		3,080
Water year 1947-48.....				23,150		331		36		63.3		45,920

g Computed from graph based on gage readings.

Note.- No gage-height record Oct. 1-15, Mar. 3 to Apr. 4; discharge computed on basis of records for stations below Grandfalls and near Girvin.

## RIO GRANDE BASIN

Gallinas River near Montezuma, N. Mex.

Location.- Water-stage recorder, lat. 35°39'00", long. 105°19'10", in Las Vegas Grant, 2 miles west of Montezuma, San Miguel County, and 6 miles northwest of Las Vegas.

Drainage area.- 84 square miles.

Records available.- October 1930 to September 1948 in reports of Geological Survey. March 1915 to December 1931 (no winter records 1915-26) in reports of State engineer.

Average discharge.- 22 years (1926-48), 21.0 second-feet.

Extremes.- Maximum discharge during year, 470 second-feet June 2 (gage height, 3.30 feet); minimum daily, 2.1 second-feet Sept. 23, 24.

1930-48: Maximum discharge, 3,310 second-feet Sept. 23, 1941 (gage height, 7.78 feet), from rating curve extended above 350 second-feet by logarithmic plotting; minimum daily, 0.8 second-foot Aug. 15-18, 21, 25, 26, 30, 1934, Jan. 20, 1938.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	2.7	2.9	3.2	b3.5	b3.5	12	21	60	35	8.8	4.6	3.4
2	2.4	2.9	3.2	b3.5	b3.5	11	23	54	67	8.5	4.6	3.4
3	2.6	2.9	3.5	b3.5	b3.5	13	26	53	a45	8.5	4.3	3.5
4	2.5	2.9	3.2	b3.5	b3.5	b10	31	46	a42	8.2	10	3.2
5	2.4	2.9	3.7	b3.5	b3.5	b11	36	41	a40	7.9	48	2.7
6	2.4	2.9	*3.4	b3.5	b3.5	b11	38	40	39	10	10	2.5
7	2.4	2.9	b3	b3.5	b3.5	11	38	41	34	8.8	6.9	2.5
8	2.4	2.7	3.2	b3.5	b3.5	9.6	38	46	41	8.2	9.2	2.6
9	2.2	3.0	3.2	*b3.5	b3.5	9.6	40	43	36	7.4	5.3	2.5
10	2.4	2.7	3.5	b3.5	b3	b10	47	41	33	7.1	4.8	5.1
11	2.5	2.6	3.2	b3.5	b3	b11	65	41	31	6.6	4.6	2.4
12	2.5	2.9	b3	3.7	b3	13	61	39	31	6.0	5.5	2.6
13	4.4	2.9	b3	3.7	b3	12	49	34	32	5.0	5.5	3.0
14	6.6	2.9	b3	4.1	b3	15	45	32	30	4.4	16	2.6
15	4.6	2.9	b3.5	4.4	b3	16	49	34	26	4.3	9.3	2.6
16	3.9	3.0	b3.5	3.9	b3.5	16	56	41	23	4.3	7.1	2.5
17	3.5	2.9	b3.5	3.9	b4	15	62	43	21	4.1	6.0	2.5
18	3.2	2.7	b3.5	b3.5	b4.5	16	70	46	20	5.0	6.0	2.5
19	3.2	3.0	b3.5	b3.5	b5	18	74	49	33	6.6	5.5	2.5
20	3.0	3.0	b3.5	b3.5	*5.7	20	71	50	a35	5.3	5.0	2.4
21	3.0	3.4	b3.5	b3.5	5.7	20	73	49	a25	4.6	7.1	2.4
22	3.0	3.0	b3.5	b3.5	6.6	17	74	47	a20	5.3	9.1	2.2
23	2.9	3.5	b3.5	b3.5	6.6	20	71	44	a18	6.6	6.4	2.1
24	2.9	3.4	b3	b3	6.9	26	61	48	16	5.5	5.5	2.1
25	3.0	3.2	b3	b3	6.9	*31	53	53	14	5.3	5.5	2.2
26	3.2	3.4	b3	b3	10	28	43	52	12	5.0	5.3	2.7
27	3.2	3.7	b3.5	b3	13	24	44	47	11	5.5	4.6	2.6
28	3.0	3.9	b3.5	b3	12	24	44	44	11	5.3	3.9	2.5
29	3.0	3.7	b3.5	b3	12	27	53	40	9.3	4.8	3.7	2.6
30	3.0	3.4	b3.5	b3	-	28	60	36	9.6	4.3	3.7	2.6
31	2.9	-	b3.5	b3	-	25	-	34	-	5.7	3.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	94.9	6.6	2.2	3.06	188
November.....	92.1	3.9	2.6	3.07	183
December.....	103.3	3.7	3	3.33	205
Calendar year 1947 .....	3,111.6	93	.9	8.52	6,170
January.....	107.2	4.4	3	3.46	213
February.....	151.9	13	3	5.24	301
March.....	530.2	31	9.6	17.1	1,050
April.....	1,616	74	21	50.5	3,010
May.....	1,368	60	32	44.1	2,710
June.....	839.9	67	9.3	28.0	1,670
July.....	192.9	10	4.1	6.22	383
August.....	233.3	48	3.5	7.53	463
September.....	85.0	6.5	2.1	2.83	169
Water year 1947-48 .....	5,314.7	74	2.1	14.5	10,540

Peak discharge (base, 150 sec.-ft.), June 2 (8 p.m.) 470 sec.-ft.; June 19 (9 p.m.) 252 sec.-ft.; Aug. 5 (4:30 a.m.) 178 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, observer's notes, weather records, and records for station at Montezuma.

b Stage-discharge relation affected by ice.

## Gallinas River at Montezuma, N. Mex.

Location.- Water-stage recorder, lat. 35°39'15", long. 105°16'30", in Las Vegas Grant, at highway bridge half a mile downstream from Montezuma, San Miguel County, and 5 miles northwest of Las Vegas.

Drainage area.- 87 square miles.

Records available.- August 1903 to December 1914 (prior to October 1904, gage heights only) and October 1930 to September 1948 in reports of Geological Survey. October 1904 to December 1931 in reports of State engineer (prior to 1930, published as Gallinas River near Las Vegas).

Average discharge.- 41 years (1905-11, 1913-48), 21.3 second-feet.

Extremes.- Maximum discharge during year, 696 second-feet June 2 (gage height, 5.50 feet, from high-water mark in gage well); minimum daily, 0.5 second-foot on many days.

1930-48: Maximum discharge, 2,590 second-feet Sept. 23, 1941 (gage height, 6.23 feet), from rating curve extended above 1,000 second-feet by logarithmic plotting; no flow Oct. 4-7, 1934.

A very destructive flood, probably the greatest known, occurred Sept. 29-30, 1904.

Remarks.- Records good except those for period of no gage-height record, which are poor. Flow regulated by reservoirs owned by Public Service Co. of New Mexico. Several diversions above station for irrigation and municipal water supply.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.5	0.8	0.8	1.4	1.2	12	19	60	36	4.9	1.0	0.5
2	.6	.8	1.0	1.4	1.2	7.5	11	60	a100	3.4	2.0	.5
3	.7	.5	1.0	1.4	1.2	8.9	20	56	a50	2.5	2.7	.5
4	.6	.5	1.0	1.4	1.4	7.1	28	55	a40	2.0	1.8	.5
5	.6	.7	1.0	1.4	1.8	5.3	32	38	a35	1.4	.87	.5
6	.7	1.0	1.0	1.2	1.6	6.7	34	25	h32	2.6	13	.5
7	.7	1.0	.7	1.2	1.6	7.1	33	34	a30	17	4.6	.6
8	.8	1.0	.8	1.2	1.6	7.1	32	37	a34	9.4	2.2	.6
9	.8	.8	.8	1.2	1.4	7.1	30	44	a32	2.2	1.8	.7
10	.8	.8	.8	1.2	1.4	6.7	36	28	a31	1.0	1.8	2.7
11	.7	.8	1.0	1.2	1.8	6.3	64	40	30	1.0	2.0	1.1
12	.8	1.0	1.0	1.2	1.4	6.7	58	21	39	1.0	2.0	.6
13	1.1	.8	1.1	1.2	1.6	8.9	46	29	33	1.0	2.0	.5
14	.8	.6	1.2	1.1	1.6	12	39	28	28	.8	8.0	.5
15	.7	.7	1.2	1.1	1.8	14	39	30	21	1.0	9.9	.5
16	.6	.7	1.4	1.1	1.8	13	46	37	15	1.0	4.6	.5
17	.7	.7	1.4	1.1	1.8	13	51	41	13	1.0	2.5	.5
18	.8	.6	1.6	1.1	2.0	13	58	42	14	2.0	2.0	.5
19	.8	.7	1.6	1.2	1.8	14	71	44	28	3.2	2.0	.5
20	.8	.8	1.6	1.1	5.2	17	68	47	46	1.0	1.8	.5
21	1.0	.8	1.6	1.1	4.9	18	67	47	22	2.0	2.5	.5
22	.8	.7	1.2	1.1	4.9	14	71	44	16	2.0	7.5	.5
23	.8	.6	1.2	1.2	7.1	16	67	41	11	2.0	3.7	.5
24	.7	.7	.7	1.2	8.4	19	59	50	8.4	1.8	1.6	.5
25	.7	.7	1.2	1.2	7.9	25	55	53	7.5	2.0	.8	.5
26	.7	.6	1.4	1.4	a10	25	53	51	7.1	3.2	.7	.6
27	.7	.6	1.2	1.4	10	21	44	41	6.3	3.2	.7	.5
28	.6	.7	1.1	1.2	12	30	45	42	6.0	3.2	.6	.5
29	.6	.8	1.2	1.2	11	27	48	40	6.0	2.2	.6	.5
30	.6	1.0	1.6	1.2	-	25	55	37	4.9	1.6	.6	.5
31	.8	-	1.6	1.2	-	26	-	36	-	1.0	.6	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	22.4	1.1	0.5	0.72	44
November.....	22.7	1.0	.5	.76	45
December.....	35.4	1.6	.6	1.14	70
Calendar year 1947 .....	1,953.8	115	.2	5.35	3,880
January.....	37.8	1.4	1.1	1.22	75
February.....	111.4	12	1.2	3.84	221
March.....	439.4	30	5.3	14.2	872
April.....	1,379	71	11	46.0	2,740
May.....	1,278	60	21	41.2	2,530
June.....	780.2	100	4.8	26.0	1,550
July.....	83.6	17	4.9	2.70	166
August.....	174.6	87	.6	5.63	346
September.....	18.4	2.7	.5	.61	36
Water year 1947-48 .....	4,382.9	100	.5	12.0	8,700

Peak discharge (base, 100 sec.-ft.)- June 2 (8:30 p.m.), 696 sec.-ft.; June 19 (10:30 p.m.) 170 sec.-ft.; July 7 (12:30 p.m.) 116 sec.-ft.; Aug. 5 (1 a.m.) 454 sec.-ft.

a No gage-height record; discharge computed on basis of recorded range in stage, weather records, and records for station near Montezuma.

h Computed from staff-gage reading.

## Rio Ruidoso at Hondo, N. Mex.

Location.- Water-stage recorder, lat. 33°23'00", long. 105°16'30", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec. 4, T. 11 S., R. 17 E., a quarter of a mile upstream from confluence with Rio Bonito and half a mile southwest of Hondo.

Drainage area.- 307 square miles.

Records available.- October 1930 to September 1948 in reports of Geological Survey. August 1930 to December 1931 in reports of State engineer.

Average discharge.- 18 years (1930-48), 22.7 second-feet.

Extremes.- Maximum discharge during year, 2,940 second-feet June 1 (gage height, 9.73 feet), from rating curve extended above 35 second-feet by logarithmic plotting; minimum daily, 0.1 second-foot Dec. 5-7.

1930-48: Maximum discharge, 12,400 second-feet Sept. 29, 1941 (gage height, 21.13 feet, from floodmark), from rating curve extended above 130 second-feet on basis of velocity-area studies; no flow Aug. 15, 16, 1935.

Remarks.- Records good except those above 100 second-feet, which are fair, and those for periods of no gage-height record, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.4	0.4	3.8	4.6	2.7	10	18	4.5	321	0.6	a2.5	0.4
2	.4	.4	3.0	4.2	2.7	10	17	1.5	a100	.5	1.7	.4
3	.4	.4	3.8	4.2	2.7	10	7.4	1.3	h51	.5	1.5	.4
4	.4	.4	1.5	3.8	2.7	11	7.4	1.3	a25	a.5	1.9	.5
5	.4	.4	.1	4.2	3.4	5.9	5.6	1.1	a15	a.6	73	.5
6	.4	.5	.1	3.4	2.7	.8	5.6	.8	a8	.7	a30	.5
7	.4	.5	.1	3.4	3.0	.8	8.0	.7	a6	20	a10	.6
8	.4	.6	.2	3.4	3.0	1.0	4.2	.6	a60	2.8	a6.0	.6
9	.5	.5	.2	2.4	2.7	2.2	7.4	.5	42	.4	a2.0	.7
10	.6	.5	.2	1.7	2.4	4.2	2.7	.5	21	.4	a2.5	.7
11	.6	.5	.3	1.5	3.8	6.2	16	.5	31	2.7	3.4	.7
12	.6	.4	1.5	2.7	3.8	6.8	13	.5	51	a2.0	18	.7
13	9.1	.5	2.2	3.0	4.6	8.0	13	.5	37	a1.0	17	.8
14	3.9	.4	1.1	1.9	4.2	5.6	2.4	.5	25	a.6	16	.8
15	.5	.4	.3	1.1	8.0	5.6	.5	.5	18	a1.2	15	.8
16	.3	.3	.3	1.5	8.0	9.3	a.5	.5	15	h.5	20	.8
17	.3	.4	.2	1.9	7.4	10	a.8	.5	14	a2.0	15	9.0
18	.3	1.0	.3	2.2	6.8	14	a.8	.5	9.3	a5.0	8	1.0
19	.3	3.0	.2	2.7	6.8	17	1.0	.7	6.2	a4.0	11	.8
20	.4	4.2	.2	2.7	6.8	16	3.4	.7	5.6	a10	10	.7
21	.4	5.6	.2	2.7	6.8	17	8.0	1.0	4.6	a6.0	3.8	.7
22	.4	5.1	.2	1.7	6.2	8.6	10	1.1	2.2	a20	3.0	.7
23	.5	5.6	.2	1.7	6.2	2.2	11	1.1	.6	a70	3.0	.6
24	.6	5.1	.2	1.9	6.2	1.7	12	2.6	.6	a15	2.2	.7
25	.5	5.6	.2	2.4	6.8	.6	20	24	.4	a5	3.0	9.3
26	.5	12	2.1	2.7	7.4	1.1	17	14	.4	a10	2.6	5.1
27	.5	19	3.8	2.7	7.4	1.5	11	12	.4	a25	a.6	1.0
28	.4	20	3.8	2.7	7.4	1.9	5.0	8.6	.5	a10	a.6	.9
29	.4	11	4.2	2.7	8.0	5.6	1.7	3.0	.5	a7	a.5	.8
30	.4	3.8	4.2	2.7	-	18	9.8	4.2	.5	a5	a.4	.8
31	.4	-	5.1	2.7	-	11	-	39	-	a3.5	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	25.4	9.1	0.3	0.82	50
November.....	108.5	20	.3	3.62	215
December.....	43.8	5.1	.1	1.41	87
Calendar year 1947 .....	921.6	20	.1	2.52	1,830
January.....	83.1	4.6	1.1	2.68	165
February.....	150.6	8.0	2.4	5.19	299
March.....	223.6	18	.6	7.21	444
April.....	240.0	20	.5	8.00	476
May.....	152.2	39	.5	4.91	302
June.....	871.8	321	.4	29.1	1,730
July.....	232.5	70	.4	7.50	461
August.....	284.6	73	.4	9.18	564
September.....	42.0	9.3	.4	1.40	83
Water year 1947-48 .....	2,458.1	321	.1	6.72	4,880

Peak discharge (base, 200 sec.-ft.).- May 24 (6:45 p.m.) 318 sec.-ft.; June 1 (1 a.m.) 955 sec.-ft.; June 1 (7:30 p.m.) 2,940 sec.-ft.; June 2 (10:45 p.m.) 332 sec.-ft.; July 7 (8:20 p.m.) 290 sec.-ft.; Aug. 5 (1 p.m.) 1,160 sec.-ft.

a No gage-height record; discharge computed on basis of available trace, weather records, engineer's notes, and records for Rio Bonito at Hondo and Rio Hondo at Diamond A Ranch.  
h Computed from staff-gage readings.

## RIO GRANDE BASIN

339

Rio Hondo at Diamond A Ranch, near Roswell, N. Mex.

Location.- Water-stage recorder, lat. 33°20'40", long. 104°51'10", in NE<sup>1</sup> sec. 20, T. 11 S., R. 21 E., at Diamond A Ranch, 8 miles upstream from Rocky Arroyo and 18 miles west of Roswell.

Drainage area.- 960 square miles (contributing area).

Records available.- May 1939 to September 1948 in reports of Geological Survey. May 1908 (corrected) to August 1909 in reports of State engineer.

Extremes.- Maximum discharge during year, 7,960 second-feet June 3 (gage height, 26.10 feet); no flow at times.  
1939-48: Maximum discharge, 27,000 second-feet Sept. 22, 1941 (gage height, 28.78 feet), by slope-area method; no flow at times.

Remarks.- Records fair except those for periods of ice effect or no gage-height record and those above 1,000 second-feet, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0	a10	b11	5.8	0	0	0	749	0.1	16	0
2	0	0	15	*b10	5.0	0	0	0	1,290	0	837	0
3	0	0	18	10	4.2	0	0	0	2,270	0	22	0
4	0	0	16	10	5.3	0	0	0	a200	0	11	0
5	.5	0	14	10	5.0	0	0	0	a100	0	20	0
6	.7	0	14	*10	2.6	.9	0	0	a60	.4	75	0
7	0	0	14	10	0	1.5	0	0	b45	0	31	0
8	0	0	14	9.8	0	1.5	0	0	45	26	26	0
9	0	0	14	9.1	0	1.7	0	0	63	56	26	0
10	0	0	15	8.8	0	2.1	0	0	a60	11	24	0
11	0	0	*15	8.5	0	1.7	0	0	a52	3.4	51	0
12	0	0	15	5.5	1.3	1.9	0	0	62	14	53	0
13	0	0	b12	.6	5.8	1.7	.2	0	64	8.3	52	0
14	857	0	b12	5.0	10	.6	.1	0	45	0	39	0
15	a15	0	b13	.1	6.3	0	0	0	38	0	a100	0
16	8.6	0	a12	0	3.4	0	0	0	31	0	a200	0
17	3.0	0	*12	0	2.3	0	0	0	29	0	17	0
18	0	0	12	0	2.3	0	0	0	23	0	.4	0
19	0	0	12	0	1.8	0	0	0	20	0	0	0
20	0	0	12	0	3.2	0	0	0	49	0	0	0
21	0	0	12	0	2.2	.6	0	0	17	0	0	0
22	0	a0	11	.2	1.9	2.1	0	0	8.5	9.3	0	0
23	0	a0	11	0	1.4	2.1	0	0	2.5	109	0	0
24	0	a1	11	0	.4	.5	.4	0	0	34	0	0
25	0	a2	11	0	0	.1	.3	0	0	45	0	0
26	0	a3	*11	0	0	.1	.2	.1	.2	36	0	184
27	0	a3	11	0	0	0	0	0	.5	21	0	37
28	0	a4	11	0	0	0	0	153	0	20	0	19
29	0	a4	10	0	0	0	0	24	0	21	0	14
30	0	a5	11	8.7	-	0	0	7.8	0	13	0	12
31	0	-	11	16	-	0	-	2.7	-	12	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	884.8	857	0	28.5	1,750
November.....	22	5	0	.73	44
December.....	392	18	10	12.6	778
Calendar year 1947.....	3,773.0	857	0	10.3	7,480
January.....	143.3	16	0	4.62	284
February.....	70.2	10	0	2.42	139
March.....	19.1	2.1	0	.62	38
April.....	1.2	.4	0	.04	2.4
May.....	187.6	153	0	6.05	372
June.....	5,325.7	2,270	0	177	10,560
July.....	447.5	109	0	14.4	898
August.....	1,600.4	837	0	51.6	3,170
September.....	266	184	0	8.87	528
Water year 1947-48.....	9,357.8	2,270	0	25.6	18,550

Peak discharge (base, 600 sec.-ft.).- Oct. 14 (2 a.m.) 6,040 sec.-ft.; May 28 (6 a.m.) 701 sec.-ft.; June 1 (8:30 a.m.) 4,170 sec.-ft.; June 2 (3:40 a.m.) 6,880 sec.-ft.; June 3 (6:45 a.m.) 7,960 sec.-ft.; Aug. 2 (6:10 a.m.) 6,600 sec.-ft.; Sept. 26 (2:15 a.m.) 701 sec.-ft.

\* Winter discharge measurement made on this day.

a No gage-height record; discharge computed on basis of available recorder trace, weather records, engineers' field notes, and records for Rio Ruidoso at Hondo and Rio Bonito at Hondo.

b Stage-discharge relation affected by ice.

c Computed from staff-gage reading.

## Rio Bonito at Hondo, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 33°23'20", long. 105°16'30", in NE1/4 sec. 4, T. 11 S., R. 17 E., at Hondo, half a mile upstream from confluence with Rio Ruidoso.

Drainage area.- 306 square miles (contributing area).

Records available.- October 1930 to September 1948 in reports of Geological Survey.  
August 1930 to December 1931 in reports of State engineer.

Average discharge.- 18 years (1930-48), 11.7 second-feet.

Extremes.- Maximum discharge during year, 8,390 second-feet June 1 (gage height, 17.83 feet); from rating curve extended above 220 second-feet on basis of slope-area determination at gage height 19.0 feet; no flow at times.  
1930-48: Maximum discharge, 11,000 second-feet Sept. 28 or 29, 1941 (gage height, 20.92 feet, from floodmark), from rating curve extended above 220 second-feet on basis of slope-area determination at gage height 19.0 feet; no flow at times.

Remarks.- Records fair except those for periods of doubtful or no gage-height record and those above 10 second-feet, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	2.9	3.7	0.2	0	0		0	719	0	3.7	0
2	0	2.9	3.7	.3	0	0		0	a50	0	6.1	0
3	0	2.9	4.2	.5	0	0		0	201	0	13	0
4	0	3.1	5.7	.4	0	.1		0	5.2	0	18	0
5	0	3.3	3.1	.4	0	.1		0	2.7	0	23	0
6	0	3.5	3.1	.4	0	.1		0	2.4	0	4.5	0
7	0	3.1	3.1	.1	0	0		0	2.0	25	a1	0
8	0	2.9	3.1	0	0	0		0	16	1	a0	0
9	0	1.5	2.9	0	0	0		0	6.4	a0	a1	0
10	0	.9	2.9	0	0	.1		0	7.2	a0	18	0
11	0	.7	2.7	0	0	.1		0	6.4	4	26	0
12	0	.7	2.7	0	.3	.1		0	16	a0	13	0
13	2.3	1.2	3.5	0	1.1	0		0	5.2	a0	2.5	0
14	4.5	4.5	2.0	0	.8	0		0	4.8	a.2	40	0
15	3.3	4.5	2.4	0	.4	.1		0	4.8	.3	182	0
16	3.1	4.5	2.0	0	.2	.1		0	4.5	.2	5.7	0
17	2.9	4.5	1.9	0	0	.1		0	4.0	.2	.4	0
18	3.1	4.5	.8	0	0	.1		0	3.1	4.3	a0	0
19	3.1	4.0	.5	0	0	0		0	3.3	3.3	a0	0
20	2.9	4.0	0	.1	0	0		0	3.1	2.5	a0	0
21	3.1	4.0	0	0	0	0		0	2.5	5.3	a0	11
22	3.1	4.0	0	0	0	0		0	2.4	2.8	0	.5
23	3.1	4.0	0	0	0	0		0	2.2	1.8	0	.4
24	2.9	4.0	0	0	0	0		0	1.8	44	0	.4
25	3.1	4.0	0	0	0	0		2.0	1.6	19	0	234
26	3.1	4.0	0	0	0	0		1.1	1.9	3.3	0	a.4
27	2.9	4.0	0	0	0	0		a.2	1.9	25	0	a0
28	3.1	4.0	0	0	0	0		13	.6	6.8	0	0
29	2.9	3.7	0	0	0	0		1.1	0	4.8	0	0
30	3.1	3.7	0	0	0	0		2.4	0	2.7	0	0
31	2.7	-	.1	0	-	0		26	-	1.5	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	58.3	4.5	0	1.88	116
November.....	99.5	4.5	.7	3.32	197
December.....	52.1	4.2	0	1.68	103
Calendar year 1947 .....	518.7	68	0	1.42	1,030
January.....	2.4	.5	0	.08	4.8
February.....	2.8	1.1	0	.10	5.6
March.....	1.0	.1	0	.03	2.0
April.....	0	0	0	0	0
May.....	45.8	26	0	1.48	91
June.....	1,092.0	719	0	36.4	2,170
July.....	158.0	44	0	5.10	313
August.....	357.9	182	0	11.5	710
September.....	246.7	234	0	8.22	489
Water year 1947-48 .....	2,116.5	719	0	5.78	4,200

Peak discharge (base, 1,000 sec.-ft.).- June 1 (12:30 a.m.) 8,390 sec.-ft.; June 1 (7:30 p.m.) 1,920 sec.-ft.; June 3 (12:05 a.m.) 1,300 sec.-ft.; Aug. 15 (5 p.m.) 2,280 sec.-ft.; Sept. 25 (4 p.m.) 3,100 sec.-ft.

a No gage-height record; discharge computed on basis of available trace, engineer's and observer's notes, and records for nearby stations.



# RIO GRANDE BASIN

341

Rio Felix at old highway bridge, near Hagerman, N. Mex.

Location.- Water-stage recorder, lat. 33°07'30", long. 104°20'40", in SW $\frac{1}{4}$  sec. 4, T. 14 S., R. 26 E., on downstream side of bridge,  $1\frac{1}{2}$  miles northwest of Hagerman and  $2\frac{1}{2}$  miles upstream from mouth.

Drainage area.- 932 square miles (contributing area).

Records available.- April 1939 to September 1948. March 1932 to April 1939 at site 1 mile downstream. Records for periods of low flow not equivalent.

Extremes.- Maximum discharge during year, 11,400 second-feet June 2 (gage height, 17.3 feet, from floodmarks); minimum daily, 0.2 second-foot on many days.

1939-48: Maximum discharge, 20,000 second-feet Sept. 22, 1941 (gage height, 23.0 feet), from rating curve extended above 5,100 second-feet by logarithmic plotting; minimum daily, 0.1 second-foot June 24, 27, July 25, 1947.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.2	0.4	0.3	0.4	0.2	0.4	0.3	0.4	28	0.8	0.7	0.4
2	.2	.4	.3	.4	.2	.4	.4	.3	460	.7	424	.4
3	.2	.4	.3	1.8	.3	.4	.4	.4	a200	.7	91	.5
4	.2	.4	.3	.4	.3	6.3	.4	.4	340	.7	1.3	.5
5	.2	.3	.3	.4	.4	21	.5	.3	80	.7	.4	.5
6	.2	.3	.3	.4	.3	.5	.5	.3	60	14	.4	.5
7	.2	.3	.3	a.4	.3	.4	.5	.3	54	.8	.4	.6
8	.2	.3	.3	a.4	.4	.4	.5	.3	24	.8	.4	.7
9	.2	.4	.3	a.4	.4	.3	.6	.3	35	.8	.4	.5
10	.2	.4	.3	a.4	.4	.9	.6	.3	40	.8	.4	.7
11	.2	.3	.4	a.4	1.2	3.0	.5	.3	40	.8	.4	.7
12	.2	.4	.4	a.4	15	.5	.6	.3	37	.7	.5	.6
13	.2	.4	.3	a.4	3.8	.4	.6	.3	37	.6	.5	.6
14	.2	.4	.3	.4	.4	.3	.5	.3	21	.6	.6	.5
15	.3	.4	.3	.4	1.2	.4	.5	.3	1.2	.6	.7	.4
16	.2	.4	.3	.4	.4	.4	.5	.3	1.0	.7	.6	.5
17	.2	.4	.4	.4	.4	.4	.4	.4	.9	.7	.6	.4
18	.3	.4	.3	.4	.5	.3	.4	.4	1.0	.6	.6	.4
19	.2	.4	.3	.4	.5	.3	.4	.4	1.0	.6	.5	.4
20	.3	.4	.3	.4	.5	.3	.4	.3	.9	.6	.6	.4
21	.3	.4	.3	.4	.5	.3	.4	.4	.9	.6	.8	.4
22	.3	.4	.3	.4	.5	.3	.4	.4	.9	.7	.6	.4
23	.3	.4	.3	.4	.5	.3	.4	.4	.9	.8	.6	.4
24	.3	.4	.3	.4	.5	.3	.3	.3	.9	.8	.6	.5
25	.3	.4	.3	.4	.5	.3	.3	.3	.9	.8	.6	.4
26	.4	.3	.3	.4	.5	.3	.3	.4	.9	.8	.6	.4
27	.3	.4	.3	.4	.5	.4	.3	.4	.9	.8	.5	.4
28	.4	.4	.4	.4	.5	.3	.4	.6	.9	.8	.5	.4
29	.4	.4	.9	3.1	.5	.3	.4	.8	.9	.8	.5	.4
30	.4	.4	1.0	2.9	-	.2	.4	.9	.8	.8	.5	.4
31	.4	-	.7	.3	-	.3	-	1.4	-	.8	.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	8.1	0.4	0.2	0.26	16
November.....	11.4	.4	.3	.38	23
December.....	11.4	1.0	.3	.37	23
Calendar year 1947 .....	244.7	27	.1	.67	485
January.....	18.9	3.1	.3	.31	37
February.....	31.6	15	.2	1.09	63
March.....	40.6	21	.2	1.31	81
April.....	13.1	.6	.3	.44	26
May.....	12.9	1.4	.3	.42	26
June.....	1,470.9	460	.8	49.0	2,920
July.....	35.8	14	.6	1.15	71
August.....	531.0	424	.4	17.1	1,050
September.....	14.3	.7	.4	.48	28
Water year 1947-48 .....	2,200.0	460	.2	6.01	4,360

Peak discharge (base, 180 sec.-ft.)- June 2 (1:30 a.m.) 1,100 sec.-ft.; June 2 (about 12 p.m.) 11,400 sec.-ft.; Aug. 2 (2:30 p.m.) 3,050 sec.-ft.

a No gage-height record; discharge computed on basis of weather records and engineers' notes.

## Cottonwood Creek near Lake Arthur, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 32°55'00", long. 104°22'00", in SW 1/4 sec. 16, T. 16 S., R. 26 E., 1 1/2 miles upstream from mouth and 6 miles south of town of Lake Arthur. Datum of gage raised 1.54 feet May 22, 1948.

Drainage area.- 199 square miles (contributing area).

Records available.- March 1932 to September 1948.

Average discharge.- 16 years, 10.0 second-feet.

Extremes.- Maximum discharge during year, 213 second-feet June 2 (gage height, 7.91 feet); minimum daily, 0.6 second-foot May 29, 30.

1932-48: Maximum discharge, 1,100 second-feet June 13, 1935, from rating curve extended above 15 second-feet by logarithmic plotting; maximum gage height, 12.0 feet May 30, 1937, present datum, from floodmarks (backwater from Pecos River); no flow at times.

Remarks.- Records good except those for Mar. 30, 31, Apr. 8, 11, May 17-22, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.9	3.0	5.9	6.8	8.4	4.2	2.2	1.0	8.6	2.8	2.2	1.3
2	.9	3.1	5.0	7.0	8.4	4.0	1.3	1.2	176	2.5	1.7	1.2
3	.9	3.2	6.6	5.9	8.4	4.0	2.0	1.0	131	2.0	1.6	1.2
4	.9	3.4	7.8	5.9	8.8	4.0	2.2	.9	34	1.3	1.7	1.2
5	.9	3.4	7.8	6.1	11	4.0	1.9	.9	15	1.2	1.7	1.2
6	.9	3.2	8.0	6.4	10	4.2	1.6	1.2	13	1.2	1.6	1.2
7	.9	3.2	8.6	6.6	9.8	4.2	2.1	1.0	13	1.7	1.5	1.2
8	.9	3.4	7.8	7.0	8.8	4.1	c2	1.3	12	2.0	1.5	1.4
9	.9	3.5	7.0	7.0	8.4	4.1	1.6	4.0	12	1.0	1.9	1.4
10	.9	3.8	6.8	7.4	9.1	4.8	1.6	2.3	12	.8	1.6	1.4
11	.9	3.8	6.6	7.8	8.2	4.7	c2	3.2	12	.9	1.1	1.3
12	.9	4.0	6.6	8.2	8.4	5.0	2.3	4.0	12	.9	2.2	1.3
13	.9	4.1	6.6	8.0	9.6	5.7	4.4	4.2	12	1.0	1.6	1.3
14	.9	4.2	6.8	8.0	9.6	5.0	2.0	4.4	11	1.2	2.0	1.3
15	.9	4.2	6.8	8.2	9.8	2.5	2.0	4.1	9.0	1.1	2.2	1.3
16	1.1	4.4	6.4	8.2	9.8	1.7	2.4	4.1	8.3	1.2	2.6	1.3
17	1.1	4.8	4.8	8.2	9.8	4.0	3.8	4.0	6.8	1.1	2.5	1.3
18	1.0	5.5	5.5	8.2	9.1	5.0	5.5	a3.5	7.2	1.6	2.3	1.3
19	1.0	5.7	5.4	8.2	8.6	4.1	2.5	a3.0	9.8	2.3	2.4	1.3
20	1.1	6.1	5.2	8.2	6.8	3.2	1.3	a2.5	9.8	1.9	2.5	1.2
21	1.1	6.3	5.5	8.2	4.0	5.7	1.3	a1.5	9.8	.8	2.0	1.3
22	1.0	6.3	5.7	8.4	4.0	6.1	1.2	.9	9.8	.8	1.8	1.3
23	1.0	6.6	5.0	8.4	4.0	2.8	1.1	.9	9.5	.8	1.8	1.2
24	1.3	6.8	5.9	8.6	4.2	1.9	1.0	1.0	6.8	.8	1.5	1.2
25	1.8	6.1	7.4	8.2	4.4	3.3	1.1	1.0	5.9	.8	1.5	1.2
26	2.0	2.3	6.8	8.2	4.2	2.4	1.2	.8	9.2	.7	1.6	1.3
27	2.1	5.9	6.3	8.2	4.4	1.9	1.0	.7	9.0	.7	1.7	1.3
28	2.3	7.0	6.8	8.2	4.2	3.8	.9	.7	7.2	1.1	2.3	1.3
29	2.5	7.2	7.4	8.2	4.4	2.5	1.0	.6	4.0	1.9	1.6	1.4
30	2.6	7.2	6.8	8.2	-	c2	.9	.6	3.3	1.4	1.3	1.4
31	2.8	-	6.6	8.4	-	c2	-	1.3	-	2.5	1.4	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	39.3	2.6	0.9	1.27	76
November.....	141.7	7.2	3.0	4.72	281
December.....	202.2	8.6	4.8	6.52	401
Calendar year 1947.....	1,752.8	19	.2	4.80	3,480
January.....	238.7	8.6	5.9	7.70	475
February.....	238.6	11	4.0	7.54	434
March.....	116.9	6.1	1.7	3.77	232
April.....	57.4	5.5	.9	1.91	114
May.....	61.8	4.4	.6	1.99	123
June.....	597.0	176	3.3	19.9	1,180
July.....	42.0	2.8	.7	1.35	83
August.....	56.9	2.6	1.1	1.84	113
September.....	36.5	1.4	1.2	1.28	76
Water year 1947-48.....	1,811.0	176	.6	4.95	3,590

Peak discharge (base, 40 sec.-ft.)- June 2 (8:00 p.m.) 213 sec.-ft.

a No gage-height record; discharge computed on basis of comparison of flow past Pecos River at Lake Arthur and Pecos River near Artesia.

c Backwater from aquatic vegetation; discharge computed as explained in footnote a.

## Black River above Malaga, N. Mex.

Location.- Water-stage recorder, lat. 32°14'00", long. 104°09'15", in E $\frac{1}{2}$  sec. 11, T. 24 S., R. 27 E., 0.6 mile upstream from Black River diversion dam, 4.8 miles west of Malaga and about 7 miles upstream from mouth.

Drainage area.- 343 square miles.

Records available.- March to December 1940 and December 1946 to September 1948.

Extremes.- Maximum discharge during period, 9,230 second-feet May 31 (gage height, 9.82 feet), from rating curve extended above 127 second-feet on basis of logarithmic plotting and peak-flow; minimum daily, 7.0 second-feet Aug. 8, 9.

1940, 1946-48: Maximum discharge, that of May 31, 1948, comparisons with rated stations downstream; minimum daily, 2.4 second-feet Oct. 10, 1940.

Maximum stage known, 19.0 feet in September 1941, from well defined floodmarks determined in 1947 (discharge not determined).

Remarks.- Records good except those above 140 second-feet, which are poor. Diversions above and below station for irrigation.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.4	0	1.0	19.9	1.9	180
.5	.44	1.1	29.8	2.1	240
.6	1.61	1.2	41.6	2.4	345
.7	3.60	1.3	56	2.7	470
.8	6.65	1.5	89	3.0	620
.9	11.7	1.7	130	3.5	940

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	11	8.0	10	14	17	12	10	8.9	405	11	8.9	10
2	11	8.0	10	14	18	12	10	9.4	619	11	8.4	10
3	11	8.0	11	14	17	12	10	9.4	42	11	8.9	10
4	11	8.0	11	14	16	12	10	10	25	10	8.4	10
5	11	8.0	11	14	16	12	10	10	19	10	8.0	10
6	11	8.0	11	14	15	12	10	10	17	13	8.0	10
7	11	8.0	11	14	14	10	10	10	16	11	7.5	11
8	11	8.0	11	14	15	10	10	10	15	10	7.0	10
9	11	8.0	11	14	14	10	10	10	15	10	7.0	11
10	12	8.4	11	14	13	9.4	10	10	15	10	7.5	11
11	10	8.4	12	14	12	8.9	8.9	10	15	10	8.0	11
12	8.4	9.4	12	15	12	8.9	10	11	14	10	7.5	12
13	8.0	8.9	12	14	12	8.9	10	11	13	10	7.5	12
14	25	10	11	14	12	8.4	10	11	13	10	7.5	12
15	9.4	9.4	12	14	12	8.0	10	10	12	10	7.5	12
16	8.4	10	12	15	12	8.9	10	10	12	10	8.4	12
17	8.0	10	12	15	13	8.9	10	9.4	12	9.4	8.9	12
18	8.0	10	12	15	13	8.4	10	9.4	12	10	8.4	12
19	8.0	10	12	15	13	8.4	9.4	9.4	12	9.4	8.4	12
20	8.4	10	12	15	13	8.9	9.4	9.4	12	9.4	8.9	11
21	8.9	10	12	15	14	8.9	10	9.4	11	9.4	8.4	11
22	8.4	10	13	14	14	8.9	10	8.9	11	9.4	8.4	10
23	8.0	10	13	14	14	8.9	10	8.9	10	9.4	8.4	10
24	8.0	10	14	14	14	8.9	9.4	8.9	10	9.4	8.4	10
25	7.5	10	14	14	14	8.9	8.9	276	11	27	8.0	10
26	8.0	10	14	14	14	9.4	9.4	148	11	10	8.4	9.4
27	8.0	10	14	15	12	9.4	8.9	26	11	10	8.9	8.9
28	8.0	10	14	14	12	10	8.9	13	10	10	9.4	8.4
29	8.0	10	14	15	13	10	9.4	10	11	9.4	10	8.4
30	8.0	10	14	15	-	10	9.4	9.4	11	8.9	10	8.0
31	8.0	-	15	16	-	9.4	-	788	-	8.9	10	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	301.4	25	7.5	9.72	598
November.....	276.5	10	8.0	9.22	548
December.....	378.0	15	10	12.2	750
Calendar year 1947.....	4,809.3	43	7.5	13.2	9,540
January.....	446	16	14	14.4	885
February.....	400	18	12	13.8	793
March.....	300.7	12	8.0	9.70	596
April.....	292.0	10	8.9	9.73	579
May.....	1,504.8	788	8.9	48.5	2,980
June.....	1,422	619	10	47.4	2,820
July.....	327.0	27	8.9	10.5	549
August.....	258.9	10	7.0	8.35	514
September.....	315.1	12	8.0	10.5	625
Water year 1947-48.....	6,222.4	788	7.0	17.0	12,340

Peak discharge (base, 200 sec.-ft.)- May 25 (7:10 p.m.) 4,020 sec.-ft.; May 31 (8:10 p.m.) 9,230 sec.-ft.; June 1 (11:30 p.m.) 3,200 sec.-ft.

## Delaware River near Red Bluff, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 32°01', long. 104°03', sec. 23, T. 26 S., R. 28 E., at bridge on U. S. Highway 285, 3½ miles upstream from mouth and 4 miles south of Red Bluff, Eddy County. Datum of gage is 2,900.7 feet above mean sea level, datum of 1929.

Drainage area.- 689 square miles (revised).

Records available.- October 1937 to September 1948. April 1912 to September 1913 at site 3 miles upstream (published as Delaware River near Malaga, N. Mex.). May 1914 to June 1915 at site 2½ miles downstream (published as Delaware River near Angeles, Tex.).

Average discharge.- 12 years (1912-13, 1937-48), 12.0 second-feet.

Extremes.- Maximum discharge during year, 8,040 second-feet May 31 (gage height, 9.02 feet); no flow at times.

1912-13, 1914-15, 1937-48: Maximum discharge, 34,600 second-feet June 27, 1938 (gage height, 18.00 feet, from floodmarks), by slope-area method; no flow at times.

Remarks.- Records fair. No diversions above station.

Rating table, water year 1947-48 (gage height, in feet, and discharge, in second-feet)

0.52	0	1.2	4.1	1.9	21	2.6	130
.6	.1	1.3	5.5	2.0	27	2.8	205
.7	.2	1.4	7.1	2.1	34	3.0	290
.8	.6	1.5	9.2	2.2	44	3.2	390
.9	1.1	1.6	12	2.3	56	3.5	575
1.0	1.9	1.7	14	2.4	72		
1.1	2.9	1.8	18	2.5	98		

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.3	0.9	2.1	2.6	2.3	1.7	1.4	0.5	121	0	0.2	0.2
2	.4	.9	2.1	2.5	2.3	1.7	1.5	.4	120	0	0	.1
3	.4	1.0	2.3	2.4	2.2	1.7	1.5	.3	24	0	0	.1
4	.4	1.1	2.5	2.3	2.5	1.7	1.4	.3	8.5	0	0	0
5	.5	1.1	2.5	2.2	3.3	1.8	1.4	.3	4.2	0	0	0
6	.5	1.0	2.4	2.2	3.1	1.9	1.3	.2	2.5	13	0	0
7	.6	1.0	2.2	2.2	2.6	1.9	1.2	.3	1.8	1.8	0	0
8	.6	1.2	2.2	2.2	2.4	1.9	1.1	.2	1.4	1.4	0	0
9	.5	1.4	2.1	2.2	2.4	1.8	1.1	.1	1.1	.4	0	0
10	.5	1.5	2.1	2.1	2.3	1.7	1.2	.1	.9	.1	0	0
11	.5	1.5	2.2	2.1	1.9	1.8	1.1	.1	.8	.1	0	0
12	.5	1.6	2.2	2.0	1.9	1.8	.9	.1	.6	0	0	0
13	.5	1.7	2.3	2.0	2.1	1.8	.9	.3	.5	0	0	0
14	.6	2.2	2.4	2.0	2.1	1.8	1.1	.5	.3	0	0	0
15	.6	2.3	2.3	2.0	2.1	1.6	1.1	.4	.2	0	4.8	0
16	.7	2.1	2.3	2.0	2.0	1.5	1.2	.3	.2	0	43	0
17	.6	2.1	2.2	2.0	1.9	1.6	1.1	.2	.2	0	6.4	0
18	.6	2.3	2.2	2.1	1.8	1.7	1.0	.1	.1	0	2.3	0
19	.6	2.3	2.2	2.1	1.9	1.7	.9	0	0	0	.9	0
20	.7	2.2	2.2	2.1	1.9	1.7	.8	0	0	0	.4	0
21	.8	2.1	2.2	2.2	1.9	1.5	.8	0	0	3.9	.1	0
22	.7	1.9	2.2	2.2	1.9	1.5	1.1	0	0	2.8	0	0
23	.6	2.1	2.2	2.1	1.9	1.5	1.4	0	0	.8	0	0
24	.7	2.1	2.2	2.2	1.9	1.5	1.3	0	0	.1	0	0
25	.7	2.1	2.2	2.2	1.9	1.5	.9	34	0	0	0	0
26	.8	1.9	2.2	2.3	2.0	1.4	.8	63	0	0	0	0
27	.9	1.9	2.2	2.3	1.9	1.4	.7	15	0	0	0	0
28	1.0	2.0	2.2	2.4	1.8	1.4	.7	5.4	.8	0	0	0
29	1.1	2.0	2.2	2.6	1.7	1.6	.7	2.8	.2	0	81	0
30	1.0	2.0	2.1	2.7	-	1.4	.7	1.7	.1	.3	3.2	0
31	.9	-	2.4	2.7	-	1.3	-	523	-	1.0	-	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	19.8	1.1	0.3	0.64	39
November.....	51.5	2.3	.9	1.72	102
December.....	69.3	2.5	2.1	2.24	137
Calendar year 1947.....	521.2	6.3	0	1.43	1,030
January.....	69.2	2.7	2.0	2.23	137
February.....	62.0	3.3	1.7	2.14	123
March.....	50.8	1.9	1.3	1.64	101
April.....	32.3	1.5	.7	1.08	64
May.....	649.6	523	0	21.0	1,290
June.....	289.4	121	0	9.65	574
July.....	25.7	13	0	.83	51
August.....	142.8	81	0	4.61	283
September.....	.4	.2	0	.01	.8
Water year 1947-48.....	1,462.8	523	0	4.00	2,900

Peak discharge (base, 650 sec.-ft.)- May 31 (10:00 p.m.) 8,040 sec.-ft.; Aug. 29 (5 p.m.) 1,060 sec.-ft.

d Doubtful gage-height record; discharge interpolated.

RIO GRANDE BASIN

345

Salt (Screwbean) Draw near Orla, Tex.

Location.- Water-stage recorder and low-water control, lat. 31°52'40", long. 103°56'50", at bridge on U. S. Highway 285, 157 feet upstream from Panhandle & Santa Fe Railway bridge, 2.7 miles southwest of Red Bluff Dam, 4.1 miles northwest of Orla, Reeves County, and 5 miles upstream from mouth. Datum of gage is 2,804.2 feet above mean sea level, datum of 1929.

Drainage area.- 464 square miles (revised).

Records available.- August 1939 to December 1940, October 1943 to September 1948.

Extremes.- Maximum discharge during year, 840 second-feet June 25 (gage height, 9.93 feet); no flow at times.  
1939-40, 1943-48: Maximum discharge, 3,040 second-feet Aug. 18, 1944 (gage height, 13.88 feet), from rating curve extended above 1,500 second-feet; no flow at times.  
Floods have reached a stage of 18 or 19 feet, from information by local residents.

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

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					0			0	10	0.2	0.1	5.9
2					0			0	26	.2	.1	5.3
3					0			0	3.2	.1	0	5.0
4					0			0	.3	.1	0	4.7
5					0			0	.2	.1	0	4.1
6					0			0	.2	.1	0	3.8
7					.1			0	.1	.1	0	3.2
8					.1			0	.1	.1	0	2.6
9					.1			0	.1	.1	0	2.3
10					.1			0	.1	0	0	1.7
11					.1			0	.1	0	0	1.4
12					0			0	.1	0	0	1.0
13					0			0	.1	0	0	.3
14					0			0	.1	0	0	.2
15					0			0	.1	0	2.9	.2
16					0			0	.1	0	.2	.2
17					0			0	.1	0	0	.2
18					0			0	.1	0	0	.2
19					0			0	.1	0	0	.1
20					0			0	0	0	0	.1
21					0			0	0	0	0	.1
22					0			0	0	0	0	.2
23					0			0	0	0	0	.1
24					0			0	0	0	0	.1
25					0			52	120	0	0	.1
26					0			7.0	57	0	0	.1
27					0			.2	4.7	0	0	.1
28					0			.2	1.2	0	0	.1
29					0			.1	.3	0	24	.1
30					-			.1	.2	.1	12	.1
31					-			28	-	.1	5.2	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947.....	51.4	9.6	0	.14	101
January.....	0	0	0	0	0
February.....	.5	.1	0	.02	1.0
March.....	0	0	0	0	0
April.....	0	0	0	0	0
May.....	87.6	52	0	2.83	174
June.....	224.5	120	0	7.48	445
July.....	1.3	.2	0	.04	2.6
August.....	45.5	24	0	1.47	90
September.....	43.6	5.9	.1	1.45	86
Water year 1947-48.....	403.0	120	0	1.10	799

Peak discharge (base, 600 sec.-ft.) - June 25 (10:30 p.m.) 840 sec.-ft.  
Note.- No gage-height record July 15 to Aug. 9, Aug. 12 to Sept. 12, Sept. 23-30; discharge computed on basis of recorded range in stage, weather records, and records for Pecos River near Orla.

## RIO GRANDE BASIN

Principal diversions from Pecos River between Red Bluff Reservoir and Imperial, Tex.

Records of discharge are collected for eight canals that divert water from Pecos River between Red Bluff Reservoir and Imperial, Tex. Each of these canals is equipped with a water-stage recorder for collecting gage-height records. All stations are located within 2 miles of canal head gate except as noted herein. Water diverted by these canals is used for irrigation of lands on both sides of Pecos River in Reeves, Ward, and Pecos Counties. Stations prior to 1941 were published separately (daily discharge figures for the earlier records). Gage-height records collected in cooperation with Red Bluff Water Power Control District, Pecos, Tex.

Reeves County Water Improvement District No. 2 Canal near Mentone, diverts from right bank, lat. 31°38', long. 103°34'. Records available, February 1922 to July 1925 (published as Farmers Independent Canal near Porterville, Tex.) and August 1939 to September 1948.

Ward County Water Improvement District No. 3 Canal near Barstow, diverts from left bank, lat. 31°34', long. 103°31'. Records available, August 1939 to September 1948.

Ward County Irrigation District No. 1 Canal near Barstow, diverts from left bank, lat. 31°33', long. 103°29'. Records available, February 1922 to September 1925 at site about half a mile upstream (published as Barstow Canal near Barstow, Tex.), and August 1939 to September 1948.

Grandfalls-Big Valley Canal near Barstow, diverts from left bank, lat. 31°25', long. 103°18'. Records available, March 1922 to November 1925, September 1939 to September 1948. Water diverted through Ward County Water Improvement District No. 2 Canal irrigates most of lands formerly supplied by this canal.

Pecos County Water Improvement District No. 2 upper diversion Canal near Grandfalls, diverts from right bank, lat. 31°20', long. 102°58' (gage 12½ miles downstream from head gates). Records available, March 1922 to July 1925 at site 11 miles upstream (published as Imperial High-line Canal near Grandfalls, Tex.), and August 1939 to September 1948. Prior to Dec. 8, 1947, water-stage recorder at site 2½ miles downstream at different datum.

Pecos County Water Improvement District No. 2 Canal near Imperial, diverts from right bank, lat. 31°18', long. 102°45' (gage 7½ miles below outlet head gate at Imperial Reservoir). Records available, April 1940 to September 1948.

Ward County Water Improvement District No. 2 Canal near Grandfalls, diverts from left bank, lat. 31°22', long. 103°01'. Records available, August 1939 to September 1948.

Pecos County Water Improvement District No. 3 Canal near Imperial, diverts from Pecos County Water Improvement District No. 2 Canal above station near Imperial on that canal, lat. 31°18', long. 102°45'. Records available, March 1940 to September 1948.

Several smaller diversions (pumps) divert water between Red Bluff Reservoir and Imperial for irrigation of lands adjacent to Pecos River, but no records for them were obtained.

Diversions, in acre-feet, water year October 1947 to September 1948

Month	Reeves County District 2 Canal near Mentone	Ward County District 3 Canal near Barstow	Ward County District 1 Canal near Barstow	Grandfalls- Big Valley Canal near Barstow
October.....	37	0	255	0
November.....	50	0	2,8	0
December.....	29	0	14	0
Calendar year 1947	6,680	7,500	17,870	2,710
January.....	50	0	19	0
February.....	99	0	21	0
March.....	135	0	21	0
April.....	cl,350	1,850	1,560	205
May.....	c407	0	2,860	443
June.....	cl,090	2,530	4,530	687
July.....	a132	1,250	3,050	636
August.....	ac1,550	0	3,890	2,8
September.....	ac487	260	a729	160
Water year 1947-48	5,410	5,890	16,950	2,130

Month	Pecos County District 2 Canal (upper diver.) near Grandfalls	Pecos County District 2 Canal near Imperial*	Ward County District 2 Canal near Grandfalls	Pecos County District 3 Canal near Imperial*
October.....	7.3	0	441	0
November.....	c97	.6	58	0
December.....	0	0	0	0
Calendar year 1947	27,190	10,490	21,240	10,940
January.....	502	0	0	0
February.....	742	0	0	0
March.....	507	713	341	0
April.....	4,770	1,140	4,480	1,620
May.....	al,520	1,410	1,350	1,330
June.....	7,170	1,670	5,920	2,060
July.....	5,830	2,230	1,830	3,350
August.....	2,350	2,250	633	374
September.....	965	871	154	71
Water year 1947-48	24,460	10,280	15,190	8,600

\*Combined flow of Pecos County Water Improvement District No. 2 Canal near Imperial and Pecos County Water Improvement District No. 3 Canal near Imperial represents released water from Imperial Reservoir (fed by Pecos County Water Improvement District No. 2 upper diversion canal) plus water diverted from Pecos River by Pecos County Water Improvement District No. 2 lower diversion canal.  
a No gage-height record at time; discharge computed on basis of available measurements, recorded range in stage, engineers' notes, and records for nearby stations.  
c Backwater from check gates part of month.

## RIO GRANDE BASIN

Madera Canyon near Toyahvale, Tex.

Location.- Water-stage recorder, lat. 30°52', long. 103°58', in Jeff Davis County, 11 miles upstream from Aguja Canyon and 12 miles southwest of Toyahvale, Reeves County.

Drainage area.- 54 square miles.

Records available.- July 1932 to September 1948.

Average discharge.- 16 years, 4.58 second-feet.

Extremes.- Maximum discharge during year, 377 second-feet July 23 (gage height, 3.01 feet), from rating curve extended above 200 second-feet on basis of slope-area determination at gage height 6.8 feet; no flow most of time.  
1932-48: Maximum discharge, 5,120 second-feet Sept. 29, 1932 (gage height, 8.00 feet, from floodmark), from rating curve extended above 200 second-feet on basis of slope-area determination at gage height 6.8 feet; no flow at times.

Remarks.- Records poor. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										0		
2										0		
3										0		
4										0		
5										0		
6										0		
7										0		
8										0		
9										0		
10										0		
11										0		
12										0		
13										0		
14										0		
15										0		
16										0		
17										0		
18										0		
19										0		
20										0		
21										0		
22										0		
23										16		
24										0		
25										0		
26										0		
27										0		
28										0		
29										2.0		
30										0		
31										0		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	0	0	0	0	0
November.....	0	0	0	0	0
December.....	0	0	0	0	0
Calendar year 1947.....	246.0	118	0	.67	488
January.....	0	0	0	0	0
February.....	0	0	0	0	0
March.....	0	0	0	0	0
April.....	0	0	0	0	0
May.....	0	0	0	0	0
June.....	0	0	0	0	0
July.....	18.0	16	0	.58	36
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48.....	18.0	16	0	.05	36

Peak discharge (base, 200 sec.-ft.).- July 23 (5:30 p.m.) 377 sec.-ft.



## RIO GRANDE BASIN

Toyah Creek below Toyah Lake, near Pecos, Tex.

Location.- Water-stage recorder, lat. 31°21', long. 103°24', at bridge on county road between Pecos and Grandfalls, at lower end of Toyah Lake, 6 miles upstream from mouth and 7.4 miles southeast of Pecos, Reeves County.

Drainage area.- 3,709 square miles (contributing area).

Records available.- August 1939 to September 1948.

Extremes.- Maximum discharge during year, 19 second-feet July 31 (gage height, 1.57 feet); no flow most of time.  
1939-48: Maximum discharge, 5,850 second-feet Aug. 7, 1940 (gage height, 4.17 feet); no flow most of time.  
Flood of September 1932 reached a stage of 7.7 feet, from information by local residents.

Remarks.- Records good. Several diversions above station for irrigation. Flood flow materially affected by use of spread-out dams above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1										0	14	
2										0	12	
3										0	9.3	
4										0	5.8	
5										0	3.5	
6										0	2.0	
7										0	.5	
8										0	.1	
9										0	0	
10										0	0	
11										0	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	0	
22										0	0	
23										.6	0	
24										7.4	0	
25										5.3	0	
26										2.7	0	
27										.5	0	
28										.1	0	
29										.2	0	
30										2.8	0	
31										16	0	
Month	Second-foot-days					Maximum	Minimum	Mean	Runoff in acre-feet			
October.....	0					0	0	0	0			
November.....	0					0	0	0	0			
December.....	0					0	0	0	0			
Calendar year 1947 .....	46.9					10	0	.13	93			
January.....	0					0	0	0	0			
February.....	0					0	0	0	0			
March.....	0					0	0	0	0			
April.....	0					0	0	0	0			
May.....	0					0	0	0	0			
June.....	0					0	0	0	0			
July.....	35.6					16	0	1.15	71			
August.....	47.2					14	0	1.52	94			
September.....	0					0	0	0	0			
Water year 1947-48 .....	82.8					16	0	.23	165			

Peak discharge (base, 400 sec.-ft.).- No peak above base.

## San Solomon Springs at Toyahvale, Tex.

Location.- Water-stage recorder and sharp-crested weir, lat. 30°55', long. 103°47', on South Canal at Toyahvale, Reeves County, and 540 feet downstream from spring pool. Datum of gage is 3,311.0 feet above mean sea level, datum of 1929.

Records available.- October 1931 to December 1933, March 1941 to September 1948. 1900, 1904, 1919, 1922-25, 1934-36 (occasional discharge measurements published as miscellaneous measurements).

Extremes.- Maximum daily discharge during year, 34 second-feet May 10, 11; minimum daily, 30 second-feet July 15, 16.  
1931-33, 1941-48: Maximum daily discharge, 71 second-feet Oct. 7-9, 1932, Oct. 26-30, 1941; minimum daily, 30 second-feet Nov. 5-11, 1931, Jan. 22 to Feb. 23, 1932, July 15, 16, 1948.  
Maximum discharge measured during years when occasional measurements were made, 46 second-feet Sept. 5, 1900, July 21, 1904.

Remarks.- Records good. Discharge represents total flow of springs and is determined by combining flows in South Canal and two additional outlets (flow measured periodically), Middle and North Canals. Flow into each canal regulated by operation of head gates. Water used for irrigation in vicinity of Balmorhea.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	31	32	31	33	32	31	32	32	31	31	32	31
2	31	32	31	33	32	31	32	32	32	31	32	31
3	32	32	31	33	32	31	32	32	32	31	32	31
4	32	32	31	33	32	31	32	32	33	31	31	31
5	32	32	31	33	32	31	31	32	32	31	31	31
6	32	32	31	33	32	31	31	32	32	31	31	31
7	31	31	31	33	32	31	31	32	32	31	31	31
8	31	31	31	33	32	31	31	32	32	31	31	31
9	31	31	31	33	32	31	31	33	32	31	31	31
10	31	31	31	33	32	31	31	34	32	31	31	32
11	31	31	31	33	31	31	31	34	32	31	31	32
12	32	31	31	33	31	31	32	33	32	31	31	32
13	32	31	31	33	31	31	32	33	32	31	31	31
14	32	31	31	33	31	31	31	33	32	31	31	31
15	31	31	31	33	31	31	31	33	32	30	31	31
16	31	31	31	33	31	31	31	33	31	30	32	31
17	31	31	31	33	31	31	31	33	31	31	32	31
18	31	31	31	33	31	31	31	33	31	31	32	31
19	31	31	31	33	31	31	32	33	32	31	31	31
20	31	31	32	33	31	31	32	33	32	31	31	31
21	32	31	32	33	31	31	32	32	32	31	31	31
22	32	31	32	33	31	31	33	32	32	31	31	31
23	32	31	32	33	31	31	33	33	32	31	31	31
24	32	31	32	33	31	31	33	33	32	31	31	31
25	32	31	32	33	31	31	33	33	32	32	31	31
26	32	31	32	33	31	31	33	33	32	32	31	31
27	32	31	32	32	31	31	33	32	32	32	31	31
28	32	31	32	32	31	31	33	32	31	32	31	31
29	32	31	32	32	31	31	33	31	31	32	31	31
30	32	31	32	32	-	31	33	31	31	32	31	31
31	32	-	32	32	-	31	-	31	-	32	31	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	979	32	31	31.6	1,940
November.....	936	32	31	31.2	1,860
December.....	973	32	31	31.4	1,930
Calendar year 1947.....	12,359	41	31	33.9	24,500
January.....	1,018	33	32	32.8	2,020
February.....	909	32	31	31.3	1,800
March.....	961	31	31	31.0	1,910
April.....	957	33	31	31.9	1,900
May.....	1,007	34	31	32.5	2,000
June.....	954	33	31	31.8	1,890
July.....	966	32	30	31.2	1,920
August.....	967	32	31	31.2	1,920
September.....	933	32	31	31.1	1,850
Water year 1947-48.....	11,560	34	30	31.6	22,940

## Comanche Springs at Fort Stockton, Tex.

Location.- Water-stage recorder, lat. 30°53', long. 102°52', on outlet canal of Pecos County Water Improvement District No. 1, in eastern outskirts of Fort Stockton, Pecos County, a quarter of a mile upstream from bridge on U. S. Highway 290 and 0.5 mile downstream from head of springs. Datum of gage is 2,922.8 feet above mean sea level, datum of 1929.

Records available.- February 1941 to September 1948. 1899, 1904, 1919, 1922, 1924-25, 1932-41 (occasional discharge measurements published as miscellaneous measurements).

Extremes.- Maximum daily discharge during year, 39 second-feet Oct. 1-8, Nov. 14 to Feb. 15; minimum daily, 33 second-feet Aug. 6 to Sept. 5.  
1941-48: Maximum daily discharge, 54 second-feet Jan. 30, 1942; minimum daily, that of Aug. 6 to Sept. 5, 1948.  
Maximum discharge measured prior to 1941, 66 second-feet June 23, 1899; minimum measured, 38.7 second-feet July 14, 1936.

Remarks.- Records good. Discharge represents total flow of springs exclusive of surface runoff from precipitation. Spring flow fluctuates slowly; aquatic growth changes stage-discharge relation frequently; daily discharge determined from hydrograph based on discharge measurements. About 6,000 acres of land irrigated below station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	39	38	39	39	39	38	38	37	38	38	34	33
2	39	38	39	39	39	38	38	37	38	38	34	33
3	39	38	39	39	39	38	38	37	38	37	34	33
4	39	38	39	39	39	38	38	37	38	37	34	33
5	39	38	39	39	39	38	38	37	38	37	34	33
6	39	38	39	39	39	38	38	37	38	37	33	34
7	39	38	39	39	39	38	38	37	38	37	33	34
8	39	38	39	39	39	38	38	37	38	37	33	34
9	38	38	39	39	39	38	38	37	38	37	33	34
10	38	38	39	39	39	38	38	36	38	37	33	34
11	38	38	39	39	39	38	38	36	38	36	33	34
12	38	38	39	39	39	38	38	36	38	36	33	34
13	38	38	39	39	39	38	38	36	38	36	33	34
14	38	39	39	39	39	38	38	36	38	36	33	34
15	38	39	39	39	39	38	38	36	38	36	33	34
16	38	39	39	39	38	38	38	36	38	36	33	34
17	38	39	39	39	38	38	38	36	38	36	33	34
18	38	39	39	39	38	38	38	36	38	35	33	34
19	38	39	39	39	38	38	38	36	38	35	33	34
20	38	39	39	39	38	38	38	37	38	35	33	34
21	38	39	39	39	38	38	38	37	38	35	33	34
22	38	39	39	39	38	38	38	37	38	35	33	34
23	38	39	39	39	38	38	37	37	38	35	33	34
24	38	39	39	39	38	38	37	37	38	35	33	34
25	38	39	39	39	38	38	37	37	38	34	33	34
26	38	39	39	39	38	38	37	37	38	34	33	34
27	38	39	39	39	38	38	37	37	38	34	33	34
28	38	39	39	39	38	38	37	37	38	34	33	34
29	38	39	39	39	38	38	37	37	38	34	33	34
30	38	39	39	39	-	38	37	37	38	34	33	34
31	38	-	39	39	-	38	-	37	-	34	33	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1,186	39	38	38.3	2,350
November.....	1,157	39	38	38.6	2,290
December.....	1,203	39	39	39.0	2,400
Calendar year 1947 .....	14,966	45	38	41.0	29,680
January.....	1,209	39	39	39.0	2,400
February.....	1,117	39	38	38.5	2,220
March.....	1,178	38	38	38.0	2,340
April.....	1,132	38	37	37.7	2,250
May.....	1,137	37	36	36.7	2,260
June.....	1,140	38	38	38.0	2,260
July.....	1,108	38	34	35.7	2,190
August.....	1,028	34	33	33.2	2,040
September.....	1,024	35	33	34.1	2,030
Water year 1947-48 .....	13,623	39	33	37.2	27,030

## Devils River near Juno, Tex.

Location.- Water-stage recorder, lat. 29°58', long. 101°09', 500 feet downstream from Walter Baker ranch house, 2 miles upstream from Phillips Creek, and 13 miles south-west of Juno, Val Verde County. Datum of gage is 1,489.7 feet above mean sea level, datum of 1929 (Corps of Engineers bench mark).

Drainage area.- 2,733 square miles.

Records available.- May 1925 to September 1948.

Average discharge.- 23 years, 196 second-feet.

Extremes.- Maximum discharge during year, 240,000 second-feet July 4 (gage height, 26.80 feet, from floodmark), by slope-area method; minimum, 38 second-feet May 1, 2, 4, 5, 1925-48: Maximum discharge, 370,000 second-feet Sept. 1, 1932 (gage height, 33.8 feet, revised, from floodmarks), by slope-area method; minimum, that of May 1, 2, 4, 5, 1948.

Remarks.- Records good except those above 500 second-feet, which are poor. No diversion above station.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	63	52	54	54	53	52	49	40	49	78	94	85
2	54	54	54	54	54	50	49	39	49	75	94	83
3	54	54	56	54	54	50	49	40	49	75	92	83
4	56	54	56	54	54	50	49	39	48	96,200	92	82
5	56	54	54	54	54	50	49	39	48	5,560	92	82
6	56	54	56	54	54	50	49	40	46	1,330	92	80
7	58	54	58	54	54	50	48	40	46	897	90	80
8	58	54	58	54	53	52	48	40	46	275	90	82
9	56	54	56	54	54	52	48	40	46	200	89	174
10	56	56	56	54	54	50	48	40	46	183	89	114
11	56	54	56	54	54	49	46	65	46	g170	89	105
12	56	54	56	54	54	49	48	84	46	g158	89	98
13	58	56	54	54	49	52	164	46	46	g144	89	94
14	58	56	58	54	53	49	48	76	45	136	87	92
15	58	56	58	54	53	49	48	70	45	132	87	89
16	58	56	56	54	52	49	46	66	45	124	87	87
17	56	54	56	54	52	49	45	66	45	118	85	89
18	58	56	56	53	52	49	45	64	45	114	85	89
19	58	56	56	54	53	49	44	62	44	111	85	87
20	56	56	56	54	52	49	44	60	45	109	85	87
21	56	56	56	54	52	50	44	60	46	107	85	85
22	56	58	56	54	52	49	45	59	46	107	85	85
23	56	56	56	54	52	49	48	59	49	103	85	83
24	56	56	56	54	52	49	46	59	63	101	85	83
25	56	56	56	54	52	50	49	56	3,360	99	85	83
26	59	56	58	54	54	50	45	54	828	98	85	82
27	59	54	56	54	56	49	43	53	156	98	85	82
28	59	54	56	54	52	49	41	53	101	96	85	82
29	59	54	56	54	52	49	41	52	92	95	85	82
30	58	-	56	54	-	49	41	52	83	94	85	80
31	58	-	56	54	-	49	-	52	-	94	85	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	1,761	59	53	56.8	3,490
November	1,666	64	54	55.5	3,300
December	1,740	60	54	56.1	3,450
Calendar year 1947	25,699	935	53	70.4	50,960
January	1,673	54	53	54.0	3,320
February	1,541	56	52	53.1	3,060
March	1,538	52	49	49.6	3,050
April	1,396	52	41	46.5	2,770
May	1,783	164	39	57.5	3,540
June	5,749	3,360	44	192	11,400
July	107,082	96,200	75	3,454	212,400
August	2,717	94	85	87.6	5,390
September	2,689	174	80	89.6	5,330
Water year 1947-48	131,335	96,200	39	359	260,500

Peak discharge (base, 500 sec.-ft.)- June 25 (3 p.m.) 11,600 sec.-ft.; July 4 (12 m.) 240,000 sec.-ft.

g Computed from graph based on gage readings.

Note.- No gage-height record July 4-10, Sept. 23-30; discharge computed on basis of slope-area determination for July 4, information by local residents, and recorded range in stage.

## Las Moras Springs at Brackettville, Tex.

Location.- Staff gage, lat. 29°18', long. 100°25', in spring pool at Brackettville, Kinney County, a quarter of a mile upstream from bridge on Brackettville-Fort Clark road. Datum of gage is 1,095.0 feet above mean sea level (Texas Highway Department bench mark).

Records available.- December 1895 to August 1938 (occasional miscellaneous discharge measurements), September 1938 to September 1948 (discharge measurements only).

Extremes.- 1895-1948: Maximum discharge measured, 60 second-feet (by Prof. T. U. Taylor) June 30, 1899; minimum measured, 5.7 second-feet July 21, 1945.

Remarks.- Discharge measurements represent total flow of springs. Springs issue from limestone in Balcones fault zone and respond to rainfall on Edwards Plateau. Elevation of spring pool is regulated by outlet gate which materially affects discharge. City of Brackettville diverts water from spring pool for domestic and recreational uses.

## RIO GRANDE BASIN

Discharge measurements, in second-feet, of Las Moras Springs at Brackettville, Tex.,  
water year October 1947 to September 1948

Date	Discharge (sec.-ft.)	Date	Discharge (sec.-ft.)	Date	Discharge (sec.-ft.)
Oct. 22	21.6	Feb. 20	13.5	June 14	9.72
Nov. 24	16.5	Mar. 26	10.6	July 27	30.9
Jan. 12	15.4	May 7	10.6	Aug. 31	11.9

## MIMBRES RIVER BASIN

Mimbres River near Mimbres, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 32°52'20", long. 107°59'00".  
In NEFSW sec. 33, T. 16 S., R. 11 W., a quarter of a mile downstream from Bear Canyon  
and 1 1/2 miles northwest of Mimbres.

Drainage area.- 183 square miles.

Records available.- October 1930 to September 1948 in reports of Geological Survey. May

1921 to December 1931 in reports of State engineer.

Average discharge.- 25 years (1921-24, 1926-48), 11.6 second-feet.

Extremes.- Maximum discharge during year, 305 second-feet July 23 (gage height, 4.54

feet; minimum daily, 1.6 second-feet Apr. 22.

1930-48: Maximum discharge, 2,230 second-feet Aug. 19, 1944 (gage height, 5.54  
feet), from rating curve extended above 120 second-feet by logarithmic plotting; mini-  
mum daily, 0.9 second-foot July 22, 1947.

Remarks.- Records fair. Flow partly regulated by Bear Canyon Reservoir (capacity, 700  
acre-feet). Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	3.1	6.8	9.3	5.2	4.7	6.3	5.3	4.4	4.1	2.2	7.8	2.5
2	2.6	6.9	9.3	5.2	4.6	5.6	5.5	4.5	6.3	2.3	16	2.4
3	2.0	7.0	9.0	5.2	4.4	5.4	4.3	4.9	8.4	2.1	7.8	2.4
4	2.0	7.2	8.8	5.2	4.7	5.4	3.6	5.6	7.8	2.3	7.3	2.3
5	2.1	7.2	8.8	5.3	4.5	5.3	3.3	8.8	7.5	2.3	6.8	2.3
6	2.2	7.4	8.8	5.3	3.6	5.2	2.2	8.0	7.3	2.3	5.6	2.2
7	2.1	7.5	8.3	5.2	3.6	5.2	2.2	7.4	6.8	2.3	5.2	2.2
8	2.0	7.5	8.6	5.2	3.6	5.1	2.6	7.5	7.0	2.3	5.4	2.1
9	2.0	7.6	8.6	5.2	3.6	4.9	3.0	7.3	7.3	2.3	4.0	2.2
10	1.9	7.6	8.3	5.2	3.9	4.8	3.0	8.0	7.2	2.3	3.1	2.3
11	1.9	7.6	8.3	4.8	4.4	4.7	2.8	8.8	7.2	2.3	3.1	2.3
12	1.9	7.6	8.3	3.6	4.5	4.7	3.0	9.3	7.8	2.3	3.2	2.3
13	1.9	7.8	8.3	3.0	4.5	4.7	2.8	8.8	6.8	2.3	3.2	2.0
14	2.0	7.6	8.0	3.1	4.6	4.6	2.6	9.3	4.5	2.4	3.1	1.9
15	2.0	7.5	7.4	3.2	4.6	5.2	2.6	9.0	3.7	2.4	3.1	1.9
16	2.0	7.5	5.1	3.5	3.2	4.8	2.6	9.0	3.6	2.5	3.2	1.8
17	2.4	8.3	4.8	3.6	2.4	5.8	2.6	9.0	3.4	2.5	3.1	1.8
18	2.4	10	4.8	3.6	2.5	6.2	2.4	8.8	3.6	2.2	3.5	2.0
19	2.9	10	4.8	3.9	2.4	6.2	1.9	9.0	3.2	2.4	3.2	2.0
20	12	10	4.8	3.9	2.4	5.5	1.7	9.8	2.9	2.9	3.9	2.1
21	9.2	10	5.0	3.7	2.3	4.4	1.8	10	2.5	3.0	4.8	2.1
22	2.4	10	5.0	3.6	2.2	4.2	1.6	9.8	2.6	3.6	4.2	2.3
23	2.4	9.8	5.1	3.4	2.2	4.3	1.8	10	2.4	3.8	4.1	2.4
24	2.7	9.8	5.0	3.1	2.5	4.3	1.9	10	2.5	9.3	3.7	2.5
25	2.7	9.8	5.0	3.4	4.6	4.7	2.3	9.8	2.1	9.4	3.1	2.6
26	2.8	9.8	5.0	3.3	4.9	4.9	2.1	7.8	1.7	7.8	3.1	2.3
27	2.8	9.5	4.9	3.6	5.0	4.5	2.0	7.3	2.0	8.0	2.7	2.1
28	2.8	9.5	5.0	3.9	5.5	4.7	2.1	7.2	2.3	7.2	2.7	2.1
29	3.1	9.5	4.3	4.3	5.8	4.7	2.1	6.5	2.3	7.2	2.6	1.9
30	3.6	9.5	5.2	4.7	-	4.9	2.7	7.0	2.4	6.8	2.6	2.0
31	5.0	-	5.2	4.7	-	5.1	-	5.6	-	16	2.5	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October	92.9	12	1.9	3.00	184
November	254.0	10	6.8	8.47	504
December	207.8	9.3	4.8	6.70	412
Calendar year 1947	1,456.2	64	.9	3.99	2,890
January	130.1	5.3	3.0	4.20	258
February	111.7	5.8	2.2	3.85	222
March	156.3	6.3	4.2	5.04	310
April	80.4	5.5	1.6	2.68	159
May	248.2	10	4.4	8.01	492
June	139.2	8.4	1.7	4.64	276
July	143.2	18	2.1	4.62	284
August	137.7	16	2.5	4.44	273
September	65.3	2.6	1.8	2.18	130
Water year 1947-48	1,766.8	18	1.6	4.83	3,500

Peak discharge (base, 290 sec.-ft.)- July 23 (2:30 p.m.) 305 sec.-ft.

## MIMBRES RIVER BASIN

353

Mimbres River near Faywood, N. Mex.

Location.- Water-stage recorder, lat. 32°35'10", long. 107°55'10", in NW<sup>1</sup> sec. 7, T. 20 S., R. 10 W., 6 miles northeast of Faywood Hot Springs, 10 miles northeast of Faywood, and 12 miles upstream from San Vicente Arroyo.

Drainage area.- 485 square miles.

Records available.- April 1908 to December 1914 and October 1930 to September 1948 in reports of Geological Survey. April 1908 to December 1931 in reports of State engineer.

Average discharge.- 32 years (1908-10, 1912-17, 1919-24, 1926-27, 1929-48), 20.2 second-feet.

Extremes.- Maximum discharge during year, 744 second-feet July 23 (gage height, 3.38 feet); no flow at times.

1930-48: Maximum discharge not determined; maximum gage height, 11.0 feet Aug. 4, 1939, present datum; no flow at times.

Remarks.- Records fair. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0.7	0.3	0.1	0.3	0	3.6	1.6	1.5	1.3	0.5	16	0
2	.6	.3	.1	.2	0	4.1	1.6	1.5	3.3	.4	a3	0
3	.6	.3	.1	0	0	4.1	1.5	1.5	13	.3	a1	0
4	.6	.2	.1	0	0	4.1	1.5	1.6	1.8	.1	0	0
5	.6	.2	.1	0	0	3.1	1.6	1.6	.8	.1	0	0
6	.6	.3	.1	0	0	3.1	1.6	1.6	.7	0	0	0
7	a.6	.3	.1	0	0	2.7	1.6	1.6	.6	9.5	0	0
8	a.6	.4	0	0	0	2.3	1.6	1.6	56	1.8	0	.6
9	a.5	.4	0	0	0	2.0	1.6	1.6	8.7	.4	0	0
10	.5	.3	0	0	0	2.3	1.8	1.6	2.7	.3	0	0
11	.6	.3	0	0	0	2.1	1.6	1.6	2.3	.2	.1	0
12	.6	.3	0	0	0	2.0	1.6	1.6	2.1	.2	0	0
13	.6	.3	.1	0	0	2.1	1.6	1.6	1.8	.3	0	0
14	.5	.2	.1	0	0	2.1	1.6	1.3	1.0	.3	0	0
15	.5	.2	0	0	0	2.1	1.5	1.2	.9	.3	0	0
16	.5	.2	0	0	0	2.0	1.6	1.2	.9	.2	0	0
17	.5	.3	0	0	0	2.0	1.8	1.3	.9	.3	0	3.0
18	.5	.3	0	0	0	2.0	1.3	1.3	.9	.2	0	.3
19	.5	.2	0	0	0	2.0	1.2	1.3	.9	.3	0	30
20	.4	.2	0	0	0	1.8	1.3	1.2	1.0	.4	0	1.5
21	.4	.2	0	0	0	1.8	1.8	1.2	.8	.3	0	0
22	.4	.2	0	0	0	2.0	1.8	1.0	.8	.5	0	0
23	.4	.2	0	0	0	2.7	1.6	1.0	.8	62	0	0
24	.4	.2	0	0	0	2.5	1.5	1.0	.8	26	0	0
25	.4	.1	0	0	.5	2.1	1.5	1.2	.7	7.2	0	0
26	.3	.2	0	0	1.8	2.1	1.5	1.2	.7	12	0	0
27	.4	.2	0	0	3.4	2.3	1.3	1.0	.7	36	0	0
28	.4	.1	0	0	3.4	2.3	1.3	.9	.7	8.0	0	0
29	.4	.2	0	0	2.9	2.0	1.3	.9	.7	.3	0	0
30	.4	.1	.2	0	-	2.0	1.5	1.0	.5	0	0	0
31	.4	-	.4	0	-	2.1	-	1.0	-	25	0	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	15.4	0.7	0.3	0.50	31
November.....	7.2	.4	.1	.24	14
December.....	1.5	.4	0	.05	3.0
Calendar year 1947.....	1,609.5	304	0	4.41	3,190
January.....	.5	.3	0	.02	1.0
February.....	12.0	3.4	0	.41	24
March.....	75.5	4.1	1.8	2.44	150
April.....	46.0	1.8	1.2	1.53	91
May.....	40.7	1.6	.9	1.31	81
June.....	88.8	36	.5	2.96	176
July.....	193.4	62	0	6.24	384
August.....	20.1	16	0	.65	40
September.....	35.6	30	0	1.19	71
Water year 1947-48.....	536.7	62	0	1.47	1,070

Peak discharge (base, 800 sec.-ft.)- No peak above base.

a No gage-height record; discharge computed on basis of recorder trace, weather records, and records for station near Mimbres.

## Bear Canyon near Mimbres, N. Mex.

Location.- Water-stage recorder and concrete Parshall flume, lat. 32°52'50", long. 107°59'20", in SW¼SW¼ sec. 28 (revised), T. 16 S., R. 11 W., 100 feet downstream from bridge on State Highway 167, 200 feet downstream from Bear Canyon Dam, and 2 miles northwest of Mimbres.

Records available.- October 1937 to September 1948.

Average discharge.- 11 years, 0.89 second-foot.

Extremes (regulated).- Maximum daily discharge during year, 9.8 second-feet May 6; no flow on many days.

1937-48: Maximum discharge, 76 second-feet Sept. 29, 1941 (gage height, 2.88 feet), from rating curve extended above 21 second-feet by logarithmic plotting; no flow for long periods.

Remarks.- Records good. Flow regulated by Bear Canyon Reservoir (capacity, 700 acre-feet). One small diversion above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	0	0.6	3.3	0.2	0.1	0		0	0.3	0.1		
2	0	.6	3.5	.1	.2	0		0	.3	0		
3	0	.6	3.2	.1	.1	0		0	.2	0		
4	0	.6	3.1	.1	.1	0		0	.2	0		
5	0	.6	3.1	.1	.1	.1		6.7	.2	0		
6	0	.6	3.1	.1	.1	0		9.8	.1	0		
7	0	.6	3.1	.1	.1	0		9.0	.1	.1		
8	0	.6	3.1	.1	0	0		8.5	.1	.1		
9	0	.6	3.0	.1	0	0		8.4	.1	.1		
10	0	.6	3.0	.2	0	0		8.2	.1	0		
11	0	.6	3.0	.2	0	0		8.1	0	0		
12	0	.6	3.0	.1	0	0		8.1	.1	.1		
13	0	.6	2.9	.1	0	0		7.6	.1	.1		
14	0	.6	2.8	.1	0	0		6.8	.1	.1		
15	0	.6	2.4	.2	0	0		6.6	.1	0		
16	0	.6	.3	.2	0	0		6.3	.1	0		
17	0	2.0	.2	.2	0	0		6.1	.1	.1		
18	0	3.9	.1	.1	0	0		5.8	.1	.1		
19	0	4.0	.1	.1	0	0		4.8	.1	.1		
20	6.6	3.9	.1	.1	0	0		4.0	.1	.1		
21	5.6	3.7	.1	.1	0	0		4.0	.1	.1		
22	.4	3.7	.1	.1	0	0		4.0	0	.2		
23	.4	3.7	.1	.1	0	0		3.7	.1	.2		
24	.4	3.7	.1	.1	0	0		3.0	.1	.1		
25	.4	3.7	.1	.1	0	0		2.0	0	.1		
26	.4	3.6	.1	.1	0	0		.3	.1	0		
27	.5	3.4	.1	.1	0	0		.3	.1	0		
28	.6	3.4	.1	.1	0	0		.3	.1	0		
29	.6	3.4	.1	.1	0	0		.3	.1	0		
30	.6	3.3	.1	.1	-	0		.4	.1	0		
31	.6	-	.1	.1	-	0		.4	-	.1		

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	17.1	6.6	0	0.55	34
November.....	59.0	4.0	.6	1.97	117
December.....	47.3	3.3	.1	1.53	94
Calendar year 1947.....	123.4	6.6	0	.34	245
January.....	3.7	.2	.1	.12	7.3
February.....	.8	.2	0	.03	1.6
March.....	.2	.1	0	.01	.40
April.....	0	0	0	0	0
May.....	133.5	9.8	0	4.31	265
June.....	3.4	.3	0	.11	6.7
July.....	1.9	.2	0	.06	3.8
August.....	0	0	0	0	0
September.....	0	0	0	0	0
Water year 1947-48.....	266.9	9.8	0	.73	530



## TULAROSA VALLEY BASIN

Rio Tularosa near Bent, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 33°08'45", long. 105°53'50"  
 E. 1/4 sec. 32, T. 13 S., R. 11 E., 50 feet downstream from bridge on U. S. Highway 70,  
 3 miles west of Bent, and 8.5 miles northeast of Tularosa.

Records available.- December 1947 to September 1948.

Extremes.- Maximum gage height during period, 1.88 feet Aug. 3 (discharge not determined);  
 minimum daily discharge, 4.6 second-feet July 13.

Remarks.- Records good except those for periods of ice effect and those above 20 second-feet, which are poor. Diversions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			-	b13	13	15	14	11	13	14	14	9.3
2			-	13	14	15	13	8.1	17	14	13	8.7
3			-	13	15	16	13	8.1	19	14	16	9.3
4			-	13	15	16	12	11	16	14	14	9.3
5			-	13	16	16	12	13	16	16	13	8.5
6			-	13	15	15	11	13	15	13	13	7.0
7			-	14	14	15	14	13	15	13	13	8.7
8			-	14	14	15	14	13	15	13	11	11
9			-	15	14	15	13	13	14	12	11	11
10			-	15	14	15	14	10	14	12	8.7	11
11			-	15	14	13	13	9.3	13	7.5	13	10
12			-	15	b14	13	11	9.3	14	5.0	13	10
13			-	15	b14	14	11	9.3	11	4.6	16	8.7
14			-	15	14	14	11	9.3	9.3	11	13	9.3
15			-	15	14	13	11	8.7	9.3	11	14	8.1
16			-	16	15	14	11	7.5	13	12	13	11
17			-	16	14	14	10	8.1	13	13	13	8.1
18			-	16	14	14	7.0	11	13	13	13	8.7
19			-	16	13	13	7.5	14	13	11	11	7.0
20			-	16	13	13	9.3	14	13	11	11	7.0
21			-	*16	13	13	14	14	11	11	11	6.0
22			-	16	13	13	15	14	11	10	8.7	11
23			-	13	15	13	12	14	14	9.3	11	8.7
24			-	13	14	*13	12	14	11	9.3	12	8.1
25			-	13	14	15	12	14	10	10	6.5	11
26			-	13	14	16	13	12	12	9.3	6.0	11
27			-	*13	b12	16	14	11	12	6.0	8.1	11
28			-	13	b12	15	11	11	5.0	12	11	11
29			-	13	12	14	15	8.7	12	7.5	11	11
30			-	13	12	-	14	11	8.7	13	11	11
31			-	13	11	-	14	-	11	-	13	-

Month	Second-foot-days	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	-	-	-	-	-
November.....	-	-	-	-	-
December 23-31.....	117	13	13	13.0	232
Calendar year.....	-	-	-	-	-
January.....	439	16	11	14.2	871
February.....	411	16	13	14.2	815
March.....	435	16	12	14.0	863
April.....	356.5	15	7.0	11.9	707
May.....	343.4	14	7.5	11.1	691
June.....	367	19	5.0	12.2	728
July.....	345.7	10	4.6	11.2	686
August.....	371.2	18	8.1	12.0	736
September.....	286.7	12	6.0	9.56	569
The period.....	-	-	-	-	6,890

Peak discharge (base, 300 sec.-ft.)- Discharge not determined.

\* Winter discharge measurement made on this day.

b Stage-discharge relation affected by ice.

## TULAROSA VALLEY BASIN

Rio Tularosa near Tularosa, N. Mex.

Location.- Water-stage recorder and concrete control, lat. 33°05'35", long. 105°58'35", in SE1SE4 sec. 16, T. 14 S., R. 10 E., 200 feet upstream from diversion dam for Tularosa Community ditch and 3 miles northeast of Tularosa.

Records available.- December 1912 to December 1914 and October 1931 to December 1947 (discontinued) in Reports of Geological Survey. December 1912 to December 1914 and October 1916 to July 1917 in reports of State engineer.

Average discharge.- 14 years (1932-37, 1938-47), 14.6 second-feet.

Extremes.- Maximum discharge during period October to December, 448 second-feet Oct. 13 (gage height, 1.86 feet), from rating curve extended above 23 second-feet on basis of slope-area determinations at gage heights 3.4 and 8.5 feet; minimum daily, 9.3 second-feet Oct. 9.  
1913-47: Maximum discharge, 9,640 second-feet Sept. 3, 1938 (gage height, 8.50 feet, from floodmarks), by slope-area method; minimum daily, 1 second-foot July 31, Aug. 1, 1934.

Remarks.- Records good except those for periods of no gage-height record, which are poor. Divisions above station for irrigation.

Discharge, in second-feet, water year October 1947 to September 1948

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	12	13	15									
2	12	13	16									
3	12	11	18									
4	12	12	17									
5	11	11	17									
6	10	11	17									
7	10	12	17									
8	10	13	17									
9	8.3	13	17									
10	10	13	16									
11	12	13	17									
12	12	13	14									
13	29	14	14									
14	a17	16	15									
15	a16	14	14									
16	a15	15	16									
17	a14	16	14									
18	a14	15	13									
19	a14	14	14									
20	a14	15	13									
21	a14	15	13									
22	a14	14	13									
23	14	15	13									
24	14	15	a13									
25	14	14	a13									
26	13	13	a13									
27	12	14	a13									
28	11	15	a13									
29	12	15	a13									
30	12	15	a13									
31	12	-	a13									
Month				Second-foot-days		Maximum	Minimum	Mean	Runoff in acre-feet			
October.....				409.3		29	9.3	13.2	812			
November.....				412		16	11	13.7	817			
December.....				454		18	18	14.6	900			
Calendar year 1947 .....				5,083.2		92	4.3	13.9	10,080			

Peak discharge (base, 300 sec.-ft.)- Oct. 13 (5:30 p.m.) 448 sec.-ft.  
a No gage-height record; discharge computed on basis of weather records, available trace, and December records for station near Bent.

## Alamogordo-La Luz ditch at La Luz, N. Mex.

Location.- Water-stage recorder and concrete Parshall flume, lat. 32°58'50", long. 105°55'15", in SW $\frac{1}{4}$  sec. 25, T. 15 S., R. 10 E., a quarter of a mile upstream from La Luz and half a mile downstream from head gate.

Records available.- October 1934 to September 1948.

Average discharge.- 14 years, 6.81 second-feet.

Extremes.- Maximum daily discharge during year, 11 second-feet Feb. 5; minimum daily, 0.6 second-foot July 21.  
1934-48: Maximum daily discharge, 22 second-feet Feb. 2, 3, 5-13, 1942; no flow at times.

Remarks.- Records fair. Ditch diverts water from left bank of Rio La Luz for irrigation.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	6.0	4.1	4.61	283
November.....	7.6	3.7	5.93	353
December.....	9.4	6.6	7.15	440
Calendar year 1947.....	11	1.9	5.72	4,140
January.....	8.1	6.0	7.08	435
February.....	11	5.9	7.38	425
March.....	8.1	6.3	7.05	434
April.....	6.8	3.8	5.30	315
May.....	4.7	2.2	3.43	211
June.....	6.7	2.6	3.58	213
July.....	3.5	.6	2.19	135
August.....	7.8	3.3	4.42	272
September.....	3.9	2.5	2.99	176
Water year 1947-48.....	11	.6	5.09	3,690

## Alamogordo water supply near Alamogordo, N. Mex.

Location.- Water-stage recorder and rectangular contracted weir, lat. 32°52'25", long. 105°55'40", in NW $\frac{1}{4}$  sec. 33, T. 16 S., R. 10 E., at lower end of pipe line, about 1 mile downstream from Alamo Canyon and 2 miles southeast of Alamogordo.

Records available.- October 1932 to September 1948.

Average discharge.- 16 years, 1.84 second-feet.

Extremes.- Maximum daily discharge during year, 1.9 second-feet Apr. 23; minimum daily, 0.6 second-foot Aug. 8.  
1932-48: Maximum daily discharge, 4.2 second-feet Sept. 15, 1942; no flow July 7, 1933, Sept. 29, 1941.

Remarks.- Records good.

Monthly discharge, in second-feet, water year October 1947 to September 1948

Month	Maximum	Minimum	Mean	Runoff in acre-feet
October.....	1.1	1.1	1.10	68
November.....	1.6	1.0	1.21	72
December.....	1.3	1.0	1.16	71
Calendar year 1947.....	1.6	1.0	1.28	928
January.....	1.2	1.1	1.15	70
February.....	1.2	1.1	1.10	63
March.....	1.2	1.1	1.13	69
April.....	1.9	1.2	1.55	92
May.....	1.6	1.3	1.42	87
June.....	1.4	1.1	1.31	78
July.....	1.5	1.2	1.37	84
August.....	1.4	.6	1.32	81
September.....	1.4	1.0	1.20	71
Water year 1947-48.....	1.9	.6	1.25	906

Measurements of stream flow in the western Gulf of Mexico basins made at points other than gaging stations are given in the following table:

Miscellaneous discharge measurements in the western Gulf of Mexico basins during water year October 1947 to September 1948

Mermentau River Basin				
Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Nov. 18	Bayou Plaquemine Brule.	Bayou des Cannes...	In NW 1/4 SW 1/4, sec. 29, T. 9 S., R. 1 E. Louisiana meridian, at bridge on State Highway 370, 1 1/2 miles northwest of Crowley, La.	509
Dec. 23	....do.....	....do.....	....do.....	82.5
Jan. 22	....do.....	....do.....	....do.....	338
Feb. 26	....do.....	....do.....	....do.....	2,380
Apr. 28	....do.....	....do.....	....do.....	4,080
July 27	....do.....	....do.....	....do.....	78.7
Sept. 9	....do.....	....do.....	....do.....	111
Nov. 17	Bayou Queue de Tortue.	Mermentau River...	In lot 39, T. 10 S., R. 1 E. Louisiana meridian, at bridge on Parish road, 2 1/2 miles below Indian Bayou and 2 1/2 miles south of Ebenezzer, La.	67.3
Dec. 16	....do.....	....do.....	....do.....	769
July 7	....do.....	....do.....	Sec. 18, T. 11 S., R. 1 W. Louisiana meridian, at bridge on State Highway 128, 100 feet below Southern Pacific R. R. bridge and half a mile northeast of Riceville, La.	75.3
Sept. 8	....do.....	....do.....	....do.....	101

Sabine River Basin				
Oct. 30	Little Cow Creek...	Sabine River.....	At bridge on State Highway 87, above McGraw Creek and 1/2 mile south of Burkeville, Tex.	48.9
Jan. 15	....do.....	....do.....	....do.....	60.8
Feb. 18	....do.....	....do.....	....do.....	59.8
Mar. 17	....do.....	....do.....	....do.....	56.2
Apr. 28	....do.....	....do.....	....do.....	46.3
May 19	....do.....	....do.....	....do.....	39.6
June 23	....do.....	....do.....	....do.....	38.3
July 22	....do.....	....do.....	....do.....	a35.7
Aug. 23	....do.....	....do.....	....do.....	a27.7
Sept. 22	....do.....	....do.....	....do.....	31.5
Oct. 30	McGraw Creek.....	Little Cow Creek...	1 mile above mouth and 2 miles south-east of Burkeville, Tex.	24.9
Jan. 15	....do.....	....do.....	....do.....	30.4
Feb. 18	....do.....	....do.....	....do.....	34.8
Mar. 17	....do.....	....do.....	....do.....	33.4
Apr. 28	....do.....	....do.....	....do.....	25.3
May 19	....do.....	....do.....	....do.....	21.5
June 23	....do.....	....do.....	....do.....	16.4
July 22	....do.....	....do.....	....do.....	a18.4
Aug. 23	....do.....	....do.....	....do.....	a13.3
Sept. 22	....do.....	....do.....	....do.....	14.5
Oct. 30	Quicksand Creek...	Sabine River.....	At U. S. Highway 190, 0.7 mile above mouth and 1 1/2 miles east of Bon Wier, Tex.	22.9
Dec. 4	....do.....	....do.....	....do.....	32.6
Jan. 16	....do.....	....do.....	....do.....	b82.1
Mar. 17	....do.....	....do.....	....do.....	b70.1
Apr. 28	....do.....	....do.....	....do.....	38.2
June 22	....do.....	....do.....	....do.....	23.1
July 22	....do.....	....do.....	....do.....	a22.4
Aug. 24	....do.....	....do.....	....do.....	16.1
Sept. 22	....do.....	....do.....	....do.....	16.8

a Discharge is spring flow.

b Backwater from Sabine River.

Neches River Basin				
June 23	Flat Creek.....	Neches River.....	Lat. 32°03'55", long. 95°24'08", 10.15 miles northwest of Jacksonville, Cherokee County, Tex.	7.30
Aug. 6	....do.....	....do.....	....do.....	2.92
24	....do.....	....do.....	....do.....	1.80
Sept. 29	....do.....	....do.....	....do.....	1.63
30	Box Creek.....	....do.....	Lat. 31°39'05", long. 95°14'05", at bridge on State Highway 294, 9.2 miles west of Alto, Cherokee County, Tex.	0
30	Bowles Creek.....	....do.....	Lat. 31°38'35", long. 95°07'45", at bridge on State Highway 294, 3 miles west of Alto, Cherokee County, Tex.	0
30	White Oak Creek....	Bowles Creek.....	Lat. 31°38'00", long. 95°10'15", at bridge on State Highway 294, 5.5 miles west of Alto, Cherokee County, Tex.	*.5
30	Larrison Creek.....	Neches River.....	Lat. 31°36'15", long. 95°02'40", 3.7 miles south southeast of Alto, Cherokee County, Tex.	0
29	Bodano Bayou.....	....do.....	Lat. 31°26'45", long. 95°50'45", 10 miles northwest of Lufkin, Angelina County, Tex.	0

\* Field estimate.

Miscellaneous discharge measurements in the western Gulf of Mexico basins during water year October 1947 to September 1948--Continued

## Neches River Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Sept. 24	Buck Creek.....	Neches River.....	Lat. 31°16'45", long. 94°36'55", 7½ miles southeast of Lufkin, Angelina County, Tex.	0
24	Balaxy Creek.....	Buck Creek.....	Lat. 31°18'10", long. 94°39'50", 4½ miles southeast of Lufkin, Angelina County, Tex.	0
24	Shawnee Creek.....	Neches River.....	Lat. 31°13'15", long. 94°32'00", 13½ miles southeast of Lufkin, Angelina County, Tex.	0
24	Sandy Creek.....	Shawnee Creek.....	Lat. 31°08'55", long. 94°26'05", at Zavalla, Angelina County, Tex.	0
Dec. 1	Prairie Creek.....	Mud Creek.....	Lat. 32°18'35", long. 95°10'25", at proposed dam site, 2 miles upstream from mouth (confluence with Mud Creek) and 3 miles southeast of Whitehouse, Smith County, Tex.	17.0
Aug. 27	Angelina River.....	Neches River.....	Lat. 31°26', long. 94°35', at Old Saline, Angelina County, Tex., 5.9 miles downstream from Mill Creek.	33.7
Sept. 24	Caney Creek.....	Angelina River.....	Lat. 31°07'40", long. 94°16'05", 10½ miles southeast of Zavalla, Angelina County, Tex.	0
24	Sandy Creek.....	.....do.....	Lat. 31°06'15", long. 94°12'45", 14 miles southeast of Zavalla, Angelina County, Tex.	0
24	Parker Creek.....	Sandy Creek.....	Lat. 31°05'45", long. 94°12'30", 15 miles southeast of Zavalla, Angelina County, Tex.	0

## Trinity River Basin

Sept. 30	Mack Creek.....	Trinity River.....	Lat. 31°39'50", long. 95°44'30", 9 miles west of Elkhart, Anderson County, Tex.	*0.2
30	Crooked Creek.....	.....do.....	Lat. 31°39'25", long. 95°42'25", 7.7 miles west of Elkhart, Anderson County, Tex.	*1.0
30	Masons Creek.....	.....do.....	Lat. 31°38'00", long. 95°38'00", 3.3 miles west of Elkhart, Anderson County, Tex.	0
30	Cedar Creek.....	Masons Creek.....	Lat. 31°38'55", long. 95°33'45", 5.1 miles west of Elkhart, Anderson County, Tex.	0

\* Field estimate.

## Oyster Creek Basin

Sept. 2	Oyster Creek.....	Gulf of Mexico.....	Lat. 29°15', long. 95°30', 2½ miles west of Chenango, Brazoria County, Tex.	c0
2	.....do.....	.....do.....	.....do.....	d31.3
Oct. 9	American Canal Co.'s canal	Oyster Creek.....	Lat. 29°36'20", long. 95°34'55", at county bridge 0.1 mile below second lift pump plant and 1½ miles southwest of Stafford, Fort Bend County, Tex.	131
Aug. 26	.....do.....	.....do.....	.....do.....	e315

c Measurement made about ½ mile upstream from Harris Reservoir.

d Measurement made about 1 mile downstream from release to Oyster Creek from Harris Reservoir.

e Total flow in canal. All three pumps pumping.

## Brazos River Basin

Aug. 17	Brazos River.....	Gulf of Mexico.....	A short distance below South Texas Water Co.'s pumping plant, 3½ miles west of Julliff, Tex.	0
25	.....do.....	.....do.....	.....do.....	f25.0
Nov. 13	.....do.....	.....do.....	At Dow Chemical Pump Plant. Lat. 29°15'30", long. 95°33'41", 7 miles west of Chenango, Brazoria County, Tex.	128
Aug. 25	.....do.....	.....do.....	.....do.....	0
24	Leon River.....	Little River.....	Lat. 31°06'37", long. 97°29'20", about 6 miles above U. S. Highway 81 crossing above Belton, Bell County, Tex.	*.3
24	Cowhouse Creek.....	Leon River.....	Lat. 31°08'48", long. 97°32'00", about 7.5 miles northwest of Belton, Bell County, Tex.	0
26	Salado Creek.....	Lampasas River.....	Lat. 30°55'18", long. 97°35'34", above all springs about 4.5 miles above Salado, Bell County, Tex.	0
26	.....do.....	.....do.....	Lat. 30°56'37", long. 97°32'06", above spring No. 1 at Salado, Bell County, Tex.	4.19
26	Salado Springs Spring No. 1.	Lampasas River.....	Lat. 30°56'37", long. 97°32'06", at Salado, Bell County, Tex.	.98
26	Spring No. 2.	.....do.....	.....do.....	*.55
26	Spring No. 3.	.....do.....	.....do.....	*1.66
26	Spring No. 4.	.....do.....	.....do.....	*.23
26	Spring No. 5.	.....do.....	.....do.....	1.14

\* Field estimate.

f No flow before 10 a.m. or after 4 p.m., on Aug. 25, 1948. Estimated outflow at peak about, 25 second-feet.

Miscellaneous discharge measurements in the western Gulf of Mexico basins during water year October 1947 to September 1948--Continued

## Brazos River Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Aug. 28	Salado Creek.....	Lampasas River....	Below springs Nos. 1 to 5 and 2,000 feet below U. S. Highway 81.	10.6
24	South San Gabriel River.	San Gabriel River..	Lat. 30°38'34", long. 97°40'38", at U. S. Highway 81 crossing, about ½ mile above confluence with North San Gabriel River, at Georgetown, Williamson County, Tex.	*.10
24	North San Gabriel River.	....do.....	Lat. 30°38'41", long. 97°40'38", at U. S. Highway 81 crossing. About ½ mile above confluence with South San Gabriel River, at Georgetown, Williamson County, Tex.	0
24	Berry Creek.....	....do.....	Lat. 30°42'10", long. 97°39'57", about 4 miles north of Georgetown, Williamson County, Tex.	0
24	Brushy Creek.....	....do.....	Lat. 30°30'48", long. 97°40'50", at U. S. Highway 81 crossing, at Roundrock, Williamson County, Tex.	0
Sept. 22	New Year Creek.....	Brazos River.....	Lat. 30°15', long. 96°13', 2.8 miles northeast of Chapel Hill, Washington County, Tex.	*1.2
22	Piney Creek.....	....do.....	Lat. 29°57', long. 96°10', 5 miles east of Bellville, Austin County, Tex.	*1.2
22	Mill Creek.....	....do.....	Lat. 29°53', long. 96°12', 5.5 miles southeast of Bellville, Austin County, Tex.	*3.0
Aug. 17	Briscoe Irrigation Co.'s canal.	....do.....	Lat. 29°30', long. 95°33', at bridge over canal 4,500 feet below pump plant, and about 4 miles east of Thompsons, Tex.	g304
25	....do.....	....do.....	....do.....	g150
Sept. 14	....do.....	....do.....	....do.....	0
Aug. 17	South Texas Water Co.'s canal.	Brazos River.....	¾ miles west of Juliff, Tex.	160
25	....do.....	....do.....	....do.....	325
Sept. 14	....do.....	....do.....	....do.....	0

\* Field estimate.

g Total flow of canal.

## Colorado River Basin

Apr. 1	South Concho River.	Concho River.....	Lat. 31°08', long. 100°30', 3.9 miles south of Christoval on William Anson Ranch, Tom Green County, Tex.	h5.07
17	....do.....	....do.....	Lat. 31°21', long. 100°28', 2.4 miles above Lake Mansworthy dam, near San Angelo, Tom Green County, Tex.	5.42
1	Cave Springs.....	South Concho River	Lat. 31°08', long. 100°25', in cave on Cave Springs Ranch, 7.3 miles southwest of Christoval, Tom Green County, Tex.	0
1	McCarthy Spring....	....do.....	Lat. 31°08', long. 100°29', at source, 3.6 miles south of Christoval, Tom Green County, Tex.	0
2	Pecan Springs.....	Pecan Creek.....	Lat. 31°14', long. 100°25', 5.3 miles northeast of Christoval, on Jake Johnson Ranch, Tom Green County, Tex.	.23
Mar. 30	Spring Creek.....	Middle Concho River	Lat. 31°13'45", long. 100°49', ½ mile below springs and 2.5 miles south of Mertzon, Irion County, Tex.	8.54
Apr. 2	Lipan Springs.....	Lipan Creek.....	Lat. 31°15', long. 100°15', 7.8 miles southwest of Vancourt, on Dick Warin Ranch, Tom Green County, Tex.	.14
8	San Saba River (main springs).	Colorado River....	Lat. 30°50', long. 100°05', 0.9 mile northeast of Ft. McKavett, Menard County, Tex.	11.1
6	Clear Creek.....	San Saba River....	7.5 miles west of Menard, Menard County, Tex.	15.2

h No flow in South Concho River above springs.

## Guadalupe River Basin

June 17	Medina River.....	San Antonio River..	500 feet below weir above reservoir, near Bandera, Tex., at site of former gaging station, Medina River near Pipe Creek.	3.52
Apr. 16	....do.....	....do.....	2,000 feet below diversion dam, near Riomedina, Tex.	16.6
Sept. 30	....do.....	....do.....	....do.....	1.80
June 16	....do.....	....do.....	Lat. 29°16', long. 98°30', first road crossing above Cassin, Bexar County, Tex.	3.88
16	Cibolo Creek.....	....do.....	Lat. 29°33'05", long. 98°16'20", at Schertz, Guadalupe County, Tex.	0
16	....do.....	....do.....	Lat. 29°32'30", long. 98°15'30", near Schertz, Guadalupe County, Tex.	1.48
16	....do.....	....do.....	Lat. 29°33'05", long. 98°13'45", about 1 mile south of Cibolo, Guadalupe County, Tex.	1.20

Miscellaneous discharge measurements in the western Gulf of Mexico basins during water year October 1947 to September 1948--Continued

## Guadalupe River Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Oct. 16	Hueco Springs.....	Guadalupe River....	Lat. 29°45'35", long. 98°08'25", 3.8 miles north of New Braunfels, Tex.	113.3
Nov. 22	....do.....	....do.....	....do.....	110.1
Dec. 18	....do.....	....do.....	....do.....	18.72
Jan. 22	....do.....	....do.....	....do.....	16.62
Feb. 26	....do.....	....do.....	....do.....	15.83
Apr. 1	....do.....	....do.....	....do.....	14.23
May 6	....do.....	....do.....	....do.....	13.93
June 10	....do.....	....do.....	....do.....	15.09
July 22	....do.....	....do.....	....do.....	12.84
Aug. 26	....do.....	....do.....	....do.....	11.22
Sept. 30	....do.....	....do.....	....do.....	0
Oct. 18	San Marcos Springs (San Marcos River).	....do.....	At San Marcos, Tex.	126
Nov. 24	....do.....	....do.....	....do.....	143
Dec. 20	....do.....	....do.....	....do.....	128
Jan. 24	....do.....	....do.....	....do.....	134
Feb. 28	....do.....	....do.....	....do.....	115
Apr. 7	....do.....	....do.....	....do.....	112
May 8	....do.....	....do.....	....do.....	94.2
June 12	....do.....	....do.....	....do.....	83.4
July 24	....do.....	....do.....	....do.....	101
Aug. 27	....do.....	....do.....	....do.....	103

1 Flow of West Springs only, no flow in East Springs.

## Nueces River Basin

Oct. 23	Prio River.....	Nueces River.....	Near Texas & New Orleans R. R. bridge, 0.6 mile above Dry Prio and 10 miles northeast of Uvalde, Tex.	30
---------	-----------------	-------------------	---	----

J Observations of no flow also made on following dates: Nov. 21, Jan. 13, Feb. 22, Mar. 27, May 9, June 11, July 29, Sept. 2.

## Rio Grande Basin

Oct. 16	Santa Fe Creek.....	Rio Grande.....	Lat. 35°41', long. 105°50', in sec. 24, T. 17 N., R. 10 E., above McClure Reservoir, 6½ miles east of Santa Fe, N. Mex.	2.19
30	....do.....	....do.....	....do.....	1.47
Nov. 11	....do.....	....do.....	....do.....	1.43
Jan. 11	....do.....	....do.....	....do.....	1.57
Apr. 27	....do.....	....do.....	....do.....	15.8
May 10	....do.....	....do.....	....do.....	24.0
24	....do.....	....do.....	....do.....	35.8
June 7	....do.....	....do.....	....do.....	21.7
22	....do.....	....do.....	....do.....	9.46
July 15	....do.....	....do.....	....do.....	3.81
27	....do.....	....do.....	....do.....	3.00
Aug. 10	....do.....	....do.....	....do.....	2.65
25	....do.....	....do.....	....do.....	2.01
Sept. 9	....do.....	....do.....	....do.....	1.35
23	....do.....	....do.....	....do.....	1.00
May 31	Bernardo Interior drain.	....do.....	Lat. 34°24'55", long. 106°49'15", in NE¼ sec. 10, T. 2 N., R. 1 E., at bridge on U. S. Highway 60, 2 mile east of Bernardo and 1½ miles west of gaging station on Rio Grande.	528
June 7	....do.....	....do.....	....do.....	745
14	....do.....	....do.....	....do.....	1,230
21	....do.....	....do.....	....do.....	150
28	....do.....	....do.....	....do.....	13.4
July 6	....do.....	....do.....	....do.....	9.34
12	....do.....	....do.....	....do.....	7.09
26	....do.....	....do.....	....do.....	4.87
Aug. 13	....do.....	....do.....	....do.....	1.01
Sept. 8	....do.....	....do.....	....do.....	2.65
17	....do.....	....do.....	....do.....	3.10
24	....do.....	....do.....	....do.....	2.54
24	....do.....	....do.....	....do.....	2.53
May 29	San Francisco Riverside drain.	....do.....	Lat. 34°25', long. 106°48', in NE¼ sec. 11, T. 2 N., R. 1 E., on downstream side of bridge on U. S. Highway 60, 2 miles east of Bernardo and 3½ miles above mouth.	1,030
31	....do.....	....do.....	....do.....	1,150
June 5	....do.....	....do.....	....do.....	2,210
7	....do.....	....do.....	....do.....	2,290
14	....do.....	....do.....	....do.....	2,380
21	....do.....	....do.....	....do.....	2,040
28	....do.....	....do.....	....do.....	1,410
July 5	....do.....	....do.....	....do.....	492
6	....do.....	....do.....	....do.....	428
12	....do.....	....do.....	....do.....	176
16	....do.....	....do.....	....do.....	130
20	....do.....	....do.....	....do.....	91.2
24	....do.....	....do.....	....do.....	194
26	....do.....	....do.....	....do.....	165
30	....do.....	....do.....	....do.....	67.6
Aug. 3	....do.....	....do.....	....do.....	44.6
10	....do.....	....do.....	....do.....	278



Miscellaneous discharge measurements in the Gulf of Mexico River basins during water year October 1947 to September 1948--Continued

## Rio Grande Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Aug. 13	San Francisco River side drain.	Rio Grande.....	Lat. 34°25', long. 106°48', in NE¼ sec. 11, T. 2 N., R. 1 E., on downstream side of bridge on U. S. Highway 60, 2 miles east of Bernardo and 3½ miles above mouth.	192
24	.....do.....	.....do.....	.....do.....	61.5
Sept. 8	.....do.....	.....do.....	.....do.....	31.2
13	.....do.....	.....do.....	.....do.....	34.2
17	.....do.....	.....do.....	.....do.....	53.4
24	.....do.....	.....do.....	.....do.....	60.1
30	.....do.....	.....do.....	.....do.....	92.6
May 12	Bluewater Creek below spillway.	San Jose River....	In NE¼NW¼ sec. 9, T. 12 N., R. 12 W., near Bluewater, N. Mex.	33.5
12	Bluewater Creek above diversions	.....do.....	In SW¼NE¼ sec. 8, T. 12 N., R. 11 W., near Bluewater, N. Mex.	36.6
Oct. 30	.....do.....	.....do.....	Corps of Engineers station at highway bridge about 14 miles southeast of Bluewater, N. Mex.	0
Nov. 18	.....do.....	.....do.....	.....do.....	0
Dec. 9	.....do.....	.....do.....	.....do.....	0
Jan. 8	.....do.....	.....do.....	.....do.....	0
26	.....do.....	.....do.....	.....do.....	0
Feb. 17	.....do.....	.....do.....	.....do.....	0
Mar. 9	.....do.....	.....do.....	.....do.....	0
Apr. 20	.....do.....	.....do.....	.....do.....	25
May 12	Bluewater main canal.	Bluewater Creek...	In SE¼NE¼SE¼ sec. 9, T. 12 N., R. 11 W., above diversion structure No. 8, near Bluewater, N. Mex.	35.6
12	.....do.....	.....do.....	In SE¼NE¼SE¼ sec. 9, T. 12 N., R. 11 W., below division gate heading, near Bluewater, N. Mex.	17.4
12	Bluewater middle main canal.	.....do.....	In SE¼NE¼SW¼ sec. 10, T. 12 N., R. 11 W., above structure No. 10, near Bluewater, N. Mex.	15.5
12	.....do.....	.....do.....	In SE¼NE¼ sec. 15, T. 12 N., R. 11 W., opposite railroad mile post 107, near Bluewater, N. Mex.	14.9
12	.....do.....	.....do.....	In SE¼SW¼SW¼ sec. 24, T. 12 N., R. 11 W., above highway crossing, near Bluewater, N. Mex.	8.24
12	Middle lateral from Middle main canal.	.....do.....	In SE¼NE¼SW¼ sec. 10, T. 12 N., R. 11 W., at head, near Bluewater, N. Mex.	1.22
12	Lateral from Middle main canal.	.....do.....	In NE¼SE¼SE¼ sec. 15, T. 12 N., R. 11 W., at head, at structure No. 12, near Bluewater, N. Mex.	1.27
12	.....do.....	.....do.....	In NW¼SW¼SW¼ sec. 14, T. 12 N., R. 11 W., at head, at structure No. 14, near Bluewater, N. Mex.	1.94
12	.....do.....	.....do.....	At head, at structure No. 18, near Bluewater, N. Mex.	1.65
12	Bluewater west side canal.	.....do.....	In SE¼NE¼SE¼ sec. 9, T. 12 N., R. 11 W., at head, below structure No. 8, near Bluewater, N. Mex.	18.3
13	West side canal....	.....do.....	In SE¼NE¼SE¼ sec. 9, T. 12 N., R. 11 W., at head, at structure No. 8, near Bluewater, N. Mex.	19.0
13	.....do.....	.....do.....	In SW¼NW¼SW¼ sec. 15, T. 12 N., R. 11 W., at turnout structure, near Bluewater, N. Mex.	6.66
13	.....do.....	.....do.....	In SW¼NW¼SW¼ sec. 25, T. 12 N., R. 11 W., 250 feet above Harmon and Reid pump, near Bluewater, N. Mex.	3.65
13	.....do.....	.....do.....	In NW¼ sec. 22, T. 12 N., R. 11 W., 25 feet below bridge, at and above Bluewater, N. Mex.	4.99
13	.....do.....	.....do.....	In SE¼NW¼SE¼ sec. 22, T. 12 N., R. 11 W., above old bakery, at Bluewater, N. Mex.	4.35
13	Lateral from West side canal.	.....do.....	In NE¼SE¼SE¼ sec. 9, T. 12 N., R. 11 W., at structure No. 4, near Bluewater, N. Mex.	2.67
13	.....do.....	.....do.....	In NW¼NE¼NE¼ sec. 16, T. 12 N., R. 11 W., at structure No. 5, near Bluewater, N. Mex.	.83
13	.....do.....	.....do.....	In SW¼NE¼NE¼ sec. 16, T. 12 N., R. 11 W., at structure No. 6, near Bluewater, N. Mex.	2.28
13	.....do.....	.....do.....	In NE¼NE¼SE¼ sec. 16, T. 12 N., R. 11 W., at C and H turnout, near Bluewater, N. Mex.	1.08
13	.....do.....	.....do.....	In NW¼SE¼SW¼ sec. 15, T. 12 N., R. 11 W., at turnout, near Bluewater, N. Mex.	.90
13	.....do.....	.....do.....	In SW¼NE¼SW¼ sec. 22, T. 12 N., R. 11 W., above old bakery, at Bluewater, N. Mex.	.84
13	Old company canal..	.....do.....	In NE¼SW¼ sec. 3, T. 12 N., R. 11 W., at head, near Bluewater, N. Mex.	4.17
13	Ojo del Gallo.....	San Jose River....	In sec. 10, T. 10 N., R. 10 W., at concrete structure, at San Rafael, N. Mex.	2.69

Miscellaneous discharge measurements in the Gulf of Mexico River basins during water year October 1947 to September 1948--Continued

## Rio Grande Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
Feb. 17	Pecos River.....	Rio Grande.....	Lat. 33°22'25", long. 104°24'00", in NE¼ sec. 9, T. 11 S., R. 25 E., above Rio Hondo, 6 miles east of Roswell, N. Mex.	27.8
18	do.....	do.....	do.....	25.1
17	do.....	do.....	At Dexter Bridge, in NW¼ sec. 10, T. 13 S., R. 26 E., 2½ miles north-east of Dexter, N. Mex.	53.8
18	do.....	do.....	do.....	53.5
17	do.....	do.....	In sec. 35, T. 13 S., R. 26 E., ¼ mile above Rio Felix and 2 miles northeast of Hagerman, N. Mex.	67.7
18	do.....	do.....	do.....	67.1
17	Rio Hondo.....	Pecos River.....	At mouth in E¼ sec. 9, T. 11 S., R. 25 E., about 6 miles east of Roswell, N. Mex.	12.6
18	do.....	do.....	do.....	10.8
17	Hagerman Canal.....	Rio Hondo.....	Lat. 33°24'20", long. 104°26'20", in NE¼ sec. 31, T. 10 S., R. 25 E., at head, 5 miles east of Roswell, N. Mex.	40.6
18	do.....	do.....	do.....	40.6
17	Rio Felix.....	Pecos River.....	In S¼ sec. 35, T. 13 S., R. 26 E., ¼ mile above mouth and 2 miles north of Hagerman, N. Mex.	6.57
18	do.....	do.....	do.....	5.52
17	Walnut Creek.....	do.....	Lat. 32°58', long. 104°22', in lot 2, sec. 2, T. 16 S., R. 26 E., at mouth, 3 miles south of Lake Arthur, N. Mex.	1.29
18	do.....	do.....	do.....	1.54
18	Ditch near Dexter..	do.....	Ditch under highway 1.8 miles east of Dexter, N. Mex.	4.74
Oct. 17	Phantom Lake Spring	Phantom Lake Irrigation System.	Lat. 30°56', long. 103°51', at source (mouth of cave) 3.7 miles west-southwest of Toyahvale, Tex.	14.4
Dec. 5	do.....	do.....	do.....	14.4
Jan. 25	do.....	do.....	do.....	14.0
Mar. 8	do.....	do.....	do.....	14.0
Apr. 14	do.....	do.....	do.....	14.0
May 16	do.....	do.....	do.....	14.6
June 25	do.....	do.....	do.....	13.6
Aug. 12	do.....	do.....	do.....	13.1
Sept. 18	do.....	do.....	do.....	12.9
Dec. 5	Giffin Springs.....	Main canal of Reeves County Water Improvement District No. 1.	Lat. 30°57', long. 103°47', in middle of northeast boundary, sec. 20, block 13, Houston & Great Northern R. R. Survey, at Toyahvale, Tex.	4.74
Mar. 8	do.....	do.....	do.....	4.48
May 20	do.....	do.....	do.....	4.70
Aug. 11	do.....	do.....	do.....	4.41
Dec. 6	West Sandia Springs	Canal of Reeves County Water Improvement District No. 1.	Lat. 30°59', long. 103°44', at head of feeder canal, 500 feet south of U. S. Highway 290, at Balmorhea, Tex.	1.27
Mar. 8	do.....	do.....	do.....	1.16
May 20	do.....	do.....	do.....	.59
Aug. 11	do.....	do.....	do.....	1.01
Dec. 6	East Sandia Springs	do.....	Lat. 30°59', long. 103°44', at former gaging station just below small dam, 1 mile east of Balmorhea, Tex.	.94
Mar. 8	do.....	do.....	do.....	.74
May 20	do.....	do.....	do.....	.99
Aug. 11	do.....	do.....	do.....	.66
Nov. 18	Leon Springs Well C or No. 9.	Leon Creek.....	8 miles west of Fort Stockton, Tex.	.52
Mar. 3	do.....	do.....	do.....	.50
Apr. 8	do.....	do.....	do.....	.37
May 15	do.....	do.....	do.....	0
June 24	do.....	do.....	do.....	0
Aug. 5	do.....	do.....	do.....	0
Nov. 18	Leon Springs Well B or No. 10.	do.....	8 miles west of Fort Stockton, Tex.	4.13
Mar. 3	do.....	do.....	do.....	4.91
Apr. 8	do.....	do.....	do.....	4.08
May 15	do.....	do.....	do.....	12.0
June 26	do.....	do.....	do.....	11.1
June 24	do.....	do.....	do.....	3.63
Aug. 5	do.....	do.....	do.....	3.45
Sept. 10	do.....	do.....	do.....	1.35
Nov. 18	Leon Springs Sulphur Well.	do.....	do.....	1.59
Apr. 8	do.....	do.....	do.....	1.63
May 15	do.....	do.....	do.....	2.19
June 26	do.....	do.....	do.....	1.79
June 24	do.....	do.....	do.....	1.23
Aug. 5	do.....	do.....	do.....	1.35
Sept. 10	do.....	do.....	do.....	1.37
May 26	Leon Springs Well No. 3.	do.....	do.....	2.30
June 24	do.....	do.....	do.....	.18
Aug. 5	do.....	do.....	do.....	.08
Sept. 10	do.....	do.....	do.....	.10
May 26	Leon Springs Well No. 2.	do.....	do.....	3.99

## MISCELLANEOUS DISCHARGE MEASUREMENTS

Miscellaneous discharge measurements in the Gulf of Mexico River basins during water year October 1947 to September 1948--Continued

## Rio Grande Basin--Continued

Date	Stream	Tributary to or diverting from--	Locality	Discharge (sec.-ft.)
June 24	Leon Springs Well No. 2.	Leon Creek.....	8 miles west of Fort Stockton, Tex...	0.93
Aug. 5	.....do.....	.....do.....	.....do.....	.81
Sept. 10	.....do.....	.....do.....	.....do.....	.32
May 26	Leon Springs Well No. 1.	.....do.....	.....do.....	1.99
June 24	.....do.....	.....do.....	.....do.....	*.05
Aug. 5	.....do.....	.....do.....	.....do.....	*.04
Sept. 10	.....do.....	.....do.....	.....do.....	*.04
Nov. 18	Leon Springs Well A or No. 11.	.....do.....	.....do.....	2.93
Mar. 3	.....do.....	.....do.....	.....do.....	2.40
Apr. 8	.....do.....	.....do.....	.....do.....	2.62
May 15	.....do.....	.....do.....	.....do.....	2.49
26	.....do.....	.....do.....	.....do.....	4.16
June 24	.....do.....	.....do.....	.....do.....	2.74
Aug. 5	.....do.....	.....do.....	.....do.....	2.06
Sept. 10	.....do.....	.....do.....	.....do.....	1.95
Nov. 18	Leon Springs total spring flow and wells.	.....do.....	.....do.....	16.3
Mar. 3	.....do.....	.....do.....	.....do.....	12.3
Apr. 8	.....do.....	.....do.....	.....do.....	15.4
May 15	.....do.....	.....do.....	.....do.....	24.8
26	.....do.....	.....do.....	.....do.....	27.5
June 24	.....do.....	.....do.....	.....do.....	K11.1
Aug. 5	.....do.....	.....do.....	.....do.....	K8.73
Sept. 10	.....do.....	.....do.....	.....do.....	5.07
Nov. 18	Leon Springs Main canal above dam.	.....do.....	.....do.....	15.5
Oct. 15	**San Pedro Springs	San Pedro Co.'s canal.	Lat. 30°59', long. 102°49', in W <sub>1</sub> Sur. 208, Joseph Burleson, Pecos County, just below source, 7 miles northeast of Fort Stockton, Tex.	3.50
Dec. 2	.....do.....	.....do.....	.....do.....	3.61
Jan. 23	.....do.....	.....do.....	.....do.....	3.81
Mar. 4	.....do.....	.....do.....	.....do.....	3.96
Apr. 7	.....do.....	.....do.....	.....do.....	3.83
May 15	.....do.....	.....do.....	.....do.....	3.64
June 23	.....do.....	.....do.....	.....do.....	3.42
Aug. 5	.....do.....	.....do.....	.....do.....	3.14
Sept. 10	.....do.....	.....do.....	.....do.....	3.28
June 24	Dry Devils River...	Devils River.....	Lat. 29°48'23", long. 100°56'35", 16.3 miles west of Carta Valley, Val Verde County, Tex. Drainage area, 742 square miles.	†460,000
24	Mailtrail Creek....	Dry Devils River...	Lat. 29°58'45", long. 100°44'15", 5 miles northeast of Loma Alta, Val Verde County, Tex. Drainage area, 75 square miles.	†170,000
24	Little Red Bluff Creek.	Red Bluff Creek....	Lat. 29°47'40", long. 100°46'30", 5.5 miles upstream from confluence with Red Bluff Creek, at Carta Valley, Val Verde County, Tex. Drainage area, 10.3 square miles.	†30,000

\* Field estimate.

\*\* 3.91 second-foot discharge of San Pedro Springs measured at this location Oct. 10, 1946, was inadvertently omitted from list of miscellaneous discharge measurements published in Water-Supply Paper 1088.

† Flow at crest, by slope-area method.

‡ Natural flow. Wells are not being jetted.

## Tularosa Valley

Oct. 7	La Luz ditch.....	Alamogordo-La Luz ditch.	Lat. 32°58'45", long. 105°56'20", in SW <sub>1</sub> sec. 25, T. 15 S., R. 10 E., at head, 1 mile above La Luz and 6 miles north of Alamogordo, N. Mex.	0.80
24	.....do.....	.....do.....	.....do.....	.63
Dec. 9	.....do.....	.....do.....	.....do.....	.87
27	.....do.....	.....do.....	.....do.....	.91
Jan. 21	.....do.....	.....do.....	.....do.....	.96
Feb. 24	.....do.....	.....do.....	.....do.....	.85
May 4	.....do.....	.....do.....	.....do.....	.68
June 9	.....do.....	.....do.....	.....do.....	.67
25	.....do.....	.....do.....	.....do.....	.81
July 16	.....do.....	.....do.....	.....do.....	.97
Aug. 16	.....do.....	.....do.....	.....do.....	.92

## INDEX

	Page		Page
Abiquiu, N. Mex., Rio Chama near.....	232	Bernalillo, N. Mex., Jemez Creek near..	304
Accuracy of field data and computed results.....	5-6	Rio Grande near.....	232
Acequia Madre, a Colmitilla, N. Mex., 277		Bernardo, El Torio, N. Mex., dis-	
Acequia Rincon, N. Mex., diversion by..	300	charge measurement of.....	236
Acme, N. Mex., Pecos River near.....	322	Bernardo, N. Mex., Rio Grande near....	331
Acres-foot, definition of.....	83	Rio Puerco near.....	309
Addicks, Tex., Addicks Reservoir near..	83	Berry Creek, Tex., discharge measure-	
Barker Reservoir near.....	80	ment of.....	360
Buffalo Bayou near.....	81	Big Creek near Guy, Tex.....	125
Addicks Reservoir near Addicks, Tex....	83	near Needville, Tex.....	124
Agencies other than Geological Survey, records collected by.....	12-13	Big Sandy Creek (Sabine River Basin) near Big Sandy, Tex.....	33
Alamogordo, N. Mex., Alamogordo water supply near.....	357	Big Sandy Creek (Trinity River Basin) near Bridgeport, Tex.....	59-60
Alamogordo Dam, N. Mex., Pecos River below.....	321	Black River above Malaga, N. Mex.....	343
Alamogordo-La Luz ditch at La Luz, N. Mex.....	357	Blanca, Colo., Trinchera Creek near....	260
Alamogordo Reservoir, N. Mex., contents of.....	241, 243	Blanco River at Wimberley, Tex.....	183
Alamogordo water supply near Alamogordo, N. Mex.....	357	Bluewater Creek, N. Mex., discharge measurements of.....	362
Alamosa, Colo., Rio Grande at.....	223	near Bluewater, N. Mex.....	311
Alamosa Creek above Terrace Reservoir, Colo.....	255	Bluewater main canal, N. Mex., discharge measurements of.....	362
below Terrace Reservoir, Colo.....	256	Bluewater middle main canal, N. Mex., discharge measurements of.....	362
Albuquerque, N. Mex., Rio Grande at....	233	discharge measurements of.....	362
Tijeras Creek near.....	305	Bluewater west canal, N. Mex., discharge measurement of.....	362
Aledo, Tex., Clear Fork Trinity River near.....	61	Blum, Tex., Noldans River at.....	111
Alire ditch at Garcia, Colo.....	277	Bodano Bayou, Tex., discharge measure-	
Alto, Tex., Angelina River near.....	38	ment of.....	358
Neches River near.....	36	Boyd, Tex., West Fork Trinity River near.....	48
Alvin, Tex., Chocolate Bayou near.....	88	Bowles Creek, Tex., discharge measure-	
American Canal Co.'s canal, Tex., dis-	359	ment of.....	358
charge measurements of.....	121	Box Creek, Tex., discharge measure-	
near Fulshear, Tex.....	43	ment of.....	358
Angelina River at Harger, Tex.....	359	Boyd, Tex., West Fork Trinity River near.....	48
discharge measurement of.....	41	Bracken, Tex., Cibola Creek above.....	198
near Austin, Tex.....	42	Brackettville, Tex., Las Moras Springs at.....	351-352
near Lufkin, Tex.....	42	West Mexico near.....	212
Angleton, Tex., Oyster Creek near.....	89	Brady Creek at Brady, Tex.....	165
Anton Chico, N. Mex., Pecos River near..	318	Brays Bayou at Houston, Tex.....	85
Aquilla Creek near Aquilla, Tex.....	112	Brazas River at East Columbia, Tex....	103
Arroyo Hondo, N. Mex., Rio Hondo at....	284	at Richmond, Tex.....	102
Arroyo Seco, N. Mex., Rio Lucero near....	287	at Seymour, Tex.....	91
Artesia, N. Mex., Pecos River near.....	324	at Waco, Tex.....	97
Asherton, Tex., Nueces River near.....	204-205	Clear Fork, at Fort Griffin, Tex.....	107
Aspermont, Tex., Double Mountain Fork Brazos River near.....	90	at Nugent, Tex.....	106
Salt Fork Brazos River near.....	104	near Crystal Falls, Tex.....	108
Atascosa River at Whitsett, Tex.....	218	discharge measurements of.....	359
Attoyac Bayou near Chireno, Tex.....	45	Double Mountain Fork, at Lubbock, Tex.....	90
Austin, Tex., Barton Springs at.....	169-170	near Aspermont, Tex.....	90
Colorado River at.....	134	near Bryan, Tex.....	99
Marshall Ford Reservoir near.....	133	near Glen Rose, Tex.....	95
Balaxy Creek, Tex., discharge measure-	359	near Hempstead, Tex.....	100
ment of.....	130	near Marlin, Tex.....	98
Ballinger, Tex., Colorado River at.....	140	near Palo Pinto, Tex.....	94
Elm Creek at.....	144	near San Felipe, Tex.....	101
Barker Reservoir near Addicks, Tex.....	80	near South Bend, Tex.....	92
Barranco Alto ditch, N. Mex., diversion by.....	300	near Whitney, Tex.....	96
Barton Springs at Austin, Tex.....	169-170	Salt Fork, near Aspermont, Tex.....	104
Basile, La., Bayou Nezeque near.....	139	Brazos River Basin, Tex., discharge measurements in.....	359-360
Bay City, Tex., Colorado River near....	139	gaging-station records in.....	90-126
Bayou des Cannes near..... Eunice, La.....	15	Bridgeport, Tex., Big Sandy Creek near	59-60
Bayou Nezeque near Basile, La.....	15	Bridgeport Reservoir above.....	47
Bayou Plaquemine Brule, La., discharge measurements of.....	358	Bridgeport Reservoir above Bridgeport, Tex.....	47
Bayou Quee de Tortue, La., discharge measurements of.....	358	Tex.....	47
Bear Canyon near Mimbres, N. Mex.....	354	Brisco Irrigation Co.'s canal Tex., discharge measurements of.....	360
Beckwith Creek near De Quincy, La.....	23	Brownwood, Tex., Brownwood Reservoir near.....	157-159
Belén, N. Mex., Rio Grande near.....	234	Pecan Bayou at.....	160
Belton, Tex., Leon River near.....	115	Brownwood Reservoir near Brownwood, Tex.....	157-159
Benbrook, Tex., Clear Fork Trinity River near.....	62	Brushy Creek, Tex., discharge measure-	
Bent, N. Mex., Rio Tularosa near.....	355	ment of.....	360
		Bryan, Tex., Brazos River near.....	99
		Buchanan Reservoir near Burnet, Tex.....	130

	Page		Page
Buck Creek, Tex., discharge measure- ment of.....	359	Colorado River at Colorado City, Tex.....	128
Buffalo Bayou at Houston, Tex.....	82	at Columbus, Tex.....	137
near Addicks, Tex.....	81	at La Grange, Tex.....	136
Bull Creek near Ira, Tex.....	140	at Robert Lee, Tex.....	129
Bulverde, Tex., Cibola Creek near.....	198	at Smithville, Tex.....	135
Bundick Creek near Dry Creek, La.....	22	at Wharton, Tex.....	138
Burnet, Tex., Buchanan Reservoir near.....	133	at Winchell, Tex.....	131
Caballo Dam, N. Mex., Rio Grande below.....	239	near Bay City, Tex.....	139
Caballo Reservoir, N. Mex., contents of.....	240, 242	near Ira, Tex.....	127
Cabezon, N. Mex., Rio Puerco at.....	307	near San Saba, Tex.....	132
Rio Puerco near.....	306	Colorado River Basin, Colo.-Tex., dis- charge measurements in.....	360
Cabresto Creek near Questa, N. Mex.....	281	diversions from, to Rio Grande Basin.....	244
Cañallen, Tex., Nueces River at.....	211	gaging-station records in.....	127-170
Calcasieu River near Glenmora, La.....	17-18	Columbus, Tex., Colorado River at.....	137
near Kinder, La.....	20	Comal River at New Braunfels, Tex.....	181
near Oberlin, La.....	19	Comanche Springs at Fort Stockton, Tex.....	350
Calcasieu River Basin, La., gaging- station records in.....	17-24	Comfort, Tex., Guadalupe River at.....	176
Callham, Tex., Frio River at.....	215	Comunidad ditch, N. Mex., diversion by.....	300
Cameron, Tex., Little River at.....	116	Computations, accuracy of results of.....	5-6
Caney Creek, Tex., discharge measure- ment of.....	359	Concan, Tex., Frio River at.....	213
near Splendor, Tex.....	79	Concho River near Paint Rock, Tex.....	149
Canyon ditch, N. Mex., diversion by.....	300	near San Angelo, Tex.....	148
Capulin, Colo., La Jara Creek near.....	257	Conejos River at Platoro, Colo.....	263
Carlsbad, N. Mex., Pecos River at.....	328	near La Sauses, Colo.....	265
Pecos River near.....	326, 327	near Mogote, Colo.....	264
Carlsbad, Tex., North Concho River near.....	155	Conroe, Tex., West Fork San Jacinto River near.....	72
Carnero Creek near La Garita, Colo.....	253	Contents, definition of.....	2
Carrollton, Tex., Elm Fork Trinity River near.....	65	Continental Reservoir, Colo., Clear Creek below.....	245
Carson Reservoir, N. Mex., contents of.....	240, 242	Control, definition of.....	1
Casias Creek near Costilla, N. Mex.....	275	Cooperation, record of.....	12-13
Cave Springs, Tex., discharge measure- ment of.....	360	Cordillera ditch at Garcia, Colo.....	277
Cedar Creek (tributary to Masons Creek), Tex., discharge measurement of.....	359	Correo, N. Mex., San Jose River at.....	313
Cedar Creek (tributary to Trinity River) near Mabank, Tex.....	69	Corsicana, Tex., Chambers Creek near.....	70
Cerro, N. Mex., Latir Creek near.....	278	Costilla, N. Mex., Acequia Madre at.....	277
Rio Grande near.....	226	Casias Creek near.....	275
Cerro Canal at Costilla, N. Mex.....	277	Cerro Canal near.....	277
near Jaroso, Colo.....	277	Costilla Creek near.....	271, 272, 273
New Mexico Branch, near Jaroso, Colo.....	277	Santistevan Creek near.....	276
Chambers Creek near Corsicana, Tex.....	70	Costilla Creek above reservoir, near Costilla, N. Mex.....	271
Chamita, N. Mex., Rio Chama near.....	293	at Garcia, Colo.....	274
Champlin Creek near Colorado City, Tex.....	143	below Reservoir, near Costilla, N. Mex.....	272
Cherokee Bayou near Elderville, Tex.....	34	diversions from.....	277
Chico Arroyo near Guadalupe, N. Mex.....	310	near Costilla, N. Mex.....	273
Chireno, Tex., Attoyac Bayou near.....	45	Cottonwood Creek near Lake Arthur, N. Mex.....	342
Chocolate Bayou near Alvin, Tex.....	88	Cotulla, Tex., Nueces River at.....	206
Christoval, Tex., South Concho Irriga- tion Co.'s canal at.....	150	Cowhouse Creek, Tex., discharge measurement of.....	359
South Concho River at.....	145	Creede, Colo., Rio Grande below.....	220
Cibola Creek above Bracken, Tex.....	198	Rio Grande near.....	219
at Selma, Tex.....	199	Crestone, Colo., North Crestone Creek near.....	252
discharge measurements of.....	360	Crooked Creek, Tex., discharge measure- ment of.....	359
near Bulverde, Tex.....	198	Crystal Falls, Tex., Clear Fork Brazos River near.....	108
near Falls City, Tex.....	200	Culebra Creek at San Luis, Colo.....	269
Clear Creek (tributary to Gulf of Mexico) near Pearland, Tex.....	86	below San Luis, Colo.....	270
Clear Creek Basin, Tex., gaging- station records in.....	86-87	Cundiyo, N. Mex., Rio Santa Cruz at.....	297
Clear Creek (tributary to Rio Grande) below Continental Reservoir, Colo.....	245	Cypress Creek near Westfield, Tex.....	76
Clear Creek (tributary to San Saba River), Tex., discharge measure- ment of.....	360	Dallas, Tex., Trinity River at.....	52
Clear Fork. See Brazos River, Clear Fork.		Data, accuracy of.....	5-6
Clear Fork. See Trinity River, Clear Fork.		explanation of.....	2-5
Cleveland, Tex., East Fork San Jacinto River near.....	77	De Quincy, La., Beckwith Creek near.....	2-5
Clifton, Tex., North Bosque River near.....	113	Del Norte, Colo., Pinos Creek near.....	248
Cochiti, N. Mex., Rio Grande at.....	230	Rio Grande near.....	221
Coletto Creek near Victoria, Tex.....	185	Delaware River near Red Bluff, N. Mex.....	344
Colorado City, Tex., Champlin Creek near.....	143	Denton Creek near Grapevine, Tex.....	67
Colorado River at.....	128	near Roanoke, Tex.....	66
Morgan Creek near.....	141-142	Derby, Tex., Frio River near.....	214
Colorado River at Austin, Tex.....	134	Devils River near Juno, Tex.....	351
at Ballinger, Tex.....	130	Diboll, Tex., Neches River near.....	37
		Dixon, N. Mex., Embudo Creek at.....	289
		Double Mountain Fork. See Brazos River, Double Mountain Fork.	
		Dove Creek near Knickerbocker, Tex.....	153
		Dove Creek Spring near Knickerbocker, Tex.....	153-154
		Dry Creek, La., Bundick Creek near.....	22

	Page		Page
Dry Creek (Brazos River Basin) near Richmond, Tex.....	122-123	Grants, N. Mex., San Jose River near....	312
Dry Creek (Colorado River Basin) at Buescher Lake, near Smithville, Tex.....	170	Grapevine, Tex., Denton Creek near....	67
Dry Devils River, Tex., discharge measurement of.....	364	Guadalupe, N. Mex., Chico Arroyo near....	310
Eagle Mountain Reservoir above Fort Worth, Tex.....	49	Guadalupe River above Comal River, at New Braunfels, Tex.....	178
East Columbia, Tex., Brazos River at....	103	at Comfort, Tex.....	176
East Sandia Spring, Tex., discharge measurements of.....	363	at Hunt, Tex.....	175
Eastdale No. 1 intake canal near Jaroso, Colo.....	277	at Victoria, Tex.....	179
Easterly, Tex., Navasota River near....	120	near Spring Branch, Tex.....	177
Edna, Tex., Lavaca River near.....	172	Guadalupe River Basin, Tex., discharge measurements in.....	360-361
El Rito Creek near El Rito, N. Mex.....	235	gaging-station records in.....	175-200
El Vado Dam, N. Mex., Rio Chama below El Vado Reservoir, N. Mex., contents of.....	291	Guy, Tex., Big Creek near.....	125
Elderville, Tex., Cherokee Bayou near....	34	Hagerman, N. Mex., Rio Felix near.....	341
Elephant Butte Dam, N. Mex., Rio Grande below.....	238	Hagerman Canal, N. Mex., discharge measurements of.....	363
Elephant Butte Reservoir, N. Mex., contents of.....	240, 242	Hallettsville, Tex., Lavaca River at....	171
Elm Creek at Ballinger, Tex.....	144	Hasse, Tex., Leon River near.....	114
Elm Fork. See Trinity River, Elk Fork.		Hempstead, Tex., Brazos River near....	103
Elmendorf Interior drain near San Antonio, N. Mex.....	316	Hickory Branch at Kernan, La.....	24
Embudo, N. Mex., Rio Grande at.....	228	Hickory Slough near Pearland, Tex.....	87
Embudo Creek at Dixon, N. Mex.....	289	Hondo, N. Mex., Rio Bonito at.....	340
Eunice, La., Bayou des Cannes near....	16	Hondo, N. Mex., Rio Bonito at.....	338
Evadale, Tex., Neches River at.....	39	Hondo Creek Reservoir near Valera, Tex.....	161
Fairchild Creek near Needville, Tex....	126	Honger, Tex., Angelina River at.....	43
Falls City, Tex., Cibola Creek near....	200	Houston, Tex., Brays Bayou at.....	85
San Antonio River near.....	187	Buffalo Bayou at.....	82
Playwood, N. Mex., Mimbres River near....	353	Whiteoak Bayou at.....	84
Flat Creek, Tex., discharge measurements of.....	358	Hueco Springs, Tex., discharge measurements of.....	361
Floods, special reports on.....	11	Huffman, Tex., San Jacinto River near....	74
Port Garland, Colo., Sangre de Cristo Creek near.....	261	Humble, Tex., West Fork San Jacinto River near.....	73
Trinchera Creek near.....	258, 259	Hunt, Tex., Guadalupe River at.....	175
Ute Creek near.....	262	Ildefonso, N. Mex., Well ditch at.....	302
Port Griffin, Tex., Clear Fork Brazos River at.....	107	Indian ditch, N. Mex., diversion by....	288
Port Phantom Hill Reservoir near Nugent, Tex.....	109	Ingram, Tex., Johnson Creek near.....	180
Port Stockton, Tex., Comanche Springs at.....	350	Ira, Tex., Bull Creek near.....	140
Port Worth, Tex., Clear Fork Trinity River at.....	63	Colorado River near.....	127
Eagle Mountain Reservoir above.....	49	Jacksonville, Tex., Mud Creek near....	40
West Fork Trinity River at.....	50	Jacona ditch, N. Mex., diversion by....	300
Frio River at Calliham, Tex.....	215	Jaroso, Colo., Cerro Canal near.....	277
at Concan, Tex.....	213	Eastdale No. 1 intake canal.....	277
discharge measurement of.....	361	New Mexico Branch Cerro Canal near....	277
near Derby, Tex.....	214	Jemez Creek near Bernalillo, N. Mex.....	304
Fuchs ditch, Colo., diversion by.....	244	Johnson City, Tex., Pedernales River near.....	169
Fulshear, Tex., American Canal Co.'s canal near.....	121	Johnson Creek near Ingram, Tex.....	180
Gallinas River at Montezuma, N. Mex....	337	Juan Manuel ditch, N. Mex., diversion by.....	288
near Montezuma, N. Mex.....	336	Junction, Tex., Llano River near.....	167
Canado, Tex., Naveda River near.....	174	North Llano River near.....	166
Garcia, Colo., Alire ditch at.....	277	Juno, Tex., Devils River near.....	351
Cordillera ditch at.....	277	Kerber Creek at Ashley Ranch, near Villa Grove, Colo.....	250
Costilla Creek at.....	274	Kernan, La., Hickory Branch at.....	24
Mesa ditch near.....	277	Kinder, La., Calcasieu River near....	20
Middle ditch at.....	277	Knickerbocker, Tex., Dove Creek near....	153
Georgetown, Tex., San Gabriel River at....	118	Dove Creek Spring near.....	153-154
Giffin Springs, Tex., discharge measurements of.....	363	Kountze, Tex., Village Creek near.....	46
Girvin, Tex., Pecos River near.....	334	La Garita, Colo., Carnero Creek near....	253
Gladewater, Tex., Sabine River near....	3, 26	La Garita Creek near.....	254
Glen Rose, Tex., Brazos River near....	95	La Garita Creek near La Garita, Colo....	254
Paluxy Creek at.....	110	La Grange, Tex., Colorado River at....	136
Glenora, La., Calcasieu River near....	17-18	La Jara Creek at Gallegos Ranch, near Capulin, Colo.....	257
Goliad, Tex., San Antonio River at....	188	La Luz, N. Mex., Alamogordo-La Luz ditch at.....	357
Goose Creek near Wagon Wheel Gap, Colo.	246	La Luz ditch, N. Mex., discharge measurements of.....	364
Graford, Tex., Possum Kingdom Reservoir near.....	93	La Madera, N. Mex., Rio Ojo Caliente at....	296
Grand Prairie, Tex., West Fork Trinity River at.....	51	La Sausas, Colo., Conejos River near....	265
Grandfalls, Tex., Pecos River below....	333	Rio Grande near.....	224
Grandfalls-Big Valley Canal, Tex., monthly diversion through.....	346	Laguna, Tex., Neches River at.....	202
		Lake Arthur, N. Mex., Cottonwood Creek near.....	342
		Pecos River near.....	323
		Lake Avalon, N. Mex., contents of.....	241, 243
		Lake Dallas near Lake Dallas, Tex.....	64
		Lake Fork. See Sabine River, Lake Fork.	
		Lake McMillan, N. Mex., contents of.....	241, 243
		Lake Nasworthy near San Angelo, Tex....	146
		Lampasas River at Youngsfort, Tex.....	117



	Page		Page
Larrison Creek, Tex., discharge measurement of.....	358	Mimbres, N. Mex., Bear Canyon near.....	354
Las Joyas ditch, N. Mex., diversion by.....	300	Mimbres River near.....	352
Las Moras Springs at Brackettville, Tex.....	351-352	Mimbres River near Paywood, N. Mex.....	353
Latir Creek near Cerro, N. Mex.....	278	near Mimbres, N. Mex.....	352
Lavaca River at Hallettsville, Tex.....	171	Mimbres River Basin, N. Mex., gaging-station records in.....	352-354
near Edna, Tex.....	172	Mineola, Tex., Sabine River near.....	25
seepage investigations.....	173	Mission River at Refugio, Tex.....	201
Lavaca River Basin, Tex., gaging-station records in.....	171-174	Mitchell ditch near Santa Fe, N. Mex.....	302
Leon River, Tex., discharge measurement of.....	359	Mocha ditch, N. Mex., diversion by.....	300
near Belton, Tex.....	115	Mogote, Colo., Conejos River near.....	254
near Hasse, Tex.....	114	Monte Vista, Colo., Rio Grande near.....	222
Leon Springs main canal above dam, Tex., discharge measurement of.....	364	Rock Creek near.....	337
Leon Springs wells, Tex., discharge measurements of.....	363-364	Montezuma, N. Mex., Gallinas River at.....	249
Leona River spring flow near Uvalde, Tex.....	217	Gallinas River near.....	336
Liberty, Tex., Trinity River at.....	58	Morgan Creek near Colorado City, Tex.....	341-342
Lipan Springs, Tex., discharge measurement of.....	360	Mud Creek near Jacksonville, Tex.....	40
Little Cow Creek, Tex., discharge measurements of.....	358	Nome Canal, N. Mex., diversion by.....	300
Little Red Bluff Creek, Tex., discharge measurement of.....	364	Nome Creek, N. Mex., diversions from.....	300
Little River at Cameron, Tex.....	116	near Nome, N. Mex.....	299
Llano ditch, N. Mex., diversion by.....	300	Navasota River near Easterly, Tex.....	120
near Questa, N. Mex.....	282	Navidad River near Ganado, Tex.....	174
Llano Frio ditch, N. Mex., diversion by.....	300	Neches River at Evadale, Tex.....	39
Llano River at Llano, Tex.....	168	near Alto, Tex.....	36
near Junction, Tex.....	167	near Diboll, Tex.....	37
Lobatos, Colo., Rio Grande near.....	225	near Neches, Tex.....	35
Logansport, La., Sabine River at.....	28	near Rockland, Tex.....	38
Los Cordovas, N. Mex., Rio Taos at.....	286	Neches River Basin, Tex., discharge measurement in.....	358-359
Los Pinos River near Ortiz, Colo.....	268	gaging-station records in.....	35-46
Lubbock, Tex., Double Mountain Fork Brazos River at.....	90	Needville, Tex., Big Creek near.....	124
Lufkin, Tex., Angelina River near.....	42	Fairchild Creek near.....	126
Luling, Tex., Plum Creek near.....	184	New Braunfels, Tex., Comal River at.....	181
San Marcos River at.....	182	Guadalupe River at.....	178
McCarthy Spring, Tex., discharge measurement of.....	360	New Year Creek, Tex., discharge measurement of.....	360
McClure Reservoir, N. Mex., contents of.....	240, 242	Nichols Reservoir, N. Mex., contents of.....	241, 242
McGraw Creek, Tex., discharge measurements of.....	358	Nolands River at Blum, Tex.....	111
McMillan Dam, N. Mex., Pecos River below.....	325	North Bosque River near Clifton, Tex.....	113
Mabank, Tex., Cedar Creek near.....	69	North Concho River at San Angelo, Tex.....	156
Mack Creek, Tex., discharge measurement of.....	359	at Sterling City, Tex.....	154
Madera Canyon near Toyahvale, Tex.....	347	near Carlsbad, Tex.....	155
Mailtrail Creek, Tex., discharge measurement of.....	364	North Crestone Creek near Crestone, Colo.....	252
Malaga, N. Mex., Black River above.....	343	North Llano River near Junction, Tex.....	166
Pecos River near.....	329	North San Gabriel River, Tex., discharge measurement of.....	360
Manassa, Colo., San Antonio River near.....	267	Noyes Canal at Menard, Tex.....	164
Marlin, Tex., Brazos River near.....	98	Nueces River at Calallen, Tex.....	211
Marshall Ford Reservoir near Austin, Tex.....	133	at Cotulla, Tex.....	206
Masons Creek, Tex., discharge measurement of.....	359	at Laguna, Tex.....	202
Mathis, Tex., Nueces River near.....	209	below Uvalde, Tex.....	203
Medina Lake near San Antonio, Tex.....	189-196	near Asherton, Tex.....	204-205
Medina River, Tex., discharge measurements of.....	360	near Mathis, Tex.....	209
near San Antonio, Tex.....	197	near Thres Rivers, Tex.....	208
Menard, Tex., Noyes Canal at.....	164	near Tilden, Tex.....	207
San Saba River at.....	162	seepage investigation.....	210
Mermontau River Basin, La., discharge measurements in.....	358	Nueces River Basin, Tex., discharge gaging-station records in.....	361
gaging-station records in.....	15-16	Nugent, Tex., Clear Fork Brazos River at.....	202-218
Mesa ditch near Garcia, Colo.....	277	Fort Phantom Hill Reservoir near.....	109
Middle Concho River near Tankersly, Tex.....	151	Oakwood, Tex., Trinity River near.....	54
Middle ditch at Garcia, Colo.....	277	Oberlin, La., Calcasieu River near.....	19
Middle main canal, lateral from, N. Mex., discharge measurements of.....	362	Whiskey Chitto Creek near.....	21
middle lateral from, N. Mex., discharge measurement of.....	362	Ojo del Gallo, N. Mex., discharge measurement of.....	362
Midway, Tex., Trinity River near.....	55	Old company canal, N. Mex., discharge measurement of.....	362
Milam, Tex., Sabine River near.....	29	Orla, Tex., Pecos River near.....	331
Mill Creek, Tex., discharge measurement of.....	360	Salt (Screwbean) Draw near.....	345
		Ortiz, Colo., Los Pinos River near.....	268
		San Antonio River at.....	266
		Ortiz ditch, N. Mex., diversion by.....	300
		San Antonio River at.....	266
		Oyster Creek, Tex., discharge measurements of.....	359
		near Angleton, Tex.....	89
		Oyster Creek Basin, Tex., discharge measurements in.....	359
		gaging-station record in.....	89
		Paint Rock, Tex., Concho River near.....	149
		Palo Pinto, Tex., Brazos River near.....	94
		Paluxy Creek at Glen Rose, Tex.....	110
		Park View, N. Mex., Rio Chama at.....	290



	Page		Page
Park View, N. Mex., Willow Creek near..	294	Richmond Irrigation Co.'s canal near	
Parker Creek, Tex., discharge measure-		Richmond, Tex.....	121
ment of.....	359	Rio Bonito at Hondo, N. Mex.....	340
Peach Creek at Splendora, Tex.....	78	Rio Chama at Park View, N. Mex.....	290
Peartland, Tex., Clear Creek near.....	86	below El Vado Dam, N. Mex.....	291
Hickory Slough near.....	87	near Abiquiu, N. Mex.....	292
Pecan Bayou at Brownwood, Tex.....	160	near Chama, N. Mex.....	293
Pecan Springs, Tex., discharge measure-		Rio Felix at old highway bridge, near	
ment of.....	360	Hagerman, N. Mex.....	341
Pecos, N. Mex., Pecos River near.....	317	discharge measurements of.....	363
Pecos, Tex., Pecos River at.....	332	Rio Grande above mouth of Trincher	
Toyah Creek near.....	348	Creek, near La Sauses, Colo.....	224
Pecos County Water Improvement District		at Alamosa, Colo.....	223
No. 2 Canal, Tex., monthly di-		at Albuquerque, N. Mex.....	233
version through.....	346	at Cochiti, N. Mex.....	230
Pecos County Water Improvement District		at Embudo, N. Mex.....	228
No. 3 Canal, Tex., monthly di-		at Otowi Bridge, near San Ildefonso,	
version through.....	346	N. Mex.....	229
Pecos County Water Improvement District		at San Acacia, N. Mex.....	236
No. 2 upper diversion canal, Tex.,		at San Felipe, N. Mex.....	231
diversion through.....	346	at San Marcial, N. Mex.....	237
Pecos River at Carlsbad, N. Mex.....	328	at Thirtymile Bridge, near Creede, Colo.	219
at dam site 3, near Carlsbad, N. Mex.	327	at Wason, below Creede, Colo.....	220
at Pecos, Tex.....	332	below Caballo Dam, N. Mex.....	239
at Red Bluff, N. Mex.....	330	below Elephant Butte Dam, N. Mex.....	238
at Santa Rosa, N. Mex.....	319	below Taos Junction Bridge, near	
below Alamogordo Dam, N. Mex.....	321	Taos, N. Mex.....	227
below Grandfalls, Tex.....	333	near Belen, N. Mex.....	234
below McMillan Dam, N. Mex.....	325	near Bernalillo, N. Mex.....	232
below Major Johnson Springs, near		near Bernardo, N. Mex.....	235
Carlsbad, N. Mex.....	326	near Cerro, N. Mex.....	226
discharge measurements of.....	363	near Del Norte, Colo.....	221
diversions from, between Red Bluff		near Lobatos, Colo.....	225
Reservoir and Imperial, Tex.....	346	near Monte Vista, Colo.....	222
near Acme, N. Mex.....	322	South Fork, at South Fork, Colo.....	247
near Anton Chico, N. Mex.....	318	Rio Grande Basin, N. Mex.-Tex., dis-	
near Artesia, N. Mex.....	324	charge measurements in.....	361-364
near Girvin, Tex.....	334	gaging-station records in.....	219-351
near Lake Arthur, N. Mex.....	323	reservoirs in, contents of.....	240-243
near Malaga, N. Mex.....	329	Rio Hondo (tributary to Pecos River)	
near Orla, Tex.....	331	at Diamond A Ranch, near Roswell,	
near Pecos, N. Mex.....	317	N. Mex.....	339
near Puerto de Luna, N. Mex.....	337	discharge measurements of.....	363
near Sherfield, Tex.....	335	Rio Hondo (tributary to Rio Grande) at	
Pedernales River near Johnson City, Tex.	169	Arroyo Hondo, N. Mex.....	284
Phantom Lake Spring, Tex., discharge		near Valdez, N. Mex.....	283
measurements of.....	363	Rio Lucero, N. Mex., diversions from.....	288
Piedra Pass ditch, Colo., diversion by..	244	near Arroyo Seco, N. Mex.....	287
Piney Creek, Tex., discharge measure-		Rio Ojo Caliente at La Madera, N. Mex...	296
ment of.....	360	Rio Pueblo de Taos near Taos, N. Mex.....	285
Pinos Creek near Del Norte, Colo.....	248	Rio Puerco at Cabezón, N. Mex.....	307
Plainview, Tex., White River at.....	105	at Rio Puerco, N. Mex.....	308
Platoro, Colo., Conejos River at.....	263	near Bernardo, N. Mex.....	309
Plum Creek near Luling, Tex.....	184	near Cabezón, N. Mex.....	306
Possum Kingdom Reservoir near Graford,		Rio Ruidoso at Hondo, N. Mex.....	338
Tex.....	93	Rio Salado near San Acacia, N. Mex.....	314
Prado ditch, N. Mex., diversion by.....	288	Rio Santa Cruz at Cundiyo, N. Mex.....	297
Prairie Creek, Tex., discharge measure-		at Riverside, N. Mex.....	298
ment of.....	359	Rio Taos at Los Cordovas, N. Mex.....	286
Publications on stream flow by Geologi-		Rio Tesuque above diversions, near	
cal Survey.....	6-9, 11	Santa Fe, N. Mex.....	301
by State agencies.....	10-11	Rio Tularosa near Bent, N. Mex.....	355
Puerto de Luna, N. Mex., Pecos River		near Tularosa, N. Mex.....	356
near.....	320	Riverside, N. Mex., Rio Santa Cruz at..	298
Questa, N. Mex., Cabresto Creek near...	281	Riverside, Tex., Trinity River at.....	56
Llano ditch near.....	282	Roanoke, Tex., Denton Creek near.....	66
Red River near.....	280	Robert Lee, Tex., Colorado River at.....	129
Quicksand Creek, Tex., discharge		Rock Creek near Monte Vista, Colo.....	242
measurements of.....	358	Rockland, Tex., Neches River near.....	38
Quitman, Tex., Lake Fork Sabine River		Rockwall, Tex., East Fork Trinity River	
near.....	32	near.....	68
Raber-Lohr ditch, Colo., diversion by..	244	Romayor, Tex., Trinity River at.....	57
Red Bluff, N. Mex., Delaware River near	344	Rosser, Tex., Trinity River near.....	53
Pecos River at.....	330	Roswell, N. Mex., Rio Hondo near.....	339
Red Bluff Reservoir, Tex., contents		Ruliff, Tex., Sabine River near.....	31
of.....	241, 243	Runoff in inches, definition of.....	1
Red River near Questa, N. Mex.....	280	Sabinal River near Sabinal, Tex.....	216
near Red River, N. Mex.....	279	Sabine River at Logansport, La.....	28
Reeves County Water Improvement Dis-		Lake Fork, near Quitman, Tex.....	32
trict No. 2 Canal, Tex., monthly		near Bon Wier, Tex.....	30
diversion through.....	346	near Gladewater, Tex.....	3, 26
Refugio, Tex., Mission River at.....	201	near Milan, Tex.....	29
Richland Creek near Richland, Tex.....	71	near Mineola, Tex.....	25
Richmond, Tex., Brazos River at.....	102	near Ruliff, Tex.....	31
Dry Creek near.....	122-123	near Tatum, Tex.....	27
Richmond Irrigation Co.'s canal near..	121	Sabine River Basin, Tex., discharge	
		measurements in.....	358

	Page		Page
Sabine River Basin, Tex., gaging-station records in.....	25-34	Selma, Tex., Cibola Creek at.....	199
Saguache Creek near Saguache, Colo.....	251	Seymour, Tex., Brazos River at.....	91
Salado Creek, Tex., discharge measurements of.....	359, 360	Shawnee Creek, Tex., discharge measurement of.....	359
Salado Springs Nos. 1, 2, 3, 4, 5, Tex., discharge measurements of.....	359	Sheffield, Tex., Pecos River near.....	335
Salt (Screwbean) Draw near Orla, Tex.....	345	Smithville, Tex., Colorado River at.....	135
Salt Fork. See Brazos River, Salt Fork.		Dry Creek near.....	170
San Acacia, N. Mex., Rio Grande at.....	236	Socorro main canal north at San Acacia, N. Mex.....	315
Rio Salado near.....	314	Socorro main canal south near San Antonio, N. Mex.....	315
Socorro main canal north at.....	315	Somerville, Tex., Yegua Creek near.....	119
San Angelo, Tex., Concho River near.....	148	South Bend, Tex., Brazos River near.....	92
Lake Nasworthy near.....	146	South Concho Irrigation Co.'s canal at Christoval, Tex.....	150
North Concho River at.....	156	South Concho River at Christoval, Tex., at San Angelo, Tex.....	145
South Concho River at.....	147	discharge measurements of.....	147
San Antonio, N. Mex., Elmendorf Interior drain near.....	316	South Fork, Colo., South Fork Rio Grande at.....	247
San Antonio Riverside drain near.....	315	South San Gabriel River, Tex., discharge measurement of.....	360
Socorro main canal south near.....	315	South Texas Water Co.'s canal, Tex., discharge measurements of.....	360
San Antonio, Tex., Medina Lake near.....	189-196	Splendor, Tex., Caney Creek near.....	79
Medina River near.....	197	Peach Creek at.....	78
San Antonio River at.....	186	Spring Branch, Tex., Guadalupe River near.....	177
San Antonio River (Guadalupe River Basin) at Coliad, Tex.....	188	Spring Creek (Colorado River Basin), discharge measurement of.....	360
at San Antonio, Tex.....	186	near Tankersly, Tex.....	152
near Falls City, Tex.....	187	Spring Creek (San Jacinto River Basin) near Spring, Tex.....	75
San Antonio River (Rio Grande Basin) at mouth, near Manassa, Colo.....	267	Squaw Pass ditch, Colo., diversion by.....	244
at Ortiz, Colo.....	266	Stage-discharge relation, definition of Sterling City, Tex., North Concho River at.....	154
San Antonio Riverside drain near San Antonio, N. Mex.....	315	Striker Creek near Summerfield, Tex.....	44
near San Marcial, N. Mex.....	316	Summerfield, Tex., Striker Creek near.....	44
San Felipe, N. Mex., Rio Grande at.....	231	Tabor ditch, Colo., diversion by.....	244
San Felipe, Tex., Brazos River near.....	101	Tankersly, Tex., Middle Concho River near.....	151
San Francisco Riverside drain, N. Mex., discharge measurements of.....	361-362	Taos, N. Mex., Rio Pueblo de Taos near.....	285
San Gabriel River at Georgetown, Tex.....	118	Rio Grande near.....	227
San Ildefonso, N. Mex., Rio Grande near Well ditch at.....	229	Tarbell ditch, Colo., diversion by.....	244
San Jacinto River, East Fork, near Cleveland, Tex.....	302	Tatum, Tex., Sabine River near.....	27
near Huffman, Tex.....	77	Tenorio ditch, N. Mex., diversion by.....	288
West Fork, near Conroe, Tex.....	78	Terms, definition of.....	1-2
near Humble, Tex.....	73	Terrace Reservoir, Colo., Alamosa Creek above.....	255
San Jacinto River Basin, Tex., gaging-station records in.....	72-85	Alamosa Creek below.....	256
San Jose River at Correo, N. Mex.....	313	Three Rivers, Tex., Nueces River near.....	208
near Grants, N. Mex.....	312	Tijeras Creek near Albuquerque, N. Mex.....	305
San Luis, Colo., Culebra Creek at.....	269	Tilden, Tex., Nueces River near.....	207
Culebra Creek below.....	270	Toyah Creek below Toyah Lake, near Pecos, Tex.....	348
San Luis Valley, Colo., closed basin in, gaging-station records for streams in.....	250-254	Toyahvale, Tex., Madera Canyon near.....	347
San Marcial, N. Mex., Rio Grande at.....	237	San Solomon Springs at.....	349
San Antonio Riverside drain near.....	316	Treasure Pass ditch, Colo., diversion by.....	244
San Marcos River at Luling, Tex.....	182	Trinchera Creek above Mountain Home Reservoir, near Fort Garland, Colo.....	259
San Marcos Springs, Tex., discharge measurements of.....	361	above Turners Ranch, near Fort Garland, Colo.....	258
San Pedro Springs, Tex., discharge measurements of.....	364	below Smith Reservoir, near Blanca, Colo.....	260
San Saba, Tex., Colorado River near.....	3, 132	Trinity River at Dallas, Tex.....	52
San Saba River at.....	163	at Liberty, Tex.....	58
San Saba River at Menard, Tex.....	162	at Riverside, Tex.....	56
at San Saba, Tex.....	163	at Romayor, Tex.....	57
discharge measurement of.....	360	Clear Fork, at Fort Worth, Tex.....	63
San Solomon Springs at Toyahvale, Tex.....	349	near Alledo, Tex.....	61
Sandy Creek (tributary to Angelina River), Tex., discharge measurement of.....	359	near Benbrook, Tex.....	62
Sandy Creek (tributary to Shawnee Creek) Tex., discharge measurement of.....	359	East Fork, near Rockwall, Tex.....	68
Sangre de Cristo Creek near Fort Garland, Colo.....	261	Elm Fork, near Carrollton, Tex.....	65
Santa Fe, N. Mex., Mitchell ditch near Rio Tesuque near.....	302	near Midway, Tex.....	55
Santa Fe Creek near.....	301	near Oakwood, Tex.....	54
Santa Fe Creek, N. Mex., discharge measurements of.....	303	near Rosser, Tex.....	53
near Santa Fe, N. Mex.....	361	West Fork, at Fort Worth, Tex.....	50
Santa Rosa, N. Mex., Pecos River at.....	319	at Grand Prairie, Tex.....	51
Santistevan Creek near Costilla, N. Mex. Screwbean Draw. See Salt Draw.	276	near Boyd, Tex.....	48
Seco ditch, N. Mex., diversion by.....	288	Trinity River Basin, Tex., discharge measurements in.....	359
Second-feet per square mile, definition of.....	1	gaging-station records in.....	47-71
Second-foot, definition of.....	1	Tularosa, N. Mex., Rio Tularosa near.....	356
Second-foot-day, definition of.....	1		

# INDEX

371

	Page		Page
Tularosa Valley, N. Mex., discharge measurements in.....	364	Well ditch at San Ildefonso, N. Mex....	302
gaging-station records in.....	355-357	West Nueces River near Brackettville, Tex.....	212
Ute Creek near Fort Garland, Colo.....	262	West Sandia Springs, Tex., discharge measurements of.....	363
Uvalde, Tex., Leona River spring flow near.....	217	West side canal, N. Mex., discharge measurements of.....	362
Nueces River below.....	203	lateral from, discharge measurements of.....	362
Valdez, N. Mex., Rio Hondo near.....	283	Westfield, Tex., Cypress Creek near....	76
Valera, Tex., Hords Creek Reservoir near.....	161	Wharton, Tex., Colorado River at.....	138
Victoria, Tex., Coleta Creek near.....	185	Whiskey Chitto Creek near Oberlin, La..	21
Guadalupe River at.....	179	White Oak Creek, Tex., discharge measurement of.....	358
Villa Grove, Colo., Kerber Creek near..	250	White River at Plainview, Tex.....	105
Village Creek near Kountze, Tex.....	46	Whiteoak Bayou at Houston, Tex.....	84
Waco, Tex., Brazos River at.....	97	Whitney, Tex., Brazos River near.....	96
Wagon Wheel Gap, Colo., Goose Creek near.....	246	Whitsett, Tex., Atacosa River at.....	218
Walnut Creek, Tex., discharge measurements of.....	363	Willow Creek near Park View, N. Mex.....	294
Ward County Irrigation District No. 1 Canal, Tex., monthly diversion through.....	346	Wimberley, Tex., Blanco River at.....	183
Ward County Ward Improvement District No. 2 Canal, Tex., monthly diversion through.....	346	Winchell, Tex., Colorado River at.....	131
Ward County Water Improvement District No. 3 Canal, Tex., monthly diversion through.....	346	Work, division of.....	14
		scope of.....	1
		Yegua Creek near Somerville, Tex.....	119
		Youngsfort, Tex., Lampasas River at.....	117











USGS LIBRARY - RESTON



3 1818 00195649 7