

Quality of Surface Waters of the United States 1957

Parts 7 and 8. Lower Mississippi River Basin and Western Gulf of Mexico Basins

Prepared under the direction of S. K. LOVE, Chief, Quality of Water Branch

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



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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, and with other agencies by personnel of the Water Resources Division under the direction of L. B. Leopold, chief hydraulic engineer, and S. K. Love, chief, Quality of Water Branch. The data were collected and computed under the supervision of the following engineers or district chemists:

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CONTENTS

	Page
Introduction	1
Collection and examination of samples	3
Chemical quality	3
Temperature	4
Sediment	4
Expression of results	6
Composition of surface waters	8
Mineral constituents in solution	9
Silica	9
Aluminum	9
Manganese	9
Iron	10
Calcium	10
Magnesium	10
Sodium and potassium	11
Carbonate and bicarbonate	11
Sulfate	11
Chloride	11
Fluoride	11
Nitrate	12
Boron	12
Dissolved solids	13
Properties and characteristics of water	13
Temperature	13
Oxygen consumed	13
Color	13
Hydrogen-ion concentration	14
Specific conductance	14
Hardness	14
Acidity	15
Corrosiveness	15
Percent sodium	15
Sodium-adsorption-ratio	16
Sediment	16
Streamflow	17
Publications	17
Cooperation	19
Division of work	22
Literature cited	22
Chemical analyses, water temperatures, and suspended sediment	24

Chemical analyses, etc.--Continued	Page
Part 7. Lower Mississippi River basin	24
Mississippi River at St. Louis, Mo.(main stem)	24
St. Francis River basin.....	28
Miscellaneous analyses of streams in St. Francis	
River basin in Arkansas	28
White River basin	29
War Eagle Creek near Hindsville, Ark.....	29
Kings River near Berryville, Ark.....	30
White River at Bull Shoals Dam, Ark	31
White River at Cotter, Ark	33
Buffalo River near St. Joe, Ark.....	35
North Fork River at Norfork Dam, near Norfork,	
Ark.....	38
Black River near Corning, Ark.....	39
Current River near Pochahontas, Ark.....	42
Spring River at Imboden, Ark.....	43
Eleven Point River near Ravenden Springs, Ark....	46
Strawberry River near Poughkeepsie, Ark	49
White River at Newport, Ark	52
Little Red River near Heber Springs, Ark.....	55
White River at Clarendon, Ark.....	56
Miscellaneous analyses of streams in White River	
basin in Arkansas	59
Arkansas River basin.....	60
Arkansas River below John Martin Reservoir, Colo .	60
Arkansas River at Arkansas City, Ark.....	62
Salt Fork Arkansas River near Jet, Okla.....	66
Chikaskia River near Blackwell, Okla.....	67
Arkansas River at Ralston, Okla	68
Black Bear Creek at Pawnee, Okla	72
Cimarron River near Kenton, Okla	73
Cimarron River near Mocane, Okla	74
Cimarron River near Waynoka, Okla.....	76
Turkey Creek near Drummond, Okla.....	77
Cottonwood Creek near Guthrie, Okla.....	78
Cimarron River near Guthrie, Okla	79
Cimarron River at Perkins, Okla	80
Arkansas River at Sand Springs Bridge, near Tulsa,	
Okla	86
Verdigris River near Lenapah, Okla.....	90
Verdigris River near Inola, Okla.....	94
Neosho (Grand) River near Langley, Okla	98
Neosho (Grand) River near Chouteau, Okla	101
Neosho (Grand) River at Fort Gibson Reservoir,	
near Fort Gibson, Okla	102
Arkansas River at Webber Falls, Okla.....	104
Illinois River at Tenkiller Reservoir near Gore,Okla	110

Chemical analyses, etc. --Continued

Part 7. Lower Mississippi River basin--Continued

Arkansas River basin--Continued	Page
Canadian River at Logan, N. Mex.....	112
Canadian River near Amarillo, Tex.....	114
Canadian River at Bridgeport, Okla.....	118
Little River below Hog Creek, near Norman, Okla....	123
Little River near Sasakwa, Okla.....	130
North Canadian River at Canton Reservoir, near Canton, Okla.....	135
North Canadian River near El Reno, Okla.....	136
North Canadian River near Wetumka, Okla.....	139
Deep Fork near Beggs, Okla.....	144
Canadian River near Whitefield, Okla.....	148
Poteau River at Wister Reservoir, near Wister, Okla	153
Poteau River at Cauthron, Ark.....	154
Lee Creek near Van Buren, Ark.....	155
Arkansas River at Van Buren, Ark.....	156
Mulberry River near Mulberry, Ark.....	161
Piney Creek near Dover, Ark.....	162
Illinois Bayou near Scottsville, Ark.....	163
Arkansas River at Dardanelle, Ark.....	164
Arkansas River at Little Rock, Ark.....	168
Miscellaneous analyses of streams in Arkansas	
River basin in Kansas.....	172
Miscellaneous analyses of streams in Arkansas	
River basin in Oklahoma and Missouri.....	173
Miscellaneous analyses of streams in Arkansas	
River basin in Texas.....	180
Red River basin.....	181
Salt Fork Red River near Hedley, Tex.....	181
Beaver Creek near Waurika, Okla.....	184
Red River near Gainesville, Tex.....	190
Washita River near Foss, Okla.....	195
Washita River at Carnegie, Okla.....	202
Washita River near Pauls Valley, Okla.....	206
Rock Creek near Dougherty, Okla.....	207
Washita River near Durwood, Okla.....	211
Red River at Dennison Dam, near Dennison, Tex.....	215
Clear Boggy Creek near Caney, Okla.....	217
Little River near Horatio, Ark.....	221
Red River at Fulton, Ark.....	224
Red River near Hosston, La.....	228
Black Bayou near Gilliam, La.....	231
Red River at Shreveport, La.....	232
Bayou Dorcheat near Minden, La.....	235
Cypress Bayou near Benton, La.....	236
Loggy Bayou near Ninock, La.....	237

Chemical analyses, etc. --Continued

Part 7. Lower Mississippi River basin--Continued

Red River basin--Continued	Page
Saline Bayou near Lucky, La.	238
Black Lake Bayou near Castor, La.	239
Red River at Alexandria, La.	240
Ouachita River at Arkadelphia, Ark.	243
Ouachita River near Felsenthal, Ark.	246
Cornie Bayou near Three Creeks, Ark.	250
Three Creek near Three Creeks, Ark.	254
Corney Bayou near Lillie, La.	258
Ouachita River at Monroe, La.	259
Boeuf River near Girard, La.	262
Tensas River at Tendal, La.	263
Miscellaneous analyses of streams in Red River basin in Oklahoma	264
Miscellaneous analyses of streams in Red River basin in Louisiana	269
Mississippi River near St. Francisville, La. (main stem)	274
Mississippi River Delta.	277
Vermilion River at Bancker Ferry, near Abbeville, La.	277
Tickfaw River at Holden, La.	281
Part 8. Western Gulf of Mexico basins	282
Mermenteau River basin	282
Mermenteau River at Lake Arthur, La.	282
Calcasieu River basin	284
Whisky Chitto Creek near Oberlin, La.	284
Bundick Creek near Dry Creek, La.	285
Sabine River basin	286
Sabine River near Tatum, Tex.	286
Sabine River near Ruliff, Tex.	289
Miscellaneous analyses of streams in Sabine River basin in Texas	292
Miscellaneous analyses of streams in Sabine River basin in Louisiana	293
Neches River basin.	294
Angelina River near Lufkin, Tex.	294
Neches River at Evadale, Tex.	297
Trinity River basin	300
Clear Fork Trinity River at Fort Worth, Tex.	300
Elm Fork Trinity River near Muenster, Tex.	301
Trinity River near Rosser, Tex.	304
Cedar Creek near Mabank, Tex.	307
Pin Oak Creek near Hubbard, Tex.	310
Richland Creek near Fairfield, Tex.	314
Trinity River at Romayor, Tex.	318
Trinity River near Moss Bluff, Tex.	321

Chemical analyses, etc. --Continued

Part 8. Western Gulf of Mexico basins--Continued

Trinity River basin--Continued	Page
Old River near Cove, Tex.....	323
Trinity River at Anahuac, Tex.....	325
Trinity Bay at mouth, near Anahuac, Tex.....	327
Miscellaneous analyses of streams in Trinity River basin in Texas.....	331
Brazos River basin.....	332
Double Mountain Fork Brazos River near Aspermont, Tex.....	332
Salt Flat Creek at Weir B, near Aspermont, Tex....	336
Salt Croton (Dove) Creek at Weir C, near Aspermont, Tex	337
Salt Croton (Dove) Creek at Weir D, near Aspermont, Tex.....	338
Haystack (Hayrick) Creek at Weir E, near Aspermont, Tex.....	339
Salt Croton (Dove) Creek near Aspermont, Tex.....	340
Salt Fork Brazos River near Aspermont, Tex.....	342
Hubbard Creek near Breckenridge, Tex.....	346
Brazos River at Possum Kingdom Dam, near Graford, Tex.....	349
Brazos River at Whitney Dam, near Whitney, Tex.....	350
Leon River near Belton, Tex.....	352
Brazos River at Richmond, Tex.....	353
Miscellaneous analyses of streams in Brazos River basin in Texas.....	357
Colorado River basin.....	358
Colorado River at Colorado City, Tex.....	358
Colorado River near Silver, Tex.....	361
Colorado River near San Saba, Tex.....	365
Waller Creek at 23rd street, Austin, Tex.....	372
Colorado River at Austin, Tex.....	373
Colorado River at Columbus, Tex.....	375
Colorado River at Wharton, Tex.....	378
Miscellaneous analyses of streams in Colorado River basin in Texas.....	380
Guadalupe River basin.....	381
Guadalupe River at Victoria, Tex.....	381
Miscellaneous analyses of streams in Guadalupe River basin in Texas.....	384
Nueces River basin.....	385
Nueces River near Mathis, Tex.....	385
Rio Grande basin.....	387
Rio Grande above Culebra Creek, near Lobatos, Colo.....	387
Rio Chama near Chamita, N. Mex.....	389

Chemical analyses, etc. --Continued

Part 8. Western Gulf of Mexico basins--Continued

Rio Grande basin--Continued	Page
Rio Grande at Otowi Bridge near San Ildefonso, N. Mex	393
Galisteo Creek at Domingo, N. Mex.....	399
Jemez River below Jemez Canyon dam, N. Mex	402
Rio Grande near Bernalillo, N. Mex	407
Rio Grande near Bernardo, N. Mex	412
Rio Puerco near Bernardo, N. Mex	418
Rio Salado near San Acacia, N. Mex	422
Rio Grande conveyance channel below heading, near San Marcial, N. Mex.....	425
Rio Grande conveyance channel at San Marcial, N. Mex	429
Rio Grande floodway at San Marcial, N. Mex.....	435
Pecos River near Puerto De Luna, N. Mex	440
Pecos River below Alamogordo Dam, N. Mex	445
Pecos River near Acme, N. Mex	446
Rio Hondo at Diamond A Ranch near Roswell, N. Mex	449
Pecos River near Artesia, N. Mex.....	453
Pecos River seepage investigation	459
Rio Penasco at Dayton, N. Mex.....	465
Pecos River at dam site 3 near Carlsbad, N. Mex ...	466
Carlsbad main canal at head, near Carlsbad, N. Mex	467
Pecos River at Carlsbad, N. Mex.....	468
Refinery intake canal near Loving, N. Mex	470
Pecos River east of Malaga, N. Mex	471
Pecos River at Pierce Canyon Crossing near Malaga, N. Mex	472
Pecos River near Red Bluff, N. Mex	474
Pecos River below Red Bluff Dam, near Orla, Tex ..	477
Pecos River near Girvin, Tex	479
Miscellaneous analyses of streams in Rio Grande basin in New Mexico.....	481
Index	495

 ILLUSTRATION

	Page
Figure 1. Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1957.....	2

QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1957

PARTS 7 and 8

INTRODUCTION

The quality-of-water investigations of the United States Geological Survey are concerned with chemical and physical characteristics of the surface and ground water supplies of the Nation. Most of the investigations carried on in cooperation with States and other Federal agencies deal with the amounts of matter in solution and in suspension in streams.

The records of chemical analysis, suspended sediment, and temperature for surface waters given in this volume serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved or suspended mineral matter in the waters. The discharge of a stream and, to a lesser extent, the chemical quality are related to variations in rainfall and other forms of precipitation. In general, lower concentrations of dissolved solids may be expected during the periods of high flow than during periods of low flow. The concentration in some streams may change materially with relatively small variations in flow, whereas for other streams the quality may remain relatively uniform throughout large ranges in discharge. The quantities of suspended sediment carried by streams are also related to discharge, and during flood periods the sediment concentrations in many streams vary over wide ranges.

Publication of annual records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. The records prior to 1948 were published each year in a single volume for the entire country. Beginning in 1948, the records were published in two volumes, and beginning in 1950, in four volumes, covering the drainage basins shown in Figure 1. The samples for which data are given in this volume were collected from October 1, 1956, to September 30, 1957. The records are arranged by drainage basins according to Geological Survey practice in reporting records of streamflow: Stations on tributary

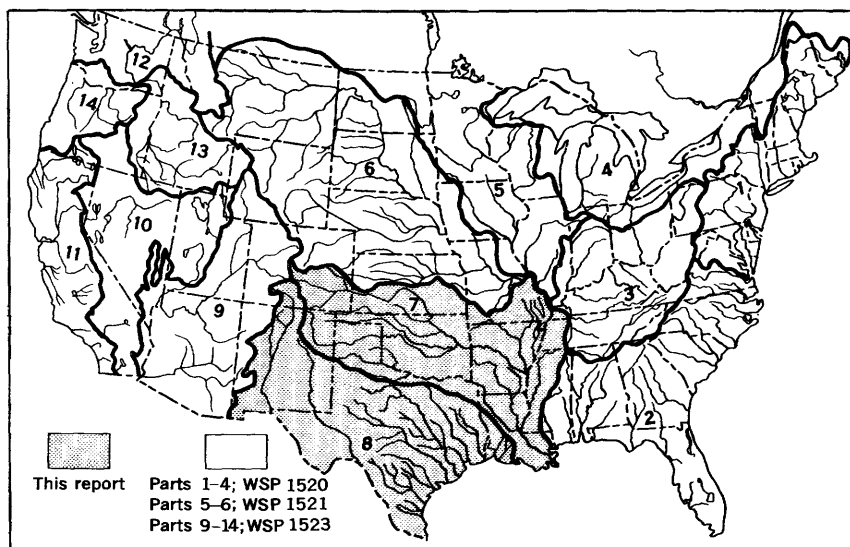


Figure 1.--Map of the United States showing basins covered by the four water-supply papers on quality of surface waters in 1957. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

streams are listed between stations on the main stem in the order in which those tributaries enter the main stem. Descriptive statements are given for each sampling station for which regular series of chemical analyses, temperature observations, or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of mineralization, hardness, water temperature, sediment loads, and other pertinent data. Records of water discharge of the streams at or near the sampling period are included in most tables of analyses.

During the year ending September 30, 1957, 152 regular sampling stations on 91 streams for the study of the chemical character of surface waters were maintained by the Geological Survey in the area covered by this volume. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 95 stations. Not all analyses of samples of surface water collected during the year have been included. Single analyses of an incomplete nature generally have been omitted. Also, analyses made of the daily samples before compositing have not been reported. The specific conductance of almost all daily samples was determined, and as noted in the table head-

ings this information is available for reference at the district offices listed under Division of Work, on page 22.

Quantities of suspended sediment are reported for 26 stations during the year ending September 30, 1957. The sediment samples were collected one or more times daily at most stations, depending on the rate of flow and changes in stage of the stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 25 of the stations.

Material which is transported almost in continuous contact with the stream bed and the material that bounces along the bed in short skips or leaps is termed "bedload" and is not considered in this report. All other undissolved fragmental material in transport is termed "suspended sediment" and generally constitutes the major part of the total sediment load. At the present time no reliable routine method has been developed for determining bedload.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples of chemical analyses were usually collected at or near points on streams where gaging stations are maintained for measurement of water discharge. Two methods of compositing water samples for analysis are used by the Geological Survey: (1) Equal volume method—Three composite samples were usually prepared each month by mixing together equal volumes of daily samples collected from the 1st to the 10th, from the 11th to the 20th, and from the 21st to the end of the month. Composite samples were prepared for shorter periods if the specific conductance of the daily samples indicated that the mineral content of the water had changed significantly. Conversely, composite samples were occasionally prepared for longer periods if the specific conductance of the daily samples indicated that the mineral content had remained nearly uniform. (2) Discharge method—Composite samples were prepared by mixing together a volume from each sample in proportion to the product of the rate of water discharge at the time of sampling and the time interval represented by that sample. Generally, each daily sample is assumed to represent an equal time interval; therefore, the volume from each sample is proportional only to the water discharge at the time of sampling. Compositing samples by the discharge method was limited to some streams west of the Mississippi River.

The samples were analyzed according to methods regularly used by the Geological Survey. These methods are essentially the same as, or are modifications of, methods described in recognized authoritative publications for the mineral analysis of water samples (Collins, 1928; Am. Public Health Assoc., 1955).

TEMPERATURE

Daily water temperatures were measured at most of the stations when chemical quality or sediment samples were collected. So far as practicable, the water temperatures were taken at about the same time each day for an individual station in order that the data would be relatively unaffected by diurnal variations in temperature. Most large, swiftly flowing streams probably have a small diurnal variation in water temperature, whereas sluggish or shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. The thermometers used for determining water temperature were accurate to plus or minus 0.5° F.

At stations where thermographs are located, the records consist of maximum and minimum temperatures for each day, and the monthly averages of maximum daily and minimum daily temperatures.

SEDIMENT

In general, suspended-sediment samples were collected daily with U. S. depth-integrating cable-suspended samplers (U. S. Interagency, 1948, p. 70-76 and U. S. Interagency, 1952, p. 86-90) from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at three or more verticals in the cross section to determine the cross-sectional distribution of the concentration of suspended sediment with respect to that at the daily sampling vertical. In streams where transverse distribution of sediment concentration ranges widely, samples were taken regularly at two or more verticals to determine the average concentration across the section. During periods of high flow, samples were taken two or more times throughout the day at many sampling stations, and during periods of rapidly changing flow samples were taken hourly at some stations.

Sediment concentrations were determined by filtration or evaporation of the samples as required. At many stations the daily mean concentration for some days was obtained by plotting the instantaneous concentrations on the original or copies of the original gage-height chart. The plotted concentrations, adjusted if necessary for cross-sectional distribution with respect to that at the daily sampling vertical, were connected or averaged by continuous curves

to obtain a concentration graph. This graph represented the estimated concentration at any time and, for most periods, daily mean concentrations were determined from the graph. When the concentration and water discharge were changing rapidly, the day was often subdivided for this computation. For some periods when the day-to-day variation in the concentration was negligible, the data were not plotted, and the average concentration of the samples was used as the mean concentration for the day. For certain stations, when the discharge and concentrations were relatively low and varied only slightly from day to day, the samples for a number of days were composited and the mean daily concentrations and mean daily loads are shown.

For some periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and suspended-sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In many instances where there were no observations for several days, the suspended-sediment loads for individual days are not estimated, because numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates for individual days. However, estimated loads of suspended sediment for missing days in otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record. For some streams, samples were collected about weekly, monthly, or less frequently, and only rates of sediment discharge at the time of sampling are shown.

In addition to the records of quantities of suspended sediment transported, records of the particle sizes of sediment are included. The particle sizes of the suspended sediments for many of the stations, and the particle sizes of the bed material for some of the stations were determined periodically. As much of the material carried in suspension is finer than 0.062 mm, the pipet method (Kilmer and Alexander, 1949) or the bottom withdrawal tube method (U. S. Interagency, 1943, p. 82-90) were used in most of the analyses. For most samples, material between 1.0 mm and 0.062 mm was analyzed by the visual accumulation tube method (U. S. Interagency 1957). Separation of sand from the silt-clay-colloid fraction was by sieve. For some samples all sediment coarser than 0.062 mm was analyzed by the sieve method. For material finer than 0.062 mm the settling medium used was native water or distilled water to which a dispersing agent had been added. Because sedimentation diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made with native water may more nearly simulate particle sizes existing in the stream. Results of analyses with dis-

tilled water containing a dispersing agent approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 5,000 parts per million where necessary by means of a sample splitter, in order to stay within limits recommended for the bottom-withdrawal tube or pipet method; therefore, the concentration of sediment for analyses was often different from the concentration in the stream. The concentration at which analyses were made is indicated in the appropriate tables.

EXPRESSION OF RESULTS

The dissolved mineral constituents are reported in parts per million. A part per million is a unit weight of a constituent in a million unit weights of water. Equivalents per million are not given in this report although the expression of analyses in equivalents per million is sometimes preferred. An equivalent per million is a unit chemical combining weight of a constituent in a million unit weights of water. Equivalents per million are calculated by dividing the concentration in parts per million by the chemical combining weights of the individual constituents. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents (ions) are given in the following table:

Constituent	Factor	Constituent	Factor
Iron (Fe^{++}).....	0.0358	Carbonate (CO_3^{--}) ..	0.0333
Iron (Fe^{+++}).....	.0537	Bicarbonate (HCO_3^-) .	.0164
Calcium (Ca}^{++}) .....	.0499	Sulfate (SO_4^{--}) .....	.0208
Magnesium (Mg}^{++}) ...	.0822	Chloride (Cl^-).....	.0282
Sodium (Na^+).....	.0435	Fluoride (F}^-) .....	.0526
Potassium (K}^+) .....	.0256	Nitrate (NO_3^-) .....	.0161

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12. A calculated quantity of sodium and potassium is given in some analyses and is the quantity of sodium needed in addition to the calcium and magnesium to balance the acid constituents.

The hardness, expressed in terms of an equivalent quantity of calcium carbonate (CaCO_3), is calculated from the equivalents of calcium and magnesium, or is determined by direct titration. The hardness caused by calcium and magnesium (and other ions if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness.

The value usually reported as dissolved solids is the residue

on evaporation after drying at 180°C for 1 hour. For some waters, particularly those containing moderately large quantities of soluble salts, the value reported is calculated from the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. The calculated sum of the constituents may be given instead of or in addition to the residue. In the analyses of most waters used for irrigation, the quantity of dissolved solids is given in tons per acre-foot as well as in parts per million.

Percent sodium is computed for those analyses where sodium and potassium are reported separately by dividing the equivalents per million of sodium by the sum of the equivalents per million of calcium, magnesium, sodium, and potassium and multiplying the quotient by 100. In analyses where sodium and potassium were calculated and reported as a combined value, the value reported for percent sodium will include the equivalent quantity of potassium. In most waters of moderate to high concentration the proportion of potassium is much smaller than that of sodium.

Specific conductance is given for most analyses and was determined by means of a conductance bridge and using a standard potassium chloride solution as reference. Specific conductance values are expressed in micromhos per centimeter at 25°C. Specific conductance in micromhos is 1 million times the reciprocal of specific resistance at 25°C. Specific resistance is the resistance, in ohms, of a column of water 1 centimeter long and 1 square centimeter in cross section. The discharge of the streams is reported in cubic feet per second (see Streamflow, p. 17) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration is expressed in terms of pH units. By definition the pH value of a solution is the negative logarithm of the concentration of gram ions of hydrogen. However, the pH meter that is generally used in Survey laboratories determines the activity of the hydrogen ions as distinguished from concentration.

An average of analyses for the water year is given for most daily sampling stations. Most of these averages are arithmetical or time-weighted; when analyses during a year are all on 10-day composites of daily samples with no missing days, the arithmetical and time-weighted averages are equivalent. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the river each day for the water year. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all of the water passing a given station during the year after thorough mixing in the reservoir. A discharge-weighted average is computed by multiplying the discharge for the sampling period by the concentrations of the individual constituents for the corresponding period and dividing the sum of the products

by the sum of the discharges. Discharge-weighted averages are usually lower than arithmetical averages for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

The concentration of sediment in parts per million is computed as 1,000,000 times the ratio of the weight of sediment to the weight of water-sediment mixture. Daily sediment loads are expressed in tons per day and except for subdivided days are usually obtained by multiplying daily mean sediment concentration in parts per million by the daily mean discharge, and the appropriate conversion factor, normally 0.0027.

Particle-size analyses are expressed in percentages of material finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union subcommittee on Terminology (Lane and others, 1947, p. 937). Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge and sediment concentration when sample was collected, the concentration of the suspension during analysis, and the method of analysis.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some rock materials. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils with which the water has been in contact and the length of time of contact. Some streams are fed by both surface runoff and ground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. Ground water is generally more highly mineralized than surface runoff because it remains in contact with the rocks and soils for much longer periods. The concentration of dissolved solids in a river water is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by drainage from irrigated lands.

The mineral constituents and physical properties of natural waters reported in the tables of analyses include those that have a practical bearing on the value of the waters for most purposes. The analyses generally include results for silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together as sodium), bicarbonate, sulfate, chloride, fluoride, nitrate, boron, pH, and dissolved solids. Aluminum, manganese, color, acidity, oxygen consumed, and other dissolved constituents and physical properties are reported for certain streams. Phenolic

material and minor elements including strontium, chromium, nickel, copper, lead, zinc, cobalt, arsenic, cadmium, and others are occasionally determined for a few streams in connection with specific problems in local areas and the results are reported when appropriate. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 parts per million of silica and a few contain more than 50 parts, but most waters contain from 1 to 30 parts per million. Silica affects the usefulness of a water because it contributes to the formation of boiler scale; it usually is removed from feed water for high-pressure boilers. Silica also forms troublesome deposits on the blades of stream turbines.

Aluminum (Al)

Aluminum is generally present only in negligible quantities in natural waters except in areas where the waters have been in contact with the more soluble rocks of high aluminum content such as bauxite and certain shales. Acid waters often contain large amounts of aluminum. It may be troublesome in feed waters where it tends to be deposited as a scale on boiler tubes.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. Waters impounded in large reservoirs may contain manganese that has been dissolved from the mud on the bottom of the reservoir by action of carbon dioxide produced by anaerobic fermentation of organic matter. Manganese is not regularly determined in areas where it is not present in the waters in appreciable amounts. It is especially objectionable in water used in laundry work and in textile processing. Concentrations as low as 0.2 part per million may cause a dark-brown or black stain on fabrics and porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to the air, normal basic waters that contain more than 1 part per million of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 part per million of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on white porcelain or enameled ware and fixtures and on fabrics washed in the water.

Calcium (Ca)

Calcium is dissolved from almost all rocks and soils, but the highest concentrations are usually found in waters that have been in contact with limestone, dolomite, and gypsum. Calcium and magnesium make water hard and are largely responsible for the formation of boiler scale. Most waters associated with granite or silicious sands contain less than 10 parts per million of calcium; waters in areas where rocks are composed of dolomite and limestone contain from 30 to 100 parts per million; and waters that have come in contact with deposits of gypsum may contain several hundred parts per million.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 parts per million, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 parts per million or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from almost all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the Western United States. Natural waters that contain only 3 or 4 parts per million of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 parts per million of the two may require careful operation of steam boilers

to prevent foaming. More highly mineralized waters that contain a large proportion of sodium salts may be unsatisfactory for irrigation.

Carbonate and bicarbonate (CO_3 and HCO_3)

Bicarbonate occurs in waters largely through the action of carbon dioxide, which enables the water to dissolve carbonates of calcium and magnesium. Carbonate as such is not usually present in appreciable quantities in natural waters. The bicarbonate in waters that come from relatively insoluble rocks may amount to less than 50 parts per million; many waters from limestone contain from 200 to 400 parts per million. Bicarbonate in moderate concentrations in water has no effect on its value for most uses. Bicarbonate or carbonate is an aid in coagulation for the removal of suspended matter from water.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils but in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and is therefore present in considerable quantities in waters from mines. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water.

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride content, whereas streams in arid or semiarid regions may contain several hundred parts per million of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands or are affected by ground-water inflow carrying appreciable quantities of chloride. Large quantities of chloride may affect the industrial use of water by increasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks in about the same amount as chloride. However, the quantity of

fluoride in natural surface waters is ordinarily very small compared to that of chloride. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none. However, excess fluoride in water is associated with the dental defect known as mottled enamel if the water is used for drinking by young children during calcification or formation of the teeth. (Dean, 1936, p. 1269-1272). This defect becomes increasingly noticeable as the quantity of fluoride in water increases above 1.5 to 2.0 parts per million.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogenous material and may indicate contamination by sewage or other organic matter. The quantities of nitrate present in surface waters are generally less than 5 parts per million (as NO_3) and have no effect on the value of the water for ordinary uses.

It has been reported that as much as 2 parts per million of nitrate in boiler water tends to decrease intercrystalline cracking of boiler steel. Studies made in Illinois indicate that nitrates in excess of 70 parts per million (as NO_3) may contribute to methemoglobinemia ("blue babies") (Faucett and Miller, 1946, p. 593), and more recent investigations conducted in Ohio show that drinking water containing nitrates in the range of 44 to 88 parts per million or more (as NO_3) may cause methemoglobinemia (Waring, 1949). In a report published by the National Research Council, Maxcy (1950, p. 271) concludes that a nitrate content in excess of 44 parts per million (as NO_3) should be regarded as unsafe for infant feeding.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 part per million of boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Water containing several thousand parts per million of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands, but generally water containing more than about 2,000 ppm is considered to be unsuitable for long-term irrigation under average conditions.

PROPERTIES AND CHARACTERISTICS OF WATER

Temperature

Large quantities of water are used in industrial operation; therefore temperature and seasonal fluctuations of that temperature are major considerations in planning the use of water for cooling in industrial plants. Water at high temperature can carry less oxygen in solution than at low temperature. Consequently water temperature can affect or determine the pollution characteristics of a stream. Temperature data are required in studies of water intended for aquatic life. A few degrees rise in temperature may seriously limit the capacity of a stream to support fish life.

Oxygen consumed

The amount of oxygen consumed furnishes an approximation of the oxidizable matter in the unfiltered and filtered samples and gives a partial measure of polluting materials such as sewage and oxidizable industrial wastes. Waters of naturally high color may have relatively high values for oxygen consumed, and waters that are not noticeably colored may contain oxidizable material.

Color

In water analysis the term "color" refers to the appearance of water that is free from suspended solids. Many turbid waters

that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. In some areas objectionable color in water results from industrial wastes and sewage. Clear deep water may appear blue as the result of a scattering of sunlight by the water molecules. Water for domestic use and some industrial uses should be free from any perceptible color. A color less than 10 units generally passes unnoticed. Some swamp waters have natural color of 200 to 300 units or more.

Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH (see p.7), is related to the corrosive properties of water and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH of 7.0 indicates that the water is neither acid nor alkaline. pH readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity. The pH of most natural surface waters ranges between 6 and 8. Some alkaline surface waters have pH values greater than 8.0, and waters containing free mineral acid usually have pH values less than 4.5.

Specific conductance (micromhos per centimeter at 25° C)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity (see p.7). The conductance varies with the concentration and degree of ionization of the different minerals in solution and with the temperature of the water. When considered in conjunction with results of determinations for other constituents, specific conductance is a useful determination and plays an important part in indicating changes in concentration of the total quantity of dissolved minerals in surface waters.

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is commonly recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and

pipes, with the resultant decrease in rate of heat transfer, possibility of boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect. Water that has less than 60 parts per million of hardness is usually rated as soft and suitable for many purposes without further softening. Waters with hardness ranging from 61 to 120 parts per million may be considered moderately hard, but this degree of hardness does not seriously interfere with the use of water for many purposes except for use in high-pressure steam boilers and in some industrial processes. Waters with hardness ranging from 121 to 200 parts per million are considered hard, and laundries and industries may profitably soften such supplies. Water with hardness above 200 parts per million generally requires some softening before being used for most purposes.

Acidity

The acidity of a natural water represents the content of free carbon dioxide and other uncombined gases, organic acids, mineral acids and salts of strong acids and weak bases that hydrolyze to give hydrogen ions. Sulfates of iron and aluminum in mine and industrial wastes are common sources of acidity.

Corrosiveness

The corrosiveness of a water is that property which makes the water aggressive to metal surfaces and frequently results in the appearance of the "red-water" caused by solution of iron. The disadvantages of iron in water have been discussed previously. Additionally, corrosion causes the deterioration of water pipes, steam boilers, and water-heating equipment. Many waters that do not appreciably corrode cold-water lines will aggressively attack hot-water lines. Oxygen, carbon dioxide, free acid, and acid-generating salts are the principal constituents in water that cause corrosion. In a general way, very soft waters of low mineral content tend to be more corrosive than hard waters containing appreciable quantities of carbonates and bicarbonates of calcium and magnesium.

Percent sodium

The proportion of sodium to the total cation concentration is termed "percent sodium", and is reported in most of the analyses

of waters collected from streams in the western part of the country where irrigation is practiced extensively. The proportion of sodium to all the constituents in the water is explained on page 10 under "Sodium and potassium". Waters in which the percent sodium is more than 60 may be injurious when applied to certain types of soils, particularly when adequate drainage is not provided (Magistad and Christiansen, 1944, p. 8-9).

Sodium-adsorption-ratio

Of more significance than percent sodium for use as an index of the sodium or alkali hazard to the soil is the sodium-adsorption-ratio because it relates more directly to the adsorption of sodium by the soil. The term, "sodium-adsorption-ratio (SAR)" was introduced by the U. S. Salinity Laboratory Staff (1954), and is a ratio expressing the relative activity of sodium ions in exchange reactions with the soil. It is expressed by the equation:

$$SAR = \frac{\sqrt{\frac{Na^+}{Ca^{++} + Mg^{++}}}}{2}$$

where the concentrations of the ions are expressed in milliequivalents per liter (or equivalents per million for most irrigation waters).

Waters are divided into four classes with respect to sodium or alkali hazard: low, medium, high, and very high, depending upon the SAR and the specific conductance. At a conductance of 100 micromhos per centimeter the dividing points are at SAR values of 10, 18, and 26, but at 5,000 micromhos the corresponding dividing points are SAR values of approximately 2.5, 6.5, and 11. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that part of it which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Most fluvial sediment results from the normal process of erosion, which in turn is part of the geologic cycle of

rock transformation. In some instances, this normal process may have been accelerated by agricultural practices. Sediment also results from a number of industrial activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended as well as dissolved material.

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, plant cover, topography, and land use. An important property of fluvial sediment is the fall velocity of the particles in transport. Particle sizes, as determined by various methods, represent mechanical diameters, which are related to sedimentation diameters indirectly. Sediment particles in the sand-size (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. The sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable characteristics, the size of particles transported, as well as the total sediment load, is in constant adjustment with the characteristics and physical features of the stream and drainage area.

STREAMFLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of daily mean discharges for the composite period. The discharges reported in the tables of single analyses are either daily mean discharges or discharges for the time at which samples were collected, computed from a stage-discharge relation or from a discharge measurement.

PUBLICATIONS

Reports giving records of chemical quality and temperatures of surface waters and suspended-sediment loads of streams in the

area covered by this volume for the water years 1941-57, are listed below:

Numbers of water-supply papers containing records for
Parts 7 and 8, 1941-57

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1946	1050	1951	1199	1956	1452
1942	950	1947	1102	1952	1252	1957	1522
1943	970	1948	1133	1953	1292		
1944	1022	1949	1163	1954	1352		
1945	1030	1950	1188	1955	1402		

Geological Survey reports containing chemical quality, temperature, and sediment data obtained before 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

- *135. Composition of river and lake waters of the United States, 1924.

BULLETINS

- *479. The geochemical interpretation of water analyses, 1911.
770. The data of geochemistry, 1924.

WATER-SUPPLY PAPERS

- *108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.
*161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
*193. The quality of surface waters in Minnesota, 1907.
*236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.
*237. The quality of the surface waters of California, 1910.
*239. The quality of the surface waters of Illinois, 1910.
*273. Quality of the water supplies of Kansas, with a preliminary report on stream pollution by mine waters in southeastern Kansas, 1911.

- *274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
- *339. Quality of the surface waters of Washington, 1914.
- *363. Quality of the surface waters of Oregon, 1914.
- *418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
- *596-B. Quality of water of Colorado River in 1925-26, 1928.
- *596-D. Quality of water of Pecos River in Texas, 1928.
- *596-E. Quality of the surface waters of New Jersey, 1928.
- *636-A. Quality of water of the Colorado River in 1926-28, 1930.
- *636-B. Suspended matter in the Colorado River in 1925-28, 1930.
- *638-D. Quality of water of the Colorado River in 1928-30, 1932.
- *839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
- *889-E. Chemical character of surface water of Georgia, 1944.
- *998. Suspended sediment in the Colorado River, 1925-41, 1947.
- 1048. Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939-40, 1948.
- 1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, upon request, furnish lists giving prices.

COOPERATION

The table on p. 20 lists State and local agencies that cooperated in quality-of-water investigations in drainage basins included in this volume. The locations of quality-of-water district or regional offices responsible for the data collected are also given in this table.

Financial assistance was furnished by the Bureau of Reclamation of the United States Department of the Interior for some of the investigations in Oklahoma and New Mexico and by the Corps of Engineers, Department of the Army, for some investigations in Texas. The Corps also provided financial assistance and made most determinations of sediment concentrations and of particle-size of bed material in connection with the sedimentation investigations of the Mississippi River at St. Louis, Mo. The Soil Conservation Service of the United States Department of Agriculture assisted on special sedimentation studies in the Rio Grande basin in New Mexico and the United States Public Health Service assisted

State	Cooperating agency	Drainage basin	District or regional office
Arkansas	Engineering Experiment Station University of Arkansas, Dean George F. Branigan, director.	Lower Mississippi River.	P. O. Box 32, University Station 205 Ozark St. Fayetteville, Ark.
Louisiana	Louisiana Department of Public Works, L. M. Wimberly, director.	Lower Mississippi River, Western Gulf of Mexico.	807 Brazos St. Austin 14, Tex.
Missouri	Corps of Engineers, Department of Army.	Lower Mississippi River (sediment investigations at St. Louis).	510 Rudge-Guenzel Bldg. Lincoln, Nebr.
New Mexico	New Mexico Interstate Stream Commission, S. E. Reynolds, secretary. Pecos River Commission, J. H. Bliss, commissioner for New Mexico, J. C. Wilson, commissioner for Texas. Sherman O. Decker, secretary.	Lower Mississippi River, Western Gulf of Mexico	P. O. Box 4217, Albuquerque, N. Mex.

State	Cooperating agency	Drainage basin	District or regional office
Oklahoma	<p>Oklahoma Water Resources Board, Francis J. Borelli, executive director.</p> <p>Division of Sanitary Engineering, Oklahoma State Department of Health, Harold L. Malone, Division of Sanitary Engineers.</p>	Lower Mississippi River.	P. O. Box 4355 Oklahoma City, Okla.
Texas	<p>Texas Board of Water Engineers, consisting of R. M. Dixon, chairman, H. A. Beckwith, and O. F. Dent; the Brazos River Authority, The Canadian River Municipal Water Authority, the Chambers-Liberty Counties Navigation District, the Cities of Dallas and Fort Worth, the Greenbelt Municipal and Industrial Water Association, the West Central Texas Municipal Water District, the Lower Colorado River Authority, the Lower Neches River Authority, the Red Bluff Water Power Control District, the Sabine River Authority, and the Tarrant County Water Control and Improvement District No. 1.</p>	Lower Mississippi River, Western Gulf of Mexico.	807 Brazos St. Austin 14, Tex.

in the operation of two stations in the Red River basin in Arkansas. Assistance in collecting data was given by many individuals and by municipal, State, and Federal agencies.

In addition, many of the investigations were supported by funds appropriated directly to the Geological Survey. Studies of suspended-sediment loads in the middle Rio Grande in New Mexico were begun in 1948 as a Federal project.

DIVISION OF WORK

The quality-of-water program was conducted by the Water Resources Division of the Geological Survey, L. B. Leopold, chief hydraulic engineer, and S. K. Love, chief of the Quality of Water Branch. The data were collected and prepared for publication under the supervision of engineers or district chemists as follows: In Missouri--P. C. Benedict succeeded by D. M. Culbertson; in Oklahoma and the Arkansas River basin in Kansas--T. B. Dover; in Texas and Louisiana--Burge Irelan; in Arkansas--M. E. Schroeder; in New Mexico and the Rio Grande and Arkansas River basins in Colorado--J. M. Stow. Any additional information on file can be obtained by writing the responsible Survey district office.

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[illegible]

MISSISSIPPI RIVER MAIN STEM--Continued

MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	59,400	220	a35,000	58,000	200	a31,000	54,200	120	a18,000
2.....	59,400	233	37,400	56,800	214	32,800	52,200	150	a21,000
3.....	58,700	245	38,800	54,800	200	a30,000	50,900	162	22,300
4.....	59,400	240	a38,000	54,800	180	a27,000	50,900	150	a21,000
5.....	56,700	230	36,500	54,800	153	22,600	49,800	120	16,100
6.....	58,000	240	a38,000	56,800	200	a31,000	51,600	150	a21,000
7.....	58,700	220	a35,000	58,000	262	41,000	56,100	333	50,400
8.....	58,700	260	a41,000	57,400	190	a29,000	57,400	380	a59,000
9.....	60,000	277	44,900	54,800	161	23,800	59,400	210	a34,000
10.....	60,000	252	40,800	54,200	170	a25,000	57,400	140	a22,000
11.....	59,400	240	a38,000	54,800	150	a22,000	54,800	115	17,000
12.....	58,700	234	37,000	55,400	150	22,400	54,200	105	15,400
13.....	58,700	240	a38,000	56,800	140	a21,000	52,800	95	a14,000
14.....	58,000	240	a38,000	56,100	150	a23,000	52,200	82	11,600
15.....	56,800	276	42,300	58,000	150	a23,000	52,200	75	a11,000
16.....	56,100	351	53,200	60,600	160	a26,000	52,200	75	a11,000
17.....	55,400	244	36,500	60,000	240	a39,000	51,600	95	a13,000
18.....	54,800	220	a33,000	60,600	220	a36,000	51,600	101	14,100
19.....	54,800	238	35,200	61,300	196	32,400	50,900	85	11,700
20.....	56,800	260	a40,000	63,200	180	a31,000	51,600	65	a9,100
21.....	59,400	240	a38,000	63,200	199	34,000	52,800	59	8,410
22.....	61,300	274	45,300	63,900	220	a38,000	54,800	65	a9,600
23.....	63,200	260	a44,000	61,300	158	26,200	57,400	75	a12,000
24.....	63,200	334	57,000	60,600	140	a23,000	62,600	85	14,400
25.....	61,300	360	a60,000	60,600	130	a21,000	62,600	100	a17,000
26.....	62,000	273	45,700	61,300	120	a20,000	62,000	122	20,400
27.....	62,000	280	a47,000	60,600	114	18,700	61,300	85	a14,000
28.....	58,000	240	a38,000	58,700	110	a17,000	60,600	86	14,100
29.....	57,400	228	35,300	57,400	100	a15,000	61,300	75	a12,000
30.....	57,400	220	a34,000	55,400	100	15,000	61,300	95	a16,000
31.....	56,800	200	30,700	--	--	--	62,600	86	14,500
Total.	1,822,500	--	1,251,600	1,750,200	--	796,900	1,723,100	--	565,110
Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	62,000	95	a16,000	59,400	122	19,600	119,000	720	231,000
2.....	61,300	87	14,400	58,700	100	a16,000	109,000	650	a190,000
3.....	60,000	95	a15,000	56,800	100	a15,000	102,000	550	a150,000
4.....	59,400	97	15,600	55,400	110	a16,000	92,800	380	a95,000
5.....	58,700	100	a16,000	56,100	108	16,400	88,000	300	a71,000
6.....	58,700	100	a16,000	57,400	110	a17,000	82,000	216	47,800
7.....	59,400	120	a19,000	57,400	124	19,200	76,300	160	a33,000
8.....	58,700	130	a21,000	58,000	110	17,200	72,100	144	28,000
9.....	58,700	142	22,500	58,700	110	a17,000	71,400	130	a25,000
10.....	58,700	160	a25,000	59,400	100	a16,000	71,400	130	a25,000
11.....	58,000	170	a27,000	61,300	112	18,500	72,100	146	28,400
12.....	56,800	190	a29,000	65,800	110	a20,000	71,400	150	a29,000
13.....	54,800	190	a28,000	70,000	130	a25,000	70,700	156	29,800
14.....	52,800	190	a27,000	74,200	190	a38,000	70,700	160	30,500
15.....	51,600	190	a26,000	79,100	151	32,200	71,400	179	34,500
16.....	49,000	150	a20,000	81,200	130	a29,000	71,400	170	a33,000
17.....	47,000	135	17,100	77,700	110	a23,000	70,700	200	a38,000
18.....	45,000	75	a9,100	70,000	120	22,700	70,700	175	33,400
19.....	45,700	51	6,300	68,600	110	a20,000	70,000	130	a25,000
20.....	46,400	49	6,140	67,200	122	22,100	70,000	113	21,400
21.....	49,600	60	8,040	67,900	120	a22,000	77,700	110	a23,000
22.....	55,400	85	a13,000	70,000	160	30,200	91,200	141	34,700
23.....	56,100	135	20,400	72,100	170	a33,000	85,000	150	a34,000
24.....	53,500	110	a16,000	70,000	180	a34,000	81,200	140	a31,000
25.....	55,400	103	15,400	69,300	164	30,700	96,000	324	84,000
26.....	60,000	110	a18,000	74,900	240	a49,000	138,000	540	201,000
27.....	62,000	180	a30,000	95,800	703	184,000	156,000	675	284,000
28.....	63,900	160	a28,000	118,000	847	270,000	143,000	497	192,000
29.....	65,800	130	a23,000	--	--	--	129,000	403	140,000
30.....	64,600	126	22,000	--	--	--	124,000	371	124,000
31.....	62,000	158	26,400	--	--	--	116,000	320	a100,000
Total.	1,751,000	--	596,380	1,931,400	--	1,072,800	2,830,200	--	2,446,500

a Computed from estimated concentration graph based on daily turbidity readings.

LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAIN STEM--Continued

MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	114,000	262	80,600	218,000	438	257,000	240,000	700	a 450,000
2.....	114,000	200	a 62,000	201,000	420	a 230,000	224,000	750	a 450,000
3.....	113,000	238	72,600	196,000	420	222,000	218,000	668	393,000
4.....	144,000	500	a 190,000	200,000	380	a 210,000	213,000	582	335,000
5.....	203,000	480	a 260,000	199,000	380	a 200,000	215,000	508	295,000
6.....	219,000	527	312,000	184,000	388	193,000	218,000	480	a 280,000
7.....	212,000	550	a 310,000	172,000	414	192,000	218,000	830	484,000
8.....	224,000	500	a 300,000	165,000	500	a 220,000	240,000	900	a 580,000
9.....	259,000	1,150	804,000	162,000	445	195,000	275,000	1,300	a 970,000
10.....	263,000	1,300	a 920,000	166,000	320	a 140,000	249,000	800	538,000
11.....	230,000	954	592,000	177,000	310	148,000	219,000	750	a 440,000
12.....	203,000	963	528,000	169,000	320	a 150,000	225,000	1,200	729,000
13.....	178,000	1,100	a 530,000	159,000	302	130,000	245,000	807	534,000
14.....	165,000	750	a 330,000	156,000	300	a 130,000	239,000	1,140	736,000
15.....	153,000	608	251,000	159,000	320	a 140,000	312,000	1,930	1,630,000
16.....	146,000	598	238,000	163,000	380	a 170,000	314,000	1,700	a 1,400,000
17.....	141,000	461	176,000	169,000	380	173,000	270,000	1,220	889,000
18.....	140,000	400	a 150,000	216,000	500	a 290,000	237,000	900	a 580,000
19.....	156,000	430	181,000	271,000	998	730,000	216,000	786	458,000
20.....	160,000	550	a 240,000	306,000	1,230	1,020,000	201,000	800	a 430,000
21.....	184,000	550	a 240,000	308,000	1,070	884,000	215,000	1,070	621,000
22.....	193,000	715	373,000	327,000	1,000	a 880,000	252,000	1,380	939,000
23.....	224,000	716	433,000	325,000	1,030	904,000	262,000	1,400	a 990,000
24.....	206,000	650	a 360,000	330,000	893	796,000	245,000	1,760	1,160,000
25.....	199,000	464	249,000	321,000	900	a 780,000	218,000	1,600	a 940,000
26.....	199,000	451	242,000	327,000	1,000	a 880,000	196,000	1,620	857,000
27.....	206,000	550	a 310,000	338,000	1,100	1,000,000	190,000	1,600	a 820,000
28.....	230,000	550	a 340,000	323,000	948	827,000	227,000	1,800	1,100,000
29.....	251,000	501	340,000	297,000	736	590,000	252,000	2,000	a 1,400,000
30.....	243,000	450	a 300,000	278,000	700	a 530,000	252,000	1,400	a 950,000
31.....	--	--	--	265,000	790	565,000	--	--	--
Total.	5,652,000	--	9,712,200	7,245,000	--	13,776,000	7,095,000	--	22,378,000
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	318,000	1,500	a 1,300,000	174,000	600	a 280,000	96,000	200	a 52,000
2.....	327,000	1,470	1,300,000	168,000	587	266,000	101,000	180	a 49,000
3.....	314,000	1,240	1,050,000	158,000	550	a 230,000	102,000	190	52,300
4.....	294,000	1,100	a 870,000	159,000	380	160,000	96,000	226	56,600
5.....	254,000	1,170	802,000	162,000	380	166,000	92,800	240	a 60,000
6.....	240,000	950	a 620,000	152,000	320	a 130,000	95,200	260	66,800
7.....	246,000	800	a 530,000	139,000	410	155,000	100,000	360	a 97,000
8.....	248,000	786	526,000	124,000	480	a 160,000	102,000	500	a 140,000
9.....	242,000	850	a 580,000	116,000	350	110,000	102,000	556	153,000
10.....	224,000	990	593,000	112,000	360	a 110,000	102,000	560	a 150,000
11.....	218,000	1,000	a 590,000	106,000	280	a 80,000	102,000	436	120,000
12.....	213,000	950	a 550,000	97,600	240	a 63,000	102,000	500	a 140,000
13.....	207,000	856	478,000	91,200	220	54,200	100,000	650	a 180,000
14.....	209,000	850	a 370,000	90,400	180	a 44,000	99,200	850	a 170,000
15.....	215,000	708	411,000	93,600	180	a 45,000	94,400	600	a 150,000
16.....	212,000	650	a 370,000	91,200	240	a 59,000	93,600	438	111,000
17.....	207,000	706	395,000	92,800	218	54,600	94,400	320	a 82,000
18.....	206,000	650	a 360,000	95,200	260	a 67,000	95,200	460	a 120,000
19.....	197,000	470	250,000	97,600	464	122,000	92,800	400	100,000
20.....	186,000	350	a 180,000	99,200	400	a 110,000	89,600	412	99,700
21.....	182,000	300	a 150,000	101,000	232	63,300	85,800	480	a 110,000
22.....	184,000	326	162,000	97,600	228	60,100	92,000	400	a 99,000
23.....	182,000	360	a 180,000	96,800	180	a 47,000	90,400	380	92,800
24.....	178,000	362	174,000	92,000	190	a 47,000	94,400	440	a 110,000
25.....	181,000	380	a 190,000	88,000	340	a 81,000	102,000	476	131,000
26.....	162,000	700	a 340,000	81,200	404	88,600	99,200	550	a 150,000
27.....	182,000	900	a 440,000	80,500	300	a 65,000	94,400	800	a 200,000
28.....	172,000	800	a 370,000	83,500	400	90,200	92,000	600	a 150,000
29.....	218,000	736	433,000	85,000	560	a 130,000	90,400	600	a 150,000
30.....	224,000	668	525,000	86,500	432	101,000	82,000	384	85,000
31.....	194,000	739	387,000	92,800	260	a 65,000	--	--	--
Total.	6,858,000	--	15,456,000	3,403,700	--	3,304,000	2,874,800	--	3,429,200

Total discharge for year (cfs-days) 44,934,900
Total load for year (tons) 74,784,690

a Computed from estimated concentration graph based on daily turbidity readings.

MISSISSIPPI RIVER MAIN STEM--Continued
MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of Collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Oct. 2, 1956	9:50 a.m.	59,400	69	209	211		57		75		91	--	--	--	--	EWCM
Nov. 5	10:30 a.m.	54,800	58	141	591		59		75		87	--	--	--	--	BWCM
Nov. 5	12:45 p.m.	54,800	58	142	880		31		60		83	98	98	100	100	SBWCM
Mar. 26, 1957	10:30 a.m.	136,000	47	502	2,830		27		41		65	71	96	100	100	SBWCM
Apr. 9	10:40 a.m.	259,000	49	1,280	5,670		42		57		76	83	97	100	100	SBWCM
May 7	10:30 a.m.	172,000	66	394	2,720		41		68		84	89	97	100	100	SBWCM
May 21	9:50 a.m.	299,000	65	1,060	6,450		19		52		85	88	96	100	100	SBN
May 21	9:50 a.m.	299,000	65	1,060	6,470		42		64		85	88	96	100	100	SBWCM
June 5	9:20 a.m.	215,000	72	524	5,340		42		63		79	79	91	99	100	SBWCM
June 28	9:35 a.m.	219,000	77	1,790	9,860		57		75		96	98	99	100	100	SBWCM

Particle-size analyses of bed material, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed;
N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material											Methods of analysis	
				Percent finer than indicated size, in millimeters												
				0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000				
Oct. 2, 1956		59,400	10													S
Nov. 6		57,400	12	0	2	46	87	97	99	100	--	--				S
Jan. 21, 1957		49,600	13	0	1	41	80	94	98	100	--	--				S
Mar. 20		69,300	13	0	1	35	72	91	98	100	--	--				S
Mar. 28		140,000	15	2	6	58	89	96	99	100	--	--				S
Apr. 9		263,000	15	1	3	61	91	99	100	--	--	--				S
Apr. 23		227,000	14	2	6	56	92	98	99	100	--	--				S
May 8		165,000	15	0	3	38	83	94	96	97	99	100				S
May 21		302,000	14	5	6	44	86	97	98	99	99	100				S
June 5		215,000	14	0	2	32	85	96	99	100	--	--				S
June 27		190,000	16	4	8	25	76	92	96	98	99	100				S

ST. FRANCIS RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN ST. FRANCIS RIVER BASIN IN ARKANSAS
Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
ST. FRANCIS RIVER AT ST. FRANCIS																		
June 27, 1957	4,510							57	5.0	1.5		1.9		50	3	112	7.7	
ST. FRANCIS RIVER AT LAKE CITY																		
June 28, 1957	8,110							99	5.0	2.0		0.9		85	4	173	7.9	
RIGHT HAND CHUTE LITTLE RIVER AT RIVERVALE																		
June 26, 1957	4,900							152	21	7.5		1.9		130	5	275	8.1	
ST. FRANCIS FLOODWAY AT MARKED TREE																		
June 19, 1957	19,100							104	5.0	4.5		1.1		96	11	200	7.9	
ST. FRANCIS RIVER AT MARKED TREE																		
June 18, 1957	1,170							188	22	5.0		0.7		164	10	341	8.2	
ST. FRANCIS RIVER AT PARKIN																		
June 26, 1957	4,230							180	8.0	5.0		0.5		158	10	313	8.2	
ST. FRANCIS BAY AT RIVERFRONT																		
June 26, 1957	20,900							102	5.0	4.0		1.2		86	2	182	7.9	

WHITE RIVER BASIN

WAR EAGLE CREEK NEAR HINDSVILLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 45, 4 miles downstream from Poyner Hollow Creek, and 4 miles north of Hindsville, Madison County. DRAINAGE AREA.--262 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957. REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1, 1956	2.8			40	2.6	3.0	--	131	2.8	4.5		2.1	135	110	3	231	7.7	5
Nov. 14	5.8			44	1.9	3.0	--	140	2.8	3.5		1.9	149	118	3	240	8.2	5
Dec. 27	57			26	2.4	2.3	--	78	7.6	3.5		2.3	96	75	11	165	7.8	5
Jan. 8, 1957	33			27	2.5	2.3	--	82	7.8	4.0		2.5	98	78	10	166	8.0	5
Feb. 21	378			15	1.5	2.0	2.2	47	6.0	3.0		3.2	70	44	5	104	7.5	15
Mar. 20	209			18	3.8	2.1	1.2	68	4.0	2.8		2.1	80	61	5	124	7.9	1
Apr. 15	618			15	3.3	1.6	1.0	57	3.0	2.2		1.9	68	51	4	92.5	7.5	5
May 2	1,450			15	2.1	2.0	.9	48	4.6	2.5		2.3	72	46	7	97.3	6.8	15
June 13	2,240			15	1.3	1.5	1.2	48	2.8	2.0		1.9	66	43	3	94.2	6.8	10
July 1	1,500			13	1.5	1.4	2.1	44	3.4	1.5		2.2	76	39	3	96.3	7.1	35
Aug. 5	73			35	3.5	3.0	1.4	123	5.4	4.0		1.7	128	102	1	207	7.5	7
Aug. 28	25			29	1.7	2.2	1.4	83	3.2	3.9		1.6	98	80	4	163	7.2	6
Sept. 16	136			28	1.6	1.8	2.2	83	4.4	2.8		3.0	104	74	6	147	7.0	24

WHITE RIVER BASIN--Continued
KINGS RIVER NEAR BERRYVILLE, ARK.

LOCATION.--At gaging station at bridge on county road, 1½ miles downstream from Bee Creek, 2¼ miles upstream from Clabber Creek, and 5½ miles northwest of Berryville, Carroll County.
DRAINAGE AREA.--532 square miles.
RECORDS AVAILABLE.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.
REMARKS.--Records of discharge for water year October 1956 to September 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mag- nesium	Non- carbon- ate			
Oct. 2, 1956	1.3			42	14	2.8	--	189	4.8	4.0		2.6	182	162	7	313	7.4	5
Nov. 13	18			41	12	3.2	--	176	4.8	4.2		.7	173	152	7	300	7.5	5
Dec. 11	250			38	11	2.2	--	152	7.8	4.0		7.0	174	140	16	279	7.5	5
Jan. 7, 1957	66			39	10	2.5	--	158	8.4	3.8		3.5	166	138	9	275	7.8	5
Feb. 20	857			29	7.7	1.8	--	114	8.0	2.8		6.1	134	104	11	217	7.6	5
Mar. 20	453			29	9.6	1.8	1.1	128	7.6	2.5		2.2	127	112	7	204	8.2	1
Apr. 30	5,520			19	3.8	1.3	.9	70	5.2	1.5		2.4	86	63	6	132	7.2	5
July 2	2,240			20	4.2	1.1	1.5	76	4.8	1.5		1.6	96	67	5	132	7.2	35
July 23	86			35	7.8	2.3	1.4	148	5.0	2.0		1.5	135	119	0	234	7.7	8
Aug. 6	67			34	7.8	2.8	1.5	146	3.2	2.0		1.3	136	117	0	235	7.7	8
Aug. 28	54			32	6.1	1.9	1.5	127	3.6	2.2		.6	120	105	1	200	7.7	5
Sept. 16	396			29	6.3	2.2	2.1	111	6.8	3.0		3.0	121	98	8	188	7.3	13

WHITE RIVER BASIN--Continued

WHITE RIVER AT BULL SHOALS DAM, ARK.

LOCATION.--At dam on White River, 6.3 miles northeast of Flippin, Marion County, 12½ miles downstream from Little North Fork, and at mile 418.6. DRAINAGE AREA.--6,036 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1954 (revised) to September 1957.

Water temperatures: October 1954 to September 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No records of discharge available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1-5, 8-12, 15, 17-19, 22-26, 29-31, 1956				39	12	2.8	--	166	8.0	3.5		3.0	167	147	11	286	7.5	7
Nov. 1-2, 5-9, 13-16, 19				36	12	2.6	--	158	8.4	3.5		1.8	160	139	10	260	8.2	7
Dec. 3-6, 17-21, 26, 28, 31				32	12	2.2	--	144	9.6	3.0		1.0	148	129	11	245	8.1	7
Jan. 2-4, 7-11, 14-18, 21-25, 28-31, 1957				32	12	2.4	--	146	8.0	3.5		1.5	150	129	10	247	8.0	7
Feb. 1, 4-8, 11-15, 18-21, 25-28				35	12	3.6	2.4	158	12	3.5		1.9	143	137	7	247	7.5	5
Mar. 1, 4-6, 8, 11-15, 19-22, 25-29				36	10	4.0	2.5	157	9.4	2.5		2.9	158	131	2	260	7.0	5
Apr. 1-5, 8-10, 22-26, 29-30				34	11	4.0	2.6	154	9.0	3.0		2.6	151	130	4	255	7.2	7
May 1-3, 6-10, 13-24, 27-29, 31				35	12	3.0	1.7	166	6.0	3.0		1.2	152	137	1	253	8.0	5
June 3-7, 10-14, 17-20, 24-28				34	12	2.8	1.6	156	6.0	2.5		1.9	156	134	6	253	7.9	8
July 1-3, 8-31				34	12	2.7	1.4	158	3.0	3.0		2.2	150	134	5	246	7.2	10
Aug. 1-20, 22-24, 28-31				32	10	2.2	1.5	146	5.4	2.0		2.5	141	121	1	232	7.9	5
Sept. 1-20, 23-30				31	9.6	2.1	1.6	136	5.0	2.0		1.2	138	117	5	222	7.8	8
Average				34	11	2.9	--	154	7.5	2.9		2.0	151	130	4	250	--	7

LOWER MISSISSIPPI RIVER BASIN

WHITE RIVER BASIN--Continued

WHITE RIVER AT BULL SHOALS DAM, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	48	49	--	--	48	47	48	48	--	48	52	56
2	48	49	--	48	--	--	47	47	--	48	52	55
3	48	--	51	48	--	--	48	47	47	48	52	55
4	48	--	51	48	48	48	48	--	47	--	53	55
5	48	49	51	--	48	47	47	--	47	--	53	55
6	--	49	51	--	48	47	--	47	47	--	54	55
7	--	50	--	48	48	--	--	47	48	--	54	55
8	48	50	--	48	49	47	47	47	--	49	54	54
9	48	50	--	48	--	--	47	47	--	49	54	55
10	48	--	--	49	--	--	47	48	48	49	54	56
11	48	--	--	49	49	47	--	--	48	49	54	57
12	48	--	--	--	49	47	--	--	48	49	54	57
13	--	51	--	--	48	46	--	47	48	50	55	57
14	--	51	--	48	48	47	--	47	44	49	55	58
15	48	50	--	48	49	47	--	48	--	49	55	57
16	--	51	--	48	--	--	--	47	--	50	55	58
17	49	--	50	48	--	--	--	47	44	50	54	57
18	48	--	50	48	48	--	--	47	45	49	55	57
19	50	51	50	--	47	46	--	47	51	50	55	57
20	--	51	50	--	47	47	--	47	50	50	55	57
21	--	50	50	48	47	46	--	48	--	49	--	--
22	50	--	--	49	--	48	48	48	--	49	55	--
23	50	51	--	48	--	--	47	48	--	50	54	57
24	49	--	--	48	--	--	48	48	49	50	55	57
25	50	--	--	48	48	47	--	48	50	50	--	57
26	50	50	50	--	48	47	47	--	49	51	55	58
27	--	51	48	--	47	47	--	48	49	51	55	58
28	--	52	48	49	47	47	--	48	48	52	56	57
29	49	52	--	48	--	47	47	48	--	52	55	57
30	49	--	--	48	--	--	--	--	--	51	55	57
31	49	--	48	48	--	--	--	48	--	52	55	--
Average	--	--	--	--	--	--	--	--	--	50	54	56

WHITE RIVER BASIN--Continued

WHITE RIVER AT COTTER, ARK.

LOCATION--At bridge on U.S. Highway 62 at Cotter, Baxter County, about 5 miles downstream from gaging station near Flippin. DRAINAGE AREA, 1,067 square miles (above gaging station).

RECORDS AVAILABLE.--Chemical analyses, October 1947 to September 1957.

TEMPERATURES:--October 1947 to May 1955; December 1955 to September 1957.

EXTREMES, 1936-57.--Dissolved solids: Maximum, 205 ppm Oct. 20; minimum, 144 ppm Sept. 1-30.

Hardness: Maximum, 141 ppm Oct. 20; minimum, 120 ppm Sept. 1-30.

Specific conductance: Maximum daily, 343 micromhos Oct. 20; minimum daily, 197 micromhos Sept. 25.

Water temperatures: Maximum, 71° F July 15, 16; minimum, 44° F on several days in January.

EXTREMES, 1951-57.--Dissolved solids: Maximum, 344 ppm Feb. 3, 7, 1954; minimum, 140 ppm May 13-17, 19-21, 23, 25-29, 31, 1955.

Hardness: Maximum, 191 ppm Feb. 11-29, Mar. 11-19, 1955; minimum, 118 ppm May 13-17, 19-21, 23, 25-29, 31, 1955.

Specific conductance: Maximum daily, 696 micromhos Nov. 23, 1954; minimum daily, 180 micromhos May 28, 1955.

Water temperatures: Maximum, 79° F Sept. 20, 1954; minimum, 35° F Feb. 11, 1955.

REMARKS.--Records of specific conductance of daily samples available in District office at Fayetteville, Ark. Records of discharge for gaging station near Flippin for water year October 1956 to September 1957 given in WSP 1511. Flow regulated by Bull Shoals Reservoir since July 1951.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesi-lum	Non-carbonate			
Oct. 1-19, 21-31, 1956	3,042			37	11	3.2	--	157	6.0	4.5		2.2	182	138	9	275	7.6	10
Oct. 20	2,460			--	--	--	--	158	10	5.0		1.8	205	141	11	343	8.2	--
Nov. 1-30	3,366			37	9.9	2.4	--	197	7.6	2.8		1.9	146	133	4	256	8.0	10
Dec. 1-31	3,814			37	10	2.7	--	b155	6.4	3.8		1.4	152	133	6	254	8.4	10
Jan. 1-31, 1957	2,949			33	13	3.2	--	152	9.6	4.0		2.3	180	136	11	282	7.9	7
Feb. 1-28	2,594			31	15	3.4	1.4	162	7.6	3.2		1.2	186	139	6	216	8.2	13
Mar. 1-31	7,854			32	13	4.2	1.3	166	7.6	4.8		9	186	133	5	272	8.0	8
Apr. 1-30	9,780			31	15	3.4	1.3	160	8.6	3.5		1.3	186	139	6	274	7.7	8
May 1-30	9,402			36	12	3.1	1.8	159	6.0	4.0		1.8	186	139	9	265	7.3	8
June 1-30	15,430			34	12	3.1	1.6	152	7.4	3.5		1.8	186	134	10	255	7.6	8
July 1-31	22,900			33	9.8	2.7	1.7	140	6.6	3.5		1.0	146	123	8	237	7.5	5
Aug. 1-31	19,130			32	10	3.6	1.7	138	7.0	5.0		1.5	150	121	8	242	7.9	10
Sept. 1-30	22,390			32	9.8	3.0	1.7	138	9.6	4.0		1.2	144	120	7	235	7.9	8
Average	10,250			34	12	3.2	--	153	7.7	4.0		1.5	186	134	9	265	--	9

a. Estimated from specific conductance.

b. Includes equivalent of 4 parts per million of carbonate (CO₃).

LOWER MISSISSIPPI RIVER BASIN

WHITE RIVER BASIN--Continued

WHITE RIVER AT COTTER, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	63	59	51	--	54	53	57	61	68	69	69
2	64	61	58	47	--	50	53	57	61	68	69	69
3	65	59	56	52	--	50	53	58	58	70	68	70
4	65	63	57	49	--	50	55	58	57	70	68	70
5	65	63	62	53	--	51	55	55	60	70	68	70
6	67	63	60	54	--	52	56	55	60	69	68	70
7	63	63	56	49	47	50	55	55	60	70	68	68
8	63	53	--	46	48	49	55	55	61	70	68	68
9	62	58	50	50	49	49	54	56	58	70	68	--
10	68	62	54	48	54	50	54	57	59	70	68	68
11	64	63	54	49	54	49	55	58	62	70	69	69
12	66	61	55	50	--	50	55	58	64	70	70	70
13	63	61	52	50	--	51	52	57	63	70	69	70
14	66	63	53	51	50	50	52	57	64	70	70	70
15	64	59	54	56	48	50	49	60	65	71	65	70
16	66	58	54	49	48	50	49	60	66	71	65	70
17	65	59	55	48	51	51	54	60	66	70	69	70
18	64	58	53	57	50	52	55	60	66	70	70	70
19	63	59	53	50	50	52	55	57	66	70	70	69
20	65	60	55	46	49	50	55	57	67	70	70	69
21	65	53	55	54	50	50	55	60	67	68	68	68
22	64	60	53	44	50	49	55	60	67	69	68	68
23	64	60	--	44	53	48	55	62	66	68	68	68
24	65	59	54	45	51	52	55	63	66	68	68	68
25	63	54	--	45	52	52	58	61	--	64	70	69
26	61	50	55	44	50	47	58	61	68	--	70	69
27	64	57	51	44	54	57	55	60	66	66	68	69
28	63	57	50	45	50	52	55	60	66	68	68	68
29	63	58	51	44	--	53	57	59	67	68	68	68
30	63	53	53	44	--	53	57	60	68	68	68	68
31	64	--	54	45	--	53	--	--	--	68	69	--
Average	64	59	54	48	--	51	54	58	64	69	68	69

BUFFALO RIVER NEAR ST. JOE, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 65, 1½ miles downstream from Mill Creek, 4 miles upstream from Bear Creek, and 4½ miles southeast of St. Joe, Seary County.

DRAINAGE AREA.--825 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 219 ppm June 19; minimum, 62 ppm Apr. 22-28, 30.

Hardness: Maximum, 204 ppm June 19; minimum, 62 ppm Apr. 22-28, 30.

Specific conductance: Maximum daily, 348 micromhos June 19; minimum daily, 112 micromhos Mar. 25, Apr. 30.

Water temperatures: Maximum, 89°F July 25; minimum, 34°F Jan. 17, 18.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
Oct. 1-10, 1956	13.2	4.8	0.02	42	5.1	3.4	1.4	141	8.6	4.5	0.2	1.9	146	126	10	239	7.3	7
Oct. 11-20	12.5	4.3	.01	43	4.0	3.2	1.8	137	10	3.5	.3	3.0	151	124	11	242	7.5	5
Oct. 21-31	22.9	4.2	.01	43	4.4	3.0	1.3	140	7.2	4.8	.1	2.0	150	125	11	244	7.5	7
Nov. 1-10	32.5	4.4	.01	50	2.6	3.4	1.4	148	9.2	5.5	.1	3.0	160	135	14	254	8.1	7
Nov. 11-20	36.8	5.6	.00	45	5.1	3.2	2.1	154	4.8	4.0	.1	2.2	159	133	7	262	8.2	5
Nov. 21-30	108	4.2	.00	46	5.5	3.7	2.3	160	5.2	4.0	.1	3.1	166	137	6	273	7.9	7
Dec. 1-10	79.0	3.7	.00	45	4.6	2.8	1.6	148	11	3.0	.1	1.9	156	131	10	259	7.9	5
Dec. 11-20	156	3.9	.00	39	4.9	2.7	1.8	134	6.0	3.0	.1	2.2	144	117	8	236	7.9	5
Dec. 21-31	189	3.7	.00	39	4.1	2.9	1.7	126	7.6	3.5	.1	4.1	144	114	11	230	7.9	6
Jan. 1-10, 1957	184	2.0	.00	37	4.5	2.7	1.5	116	16	3.0	.1	2.9	146	111	16	226	7.7	7
Jan. 11-22	165.4	---	---	38	4.3	3.2	---	126	5.6	3.5	---	2.9	148	112	9	223	7.6	7
Jan. 23-31	1,190	---	---	25	2.2	2.6	---	77	4.4	3.5	---	3.5	99	71	8	153	7.9	17
Feb. 1-10	2,326	4.6	.00	22	2.5	2.3	.7	71	8.8	2.0	.1	2.4	80	65	7	143	6.7	13
Feb. 11-20	1,172	---	---	25	2.5	2.2	---	76	8.6	3.0	---	2.9	90	73	10	149	7.7	8
Feb. 21-23, 25-28	3,108	---	---	25	1.9	2.1	---	77	4.4	3.5	---	5.7	90	70	7	147	7.8	20
Feb. 24	849	---	---	25	---	---	---	a154	4.0	2.8	---	2.2	b161	138	12	257	8.6	---
Mar. 1-10	1,270	3.9	.00	27	2.0	3.4	.5	85	8.8	3.0	.0	2.8	92	76	6	158	7.4	7
Mar. 11-24	576	---	---	27	5.5	2.9	1.2	98	8.4	5.8	---	1.2	136	90	10	201	7.2	8
Mar. 25-31	1,953	---	---	21	3.5	2.3	.9	75	6.4	2.8	---	1.0	93	67	5	149	7.3	15
Apr. 1-10	9,009	3.7	.00	27	2.2	2.5	.9	82	5.6	3.5	.1	2.9	94	76	9	155	7.4	17
Apr. 11-20	1,750	---	---	27	4.3	2.6	.6	94	7.0	2.5	---	1.0	101	85	8	174	7.4	10
Apr. 21	3,180	---	---	---	---	---	---	142	5.0	2.5	---	1.0	b138	123	7	219	7.9	---
Apr. 22-28, 30	9,938	---	---	21	2.4	2.4	1.2	72	3.6	2.2	---	2.0	98	62	3	126	7.3	---
Apr. 29	11,900	---	---	---	---	---	---	140	5.0	1.5	---	1.0	b126	120	5	201	7.8	---

a Includes equivalent of 6 parts per million of carbonate (CO₃).

b Estimated from specific conductance.

WHITE RIVER BASIN--Continued
BUFFALO RIVER NEAR ST. JOE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg-nesium	Non-carbonate			
May 1-10, 1957	4,066	4.0	0.00	29	2.6	2.2	0.8	96	6.0	2.5	0.2	1.4	104	83	4	187	7.5	7
May 11-13	2,870	--	--	38	2.3	2.8	1.4	124	2.6	3.0	--	1.7	140	104	3	215	7.9	10
May 14-20	8,007	--	--	25	2.1	2.1	1.0	86	3.4	1.5	--	1.5	102	71	1	152	7.5	10
May 21-31	7,765	--	--	29	2.4	2.3	1.1	100	4.2	2.0	--	1.5	110	82	0	173	7.5	10
June 1	1,960	--	--	--	--	--	--	150	5.0	2.0	--	2.6	b148	126	3	238	8.0	--
June 2-9	3,650	4.3	.00	30	2.5	2.4	.8	99	6.6	1.5	.2	2.3	112	85	4	170	7.4	8
June 10	10,700	--	--	--	--	--	--	158	3.0	2.0	--	1.2	b158	142	12	251	8.1	--
June 11	5,260	--	--	--	--	--	--	189	2.0	3.0	--	3.8	b189	144	5	269	8.1	--
June 12-18, 20	3,978	--	--	30	2.9	2.4	1.4	108	4.6	2.2	--	1.0	116	87	0	182	7.9	8
June 19	1,450	--	--	--	--	--	--	201	2.0	2.0	--	3.3	b219	204	39	348	8.1	--
June 21-30	1,572	--	--	40	3.5	2.8	1.7	120	4.0	3.5	--	3.3	152	114	8	238	7.4	8
July 1-10	684	4.6	.00	38	3.2	2.7	1.1	124	5.6	2.0	.1	1.7	136	108	6	208	7.3	8
July 11-20	206	--	--	40	4.8	3.0	1.4	144	4.8	2.5	--	1.1	124	120	2	236	8.0	7
July 21-31	229	--	--	42	3.6	3.1	1.0	142	4.8	2.5	--	1.8	142	120	3	221	7.7	7
Aug. 1-10	143	4.2	.15	44	3.5	3.0	.9	146	4.8	2.0	.1	1.6	150	124	5	244	7.9	7
Aug. 11-15, 17-19	682	--	--	35	2.6	2.4	.9	116	4.2	2.0	--	2.0	128	96	3	194	8.1	7
Aug. 16, 20-31	235	--	--	43	3.1	3.4	1.0	138	4.2	3.0	--	2.9	152	120	7	236	7.6	5
Sept. 1-10	183	4.6	.12	43	3.6	2.8	.8	142	5.8	3.0	.0	.9	144	122	6	238	7.9	5
Sept. 11-14, 16-20	118	--	--	42	4.1	3.1	.8	143	6.0	2.8	--	1.2	148	122	4	236	8.1	6
Sept. 15	116	--	--	--	--	--	--	240	2.0	1.5	--	.1	b186	173	0	316	8.2	--
Sept. 21-30	314	--	--	43	3.9	3.0	1.0	142	6.0	3.2	--	.9	146	123	7	237	8.1	6
Average	1,694	--	--	35	3.5	2.8	1.2	126	5.8	2.9	--	2.0	135	102	0	215	--	9

b Estimated from specific conductance.

WHITE RIVER BASIN--Continued

BUFFALO RIVER NEAR ST. JOE, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	65	45	45	44	--	55	64	--	75	80	78
2	66	55	40	42	44	50	55	63	66	75	80	76
3	66	57	43	45	45	49	57	62	65	78	78	76
4	64	56	46	46	48	48	54	66	68	80	78	78
5	59	59	54	45	45	49	55	65	68	79	76	78
6	61	62	55	46	47	49	50	64	64	79	75	78
7	62	52	56	46	48	48	55	--	73	80	75	77
8	58	57	50	44	50	48	54	65	73	79	76	76
9	66	52	41	49	54	46	50	67	74	80	76	74
10	59	41	42	41	54	51	51	70	69	81	76	74
11	57	55	45	42	52	52	61	69	67	79	76	73
12	70	57	45	40	51	53	50	73	76	79	75	73
13	66	46	45	40	49	52	50	65	73	80	78	73
14	62	55	49	40	49	55	52	65	75	81	76	74
15	63	60	50	40	49	51	55	--	74	82	77	70
16	62	46	48	36	46	52	56	--	75	68	76	70
17	69	46	46	34	45	54	60	62	74	85	75	76
18	65	50	45	34	47	56	60	69	75	85	75	73
19	60	52	48	40	47	57	63	--	76	84	74	73
20	66	54	50	40	47	55	69	72	75	82	74	73
21	63	45	52	47	45	53	68	67	73	82	75	73
22	69	44	49	52	46	51	64	68	76	80	76	73
23	65	48	51	45	48	52	69	--	75	83	76	72
24	61	45	47	43	48	52	66	--	74	83	76	73
25	65	47	48	45	50	--	63	--	78	89	76	73
26	56	44	44	41	53	50	64	--	78	80	76	73
27	60	46	46	41	49	47	60	--	77	81	76	73
28	50	40	--	41	49	50	62	70	76	82	--	73
29	59	45	44	44	--	51	59	69	76	83	84	72
30	59	44	43	43	--	50	60	65	--	80	80	72
31	57	--	45	44	--	50	--	67	--	80	82	--
Average	62	51	47	43	48	51	58	--	73	81	77	74

WHITE RIVER BASIN--Continued
NORTH FORK RIVER AT NORFORK DAM, NEAR NORFORK, ARK.

LOCATION.--At gaging station at Norfolk Dam, 4.3 miles northeast of Norfolk, Baxter County.
DRAINAGE AREA.--1,806 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to August 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, October 1956 to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./l.	Non-carbonate			
Oct. 12, 1956	1,950	2.6	0.00	36	21	1.7	1.4	208	4.4	2.5	0.0	1.8	177	176	6	335	7.5	7
Nov. 30	1,670	3.7	.00	33	21	1.4	1.6	200	4.0	2.0	.0	1.3	171	168	5	315	7.8	7
Dec. 21	647	3.3	.00	33	21	1.3	1.3	196	5.6	1.5	.0	1.3	168	168	8	313	7.6	5
Jan. 4, 1957	978	2.9	.00	33	21	1.2	1.5	194	8.4	1.5	.0	2.5	158	168	10	314	7.5	5
Mar. 7	138	2.3	.00	33	21	1.5	1.6	200	5.2	2.5	.0	1.4	165	169	5	312	8.0	5
Apr. 9	4,390	2.8	.00	34	21	1.2	1.5	200	4.0	2.0	.0	1.0	158	171	7	311	8.0	5
Apr. 19	4,540	2.8	.00	33	21	1.4	1.6	196	5.0	2.0	.0	1.3	166	169	8	313	7.9	5
Apr. 25	4,600	2.8	.00	34	21	1.4	1.7	196	7.2	2.5	.0	1.3	160	171	11	313	8.0	8
May 3	4,620	2.8	.00	33	21	1.2	1.8	196	8.4	2.0	.2	1.7	158	169	8	311	8.1	7
July 16	4,800	1.8	.24	32	17	1.8	1.2	179	2.2	2.0	.0	2.6	154	150	3	279	7.6	15
Aug. 28	1,640	2.6	.00	28	16	1.5	1.5	157	5.0	.5	.3	1.7	144	136	7	241	7.2	8

WHITE RIVER BASIN--Continued
BLACK RIVER NEAR CORNING, ARK.

LOCATION. --At gaging station at bridge on U. S. Highway 62, 2½ miles east of Corning, Clay County, 13.9 miles downstream from Cane Creek, and at mile 152.2. DRAINAGE AREA. --1,749 square miles.

RECORDS AVAILABLE. --Chemical analyses: October 1954 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES. 1956-57. --Dissolved solids: Maximum, 164 ppm Oct. 1-10, 21-31; minimum, 38 ppm Jan. 24.

Hardness: Maximum, 154 ppm Nov. 11-20; minimum, 25 ppm Jan. 24.

Specific conductance: Maximum daily, 323 micromhos Oct. 23; minimum daily, 54.5 micromhos Apr. 7.

Water temperatures: Maximum, 80°F Aug. 3; minimum, 33°F Jan. 16.

REMARKS. --Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1956	272	5.2	0.00	30	17	4.2	1.2	169	6.4	5.0	0.0	2.2	184	145	6	283	7.4	7
Oct. 11-20	263	6.3	.00	31	17	4.0	1.1	173	6.8	4.0	.1	1.9	157	147	6	279	8.1	8
Oct. 21-31	272	4.8	.00	31	17	4.0	1.0	174	6.8	5.0	.0	1.6	164	147	5	283	8.0	7
Nov. 1-10	284	2.8	.01	33	17	3.3	.9	173	7.2	5.0	.0	1.3	163	152	10	283	7.6	10
Nov. 11-20	295	4.6	.00	32	18	3.0	.9	177	7.2	3.5	.3	1.4	162	154	9	280	8.0	5
Nov. 21-30	459	4.6	.00	30	16	3.3	1.0	166	6.8	4.5	.0	1.9	150	141	5	288	8.0	7
Dec. 1-10	458	2.8	.00	30	17	3.1	.9	164	7.0	4.5	.0	1.4	152	145	10	270	7.7	8
Dec. 11-20	770	5.2	.00	28	17	3.0	.8	160	6.6	3.5	.1	1.5	150	140	9	261	7.5	7
Dec. 21-31	691	6.0	.00	28	16	2.4	.9	151	7.6	3.0	.1	1.9	140	138	12	248	7.5	8
Jan. 1-10, 1957	530	3.3	.00	30	15	4.6	.8	158	8.0	5.5	.0	2.7	137	137	7	266	8.0	7
Jan. 11-22	447	--	--	29	16	2.2	--	157	4.4	4.0	--	2.7	133	138	10	260	7.6	5
Jan. 23, 25-28	2,944	--	--	8.7	4.5	2.4	--	42	4.8	1.2	--	4.6	83	25	6	97.6	7.7	33
Jan. 24	2,620	--	--	--	--	--	--	22	18	1.2	--	5.1	436	25	7	38.1	7.3	--
Jan. 29-31, Feb. 1-6	2,229	--	--	16	9.6	2.4	--	87	4.0	3.3	--	5.1	117	79	8	165	7.7	27
Feb. 7-11, 28	2,398	--	--	12	5.9	2.3	--	56	5.6	2.5	--	3.1	92	54	8	118	7.7	20
Feb. 12-27	1,956	2.6	.00	18	9.6	3.4	.9	94	7.4	3.5	--	2.8	98	84	7	176	6.9	23
Mar. 1-9	2,616	--	.00	30	8.6	2.1	1.4	76	7.0	3.5	--	2.0	a173	110	46	267	6.8	20
Mar. 10-25	1,211	4.0	.00	21	11	3.0	1.8	110	6.8	2.8	--	2.3	116	98	8	198	6.8	6
Mar. 26-31	1,750	--	--	15	8.6	3.2	1.6	84	8.0	3.0	--	2.9	96	73	4	164	7.6	20
Apr. 1-3	2,737	--	--	16	8.1	2.1	1.4	84	7.6	2.8	--	2.1	106	73	4	158	7.4	20
Apr. 4-5, 13-20	4,768	2.5	.44	11	4.8	2.4	1.7	52	7.2	2.0	.3	2.1	72	47	5	108	7.6	25
Apr. 6-12	13,030	--	--	6.0	2.8	1.8	2.1	30	3.2	3.0	--	1.3	a45	26	2	68.8	6.9	40
Apr. 21-30	4,978	--	--	10	5.3	2.2	1.6	53	6.4	3.0	--	1.5	80	47	3	109	7.0	40

a Estimated from specific conductance.

WHITE RIVER BASIN--Continued

BLACK RIVER NEAR CORNING, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, nesium	Non-carbonate			
May 1-4, 20-21, 1957..	4,845	--	--	11	5.1	1.7	1.6	54	5.2	2.5	--	1.5	77	48	4	111	7.1	40
May 5-19	3,275	2.8	0.32	15	6.3	3.4	1.1	74	3.4	3.5	0.1	2.4	89	63	3	138	7.4	35
May 22-31	11,660	--	--	8.1	3.3	1.5	1.8	38	3.2	2.0	--	1.4	52	33	3	79.8	6.7	40
June 1-10	4,287	3.3	.00	13	6.3	1.9	1.5	66	6.0	2.0	.5	2.7	86	58	4	124	7.5	18
June 11-20	3,255	--	--	14	7.1	2.1	1.3	76	6.0	2.2	--	1.2	101	64	2	138	7.0	22
June 21-30	3,117	--	--	14	6.8	2.0	1.2	72	4.8	2.0	--	1.3	98	63	4	139	7.0	25
July 1-8	6,934	--	--	10	4.1	2.0	1.6	46	4.8	3.0	--	3.2	78	42	4	94.4	7.0	35
July 9-20	2,507	6.8	.29	16	7.2	2.6	1.1	84	4.0	2.5	.1	1.8	94	70	1	140	7.8	15
July 21-31	3,095	--	--	16	7.0	2.0	1.1	84	3.0	2.0	--	2.2	92	69	0	136	7.6	15
Aug. 1-10	3,385	5.6	.26	16	7.0	2.0	1.2	84	2.8	2.2	.1	1.5	90	69	0	138	7.2	12
Aug. 11-20	3,371	--	--	18	7.5	1.9	1.1	90	2.8	1.8	--	1.0	96	76	2	149	7.2	12
Aug. 21-31	3,064	--	--	23	6.4	2.2	1.2	96	3.6	2.5	--	2.8	104	84	5	158	7.2	10
Sept. 1-10	2,592	2.6	.15	21	9.5	2.1	1.1	108	3.4	2.5	.1	1.6	112	91	3	176	7.8	10
Sept. 11-20	1,936	--	--	22	10	2.8	1.1	113	4.8	3.0	--	2.1	121	96	3	193	7.8	8
Sept. 21-30	1,819	--	--	24	10	2.5	1.1	122	3.6	2.0	--	1.8	122	101	1	186	7.9	7
Average	2,653	--	--	20	9.9	2.6	1.2	101	5.8	3.8	--	2.1	112	90	8	178	--	18

a Estimated from specific conductance.

WHITE RIVER BASIN--Continued

BLACK RIVER NEAR CORNING, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	62	44	42	40	50	48	72	73	74	77	76
2	70	62	45	39	41	47	50	71	68	73	79	77
3	71	63	50	41	43	46	57	67	70	75	80	77
4	72	63	52	41	42	47	61	--	70	77	79	76
5	72	64	54	42	42	45	56	62	71	77	76	75
6	72	62	56	42	43	46	57	67	72	78	74	74
7	69	62	52	42	44	47	61	65	75	78	75	71
8	65	57	46	43	46	44	57	65	75	79	76	70
9	64	53	45	51	50	45	52	68	75	78	77	70
10	64	54	46	41	50	47	60	69	75	77	78	71
11	64	55	46	41	48	50	61	70	76	76	78	73
12	65	53	46	42	51	52	52	70	76	76	79	78
13	65	56	43	38	50	54	51	67	75	77	77	74
14	66	59	44	35	46	55	53	70	77	77	78	75
15	66	54	47	36	45	54	54	71	77	76	79	75
16	65	--	45	33	45	55	55	71	78	77	77	73
17	65	49	47	39	47	55	61	72	78	77	76	73
18	65	52	43	35	45	55	62	72	78	77	75	74
19	64	50	45	36	44	52	67	68	75	78	75	75
20	65	68	49	36	43	52	69	69	75	77	75	75
21	64	50	49	45	45	50	68	70	76	78	75	75
22	65	44	48	49	47	49	71	--	75	78	75	72
23	65	50	49	44	49	52	72	70	75	77	75	71
24	66	46	46	43	52	58	72	70	74	77	74	70
25	66	47	45	42	52	52	72	72	73	76	74	70
26	63	42	47	48	45	49	69	72	74	77	76	70
27	60	42	48	39	51	52	72	71	75	77	77	70
28	60	44	43	39	47	55	71	71	75	77	77	69
29	60	41	43	37	--	56	72	71	76	76	78	68
30	62	40	44	37	--	56	72	72	73	76	78	69
31	61	--	45	38	--	57	--	73	--	77	79	--
Average	66	53	47	41	46	51	62	70	74	77	77	73

WHITE RIVER BASIN--Continued
CURRENT RIVER NEAR POCAHONTAS, ARK.

LOCATION --At bridge on U. S. Highway 67 near Pocahontas, Randolph County.

RECORDS AVAILABLE--Chemical analyses; October 1954 to September 1957.

REMARKS.--No records of discharge available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 25, 1956			37	22	1.9	--	215	4.0	2.8		1.9	214	183	7	341	7.8	5
Nov. 29		19	19	22	1.6	--	a165	2.8	2.5		1.2	146	138	3	261	8.4	5
Dec. 19		36	22	22	2.2	--	211	4.4	2.5		2.1	198	180	7	338	7.5	5
Jan. 17, 1957		36	22	22	1.9	--	211	4.0	2.5		2.6	183	180	7	335	7.9	5
Feb. 13		25	15	15	1.7	--	139	4.4	2.5		3.2	134	124	10	238	8.2	15
Mar. 14		24	18	18	1.8	1.0	152	5.6	2.5		2.4	144	134	9	227	7.7	2
Apr. 9		12	8.2	8.2	.9	1.6	74	4.0	1.0		1.8	92	64	3	128	7.4	1
June 20		27	16	16	4.8	1.2	a162	5.4	2.0		1.6	156	133	0	251	8.4	5
July 11		23	14	14	1.5	1.2	140	3.8	1.5		1.9	128	115	0	216	7.9	2
Aug. 8		31	18	18	2.4	1.0	184	4.4	2.5		1.0	164	151	1	289	8.0	--
Sept. 25		37	19	19	2.1	1.0	202	4.6	2.6		1.1	171	170	5	303	8.0	2

a Includes equivalent of 3 parts per million of carbonate (CO₃).

WHITE RIVER BASIN--Continued

SPRING RIVER AT IMBODEN, ARK.

LOCATION.--At gaging station at bridge on U.S. Highway 62 at Imboden, Lawrence County, 3.9 miles downstream from Janes Creek, 8.5 miles upstream from Eleven Point River, and 12.1 miles upstream from mouth.

DRAINAGE AREA.--1,162 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 239 ppm Aug. 21-31; minimum, 81 ppm Apr. 5.

Hardness: Maximum, 227 ppm Sept. 21-30; minimum, 69 ppm Apr. 5.

Specific conductance: Maximum daily, 460 micromhos Dec. 17; minimum daily, 145 micromhos Apr. 5.

Water temperatures: Maximum, 79°F July 17, 18, 23, Aug. 3; minimum, 34°F Jan. 17-19.

EXTREMES, 1955-57.--Dissolved solids: Maximum, 312 ppm Jan. 6, 1956; minimum, 81 ppm Apr. 5, 1957.

Hardness: Maximum, 248 ppm Jan. 21-31, 1956; minimum, 69 ppm Apr. 5, 1957.

Specific conductance: Maximum daily, 557 micromhos Jan. 6, 1956; minimum daily, 145 micromhos Apr. 5, 1957.

Water temperatures: Maximum, 82°F on several days during July and August 1956; minimum, 34°F Jan. 17-19, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, nesium	Non-carbonate			
Oct. 1-10, 1956.....	282	5.8	0.00	30	30	2.4	1.0	232	0	7.2	3.5	0.0	2.0	190	198	8	351	8.1	5
Oct. 11-20	272	--	--	30	30	2.6	--	236	0	10	4.0	--	1.6	194	198	8	364	7.6	5
Oct. 21-31	289	--	--	36	30	2.4	--	250	0	8.8	3.5	--	1.4	209	213	8	381	8.0	5
Nov. 1-10	305	--	--	34	28	2.1	--	240	0	9.2	2.5	--	1.3	190	200	3	358	8.2	5
Nov. 11-20	294	--	--	40	29	2.1	--	266	0	1.8	2.0	--	1.6	209	219	1	398	7.8	5
Nov. 21-30	372	--	--	37	29	3.2	--	252	0	7.6	3.0	--	1.3	194	212	5	387	8.0	7
Dec. 1-10	374	--	--	35	30	2.0	--	250	0	8.6	2.0	--	1.9	200	211	6	375	8.2	5
Dec. 11-20	377	--	--	40	29	3.0	--	259	0	4.0	4.0	--	1.6	229	219	7	394	8.0	8
Dec. 21-31	385	--	--	39	29	2.7	--	256	0	4.0	2.0	--	1.8	213	217	7	391	8.0	5
Jan. 1-10, 1957	333	4.6	0.00	33	30	3.3	1.3	244	0	4.4	2.5	1.0	1.2	198	206	6	365	7.8	10
Jan. 11-20	306	--	--	31	29	2.6	--	235	0	4.8	2.5	--	2.0	197	197	4	363	7.9	7
Jan. 21, 24-31	679	--	--	36	25	3.1	--	222	2	3.2	4.5	--	3.5	207	193	7	357	8.3	7
Jan. 22	5,910	--	--	--	--	--	--	162	0	4.0	1.5	--	1.3	a148	150	17	264	8.2	--
Jan. 23	2,570	--	--	--	--	--	--	129	3	6.0	2.5	--	1.3	a130	128	17	232	8.3	--
Feb. 1-5, 10-15	1,296	--	--	44	25	2.0	--	241	2	3.6	2.8	--	4.7	210	213	12	379	8.3	8
Feb. 6-9, 16-18	3,179	--	--	32	16	2.2	--	166	0	4.6	3.5	--	4.8	154	146	10	276	8.2	27
Feb. 19-28	1,796	--	--	41	22	2.3	--	220	0	3.4	2.8	--	5.1	200	193	12	347	8.1	13
Mar. 1-10	1,268	--	--	35	26	2.1	.9	220	0	6.8	2.5	--	3.7	195	194	14	350	8.2	8
Mar. 11-20	788	--	--	33	26	2.6	1.0	222	0	4.8	3.0	--	2.0	199	189	7	360	7.8	8
Mar. 21-31	735	--	--	31	30	2.7	1.0	235	0	5.2	2.5	--	2.7	201	201	8	374	7.7	8

a Estimated from specific conductance.

WHITE RIVER BASIN--Continued
SPRING RIVER AT IMBODEN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium	Non-carbonate			
Apr. 1-2, 7-15, 1957	2,577	6.7	0.00	43	22	3.2	1.0	228	0	9.2	3.5	0.1	3.7	208	198	11	359	7.9	7
Apr. 3	15,700							128	2	7.0	4.2		3.3	al35	120	12	240	8.3	
Apr. 4	47,800							85	0	7.0	2.2		3.5	a90	78	8	161	8.0	
Apr. 5	18,800							76	0	8.0	.5		3.9	a81	69	7	145	8.0	
Apr. 6	5,790							155	5	4.0	2.5		5.3	al57	116	0	279	8.5	
Apr. 16-22, 25-26, 30	3,669					1.8	1.2	219	0	5.2	2.5		3.0	199	191	12	358	7.6	10
Apr. 23	8,430							104	0	3.0	.5		3.4	al06	94	9	189	8.0	
Apr. 24, 27-29	10,450					1.9	1.4	144	0	3.8	2.0		2.1	139	124	6	244	8.2	28
May 1-10	3,259					4.2	1.9	199	2	3.4	3.0		3.1	182	170	3	312	8.3	10
May 11-27	6,234					3.6	1.9	188	0	5.4	3.0		2.8	174	158	4	288	7.4	5
May 28-31	3,028					3.9	1.9	211	0	7.2	3.0		3.0	190	179	7	325	8.2	5
June 1-10	2,378					3.4	2.1	214	0	7.4	2.0		2.4	184	179	3	328	7.9	5
June 11-20	1,569					3.6	2.3	225	0	7.2	3.0		2.4	195	187	2	343	8.1	5
June 21-30	1,020					2.5	2.3	244	0	7.0	2.0		2.1	216	205	5	374	7.6	5
July 1-10	930	5.6	.15	22	25	3.9	.9	168	8	3.4	1.8	.0	3.2	164	158	7	287	8.4	7
July 11-20	730					2.7	1.3	172	10	4.0	2.2		3.5	168	162	4	292	8.5	7
July 21-31	741					2.6	1.1	188	8	4.0	2.5		2.3	180	168	0	309	8.5	6
Aug. 1-10	598					2.5	.9	192	10	4.4	2.0		3.2	186	182	8	323	8.5	5
Aug. 11-20	562					2.3	.9	220	8	3.6	2.0		1.8	202	198	4	348	8.4	7
Aug. 21-31	594					2.4	1.1	210	10	4.2	2.2		2.9	239	195	6	343	8.6	7
Sept. 1-10	501					2.3	.9	228	12	3.8	1.8		2.9	208	214	7	371	8.5	5
Sept. 11-20	597					2.2	.9	216	14	3.8	2.5		2.2	201	207	7	364	8.6	6
Sept. 21-30	579					2.5	.9	248	12	2.2	2.0		2.2	225	227	3	399	8.5	5
Average	1,024					2.7	--	205	3	5.4	2.6	--	2.7	184	194	22	327	--	8

a Estimated from specific conductance.

WHITE RIVER BASIN--Continued

SPRING RIVER AT IMBODEN, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	59	40	42	42	47	56	66	69	74	78	74
2	69	58	41	41	40	49	58	66	67	74	78	75
3	70	60	43	40	44	48	56	64	66	73	79	74
4	70	61	44	43	46	46	55	60	67	76	78	73
5	68	62	50	42	44	47	54	60	68	76	72	73
6	67	62	52	42	45	49	51	60	69	75	70	72
7	68	60	56	42	44	47	55	62	71	76	72	70
8	63	67	53	42	48	43	55	63	73	76	74	68
9	62	51	48	46	52	45	53	65	73	77	73	67
10	62	50	45	43	52	47	54	58	73	76	74	68
11	61	51	46	42	52	53	55	66	73	76	76	68
12	63	53	45	41	51	52	56	66	75	76	76	71
13	63	51	45	40	49	52	47	67	75	77	75	70
14	63	54	45	39	49	56	52	66	75	78	76	71
15	63	57	46	38	49	52	58	68	75	78	75	71
16	63	50	46	36	45	52	54	68	76	78	78	70
17	63	49	46	34	43	55	55	68	77	79	75	69
18	63	47	45	34	45	53	59	69	77	79	72	70
19	62	48	45	34	46	53	60	66	75	78	71	70
20	63	52	47	36	44	51	64	65	74	78	70	71
21	63	49	50	42	44	51	65	68	74	78	71	72
22	64	47	49	50	45	50	65	69	75	78	70	71
23	63	45	50	45	48	50	66	65	73	79	68	67
24	63	45	47	43	49	52	66	68	73	77	71	67
25	62	45	46	42	53	51	66	67	72	75	71	67
26	62	44	45	42	54	50	66	68	72	75	72	67
27	59	42	45	--	51	49	65	66	73	77	73	67
28	58	42	45	40	48	51	63	68	73	78	72	65
29	58	42	44	40	--	53	65	66	74	77	72	65
30	59	40	43	39	--	55	66	68	74	77	73	64
31	60	--	43	40	--	56	--	69	--	77	75	--
Average	63	51	46	41	47	50	59	68	73	77	74	70

WHITE RIVER BASIN--Continued
ELEVEN POINT RIVER NEAR RAVENDEN SPRINGS, ARK.

LOCATION.--At gaging station at bridge on State Highway 90, 4½ miles downstream from small tributary, 6½ miles northeast of Ravenden Springs, Randolph County, and 21 miles upstream from mouth.

DRAINAGE AREA.--1,123 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES: 1956-57.--Dissolved solids: Maximum, 230 ppm Nov. 11-20; minimum, 60 ppm May 23.

Hardness: Maximum, 223 ppm Oct. 11-20, Nov. 1-10; minimum, 51 ppm Apr. 3-5.

Specific conductance: Maximum daily, 434 micromhos Jan. 16; minimum daily, 89.5 micromhos Apr. 4.

Water temperatures: Maximum, 78°F Aug. 11; minimum, 39°F Jan. 19.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
															Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1956....	279	3.7	0.00	43	27	2.4	1.2	256	0	6.8	2.0	0.0	2.4	224	218	8	380	8.2	5
Oct. 11-20.....	264	4.8	.00	45	27	2.7	1.2	262	0	6.4	3.2	.0	2.2	228	223	9	396	8.0	5
Oct. 21-31.....	273	4.3	.00	42	28	2.2	1.4	257	0	6.4	3.5	.0	2.1	228	220	9	392	7.7	10
Nov. 1-10.....	274	4.3	.00	45	27	2.4	1.2	257	0	6.2	3.0	.0	1.9	224	223	13	394	7.7	8
Nov. 11-20.....	273	4.6	.00	45	26	2.1	1.4	254	3	2.0	2.0	.1	1.9	230	219	6	384	8.5	5
Nov. 21-30.....	307	5.3	.00	36	26	2.1	1.6	228	2	2.4	2.5	.1	2.2	202	197	6	353	8.3	5
Dec. 1-10.....	284	4.6	.00	36	26	2.1	1.5	236	0	2.6	2.0	.1	2.2	204	197	3	361	8.0	5
Dec. 11-20.....	312	3.7	.00	38	25	1.9	1.5	232	2	1.6	2.0	.0	2.1	260	198	4	354	8.3	5
Dec. 21-31.....	310	5.6	.00	37	25	1.9	1.4	232	0	2.0	1.5	.0	2.5	202	195	5	355	8.2	5
Jan. 1-10, 1957....	273	3.7	.00	47	24	3.5	1.4	260	0	6.4	2.5	.0	1.7	219	216	3	397	8.2	8
Jan. 11-20.....	253	--	--	46	24	3.8	--	236	12	2.8	2.2	--	2.3	224	213	0	354	8.5	10
Jan. 21-31.....	720	--	--	34	20	2.1	--	196	0	4.2	2.2	--	3.7	162	167	6	312	8.2	20
Feb. 1-10.....	912	5.1	.00	41	22	3.0	1.3	205	4	7.8	2.5	.0	2.8	192	193	10	342	8.4	10
Feb. 11-20.....	850	--	--	39	21	2.2	--	213	0	4.8	2.5	--	4.9	186	184	9	335	8.2	8
Feb. 21-28.....	874	--	--	37	21	2.9	1.1	208	0	4.0	2.5	--	4.8	198	179	8	318	8.1	13
Mar. 1-10.....	853	3.2	.00	38	21	3.1	.9	206	0	8.8	2.0	.0	4.0	186	181	13	326	8.0	7
Mar. 11-20.....	600	--	--	37	22	2.6	1.2	213	0	4.0	3.0	--	2.8	191	183	8	344	7.5	8
Mar. 21-31.....	588	--	--	37	23	2.3	1.1	218	0	3.2	2.0	--	3.4	192	187	8	340	7.7	10
Apr. 1, 6-10.....	3,135	4.2	.00	29	15	2.9	1.2	156	0	6.8	2.5	.0	3.8	139	134	6	254	8.0	13
Apr. 2.....	628	--	--	--	--	--	--	189	6	2.0	2.2	--	2.8	184	181	16	328	8.5	--
Apr. 3-5.....	16,380	--	--	12	5.2	1.0	2.2	40	0	4.0	1.0	--	2.6	96	85	2	218	7.1	17
Apr. 11-22.....	1,682	--	--	28	20	3.0	2.2	175	2	4.4	3.2	--	2.7	178	152	5	267	8.3	8

Apr. 23-30, 1957.....	5,139	--	24	12	1.8	1.5	1.2	148	0	4.8	1.5	--	2.6	146	109	6	218	7.4	7
May 1-11.....	2,684	6.4	.00	27	15	1.6	1.2	148	0	4.4	2.0	.2	3.2	141	129	8	243	7.4	7
May 12.....	4,710	--	--	--	--	--	--	114	2	3.0	1.8	--	3.8	111	107	10	188	8.3	--
May 13-20.....	2,714	--	31	13	3.2	1.6	1.53	153	0	4.0	2.5	--	3.2	154	131	1	280	7.3	8
May 21-22, 25-31...	4,553	--	22	16	2.0	1.4	1.4	136	0	6.6	1.5	--	3.6	135	121	9	215	7.9	5
May 23.....	20,500	--	--	--	--	--	--	82	0	5.0	1.0	--	2.7	80	52	1	102	7.5	--
May 24.....	14,600	--	--	--	--	--	--	90	0	5.0	1.5	--	1.0	84	78	4	142	7.8	--
June 1-10.....	2,305	6.9	.02	29	17	1.9	.9	162	0	4.6	2.5	.2	2.8	154	142	10	280	7.6	8
June 11-20.....	1,785	--	--	28	18	2.2	1.4	175	0	4.4	2.2	--	3.5	167	144	0	271	8.2	5
June 21-30.....	1,380	--	--	30	20	2.2	1.3	193	0	4.0	2.2	--	3.0	173	157	0	291	7.9	5
July 1-10.....	1,180	6.4	.00	29	20	2.1	.9	181	0	4.0	2.0	.0	4.1	158	155	6	284	7.7	8
July 11-20.....	1,019	--	--	31	22	2.5	1.3	205	0	4.0	2.5	--	3.3	204	168	0	314	7.9	7
July 21-31.....	969	--	--	33	23	2.4	1.3	216	0	4.2	2.5	--	3.2	192	177	0	312	8.1	7
Aug. 1-10.....	865	5.7	.00	38	22	2.1	1.0	220	0	4.0	1.8	.0	2.0	193	185	5	331	7.9	4
Aug. 11-20.....	776	--	--	39	22	2.3	1.2	226	0	2.6	2.3	--	2.7	174	188	3	342	8.2	7
Aug. 21-31.....	690	--	--	39	25	2.3	1.1	228	0	3.0	6.5	--	2.5	206	200	13	346	8.2	12
Sept. 1-10.....	748	5.1	.12	38	23	2.5	.9	223	0	3.4	2.0	.0	2.3	197	189	7	337	8.2	6
Sept. 11-20.....	618	--	--	42	34	2.4	.9	238	0	3.4	2.5	--	1.8	206	204	8	356	8.2	5
Sept. 21-30.....	583	--	--	42	34	2.6	.8	216	12	2.8	2.5	--	1.8	206	204	6	356	8.3	7
Average	1,313	--	--	36	21	2.4	1.3	197	1	4.3	2.3	--	2.8	180	176	14	308	--	8

a Estimated from specific conductance.

LOWER MISSISSIPPI RIVER BASIN

WHITE RIVER BASIN--Continued

ELEVEN POINT RIVER NEAR RAVENDEN SPRINGS, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	62	48	--	46	55	60	67	68	70	73	71
2	67	61	50	--	50	54	60	64	65	69	74	70
3	67	65	50	48	48	51	60	63	67	71	74	70
4	68	65	50	45	50	49	60	65	65	73	73	70
5	70	62	60	50	50	50	54	60	66	72	72	70
6	68	63	48	48	50	50	55	60	63	70	71	68
7	70	62	50	47	52	50	60	65	67	72	64	65
8	63	60	55	50	52	48	58	64	70	72	71	65
9	65	58	50	44	57	49	59	65	69	74	70	65
10	61	55	48	50	58	50	59	65	69	72	75	64
11	62	60	50	46	55	55	59	64	70	70	78	68
12	61	54	50	48	57	55	55	68	71	70	76	70
13	61	55	50	45	53	55	54	65	69	72	74	69
14	62	60	50	44	58	60	56	65	71	74	75	69
15	65	60	50	44	50	53	55	68	71	72	75	68
16	63	60	50	42	50	56	54	67	72	72	75	70
17	63	55	50	40	51	55	56	66	73	73	71	68
18	64	55	48	40	50	57	60	65	69	73	71	68
19	64	55	48	39	50	55	60	64	65	71	70	71
20	64	55	50	40	48	55	55	64	71	72	69	69
21	64	55	55	42	49	53	58	68	69	73	70	70
22	65	55	54	50	49	53	65	62	70	71	69	65
23	64	50	50	45	50	52	67	69	70	74	69	68
24	64	52	50	46	53	53	65	68	69	73	69	69
25	65	50	49	45	58	51	65	69	69	73	70	67
26	60	50	49	--	58	55	64	62	67	73	68	68
27	60	50	48	--	52	50	64	66	70	72	72	68
28	60	48	51	--	50	58	65	65	70	72	71	64
29	60	45	49	--	--	58	68	70	71	70	70	65
30	60	42	48	--	--	59	68	70	70	72	70	60
31	61	--	45	48	--	59	--	--	--	72	70	--
Average	64	56	50	--	52	54	60	65	69	72	72	68

WHITE RIVER BASIN--Continued
STRAWBERRY RIVER NEAR POUGHKEEPSIE, ARK.

LOCATION.--At gaging station at bridge on State Highway 58, half a mile downstream from Hurricane Creek, and 2½ miles northeast of Poughkeepsie, Sharp County.

DRAINAGE AREA.--476 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1953 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 250 ppm Nov. 1-10; minimum, 106 ppm Apr. 2-4, 27-28.

Hardness: Maximum, 240 ppm Nov. 1-10; minimum, 55 ppm Apr. 2-4, 27-28.

Specific conductance: Maximum daily, 456 micromhos Nov. 7; minimum daily, 94.5 micromhos Apr. 4.

Water temperatures: Maximum, 92°F July 7, 15; minimum, 36°F Jan. 16, 18.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis- charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mag- nesium	Non- carbon- ate			
Oct. 1-10, 1956....	42.7	6.0	0.00	40	29	3.8	2.0	254	0	8.0	4.0	0.1	4.9	225	11	394	8.0	7
Oct. 11-20.....	39.6	4.6	.01	43	28	3.2	1.8	262	0	6.8	1.5	.1	3.5	226	22	391	8.1	5
Oct. 21-31.....	44.3	3.2	.01	45	28	3.6	.6	264	0	7.6	4.0	.1	2.3	231	11	406	8.0	8
Nov. 1-10.....	50.0	3.7	.00	50	28	2.4	1.4	280	0	8.0	3.5	.1	1.6	250	10	418	7.7	7
Nov. 11-20.....	47.2	5.1	.00	41	29	3.1	1.6	253	0	7.6	2.5	.0	1.3	218	14	385	8.1	8
Nov. 21-29.....	72.7	4.8	.00	26	28	3.3	1.2	200	0	9.2	2.5	.0	1.5	174	172	8	8.0	8
Nov. 30, Dec. 1-9..	66.5	3.4	.00	39	28	3.8	1.6	242	2	8.4	2.5	.0	1.0	219	11	374	8.3	10
Dec. 10-20.....	67.2	4.1	.00	30	26	3.0	1.2	209	0	9.2	3.0	.0	1.2	183	10	328	7.8	8
Dec. 21-26, 28-31..	92.1	3.7	.00	30	26	3.3	1.3	211	0	7.4	2.5	.0	2.1	181	182	9	7.9	8
Dec. 27.....	84.0	--	--	--	--	--	--	219	20	2.0	3.8	--	7.7	a246	223	11	8.6	--
Jan. 1-7, 11, 13-16,																		
18, 1957.....	63.6	5.6	.00	30	25	2.8	1.1	207	0	8.4	2.5	.0	1.5	175	78	320	8.1	6
Jan. 8-10, 12, 17..	62.6	--	--	44	29	2.9	1.4	274	0	5.6	2.5	--	1.9	227	239	4	8.0	13
Jan. 19-23.....	1,459	--	--	12	6.8	1.2	2.9	65	0	4.0	.8	--	3.0	c118	58	5	127	7.1
Jan. 24.....	1,670	--	--	--	--	--	--	141	2	3.0	1.8	--	5.5	a146	132	15	245	8.4
Jan. 25-31.....	507	--	--	33	21	2.7	1.4	187	0	11	2.5	--	4.4	187	169	15	307	7.5
Feb. 1-6, 9-13....	647	3.2	.32	39	20	3.2	1.2	202	0	7.6	3.0	.0	14	192	180	14	325	7.8
Feb. 7, 14-16.....	1,006	--	--	20	10	3.4	2.6	106	0	9.4	2.5	--	5.0	130	91	4	198	7.8
Feb. 8.....	1,010	--	--	--	--	--	--	142	4	3.0	3.0	--	6.0	a153	139	16	257	8.4
Feb. 17-28.....	919	--	--	33	16	3.2	1.7	170	0	11	2.0	--	3.6	166	148	9	274	7.6
Mar. 1-9.....	507	3.3	.17	40	21	3.0	1.0	210	0	8.2	2.5	.0	5.1	196	186	14	531	8.2
Mar. 10-20.....	264	--	--	39	22	3.6	1.7	219	0	9.0	2.5	--	3.7	197	188	8	347	7.2
Mar. 21-31.....	265	--	--	37	23	3.5	1.5	216	0	9.0	2.2	--	2.7	187	187	10	344	7.4

a Estimated from specific conductance.

c Includes organic matter present.

WHITE RIVER BASIN--Continued
STRAMBERRY RIVER NEAR POUHKEEPSIE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
															Calcium, meq/l	Non-carbon- ate			
Apr. 1, 1957.....	439	--	--	--	--	--	--	167	0	2.0	2.5	--	1.9	a 328	146	9	382	8.0	--
Apr. 2-4, 27-28....	11,860	--	--	13	5.4	1.9	2.6	66	0	3.4	1.0	--	2.1	c 106	55	1	126	7.3	45
Apr. 5-20.....	1,472	6.5	0.00	27	2.1	2.1	1.8	168	0	6.0	2.5	0.3	3.8	155	150	12	287	8.1	9
Apr. 21-26, 29-30..	3,482	--	--	26	14	1.8	1.8	142	0	6.0	2.0	--	2.5	143	122	6	229	8.0	10
May 1-10.....	900	7.7	0.00	36	20	2.3	1.0	200	0	6.0	3.0	0.3	3.5	178	172	8	302	7.7	10
May 11-19.....	728	--	--	36	20	2.6	2.0	192	6	6.2	3.5	--	3.6	203	172	5	314	8.4	8
May 20-31.....	2,359	--	--	34	16	2.6	1.6	174	4	5.2	2.5	--	2.2	181	151	1	288	8.3	8
June 1-10.....	712	8.0	.01	30	20	2.7	1.1	184	0	5.6	2.0	0	2.3	168	157	6	282	7.7	5
June 11-19.....	261	--	--	22	22	2.8	1.6	170	3	3.6	2.5	--	2.0	170	145	1	278	8.3	5
June 20-30.....	171	--	--	30	15	1.9	1.7	158	0	4.8	2.8	--	3.7	165	137	7	263	7.5	8
July 1-10.....	278	6.3	.01	26	24	2.6	1.1	194	0	5.6	2.5	0	1.7	168	164	5	294	7.8	5
July 11-20.....	113	--	--	28	24	2.6	1.1	182	8	4.0	2.0	--	1.9	170	169	6	309	8.4	5
July 21-31.....	164	--	--	37	23	2.6	1.1	202	10	4.4	2.5	--	1.8	188	187	5	328	8.5	6
Aug. 1-10.....	91.1	4.5	.15	31	23	2.3	1.0	188	8	4.0	2.0	0	1.0	172	172	5	312	8.4	6
Aug. 24-31.....	70.5	--	--	31	25	2.5	1.1	188	12	4.4	2.5	--	3.0	180	180	6	323	8.5	7
Sept. 1-10.....	135	3.0	.15	38	25	3.1	1.3	202	14	3.6	2.5	0	4.6	202	198	9	355	8.6	7
Sept. 11-20.....	75.0	--	--	43	25	2.1	1.2	226	10	4.4	2.5	--	1.4	206	210	8	363	8.6	8
Sept. 21-30.....	68.4	--	--	38	24	2.3	1.4	204	12	4.2	2.0	--	1.3	188	194	6	338	8.5	10
Average	b 648	--	--	33	22	2.8	1.5	194	3	6.2	2.5	---	3.2	185	173	9	315	--	10

a Estimated from specific conductance.

b Represents 96 percent of runoff for water year October 1955 to September 1957.

c Includes organic matter present.

WHITE RIVER BASIN--Continued

STRAWBERRY RIVER NEAR POUGHKEEPSIE, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	62	40	45	40	54	62	69	71	84	75	83
2	70	63	46	45	42	56	--	68	67	89	79	75
3	69	63	47	44	44	55	56	69	70	85	83	80
4	71	60	44	43	41	56	56	68	69	89	80	81
5	75	61	45	--	46	52	55	66	72	90	81	81
6	73	60	46	43	47	50	56	65	76	81	87	85
7	71	61	45	44	51	51	55	67	76	92	79	79
8	71	54	44	42	52	52	57	68	77	87	80	77
9	70	52	46	41	--	53	58	68	75	89	81	80
10	65	53	47	46	52	55	56	69	80	82	80	75
11	67	52	46	40	54	57	57	73	82	64	--	73
12	68	62	45	46	54	60	54	73	85	90	--	79
13	68	60	47	45	55	57	55	74	85	89	--	73
14	66	59	46	39	--	61	47	71	79	86	--	70
15	67	52	45	39	47	59	49	72	85	92	--	71
16	70	52	44	36	45	60	55	73	83	90	--	75
17	67	52	47	50	44	47	56	69	71	--	--	72
18	66	44	46	36	43	55	60	--	71	75	--	70
19	--	45	47	46	46	50	63	73	72	79	--	70
20	--	46	46	--	45	56	66	74	73	78	--	72
21	--	46	45	54	46	57	67	73	74	80	--	71
22	--	43	46	54	49	55	66	72	71	83	--	72
23	--	46	47	47	50	56	69	71	73	78	--	79
24	67	45	46	43	49	57	70	69	75	79	81	70
25	67	40	45	40	47	56	69	70	75	80	79	69
26	66	42	45	43	55	59	--	71	71	85	83	73
27	60	40	44	42	53	60	65	69	75	81	82	69
28	61	41	45	41	54	60	77	70	79	80	78	70
29	60	42	44	42	--	61	74	69	81	80	80	61
30	61	42	46	43	--	60	69	68	85	79	81	71
31	61	--	44	41	--	62	--	70	--	81	84	--
Average	67	51	45	43	48	56	61	70	76	83	--	74

WHITE RIVER BASIN--Continued

WHITE RIVER AT NEWPORT, ARK.

LOCATION.--At gaging station at bridge on U.S. Highway 67 at Newport, Jackson County, 7.2 miles downstream from Black River, and at mile 257.6.
DRAINAGE AREA.--19,812 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1957.

Water temperatures: October 1945 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 215 ppm Mar. 15; minimum, 98 ppm Apr. 4-5, 9-11.

Hardness: Maximum, 175 ppm Oct. 11-20; minimum, 82 ppm Apr. 4-5, 9-11.

Specific conductance: Maximum daily, 357 microhos Mar. 15; minimum daily, 143 microhos Jan. 24.

Water temperatures: Maximum, 74°F June 13; minimum, 36°F Jan. 17, 18.

EXTREMES, 1945-57.--Dissolved solids: Maximum, 388 ppm Jan. 20-21, '23, '30, 1954; minimum, 98 ppm Feb. 1-3, 1949, Apr. 4-5, 9-11, 1957.

Hardness: Maximum, 193 ppm Oct. 4-7, 10, 1945; minimum, 51 ppm Jan. 25-31, 1949.

Specific conductance: Maximum daily, 695 microhos Jan. 30, 1954; minimum daily, 103 microhos Jan. 28, 1949.

Water temperatures: Maximum, 87°F Aug. 4, 9, 1947; Aug. 1, 1952; minimum, 34°F Feb. 2-4, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1956.....	6,305	2.8	0.00	38	18	4.4	1.9	186	8.4	9.0	0.1	3.7	188	173	12	336	7.8	8
Oct. 11-20	6,150	--	--	39	19	3.6	--	203	7.2	4.5	--	2.5	184	175	9	328	7.9	10
Oct. 21-31	6,211	--	--	40	17	4.2	--	194	6.8	6.0	--	4.2	186	170	11	322	8.2	10
Nov. 1-10	7,096	--	--	39	16	3.7	--	193	6.4	4.5	--	3.1	183	163	10	310	7.9	18
Nov. 11-20	6,779	--	--	37	18	3.6	--	188	8.8	4.5	--	3.4	187	168	12	315	7.7	8
Nov. 21-30	7,416	--	--	35	18	3.6	--	186	9.6	4.5	--	3.0	186	161	9	310	7.9	7
Dec. 1-10	7,688	--	--	35	18	3.4	--	186	8.4	4.0	--	2.9	182	161	9	316	8.1	25
Dec. 11-20	8,772	--	--	35	17	3.0	--	186	8.0	3.5	--	2.4	178	187	5	304	7.9	7
Dec. 21-31	8,311	--	--	38	16	3.0	--	184	9.6	3.5	--	2.1	174	161	10	299	8.0	8
Jan. 1-10, 1957	6,968	6.1	.00	37	17	3.5	1.2	191	5.8	3.2	.0	1.0	170	162	6	297	8.3	5
Jan. 11-22	7,158	--	--	37	16	3.7	--	187	9.0	5.0	--	2.2	178	158	5	305	8.1	8
Jan. 23-31	21,330	--	--	23	9.2	1.8	--	105	9.0	2.0	--	3.2	138	95	9	187	7.8	7
Feb. 1-10	21,700	--	--	26	11	1.9	--	126	8.8	2.5	--	3.2	135	110	7	218	7.8	27
Feb. 11-20	20,540	--	--	29	11	3.6	2.0	136	8.2	2.5	--	3.9	148	118	6	231	7.1	5
Feb. 21-28	21,610	--	--	30	12	4.0	2.1	147	8.6	3.5	--	3.9	150	124	4	208	8.2	5
Mar. 1-10	23,710	--	--	31	13	3.4	1.8	150	9.8	3.5	--	3.4	148	131	8	234	8.1	5
Mar. 11-14, 16-20	16,790	--	--	33	13	4.1	2.0	156	9.2	3.0	--	2.1	160	136	8	254	8.1	5
Mar. 15	16,200	--	--	--	--	--	--	b208	2.0	4.2	--	2.8	c215	140	0	387	8.7	--
Mar. 21-31	19,020	--	--	36	12	4.0	2.1	160	7.8	3.0	--	3.0	163	139	8	263	7.5	5
Apr. 1-3, 6-8	62,550	--	--	32	8.8	2.6	3.8	133	6.6	2.5	--	5.1	159	116	7	238	8.9	5
Apr. 4-5, 9-11	80,020	--	--	20	7.9	2.6	2.5	91	8.6	2.0	--	2.8	98	82	8	180	7.9	18
Apr. 12-20	62,520	2.6	.18	25	9.4	2.4	1.5	120	4.2	1.5	.0	2.1	118	101	3	206	7.9	26
Apr. 21-30, May 1-6	78,100	--	--	26	9.4	3.3	2.2	118	7.8	2.5	--	2.4	115	104	7	197	7.9	19

May 7-20, 1957	55,060	--	--	29	11	3.1	2.2	136	11	2.5	--	2.2	127	118	6	222	8.1	10
May 21-31	78,030	--	--	26	9.6	3.5	2.4	120	8.6	2.0	--	2.2	114	104	6	196	7.4	10
June 1-10	69,410	--	--	25	9.8	3.5	2.1	120	8.2	1.8	--	1.8	124	103	4	187	7.7	5
June 11-20	56,830	--	--	30	11	3.7	2.2	139	9.2	2.2	--	2.6	122	120	6	223	8.1	5
June 21-30	39,920	--	--	34	12	3.1	1.4	154	7.2	2.5	--	3.3	154	134	8	252	8.0	8
July 1-10	40,930	7.4	0.00	32	11	3.3	1.7	150	7.0	2.5	.1	2.8	154	125	2	253	7.9	10
July 11-20	38,900	--	--	30	11	2.8	1.5	140	6.0	3.0	--	2.6	138	120	5	231	7.9	10
July 21-31	38,340	--	--	33	11	3.3	1.9	152	5.0	3.5	--	3.5	150	128	3	251	7.9	8
Aug. 1-10	38,870	--	--	33	11	2.6	1.7	148	4.2	2.5	--	3.5	146	128	6	244	7.9	8
Aug. 11-20	36,070	--	--	30	11	2.7	1.8	142	4.8	2.5	--	2.4	138	120	4	227	7.9	5
Aug. 21-31	28,790	--	--	32	11	3.0	2.1	152	3.6	1.5	--	2.8	140	125	0	245	7.4	6
Sept. 1-10	28,060	--	--	31	11	2.9	1.9	154	4.4	1.5	--	2.4	136	122	0	242	7.7	5
Sept. 11-20	29,210	--	--	31	13	4.0	2.1	160	5.6	4.0	--	1.8	144	131	0	253	7.9	5
Sept. 21-30	31,320	--	--	33	11	2.8	2.0	154	4.8	3.0	--	1.8	145	128	2	245	7.7	6
Average	30,680	--	--	32	13	3.3	--	156	7.2	3.2	--	2.8	153	134	6	256	--	9

a Includes equivalent of 2 parts per million of carbonate (CO₃).b Includes equivalent of 12 parts per million of carbonate (CO₃).

c Estimated from specific conductance.

LOWER MISSISSIPPI RIVER BASIN

WHITE RIVER BASIN--Continued

WHITE RIVER AT NEWPORT, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	60	45	45	40	49	54	67	71	70	69	73
2	68	60	46	43	40	50	54	66	71	69	70	72
3	68	61	47	44	41	49	56	67	69	69	70	71
4	69	61	50	44	43	50	56	65	67	70	71	72
5	70	62	51	44	43	48	55	64	68	71	70	72
6	70	61	53	44	44	48	55	64	68	71	69	71
7	--	61	55	44	45	47	55	64	70	71	69	70
8	68	60	56	44	46	46	54	64	71	72	69	68
9	67	56	52	45	47	45	55	65	71	73	69	68
10	65	54	49	46	48	47	55	65	72	73	69	69
11	64	54	48	44	49	48	56	66	71	73	69	68
12	64	54	47	43	51	49	55	67	72	72	70	69
13	64	55	45	44	51	50	53	67	74	73	69	69
14	65	56	46	41	51	53	53	67	73	73	68	70
15	67	58	47	40	50	53	53	66	--	72	71	70
16	66	55	48	38	47	53	53	66	72	72	73	70
17	66	53	48	36	46	54	54	67	--	72	72	69
18	66	53	48	36	47	52	55	66	73	72	71	69
19	65	51	48	37	45	52	56	66	72	72	71	69
20	66	52	49	38	45	51	57	66	72	73	72	68
21	65	52	49	40	45	51	59	67	72	72	72	69
22	64	50	55	45	46	49	60	68	71	70	72	68
23	64	49	50	46	47	49	60	67	70	69	70	66
24	65	48	49	46	46	50	64	66	69	68	70	67
25	65	48	47	--	49	50	65	66	70	68	69	67
26	64	46	46	43	50	49	64	67	70	69	69	67
27	62	44	46	41	50	49	65	67	70	69	70	68
28	60	45	46	38	50	50	64	68	69	69	72	67
29	60	44	45	39	--	50	63	68	70	69	72	68
30	61	44	45	40	--	52	66	69	70	69	72	67
31	63	--	46	41	--	54	--	70	--	68	73	--
Average	65	54	48	42	46	50	57	66	71	71	70	69

WHITE RIVER BASIN--Continued
LITTLE RED RIVER NEAR HEBER SPRINGS, ARK.

LOCATION --At gaging station, 2½ miles downstream from Peter Creek, and 3 miles northeast of Heber Springs, Cleburne County.
DRAINAGE AREA --1,141 square miles.

RECORDS AVAILABLE --Chemical analyses: November 1949 to September 1952, October 1954 to September 1957.

EXTREMES, 1949-52.--Dissolved solids: Maximum, 38 ppm Aug. 21-24, 1950; minimum, 21 ppm Mar. 17-20, 1951.
Water temperatures: November 1949 to September 1952.

Hardness: Maximum, 31 ppm Nov. 11-16, 1950; Aug. 21-31, 1952; minimum, 10 ppm Jan. 2-6, 1952.
Specific conductance: Maximum daily, 126 micromhos Jan. 21, 1951; minimum daily, 25.2 micromhos Jan. 3, 1952.

Water temperatures: Maximum, 92° F July 25-28, 1952; minimum, freezing point Feb. 2, 1951

REMARKS --Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mg./residue	Non-carbonate			
Nov. 13, 1956	0.2			4.6	1.5	2.9	1.0	26	2.4	2.0		1.2	28	18	0	53.1	7.3	2
Dec. 18	256			6.2	1.5	1.6	.9	22	3.4	2.5		1.1	40	22	4	55.9	7.2	4
Jan. 1, 1957	458			4.9	1.3	1.5	.6	18	2.8	3.0		1.0	36	16	3	48.1	7.2	3
Feb. 13	2,500			3.6	1.4	1.2	.7	16	2.8	1.8		1.1	32	15	2	38.4	7.2	3
Mar. 5	2,060			4.8	.9	1.4	.5	16	2.6	1.5		1.1	34	16	3	41.4	7.3	7
Apr. 18	1,760			6.4	1.6	1.5	.7	21	6.0	1.8		1.1	38	23	5	51.4	7.3	8
June 19	989			5.8	1.1	1.4	.7	22	1.6	1.8		.6	38	19	1	46.5	6.9	7
Aug. 6	102			6.2	1.2	1.8	1.2	26	1.0	2.2		.7	38	20	0	53.7	7.0	8
Sept. 25	238			6.4	1.4	1.8	1.0	27	1.0	2.5		1.2	41	22	0	54.9	6.8	6

WHITE RIVER BASIN--Continued

WHITE RIVER AT CLARENDON, ARK.

LOCATION --At gaging station on Cottonbelt Railroad bridge at Clarendon, Monroe County.

DRAINAGE AREA --25,497 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1947 to September 1957.

Water temperatures: October 1948 to September 1957.

EXTREMES, 1956-57 --Dissolved solids: Maximum, 282 ppm Oct. 14; minimum, 94 ppm Feb. 1-10, 11-20, May 28-31, June 1-11.

Hardness: Maximum, 184 ppm Oct. 14; minimum, 36 ppm Feb. 1-10.

Specific conductance: Maximum daily, 429 micromhos Oct. 14; minimum daily, 81.4 micromhos Feb. 6.

Water temperatures: Maximum, 88° F June 12; minimum, 34° F Jan. 30.

EXTREMES, 1947-57 --Dissolved solids: Maximum, 349 ppm Nov. 12, 1955; minimum, 38 ppm Feb. 1-9, 1950.

Hardness: Maximum, 202 ppm Apr. 25, 1956; minimum, 29 ppm Mar. 1-10, 1948.

Specific conductance: Maximum daily, 544 micromhos Nov. 12, 1955; minimum daily, 60.7 micromhos Feb. 3, 1950.

Water temperatures: Maximum, 90° F on several days during June and July 1954; minimum, 34° F Dec. 23, 1953, Dec. 20, 1955, Jan. 20, 1956, Jan. 30, 1957.

REMARKS --Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 furnished by District Office, Corps of Engineers, Memphis, Tenn.

Chemical analyses, in parts per million, water year October 1958 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, mg./l.	Non-carbonate, mg./l.			
Oct. 1-10, 1956	7,576	4.6	0.00	38	18	4.7	1.3	a186	11	5.5	0.0	7.2	184	169	16	317	7.8	5
Oct. 11-13, 15-20	6,799	--	--	40	17	4.1	--	a188	5.8	4.5	--	1.6	182	170	7	316	8.4	10
Oct. 14	6,500	--	--	--	--	--	--	b199	6.0	36	--	--	c282	184	21	439	8.3	--
Oct. 21-31	6,697	--	--	40	17	5.2	--	200	6.0	7.5	--	1.6	196	170	6	328	8.2	10
Nov. 1-10	7,249	--	--	36	16	3.8	--	184	8.4	4.5	--	1.5	180	158	5	306	7.5	7
Nov. 11-20	7,417	--	--	36	17	3.5	--	186	8.6	4.0	--	1.6	188	160	7	305	7.9	10
Nov. 21-30	7,562	--	--	36	16	3.9	--	b185	9.8	5.0	--	1.5	161	156	4	286	8.3	7
Dec. 1-10	7,924	--	--	37	16	5.0	--	183	9.8	7.5	--	1.3	171	158	8	312	7.8	7
Dec. 11-20	10,480	--	--	33	15	4.8	--	186	11	7.5	--	1.3	164	144	8	289	7.6	10
Dec. 21-24, 26-31	10,720	--	--	30	13	4.3	--	148	10	5.2	--	2.2	149	128	8	259	7.8	10
Dec. 25	11,200	--	--	--	--	--	--	180	9.0	20	--	1.6	c232	187	26	353	8.2	--
Jan. 1-10, 1957	9,405	5.7	.00	33	14	3.7	1.3	183	9.6	4.8	.1	1.0	136	140	6	272	7.8	10
Jan. 11-24	8,751	--	--	32	15	4.3	--	184	11	5.5	--	1.4	146	142	7	275	8.0	10
Jan. 25-31	32,030	--	--	13	5.3	2.5	--	61	4.8	3.0	--	2.2	100	54	4	126	7.2	23
Feb. 1-10	50,350	--	--	--	--	--	--	39	6.4	5.2	--	1.5	94	36	5	97.6	7.0	37
Feb. 11-20	43,710	--	--	10	4.7	2.8	--	30	6.0	2.8	--	1.7	94	44	3	105	7.4	37
Feb. 21-28	37,980	--	--	13	3.5	4.4	--	60	7.0	7.0	--	1.8	106	55	6	134	7.7	40
Mar. 1-10	32,820	--	--	15	5.8	4.6	2.5	66	11	3.5	--	2.2	108	61	7	130	7.2	30
Mar. 11-20	31,280	--	--	19	7.1	4.6	2.5	80	7.8	3.0	--	1.8	116	77	3	166	6.7	25
Mar. 21-29	25,080	--	--	23	9.0	4.4	2.0	109	4.4	5.5	--	1.9	118	94	5	199	6.9	20

Mar. 30, 1957	25,700	--	--	--	--	--	a131	5.0	11	--	2.6	c161	118	11	245	8.4	--
Mar. 31	26,600	--	--	--	--	--	a155	23	19	--	3.7	c180	135	8	274	8.4	--
Apr. 1-5	32,500	--	19	6.8	5.5	2.5	86	7.4	3.0	--	7.8	117	75	5	170	7.4	--
Apr. 6-20	83,230	2.0	15	4.6	3.0	2.2	62	6.4	2.5	.5	1.7	97	56	6	120	7.0	25
Apr. 21-26, 28-30	94,030	--	14	4.7	2.8	2.8	66	4.6	2.0	--	3.3	96	54	0	132	6.7	40
Apr. 27	96,300	--	--	--	--	--	44	4.0	20	--	4.1	c120	73	37	182	7.4	--
May 1-10	116,300	--	16	5.7	4.1	2.6	78	4.6	2.5	--	1.8	96	63	0	138	6.8	30
May 11-27	87,240	--	19	5.7	4.1	3.1	88	3.0	5.0	--	2.4	110	71	0	161	7.1	35
May 28-31, June 1-11	109,600	--	15	4.9	3.0	2.8	69	4.0	2.5	--	1.9	94	58	1	126	7.0	30
June 12-20	83,260	--	18	6.1	3.5	2.9	80	3.8	6.2	--	2.3	113	70	4	156	7.1	35
June 21-30	64,250	--	22	7.8	4.4	2.9	105	7.0	3.2	--	1.9	116	87	1	181	7.5	25
July 1-4, 6-10	53,430	--	25	8.5	3.3	1.8	116	4.6	3.0	--	3.1	121	97	2	183	7.9	8
July 5	54,600	--	--	--	--	--	42	7.0	58	--	2.4	c223	118	84	339	6.9	--
July 11-20	44,900	--	27	--	2.9	1.7	124	9.0	3.0	--	2.2	129	105	4	206	7.8	8
July 21-31	41,620	5.2	29	10	3.9	2.0	134	7.0	4.5	.1	2.4	141	113	4	233	7.7	10
Aug. 1-10	43,590	--	29	9.4	3.1	1.5	129	5.0	3.0	--	2.6	129	111	5	214	7.8	10
Aug. 11-18	45,600	--	27	9.6	3.0	1.7	123	4.0	3.5	--	2.3	124	107	6	204	7.7	8
Aug. 19-31	57,160	--	21	7.2	3.2	1.9	98	4.6	3.0	--	2.0	106	82	2	171	7.7	8
Sept. 1-10	39,380	--	24	7.8	3.5	1.8	108	5.0	3.0	--	3.0	121	92	3	187	7.6	10
Sept. 11-20	34,240	--	28	10	2.7	1.6	128	5.4	3.0	--	1.9	128	111	6	215	7.8	10
Sept. 21-30	32,810	--	31	11	2.9	1.5	138	6.4	4.0	--	1.9	132	123	10	234	7.7	8
Average	42,540	--	25	9.8	3.8	--	120	7.1	7.8	--	2.3	140	103	4	221	--	18

a Includes equivalent of 4 parts per million of carbonate (CO₃).b Includes equivalent of 2 parts per million of carbonate (CO₃).

c Estimated from specific conductance.

LOWER MISSISSIPPI RIVER BASIN

WHITE RIVER BASIN--Continued

WHITE RIVER AT CLARENDON, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	64	50	47	43	54	55	70	76	79	79	79
2	71	64	51	--	44	50	60	70	77	78	81	79
3	71	68	52	45	48	50	60	68	74	79	80	78
4	72	67	55	46	47	52	--	62	74	81	78	77
5	73	65	55	44	45	51	55	64	75	79	77	78
6	74	64	56	45	45	48	58	66	77	80	76	77
7	--	63	58	--	48	45	62	68	77	80	78	72
8	69	59	53	52	55	46	55	69	78	80	79	74
9	70	58	50	54	55	50	59	70	78	82	79	73
10	68	61	49	43	54	53	59	70	79	80	81	73
11	69	58	50	44	54	55	60	73	80	80	79	75
12	69	58	53	47	54	55	47	73	88	81	79	72
13	67	59	45	45	55	62	54	70	79	82	78	74
14	69	60	47	--	51	58	56	74	80	80	80	75
15	68	59	52	--	51	55	58	74	80	83	77	73
16	69	55	50	39	50	58	59	71	80	82	79	73
17	69	55	51	39	50	54	62	75	83	--	79	84
18	69	56	44	39	49	50	61	76	84	80	79	--
19	69	54	50	41	47	58	66	73	82	80	77	73
20	70	58	51	43	45	54	70	75	78	80	76	75
21	69	56	49	49	48	54	68	76	83	80	78	74
22	69	51	50	47	51	53	67	76	77	80	77	70
23	69	53	50	42	52	54	68	78	78	81	78	71
24	69	54	48	41	53	53	70	75	77	79	75	72
25	69	52	49	45	54	53	--	75	75	79	78	70
26	65	48	50	42	58	50	69	74	78	80	78	70
27	65	48	50	43	47	53	70	73	80	80	79	70
28	65	48	49	45	51	55	70	70	80	80	78	68
29	65	46	47	44	--	55	70	74	81	79	79	70
30	65	48	40	34	--	57	75	75	80	78	80	68
31	64	--	50	42	--	58	--	77	--	--	78	--
Average	69	57	50	44	50	53	62	72	79	80	78	74

WHITE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN WHITE RIVER BASIN IN ARKANSAS

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
BAYOU DE VIEW NEAR BRASFIELD																		
Dec. 5, 1956				8.7	3.8	10	3.6	34	18	10		2.2	73	37	10	149	6.5	40
Jan. 9, 1957				6.1	3.1	7.3	3.5	35	7.2	7.5		1.3	53	28	0	94.2	6.7	3
Feb. 7				2.4	1.4	3.1	2.5	18	4.8	2.0		1.1	26	12	0	45.6	7.4	2
Mar. 5				5.0	2.3	3.6	3.2	28	6.0	2.5		1.4	38	22	0	85.5	7.1	1
Apr. 2				6.2	2.9	4.0	2.6	31	5.0	5.0		2.0	43	27	2	75.2	7.7	4
June 18				9.2	3.9	5.5	3.5	59	1.6	3.5		3.2	59	30	0	101	6.8	45
July 17				9.0	4.1	5.8	3.2	81	3.2	2.0		2.4	60	30	0	96.8	7.0	--
Aug. 5				10	4.6	7.9	3.6	64	3.6	5.0		2.0	89	44	0	125	7.2	--
Sept. 10				11	4.0	7.0	3.6	63	2.2	4.2		2.0	65	44	0	117	6.8	70

ARKANSAS RIVER BASIN

ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.

LOCATION. --At gaging station 1 mile upstream from Caddoa Creek, 1½ miles downstream from John Martin Dam, Bent County, and 3 miles southeast of Hasty. DRAINAGE AREA. --18,917 square miles, of which 785 square miles is probably noncontributing.

RECORDS AVAILABLE. --Chemical analyses: August 1942 to August 1943, October 1945 to July 1949 (intermittent and weekly samples); January 1951 to September 1957 (daily samples).

Water temperatures: January 1951 to September 1957.

EXTREMES. 1956-57. --Dissolved solids: Maximum, 4,140 ppm Dec. 8-10; minimum, 617 ppm Aug. 1-31.

Hardness: Maximum, 1,900 ppm Dec. 8-10; minimum, 335 ppm Aug. 1-31.

Specific conductance: Maximum daily, 4,610 micromhos Dec. 9; minimum daily, 818 micromhos Aug. 17, 20.

Water temperatures: Maximum, 80°F on several days during August; minimum, freezing point Mar. 24, 20.

EXTREMES. 1951-57. --Dissolved solids: Maximum, 4,280 ppm Aug. 8, 1955; minimum, 609 ppm June 11, 1956.

Hardness: Maximum, 1,910 ppm Aug. 8, 1955; minimum, 335 ppm Aug. 1-31, 1957.

Specific conductance: Maximum daily, 5,180 micromhos Apr. 21, 1955; minimum daily, 818 micromhos Aug. 17, 20, 1957.

Water temperatures: Maximum, 85°F Aug. 6, 1951; minimum, freezing point on several days during winter months.

REMARKS. --Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1956	18.7	18	0.01	397	176	478	8.2	317	2,200	133	0.8	4.0	0.86	3,770	5.13	190	1,710	1,450	38	5.0	4,080	7.7
Nov. 1-19	26.4	--	--	387	170	442	--	328	--	--	--	--	--	3,480	4.71	247	1,610	1,350	37	4.8	3,800	7.8
Nov. 20-24	24.8	--	--	405	181	476	--	355	--	--	--	--	--	3,770	5.13	252	1,760	1,460	37	4.9	4,080	7.7
Nov. 25-30	26.5	--	--	341	162	420	--	283	--	--	--	--	--	3,290	4.47	235	1,520	1,280	38	4.7	3,840	7.8
Dec. 1-7	18.7	--	--	383	177	458	--	332	--	--	--	--	--	3,630	4.94	183	1,680	1,410	37	4.9	4,000	7.9
Dec. 8-10	1.33	--	--	439	196	537	--	355	--	--	--	--	--	4,140	5.63	14.9	1,900	1,610	38	5.4	4,450	7.7
Dec. 11-31	2.24	--	--	375	189	480	--	372	--	--	--	--	--	3,730	5.07	22.3	1,710	1,410	38	5.0	4,070	7.9
Jan. 1-31, 1957	1.67	18	.01	383	191	488	7.6	388	2,190	138	.8	2.6	.79	3,890	5.29	17.5	1,740	1,420	38	5.1	4,190	7.7
Feb. 1-28	1.88	--	--	377	185	488	--	380	--	--	--	--	--	3,850	5.24	19.5	1,700	1,390	38	5.1	4,130	7.8
Mar. 1-31	1.53	--	--	343	177	476	--	366	--	--	--	--	--	3,650	4.96	15.1	1,580	1,280	40	5.2	3,960	7.9
Apr. 1-12	1.92	--	--	341	174	473	--	347	--	--	--	--	--	3,610	4.91	18.7	1,570	1,280	40	5.2	3,940	7.8
Apr. 13-22	688	--	--	234	92	256	--	161	--	--	--	--	--	2,080	2.84	3,880	962	830	37	3.6	2,460	7.7
Apr. 23-May 9	402	17	.02	185	66	145	6.2	219	779	41	.8	9.7	.21	1,440	1.98	1,560	733	554	30	2.3	1,770	7.7
May 10-16	564	--	--	146	43	97	--	209	--	--	--	--	--	991	1.35	1,510	542	370	28	1.8	1,300	7.8
May 17-26	2.77	--	--	298	137	400	--	282	--	--	--	--	--	3,080	4.19	23.0	1,310	1,080	40	4.8	3,460	7.9
May 27-June 2	134	--	--	158	47	101	--	156	--	--	--	--	--	1,120	1.52	405	588	460	27	1.8	1,390	7.8
June 3-13	3.95	--	--	316	144	400	--	347	--	--	--	--	--	3,210	4.37	34.2	1,380	1,100	39	4.7	3,540	8.0
June 14-30	324	--	--	141	39	98	--	135	--	--	--	--	--	997	1.36	872	512	402	29	1.9	1,290	7.8
July 1-31	937	15	--	119	26	91	--	127	433	18	.7	1.6	.11	607	1.10	2,040	404	280	33	2.0	1,070	7.5
Aug. 1-31	1,117	--	--	93	25	85	--	157	--	--	--	--	--	617	.84	1,860	335	231	36	2.0	852	7.7
Sept. 1-30	430	--	--	107	29	72	--	151	--	--	--	--	--	732	1.00	850	386	262	29	1.6	997	8.1
Weighted average	281	--	--	128	37	108	--	153	--	--	--	--	--	931	1.27	706	472	346	33	2.2	1,200	--

ARKANSAS RIVER BASIN

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 /Once-daily measurement at 8 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	48	39	39	35	45	48	58	58	75	78	77
2	60	59	37	37	36	45	45	49	58	76	78	75
3	60	38	35	36	37	45	41	59	65	73	75	75
4	60	38	36	39	36	45	46	49	68	71	75	75
5	60	38	39	39	36	45	46	52	68	75	76	70
6	59	41	33	37	35	40	43	54	68	72	80	71
7	58	48	34	35	37	36	43	60	70	73	80	70
8	62	41	37	37	40	41	37	59	66	76	80	70
9	56	41	36	34	41	44	50	59	67	76	80	68
10	55	43	37	33	43	46	54	59	68	76	76	68
11	58	44	43	34	41	49	47	52	68	76	76	70
12	60	44	40	38	42	45	38	54	68	76	80	68
13	56	45	35	37	43	49	41	50	70	74	77	67
14	57	44	35	34	50	42	44	50	68	73	80	65
15	57	37	36	35	45	43	50	56	64	76	80	65
16	55	35	36	34	42	45	54	50	66	--	75	65
17	57	36	40	34	44	43	53	55	70	77	76	66
18	55	39	36	35	42	47	58	54	70	77	76	66
19	55	39	--	35	44	48	58	59	70	77	75	65
20	55	34	37	36	45	48	54	60	70	--	75	62
21	52	33	37	37	45	46	56	58	70	74	78	63
22	53	39	38	37	35	50	50	58	70	77	78	62
23	52	35	36	33	35	37	54	58	68	75	75	63
24	57	37	36	33	43	32	52	58	70	77	75	64
25	49	40	37	33	46	37	55	52	73	76	75	64
26	48	39	36	36	46	42	54	51	74	76	75	63
27	49	37	37	37	45	48	51	65	74	72	78	62
28	50	37	40	37	45	51	48	58	70	76	75	61
29	56	37	40	35	--	48	52	65	71	78	75	61
30	50	38	39	33	--	46	53	59	71	77	77	64
31	48	--	39	37	--	45	--	61	--	79	73	--
Average	55	39	37	36	41	44	49	56	68	75	77	67

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT ARKANSAS CITY, KANS.

LOCATION.--At gaging station at bridge on U. S. Highway 166, 0.1 mile downstream from St. Louis and San Francisco Railroad bridge, 0.5 mile west of Arkansas City, Cowley County, and 5.4 miles upstream from Walnut River.

DRAINAGE AREA.--43,713 square miles, of which 7,607 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1957.

Water temperatures: October 1951 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 3,380 ppm Jan. 16; minimum, 192 ppm May 15-20.

Hardness: Maximum, 760 ppm Jan. 16; minimum, 96 ppm May 15-20.

Specific conductance: Maximum, 5,770 micromhos Jan. 16; minimum, 275 micromhos May 19.

Water temperatures: Maximum, 85°F July 31, Aug. 1, 15; minimum, freezing point on many days during November to March.

EXTREMES, 1951-57.--Dissolved solids: Maximum, 3,380 ppm Jan. 16, 1957; minimum, 172 ppm Oct. 1-6, 1955.

Hardness: Maximum, 760 ppm Jan. 16, 1957; minimum, 84 ppm Oct. 1-6, 1955.

Specific conductance: Maximum, 5,770 micromhos Jan. 16, 1957; minimum, 259 micromhos Oct. 4, 1955.

Water temperatures: Maximum, 85°F July 31, Aug. 1, 15, 1957; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)				Hardness as CaCO ₃		Percent adsorption	Bo- dium ratio	Specific conductance (micro-mhos at 25° C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1956	28.1	26	0.01	152	42	706	9.5	304	0	220	1,170	0.7	--	0.48	2,550	3.47	193	550	301	73	13	4,370	8.7
Oct. 11-13	36.7	--	--	156	46	700	--	316	0	213	1,150	--	--	--	2,460	3.35	244	580	321	72	13	4,330	7.7
Oct. 14, 16-20	98.3	--	--	88	26	326	--	222	0	127	500	--	18	--	1,210	1.65	321	325	143	89	7.9	2,180	7.3
Oct. 15	89.0	--	--	118	39	450	--	262	0	94	780	--	19	--	1,780	2.42	428	450	238	88	9.2	3,100	7.8
Oct. 21-26	90.8	--	--	101	26	404	--	244	0	141	620	--	22	--	1,500	2.04	368	360	160	71	9.3	2,630	8.0
Oct. 27-31	79.2	--	--	110	28	471	--	256	0	148	730	--	26	--	1,700	2.31	384	390	180	72	10	2,970	7.8
Nov. 1-7	149	--	--	82	26	312	--	212	0	120	480	--	16	--	1,180	1.60	475	310	136	89	7.7	2,110	8.1
Nov. 8-10	135	--	--	98	26	391	--	228	0	138	605	--	22	--	1,430	1.94	521	350	163	71	9.1	2,550	8.1
Nov. 11-20	121	13	.01	104	24	412	9.8	246	0	143	640	.6	2.6	.12	1,500	2.04	490	380	158	71	9.4	2,680	7.5
Nov. 21-30	120	--	--	108	24	397	--	260	0	135	610	--	24	--	1,470	2.00	476	370	137	70	9.0	2,610	8.2
Dec. 1-10	121	--	--	110	23	437	--	250	0	143	670	--	26	--	1,570	2.14	513	370	165	72	9.9	2,800	7.7
Dec. 11-19	137	--	--	108	23	408	--	246	0	145	625	--	24	--	1,520	2.07	562	365	164	71	9.3	2,690	8.2
Dec. 20	178	--	--	118	26	311	--	244	14	171	465	--	23	--	1,260	1.71	806	400	176	63	6.8	2,190	8.5
Dec. 21-31	174	--	--	100	22	392	--	234	0	143	590	--	24	--	1,450	1.97	681	340	148	71	9.2	2,560	7.9
Jan. 1-10, 1957	158	--	--	103	21	388	--	248	0	142	580	--	23	--	1,450	1.97	619	345	142	71	9.1	2,560	7.7
Jan. 11-15, 17-20	119	--	--	133	30	516	--	294	0	179	800	--	26	--	1,910	2.60	814	455	214	71	11	3,300	7.5
Jan. 16	86.0	--	--	216	54	948	--	390	42	303	1,500	--	--	--	3,380	4.60	765	760	370	73	15	5,770	8.7
Jan. 21-23	133	--	--	102	22	355	--	242	0	132	535	--	32	--	1,390	1.89	499	345	146	62	6.0	2,440	7.5
Jan. 24-27	88.8	--	--	136	29	570	--	266	0	193	880	--	29	--	2,070	2.82	498	460	286	73	12	3,580	7.6
Jan. 28-31	110	--	--	116	28	452	--	278	0	158	700	--	10	--	1,690	2.30	503	405	177	71	9.8	2,970	8.1

Feb. 1-4, 1957	190	--	112	26	388	250	0	141	610	--	19	--	1,520	2.07	780	385	180	89	8.6	2,500	8.2
Feb. 5-8	221	--	90	18	308	208	0	114	470	--	25	--	1,190	1.62	716	300	130	89	7.8	2,060	8.2
Feb. 9-12	293	--	80	16	269	198	0	101	405	--	14	--	1,030	1.40	809	265	102	89	7.2	1,820	8.4
Feb. 13-20	238	--	117	9.2	337	220	6	131	510	--	22	--	1,290	1.75	829	330	140	89	8.1	2,270	8.4
Feb. 21-28	218	20	.04	108	347	242	0	151	540	.13	18	--	1,360	1.85	800	345	146	89	8.1	2,360	8.1
Mar. 1-10	282	--	102	21	334	220	6	143	505	--	17	--	1,370	1.86	1,040	340	150	68	7.9	2,310	8.4
Mar. 11-14	267	--	108	18	346	230	6	153	515	--	16	--	1,400	1.90	1,010	345	146	69	8.1	2,360	8.4
Mar. 15-20	224	--	110	24	411	248	0	170	620	--	19	--	1,570	2.14	950	375	172	70	9.2	2,660	7.4
Mar. 21-27	371	--	94	23	366	200	6	160	550	--	12	--	1,420	1.93	1,420	330	156	71	8.8	2,440	8.4
Mar. 28-31	1,202	--	86	12	239	180	2	118	380	--	4.8	--	987	1.34	3,200	285	114	66	6.4	1,720	8.3
Apr. 1-2	1,034	--	82	20	310	174	0	131	480	--	4.3	--	1,180	1.60	3,290	285	142	70	8.0	2,120	8.2
Apr. 3	4,580	--	41	7.7	111	96	0	50	189	--	7.5	--	1,440	1.60	5,440	134	56	64	4.2	820	7.9
Apr. 4-10	2,379	--	58	13	149	150	0	78	223	--	3.5	--	639	.87	4,100	200	77	62	4.6	1,150	8.2
Apr. 11-12	1,260	--	74	16	189	172	0	118	278	--	9.1	--	819	1.11	2,790	250	109	62	5.2	1,420	8.2
Apr. 13-20	905	--	98	31	291	212	0	222	420	--	8.7	--	1,260	1.71	3,080	370	186	63	6.6	2,110	8.2
Apr. 21-22	2,355	--	69	19	210	154	0	149	300	--	3.5	--	898	1.22	5,710	250	124	65	5.8	1,560	8.1
Apr. 23-28	4,148	--	52	17	82	142	0	78	128	--	2.3	--	456	.82	5,110	200	84	47	2.5	801	8.0
Apr. 29-30	1,775	--	72	15	145	164	0	102	220	--	5.5	--	697	.95	3,340	240	106	57	4.1	1,200	8.0
May 1-10	1,528	18	82	17	228	192	0	139	320	.4	6.9	15	935	1.27	3,860	275	116	64	5.9	1,600	7.8
May 11-12	1,990	--	86	22	283	180	10	158	415	--	6.4	--	1,110	1.51	5,060	305	140	67	7.0	1,970	8.5
May 13-14	9,480	--	62	11	138	148	8	83	195	--	3.5	--	590	.80	15,100	200	65	60	4.2	1,070	8.5
May 15-20	33,450	--	31	4.5	31	104	2	19	38	--	2.0	--	192	.26	17,340	98	8	41	1.4	347	8.3
May 21-23	13,840	--	43	6.9	60	146	0	36	76	--	3.0	--	297	.40	11,100	138	16	49	2.2	521	8.1
May 24-27	6,385	--	61	14	107	156	0	82	158	--	7.6	--	597	.69	8,740	210	82	53	3.2	934	8.1
May 28-30	4,190	--	76	16	149	168	0	109	230	--	5.7	--	878	.92	7,670	255	118	56	4.1	1,230	8.2
May 31	4,940	--	54	12	86	136	0	75	125	--	4.4	--	426	.56	5,680	182	70	51	2.8	764	8.1
June 1-2	4,590	--	80	22	157	176	6	141	232	--	4.5	--	757	1.03	9,390	290	136	54	4.0	1,290	8.3
June 3-7	8,440	--	48	8.8	73	128	0	56	105	--	4.8	--	378	.52	8,640	156	51	51	2.6	665	8.0
June 8-10	3,410	--	68	15	135	170	0	99	200	--	4.6	--	636	.86	5,880	230	92	56	3.9	1,110	8.2
June 11	3,900	--	87	19	128	156	0	121	188	--	5.0	--	681	.88	6,790	245	116	53	3.6	1,100	8.2
June 12-14	12,970	--	36	9.0	44	112	0	44	62	--	3.9	--	280	.38	9,810	132	40	42	1.7	478	8.0
June 15	7,360	--	31	13	71	146	0	70	100	--	3.9	--	361	.52	7,570	182	62	46	2.3	682	8.2

a. Values above 200 ppm reported to the nearest 5 ppm

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT ARKANSAS CITY, KANS.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃) (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Per-cent ad-sorp-tion	So-dium ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg/l	Non-carbonate, mg/l				
June 16, 1957.....	3,860	--	--	69	18	133		170	0	113	195	--	6.9	632	0.86	6,590	230	108	54	3.7	1,120	8.2
June 17-19.....	3,917	--	--	84	22	91		188	0	157	125	--	5.9	821	1.12	8,680	300	146	43	2.3	1,380	8.2
June 20.....	7,660	--	--	48	12	136		136	0	87	84	--	4.4	343	4.7	7,090	188	56	40	2.0	806	8.1
June 21-23.....	6,020	--	--	58	12	150		150	0	89	124	--	5.0	494	6.7	8,030	194	71	51	2.9	821	8.1
June 24-27.....	13,680	--	--	45	8.6	57		136	0	53	72	--	4.3	334	4.5	12,340	148	36	45	2.0	553	8.1
June 28, 30.....	32,900	--	--	30	5.7	104		104	0	23	47	--	4.4	199	2.7	17,680	106	21	41	1.4	338	8.1
June 29.....	40,700	--	--	70	17	171		156	0	75	290	--	4.5	745	1.01	31,870	245	118	60	4.8	1,330	8.2
July 1-4.....	24,780	--	--	42	4.6	41		130	0	29	53	--	3.7	253	.34	16,930	124	18	42	1.6	428	7.7
July 5-7.....	12,540	--	--	56	7.9	69		160	0	63	86	--	3.9	387	.53	13,100	172	41	46	2.3	651	7.5
July 8-10.....	5,613	--	--	82	14	125		202	0	120	170	--	4.9	629	.86	9,530	260	96	51	3.4	1,090	7.8
July 11-13.....	3,627	--	--	96	20	179		214	0	168	252	--	4.5	851	1.16	8,330	320	144	55	4.4	1,450	7.8
July 14-17.....	2,615	--	--	114	21	233		234	0	200	325	--	4.0	1,050	1.43	7,410	370	178	58	5.3	1,790	7.6
July 18-19.....	2,020	--	--	116	23	256		240	0	211	370	--	4.9	1,140	1.55	6,220	385	188	59	5.7	1,930	7.9
July 20-31.....	2,464	22	0.03	99	25	221	--	212	0	165	325	0.6	6.4	975	1.33	6,490	325	150	60	5.3	1,680	8.2
Aug. 1-6.....	1,945	--	--	82	18	175		204	0	116	260	--	7.8	813	1.11	4,270	280	113	58	4.6	1,400	7.7
Aug. 7-10.....	1,242	--	--	110	29	271		242	0	195	410	--	7.0	1,190	1.62	3,980	395	198	60	5.9	2,030	7.8
Aug. 11-17.....	1,014	--	--	112	31	323		240	0	213	485	--	7.3	1,350	1.84	3,700	405	208	63	7.0	2,310	7.7
Aug. 18.....	1,750	--	--	83	26	240		226	0	186	355	--	7.0	997	1.36	4,710	340	156	61	5.7	1,780	7.9
Aug. 19.....	1,770	--	--	81	16	155		146	0	105	225	--	7.6	668	.91	3,180	215	98	61	4.6	1,180	7.6
Aug. 20.....	1,120	--	--	104	27	278		204	0	131	410	--	9.0	1,140	1.55	3,450	340	173	64	6.5	1,980	7.6
Aug. 21-31.....	851	--	--	104	32	359		218	0	211	545	--	4.8	1,430	1.94	3,260	390	212	67	7.9	2,460	7.8
Sept. 1-6.....	675	--	--	110	29	375		224	0	216	565	--	6.2	1,480	2.01	2,700	395	212	67	8.2	2,550	7.9
Sept. 7-10.....	750	--	--	102	27	327		212	0	194	490	--	4.6	1,300	1.77	2,630	380	188	66	7.5	2,280	7.7
Sept. 11-12.....	729	--	--	102	27	330		218	0	192	495	--	7.1	1,320	1.80	2,600	385	188	66	7.5	2,280	7.9
Sept. 13-14.....	988	--	--	85	21	258		194	0	149	380	--	7.1	1,030	1.40	2,750	300	141	65	6.4	1,820	7.9
Sept. 15-17.....	2,213	--	--	89	13	108		174	0	72	152	--	5.9	511	.69	3,080	200	60	54	3.3	910	7.7
Sept. 18-20.....	5,833	--	--	48	6.8	154		154	0	34	70	--	4.2	307	.42	4,830	148	22	44	1.9	542	7.7
Sept. 21-25.....	6,208	--	--	48	7.3	69		166	0	80	77	--	5.9	339	.46	5,690	150	14	50	2.5	573	7.7
Sept. 26-30.....	1,950	--	--	75	16	147		190	0	117	203	--	7.1	877	.92	3,580	250	98	58	4.0	1,200	7.8
Weighted Average	2,900	--	--	55	11	101		b148	--	86	145	--	4.6	433	0.66	3,780	182	80	55	3.2	840	--

a Values above 200 ppm reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT ARKANSAS CITY, KANS.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	53	35	38	32	44	55	65	71	78	85	76
2	62	55	37	34	33	46	55	66	67	81	84	78
3	60	46	38	36	35	42	50	66	68	83	83	74
4	64	47	--	42	33	44	43	57	68	82	83	78
5	63	47	--	38	35	43	46	58	72	79	76	76
6	64	46	--	40	35	42	46	60	75	78	77	75
7	55	49	33	35	41	32	50	62	76	78	77	69
8	56	39	32	40	45	34	43	62	77	78	79	74
9	56	37	32	41	52	44	47	65	75	80	79	69
10	55	42	32	32	47	45	48	65	--	82	80	78
11	58	46	33	32	43	53	53	61	75	81	81	78
12	60	48	33	32	--	50	38	63	73	79	84	69
13	65	46	32	32	43	48	40	67	72	80	85	75
14	62	56	32	32	45	48	45	66	74	80	83	68
15	61	45	33	32	50	41	50	68	76	81	85	68
16	--	35	33	32	42	43	52	67	75	82	84	66
17	64	36	35	32	42	49	56	62	75	82	75	68
18	62	39	32	32	47	46	59	62	72	81	73	70
19	65	42	33	32	42	44	63	63	70	83	76	71
20	63	45	45	34	39	46	65	65	72	82	80	69
21	56	33	37	39	40	46	64	66	75	81	76	69
22	55	34	34	36	35	45	67	68	73	79	81	62
23	56	37	34	32	34	44	62	64	70	81	76	64
24	60	38	33	32	36	44	63	65	70	80	77	66
25	58	40	34	--	45	42	64	66	70	80	76	67
26	50	33	35	32	37	38	--	68	72	79	77	68
27	51	33	36	32	42	43	60	70	71	81	76	70
28	51	36	40	32	42	46	64	72	72	81	73	65
29	58	32	38	32	--	49	63	71	73	83	75	65
30	61	33	38	32	--	52	63	72	76	83	78	65
31	51	--	37	32	--	55	--	72	--	85	80	--
Average	59	42	35	34	40	45	54	65	73	81	79	70

ARKANSAS RIVER BASIN--Continued

SALT FORK ARKANSAS RIVER NEAR JET, OKLA.

LOCATION.--At gaging station at county highway bridge, 0.6 mile downstream from Great Salt Plains Dam, 4 miles upstream from Wagon Creek, and 6 miles northeast of Jet, Alfalfa County.

DRAINAGE AREA.--3,202 square miles of which 8 square miles is probably noncontributing.

RECORDS AVAILABLE.--October 1952 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Oct. 1, 1956.....	3.51	340	103	--	136		9,400	1,270	1,160	--	--	28,300	7.9
Oct. 17.....	3.01	356	122	--	184		9,410	1,390	1,240	--	--	27,400	7.9
Nov. 1.....	3.79	352	100	--	160		9,410	1,290	1,160	--	--	27,500	7.8
Nov. 15.....	3.56	418	116	--	166		12,400	1,520	1,380	--	--	34,500	8.1
Dec. 3.....	3.57	356	134	--	182		10,800	1,440	1,290	--	--	31,000	8.0
Dec. 18.....	3.87	418	121	--	187		12,200	1,540	1,390	--	--	34,100	7.9
Jan. 8, 1957.....	4.05	399	113	--	192		11,500	1,460	1,300	--	--	31,800	8.1
Jan. 29.....	4.05	144	44	1,180	104		1,950	540	455	83	22	6,550	8.1
Feb. 12.....	3.95	480	149	8,930	208		13,300	1,810	1,640	91	91	36,000	8.2
Feb. 27.....	4.25	356	98	--	168		10,100	1,290	1,150	--	--	29,000	7.7
Mar. 18.....	3.89	410	131	8,150	171		12,000	1,560	1,420	92	90	34,700	7.8
Apr. 8.....	4.45	332	132	6,930	83		10,400	1,370	1,300	92	81	30,200	8.0
Apr. 22.....	1,470	274	84	5,050	147		7,580	1,030	910	91	68	22,800	7.8
Apr. 29.....	1,450	183	58	2,720	118		4,080	697	600	89	45	13,300	7.9
May 6.....	1,200	195	51	2,530	135		3,880	697	586	89	42	12,600	8.0
May 13.....	2,240	191	51	2,060	138		3,140	688	575	87	34	10,400	8.0
May 16.....	4,780	184	37	1,340	122		2,050	610	510	83	24	7,290	8.0
May 20.....	8,840	88	20	241	92		445	300	224	64	6.1	1,740	7.8
May 31.....	3,920	128	15	416	108		630	380	292	70	9.3	2,760	7.9
June 19.....	2,760	152	32	456	132		510	350	402	66	8.8	3,090	8.0
July 3.....	8,540	116	15	100	118		150	350	254	38	2.3	1,170	7.9
July 16.....	1,470	134	28	325	128		460	450	345	61	6.7	2,420	7.5
July 29.....	315	180	39	588	140		860	560	446	70	11	3,870	8.0
Aug. 14.....	31.2	184	46	990	158		1,400	650	520	77	17	5,750	8.0
Sept. 24.....	770	144	32	708	96		1,000	490	412	76	14	4,270	7.7

ARKANSAS RIVER BASIN--Continued
CHICKASKIA RIVER NEAR BLACKWELL, OKLA.

LOCATION.--At gaging station on St. Louis-San Francisco Railway Co. bridge at northeast edge of city of Blackwell, Kay County, 0.2 mile downstream from Bitter Creek.

DRAINAGE AREA.--1,859 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1952 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
								Total	Non- carbonate				
Oct. 2, 1956	0.86	1,480	330	--	111	0	9,410	5,050	4,960	--	--	25,100	7.8
Oct. 15	.54	1,416	93	--	82	0	2,100	1,420	1,350	--	--	6,880	7.5
Nov. 2	.65	1,150	268	--	115	0	6,700	3,970	3,880	--	--	18,900	7.8
Nov. 14	.89	718	194	--	134	0	5,360	2,590	2,480	--	--	12,400	7.8
Nov. 27	.57	994	243	--	111	0	5,090	3,480	3,390	--	--	17,900	7.9
Dec. 11	1.23	1,090	270	--	151	0	6,890	3,850	3,710	--	--	19,300	7.8
Jan. 3, 1957	2.35	560	132	--	221	0	2,950	1,940	1,760	--	--	9,880	7.8
Jan. 15	6.41	468	125	--	96	0	2,700	1,730	1,650	--	--	8,550	7.8
Feb. 5		700	156	--	163	0	2,380	2,380	2,240	--	--	8,070	7.8
Feb. 18	17.1	134	53	269	263	0	555	600	384	49	4.8	2,350	8.0
Mar. 6	26.8	62	27	110	108	0	240	284	176	48	2.9	1,170	8.2
Mar. 18	13.6	64	43	215	88	0	445	336	264	58	5.1	1,830	7.8
Apr. 11	67.4	63	23	67	142	0	153	252	136	37	1.8	830	8.2
May 1	357	74	20	40	190	8	74	288	99	25	1.1	681	8.4
May 6	218	79	23	64	136	8	121	282	118	32	1.6	861	8.4
June 7	379	58	30	81	136	0	150	288	156	40	2.1	1,100	8.2
July 11	359	82	36	100	168	0	214	352	214	38	2.3	1,310	8.3
July 25	232	98	25	83	180	0	225	348	200	34	1.9	1,170	7.7
Aug. 9	78.0	148	57	251	106	0	620	605	518	47	4.4	2,020	7.9
Aug. 19	207	50	21	77	72	0	177	620	153	44	2.3	799	7.7
Sept. 10	48.5	164	51	263	114	0	625	620	526	48	4.6	2,500	7.8

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT RALSTON, OKLA.

LOCATION.--At gaging station at bridge on State Highway 18 at Ralston, Pawnee County, 2 miles downstream from Salt Creek, and 2 miles upstream from Grayhorne Creek.

DRAINAGE AREA.--54,465 square miles, of which 7,615 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: January 1950 to September 1957.

Water temperatures: January 1950 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 3,260 ppm May 1-2; minimum 218 ppm June 23-26.

Hardness: Maximum, 455 ppm Feb. 1-10; minimum, 96 ppm June 23-26.

Specific conductance: Maximum daily, 5,650 microhmhos May 1; minimum daily, 286 microhmhos June 25.

Water temperatures: Maximum, 92°F Aug. 1-2; minimum, 33°F on several days during December and January.

EXTREMES 1950-57.--Dissolved solids: Maximum, 3,390 ppm Sept. 11-16, 1955; minimum, 166 ppm Oct. 3-6, 1955.

Hardness: Maximum, 562 ppm Jan. 5, 1951; minimum, 76 ppm Oct. 3-6, 1955.

Specific conductance: Maximum daily, 7,510 microhmhos Sept. 14, 1955; minimum daily, 251 microhmhos Oct. 5, 1955.

Water temperatures: Maximum, 98°F July 28, 1956; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-ladscorp-tion ratio	Specific conductance (microhmhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-magne-sium a			
Oct. 1-10, 1956.....	17.2	13	0.01	108	34	518	5.9	190	0	179	860	0.4	2.8	0.22	1,860	2.53	86	410	254	73	11	3,300
Oct. 11-18.....	22.8	--	--	112	38	518	--	192	0	182	860	--	2.0	--	1,860	2.53	115	435	278	72	11	3,300
Oct. 19.....	57.0	--	--	82	38	329	--	180	0	119	540	--	3.3	--	1,250	1.70	192	320	172	69	8.0	2,220
Oct. 20.....	51.0	--	--	84	35	414	--	184	0	146	690	--	3.6	--	1,550	2.11	213	380	229	70	9.2	2,720
Oct. 21-29.....	54.4	--	--	107	34	517	--	188	0	181	840	--	2.0	--	1,880	2.56	276	405	251	74	11	3,220
Oct. 30-31.....	96.0	--	--	98	30	435	--	196	0	160	700	--	2.4	--	1,550	2.11	402	370	210	72	9.8	2,740
Nov. 1-4.....	82.8	--	--	108	34	474	--	216	0	170	770	--	1.7	--	1,740	2.37	389	410	233	72	10	3,080
Nov. 5-10.....	159	--	--	104	32	420	--	210	0	182	680	--	5.5	--	1,570	2.14	674	390	218	70	9.3	2,730
Nov. 11-20.....	140	5.8	0.1	120	29	469	6.4	228	0	170	780	4	3.9	17	1,730	2.35	654	420	233	70	10	3,040
Nov. 21-30.....	100	--	--	112	33	481	--	244	0	171	765	--	4.3	--	1,750	2.38	472	415	215	72	10	3,080
Dec. 1-10.....	107	--	--	116	32	462	--	238	6	163	740	--	6.6	--	1,700	2.31	491	420	215	70	9.8	2,970
Dec. 11-20.....	136	--	--	120	32	472	--	246	0	167	760	--	12	--	1,740	2.37	689	480	228	70	9.9	3,040
Dec. 21-31.....	191	--	--	120	34	620	--	232	0	197	990	--	7.8	--	2,140	2.91	1,100	440	250	75	13	3,790
Jan. 1-10, 1957.....	182	12	0.1	164	24	478	--	198	0	169	780	6	7.3	--	1,760	2.39	912	360	198	74	11	3,090
Jan. 11-20.....	152	--	--	120	32	492	--	224	0	172	800	--	11	--	1,830	2.49	751	430	246	71	10	3,160
Jan. 21-31.....	127	--	--	122	34	553	--	226	0	179	900	--	8.2	--	1,980	2.69	679	445	260	73	11	3,390
Feb. 1-10.....	201	--	--	144	23	453	--	236	0	157	760	--	14	--	1,800	2.45	977	455	282	68	9.2	3,110
Feb. 11-20.....	248	--	--	140	15	404	--	232	8	147	655	--	11	--	1,610	2.19	1,060	410	268	68	8.7	2,670
Feb. 21-28.....	266	--	--	144	17	419	--	232	6	160	685	--	9.6	--	1,670	2.27	1,150	400	230	68	8.3	2,870
Mar. 1-10.....	305	--	--	116	27	448	--	240	0	163	710	--	9.0	--	1,670	2.27	1,360	400	204	71	9.7	2,900

Mar. 11-20, 1957...	315	--	116	29	495	234	0	182	780	--	5.9	--	1,810	2.46	1,540	410	218	72	11	3,120	8.0
Mar. 21-27	384	--	102	26	436	200	6	163	680	--	7.6	--	1,620	2.20	1,680	360	186	72	10	2,760	8.4
Mar. 28-30	489	--	104	34	530	188	6	182	840	--	7.8	--	1,440	2.56	2,560	400	228	74	12	3,320	8.4
Mar. 31	721	--	88	18	382	164	10	138	585	--	8.0	--	1,440	1.96	2,800	295	144	74	9	2,470	8.7
Apr. 1-4	1,730	--	78	20	250	172	0	117	390	--	6.9	--	1,030	1.40	4,810	275	134	66	6.6	1,800	8.1
Apr. 5-7	9,030	--	41	10	93	112	0	44	146	--	2.3	--	422	.57	10,290	144	52	58	3.4	758	7.9
Apr. 8	3,810	--	90	24	469	128	0	120	475	--	11	--	1,170	1.59	12,040	325	220	64	6.5	2,000	8.2
Apr. 9-10	3,200	--	69	17	186	136	0	89	308	--	8.3	--	814	1.11	7,030	240	128	63	5.2	1,430	8.1
Apr. 11-15	2,480	--	64	18	164	154	0	89	260	--	7.6	--	728	.99	4,890	235	109	60	4.7	1,290	8.0
Apr. 16-17	1,595	--	85	24	233	180	0	149	360	--	7.0	--	1,020	1.39	4,390	310	162	62	5.7	1,760	8.2
Apr. 18-20	3,730	--	37	8.1	85	98	0	43	130	--	2.5	--	378	.51	3,810	126	46	59	3.3	691	7.8
Apr. 21-23	13,540	--	29	8.6	49	98	0	24	76	--	2.3	--	249	.34	9,100	108	28	50	2.0	450	8.0
Apr. 24-25	27,850	--	40	9.7	213	92	0	44	340	--	2.8	--	757	1.03	56,920	140	64	77	7.8	1,410	7.8
Apr. 26	24,900	--	46	11	324	90	0	67	510	--	3.0	--	1,140	1.55	76,640	160	86	82	11	2,150	8.0
Apr. 27-28	11,640	--	68	20	556	110	0	120	860	--	3.9	--	1,770	2.41	55,530	250	160	83	15	3,200	8.0
Apr. 29-30	7,360	--	96	22	860	128	0	185	1,390	--	4.0	--	2,770	3.77	55,050	330	225	85	21	4,880	8.2
May 1-2	5,980	--	101	25	1,070	140	0	209	1,670	--	4.0	--	2,260	4.43	52,640	355	240	87	25	5,620	8.2
May 3-7	7,304	--	66	17	486	128	0	112	770	--	6.2	--	1,590	2.16	31,360	235	129	82	14	2,860	8.1
May 8-10	4,333	--	102	26	857	182	2	202	1,330	--	6.0	--	2,720	3.70	31,920	360	224	84	20	2,720	8.3
May 11	5,860	--	86	21	583	154	4	139	910	--	9.7	--	1,920	2.61	30,380	300	168	81	15	3,340	8.4
May 12-15	7,955	--	82	21	436	152	2	140	680	--	5.9	--	1,560	2.12	30,560	290	162	77	11	2,770	8.3
May 16	46,500	--	40	8.8	163	166	0	45	245	--	4.0	--	568	.80	73,220	128	41	75	6.3	1,080	8.2
May 17-20	87,850	--	32	8.8	89	98	0	36	133	--	1.6	--	369	.50	86,830	104	32	63	3.8	681	7.8
May 21	91,900	--	46	8.8	138	116	0	54	215	--	3.7	--	535	.73	132,100	136	61	66	4.8	1,090	8.0
May 22	40,300	--	56	16	229	122	0	101	350	--	3.5	--	530	1.13	90,310	205	104	71	7.0	1,580	8.2
May 23	48,000	--	67	6.6	152	128	0	95	225	--	4.4	--	613	.83	79,440	194	89	63	4.7	1,110	8.1
May 24-25	44,200	--	50	8.5	103	98	0	78	155	--	3.9	--	452	.61	53,940	160	80	58	3.5	836	8.0
May 26-28	43,920	--	38	8.0	78	96	0	52	119	--	3.0	--	341	.46	40,450	128	56	57	3.0	684	7.9
May 29-31	17,700	--	67	13	155	126	0	111	238	--	4.2	--	663	.90	31,580	220	116	61	4.6	1,200	8.1
June 1-2	30,900	--	62	13	114	124	0	90	182	--	4.8	--	588	.80	49,060	210	106	54	3.4	986	8.2

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
ARKANSAS RIVER AT RALSTON, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids, (residue at 180° C.)			Hardness as CaCO ₃	Per-cent so-dium	Specific conductance (micro-mhos at 25° C.)
															Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate	
June 3-10, 1957	19,060	--	--	66	15	148	120	0	108	238	238	--	5.1	--	700	0.95	36,020	230	130	1,210
June 11-16	48,750	--	--	39	7.4	51	106	0	41	76	76	--	3.3	--	283	.38	37,250	128	41	2,058
June 17	15,600	--	--	69	14	110	136	0	109	170	170	--	4.0	--	581	.79	24,470	230	116	986
June 18-20	29,830	--	--	54	9.1	82	108	0	72	130	130	--	3.8	--	435	.59	35,040	172	84	751
June 21-22	19,450	--	--	50	10	88	118	0	66	136	136	--	3.6	--	445	.61	23,370	168	72	764
June 23-26	55,300	--	--	26	7.5	41	80	0	33	58	58	--	2.8	--	218	.30	32,550	96	30	368
June 27-30	76,820	--	--	36	7.8	47	96	0	43	69	69	--	3.0	--	292	.40	60,860	122	44	1,885
July 1-6	60,630	--	--	54	8.1	73	118	0	71	109	109	--	2.6	--	393	.53	64,320	168	72	696
July 7-10	17,550	--	--	91	15	140	168	0	148	212	212	--	3.8	--	731	.99	34,640	290	152	1,230
July 11-20	20	--	0.07	101	29	227	204	0	186	330	330	0.7	3.3	0.27	1,080	1.47	23,090	370	203	1,780
July 21-31	5,523	--	--	104	21	240	204	0	157	378	378	--	4.0	--	1,050	1.43	15,660	345	178	5.6
Aug. 1-10	3,437	--	--	106	21	272	210	0	146	435	435	--	4.3	--	1,150	1.86	10,070	330	178	6.3
Aug. 11-20	2,178	--	--	99	32	353	200	0	184	560	560	--	2.8	--	1,400	1.80	8,230	360	216	7.9
Aug. 21-23	2,133	--	--	90	31	251	204	0	148	405	405	--	5.0	--	1,150	1.86	6,020	330	183	6.1
Aug. 24-31	1,451	--	--	95	32	370	186	0	179	580	580	--	3.2	--	1,440	1.96	5,940	370	218	8.4
Sept. 1-10	1,186	--	--	93	35	412	186	0	187	865	865	--	2.4	--	1,540	2.09	4,930	375	239	7.0
Sept. 11-16	1,713	--	--	90	32	328	172	0	156	540	540	--	3.6	--	1,310	1.78	6,060	355	214	7.7
Sept. 17	5,980	--	--	82	23	256	160	0	108	430	430	--	7.0	--	1,010	1.37	16,310	300	169	7.6
Sept. 18-21	6,355	--	--	56	15	161	122	0	93	248	248	--	5.5	--	669	.91	11,480	200	100	6.4
Sept. 22-25	10,740	--	--	56	13	130	120	0	74	210	210	--	5.8	--	575	.78	11,670	194	96	5.9
Sept. 26-30	4,906	--	--	74	17	208	146	0	129	320	320	--	4.5	--	868	1.18	11,500	255	136	5.7
Weighted average	8,646	--	--	52	11	135	b116	--	74	208	208	--	3.4	--	573	0.78	13,380	174	80	4.4
																				1,010

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of carbonate values shown above.

ARKANSAS RIVER BASIN

71

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT RALSTON, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	64	50	47	35	59	60	70	81	80	92	88
2	80	60	52	44	44	48	63	70	67	85	92	--
3	83	55	54	46	--	47	56	67	70	88	87	87
4	80	--	55	47	43	53	53	65	74	84	--	83
5	79	52	53	43	43	45	50	68	78	84	83	79
6	72	55	44	41	47	41	55	70	81	85	83	78
7	--	53	37	45	55	47	--	70	81	--	84	72
8	73	50	33	51	62	54	55	70	80	86	86	77
9	70	53	33	39	58	62	59	75	--	87	87	--
10	73	58	35	33	--	--	62	68	78	86	88	78
11	72	62	40	35	52	63	58	65	78	88	90	--
12	73	69	41	37	58	63	39	--	76	87	91	76
13	70	61	35	35	68	67	51	72	78	87	91	78
14	--	65	38	33	55	54	56	76	78	--	87	70
15	73	50	41	33	55	60	54	76	79	89	88	--
16	76	50	--	33	53	54	57	70	--	89	89	75
17	76	52	41	33	54	55	63	67	83	87	77	74
18	71	--	40	34	50	59	68	66	78	85	--	75
19	70	59	42	33	47	59	68	67	77	89	85	78
20	69	47	45	--	46	52	70	69	79	90	85	76
21	70	45	48	59	49	50	70	72	80	--	86	68
22	73	--	47	33	39	52	70	71	79	87	84	70
23	72	48	--	35	38	49	65	69	71	88	83	71
24	68	52	41	40	45	--	78	68	73	86	85	--
25	62	--	--	33	51	42	68	71	75	85	--	75
26	64	44	47	33	51	--	66	70	73	87	88	74
27	67	47	47	--	55	65	68	73	75	90	83	73
28	63	41	46	33	55	63	68	76	80	--	83	73
29	68	41	50	33	--	64	66	77	76	91	83	--
30	60	45	--	33	--	61	69	--	80	81	84	73
31	64	--	45	33	--	64	--	--	--	90	84	--
Average	71	53	44	38	50	55	62	70	77	87	66	--

ARKANSAS RIVER BASIN--Continued
BLACK BEAR CREEK AT PAWNEE, OKLA.

LOCATION --At gaging station at bridge on State Highway 18 in north Pawnee, Pawnee County, 50 feet downstream from Skedee Creek.
DRAINAGE AREA --576 square miles
RECORDS AVAILABLE --Chemical analyses: November 1951 to August 1952, October 1955 to August 1956, November 1956 to September 1957.
REMARKS --Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Nov. 15, 1956.....	1.77	46	14	52	120		118	172	74	40	1.7	839	7.7
Jan. 9, 1957.....	.28	74	16	106	179		209	250	104	48	3.0	1,010	8.2
Jan. 21.....	.14	52	18	56	118		157	202	106	38	1.6	812	7.3
Feb. 4.....	.17	46	27	97	132		210	228	120	48	2.8	1,000	8.1
Feb. 21.....	.80	136	43	208	128		535	515	410	47	4.0	2,040	7.8
Mar. 5.....	3.95	92	39	209	66		530	390	336	54	4.6	1,980	8.1
Apr. 2.....	7.75	276	90	493	122		1,300	1,060	960	50	6.6	4,380	8.1
Apr. 4.....	804	34	13	23	160		34	140	9	28	1.8	323	7.5
Apr. 10.....	495	39	15	68	102		138	160	76	48	2.3	637	8.1
Apr. 18.....	3,460	14	3.2	9.7	56		9.6	48	0	30	.6	118	6.9
Apr. 19.....	3,370	11	3.0	7.0	44		11	40	4	27	.5	104	7.4
Apr. 22.....	2,990	13	5.2	16	60		20	54	5	39	1.0	158	7.6
Apr. 23.....	5,010	14	4.6	12	56		19	54	8	32	.7	157	6.8
Apr. 24.....	3,370	17	6.4	12	72		21	69	10	27	.6	188	7.1
Apr. 30.....	27.2	56	21	59	164		149	224	90	36	1.7	756	8.2
May 7.....	84.1	36	11	39	128		74	134	29	39	1.5	446	8.1
May 20.....	6,340	15	5.5	11	64		19	60	8	29	.6	164	7.7
June 20.....	3,800	20	8.3	14	0		33	84	84	24	.7	253	3.6
July 10.....	46.4	42	34	170	43		185	224	104	43	2.3	1,120	8.2
July 22.....	17.6	96	49	137	390		280	440	120	40	2.8	1,990	7.6
Aug. 19.....	22.4	124	66	196	388		430	560	262	42	3.5	1,900	7.5
Sept. 9.....	4.59	33	44	160	203		280	284	94	57	4.3	1,300	8.2
Sept. 18.....	95.1	30	7.5	35	90		72	106	32	42	1.5	394	7.0
Sept. 30.....	5.74	56	21	61	222		117	224	42	37	1.6	716	8.1

ARKANSAS RIVER BASIN--Continued
CIMARRON RIVER NEAR KENTON, OKLA.

LOCATION.--At gaging station on highway bridge, 1.5 miles upstream from Carrizo Creek, 1.7 miles northeast of Kenton, Cimarron County, and 2.2 miles downstream from Carrizo Creek.

DRAINAGE AREA.--1,106 square miles, of which 68 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: November 1953 to August 1956, October 1956 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Oct. 30, 1956	1.45	84	85	343	264		62	560	344	57	6.3	2,500	7.9
Nov. 7	.73	96	102	275	370		67	660	357	48	4.7	2,320	7.8
Nov. 29	1.56	80	78	207	334		42	520	246	46	3.9	1,770	7.7
Dec. 5	1.47	84	89	256	372		60	575	270	49	4.6	2,060	8.1
Dec. 18	1.23	108	94	262	386		66	665	338	47	4.5	2,220	7.5
Jan. 9, 1957	1.26	48	57	183	222		52	355	173	53	4.2	1,430	8.0
Jan. 18	.65	96	117	327	482		90	720	325	50	5.3	2,690	7.9
Jan. 29	1.32	104	89	253	458		66	625	250	47	4.4	2,130	7.5
Mar. 20	.54	110	113	407	412		88	740	402	54	6.5	2,690	8.2
May 7	2.94	86	94	256	260		57	600	387	48	4.5	1,980	7.6
June 1	38.6	96	56	115	268		24	470	250	35	2.3	1,220	7.9
July 10	34.0	75	23	39	302		9.8	280	32	23	1.0	677	7.8
July 24	1.49	67	43	138	144		31	344	226	47	3.2	1,210	7.7
July 26	501	90	23	19	338		4.2	320	43	11	5.5	650	7.5
July 31	959	111	37	32	310		6.4	430	176	14	.7	847	7.5
Aug. 5	76.2	117	29	45	302		10	410	182	19	1.0	891	7.3
Aug. 16	851	90	21	27	344		6.4	310	28	16	1.7	687	7.5
Aug. 20	19.3	58	24	66	140		19	245	130	37	1.8	769	7.5
Aug. 28	6.19	66	50	144	76		34	370	306	46	3.3	1,340	6.9
Sept. 11	19.9	35	117	185	272		34	570	347	39	3.0	1,610	7.3
Sept. 18	1.69	65	85	234	272		51	510	287	50	4.5	1,650	8.0

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER NEAR MOCANE, OKLA.

LOCATION ---At gaging station at bridge on county highway 64 miles northeast of Mokane, Beaver county, and 14.7 miles upstream from Crooked Creek. DRAINAGE AREA ---8,670 (revised) square miles, of which 4,365 square miles is probably noncontributing.

RECORDS AVAILABLE ---Chemical analyses: October 1946 to September 1957.

Water temperatures: October 1946 to September 1948.

EXTREMES, 1946-48. --Dissolved solids: Maximum, 2,010 ppm Jan. 1-3, 1948; minimum, 435 ppm Oct. 6, 8-11, 17, 1946.

Hardness: Maximum, 580 ppm Jan. 1-3, 1948; minimum, 182 ppm Nov. 5, 1946.

Water temperatures: Maximum, 78° F Aug. 3, 28, 1948; minimum, freezing point on many days during winter months.

REMARKS ---Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium magnesium	Non- carbonate				
Oct. 2, 1956	29.9	96	39	347	198		990	400	238	65	7.5	2,570	7.3
Oct. 8	29.7	94	41	357	272		800	405	182	66	7.7	2,570	7.1
Oct. 17	56.3	148	58	477	316		800	610	351	63	8.4	3,370	7.4
Oct. 31	50.7	40	11	103	102		150	146	62	61	3.7	1,780	7.5
Nov. 19	58.3	48	21	141	150		215	205	82	60	4.3	1,070	7.7
Nov. 30	58.9	100	37	321	300		520	400	154	64	7.0	2,380	7.6
Dec. 3	68.7	96	38	343	268		495	395	176	65	7.5	2,320	7.4
Dec. 21	67.0	94	39	287	262		510	395	180	61	6.3	2,340	7.5
Jan. 7, 1957	63.4	72	35	280	212		450	325	152	65	6.8	2,070	7.8
Feb. 6	71.9	74	57	348	300		485	420	174	64	7.4	2,280	7.7
Mar. 13	62.8	92	56	328	292		515	460	220	61	6.7	2,430	7.7
Apr. 1	126	86	62	305	306		470	470	219	59	6.1	2,370	7.4
Apr. 9	81.0	116	74	269	322		420	595	331	50	4.8	2,270	7.5
Apr. 18	71.0	92	61	318	286		505	505	246	69	6.3	2,380	7.9
May 1	170	92	61	213	320		315	480	218	49	4.2	1,880	7.9
May 13	84.2	100	58	308	284		480	480	258	58	6.1	2,260	7.5
May 22	58.9	100	44	227	298		375	430	186	53	4.8	1,910	7.7
May 27	71.4	98	51	282	300		415	455	209	56	3.3	2,100	7.8

June 25, 1957	391	74	44	98	328	125	365	96	37	2.2	1,120	7.9
July 9	36.6	83	42	325	76	250	380	318	65	7.3	2,270	7.0
July 16	30.8	98	72	278	366	410	540	248	53	5.2	2,250	7.5
Aug. 8	126	109	64	110	272	138	535	312	31	2.1	1,420	7.8
Aug. 22	74	85	70	117	394	150	500	186	34	2.3	1,330	7.5
Aug. 30	32.5	84	68	307	344	475	490	208	58	6.0	2,350	7.6
Sept. 5	79.6	74	44	144	338	220	365	88	46	3.3	1,340	7.5
Sept. 12	471	69	36	66	374	92	320	14	31	1.6	837	7.5
Sept. 19	65.3	122	29	172	368	265	425	124	47	3.6	1,540	7.3
Sept. 25	45.0	106	35	289	330	420	410	140	61	6.2	2,090	7.5

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER NEAR WAYNOKA, OKLA.

LOCATION.--At gaging station at bridge on U. S. Highway 281, three-quarters of a mile downstream from Maine Creek, and 5 miles south of Waynoka, Woods County.

DRAINAGE AREA.--13,334 square miles of which 4,380 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: September 1951 to August 1956, November 1956 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
								Calcium, mg- nessium	Non- carbonate				
Nov. 1, 1956	0.24	892	283	--	171	0	63,200	3,440	3,300	--	--	135,000	8.0
Nov. 15	0.07	191	63	--	312	6	6,950	735	470	--	--	20,900	8.4
Dec. 3	4.43	52	35	--	306	0	2,250	350	99	--	--	7,600	8.1
Dec. 18	1.81	134	33	--	380	0	2,150	445	134	--	--	7,190	8.2
Jan. 6, 1957	3.34	128	39	--	284	11	2,800	480	229	--	--	9,130	8.4
Jan. 29	3.99	37	21	909	140	4	1,360	180	59	92	29	4,700	8.4
Feb. 12	24.3	380	178	--	244	0	26,700	1,680	1,480	--	--	65,800	8.0
Feb. 27	24.8	570	393	--	207	0	44,800	3,040	2,870	--	--	100,000	7.8
Mar. 13	56.5	280	120	8,800	221	16	11,300	1,140	932	94	113	37,500	8.4
Mar. 18	30.9	309	206	12,300	117	0	17,400	1,620	1,520	94	133	49,200	8.0
Mar. 22	187	518	284	27,000	225	0	41,900	2,500	2,350	96	235	92,700	8.1
Mar. 28	205	187	82	4,060	284	0	6,360	804	572	91	60	18,800	8.2
Apr. 1	235	268	98	7,710	221	0	12,000	1,070	889	94	103	32,300	8.2
Apr. 4	865	261	136	5,760	210	0	9,150	1,210	1,040	91	72	25,100	8.0
Apr. 15	127	245	184	8,060	197	0	12,600	1,370	1,210	93	95	34,300	8.0
Apr. 19	1,660	248	107	887	152	0	1,400	1,060	936	65	12	5,620	7.9
Apr. 22	502	282	177	3,780	191	0	6,160	1,430	1,270	85	43	18,300	8.0
May 3	4,490	280	117	417	130	0	685	1,130	1,020	45	5.4	3,750	7.3
May 6	1,070	320	156	1,620	128	0	2,650	1,440	1,340	71	19	9,140	7.9
May 13	15,200	232	83	650	104	0	1,010	920	635	61	9.3	4,220	7.8
July 16	94.5	379	210	3,870	97	0	6,360	1,810	1,720	82	40	19,800	7.6
July 29	77.8	124	100	1,200	176	0	1,820	720	576	78	19	6,540	7.9
Aug. 13	50.8	365	112	5,530	288	0	7,790	1,370	1,130	90	65	25,100	7.9
Sept. 16	1,230	212	34	1,640	136	0	2,200	670	558	84	28	8,380	8.0
Sept. 24	528	110	31	1,510	188	0	2,120	400	246	89	33	7,710	8.0

ARKANSAS RIVER BASIN--Continued
TURKEY CREEK NEAR DRUMMOND, OKLA.

LOCATION.--At gaging station on county highway bridge, 2½ miles northeast of Drummond, Garfield County, 2½ miles downstream from Clear Creek, and 9 miles southwest of Enid, Garfield County.
DRAINAGE AREA.--248 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1948, October 1952 to August 1953, November 1954 to June 1956, December 1956 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, December 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, mg/l.	Non- carbonate				
Dec. 3, 1956	0.16	80	93	496	230	6	980	580	382	65	9.0	3,770	8.4
Jan 8, 1957	.34	108	141	1,220	132	0	2,000	850	742	76	18	7,020	8.2
Feb 12	.46	112	147	1,170	164	0	1,780	885	750	74	17	6,880	8.1
Mar. 18	.36	104	125	1,060	184	0	1,550	775	634	75	17	6,140	8.1
Apr. 4	207	14	3.6	20	58	0	24	50	2	47	1.2	218	7.5
Apr. 15	.80	95	52	350	220	0	570	450	270	63	7.2	2,490	8.2
Apr. 21	730	16	3.4	8.0	68	0	6.6	54	0	24	.5	140	7.5
Apr. 22	258	14	3.2	12	64	0	14	48	0	35	.8	156	7.1
Apr. 26	33.5	34	13	80	106	0	121	140	52	55	2.6	875	7.8
May 13	21.4	36	14	70	145	0	164	148	32	52	2.7	664	7.6
May 19	2,170	10	4.6	7.2	46	0	7.4	44	6	26	.5	103	7.2
June 1	40.5	83	45	235	278	0	350	390	182	57	5.2	1,850	8.2
June 19	956	15	6.2	14	70	0	20	63	6	33	.8	201	7.5
June 24	2.26	9.6	2.9	6.8	46	0	7.4	36	0	29	.5	107	7.2
Aug. 14	5.01	66	116	417	325	0	580	640	374	59	7.2	4,470	8.2
Sept. 16	265	14	4.6	16	70	0	19	54	0	42	1.1	210	7.6

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN.--Continued
COTTONWOOD CREEK NEAR GUTHRIE, OKLA.

LOCATION.--At county highway bridge, 2 miles southwest of Guthrie, Logan County.
DRAINAGE AREA.--366 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to July 1954, October 1955 to July 1956, October 1956 to September 1957.
REMARKS.--Discharge data obtained at time of sampling. Records of discharge given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Oct. 17, 1956	23.9	35	10	26	108	0	10	130	42	30	1.0	376	7.8
Nov. 14 .....	.37	47	11	41	190	0	31	162	6	35	1.4	493	8.0
Dec. 5 .....	.23	80	17	49	326	0	47	270	3	26	1.3	715	8.1
Jan. 7, 1957	17.0	59	41	102	196	4	92	314	147	41	2.5	1,060	8.4
Feb. 6	3.55	86	63	131	260	36	98	472	199	38	2.6	1,310	8.8
Mar. 1	23.4	96	46	133	274	6	108	428	194	40	2.8	1,350	8.3
Apr. 23	1.130	65	36	74	208	0	89	308	138	34	1.8	991	8.1
May 8	67,900	57	38	38	182	0	77	300	151	36	1.9	994	8.0
June 17	2,700	40	55	112	186	0	144	328	192	43	2.7	1,340	7.9
July 24	31.8	72	61	138	184	0	140	430	296	41	2.9	1,590	7.8
Aug. 8	11.1	49	51	102	196	0	94	332	172	40	2.4	1,310	7.9
Sept. 11	8.01	40	63	116	220	0	120	360	180	42	2.7	1,260	8.0

ARKANSAS RIVER BASIN--Continued
CUMMARTON RIVER NEAR GUTHRIE, OKLA.

LOCATION --At gaging station 125 feet upstream from Atchinson, Topeka and Santa Fe Railway Co. bridge, 1.2 miles downstream from Cottonwood Creek, and 2½ miles north of Guthrie, Logan County.
DRAINAGE AREA --16,892 square miles, of which 4,926 square miles is probably contributing.
RECORDS AVAILABLE --Chemical analyses: November 1953 to September 1957.
REMARKS --Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25° C)	pH
								Calcium Magnesium	Non- Carbonate				
Oct. 1, 1956	1.07	198	90	--	338	0	2,300	880	584	--	--	8,040	8.1
Nov. 6	241	104	29	--	132	0	1,030	380	272	--	--	3,780	7.7
Nov. 15	9.30	148	44	--	232	0	1,820	550	380	--	--	5,780	8.1
Nov. 23	4.42	224	73	--	272	0	3,000	880	637	--	--	8,940	8.1
Dec. 5	3.88	236	80	--	280	0	3,000	920	690	--	--	9,910	7.9
Dec. 28	14.0	180	56	--	280	0	2,000	680	467	--	--	6,820	8.0
Jan. 7, 1957	17.0	194	65	--	254	6	2,300	750	532	--	--	7,990	8.3
Jan. 14	0.56	204	76	--	254	16	2,550	820	588	--	--	8,540	8.5
Feb. 6	15.0	172	61	--	284	0	1,980	630	448	--	--	6,970	7.9
Feb. 20	17.1	243	83	--	250	0	4,430	948	738	--	--	14,200	7.9
Mar. 1	28.4	187	80	2,810	174	5	4,460	796	645	88	43	13,800	8.3
Mar. 15	65.9	260	129	6,360	103	0	10,800	1,180	1,100	94	106	35,800	8.0
Mar. 26	203	207	87	3,850	103	0	4,520	874	790	91	57	18,800	7.9
Mar. 29	491	277	85	4,700	215	0	7,760	1,040	884	91	63	27,600	8.1
Apr. 5	1,820	106	43	1,160	188	0	1,920	440	286	85	24	6,100	7.9
Apr. 15	187	214	90	3,580	224	0	5,460	904	720	90	52	17,100	8.0
Apr. 29	1,130	176	80	1,350	166	0	2,120	770	634	79	21	7,210	8.0
May 8	2,170	228	49	1,860	188	0	2,600	770	616	82	26	8,680	8.1
May 14	4,540	188	68	792	146	0	1,230	750	630	70	13	4,820	7.9
June 5	6,390	126	46	931	196	0	1,450	505	344	80	18	5,210	8.1
June 17	2,700	164	63	963	196	0	1,520	670	510	76	16	5,380	8.1
July 16	699	220	90	1,580	162	0	2,000	920	787	79	23	8,660	7.9
Aug. 12	408	110	97	1,330	244	0	2,120	675	475	81	22	7,290	8.1
Sept. 11	230	220	80	1,860	284	0	2,650	880	648	82	27	9,710	8.0
Sept. 24	1,380	93	31	874	204	0	1,180	390	193	84	20	4,650	8.1

Chemical analyses, in parts per million, water year October 1956 to September 1957

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.

LOCATION.--At gaging station at bridge on State Highway 40, 1 mile south of Perkins, Payne County, 1½ miles upstream from Dugout Creek, and 4 miles downstream from Wildhorse Creek.

DRAINAGE AREA.--17,852 square miles, of which 4,926 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1957.

Water temperatures: October 1952 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 19,600 ppm Mar. 18-20; minimum, 277 ppm May 17.

Hardness: Maximum, 1,120 ppm Mar. 17-18-20; minimum, 105 ppm May 17.

Specific conductance: Maximum daily, 32,400 micromhos Mar. 18; minimum daily, 497 micromhos May 17.

Water temperatures: Maximum, 85°F Aug. 3; minimum, freezing point Jan. 16-17.

EXTREMES 1952-57.--Dissolved solids: Maximum, 20,500 ppm Feb. 18, 20, 1955; minimum, 277 ppm May 17, 1957.

Hardness: Maximum, 1,880 Aug. 27-29, 1954; minimum, 92 ppm May 20, 1955.

Specific conductance: Maximum daily, 32,400 micromhos Mar. 18, 1956; minimum daily, 438 micromhos Oct. 5, 1955.

Water temperatures: Maximum, 88°F Oct. 1, 1954; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate		
Oct. 1-10, 1956.....	3.07	17	0.00	245	89	2,200	9.8	227	0	446	3,640	0.2	--	0.45	6,930	9.42	980	791	83	11,500
Oct. 11-14.....	5.90	--	--	259	91	2,220	114	239	0	438	3,690	--	--	--	7,070	9.62	1,020	824	83	11,800
Oct. 15.....	498	--	--	37	7.7	--	--	--	--	--	--	--	--	--	485	66	124	29	67	7.4
Oct. 16.....	278	--	--	80	26	552	148	0	158	860	--	--	2.8	--	1,780	2.43	305	184	80	7.6
Oct. 17, 19-20.....	138	--	--	38	10	147	118	0	53	215	--	--	3.3	--	537	73	138	42	70	7.4
Oct. 18.....	228	--	--	120	31	715	--	150	0	238	1,140	--	--	--	2,400	3.26	425	302	79	15
Oct. 21-23.....	50.7	--	--	59	18	243	156	0	82	370	--	--	3.1	--	887	1.21	210	82	72	7.3
Oct. 24-25.....	31.0	--	--	82	21	414	202	0	114	640	--	--	3.5	--	1,400	1.90	290	124	76	11
Oct. 26-28.....	22.3	--	--	106	31	575	232	0	145	920	--	--	3.5	--	1,940	2.64	390	200	76	13
Oct. 29-31.....	23.0	--	--	118	35	740	236	0	170	1,190	--	--	--	--	2,460	3.35	440	246	79	15
Nov. 1-4.....	24.0	--	--	128	46	949	214	0	203	1,350	--	--	--	--	3,090	4.20	510	334	80	18
Nov. 5, 9.....	90.0	--	--	66	23	404	126	0	108	650	--	--	6.4	--	1,340	1.82	260	136	77	11
Nov. 6-8, 10.....	86.2	--	--	100	24	653	184	0	182	1,040	--	--	--	--	2,110	2.87	350	216	80	15
Nov. 11-12.....	45.0	--	--	104	29	613	186	8	181	960	--	--	6.4	--	2,040	2.77	346	214	78	14
Nov. 13-16.....	27.5	--	--	96	26	506	230	2	156	770	--	--	5.9	--	1,680	2.28	345	153	76	12
Nov. 17-20.....	16.8	--	--	116	32	669	244	6	163	1,060	--	--	--	--	2,220	3.02	420	210	78	14
Nov. 21-24.....	12.5	--	--	138	43	892	258	6	186	1,450	--	--	--	--	2,910	3.96	520	288	79	17
Nov. 25-30.....	10.1	--	--	166	49	1,120	286	4	223	1,920	--	--	--	--	3,640	4.95	615	372	80	20

14	--	--	190	57	1,340	308	0	259	2,200	--	--	--	--	4,360	5.93	120	710	458	80	22	7,430	8.1
			186	53	1,340	298	0	278	2,150	2				4,360	5.71	175	670	428	81	23	7,370	8.1
			186	50	1,190	276	0	284	1,920	--	--	--	--	3,850	5.24	247	620	394	81	21	6,930	8.1
			160	49	1,040	256	8	229	1,700	--	--	--	--	3,450	4.66	173	600	376	78	18	6,340	8.1
			176	61	1,170	296	0	283	1,920	--	--	--	--	3,970	5.40	170	680	448	79	19	6,730	8.1
	--	--	184	59	1,150	312	0	285	1,900	--	--	--	--	3,900	5.30	153	700	444	78	19	6,570	8.2
8.0	.04		152	51	1,130	--																
			182	27	1,010	267	16	287	1,780	4				3,660	4.98	220	590	358	81	20	6,340	8.6
			192	27	1,010	264	10	283	1,620	--	--	--	--	3,410	4.64	273	590	357	78	18	5,950	8.6
			152	54	1,330	228	6	319	2,100	--	--	--	--	4,340	5.90	283	600	405	83	24	7,310	8.4
			178	67	1,850	226	12	371	2,950	--	--	--	--	5,890	8.01	488	720	515	85	30	9,800	8.5
	--	--	188	57	1,910	256	8	380	3,000	--	--	--	--	5,950	8.09	684	705	482	85	31	9,770	8.5
		--	264	54	2,210	202	14	333	3,800	--	--	--	--	7,440	10.12	1,580	880	690	85	32	11,600	8.6
		--	203	78	2,850	207	18	478	4,480	--	--	--	--	8,450	11.49	2,100	825	626	88	43	14,200	8.5
		--	246	78	4,070	213	12	487	6,450	--	--	--	--	12,000	16.32	2,730	930	738	90	58	19,400	8.3
		--	277	104	6,280	184	20	640	9,890	--	--	--	--	17,400	23.66	3,240	1,120	928	92	82	27,700	8.6
	--	--	282	95	6,950	204	14	646	10,900	--	--	--	--	19,600	26.66	3,210	1,120	930	93	90	30,800	8.3
		--	211	89	4,480	187	12	490	7,050	--	--	--	--	12,800	17.41	2,830	895	721	92	65	21,100	8.5
		--	197	62	2,910	205	12	419	4,580	--	--	--	--	8,610	11.71	4,320	745	559	89	46	14,400	8.5
		--	270	77	5,350	167	6	571	8,420	--	--	--	--	15,100	20.54	18,220	990	845	92	74	24,400	8.4
		--	282	80	6,640	170	8	556	10,400	--	--	--	--	18,100	24.62	16,710	960	806	94	93	28,400	8.4
	--	--	167	53	3,680	171	14	355	5,770	--	--	--	--	10,400	14.14	17,470	835	472	83	64	17,000	8.5
		--	132	36	2,300	175	2	289	3,990	--	--	--	--	6,650	9.04	40,220	480	532	91	46	11,400	8.3
		--	104	22	1,270	154	4	217	1,950	--	--	--	--	3,760	5.11	13,550	350	218	89	29	6,630	8.3
		--	156	29	1,660	128	4	356	2,580	--	--	--	--	5,080	6.91	9,880	510	398	88	32	8,530	8.3
		--	203	50	3,320	147	2	427	5,220	--	--	--	--	9,540	12.87	13,240	710	587	91	54	15,900	8.3
	--	--	183	56	3,310	203	0	406	5,170	--	--	--	--	9,470	12.88	6,700	685	520	91	55	15,700	8.0
		--	148	36	2,150	158	6	262	3,390	--	--	--	--	6,230	8.47	22,540	520	378	90	41	10,700	8.4
		--	61	14	590	130	2	83	915	--	--	4.5	--	1,860	2.53	14,210	210	98	86	18	3,350	8.3
		--	2,830	Apr. 20	1,800	2	83	915	--	--	--	--	--	1,860	2.53	14,210	210	98	86	18	3,350	8.3
		--	106	18	11,800	176	4	206	1,140	--	--	--	--	2,510	3.41	78,610	340	190	83	18	4,350	8.3
	--	--	69	11	340	142	0	138	500	--	--	1.9	--	1,210	1.65	90,480	215	100	77	10	2,180	7.6
		--	15,450	Apr. 22-23	11,800	176	4	206	1,140	--	--	--	--	2,510	3.41	78,610	340	190	83	18	4,350	8.3

Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Potas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Per-cent adsorp-tion	So-dium adsorp-tion ratio	Specific conductance (micro-mhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per foot	Calcium	Non-magne-sium				
Apr. 24-25, 1957...	17,550	--	--	63	8.5			132	0	113	248	--	2.3	--	739	1.01	35,020	192	84	67	5.6	1,270	7.9
Apr. 26	4,690	--	--	134	16	487	120	0	295	745		--	4.2	--	1,910	2.60	23,220	400	302	73	11	2,360	8.1
Apr. 27-28	2,335	--	--	98	13	337	106	0	221	505		--	3.2	--	1,350	1.94	8,560	300	211	71	8.5	2,300	8.1
Apr. 29-30	1,475	--	--	166	23	1,122	122	0	322	1,460		--	--	--	3,080	4.19	12,270	510	410	80	18	5,240	7.8
May 1	1,320	--	--	160	15	1,180	132	0	281	1,850		--	--	--	3,700	5.03	23,180	460	336	85	24	6,250	8.4
May 2	3,510	--	--	107	24	762	144	12	212	1,180		--	--	--	2,470	3.36	14,090	365	227	82	17	4,250	8.5
May 3-5	16,030	--	--	83	13	328	120	0	173	490		--	4.2	--	1,230	1.67	53,240	260	162	73	8.8	2,140	7.7
May 6	7,050	--	--	104	13	478	106	0	223	730		--	7.2	--	1,700	2.31	32,360	315	228	77	12	2,890	8.2
May 7	4,380	--	--	142	33	862	116	6	356	1,340		--	--	--	2,970	4.04	35,120	490	385	79	17	4,950	8.4
May 8-10	2,347	--	--	182	31	1,400	144	4	413	2,180		--	--	--	4,410	6.00	27,950	580	456	84	25	7,460	8.3
May 11-13	2,870	--	--	196	39	1,430	156	20	447	2,220		--	--	--	4,590	6.24	35,570	650	488	83	24	7,760	8.6
May 14-15	5,810	--	--	172	28	708	120	20	426	1,070		--	--	--	2,520	3.43	39,530	545	413	74	13	4,340	8.6
May 16	18,100	--	--	212	33	1,010	124	16	462	1,560		--	--	--	3,460	4.71	169,100	665	537	77	17	5,760	8.6
May 17	108,000	--	--	34	4.9	86	112	8	25	80		--	4.0	--	277	.38	80,770	105	0	58	2.8	497	8.5
May 18-20	47,200	--	--	38	6.1	100	108	6	32	144		--	2.6	--	412	.56	32,510	120	22	64	4.0	737	8.5
May 21	61,900	--	--	47	7.4	78	142	0	30	118		--	3.3	--	381	.52	63,680	148	32	53	2.8	706	7.7
May 22-23	15,900	--	--	62	14	204	140	0	83	320		--	2.8	--	761	1.03	32,670	210	98	68	6.1	1,440	8.0
May 24	7,900	--	--	91	21	407	160	0	182	620		--	5.4	--	1,480	2.01	31,570	315	184	74	10	2,690	7.8
May 26	23,900	--	--	102	28	503	164	0	230	770		--	6.2	--	1,730	2.35	111,600	370	236	75	11	3,040	8.1
May 25	8,790	--	--	77	21	323	166	0	147	380		--	5.1	--	1,080	1.47	25,630	280	144	66	6.6	1,940	7.8
May 27-29	9,030	--	--	94	31	368	130	0	223	580		--	4.0	--	1,440	1.96	35,100	360	254	69	8.4	2,500	7.5
May 30	6,400	--	--	136	39	680	158	0	313	1,080		--	--	--	2,410	3.28	41,640	500	370	75	13	4,100	8.1
May 31	24,700	--	--	83	20	307	164	0	136	480		--	5.1	--	1,150	1.56	76,690	290	156	70	7.8	2,050	7.7
June 1	23,100	--	--	98	31	522	144	0	174	850		--	8.7	--	1,830	2.49	114,100	370	252	75	12	3,170	8.2
June 2-3	11,720	--	--	118	38	840	102	0	278	1,350		--	--	--	2,840	3.86	89,870	450	366	80	17	4,950	8.1
June 4	11,200	--	--	107	29	720	188	0	244	750		--	8.3	--	1,750	2.38	50,560	385	231	74	11	3,000	8.2
June 5-6	6,085	--	--	114	35	519	168	0	224	1,150		--	--	--	2,410	3.28	44,310	430	292	78	15	4,240	8.2
June 7-8	4,985	--	--	109	30	577	174	0	226	900		--	4.0	--	2,010	2.73	22,170	395	252	76	13	3,520	8.2
June 9	3,940	--	--	135	51	733	168	0	319	1,400		--	--	--	3,040	4.13	26,590	545	408	78	16	5,160	8.2
June 10	14,500	--	--	77	23	348	138	0	130	560		--	5.4	--	1,270	1.73	49,030	285	172	73	9.0	2,260	8.1
June 11	35,100	--	--	131	35	755	162	0	249	1,220		--	--	--	2,590	3.52	245,500	470	337	78	15	4,480	8.2
June 12	21,000	--	--	95	20	215	116	0	214	330		--	3.7	--	2,990	1.35	56,130	390	225	59	5.2	1,670	7.4

June 13, 1957	11,000	--	--	77	14	148	114	0	147	228	--	4.4	--	--	707	0.96	21,000	250	156	56	4.1	1,250	7.9
June 14	7,530	--	--	128	20	189	130	0	177	295	--	5.0	--	--	916	1.25	18,620	300	194	58	4.7	1,540	8.0
June 15	7,150	--	--	88	27	380	144	0	265	610	--	3.6	--	--	1,610	2.19	31,210	430	312	66	8.0	2,680	7.9
June 16-17	4,035	--	--	173	46	858	168	0	359	1,400	--	--	--	--	3,060	4.16	33,340	620	482	75	15	5,210	8.0
June 18	10,300	--	--	101	26	502	130	0	203	800	--	5.5	--	--	1,760	2.39	48,950	360	254	75	11	3,100	7.9
June 19-20	13,950	--	--	69	16	251	122	0	123	390	--	3.8	--	--	956	1.30	36,010	235	136	70	7.1	1,720	7.9
June 21	7,500	--	--	78	19	205	124	0	142	330	--	3.3	--	--	919	1.25	18,710	270	170	62	5.4	1,600	7.9
June 22	4,730	--	--	139	34	868	168	0	247	1,400	--	--	--	--	2,830	3.85	36,140	485	348	80	17	4,920	8.0
June 23	16,100	--	--	74	19	384	152	0	116	600	--	7.8	--	--	1,310	1.78	56,950	365	140	76	10	2,380	7.9
June 24	42,600	--	--	46	15	83	124	0	56	154	--	4.5	--	--	458	.62	52,680	178	76	53	3.0	832	7.8
June 25-30	21,680	--	--	75	18	204	120	0	145	320	--	2.6	--	--	878	1.19	51,390	260	162	63	5.5	1,540	7.8
July 1-2	9,370	--	--	87	28	288	168	0	154	450	--	4.6	--	--	1,160	1.58	39,350	310	172	67	7.1	2,020	7.9
July 3-7	9,450	--	--	117	26	539	148	0	252	840	--	5.0	--	--	1,880	2.56	47,970	400	278	75	12	3,270	7.2
July 8-10	1,997	--	--	163	46	719	240	0	339	1,140	--	--	--	--	2,650	3.80	14,390	595	398	72	13	4,480	8.1
July 11-13	1,353	--	--	198	60	1,000	264	0	432	1,600	--	--	--	--	3,570	4.86	13,040	740	524	75	16	5,980	8.0
July 14-20	876	--	--	200	78	1,260	224	0	487	2,080	--	--	--	--	4,440	6.47	10,500	820	646	77	20	7,340	7.7
July 21-23	777	--	--	234	53	1,430	188	0	491	2,300	--	--	--	--	4,760	6.94	9,980	800	646	80	22	8,010	8.0
July 24, 27-28	1,391	--	--	134	74	925	242	0	324	1,500	--	--	--	--	3,180	4.32	11,940	640	442	76	16	5,480	8.2
July 29	1,155	--	--	107	56	627	172	0	241	980	--	4.8	--	--	2,160	2.94	6,740	415	274	77	13	3,800	7.7
July 29-31	614	--	--	208	63	1,320	220	0	468	2,100	--	--	--	--	4,400	5.98	7,280	780	600	79	21	7,360	7.4
Aug. 1	673	--	--	198	79	1,510	180	0	535	2,190	--	--	--	--	4,940	6.72	8,980	920	689	80	23	8,340	7.8
Aug. 2-3	646	--	--	233	84	2,120	163	0	532	2,360	--	--	--	--	6,270	9.07	11,680	923	777	83	30	11,000	7.8
Aug. 4	795	--	--	152	51	1,400	164	0	335	2,220	--	--	--	--	4,340	5.90	9,320	590	439	84	25	7,500	7.8
Aug. 5-6	664	--	--	132	45	982	210	0	281	1,550	--	--	--	--	3,140	4.27	5,690	515	343	81	19	5,460	7.8
Aug. 7	546	--	--	134	54	1,280	200	0	348	1,950	--	--	--	--	5,120	5.33	5,180	605	441	82	22	6,740	7.9
Aug. 8-10	744	--	--	180	66	1,670	218	0	408	2,650	--	--	--	--	5,190	7.06	10,430	720	562	83	27	8,740	7.9
Aug. 11	615	--	--	201	62	2,280	213	0	450	3,900	--	--	--	--	6,830	9.29	11,340	780	584	87	36	11,400	8.2
Aug. 12-20	421	--	--	166	62	1,380	246	0	342	2,200	--	--	--	--	4,390	5.97	4,980	670	468	82	23	7,540	8.2

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
CIMARRON RIVER AT PERKINS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-magnesium			
Aug. 21-26, 1957...	301	--	--	200	80	1,810	244	0	437	2,920	--	--	--	--	5,850	7.96	4,750	830	630	83	9,890	8.0
Aug. 27-31	235	--	--	221	86	2,350	297	0	475	3,780	--	--	--	--	7,230	9.83	4,590	905	712	85	12,100	8.1
Sept. 1-10	213	26	0.01	215	88	1,980	247	0	551	3,190	0.1	--	--	0.50	6,280	8.35	3,620	895	694	83	10,500	7.9
Sept. 11	295	--	--	207	58	2,590	177	0	532	4,030	--	--	--	--	7,670	10.43	6,110	735	912	86	13,000	8.0
Sept. 12	348	--	--	128	60	1,110	208	0	234	1,800	--	--	--	--	3,540	4.81	3,530	960	390	81	6,270	8.0
Sept. 13	327	--	--	120	101	1,470	240	0	281	2,420	--	--	--	--	4,740	6.45	4,160	715	518	82	8,190	8.1
Sept. 14	2,200	--	--	142	45	1,020	254	0	275	1,800	--	--	--	--	3,220	4.38	19,130	540	332	80	5,630	8.1
Sept. 15, 17	10,090	--	--	69	16	234	138	0	128	350	--	--	5.5	--	927	1.26	25,250	235	123	68	1,660	7.7
Sept. 16, 18	10,550	--	--	115	27	454	144	0	251	710	--	--	6.6	--	1,670	2.27	47,570	400	282	71	2,900	7.8
Sept. 19-20	2,050	--	--	157	34	787	132	0	356	1,250	--	--	--	--	2,750	3.74	15,220	530	422	76	4,710	7.7
Sept. 21-30	1,059	--	--	123	36	982	178	0	249	1,550	--	--	--	--	3,060	4.16	8,750	455	309	82	5,370	7.4
Weighted average	3,450	--	--	85	20	403	b141	--	161	629	--	--	--	--	1,430	1.94	13,320	295	179	75	2,480	--

a Values above 200 ppm are reported to the nearest 5 ppm

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

CIMARRON RIVER AT PERKINS, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	62	40	46	36	47	61	69	69	80	84	77
2	68	60	43	43	37	50	57	69	65	82	84	78
3	68	58	46	44	46	48	60	69	66	83	85	73
4	70	53	52	44	38	50	52	63	67	83	78	74
5	69	53	52	44	46	48	48	62	70	79	77	74
6	70	52	50	46	45	49	50	64	74	78	77	73
7	62	52	46	41	47	42	58	65	77	83	75	68
8	64	47	38	51	53	46	49	67	79	80	75	64
9	67	45	35	45	58	43	50	66	77	82	77	66
10	63	48	35	54	58	52	55	68	72	83	80	68
11	63	50	35	34	51	60	57	63	77	84	80	70
12	66	56	36	34	50	58	43	67	76	83	82	67
13	70	58	36	36	51	55	40	70	77	84	82	68
14	68	68	38	35	53	55	46	66	80	64	82	68
15	66	58	38	34	50	49	55	72	78	84	82	66
16	67	46	36	32	53	53	56	71	79	83	77	66
17	67	49	43	32	52	53	62	68	78	83	81	66
18	66	46	37	33	52	53	62	65	73	83	78	69
19	66	51	43	35	48	49	66	66	73	84	75	72
20	65	54	45	38	46	54	68	65	74	84	73	72
21	62	45	43	47	45	49	66	67	77	83	76	70
22	62	43	46	51	44	48	66	71	75	82	76	66
23	64	44	46	35	40	52	83	68	73	82	77	63
24	65	44	42	37	42	48	60	68	67	82	76	63
25	63	46	40	35	43	46	66	69	71	82	74	65
26	56	44	43	34	47	43	68	68	73	82	77	66
27	58	42	41	33	44	48	67	69	73	84	77	67
28	57	44	45	35	47	47	65	68	75	83	76	67
29	62	36	40	37	--	48	65	73	80	84	77	65
30	58	41	47	34	--	55	65	72	82	84	76	--
31	57	--	46	36	--	56	--	71	--	84	72	--
Average	64	50	42	39	47	50	58	68	74	83	78	69

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.

LOCATION --At bridge on State Highway 33 in Sand Springs, 7 miles downstream from Cimarron River, and 10 miles above gaging station at Tulsa, Tulsa County. DRAINAGE AREA --74,615 square miles above gaging station, of which 12,541 square miles is probably noncontributing.

RECORDS AVAILABLE --Chemical analyses: October 1946 to September 1957.

Water temperatures: October 1946 to September 1957.

EXTREMES 1956-57--Dissolved solids: Maximum, 13,500 ppm Oct. 19; minimum, 396 ppm May 18.

Hardness: Maximum, 2,600 ppm Oct. 19; minimum, 120 ppm May 22.

Specific conductance: Maximum, 2,600 ppm Oct. 19; minimum, 120 ppm May 22.

Water temperatures: Maximum, 90°F July 13; minimum, freezing point Jan. 10, 14, 15, 26-30.

EXTREMES 1946-57--Dissolved solids: Maximum, 13,500 ppm Oct. 19, 1956; minimum, 232 ppm July 18-20, 1950.

Hardness: Maximum, 2,600 ppm Oct. 19, 1956; minimum, 106 ppm July 2, 1947.

Specific conductance: Maximum, 2,600 ppm Oct. 19, 1956; minimum, 379 micromhos July 19, 1950.

Water temperatures: Maximum, 96°F Aug. 1, 1947; minimum, freezing point on many days during winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station at Tulsa for water year October 1956 to September 1957 given in WSP 1511. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium, sodium	Non-carbonate		
Oct. 1-10, 1956	49.7	12	0.01	208	63	1,170	11	176	0	232	2,100	0.2	0.30	4,060	5.52	545	836	76	8,840
Oct. 11-15	66.6	--	--	184	59	986	148	148	0	205	1,780	--	--	3,400	4.62	611	980	76	5,920
Oct. 16-18	130	--	--	304	59	1,810	138	138	0	289	3,300	--	--	6,170	8.39	2,170	1,030	78	10,400
Oct. 19	298	--	--	705	205	5,830	109	0	323	7,450	--	--	--	13,500	18.36	10,860	2,600	78	21,300
Oct. 20	237	--	--	307	101	2,010	100	0	318	3,640	--	--	--	6,780	9.22	4,340	1,300	79	11,300
Oct. 21	292	--	--	166	40	1,100	110	0	195	1,900	--	--	--	3,800	4.90	2,840	585	80	6,220
Oct. 22-23	334	--	--	154	36	827	128	0	144	1,470	--	--	--	2,840	3.86	2,560	426	77	5,030
Oct. 24-27	165	--	--	138	34	717	138	0	143	1,260	--	--	--	2,500	3.40	1,110	480	76	4,420
Oct. 28-31	128	--	--	164	38	836	134	0	178	1,480	--	--	--	2,940	4.00	1,020	565	76	5,140
Nov. 1-8	301	--	--	164	46	858	136	0	149	1,560	--	--	--	3,130	4.26	2,540	600	76	5,270
Nov. 9-10	334	--	--	120	32	606	180	0	144	1,040	--	--	--	2,170	2.95	1,960	430	75	3,720
Nov. 11-20	259	--	--	124	39	658	164	0	153	1,140	--	--	--	2,380	3.24	1,660	470	75	4,080
Nov. 21-30	170	--	--	160	44	799	198	0	174	1,400	--	--	--	2,810	3.82	1,290	580	75	4,910
Dec. 1-10	163	--	--	170	49	851	203	0	173	1,510	--	--	--	3,020	4.11	1,330	625	75	5,260
Dec. 11-20	208	--	--	196	54	936	208	0	170	1,700	--	--	--	3,430	4.66	1,910	710	74	5,870
Dec. 21-31	258	5.8	0.00	168	48	832	187	0	176	1,500	--	4	.20	3,030	4.12	2,090	615	74	5,310
Jan. 1-10, 1957	276	--	--	148	40	763	180	0	177	1,390	--	--	--	2,890	3.93	2,150	535	76	4,790
Jan. 11-16	184	--	--	152	44	796	198	0	176	1,380	--	--	--	2,830	3.85	1,410	598	76	4,830
Jan. 17-20	158	--	--	188	54	988	212	0	189	1,750	--	--	--	3,490	4.75	1,490	690	76	5,910
Jan. 21-24	298	--	--	160	44	796	190	0	173	1,400	--	--	--	2,960	4.03	2,380	580	75	4,920
Jan. 25-31	137	--	--	192	57	1,040	198	0	196	1,850	--	--	--	3,850	5.24	1,420	715	76	6,170

Feb. 1-10, 1957	242	--	--	172	46	828	160	0	168	1,500	--	--	3,070	4.18	2,010	620	489	74	14	5,180 8.2
Feb. 11-20	326	--	--	168	32	721	180	0	158	1,280	--	--	2,680	3.64	2,360	550	402	74	13	4,520 7.9
Feb. 21-28	378	--	--	140	46	630	194	0	159	1,280	--	--	2,400	3.26	2,450	540	374	72	12	4,030 8.3
Mar. 1-20	368	--	--	132	34	671	180	10	173	1,700	--	--	2,960	3.48	2,540	520	396	74	13	4,210 8.6
Mar. 21-30	442	--	--	128	41	1,030	154	0	208	1,700	--	--	3,400	4.62	4,060	490	364	82	20	5,780 8.2
Mar. 31	844	--	--	152	34	1,480	152	4	233	2,380	--	--	4,630	6.30	10,550	520	389	86	28	7,790 8.3
Apr. 1	1,220	--	--	144	34	1,500	152	6	223	2,400	--	--	4,580	6.23	15,080	500	366	87	29	7,780 8.4
Apr. 2	3,640	--	--	96	27	3,812	146	8	143	1,300	--	--	2,530	3.44	24,860	350	217	83	19	4,500 8.4
Apr. 3	4,380	--	--	70	15	4,447	120	4	73	725	--	6.4	1,510	2.05	17,860	235	131	80	13	2,660 8.3
Apr. 4-5	3,145	--	--	88	28	1,030	132	8	152	1,650	--	--	3,170	4.31	26,920	360	238	86	24	5,510 8.4
Apr. 6	11,700	--	--	92	20	743	148	0	107	1,200	--	--	2,470	3.36	78,030	310	188	84	18	4,170 8.2
Apr. 7	12,400	--	--	112	27	1,400	144	8	167	2,220	--	--	4,200	5.71	140,600	390	258	89	31	7,370 8.4
Apr. 8-10	7,260	--	--	82	17	536	156	0	116	840	--	7.8	1,740	2.37	34,110	275	146	81	14	3,160 8.2
Apr. 11-17	3,609	--	--	85	21	608	116	0	133	980	--	7.1	2,000	2.72	19,480	300	205	81	15	3,540 8.2
Apr. 18, 20	9,920	--	--	62	12	293	140	0	57	470	--	2.8	1,070	1.46	28,660	200	88	76	9.0	1,910 8.0
Apr. 19	14,800	--	--	34	9.5	144	104	0	25	230	--	2.9	581	.79	23,220	124	39	72	5.6	1,030 7.9
Apr. 21	31,400	--	--	48	11	208	148	0	32	325	--	2.8	779	1.06	66,040	164	42	73	7.1	1,360 8.2
Apr. 22	31,400	--	--	86	18	558	178	0	143	855	--	2.3	1,840	2.50	156,000	290	144	81	14	3,250 8.2
Apr. 23-27	42,320	--	--	58	11	219	136	0	83	330	--	3.3	830	1.13	94,840	190	78	71	6.9	1,490 8.2
Apr. 28-30	13,570	--	--	79	19	462	116	6	151	720	--	3.9	1,550	2.11	56,790	225	171	78	12	2,740 8.3
May 1-3	12,130	--	--	97	17	572	134	0	163	900	--	4.8	1,880	2.56	61,570	310	200	80	14	3,340 7.9
May 4-7	28,380	--	--	94	16	353	120	0	195	540	--	4.9	1,280	1.74	98,080	300	202	72	8.9	2,250 8.0
May 8-10	11,430	--	--	107	18	574	122	0	205	900	--	5.5	1,940	2.64	59,870	340	240	79	14	3,400 7.8
May 11	7,950	--	--	117	24	795	152	0	222	1,250	--	--	2,640	3.59	56,670	390	266	82	18	4,540 8.2
May 12-13	13,800	--	--	74	15	444	132	0	135	680	--	5.6	1,480	2.01	55,140	245	138	80	12	2,600 8.1
May 14-16	17,000	--	--	110	23	601	146	0	219	940	--	5.8	2,060	2.80	94,550	370	250	78	14	3,570 7.9
May 17	99,300	--	--	66	8.6	242	132	0	101	360	--	8.2	885	1.20	237,300	200	92	72	7.5	1,570 8.0
May 18	169,000	--	--	41	6.7	89	116	0	35	134	--	3.5	396	.54	180,700	130	35	60	3.4	697 7.3
May 19	205,000	--	--	90	13	270	128	0	159	420	--	4.4	1,100	1.50	608,800	280	175	68	7.0	1,880 8.1
May 20	135,000	--	--	57	7.3	168	128	0	64	260	--	5.4	672	.91	244,900	172	72	68	5.6	1,170 7.9
May 21	205,000	--	--	60	7.4	174	134	0	67	260	--	15	702	.95	388,600	180	70	68	5.6	1,200 8.1
May 22	171,000	--	--	38	6.1	93	108	0	33	140	--	3.0	410	.56	189,300	120	32	63	3.7	694 8.0

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
 ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.--Continued
 Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent adsorption	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, and silica	Non-carbonate				
May 23-26, 1957.....	79,120	--	--	51	9.0	120	124	0	55	185	--	--	6.2	540	0.73	115,400	165	62	61	4.1	968	7.8	
May 27.....	80,200	--	--	90	16	361	154	0	142	580	--	--	13	1,330	1.81	288,000	290	164	73	9.2	2,260	8.2	
May 28-31.....	37,280	--	--	77	17	218	132	0	138	340	--	--	3.2	976	1.33	98,240	260	152	65	5.9	1,650	7.7	
June 1-10.....	36,840	16	0.01	62	14	330	1	--	124	520	0.5	0.14	5.4	1,230	1.87	122,300	275	154	72	8.7	2,160	7.7	
June 11.....	53,800	--	--	62	14	190	148	0	74	300	--	--	4.9	742	1.01	107,800	210	92	66	5.7	1,360	8.1	
June 12.....	87,200	--	--	99	21	344	132	0	228	520	--	--	5.5	1,310	1.78	308,400	335	227	69	8.2	2,330	8.1	
June 13-15.....	87,430	--	--	59	8.5	88	120	0	78	135	--	--	3.7	460	.63	108,600	182	84	51	2.8	792	8.0	
June 16-20.....	46,880	--	--	98	6.2	209	138	0	124	340	--	--	4.0	918	1.25	116,200	270	157	63	5.5	1,560	8.1	
June 21-23.....	40,100	--	--	73	8.3	149	130	0	88	240	--	--	4.5	688	.94	74,490	215	110	60	4.4	1,170	8.1	
June 24.....	95,400	--	--	91	14	361	148	0	94	600	--	--	6.4	1,320	1.80	340,000	285	164	73	9.3	2,350	8.1	
June 25-26.....	117,000	--	--	92	9.8	184	124	0	152	290	--	--	3.3	847	1.15	267,600	270	168	60	4.9	1,450	8.0	
June 27-30.....	94,320	--	--	62	6.2	118	120	0	78	180	--	--	3.1	556	.76	141,600	180	82	59	3.8	935	8.0	
July 1-3.....	103,400	--	--	50	9.5	94	120	0	56	148	--	--	4.2	458	.62	127,900	164	66	56	3.2	824	7.7	
July 4-10.....	45,800	--	--	82	17	217	144	0	141	340	--	--	4.5	942	1.28	116,500	275	158	63	5.7	1,660	7.6	
July 11-12.....	16,900	--	--	116	17	278	198	0	178	435	--	--	4.3	1,170	1.59	53,390	360	198	63	6.4	2,010	8.0	
July 13-20.....	11,680	--	--	140	24	383	212	0	223	620	--	--	3.6	1,560	2.12	49,110	450	276	65	7.8	2,640	7.8	
July 21-26.....	8,253	--	--	132	37	477	210	0	233	780	--	--	2.5	1,830	2.49	40,780	480	308	68	9.5	3,130	8.1	
July 27-31.....	6,966	--	--	116	26	383	208	0	174	620	--	--	3.8	1,460	1.99	27,460	395	224	68	8.4	2,500	8.2	
Aug. 1-5.....	5,184	--	--	126	33	476	210	0	201	780	--	--	4.5	1,810	2.46	25,330	450	278	70	9.8	3,150	8.0	
Aug. 6.....	5,110	--	--	144	34	630	222	0	240	1,020	--	--	--	2,230	3.03	30,770	500	318	73	12	3,800	8.1	
Aug. 7.....	4,930	--	--	156	39	811	212	0	268	1,320	--	--	--	2,620	3.84	37,540	550	376	76	15	4,800	8.0	
Aug. 8-10.....	4,210	--	--	117	31	484	202	0	169	800	--	--	4.4	1,780	2.42	29,230	420	254	71	10	3,100	7.9	
Aug. 11-16.....	3,580	--	--	128	34	679	182	0	227	1,100	--	--	--	2,370	3.22	22,910	470	311	76	14	4,140	7.9	
Aug. 17-20.....	3,135	--	--	128	37	579	204	0	198	960	--	--	3.0	2,080	2.83	17,610	470	303	73	12	3,660	7.9	
Aug. 21-31.....	2,673	--	--	124	41	587	180	0	202	990	--	--	2.8	2,080	2.94	15,080	480	332	73	12	3,660	7.2	
Sept. 1-10.....	2,912	10	.05	128	44	671	174	0	217	1,150	.5	--	--	.28	2,500	3.40	13,380	500	358	74	13	4,310	7.5
Sept. 11-15.....	3,150	--	--	109	36	614	172	0	169	1,200	--	--	--	2,120	2.88	16,030	420	279	76	13	3,770	7.7	
Sept. 16-18.....	17,000	--	--	87	23	385	196	0	111	940	--	--	2.0	1,450	1.94	65,640	310	182	73	9.5	2,550	7.7	
Sept. 19-20.....	10,870	--	--	85	20	234	138	0	166	350	--	--	4.8	1,010	1.37	28,640	295	182	63	5.9	1,770	7.7	
Sept. 21-30.....	9,438	--	--	94	23	438	142	0	168	700	--	--	4.6	1,560	2.12	39,750	330	214	74	10	2,750	7.4	
Weighted average...	14,450	--	--	76	14	246	b136	--	113	392	--	--	--	976	1.33	38,080	245	136	68	6.8	1,700	--	

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	57	37	42	34	61	60	70	70	85	84	80
2	71	56	43	35	33	50	62	69	68	85	74	81
3	70	52	42	39	51	--	59	69	67	83	84	88
4	74	51	51	44	42	--	59	66	68	86	81	76
5	73	51	54	38	43	--	51	65	69	86	78	76
6	73	50	50	44	45	--	57	66	73	82	75	74
7	67	50	40	39	49	--	55	68	76	88	75	72
8	66	45	36	42	61	--	50	67	82	81	74	75
9	66	52	34	47	56	--	57	69	81	82	76	68
10	65	52	35	32	52	--	--	68	80	83	85	68
11	66	54	37	39	50	--	--	64	80	83	85	71
12	72	55	40	41	49	--	54	70	78	83	82	76
13	70	54	36	35	44	--	54	66	80	90	84	68
14	65	52	35	32	50	--	54	74	81	86	83	77
15	64	52	35	32	52	--	51	76	76	85	82	71
16	65	44	33	29	45	--	53	86	84	83	84	65
17	67	40	34	31	46	--	51	67	85	84	80	63
18	65	46	34	36	45	--	56	65	80	84	77	66
19	68	50	36	33	44	--	53	66	79	84	75	70
20	63	49	42	35	44	--	60	69	75	85	77	71
21	62	42	45	52	42	--	53	68	78	83	78	70
22	68	41	45	45	42	--	57	67	76	83	74	68
23	63	43	44	33	39	--	54	68	73	84	76	64
24	64	47	43	34	46	--	67	68	70	81	81	68
25	62	46	42	34	50	--	66	68	73	82	76	67
26	61	41	39	32	51	--	67	73	72	81	73	69
27	63	40	40	32	56	54	66	76	75	85	79	73
28	56	43	47	32	53	58	68	73	79	87	76	74
29	61	35	50	32	--	65	67	75	80	84	77	61
30	62	44	40	32	--	62	70	75	81	85	77	59
31	55	--	41	34	--	61	--	78	--	83	78	--
Average	66	48	41	37	47	--	58	70	76	84	79	71

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR LENAPAH, OKLA.

LOCATION.--At gaging station at bridge on county highway, 2½ miles east of Lenapah, Nowata County, and 4½ miles upstream from Cedar Creek. DRAINAGE AREA.--3,639 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1957.

Water temperatures: October 1951 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 937 ppm Feb. 25-28; minimum, 127 ppm June 9-10.

Hardness: Maximum, 276 ppm Apr. 5-6; minimum, 76 ppm June 9-10.

Specific conductance: Maximum daily, 1,620 micromhos Feb. 27; minimum daily, 207 micromhos May 18.

Water temperatures: Maximum, 94°F July 22, Aug. 15; minimum, 34°F Jan. 14.

EXTREMES, 1951-57.--Dissolved solids: Maximum, 937 ppm Feb. 25-28, 1956; minimum, 121 ppm Oct. 3-4, 1955.

Hardness: Maximum, 304 ppm Oct. 4-5, 9-10, 1951; minimum, 48 ppm Oct. 3-4, 1955.

Specific conductance: Maximum daily, 1,620 micromhos Feb. 27, 1957; minimum daily, 134 micromhos Oct. 3, 1955.

Water temperatures: Maximum, 94°F July 22, Aug. 15, 1957; minimum, freezing point Dec. 21, 22, 1951, Jan. 3, 1952.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511. No flow Oct. 1-15.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate					
Oct. 16-20, 1956	4.66	--	--	46	8.5	89		108	0	20	166	--	1.3	--	397	0.54	5.0	150	52	56	3.2	709	7.5
Oct. 21-31	3.71	--	--	43	10	80		112	0	19	150	--	.8	--	386	.53	3.9	150	58	54	2.6	710	7.5
Nov. 1-10	37.1	7.5	0.03	48	12	70	4.7	134	0	23	142	0.4	.7	0.09	401	.55	40	170	60	46	2.3	715	7.5
Nov. 11-20	4.07	--	--	53	11	114		168	0	35	178	--	1.1	--	488	.68	5.4	178	40	58	3.7	941	7.5
Nov. 21-30	2.35	--	--	56	11	131		184	0	36	198	--	.8	--	531	.72	3.4	184	33	61	4.2	1,020	7.7
Dec. 1-10	4.88	--	--	70	3.3	139		184	0	37	212	--	2.4	--	580	.79	7.6	188	37	82	4.4	1,070	7.7
Dec. 11-20	6.73	--	--	60	13	143		170	0	49	228	--	4.4	--	628	.85	11	205	66	60	4.3	1,130	7.6
Dec. 21-31	15.0	--	--	60	18	151		158	0	53	258	--	6.4	--	679	.92	27	225	96	59	4.4	1,226	7.7
Jan. 1-10, 1957	8.74	--	--	60	15	157		180	0	53	258	--	2.8	--	649	.88	15	210	81	62	4.7	1,220	8.0
Jan. 11-20	5.30	--	--	62	19	147		166	0	50	258	--	2.4	--	655	.89	9.4	235	98	58	4.2	1,230	8.0
Jan. 21-31	5.94	--	--	62	16	126		160	0	43	225	--	2.2	--	600	.82	9.6	220	91	55	3.7	1,060	8.0
Feb. 1-10	8.99	4.0	.01	64	9.8	126		160	0	44	208	.4	3.1	.27	580	.79	14	200	69	58	3.9	1,030	8.1
Feb. 11-15	16.5	--	--	67	15	117		150	2	48	215	--	6.8	--	642	.87	29	230	104	53	3.4	1,060	8.3
Feb. 16	665	--	--	51	13	46		110	2	39	95	--	.4	--	376	.51	675	180	86	36	1.5	914	8.3
Feb. 17-18	272	--	--	62	20	162		138	0	71	275	--	.15	--	781	1.06	574	235	122	60	4.6	1,290	8.2
Feb. 19-20	91.0	--	--	61	24	75		130	0	47	178	--	7.9	--	543	.74	133	250	144	39	2.1	898	8.2
Feb. 21-24	48.8	--	--	54	20	113		118	0	57	215	--	4.2	--	623	.65	62	215	120	53	3.4	1,060	7.8
Feb. 25-28	31.8	--	--	62	29	196		118	0	65	375	--	7.4	--	937	1.27	80	275	178	61	6.1	1,860	7.8

Mar. 1-5, 1957.....	13.2	--	--	74	16	183	128	0	44	350	--	6.0	--	821	1.12	29	250	145	62	5.1	1,460	7.8
Mar. 7-10.....	10.5	--	--	69	17	137	138	0	33	275	--	4.4	--	690	.94	20	240	129	55	3.8	1,220	7.9
Mar. 11-20.....	11.0	--	--	60	15	113	118	0	32	230	--	3.2	--	582	.79	17	210	116	54	3.4	1,050	7.3
Mar. 21-26.....	161	--	--	62	10	50	140	0	36	103	--	4.7	--	380	.52	165	198	82	36	1.5	662	7.9
Mar. 27-31.....	82.0	--	--	50	22	92	140	0	55	170	--	6.6	--	546	.74	121	215	102	48	2.7	915	7.7
Apr. 1-2.....	456	--	--	66	8.6	97	132	10	44	165	--	9.9	--	554	.75	682	200	76	51	3.0	895	8.6
Apr. 3-4.....	2,315	--	--	34	5.6	29	83	2	20	52	--	5.7	--	206	.28	1,280	108	96	37	1.2	367	8.4
Apr. 5-6.....	2,005	--	--	84	16	124	160	16	66	222	--	4.0	--	674	.82	3,650	273	118	49	3.2	1,100	8.8
Apr. 7-10.....	1,522	--	--	57	8.3	76	104	8	42	140	--	7.2	--	402	.55	1,650	176	18	49	2.6	693	8.6
Apr. 11-16.....	183	--	--	54	18	52	128	0	31	126	--	6.9	--	433	.59	214	210	103	35	1.6	702	7.9
Apr. 19-20.....	5,350	--	--	30	5.6	28	84	0	29	39	--	5.2	--	175	.24	2,530	98	29	38	1.2	296	7.7
Apr. 21-25.....	5,070	--	--	48	7.5	31	108	0	30	66	--	7.5	--	297	.40	4,070	151	62	31	1.1	465	7.9
Apr. 26-30.....	2,330	--	--	43	15	71	122	0	33	130	--	6.5	--	457	.62	2,870	168	68	48	2.4	706	7.9
May 1-2.....	3,910	--	--	34	6.6	24	90	0	24	44	--	5.1	--	221	.30	2,330	112	38	32	1.0	357	8.0
May 3-10.....	1,100	--	--	70	12	66	152	0	35	142	--	8.0	--	493	.67	1,480	225	100	39	1.9	808	7.9
May 11-15.....	1,359	--	--	74	5.7	64	144	0	37	132	--	6.6	--	460	.63	1,690	210	90	40	1.9	734	8.1
May 16-20.....	21,330	--	--	35	4.5	22	98	0	16	38	--	4.6	--	202	.27	11,630	106	26	31	.9	311	7.8
May 21-31.....	16,920	8.8	.09	34	7.1	20	98	0	21	36	.3	7.1	.09	202	.27	9,230	114	34	28	.8	329	6.9
June 1-5.....	23,380	--	--	32	4.4	14	92	0	12	26	--	4.6	--	152	.21	9,600	98	22	23	.6	257	7.3
June 6-8.....	6,703	--	--	62	9.1	28	162	0	26	52	--	5.7	--	311	.42	5,630	182	59	24	.9	509	7.7
June 9-10.....	15,800	--	--	24	3.9	12	72	0	11	20	--	4.0	--	127	.17	5,420	76	17	25	.6	213	7.2
June 11-17.....	22,990	--	--	31	5.0	18	95	0	13	30	--	4.3	--	160	.22	9,930	98	20	29	.8	270	6.9
June 18.....	10,200	--	--	50	9.0	26	144	0	25	48	--	7.7	--	286	.39	7,880	162	44	26	.9	430	7.6
June 19.....	19,200	--	--	30	4.6	16	90	0	8.6	29	--	5.4	--	176	.24	9,120	94	20	27	.7	265	7.4

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
VERDIGRIS RIVER NEAR LENAPAH, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃) (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Per-cent so-dium adsorp-tion ratio	So-dium conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
June 20, 1957.....	16,000	--	--	49	6.7	24		140	0	23	40	--	8.6	244	0.33	540	150	36	26	0.8	386	7.6
June 21-30.....	2,676	16	0.02	50	6.6	24		136	0	21	50	0.7	5.2	251	.34	6,240	152	40	25	.8	418	7.9
July 1-10.....	2,476	--	--	63	11	38		176	0	24	79	--	5.5	366	.50	2,640	205	60	29	1.2	586	8.1
July 11-20.....	235	--	--	67	15	64		188	0	58	107	--	2.6	424	.58	269	230	74	38	1.8	691	7.8
July 21-31.....	311	--	--	72	18	67		288	0	40	119	--	2.4	443	.60	372	250	65	37	1.9	748	7.8
Aug. 1-10.....	65.2	--	--	51	26	55		180	0	38	116	--	1.0	413	.56	73	230	84	34	1.6	740	7.2
Aug. 11-20.....	125	--	--	65	17	57		180	0	36	121	--	1.0	432	.59	146	230	84	35	1.6	745	7.9
Aug. 21-31.....	61.7	--	--	50	12	35		154	0	25	71	--	.6	295	.40	49	176	50	30	1.2	525	7.8
Sept. 1-10.....	9.78	--	--	56	11	35		164	0	23	72	--	1.0	298	.41	7.9	184	50	30	1.1	542	7.9
Sept. 11-20.....	56.0	--	--	57	12	43		170	0	26	83	--	1.1	322	.44	49	190	50	33	1.4	580	7.7
Sept. 21-30.....	414	--	--	72	14	64		182	0	39	130	--	1.7	447	.61	500	235	87	37	1.8	787	7.9
Weighted average...	2,550	--	--	39	6.4	23		b108	--	19	44	--	5.5	219	0.30	1,510	124	36	29	0.9	357	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR LENAPAH, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	63	46	45	40	50	58	68	70	78	90	85
2	73	59	47	42	40	50	60	69	68	80	90	82
3	72	59	47	42	39	51	58	68	68	81	90	83
4	--	57	50	44	40	53	56	68	68	83	87	80
5	71	57	55	42	42	52	--	68	72	82	85	84
6	73	58	50	45	--	50	58	70	73	83	81	78
7	72	58	40	41	--	44	54	74	78	86	84	72
8	69	54	37	45	55	45	52	72	79	87	85	78
9	--	54	38	40	54	50	55	72	75	90	86	78
10	67	57	38	37	51	50	60	69	74	--	87	78
11	67	54	43	38	50	60	57	68	74	--	--	78
12	72	56	40	40	54	60	49	--	75	--	86	75
13	--	59	--	--	55	63	48	71	75	--	89	77
14	--	60	--	34	52	58	48	74	74	--	93	73
15	--	56	41	--	50	--	51	75	79	--	94	75
16	--	52	42	35	50	57	51	70	79	--	87	--
17	72	48	41	36	50	56	55	73	80	90	79	--
18	70	50	40	40	51	56	58	67	79	90	84	73
19	69	53	42	37	48	57	63	70	76	91	85	75
20	70	51	45	--	46	56	65	69	80	93	86	76
21	67	49	45	46	50	54	65	69	80	93	88	72
22	69	49	46	43	44	53	65	70	78	94	87	72
23	68	48	43	37	45	53	66	66	73	90	84	72
24	--	48	43	38	49	50	68	67	73	92	85	72
25	67	48	42	38	48	47	69	68	75	89	84	72
26	68	47	41	38	47	49	65	70	75	92	85	73
27	62	46	44	35	50	53	66	72	76	90	83	73
28	63	43	45	37	--	54	67	70	78	92	85	73
29	67	42	45	37	--	60	68	71	--	90	85	70
30	60	43	47	36	--	60	--	70	76	91	85	70
31	60	--	46	37	--	56	--	71	--	90	85	--
Average	--	53	44	39	48	54	59	70	75	--	86	76

ARKANSAS RIVER BASIN--Continued
VERDIGRIS RIVER NEAR INOLA, OKLA.

LOCATION. --At gaging station at bridge on State Highway 33, 6 miles downstream from Dog Creek, and 6 miles west of Inola, Rogers County. DRAINAGE AREA. --7,911 square miles.

RECORDS AVAILABLE. --Chemical analyses: October 1947 to September 1957.

Water temperatures: October 1950 to September 1957.

EXTREMES 1956-57. --Dissolved solids: Maximum, 2,930 Oct. 11-13; minimum, 144 ppm May 17-20.

Hardness: Maximum, 560 ppm Oct. 11-13; minimum, 74 ppm May 17-20.

Specific conductance: Maximum daily, 5,610 micromhos Oct. 13; minimum daily, 167 micromhos June 14.

Water temperatures: Maximum, 89°F Aug. 13; minimum freezing point Jan. 14-18, 22-29.

EXTREMES 1947-57. --Dissolved solids: Maximum, 3,060 ppm Sept. 21-24, 1956; minimum, 91 ppm June 22-30, July 1-2, 1948.

Hardness: Maximum, 580 ppm Sept. 21-24, 1956; minimum, 48 ppm Oct. 4, 1953.

Specific conductance: Maximum daily, 6,030 micromhos Sept. 22, 1956; minimum daily, 143 micromhos June 24, 1948.

Water temperatures: Maximum, 95°F on several days during July, 1954; minimum freezing point on many days during winter months.

REMARKS. --Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year

October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-3, 7-10, 1956.....	7.36	--	--	120	34	635	194	194	24	1,160	--	5.0	--	2,260	3.07	45	440	224	76	13	4,000	7.6
Oct. 4-6.....	7.40	--	--	104	32	493	202	202	22	900	--	5.4	--	1,820	2.48	36	390	281	73	11	3,210	7.5
Oct. 11-13.....	8.87	--	--	140	51	934	210	210	21	1,700	--	5.0	--	2,930	3.98	70	560	388	78	17	5,040	7.9
Oct. 14.....	21.0	--	--	104	34	548	192	192	19	1,000	--	4.6	--	1,980	2.69	112	400	242	71	9.7	3,420	7.9
Oct. 15.....	72.0	--	--	80	24	352	202	202	22	620	--	4.6	--	1,300	1.77	253	300	134	72	8.8	2,320	7.9
Oct. 16-20.....	51.6	--	--	64	12	150	210	210	21	238	--	6.9	--	616	.84	86	210	38	61	4.5	1,160	7.6
Oct. 21-22.....	25.0	--	--	64	20	164	208	208	20	282	--	10	--	695	.95	47	240	70	60	4.6	1,300	7.9
Oct. 23-28.....	20.5	--	--	72	20	237	200	200	23	408	--	15	--	919	1.25	51	260	96	66	6.4	1,700	7.4
Oct. 29.....	18.0	--	--	92	26	391	192	192	26	700	--	18	--	1,480	2.01	72	335	178	72	9.3	2,630	7.8
Oct. 30.....	28.0	--	--	76	17	257	176	176	24	452	--	15	--	1,010	1.37	76	260	116	68	6.9	1,830	7.8
Oct. 31.....	55.0	--	--	68	15	183	170	27	27	315	--	19	--	778	1.06	116	230	90	63	5.2	1,410	7.7
Nov. 1.....	97.0	--	--	68	16	199	172	38	38	330	--	22	--	828	1.13	217	230	89	65	5.7	1,540	7.9
Nov. 2-3.....	44.0	--	--	52	15	110	152	42	42	170	--	26	--	540	.73	64	190	66	56	3.5	972	8.1
Nov. 4-10.....	54.7	--	--	46	8.5	81	122	33	33	125	--	25	--	411	.56	61	155	55	53	2.8	756	7.7
Nov. 11.....	14.0	--	--	48	11	97	116	36	36	160	--	22	--	478	.65	18	165	70	56	3.3	889	7.8
Nov. 12-13.....	11.5	--	--	52	12	139	122	37	37	230	--	23	--	561	.79	18	180	80	63	4.3	1,300	7.8
Nov. 14-15.....	11.0	--	--	70	18	275	124	36	36	490	--	21	--	1,020	1.39	30	230	148	70	7.6	1,950	7.9
Nov. 16-17.....	14.0	--	--	61	17	198	124	35	35	350	--	23	--	1,732	1.08	30	220	118	66	5.8	1,500	7.9

Nov. 18-20, 1956.	19.7	--	--	77	20	326	122	35	590	--	19	--	1,220	1.66	65	275	175	72	8.6	2,280	7.7
Nov. 21.....	78.0	--	--	82	23	373	124	35	680	--	16	--	1,380	1.85	286	300	198	73	9.4	2,500	7.9
Nov. 22-23.....	56.2	--	--	86	11	94	108	36	160	--	16	--	452	1.81	69	160	72	56	3.2	844	7.7
Nov. 26-29.....	18.8	--	--	67	15	224	108	37	410	--	14	--	884	1.20	45	230	142	68	6.4	1,670	7.8
Nov. 30.....	23.0	--	--	58	15	140	112	38	258	--	16	--	634	.86	39	205	113	60	4.2	1,160	7.3
Dec. 1-3.....	23.0	--	--	62	13	204	116	37	360	--	16	--	808	1.10	50	210	115	68	6.1	1,530	7.8
Dec. 4.....	21.0	--	--	57	22	417	126	36	760	--	18	--	1,450	1.97	82	320	216	74	10	2,730	8.1
Dec. 5-6.....	20.0	--	--	92	12	151	116	35	265	--	16	--	626	.85	34	190	95	63	4.8	1,170	7.8
Dec. 7.....	21.0	--	--	61	17	188	116	34	345	--	15	--	790	1.07	45	220	125	65	5.5	1,430	8.0
Dec. 8-9.....	61.5	--	--	83	24	414	108	32	760	--	14	--	1,470	2.00	244	305	216	75	10	2,710	7.7
Dec. 10.....	123	--	--	54	9.8	115	116	41	195	--	16	--	532	.72	177	175	80	59	3.8	978	7.9
Dec. 11-12.....	60.5	--	--	54	7.2	93	118	43	148	--	20	--	470	.64	77	164	68	55	3.2	828	8.0
Dec. 13-14.....	41.0	--	--	60	12	123	122	49	210	--	22	--	598	.81	66	198	98	57	3.8	1,080	8.0
Dec. 15-20.....	38.2	--	--	72	-8	175	120	49	325	--	34	--	837	1.14	86	255	156	60	4.8	1,460	7.9
Dec. 21-31.....	81.1	7.4	--	59	17	137	113	46	250	--	30	--	664	.90	145	215	122	56	4.1	1,180	7.7
Jan. 1-4, 1957...	64.8	--	--	78	20	171	176	38	320	--	16	--	803	1.09	140	275	132	57	4.5	1,350	7.9
Jan. 5-10.....	56.7	--	--	99	27	186	92	49	440	--	16	--	1,150	1.56	176	355	280	53	4.3	1,780	7.8
Jan. 11-20.....	39.6	--	--	97	31	202	134	40	460	--	12	--	1,180	1.60	126	370	260	54	4.6	1,830	7.5
Jan. 21-22.....	41.5	--	--	92	26	243	140	37	495	--	16	--	1,140	1.55	128	335	222	61	5.8	1,990	8.1
Jan. 23-31.....	59.7	--	--	76	16	142	132	42	280	--	22	--	750	1.02	121	255	148	55	3.9	1,300	7.1
Feb. 1-6.....	63.7	--	--	70	21	144	132	47	275	--	34	--	744	1.01	128	260	152	55	3.9	1,320	7.5
Feb. 7-8.....	87.0	--	--	93	20	270	124	44	520	--	28	--	1,160	1.58	272	315	214	65	6.6	2,050	8.1
Feb. 9-10.....	212	--	--	58	23	87	88	55	200	--	22	--	631	.86	361	240	168	44	2.4	1,040	8.1
Feb. 11-20.....	235	5.5	--	78	13	119	134	56	230	0.5	6.9	--	704	.96	447	250	140	51	3.3	1,130	7.5
Feb. 21-28.....	152	--	--	78	19	142	150	39	290	--	9.5	--	754	1.03	309	270	149	53	3.7	1,300	7.4
Mar. 1-10, 1957...	83.5	--	--	66	32	145	152	54	300	--	10	--	848	1.15	191	295	172	52	3.7	1,390	7.1
Mar. 11-20.....	61.8	--	--	74	40	216	154	59	440	--	11	--	1,120	1.52	187	350	222	57	5.0	1,840	7.9
Mar. 21-24.....	123	--	--	69	31	225	148	116	380	--	11	--	985	1.34	327	300	176	62	5.7	1,630	8.1
Mar. 25-31.....	815	--	--	59	22	127	128	114	200	--	7.5	--	618	.84	1,360	235	131	54	3.6	966	7.9
Apr. 1.....	5,040	--	--	61	10	78	b116	54	148	--	6.2	--	520	.71	7,080	195	100	47	2.4	811	8.3

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of 2 parts per million of carbonate (CO₃).

ARKANSAS RIVER BASIN--Continued
VERDIGRIS RIVER NEAR INOLA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₄)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per- cent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Apr. 2, 1957.....	4,540	--	--	63	14	114	100	100	47	235	--	1.0	--	1,060	0.90	8,090	215	133	54	3.4	1,060	7.5
Apr. 3.....	5,620	--	--	47	13	51	110	34	108	108	--	2.2	--	374	.51	5,680	170	80	39	1.7	5,680	7.7
Apr. 4.....	13,300	--	--	32	4.9	33	80	21	58	58	--	2.4	--	250	.34	8,980	100	34	42	1.4	377	8.1
Apr. 5-8.....	5,865	--	--	46	10	58	98	36	114	114	--	5.8	--	378	.51	5,990	158	78	44	2.0	627	8.1
Apr. 9.....	3,460	--	--	74	15	79	162	45	165	165	--	6.0	--	586	.80	5,470	245	112	41	2.2	904	8.2
Apr. 10.....	1,870	--	--	61	10	66	126	33	137	137	--	8.4	--	488	.66	2,460	195	92	42	2.0	740	8.2
Apr. 11-18.....	1,286	--	--	63	10	65	126	41	132	132	--	8.4	--	468	.64	1,620	198	94	42	2.0	743	7.9
Apr. 19-27.....	22,450	--	--	31	5.5	25	80	21	46	46	--	3.4	--	212	.29	12,850	100	34	35	1.1	344	7.5
Apr. 28-30.....	7,767	--	--	51	9.0	47	108	33	98	98	--	6.2	--	377	.51	7,910	164	76	38	1.6	586	8.2
May 1.....	9,850	--	--	50	8.5	39	112	29	82	82	--	7.8	--	352	.48	9,360	160	68	34	1.3	535	8.1
May 2-4.....	21,000	--	--	28	5.6	21	76	18	39	39	--	3.2	--	196	.27	11,110	93	30	33	.9	300	7.5
May 5-11.....	6,410	--	--	45	10	31	121	25	65	65	--	5.5	--	315	.43	5,450	154	55	30	1.1	484	7.6
May 12-16.....	8,902	--	--	46	9.0	44	112	25	90	90	--	4.2	--	340	.46	8,170	152	60	39	1.6	532	7.7
May 17-20.....	34,650	--	--	24	3.4	19	70	10	31	31	--	3.5	--	144	.20	13,470	74	16	35	.9	243	7.6
May 21-31.....	53,480	8.0	0.06	24	5.1	14	74	14	26	26	0.2	3.3	0.04	145	.20	20,940	81	20	27	.7	236	6.9
June 1-10.....	35,360	--	--	33	4.3	19	92	12	35	35	--	3.5	--	182	.25	17,380	100	24	29	.8	296	7.6
June 11-20.....	51,990	12	.06	26	6.8	15	77	12	29	29	.9	3.7	.35	156	.21	21,900	93	30	26	.7	245	7.5
June 21-31.....	36,850	--	--	31	5.2	20	92	11	37	37	--	3.1	--	189	.26	18,800	99	24	30	.9	289	7.8
July 1-10.....	15,260	--	--	44	6.1	22	128	15	41	41	--	2.3	--	232	.32	9,560	135	30	26	.8	378	7.7
July 11-13.....	8,680	--	--	45	6.2	18	144	15	30	30	--	2.3	--	194	.26	4,550	138	20	22	.7	360	7.5
July 14-20.....	2,503	--	--	59	12	45	170	27	88	88	--	3.2	--	349	.47	2,360	196	56	33	1.4	590	7.5
July 21-31.....	567	--	--	74	13	66	182	35	132	132	--	2.9	--	464	.63	710	240	82	37	1.8	785	7.3
Aug. 1-9.....	362	--	--	72	16	82	172	48	160	160	--	5.9	--	531	.72	519	245	103	42	2.3	884	7.4
Aug. 10-16.....	186	--	--	78	19	115	182	36	228	228	--	5.8	--	677	.92	358	270	114	48	3.0	1,090	7.7
Aug. 17-20.....	389	--	--	66	14	66	166	36	132	132	--	6.2	--	471	.64	495	220	86	39	1.9	777	7.5
Aug. 21-31.....	286	--	--	78	20	90	194	40	190	190	--	4.6	--	573	.80	442	275	117	42	2.4	968	7.5
Sept. 1-10.....	162	--	--	74	15	90	190	30	180	180	--	4.0	--	550	.75	241	250	92	44	2.5	958	7.3
Sept. 11-20.....	745	--	--	70	16	81	152	46	172	172	--	4.6	--	540	.73	1,090	240	118	42	2.3	922	7.7
Sept. 21-27.....	383	--	--	82	17	113	158	51	238	238	--	4.0	--	655	.89	677	275	146	47	3.0	1,120	7.7
Sept. 28-30.....	441	--	--	70	14	84	170	31	170	170	--	3.8	--	515	.70	613	230	92	44	2.4	895	7.8
Weighted average	7,305	--	--	31	5.9	21	88	15	41	41	--	3.7	--	195	0.27	3,850	102	30	31	0.9	313	--

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

VERDIGRIS RIVER NEAR INOLA, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	60	47	41	34	48	49	57	68	80	88	84
2	72	60	48	41	36	44	51	58	66	81	88	84
3	72	60	48	40	36	46	48	56	66	82	88	84
4	76	60	49	39	37	46	46	57	68	82	88	84
5	76	--	49	37	38	48	48	59	68	80	88	83
6	76	64	49	39	39	46	48	60	70	82	86	83
7	74	58	49	39	39	42	48	62	70	83	85	83
8	74	54	46	39	40	41	48	64	74	84	86	79
9	74	54	47	36	42	41	48	66	--	84	86	78
10	74	54	47	34	40	40	49	64	74	84	87	78
11	74	51	47	33	46	46	46	--	72	85	88	76
12	--	51	44	35	46	52	48	64	--	84	--	74
13	74	51	40	33	47	57	--	64	71	--	89	74
14	--	51	44	32	48	48	50	65	72	85	88	75
15	72	45	44	32	48	46	51	65	76	85	--	74
16	--	45	37	32	46	49	53	65	78	85	88	72
17	70	48	37	32	46	49	53	63	72	85	86	74
18	70	46	38	32	46	50	55	61	76	86	86	71
19	68	46	39	33	46	58	52	61	76	86	--	74
20	68	42	39	33	46	50	52	61	76	86	84	70
21	68	44	39	34	46	46	53	61	76	86	83	70
22	--	44	40	32	41	46	54	61	76	86	82	70
23	68	44	38	32	44	47	54	62	76	86	82	70
24	68	42	40	32	42	47	52	61	77	86	83	69
25	68	42	40	32	42	46	57	64	74	86	84	68
26	64	40	40	32	42	47	55	66	74	86	84	68
27	66	49	40	32	44	46	58	66	76	--	84	67
28	66	49	40	32	46	47	57	68	77	87	84	66
29	66	47	39	32	--	47	60	68	79	88	84	66
30	62	48	41	33	--	48	59	68	79	87	84	66
31	61	--	41	33	--	48	--	70	--	87	84	--
Average	70	50	43	34	43	47	52	63	73	85	86	75

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER NEAR LANGLEY, OKLA.

LOCATION.--At gaging station at bridge on State Highway 82, 1½ miles southwest of Langley, Mayes County, 4.1 miles downstream from Pennsacola Dam, and 5.8 miles upstream from Big Cabin Creek.

DRAINAGE AREA.--10,335 square miles.

RECORDS AVAILABLE.--Chemical analyses.

Water temperatures: May 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 293 ppm Nov. 22; minimum, 128 ppm June 11-20.

Hardness: Maximum, 170 ppm Nov. 22; minimum, 78 ppm June 1-10.

Specific conductance: Maximum daily, 508 micromhos Nov. 22; minimum, 188 micromhos June 1-10.

Water temperatures: Maximum, 84°F Aug. 10; minimum, freezing point Jan. 27.

EXTREMES, May 1956 to September 1957.--Dissolved solids: Maximum, 293 ppm Nov. 22, 24-30, 1956; minimum, 128 ppm June 11-20, 1957.

Hardness: Maximum, 170 ppm Nov. 22, 24-30, 1956; minimum, 78 ppm June 1-10, 1957.

Specific conductance: Maximum daily, 508 micromhos Nov. 22, 1956; minimum daily, 148 micromhos Apr. 23, 1957.

Water temperatures: Maximum, 88°F Aug. 9, 1956; minimum, freezing point Jan. 27, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1956...	56.4	10	0.02	45	7.7	12	3.5	118	51	14	0.2	1.0	0.10	203	0.28	31	144	48	15	0.4	335	7.5
Oct. 11-20.....	57.4	--	--	46	6.6	15	--	123	51	14	--	2.2	--	203	28	31	142	41	19	6	335	7.4
Oct. 21-31.....	62.7	--	--	46	6.6	19	--	124	51	19	--	1.9	--	206	28	35	142	40	22	7	338	7.3
Nov. 1-10.....	64.8	9.0	.02	49	6.7	8.7	3.2	118	53	14	2	1.6	.08	204	28	36	150	54	11	3	341	7.6
Nov. 11-20.....	61.6	--	--	48	6.8	18	--	121	51	23	--	2.6	--	213	29	35	148	49	21	6	374	7.6
Nov. 21, 23-30....	62.5	--	--	47	6.4	13	--	123	50	12	--	2.8	--	194	26	33	144	43	17	5	337	7.8
Nov. 22.....	62.5	--	--	54	8.6	34	--	118	51	66	--	3.1	--	293	40	49	170	74	31	1.2	508	7.8
Dec. 1-10.....	451	7.2	.00	48	5.4	12	3.2	124	47	17	1	2.0	.08	203	28	247	142	40	15	4	346	8.1
Dec. 11-20.....	552	--	--	47	7.4	13	--	123	52	13	--	2.9	--	196	27	292	148	47	16	5	344	7.5
Dec. 21-31.....	1,172	--	--	48	6.1	3.7	--	124	29	14	--	2.3	--	205	28	649	145	44	5	1	342	7.4
Jan. 1-10, 1957...	188.7	5.5	.00	43	7.9	13	--	126	52	16	4	3.5	.04	210	29	30	152	49	16	5	353	7.9
Jan. 11-20.....	182	--	--	50	6.6	8.7	--	122	48	16	--	1.9	--	212	29	104	152	52	11	3	345	7.4
Jan. 21-31.....	1,406	--	--	52	6.9	5.3	--	124	46	13	--	2.0	--	206	28	781	158	56	7	2	338	7.4
Feb. 1-10.....	355	5.0	.01	50	8.5	12	--	127	50	13	3	2.6	.04	204	28	196	160	56	14	4	345	7.2
Feb. 11-20.....	2,944	--	--	49	8.1	6.7	--	128	46	11	--	2.3	--	198	27	1,570	156	51	9	2	334	7.6
Feb. 21-28.....	2,195	--	--	54	4.7	6.7	--	124	48	11	--	2.0	--	209	28	1,240	154	52	9	2	340	7.6
Mar. 1-10.....	2,094	6.4	.00	48	6.8	11	--	128	48	14	3	3.3	.06	209	28	1,180	144	43	14	4	339	7.9
Mar. 11-20.....	2,409	--	--	58	2.8	6.9	--	128	47	11	--	1.9	--	197	27	1,280	150	51	9	2	334	8.1
Mar. 21-31.....	1,559	--	--	48	8.3	7.8	--	132	43	10	--	4.8	--	198	27	833	154	46	10	3	330	8.0

Apr. 1-10, 1957...	6,214	5.2	.00	48	5.8	12	--	126	46	13	.3	3.9	--	205	0.28	3,440	144	40	15	.4	339	8.0
Apr. 11-20	8,640	--	--	46	4.6	12	--	116	43	12	--	3.9	--	198	.27	4,620	134	39	16	.4	330	7.7
Apr. 21-30	16,630	--	--	44	1.7	7.4	--	100	31	9.9	--	5.4	--	169	.23	7,590	117	35	12	.3	272	7.6
May 1-10	11,780	8.0	.00	38	4.6	8.1	--	94	34	8.8	.2	10	--	165	.22	5,250	114	37	13	.3	265	7.5
May 11-20	9,072	--	--	42	1.7	5.3	--	96	26	9.6	--	5.3	--	162	.22	3,970	112	34	9	.2	259	7.4
May 21-31	76,070	--	--	32	3.6	10	--	76	30	14	--	2.6	--	148	.20	30,400	95	30	19	.5	227	7.4
June 1-10	41,120	11	.08	27	2.6	6.2	--	71	22	7.0	.5	5.7	.12	132	.18	14,660	78	20	15	.3	188	7.0
June 11-20	39,630	--	--	28	3.4	8.3	--	78	25	5.6	--	4.9	--	128	.17	13,700	84	20	18	.4	207	7.2
June 21-30	16,710	--	--	23	3.4	7.1	--	78	23	5.7	--	4.5	--	133	.18	6,000	84	20	16	.3	205	7.3
July 1-10	14,430	11	.06	29	3.8	6.2	--	79	26	6.5	.3	5.5	.14	138	.19	5,380	88	24	13	.3	199	7.4
July 11-20	11,340	--	--	30	3.9	7.8	--	82	23	8.3	--	7.0	--	134	.18	4,100	91	24	16	.4	212	7.1
July 21-31	4,920	--	--	31	4.0	9.2	--	85	24	9.7	--	7.7	--	140	.19	1,860	94	24	18	.4	235	6.7
Aug. 1-10	2,258	10	.05	32	4.4	6.9	--	90	25	7.6	.3	6.3	.29	156	.21	951	98	24	13	.3	225	7.3
Aug. 11-20	2,187	--	--	34	4.4	6.2	--	94	21	8.4	--	6.6	--	143	.19	844	103	26	12	.3	228	7.2
Aug. 21-31	2,793	--	--	32	5.4	9.0	--	96	23	10.4	--	6.0	--	143	.19	1,080	102	24	16	.4	233	7.1
Sept. 1-10	2,154	8.5	.01	34	4.9	7.6	--	98	26	8.2	.1	4.6	.16	163	.22	948	105	24	14	.3	239	7.4
Sept. 11-20	3,174	--	--	34	5.1	7.8	--	100	23	9.5	--	4.5	--	144	.20	1,230	106	24	14	.3	244	6.9
Sept. 21-30	2,239	--	--	35	5.0	9.0	--	104	25	9.6	--	3.9	--	146	.20	883	108	23	15	.4	248	6.9
Weighted average	8,096	--	--	33	3.6	9.4	--	86	29	9.8	--	4.6	--	149	0.20	3,260	98	27	17	0.4	233	--

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER NEAR LANGLEY, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	60	49	44	40	43	--	60	66	73	76	74
2	70	63	45	43	40	44	--	60	67	73	--	77
3	72	58	45	40	42	45	50	58	68	71	77	76
4	73	58	50	43	43	49	49	62	67	74	79	78
5	73	56	55	43	43	48	46	60	67	73	76	--
6	70	57	54	44	42	44	48	62	66	78	75	77
7	87	50	49	44	44	42	50	60	67	76	77	75
8	86	56	40	43	44	42	50	60	69	73	76	70
9	--	57	37	39	44	48	49	60	69	76	76	75
10	75	53	40	38	48	41	48	58	73	78	84	75
11	65	55	44	37	43	42	46	60	69	79	80	75
12	65	58	43	37	43	45	48	60	70	76	82	75
13	73	59	--	39	42	45	47	58	--	76	--	75
14	70	59	--	35	44	45	48	60	70	76	79	74
15	65	--	46	40	44	45	49	60	71	75	75	74
16	68	55	46	35	41	44	46	60	71	75	76	76
17	69	53	45	37	44	46	50	60	72	75	--	75
18	62	52	45	37	--	47	--	60	72	--	75	75
19	67	50	45	39	43	46	52	65	72	76	76	75
20	66	55	--	40	41	--	53	65	72	76	76	74
21	65	50	47	38	44	40	57	--	73	78	76	74
22	65	49	46	41	43	46	54	--	72	76	--	75
23	64	52	45	35	43	49	58	64	74	76	75	75
24	66	--	44	39	43	47	56	64	--	78	77	74
25	67	--	44	39	45	48	54	67	74	78	76	74
26	63	--	44	34	45	44	54	65	73	76	78	73
27	60	--	44	32	43	44	56	65	75	82	--	74
28	60	--	--	--	43	45	58	65	75	80	75	72
29	63	--	44	--	--	47	58	66	75	--	76	74
30	60	--	46	37	--	46	60	66	75	--	75	73
31	61	--	45	--	--	--	--	66	--	76	74	--
Average	61	--	45	39	43	45	52	62	71	76	77	75

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER NEAR CHOUTEAU, OKLA.

LOCATION.--At bridge on country road between Locust Grove and Pryor, 5 miles upstream from Pryor Creek, and 7½ miles northeast of Chouteau, Mayes County.

DRAINAGE AREA.--11,546 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1955, October 1956 to September 1957.

Water temperatures: October 1950 to September 1951.

EXTREMES.--1950-51, Dissolved solids: Maximum, 215 ppm May 21-31; minimum, 134 ppm Feb. 18-20.

Hardness: Maximum, 137 ppm Apr. 1-10, May 21-31; minimum, 68 ppm Feb. 21-23.

Specific conductance: Maximum daily, 382 micromhos May; minimum daily, 145 micromhos Oct. 4.

Water temperatures: Maximum, 85°F July 31, Aug. 5, 6, 14, 19-20, 31, Sept. 2, 3; minimum, freezing point Dec. 6, Jan. 10, 30, 31, Feb. 1.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Oct. 29, 1956.....	70.0	40	5.8	13	95		17	124	46	19	0.5	315	7.8
Dec. 6.....	1.74	48	6.3	8.2	126		12	146	42	11	.3	330	7.6
Jan. 7, 1957.....	--	40	5.8	12	48		25	124	84	17	.5	358	7.3
Feb. 7.....	200	50	6.1	8.6	126		11	150	46	11	.3	345	7.3
Mar. 4.....	140	44	6.3	10	50		8.0	136	95	14	.4	333	6.7
Apr. 8.....	7,200	46	6.1	7.8	112		11	140	48	11	.3	321	7.5
May 6.....	9,500	39	4.5	5.8	92		8.7	116	40	10	.2	266	6.6
June 13.....	1,640	23	3.0	3.6	0		4.4	70	70	9	.2	175	3.6
July 29.....	908	38	3.6	5.4	97		8.8	110	30	9	.2	251	6.5
Sept. 5.....	5,400	28	5.8	5.4	83		7.2	89	20	11	.2	205	7.2

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR, NEAR FORT GIBSON, OKLA.

LOCATION.--Immediately below dam on Neosho (Grand) River, 1.1 miles upstream from gaging station and 4 miles north of Fort Gibson, Wagoner County. DRAINAGE AREA.--12,492 square miles above sampling station, 12,495 square miles above gaging station.

RECORDS AVAILABLE.--Chemical analyses; October 1951 to September 1957.

Water temperatures: October 1951 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 224 ppm Mar. 1-31; minimum, 128 ppm June 1-10.

Hardness: Maximum, 158 ppm Jan. 1-31; minimum, 82 ppm June 1-10.

Specific conductance: Maximum daily, 417 micromhos Oct. 7; minimum daily, 176 micromhos June 20.

Water temperatures: Maximum, 86°F July 26 to Aug. 3; minimum, 38°F Jan. 28.

EXTREMES, 1951-57.--Dissolved solids: Maximum, 233 ppm Nov. 1-30, 1952; minimum 128 ppm June 1-10, 1957.

Hardness: Maximum, 171 ppm Dec. 1-31, 1952; minimum 82 ppm June 1-10, 1957.

Specific conductance: Maximum daily, 424 micromhos Feb. 16, 1953; minimum daily, 176 micromhos June 20, 1957.

Water temperatures: Maximum, 89°F July 31, Aug. 1, 1955, Aug. 15, 1956; minimum, 34°F Dec. 21, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records for discharge for gaging station near Fort Gibson for water year October 1956 to September 1957 given in WSP 1511. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption	Specific conductance (micromhos at 25°C)
													Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate		
Oct. 1-31, 1956...	128	5.0	0.02	46	7.5	13	2.2	126	46	18	0.2	1.4	201	0.27	146	42	16	357
Nov. 1-30.....	310	8.0	0.03	46	8.5	13	3.2	124	47	16	3	1.3	204	0.28	171	48	16	345
Dec. 1-31.....	513	7.2	0.07	47	6.0	12	3.5	126	50	15	1	1.8	205	0.28	150	38	15	346
Jan. 1-31, 1957...	487	5.0	0.00	50	8.0	14	--	130	50	16	3	1.7	219	0.30	142	52	16	359
Feb. 1-28.....	2,344	5.5	0.00	50	6.6	15	--	129	50	19	3	2.4	216	0.29	152	46	18	366
Mar. 1-31.....	2,120	5.0	0.00	46	7.1	17	--	124	48	19	2	4.8	234	0.30	144	42	20	367
Apr. 1-30.....	13,490	4.8	0.00	38	6.6	12	--	106	38	14	2	6.0	181	0.25	122	35	18	297
May 1-31.....	42,130	8.4	0.01	34	4.6	8.2	--	90	30	8.5	3	6.5	156	0.21	104	30	15	244
June 1-10.....	48,180	13	0.05	26	4.1	6.4	--	74	21	7.8	3	5.0	128	0.17	82	22	15	192
July 1-31.....	22,640	12	0.03	28	4.3	6.2	--	83	22	7.2	1	4.9	134	0.18	90	22	13	204
Aug. 1-31.....	2,460	8.7	0.01	31	4.5	8.6	--	90	24	11	0	3.9	149	0.20	96	22	16	231
Sept. 1-30.....	2,863	5.8	0.02	33	4.3	8.9	--	94	25	11	0	3.7	152	0.21	100	23	16	237
Weighted average	11,500	10	0.03	31	4.8	7.9	--	86	27	9.1	0.2	5.3	147	0.20	97	26	15	229

ARKANSAS RIVER BASIN--Continued

NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR NEAR FORT GIBSON, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	64	49	44	40	46	52	65	70	77	86	80
2	73	64	49	44	40	46	52	65	70	78	86	80
3	72	62	49	44	40	46	54	66	70	78	86	81
4	73	62	50	45	41	46	54	65	70	80	84	81
5	73	62	50	45	40	47	--	63	70	80	83	81
6	72	62	52	45	41	47	52	63	72	74	82	80
7	72	61	51	45	42	46	52	64	74	76	81	78
8	--	59	50	45	43	--	52	64	72	80	82	78
9	71	59	46	46	44	46	54	65	72	80	82	77
10	71	58	46	43	44	47	54	66	72	82	82	78
11	70	58	46	44	44	48	55	66	74	82	82	78
12	71	58	47	43	45	49	--	66	75	83	82	77
13	70	58	46	42	45	50	56	67	74	84	82	78
14	70	57	46	42	45	50	56	67	77	84	84	76
15	70	59	46	43	45	50	57	67	75	84	82	75
16	69	57	46	40	45	50	--	68	74	84	82	75
17	69	56	46	40	45	50	58	68	74	85	81	75
18	69	56	46	39	45	50	--	68	76	85	81	74
19	69	56	46	40	46	50	58	68	76	85	81	74
20	69	57	46	42	46	50	58	68	76	84	80	74
21	68	55	46	43	46	50	--	69	75	84	80	74
22	68	53	46	42	46	52	--	70	75	83	80	73
23	68	52	46	40	46	50	59	69	75	84	80	73
24	68	52	45	41	46	50	60	69	75	85	80	73
25	--	52	45	42	46	49	60	68	75	84	80	74
26	66	50	45	42	46	48	60	68	75	86	80	73
27	66	51	45	40	47	49	62	68	76	86	80	73
28	66	50	46	38	48	49	--	69	76	86	80	72
29	65	50	45	39	--	50	--	69	76	86	80	72
30	65	49	45	39	--	51	64	70	76	86	80	72
31	64	--	45	39	--	51	--	70	--	86	80	--
Average	69	57	47	42	44	49	--	67	74	83	82	76

ARKANSAS RIVER BASIN--Continued
ARKANSAS RIVER AT WEBBERS FALLS, OKLA.

LOCATION.--At bridge on U.S. Highway 64 at Webbers Falls, Muskogee County.

DRAINAGE AREA.--97,049 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949, October 1956 to September 1957.

Water temperatures: October 1948 to September 1957: Maximum, 3,500 ppm Nov. 2-3; minimum, 207 ppm May 27-29.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 3,500 ppm Nov. 2-3; minimum, 207 ppm May 27-29.

Hardness: Maximum, 650 ppm Nov. 2-3; minimum, 104 ppm June 17-19.

Specific conductance: Maximum daily, 6,070 micromhos Nov. 2; minimum daily, 344 micromhos May 27-28.

Water temperatures: Maximum, 88°F July 18; minimum, 34°F Jan. 16-18, 27.

EXTREMES, 1948-49, 1956-57.--Dissolved solids: Maximum, 3,500 ppm Nov. 2-3, 1956; minimum, 207 ppm May 27-29, 1957.

Hardness: Maximum, 650 ppm Nov. 2-3, 1956; minimum, 104 ppm June 17-19, 1957.

Specific conductance: Maximum daily, 6,070 micromhos Nov. 2, 1956; minimum daily, 344 micromhos May 27-28, 1957.

Water temperatures: Maximum, 88°F July 18, 1957; minimum, freezing point Jan. 20, 1949.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Per-cent so-ad-sorp-tion ratio	Specific conductance (micro-mhos at 25° C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-6, 1956			70	21	242		136	0	91	410	--	1.2	--	923	1.26	454	260	148	67	6.5	1,730	7.5
Oct. 7-8			86	24	389		128	0	119	660	--	1.8	--	1,360	1.85	367	315	210	73	9.5	2,520	7.6
Oct. 9-10			104	31	542		118	0	148	930	--	2.3	--	1,860	2.53	495	385	238	75	12	3,370	7.5
Oct. 11-15			102	32	545		132	0	143	930	--	2.0	--	1,860	2.53	495	385	277	75	12	3,370	7.5
Oct. 16-17, 19			84	26	375		144	0	104	640	--	1.1	--	1,340	1.82	1,360	315	197	72	9.2	2,460	7.4
Oct. 18, 20			74	21	268						--	1.1	--	1,010	1.37	1,160	270	156	68	7.1	1,900	7.5
Oct. 21-23			75	18	261		144	0	84	460	--	1.6	--	1,020	1.39	1,020	260	142	69	7.0	1,880	7.7
Oct. 24-26			99	27	483				121	850	--	3.3	--	1,730	2.35	1,900	360	246	74	11	3,150	7.6
Oct. 27-30			94	24	412		140	0	99	730	--	2.0	--	1,510	2.05	1,260	335	220	73	9.8	2,730	7.5
Oct. 31			122	28	556		150	0	119	1,000	--	4.5	--	2,010	2.73	2,810	420	297	74	12	3,530	7.7
Nov. 1			147	42	761		114	0	142	1,400	--	4.0	--	2,720	3.70	3,750	540	446	75	14	4,740	7.6
Nov. 2-3			192	42	996		96	0	152	1,800	--	3.0	--	3,500	4.76	5,340	650	572	77	17	6,020	7.4
Nov. 4-5			110	33	549		140	0	105	975	--	3.2	--	1,940	2.64	2,810	410	296	74	12	3,510	7.7
Nov. 6-8			91	20	357		150	0	87	620	--	2.2	--	1,340	1.82	3,720	310	187	71	8.8	2,420	7.6
Nov. 9-10			85	18	250		176	0	74	440	--	3.2	--	1,020	1.39	2,400	285	141	66	6.4	1,840	7.9
Nov. 11-15			88	17	286		150	0	80	500	--	3.0	--	1,100	1.50	1,850	290	167	68	7.3	2,000	8.0
Nov. 16-17			112	28	420		174	0	88	760	--	2.9	--	1,600	2.18	3,050	395	252	70	9.2	2,830	8.0
Nov. 18-20			98	23	298		188	0	76	535	--	1.4	--	1,190	1.62	1,840	340	186	66	7.0	2,170	8.1
Nov. 21-23			80	20	206		180	0	66	362	--	1.4	--	858	1.17	1,330	280	132	82	5.3	1,590	8.0
Nov. 24-30			96	20	282		194	0	79	490	--	1.6	--	1,110	1.51	1,540	320	161	66	6.9	2,020	7.9

Dec. 1, 1956.....	81	21	215	178	14	73	370	--	2.2	--	907	1.23	1,310	280	120	62	5.5	1,650	8.5
Dec. 2-9.....	85	21	270	178	0	83	470	2.3	2.3	--	1,080	1.47	1,540	300	154	66	6.8	1,970	7.9
Dec. 10.....	78	16	207	156	0	74	350	--	1.4	--	853	1.16	1,400	280	132	63	5.6	1,540	8.2
Dec. 11-13.....	80	18	245	172	0	74	410	--	3.3	--	950	1.29	2,180	275	134	66	6.4	1,740	8.1
Dec. 14-15.....	84	22	315	154	0	85	530	--	5.6	--	1,180	1.60	3,070	300	174	70	7.9	2,150	8.2
Dec. 16-20.....	70	17	153	162	2	63	272	--	2.4	18	699	.95	1,270	245	108	58	4.3	1,280	8.3
Dec. 21-22.....	96	17	303	168	0	82	540	--	3.8	--	1,230	1.67	3,980	310	172	68	7.5	2,180	8.2
Dec. 23-25.....	78	16	199	164	0	71	350	--	3.0	--	863	1.17	2,490	260	126	62	5.4	1,550	8.2
Dec. 26-29.....	92	20	259	180	0	78	455	--	2.9	--	1,060	1.44	3,320	310	162	65	6.4	1,910	8.2
Dec. 27-28, 30-31..	80	15	212	182	0	69	380	--	2.9	--	921	1.25	2,830	260	127	64	5.7	1,660	7.9
Jan. 1-4, 1957.....	80	18	226	160	0	74	410	--	2.4	25	955	1.30	3,020	275	144	64	5.9	1,730	8.1
Jan. 5-8.....	74	13	187	148	0	71	330	--	2.8	19	821	1.12	2,220	240	118	63	5.2	1,470	8.2
Jan. 9-10.....	84	18	261	156	0	82	480	--	3.0	--	1,070	1.46	2,800	285	157	67	6.7	1,900	8.1
Jan. 11-17.....	96	17	236	178	0	91	400	--	2.6	26	958	1.30	1,730	285	139	64	6.1	1,750	8.2
Jan. 18-20.....	92	21	307	190	0	88	500	--	3.7	--	1,140	1.55	1,560	315	180	68	7.5	2,090	8.2
Jan. 21-22.....	82	12	221	156	0	79	385	--	4.9	--	895	1.22	1,320	255	127	65	6.0	1,670	8.0
Jan. 23-27.....	57	12	171	112	0	55	285	--	3.6	--	689	.85	1,850	180	98	66	5.4	1,300	7.9
Jan. 28, 29.....	84	11	220	162	0	71	360	--	4.3	--	899	1.22	2,500	255	122	65	6.0	1,640	8.0
Jan. 30, 31.....	97	14	163	156	0	58	280	--	4.6	--	705	.96	2,360	225	97	61	4.7	1,300	8.0
Jan. 27-28.....	74	16	169	176	0	62	300	--	1.2	--	744	1.01	1,700	250	106	60	4.6	1,360	8.0
Feb. 1-5.....	61	11	125	136	0	54	215	--	5.5	--	562	.76	2,920	186	84	58	3.9	1,040	8.1
Feb. 6-7.....	46	8.5	70	114	0	47	110	--	2.5	--	347	.47	1,690	150	56	50	2.5	656	7.9
Feb. 8-9.....	56	9.8	108	128	0	52	175	--	3.7	--	482	.66	2,160	180	75	57	3.5	899	7.9
Feb. 10.....	69	12	165	136	0	60	300	--	4.0	--	732	1.00	2,430	220	108	65	5.4	1,310	8.1
Feb. 11, 13-15.....	55	9.5	83	134	0	54	128	--	2.2	--	412	.56	3,060	176	66	51	2.7	744	8.0
Feb. 12, 16, 19.....	66	13	142	136	0	64	260	--	2.8	--	655	.89	6,840	220	108	58	4.2	1,200	8.0
Feb. 17-18, 20.....	57	9.7	81	126	0	57	140	--	4.6	--	430	.58	4,280	182	78	49	2.6	798	7.9
Feb. 21-23.....	62	9.8	101	134	0	59	176	--	3.5	.00	506	.69	6,600	195	85	53	3.1	919	7.9
Feb. 24.....	52	7.4	46	130	0	54	75	--	3.0	--	318	.43	1,430	160	54	38	1.6	561	8.0
Feb. 25-27.....	59	13	95	136	0	59	170	--	4.0	.00	498	.68	6,040	200	88	51	2.9	900	7.9
Feb. 28.....	53	6.8	43	128	0	46	70	--	2.9	--	312	.42	3,410	160	55	37	1.5	545	8.1

a Values above 200 ppm are reported to the nearest 5 ppm.

May 19, 1957.....	50	4.6	98	128	0	39	148	--	4.0	--	449	.61	283,700	144	39	60	3.5	797	8.2
May 20.....	67	9.0	173	122	2	96	265	--	4.8	--	756	1.03	492,300	215	100	66	5.3	1,300	8.3
May 21-22.....	50	7.1	105	124	0	50	160	--	3.6	--	432	.61	250,800	134	52	60	3.7	842	8.0
May 23-25.....	40	4.9	65	110	0	29	98	--	3.6	--	318	.43	179,700	120	30	54	2.6	568	7.9
May 26	46	5.6	78	108	0	48	118	--	3.6	--	389	.53	375,000	138	50	55	2.9	694	8.1
May 27-29	35	4.5	34	92	0	30	50	--	3.8	--	207	.28	135,600	106	30	41	1.4	382	7.9
May 30-31.....	38	5.1	50	92	0	40	74	--	3.7	--	275	.37	112,900	116	40	48	2.0	486	7.9
June 1	42	5.6	55	100	0	45	82	--	3.5	--	303	.41	130,900	128	46	48	2.1	548	8.0
June 2-5	50	5.6	93	116	0	51	142	--	3.9	--	440	.60	178,000	148	53	58	3.3	772	7.9
June 6	53	8.3	132	124	0	57	205	--	4.5	--	569	.77	224,300	166	64	63	4.5	1,010	8.2
June 7-10	46	6.1	77	114	0	46	115	--	3.7	--	381	.52	141,800	140	46	54	2.8	687	7.9
June 11	43	7.9	70	112	0	41	108	--	5.6	--	358	.49	133,400	140	48	52	2.6	625	8.1
June 12	58	11	126	136	0	61	200	--	5.6	--	580	.79	241,200	188	76	59	4.0	994	7.5
June 13-14	46	7.1	80	118	0	49	118	--	4.5	--	396	.54	164,700	144	48	55	2.9	687	8.1
June 15-16	39	3.5	45	104	0	35	60	--	4.2	--	260	.35	115,100	112	27	47	1.8	443	8.0
June 17-19	34	4.6	34	90	0	29	51	--	3.5	--	230	.31	102,000	104	30	42	1.5	378	8.0
June 20	51	10	87	120	0	63	135	--	3.7	--	473	.64	209,400	168	70	53	2.9	772	8.2
June 21-30	45	8.1	71	112	0	50	108	.5	2.9	.15	382	.52	159,800	146	54	51	2.6	645	7.7
July 1-4	43	8.4	51	124	0	34	80	--	3.0	--	296	.40	110,400	142	40	44	1.9	536	8.0
July 5-10	51	9.0	78	120	0	60	121	--	3.9	--	389	.53	120,800	164	66	51	2.7	715	8.0
July 11-14	54	14	61	128	0	66	104	.4	3.6	.22	404	.55	77,720	192	87	41	1.9	740	8.2
July 15-20	77	21	131	162	0	116	218	.6	2.6	.16	753	1.02	45,890	280	147	50	3.4	1,320	8.2
July 21-26	73	22	146	152	0	113	245	.3	2.6	.24	796	1.08	35,500	275	150	54	3.8	1,400	8.2
July 27-31.....	93	34	262	174	6	162	435	.3	3.6	.23	1,290	1.75	40,330	370	218	61	5.9	2,220	8.3
Aug. 1-3	82	26	181	184	0	116	305	.1	2.2	.23	946	1.29	19,740	310	161	56	4.5	1,670	8.0
Aug. 4-10	85	30	285	164	0	144	475	.1	1.9	.26	1,280	1.75	25,600	335	202	65	6.8	2,260	8.0
Aug. 11-12	74	24	241	160	0	105	400	.3	2.5	.22	1,070	1.46	16,480	285	153	65	6.2	1,910	8.0
Aug. 13-15	58	20	155	128	0	81	265	.2	1.6	.24	767	1.04	14,900	230	123	60	4.4	1,370	7.7
Aug. 16-21	70	24	252	136	0	109	420	.3	1.8	.19	1,120	1.52	18,080	270	160	67	6.7	1,980	7.7
Aug. 22-23	53	18	159	116	0	73	270	.2	2.0	.43	1,760	1.03	16,050	210	113	62	4.7	1,370	7.9

a. Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
ARKANSAS RIVER AT WEBBERS FALLS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- di- um (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per- cent so- dium	So- lumsorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, magne- sium ^a	Non-carbon- ate				
Aug. 24, 1957.....				74	29	277		132	0	114	480	--	1.9	--	1,150	1.56	20,930	300	194	87	7.0	2,110	8.0
Aug. 25.....				51	20	150		112	0	71	280	--	2.0	--	642	87	7,050	210	116	61	4.5	1,210	8.0
Aug. 26.....				65	26	241		136	0	106	405	--	1.8	--	936	1.34	17,280	270	158	86	6.4	1,810	8.0
Aug. 27.....				93	41	380		162	0	181	655	--	1.8	--	1,510	2.05	30,580	400	267	87	8.3	2,710	8.1
Aug. 28-30.....				51	16	144		104	0	70	245	0.3	1.0	0.22	595	81	8,110	192	107	62	4.5	1,130	7.8
Aug. 31.....				62	23	258		110	0	100	435	--	1.4	--	990	1.35	16,490	250	158	69	7.1	1,850	7.2
Sept. 1-3.....				54	18	164		112	0	70	262	.4	1.2	.18	684	.93	6,270	210	116	63	4.9	1,270	7.9
Sept. 4-5.....				84	34	353		136	0	130	615	.0	1.1	.57	1,390	1.89	19,870	350	238	69	8.2	2,500	8.1
Sept. 6.....				62	21	221		114	0	85	380	--	1.9	--	872	1.19	16,570	240	148	87	6.2	1,620	7.9
Sept. 7-9.....				53	18	134		112	0	68	265	.1	1.6	.20	644	.88	6,280	205	112	62	4.7	1,220	7.9
Sept. 10-12.....				66	27	336		108	0	116	570	.2	1.8	.27	1,190	1.62	17,370	280	192	72	8.8	2,210	7.5
Sept. 13-14.....				54	20	191		106	0	74	330	.1	2.3	.38	756	1.03	13,920	215	129	86	5.7	1,420	7.9
Sept. 15-17.....				50	16	151		110	0	56	262	.4	1.6	.21	635	.86	32,970	192	102	63	4.7	1,160	7.9
Sept. 18-20.....				75	20	278		144	0	100	460	.4	3.9	.19	1,040	1.41	55,040	270	132	69	7.4	1,920	7.9
Sept. 21-24.....				63	21	154		126	0	99	260	.3	3.2	.19	687	.93	26,670	240	136	58	4.3	1,260	8.0
Sept. 25-26.....				74	15	209		142	0	108	332	.3	5.7	.50	828	1.13	41,360	250	132	65	5.7	1,530	7.9
Sept. 27-28.....				61	14	138		120	0	73	235	.2	3.6	.50	594	.81	22,530	210	112	59	4.1	1,110	7.9
Sept. 29-30.....				69	19	218		130	0	89	370	.2	5.0	.54	881	1.20	22,720	250	146	65	6.0	1,610	7.9

^a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT WEBBERS FALLS, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	58	40	45	38	49	56	66	71	78	86	82
2	--	60	44	40	39	54	56	66	71	79	86	80
3	--	58	42	40	42	49	57	69	69	81	87	81
4	75	60	52	42	44	54	58	64	70	82	83	82
5	74	58	55	45	46	49	58	64	70	79	83	80
6	73	58	56	45	45	53	54	65	72	80	80	80
7	70	58	48	44	46	42	55	65	72	80	80	79
8	65	52	45	45	48	51	54	65	74	78	82	74
9	68	48	38	48	54	59	54	67	76	81	82	80
10	64	52	38	37	54	50	55	68	74	83	83	80
11	64	54	42	38	52	60	59	68	75	82	84	80
12	68	55	44	38	53	62	49	69	76	83	83	80
13	69	55	38	39	48	60	45	69	75	83	83	80
14	68	62	42	38	50	60	50	69	76	84	83	80
15	67	56	44	38	50	62	50	70	75	85	83	75
16	68	48	38	34	49	60	52	67	76	86	83	75
17	68	48	44	34	46	54	56	71	77	85	82	85
18	68	48	42	34	49	53	56	70	77	88	80	75
19	68	48	44	38	49	50	62	66	77	85	80	79
20	67	55	48	38	47	50	63	67	77	85	82	80
21	60	48	48	45	45	50	63	69	77	84	82	75
22	64	45	44	47	48	50	64	70	77	85	82	74
23	65	48	46	40	48	42	65	68	77	85	80	75
24	66	47	44	40	48	48	65	68	75	84	80	72
25	66	48	39	39	50	48	65	69	74	83	81	72
26	58	45	42	37	45	46	66	70	75	81	82	72
27	60	39	40	34	45	50	66	70	74	82	83	72
28	58	40	44	38	46	50	67	76	75	84	82	72
29	60	40	40	35	--	52	68	70	76	85	82	70
30	64	39	40	36	--	55	67	70	78	86	82	70
31	60	--	45	40	--	55	--	70	--	85	82	--
Average	66	51	44	40	47	53	58	68	75	83	82	77

ARKANSAS RIVER BASIN--Continued

ILLINOIS RIVER AT TENKILLER RESERVOIR, NEAR GORE, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	52	53	--	50	46	46	48	56	58	66	66	64
2	52	53	52	50	46	46	48	54	57	66	66	--
3	52	--	53	50	47	46	50	54	57	67	66	65
4	52	53	53	50	45	46	50	54	58	66	64	68
5	52	53	53	50	46	46	50	54	58	68	68	67
6	52	53	53	51	46	46	50	56	58	67	66	68
7	53	53	53	51	46	46	--	54	56	68	66	--
8	52	53	--	50	46	48	52	57	58	64	66	64
9	--	52	50	50	47	48	--	54	58	64	69	64
10	52	47	53	48	46	46	52	55	60	68	66	64
11	52	53	53	--	46	48	--	55	60	68	66	66
12	52	53	53	50	46	48	54	55	62	68	68	66
13	51	52	52	48	46	48	52	54	62	70	68	65
14	52	52	52	48	46	48	51	54	60	67	72	64
15	--	52	52	48	46	48	52	52	60	68	68	64
16	52	52	54	47	46	48	52	56	60	68	68	64
17	52	53	52	47	46	46	--	58	60	--	68	68
18	52	51	52	47	46	48	53	56	60	68	68	64
19	52	52	52	49	46	48	53	54	62	70	68	66
20	52	53	52	48	46	48	54	54	62	68	66	68
21	51	52	52	50	46	48	53	57	64	69	64	69
22	53	--	52	50	46	48	52	54	63	68	66	67
23	52	52	52	50	46	48	53	55	64	68	65	68
24	52	53	51	50	44	46	53	54	64	68	68	68
25	52	51	51	50	46	48	52	54	64	68	68	68
26	52	54	50	51	46	48	53	56	65	66	68	68
27	53	53	50	51	46	48	56	56	64	66	64	68
28	52	54	50	50	46	48	50	56	65	66	68	70
29	52	52	--	50	--	48	52	57	65	66	67	69
30	--	52	51	48	--	49	--	56	65	66	66	69
31	53	--	50	48	--	46	--	58	--	66	64	--
Average	52	52	52	49	46	47	52	55	61	67	67	67

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER AT LOGAN, N. MEX.

LOCATION.--At bridge on U. S. Highway 54, 1,100 feet below gaging station which is half a mile south of Logan, Quay County, 1½ miles upstream from Chicago, Rock Island and Pacific Railroad Co. Bridge, 4½ miles upstream from Revuelto Creek, and 5½ miles downstream from Ute Creek.

DRAINAGE AREA.--11,141 square miles, of which 1,110 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: July to September 1957.

Water temperatures: July to September 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, July to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate
July 9, 1957	a 461	14		69	29	228		641	73	132		0.2	--	860	1.17	1,070	281	0	83	1,350	7.5
July 10	363	21		51	17	118		390	77	39		.3	0.27	516	.70	506	197	0	57	735	7.6
July 11-12	46.5	25		46	15	99		255	111	47		1.2	.25	469	.64	58.9	176	0	55	3.2	744
July 13	1	24		56	19	227		227	193	229		.9	.31	861	1.17	2.32	218	32	89	6.6	7.6
July 14	a 8	15		37	9.5	55		173	55	37		.6	.23	294	.40	6.35	132	0	48	2.1	480
July 20-22	11.5	11		40	11	118		162	170	65		1.3	.21	497	.68	15.4	145	12	64	4.3	717
July 23-24	8.0	18		42	9.5	176		228	208	88		2.8	.29	654	.89	14.1	144	0	73	6.4	8.1
July 25	74	23		56	18	279		b 216	299	233		.4	.17	1,020	1.39	204	214	36	74	8.3	8.4
July 26	4,070	14		37	8.6	46		191	29	29		.4	.17	258	.35	2,840	128	0	44	1.8	398
July 27-30	456	19		41	9.5	82		219	62	53		1.6	.16	378	.51	463	142	0	56	3.0	616
July 31	3,210	17		41	14	63		283	39	18		.1	.21	331	.45	2,870	160	0	46	2.2	499
Aug. 1-2	290	23		43	10	63		235	60	22		.8	.24	338	.46	265	148	0	48	2.3	543
Aug. 3	98	16		41	10	93		197	89	64		2.0	.16	412	.56	109	144	0	58	3.4	664
Aug. 4	952	14		35	6.2	51		197	38	16		.7	.15	257	.35	661	113	0	49	2.1	385
Aug. 5-7	2,115	22		39	10	65		223	60	24		.1	.19	331	.45	1,890	138	0	50	2.4	8.1
Aug. 8	138	17		41	12	88		c 192	110	50		1.7	.12	414	.56	154	152	0	56	3.1	666
Aug. 9	135	10		59	17	131		116	188	92		.0	.28	603	.82	220	217	40	57	3.9	972
Aug. 10	304	15		48	14	104		199	144	64		.1	.23	487	.66	400	178	14	56	3.4	774
Aug. 11-21	560	22		39	9.7	61		202	56	32		1.0	.20	320	.44	484	138	0	49	2.3	521
Aug. 22-27	266	21		47	14	118		212	104	105		.6	.24	514	.70	369	175	2	59	3.9	858
Aug. 28	35	18		50	14	156		194	123	167		.1	.21	623	.85	58.9	182	24	65	5.0	1,060
Aug. 29	28	20		63	23	253		220	169	315		1.0	.25	952	1.29	72.0	252	71	69	7.0	1,630
Aug. 30-Sept. 3	108	22		37	10	74		197	79	35		.5	.17	355	.48	104	134	0	55	2.8	568

Sept. 4-5, 1957....	38.0	20	45	11	117	189	109	101	.22	496	0.87	50.9	158	2	62	4.0	814	8.2
Sept. 6.....	19	18	72	19	277	216	300	262	1.0	.41	1,060	54.4	256	80	70	7.5	1,710	8.1
Sept. 7-9.....	841	19	37	8.6	64	222	42	29	1.2	.18	310	704	138	0	52	2.5	504	7.7
Sept. 10.....	14	17	46	8.1	120	193	108	97	3.2	.25	495	18.7	148	0	64	4.3	803	7.9
Sept. 11-20.....	1.7	24	113	26	544	264	288	748	1.3	.36	1,870	2.54	389	172	75	12	3,180	7.8
Sept. 21-27.....	a 1.0	18	246	94	1,880	347	522	3,040	--	.46	5,980	8.13	1,000	716	80	26	9,800	7.8

a No flow July 1-8, 15-19, Sept. 28-30.

b Includes equivalent of 4 parts per million of carbonate (CO_3).c Includes equivalent of 1 part per million of carbonate (CO_3).Temperature ($^{\circ}\text{F}$) of water, July to September 1957
Once-daily measurement, generally in p.m.

Day	July	Aug.	Sept.	Day	July	Aug.	Sept.	Day	Sept.	Aug.	Sept.	Day	July	Aug.	Sept.
1	--	87	78	9	878	85	74	17	--	b 68	80	25	84	81	79
2	--	87	82	10	b 71	89	76	18	--	b 70	79	26	b 70	85	81
3	--	92	80	11	b 71	b 73	72	19	--	83	75	27	84	87	79
4	--	79	83	12	85	89	80	20	--	82	73	28	89	84	--
5	--	a 73	81	13	84	85	b 88	21	b 73	85	77	29	84	82	--
6	--	82	74	14	85	90	82	22	88	83	77	30	89	79	--
7	--	84	68	15	--	86	77	23	82	85	78	31	b 73	74	--
8	--	82	72	16	--	80	76	24	87	76	73	--	--	82	76
Average															

a Measurement obtained after 6 p.m.

b Measurement obtained in a.m.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR AMARILLO, TEX.

LOCATION --At gaging station at bridge on U.S. Highways 87 and 287, 2,000 feet downstream from Pitcher Creek, 2.0 miles downstream from Panhandle and Santa Fe Railway bridge, and 19 miles north of Amarillo, Potter County.

DRAINAGE AREA --19,445 square miles of which 4,069 square miles is probably noncontributing.

RECORDS AVAILABLE --Chemical analyses: July 1948 to October 1949, February 1950 to September 1957.

Water temperatures: August 1949 to September 1957.

Silica analyses: August 1949 to September 1952.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 3,000 ppm Mar. 21; minimum, 252 ppm Sept. 21-30.

Hardness: Maximum, 974 ppm Mar. 21; minimum, 69 ppm Sept. 6.

Specific conductance: Maximum daily, 4,490 micromhos Mar. 21; minimum daily, 372 micromhos Aug. 17, Sept. 24.

Water temperatures: Maximum, 76° F July 31; minimum, freezing point, on many days during winter months.

EXTREMES, 1948-57.--Dissolved solids: Maximum, 3,000 ppm Mar. 21, 1957; minimum, 252 ppm Sept. 21-30, 1957.

Hardness: Maximum, 974 ppm Mar. 21, 1957; minimum, 69 ppm Sept. 6, 1957.

Specific conductance: Maximum daily, 4,490 micromhos Mar. 21, 1957; minimum daily, 372 micromhos Aug. 17, Sept. 24, 1957.

Water temperatures: (1949-57): Maximum, 95° F June 29, 1951; minimum, freezing point on many days during winter months.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1956	4.71	58		60	31	125		286	93	110	3.6	66		705	0.96	8.97	277	42	50	3.3	1,090	7.5
Oct. 11-20	11.8	60		59	30	129		285	96	108	3.2	69		a 694	.94	22.1	271	37	51	3.4	1,100	7.0
Oct. 21-30	5.77	58		58	32	119		273	94	105	3.6	69		a 673	.92	10.5	276	52	48	3.1	1,100	7.4
Nov. 1-10	9.68	56		61	29	125		288	89	112	3.6	58		a 676	.92	17.7	272	36	50	3.3	1,080	7.2
Nov. 11-20	7.82	65		56	33	141		291	108	117	3.6	71		a 738	1.00	15.6	276	38	53	3.7	1,190	7.1
Nov. 21-30	9.30	61		64	36	132		286	125	118	3.6	69		770	1.05	19.3	308	74	48	3.3	1,230	7.7
Dec. 1-10	9.14	72		67	36	147		297	127	132	4.0	78		835	1.14	20.6	316	72	50	3.6	1,240	8.0
Dec. 11-20	11.7	68		76	34	139		310	142	120	4.0	62		831	1.13	26.3	330	76	48	3.3	1,230	7.6
Dec. 21-31	11.7	65		69	35	132		282	120	120	4.0	85		805	1.09	25.4	316	85	48	3.2	1,250	7.7
Jan. 1-10, 1957	9.38	67		64	36	126	15	274	125	117	3.6	82		a 771	1.05	19.5	308	83	46	3.1	1,230	7.7
Jan. 11-20	8.14	71		59	36	133	15	284	112	127	3.2	85		a 781	1.06	17.2	295	62	48	3.4	1,250	7.5
Jan. 21-31	9.95	73		60	38	137	16	277	120	124	3.6	102		a 810	1.10	21.8	306	79	48	3.4	1,330	7.7
Feb. 1-10	12.5	72		59	34	128		270	111	104	3.6	92		745	1.01	25.1	288	66	49	3.3	1,190	7.1
Feb. 11-17, 22-23	11.1	70		63	36	138		365	114	114	4.0	19		755	1.03	22.6	304	5	50	3.4	1,290	7.2
Feb. 26-28	11.2	67		112	46	272		247	300	332	3.2	84		1,340	1.82	40.5	468	266	56	5.4	2,200	7.1
Feb. 18-21, 24-25																						
Mar. 1-9	14.2	53		104	41	236		248	250	292	3.2	72		1,170	1.59	44.9	428	225	55	5.0	1,920	6.8
Mar. 10-20	7.36	64		70	34	145		276	124	134	4.0	93		821	1.12	16.3	314	88	50	3.5	1,340	7.2

ARKANSAS RIVER BASIN

115

Mar. 21, 1957	37	37	79	260	671	170	888	945	2.0	38	3,000	4.08	300	974	834	60	9.3	4,490	8.2
Mar. 22-25	22.0	43	25	59	141	218	139	135	2.4	45	724	.98	61.0	250	72	55	3.9	1,160	7.1
Mar. 26-31	22.0	47	37	97	235	280	260	270	2.8	21	1,100	1.50	65.3	394	164	56	5.1	1,820	7.2
Apr. 1-4	10.5	52	46	130	312	249	358	398	2.4	58	1,480	2.01	42.0	514	310	57	6.0	2,350	7.2
Apr. 5-10	10.9	61	35	70	143	276	123	135	3.2	94	826	1.12	24.3	318	92	49	3.5	1,310	6.8
Apr. 11-20	18.66	60	34	69	156	267	124	154	3.2	97	844	1.15	19.7	312	93	52	3.9	1,380	7.1
Apr. 21-26	14.5	60	35	66	144	320	120	149	3.2	21	788	1.07	30.9	308	46	50	3.6	1,350	7.2
Apr. 27	489	30	32	79	450	390	317	462	1.4	1.2	1,560	2.12	1,960	328	8	75	11.6	2,440	8.2
Apr. 28-30	985	20	14	40	137	187	110	130	1.2	2.2	555	.75	1,450	158	4	65	4.8	938	7.5
May 1-10	76.6	22	33	92	321	223	326	375	1.2	11	1,290	1.75	267	365	182	66	7.3	2,150	8.1
May 11, 14-15, 23-24	2,685	22	38	94	368	229	338	452	1.6	12	1,440	1.96	10,360	390	202	67	8.1	2,390	7.8
May 12-13, 18-22, 28-30	330	19	20	52	184	191	172	189	1.6	8.4	752	1.02	670	212	56	65	5.5	1,230	8.0
May 16-17, 25, 31	1,310	18	36	36	99	201	76	76	1.6	2.2	432	.59	1,530	144	0	60	3.6	1,077	7.9
June 1-5	3,254	17	15	44	166	217	127	154	1.4	2.0	635	.86	5,590	172	0	68	5.5	1,080	7.8
June 6-10	284	19	66	66	250	213	241	258	1.4	7.9	968	1.94	624	255	80	68	6.8	1,910	7.9
June 11-20	25.9	47	172	172	459	252	349	600	2.0	26	2,020	2.75	141	696	490	58	7.2	3,220	8.1
June 21-22, 27-30, July 1-3	25.1	55	118	118	279	270	330	342	2.4	35	1,340	1.82	90.8	476	254	56	5.6	2,130	7.9
June 23-26	502	22	43	43	118	176	115	114	1.6	3.8	520	.71	705	174	30	60	3.9	596	7.9
July 4-10	5.61	64	36	62	146	322	129	131	3.2	34	788	1.07	11.9	302	38	51	3.7	1,240	7.6
July 11-14, 18-22	8.77	68	38	68	137	324	102	138	3.6	50	a744	1.01	17.8	326	60	46	3.1	1,220	7.7
July 15	18	31	92	92	373	b458	214	428	2.0	1.0	1,410	1.92	68.5	398	22	67	8.1	2,420	8.5
July 16-17, 23-25	76.3	26	72	30	274	260	268	268	1.6	13	1,090	1.48	225	303	68	66	6.8	1,770	7.8
July 26-29, 31	1,036	19	38	38	146	229	113	114	1.4	1.5	594	.79	1,630	152	0	68	5.1	942	7.8
July 30, Aug. 1-3, 7-10	1,498	17	35	35	106	189	94	78	1.4	1.5	453	.62	1,830	137	0	63	3.9	730	7.8

a Calculated from determined constituents.

 b Includes equivalent of 17 parts per million of carbonate (CO₃).

ARKANSAS RIVER BASIN--Continued
CANADIAN RIVER NEAR AMARILLO, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Aug. 4-6, 1957	4,357	16		20	6.8		70	162	46	32	1.4	2.5	293	0.40	3,450	78	0	66	3.4	448	7.8
Aug. 11-14	383	18		48	16	135	191	109	146	146	1.2	2.0	608	.83	629	186	30	61	4.3	1,020	8.0
Aug. 15-21	3,341	17		34	11	72	185	62	47	47	.8	1.0	342	.47	3,090	130	0	54	2.7	561	8.1
Aug. 22-31	347	18		46	16	123	187	123	113	113	.8	7.5	549	.75	514	181	28	60	4.0	909	8.0
Sept. 1-5, 7-10	332	18		56	19	159	199	162	160	160	.8	5.1	678	.92	608	218	54	61	4.7	1,130	7.9
Sept. 6	723	--		17	6.7		--	184	--	35	1.6	.5	--	--	--	70	0	--	--	460	8.2
Sept. 11-13	214	18		42	14	138	210	125	111	111	.8	2.5	a554	.75	320	162	0	65	4.7	935	7.9
Sept. 14-17	473	20		34	11	81	189	66	56	56	.8	3.0	a365	.50	466	130	0	58	3.1	615	8.0
Sept. 18-20	30	28		96	32	258	212	288	315	315	1.0	14	1,140	1.55	92.3	371	198	60	5.8	1,860	7.9
Sept. 21-30	13.0	30		47	9.3	27	218	16	12	12	.4	2.5	252	.34	8.8	156	0	28	1.0	400	8.2
Weighted average	313	19		46	17	148	200	130	141	141	1.3	5.0	613	0.83	518	185	21	64	4.7	1,010	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR AMARILLO, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily temperature measurement, usually between 5 a. m. and 9 a. m.⁷

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	56	42	34	32	32	45	48	60	61	73	75	69
2	57	45	32	36	34	45	54	58	55	75	71	68
3	55	38	32	34	37	43	45	58	60	72	72	65
4	54	38	36	41	40	43	40	54	62	75	70	65
5	53	37	38	37	37	47	38	50	62	66	70	63
6	56	38	41	38	42	40	43	51	61	69	--	60
7	50	48	32	35	50	--	45	52	65	65	72	59
8	54	38	32	47	52	--	32	55	68	67	71	59
9	46	--	32	45	--	38	40	54	67	72	70	60
10	53	38	32	32	--	42	45	55	60	68	70	62
11	51	39	32	32	45	45	46	58	66	70	72	62
12	52	43	38	35	41	48	35	54	61	67	71	57
13	57	42	32	38	--	42	35	52	61	70	69	63
14	55	46	32	32	43	37	37	55	67	67	69	58
15	55	38	34	32	46	39	42	57	68	67	68	52
16	61	32	34	32	42	43	50	55	65	67	72	44
17	55	32	34	32	40	50	57	58	60	66	69	--
18	--	36	32	--	43	44	57	57	60	70	69	60
19	53	36	34	32	40	43	55	58	62	72	70	59
20	51	35	32	32	41	46	50	59	64	--	70	58
21	45	32	32	34	44	42	53	55	60	--	68	57
22	38	32	32	32	32	45	58	54	65	70	68	54
23	48	34	32	32	35	35	45	54	64	70	66	50
24	50	32	32	32	41	32	47	60	67	69	71	50
25	43	34	32	32	40	32	49	55	71	72	70	66
26	43	32	32	32	40	32	47	62	69	67	65	54
27	44	--	32	32	--	39	55	64	71	--	68	53
28	54	34	35	32	40	38	47	61	--	70	69	--
29	59	--	35	32	--	42	50	65	72	73	70	53
30	45	--	32	34	--	50	53	65	71	72	67	56
31	--	--	34	34	--	45	--	62	--	76	67	--
Average	51	37	33	34	41	42	47	57	64	70	70	58

ARKANSAS RIVER BASIN--Continued
CANADIAN RIVER AT BRIDGEPORT, OKLA.

LOCATION --At gaging station at Chicago, Rock Island and Pacific Railroad bridge, 1 mile north of Bridgeport, Caddo County, and 2½ miles upstream from
Lumpmouth Creek.
DRAINAGE AREA--25,229 square miles of which 4,801 square miles is probably noncontributing.
RECORDS AVAILABLE--Chemical analyses: October 1948 to September 1957.

WATER TEMPERATURES: 1956-57.--Dissolved solids: Maximum, 1,340 ppm Mar. 11-14; minimum, 245 ppm June 20.

Hardness: Maximum, 370 ppm Jan. 15-16; minimum, 156 ppm June 20.
Specific conductance: Maximum daily, 2,280 micromhos Mar. 14; minimum daily, 409 micromhos June 20.

Water temperatures: Maximum, 80°F July 11, 27; minimum, freezing point Jan. 22, 27.
EXTREMES, 1948-57.--Dissolved solids: Maximum, 2,450 ppm Oct. 11, 1954; minimum, 173 ppm May 19, 1955.

Hardness: Maximum, 778 ppm Jan. 28-31, 1951; minimum, 120 ppm May 19, 1955.
Specific conductance: Maximum daily, 4,000 micromhos Oct. 11, 1954; minimum daily, 226 micromhos May 23, 1952.

Water temperatures: Maximum, 97°F July 11, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year
October 1956 to September 1957 given in WSP 1511. No flow Oct. 1-14.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sol-uble sulfate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per-cent so-lidum	So-lidum ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)		
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium				Non-carbon-ate	
Oct. 15, 1956	176	--	--	47	13	58	--	166	0	48	77	--	1.0	--	338	0.46	161	170	34	42	1.9	529	7.5
Oct. 16-20	80.4	--	--	75	18	27	--	132	0	172	20	--	4.2	--	388	.53	84	260	152	18	.7	602	7.5
Oct. 21, 30	33.0	--	--	104	6.1	30	--	184	0	130	32	--	3.6	--	406	.55	36	270	119	19	.8	630	8.0
Oct. 22-29, 31	12.3	--	--	94	13	30	--	252	0	121	14	--	3.7	--	421	.57	14	290	84	18	.8	633	7.9
Nov. 1-10	9.55	16	0.02	106	16	25	3.9	258	0	158	14	0.2	2.6	0.02	471	.64	12	330	118	14	.6	709	7.9
Nov. 11-16	8.15	--	--	108	17	30	--	262	4	160	12	--	.8	--	461	.63	10	340	119	16	.7	716	8.3
Nov. 17	7.80	--	--	104	22	39	--	256	6	166	28	--	1.8	--	495	.67	10	350	130	19	.9	769	8.4
Nov. 18-20	8.50	--	--	108	22	32	--	274	6	168	14	--	1.1	--	488	.66	11	360	126	16	.7	745	8.3
Nov. 21-30	8.73	--	--	116	22	34	--	286	8	177	15	--	1.1	--	520	.71	12	380	132	16	.8	779	8.3
Dec. 1-10	9.85	20	.00	125	20	34	3.7	298	0	203	15	.1	1.3	.09	569	.77	15	395	151	16	.7	823	8.1
Dec. 11-20	13.3	--	--	124	24	32	--	272	8	211	16	--	2.2	--	575	.78	21	410	174	15	.7	834	8.4
Dec. 21-31	15.0	--	--	130	24	33	--	272	6	233	14	--	2.0	--	596	.81	24	425	192	14	.7	863	8.3
Jan. 1-3, 5-9, 1957	16.1	--	--	134	28	26	--	260	12	241	14	--	2.4	--	635	.86	28	450	217	11	.5	866	8.5
Jan. 4	21.0	--	--	122	21	48	--	190	8	262	36	--	2.6	--	651	.89	37	390	221	21	1.1	913	8.5
Jan. 10	10.0	--	--	120	27	37	--	150	4	312	24	--	4.0	--	681	.93	18	410	280	17	.8	1,040	8.4
Jan. 11-14	13.2	--	--	162	17	31	--	292	0	266	16	--	3.3	--	697	.95	25	475	236	12	.6	934	8.2
Jan. 15-16	11.5	--	--	180	29	59	--	292	18	354	40	--	4.4	--	892	1.21	28	570	300	18	1.1	1,170	8.7
Jan. 17-18	11.0	--	--	158	33	38	--	254	8	339	24	--	4.6	--	806	1.10	24	530	308	13	.7	1,050	8.4

Jan. 19-20, 1957....	13.0	--	--	--	148	24	31	256	18	261	16	--	4.3	--	685	.93	24	470	230	13	0.6	907	8.7
Jan. 21-31.....	14.5	--	--	--	152	29	30	274	14	278	17	--	3.8	--	721	.98	28	500	252	11	.6	951	8.5
Feb. 1.....	18.0	--	--	--	114	16	29	186	8	207	19	--	4.8	--	533	.72	26	350	184	15	.7	759	8.5
Feb. 2.....	20.0	--	--	--	83	21	24	102	0	233	13	--	3.9	--	499	.68	27	295	212	15	.6	831	8.1
Feb. 3.....	20.0	--	--	--	88	22	23	106	0	243	13	--	1.8	--	518	.70	28	310	223	14	.6	856	8.1
Feb. 4-10.....	18.3	--	--	--	142	29	22	244	0	287	14	--	1.2	--	693	.94	34	470	272	9	.4	921	8.2
Feb. 11-17.....	14.7	--	--	--	151	27	25	242	8	298	14	--	1.0	--	720	.98	29	490	276	10	.5	935	8.4
Feb. 18-19.....	21.5	--	--	--	144	28	29	246	10	269	27	--	1.1	--	703	.96	41	475	257	12	.6	949	8.4
Feb. 20.....	20.0	--	--	--	89	23	26	132	0	233	14	--	1.2	--	519	.71	28	315	207	15	.6	868	8.2
Feb. 21-23.....	16.3	--	--	--	92	24	25	118	0	257	14	--	1.7	--	548	.75	24	330	234	14	.6	914	8.2
Feb. 24-25.....	21.0	--	--	--	137	26	34	244	10	249	33	--	1.6	--	684	.93	39	450	234	14	.7	926	8.5
Feb. 26-28.....	15.0	--	--	--	144	29	27	266	0	281	19	--	1.8	--	704	.96	29	480	262	11	.5	938	8.2
Mar. 1, 3.....	25.0	--	--	--	117	21	44	198	2	264	32	--	1.3	--	610	.83	41	380	214	20	1.0	882	8.3
Mar. 2.....	26.0	--	--	--	100	22	66	164	6	265	43	--	1.8	--	590	.80	41	340	196	30	1.5	876	8.4
Mar. 4-6.....	36.3	--	--	--	114	26	43	220	6	231	37	--	1.7	--	606	.82	59	390	200	20	1.0	887	8.4
Mar. 7-10.....	372	--	--	--	95	32	256	208	4	243	350	--	3.8	--	1,130	1.54	1,130	370	193	60	5.8	1,910	8.4
Mar. 11-14.....	133	--	--	--	114	40	301	228	8	282	430	--	4.8	--	1,340	1.82	481	450	250	59	6.2	2,240	8.5
Mar. 15-16.....	45.5	--	--	--	130	38	257	248	12	300	355	--	3.3	--	1,280	1.74	157	480	257	54	5.1	2,080	8.5
Mar. 17.....	23.0	--	--	--	96	33	203	138	4	299	272	--	3.3	--	1,050	1.43	65	375	256	54	4.6	1,800	8.4
Mar. 18.....	20.0	--	--	--	94	33	146	144	4	288	185	--	2.5	--	925	1.26	50	370	246	46	3.3	1,580	8.4
Mar. 19.....	20.0	--	--	--	90	31	105	120	2	281	130	--	1.4	--	752	1.02	41	350	248	40	2.4	1,310	8.3
Mar. 20.....	33.0	--	--	--	91	27	60	108	2	283	58	--	2.0	--	629	.86	56	340	248	28	1.4	1,060	8.3
Mar. 21-23.....	93.0	--	--	--	71	25	110	120	4	215	135	--	.4	--	657	.89	165	280	175	46	2.9	1,090	8.4
Mar. 24-26.....	280	--	--	--	84	28	152	132	4	261	190	--	1.4	--	826	1.12	647	325	210	50	3.7	1,350	8.5
Mar. 27-31.....	804	--	--	--	54	26	257	82	0	241	340	--	.8	--	1,000	1.36	2,170	480	173	70	7.2	1,740	7.6
Apr. 1-2.....	378	--	--	--	112	34	269	290	0	253	395	--	5.2	--	1,240	1.69	1,270	420	240	58	5.7	2,090	8.2
Apr. 3.....	1,810	--	--	--	86	39	232	182	0	244	335	--	5.1	--	1,090	1.48	5,330	375	226	57	5.2	1,840	8.2
Apr. 4-10.....	628	--	--	--	107	36	168	194	0	283	235	--	3.2	--	1,020	1.39	1,730	425	268	46	3.5	1,610	8.2
Apr. 11-18.....	65.2	--	--	--	117	43	207	250	6	290	295	--	2.5	--	1,170	1.59	206	470	272	49	4.1	1,820	8.4
Apr. 19-20.....	2,195	--	--	--	68	22	42	136	0	150	57	--	1.2	--	445	.61	2,640	260	147	26	1.1	1,702	8.2
Apr. 21.....	5,640	--	--	--	67	17	23	148	0	113	31	--	2.8	--	348	.47	5,300	235	114	18	.7	535	7.9
Apr. 22.....	2,820	--	--	--	94	27	53	128	0	250	66	--	4.0	--	604	.82	4,600	345	240	23	1.2	904	8.2
Apr. 23.....	7,260	--	--	--	78	16	9.7	120	0	156	12	--	3.5	--	351	.48	6,860	260	162	7	.3	530	8.1

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Chemical analyses, in parts per million, except for bicarbonate										Dissolved solids (residue at 180° C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH			
				Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Boron (B)	Parts per million	Tons per acre-foot	Calcium-magnesium				Non-carbonate		
Apr. 24, 1957.....	1,840	--	--	86	28	56	130	0	241	64	--	--	6.3	--	586	0.80	2,910	330	224	27	1.3	884	8.1
Apr. 25-26, 28-30.....	1,245	--	--	90	34	89	168	0	239	120	--	--	2.5	--	719	.98	2,420	365	228	35	2.0	1,100	8.2
Apr. 27.....	731	--	--	64	18	41	124	0	141	52	--	--	3.7	--	410	.56	809	235	134	28	1.2	649	8.2
May 1.....	6,370	--	--	110	35	282	214	20	256	395	--	--	.6	--	1,270	1.73	21,840	420	211	59	6.0	2,100	8.8
May 2-10.....	2,950	--	--	93	27	178	186	12	222	230	--	--	2.6	--	881	1.20	7,020	345	172	53	4.2	1,490	8.4
May 11-16.....	1,252	--	--	99	27	133	152	8	257	172	--	--	2.6	--	825	1.12	2,740	360	222	45	3.1	1,310	8.4
May 17.....	4,670	--	--	85	23	104	140	8	209	130	--	--	3.6	--	665	.90	3,000	305	177	43	2.6	1,070	8.6
May 18-20.....	4,967	--	--	83	26	188	188	12	182	252	--	--	1.2	--	862	1.17	11,560	310	138	57	4.6	1,490	8.6
May 21-24.....	5,978	--	--	89	22	218	220	0	209	272	--	--	5.0	--	933	1.27	2,460	310	132	50	5.4	1,600	8.1
May 25.....	5,180	--	--	77	18	155	228	0	160	172	--	--	7.5	--	712	.97	9,980	265	77	56	4.2	1,170	8.1
May 26.....	12,600	--	--	97	26	100	160	0	239	115	--	--	5.1	--	706	.96	24,020	350	219	38	2.3	1,090	7.9
May 27-30.....	5,942	--	--	90	31	198	220	0	233	250	--	--	5.0	--	935	1.27	15,000	350	170	55	4.6	1,580	8.0
May 31.....	5,260	--	--	96	24	83	152	0	245	98	--	--	5.2	--	850	.88	9,230	340	216	35	2.0	1,010	8.0
June 1.....	3,440	--	--	98	23	129	178	0	230	162	--	--	8.3	--	759	1.03	7,050	340	194	45	3.0	1,210	7.9
June 2-9.....	2,900	--	--	100	29	184	220	0	223	252	--	--	1.8	--	930	1.26	7,280	370	190	52	4.2	1,550	7.9
June 10.....	1,350	--	--	116	31	137	238	0	268	170	--	--	.0	--	856	1.16	3,120	415	220	42	2.9	1,300	7.7
June 11.....	558	--	--	110	29	156	164	0	304	195	--	--	11	--	913	1.24	1,380	395	260	46	3.4	1,420	8.1
June 12-13.....	878	--	--	102	29	184	188	0	256	250	--	--	3.5	--	954	1.30	2,260	375	221	52	4.1	1,560	7.8
June 14-17.....	503	--	--	102	31	235	190	0	252	332	--	--	5.5	--	1,080	1.47	1,470	380	224	57	5.2	1,820	7.8
June 18.....	6,460	--	--	65	8.3	21	136	0	92	20	--	--	6.9	--	286	.39	4,990	196	84	19	.6	442	7.7
June 19.....	1,700	--	--	98	18	58	144	0	222	67	--	--	4.2	--	556	.76	2,550	320	202	28	1.4	844	7.7
June 20.....	802	--	--	47	9.4	33	196	0	31	23	--	--	1.8	--	245	.33	531	156	0	31	1.1	409	7.9
June 21-23.....	578	--	--	68	17	53	208	0	104	51	--	--	1.6	--	405	.55	632	240	68	32	1.5	854	8.0
June 24-28.....	930	--	--	94	26	94	158	0	230	122	--	--	3.1	--	670	.91	1,680	340	210	37	2.2	1,060	7.8
June 29-30.....	139	--	--	98	28	155	188	0	223	220	--	--	1.3	--	853	1.16	320	360	206	48	3.6	1,380	7.9

July 1, 1957.....	223	--	--	101	27	152	190	0	212	225	--	4.5	--	895	1.22	539	365	210	48	3.5	1,480	7.9
July 2-5.....	86.0	--	--	122	35	212	188	0	292	320	--	2.8	--	1,180	1.60	274	450	296	51	4.4	1,940	7.9
July 6.....	30.0	--	--	110	38	155	140	0	332	215	--	5.4	--	1,020	1.39	83	430	316	44	3.3	1,680	7.8
July 7.....	21.0	--	--	102	38	103	140	0	320	130	--	2.3	--	833	1.13	47	410	296	35	2.2	1,360	7.8
July 8.....	15.0	--	--	104	34	55	124	0	320	58	--	3.2	--	698	.95	28	400	298	23	1.2	1,100	7.8
July 9-10.....	13.5	--	--	128	34	32	204	0	316	22	--	2.5	--	648	.88	24	460	293	13	.6	941	8.0
July 11-20.....	9.36	26	.00	106	43	36	210	0	295	22	.3	1.7	.33	677	.92	17	440	268	15	.7	897	8.0
July 21-31.....	13.9	--	--	126	28	25	186	0	291	19	--	2.0	--	657	.89	25	430	278	11	.5	879	8.1
Aug. 1-5.....	896	--	--	99	34	187	228	0	259	235	--	3.3	--	966	1.31	2,340	385	198	51	4.1	1,560	7.4
Aug. 6-10.....	2,200	--	--	82	26	243	248	0	217	288	--	3.8	--	998	1.36	5,930	310	107	63	6.0	1,680	7.6
Aug. 11-20.....	731	--	--	66	24	202	214	0	191	230	--	5.9	--	868	1.18	1,710	265	88	62	5.4	1,430	7.3
Aug. 21-31.....	1,095	--	--	66	23	185	234	0	172	200	--	6.0	--	769	1.05	2,270	255	64	61	5.0	1,320	7.2
Sept. 1-3.....	11.2	--	--	59	28	169	230	0	176	180	--	6.8	--	771	1.05	23	265	76	58	4.5	1,260	8.0
Sept. 4.....	5.70	--	--	47	36	99	188	0	164	108	--	2.6	--	605	.82	9.3	265	110	45	2.6	1,960	8.0
Sept. 5-6.....	7.60	--	--	71	22	56	232	0	127	45	--	1.7	--	485	.63	9.5	265	76	31	1.5	743	8.0
Sept. 7-10.....	17.2	--	--	75	27	190	220	0	198	225	--	6.3	--	870	1.18	40	295	116	58	5.8	1,470	8.0
Sept. 11-12.....	13.0	--	--	80	23	75	220	0	162	76	--	1.8	--	558	.76	20	295	114	36	1.9	873	8.0
Sept. 13.....	86.0	--	--	94	35	291	240	0	291	370	--	3.2	--	1,250	1.70	290	380	194	62	6.5	2,060	8.0
Sept. 14-20.....	832	--	--	65	2.4	203	198	0	159	200	--	3.0	--	761	1.03	1,710	172	10	72	6.7	1,320	8.0
Sept. 21-22.....	756	--	--	68	17	73	166	0	130	97	--	2.9	--	486	.66	992	240	102	40	2.0	920	7.8
Sept. 23-27.....	42.4	--	--	87	25	109	192	0	184	145	--	3.6	--	694	.94	79	320	162	42	2.6	1,120	8.0
Sept. 28-30.....	12.0	--	--	108	24	36	282	0	161	33	--	3.6	--	541	.74	16	370	139	17	.8	803	8.2
Weighted average..	699	--	--	87	26	156	b196	--	212	198	--	3.6	--	808	1.10	1,520	325	164	51	3.8	1,330	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	50	37	--	35	41	54	64	69	75	77	74
2	--	50	41	35	34	51	54	63	64	79	78	73
3	--	44	40	36	44	43	51	65	64	77	79	68
4	--	44	51	44	40	46	45	--	66	73	77	70
5	--	47	45	37	38	44	--	57	68	66	75	70
6	--	50	43	42	41	40	43	60	72	72	71	71
7	--	49	36	39	35	48	52	57	73	77	72	--
8	--	37	33	45	53	35	43	61	74	72	70	67
9	--	38	34	43	53	42	47	62	72	73	73	68
10	--	42	34	33	50	54	52	60	73	75	75	66
11	--	45	35	33	45	55	52	59	78	80	76	66
12	--	48	36	35	42	50	35	66	77	77	79	67
13	--	47	33	34	45	49	33	65	74	75	75	66
14	--	47	36	34	45	45	36	63	71	78	77	67
15	59	38	34	35	56	43	48	69	75	75	75	--
16	64	34	35	33	41	45	56	71	--	73	79	--
17	--	34	35	34	40	51	62	67	--	73	74	64
18	--	40	33	33	--	47	67	--	67	75	71	--
19	60	--	36	35	43	43	63	63	70	77	68	69
20	59	48	39	36	40	48	62	67	68	76	73	64
21	50	48	37	42	41	51	59	69	73	77	73	65
22	48	40	36	32	--	45	62	64	73	75	72	60
23	50	42	38	33	--	47	60	64	70	77	73	55
24	66	37	34	34	45	--	59	66	65	76	73	58
25	51	45	34	35	44	40	62	65	69	77	75	61
26	43	35	35	33	42	49	57	69	70	78	75	62
27	50	34	35	32	40	43	60	72	73	80	72	61
28	52	37	36	34	45	42	61	67	75	78	71	--
29	60	33	34	34	--	47	59	70	79	78	71	59
30	57	39	36	34	--	53	62	67	77	78	71	57
31	46	--	39	35	--	55	--	69	--	75	72	--
Average	--	42	37	36	43	46	54	65	71	76	74	65

ARKANSAS RIVER BASIN--Continued
LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.

LOCATION--At gaging station at bridge on county road just downstream from Hog Creek, three-quarters of a mile upstream from Prairie Creek, 0.8 mile south of Little Ark, and 13 miles east of Norman, Cleveland County.

DRAINAGE AREA, 257 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1953 to September 1957.

Sediment records: May 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,460 ppm Nov. 1-3; minimum, 80 ppm May 24-25.

Hardness: Maximum, 390 ppm Nov. 1-3; minimum, 52 ppm Sept. 21.

Specific conductance: Maximum daily, 2,770 micromhos Nov. 3; minimum, freezing point Jan. 29.

Water temperatures: Maximum, 94 F July 2; minimum, freezing point Jan. 29.

Sediment concentrations: Maximum daily, 10,550 ppm Apr. 3; minimum daily, 0 tons on many days.

Sediment loads: Maximum daily, 280,000 tons May 25; minimum daily, 0 tons on many days.

EXTREMES, 1953-57.--Dissolved solids: Maximum, 1,460 ppm Nov. 1-3, 1956; minimum, 80 ppm May 24-25, 1957.

Hardness: Maximum, 390 ppm Nov. 11-20, 1955, Nov. 1-3, 1956; minimum, 52 ppm Sept. 21, 1957.

Specific conductance: Maximum daily, 2,770 micromhos Nov. 3, 1956; minimum daily, 100 micromhos May 25, 1957.

Water temperatures: Maximum, 98 F July 11-12, 1954; minimum, freezing point Feb. 2, 1956; Jan. 29, 1957.

Sediment concentrations (May 1956 to September 1957): Maximum daily, 10,550 ppm Apr. 3, 1957; minimum daily, no flow on many days.

Sediment loads (May 1956 to September 1957): Maximum daily, 280,000 tons May 25, 1957; minimum daily, 0 tons on many days.

REMARKS--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. No flow during August and September 1956; suspended-sediment tabulation omitted for these months. Records of discharge for water year October 1956 to September 1957 given in WSP 1511. No flow Oct. 2-18, 20-29, 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-magnesium				
Oct. 1, 1956	0.10	9.0	0.03	60	40	329	4.3	304	0	178	440	0.2	1.4	0.86	1,210	1.65	0.3	315	66	69	8.1	2,170	8.1
Oct. 19	0.20	--	--	54	44	316	--	304	0	168	408	--	1.6	--	1,140	1.55	.6	315	66	69	7.7	2,040	8.0
Oct. 30-31	.45	--	--	56	41	338	--	312	0	178	428	--	1.1	--	1,200	1.63	1.5	310	54	70	8.4	2,130	8.0
Nov. 1-3	.10	--	--	62	57	402	--	286	14	220	550	--	.8	--	1,460	1.99	.4	390	132	69	8.8	2,600	8.6
Nov. 4	99.0	--	--	27	16	110	--	108	0	52	160	--	3.2	--	423	.58	113	132	44	64	4.2	828	7.9
Nov. 5-7	20.8	--	--	21	13	27	--	130	0	13	28	--	2.9	--	174	.24	9.8	104	0	36	1.1	311	8.1
Nov. 8-10	.67	--	--	27	16	65	--	162	0	31	77	--	2.0	--	298	.41	.5	134	1	51	2.4	549	8.2
Nov. 11-15	.38	--	--	34	20	111	--	204	0	54	132	--	1.2	--	456	.62	.5	168	1	59	3.7	824	8.0
Nov. 16-20	.45	--	--	42	27	166	--	248	0	83	203	--	.7	--	644	.88	.3	215	13	62	4.9	1,170	8.0
Nov. 21-30	3.08	--	--	44	30	218	--	278	4	121	245	--	.7	--	800	1.09	1.0	230	0	67	6.3	1,380	8.4
Dec. 1-10	.90	--	--	49	32	172	--	338	0	80	190	--	1.7	--	698	.95	1.7	255	0	59	4.7	1,240	8.2
Dec. 11-20	1.44	--	--	72	31	101	--	408	0	49	100	--	1.2	--	555	.75	2.2	310	0	42	2.5	972	8.1
Dec. 21-31	1.63	--	--	56	37	81	--	364	4	40	86	--	1.1	--	484	.66	2.1	280	0	38	2.1	861	8.3
Jan. 1-10, 1957	1.65	--	--	59	48	69	--	396	0	40	90	--	.6	--	531	.72	2.4	345	20	30	1.6	927	8.1
Jan. 11-20	1.65	16	.00	62	35	93	--	364	12	50	105	.3	.7	.44	553	.75	2.4	300	0	40	2.3	954	8.5
Jan. 21-23	3.80	--	--	45	41	90	--	348	0	44	102	--	.5	--	494	.67	5.1	280	0	41	2.3	900	8.1
Jan. 24-31	3.08	--	--	38	33	28	--	240	0	23	49	--	3.2	--	320	.44	2.7	230	36	21	.8	555	8.0

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per-cent so-dium ad-sorp-tion ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Calcium/magnesium	Non-carbonate				
Feb. 1-10, 1957.....	2.08	13	0.01	53	35	69	332	10	39	74	0.3	1.1	0.30	458	0.62	2.6	275	0	35	1.8	800	8.4
Feb. 11-20.....	1.72	--	--	51	45	77	348	14	42	90	--	--	--	510	.69	2.4	310	4	35	1.9	897	8.5
Feb. 21-28.....	1.98	--	--	47	47	75	366	19	37	83	--	--	--	488	.66	2.6	310	0	34	1.8	879	8.4
Mar. 1-10.....	2.33	--	--	47	45	71	342	30	37	74	--	--	--	462	.63	2.9	305	0	34	1.8	825	8.6
Mar. 11-20.....	1.94	--	--	46	47	83	328	30	41	90	--	--	--	503	.68	2.6	310	0	37	2.1	893	8.7
Mar. 21-30.....	1.96	--	--	49	41	62	356	0	34	71	--	--	--	450	.61	2.4	290	0	32	1.6	808	8.2
Mar. 31.....	9.00	--	--	30	17	19	180	0	10	18	--	--	4.9	213	.29	5.2	146	0	22	.7	374	7.6
Apr. 1-2.....	19.3	--	--	40	31	39	268	0	26	46	--	--	1.1	336	.46	18	230	8	27	1.1	605	7.6
Apr. 3-4.....	646	--	--	23	9.8	18	102	0	4.1	32	--	--	4.3	161	.72	281	98	14	28	.8	294	7.2
Apr. 5-10.....	6.80	--	--	38	24	49	280	0	17	51	--	--	5.1	307	.42	5.6	192	0	36	1.5	541	7.3
Apr. 11-18.....	2.49	--	--	46	35	32	266	0	28	58	--	--	1.0	385	.32	2.6	260	42	21	.9	694	7.6
Apr. 19-20.....	166	--	--	23	9.6	15	116	0	3.8	10	--	--	1.2	194	.18	60	102	7	11	.2	237	7.2
Apr. 21-24.....	1,067	--	--	21	11	15	136	0	6.2	17	--	--	2.8	152	.21	446	112	0	22	.6	268	7.5
Apr. 25-30.....	96.0	--	--	39	24	20	210	0	11	38	--	--	2.4	218	.38	72	196	24	18	.6	416	7.0
May 1-4.....	325	--	--	34	11	19	160	4	6.2	20	--	--	2.4	190	.26	167	132	0	24	.7	321	8.3
May 5-8.....	49.0	--	--	51	26	31	256	8	13	44	--	--	1.4	317	.43	42	230	8	23	.9	556	8.4
May 9-10.....	262	--	--	27	11	14	132	0	6.0	19	--	--	2.8	156	.21	110	112	4	22	.6	283	8.0
May 11-12.....	270	--	--	34	14	20	172	0	7.4	26	--	--	3.2	202	.27	147	144	3	23	.7	357	8.2
May 13.....	3,340	--	--	27	8.4	6.2	138	0	2.3	4.0	--	--	3.0	120	.16	1,080	102	0	12	.3	148	8.0
May 14.....	345	--	--	33	10	13	152	2	5.4	12	--	--	2.9	169	.23	157	124	0	19	.5	285	8.3
May 15-16.....	81.0	--	--	48	24	24	248	8	13	28	--	--	2.6	276	.38	60	220	4	19	.7	484	8.5
May 17-18.....	2,690	--	--	37	5.2	3.7	80	0	.0	3.8	--	--	1.3	83	.11	603	64	0	14	.3	141	7.8
May 19.....	376	--	--	32	13	14	148	4	4.7	18	--	--	3.5	180	.24	183	132	4	18	.5	299	8.3
May 20.....	86.0	--	--	51	25	24	236	12	13	35	--	--	3.9	236	.40	69	230	14	18	.7	525	8.7
May 21-23.....	210	--	--	37	6.2	38	196	0	8.0	21	--	--	2.9	212	.29	120	168	0	41	1.5	372	8.2
May 24-25.....	10,760	--	--	16	4.9	1.6	68	0	.0	4.0	--	--	3.3	80	.11	2,330	60	4	6	.1	100	7.8
May 26-31.....	252	--	--	48	24	20	244	8	10	26	--	--	2.6	278	.38	189	220	6	16	.6	501	8.5
June 1-2.....	548	--	--	42	22	20	208	6	7.4	34	--	--	3.0	236	.32	349	196	16	18	.6	430	8.4
June 3-5.....	1,118	--	--	37	13	12	176	0	5.6	14	--	--	2.9	174	.24	525	146	2	15	.4	310	8.2
June 6-7.....	138	--	--	57	35	13	274	14	12	30	--	--	3.1	303	.41	113	285	36	7	.3	537	8.5
June 8-10.....	62.3	--	--	53	39	40	340	8	19	45	--	--	3.2	374	.51	63	290	0	23	1.0	671	8.4
June 11-14.....	130	--	--	39	45	29	304	8	21	42	--	--	3.2	336	.46	118	280	20	18	.8	620	8.4

June 15, 1957.....	9,320	--	--	17	7.2	2.5	82	0	2.1	4.7	--	2.4	--	98	.13	2,470	72	5	7	.1	136	7.8
June 16-17.....	286	--	--	44	33	20	242	16	16	30	--	4.2	--	290	.39	224	245	20	15	.5	513	8.5
June 18-19.....	266	--	--	42	23	15	198	14	12	20	--	4.8	--	228	.31	164	198	12	14	.5	411	8.5
June 20-21.....	101	--	--	34	37	25	242	12	17	36	--	4.8	--	285	.39	78	235	18	19	.7	522	8.5
June 22-24.....	2,251	--	--	27	13	8.3	144	0	5.6	9.5	--	2.8	--	139	.19	845	122	4	13	.3	257	8.2
June 25-30.....	103	--	--	47	45	30	320	10	19	47	--	4.2	--	361	.49	100	305	26	18	.7	653	8.4
July 1-10.....	28.4	21	.00	37	58	53	398	0	31	60	.1	2.6	.55	459	.62	35	330	4	26	1.3	767	8.0
July 11-20.....	14.5	--	--	31	57	58	370	6	33	64	--	1.2	--	434	.59	17	310	0	29	1.4	794	8.3
July 21-25.....	14.0	--	--	54	41	57	366	0	33	66	--	1.2	--	432	.59	16	305	4	29	1.4	759	7.9
July 26.....	13.0	--	--	22	67	74	312	0	26	148	--	1.7	--	562	.76	20	330	76	33	1.8	1,140	7.9
July 27-31.....	9.72	--	--	37	55	74	388	0	37	87	--	3.3	--	484	.66	13	320	2	34	1.8	856	7.9
Aug. 1-3.....	7.67	--	--	40	55	76	408	0	39	80	--	4.3	--	495	.67	10	325	0	34	1.8	870	7.9
Aug. 4-5.....	63.0	--	--	30	23	36	208	0	16	39	--	7.1	--	253	.34	43	170	0	31	1.2	461	7.5
Aug. 6-10.....	7.32	--	--	45	41	86	328	0	52	102	--	1.3	--	460	.63	9.1	280	11	40	2.2	829	7.8
Aug. 11-14.....	5.40	--	--	46	54	89	384	0	39	124	--	.5	--	545	.74	7.9	335	22	37	2.1	873	8.1
Aug. 15-20.....	11.3	--	--	42	40	49	332	0	26	54	--	.8	--	384	.52	12	270	0	29	1.3	673	8.1
Aug. 21-31.....	4.11	--	--	40	54	85	406	0	46	88	--	.1	--	532	.72	5.9	320	0	37	2.1	941	8.1
Sept. 1-10.....	3.49	--	--	29	52	107	346	10	56	112	--	.6	--	538	.73	5.1	285	0	45	2.7	966	8.4
Sept. 11-13.....	4.40	--	--	45	53	104	412	4	56	108	--	.7	--	574	.78	6.8	330	0	41	2.5	1,010	8.3
Sept. 14-17.....	1,001	--	--	29	9.1	13	136	0	9.3	12	--	1.4	--	144	.20	389	110	0	21	.6	256	7.8
Sept. 18-20.....	14.3	--	--	46	27	44	260	0	18	63	--	2.3	--	347	.47	13	225	13	30	1.3	618	8.1
Sept. 21.....	1,220	--	--	14	4.1	66	66	0	2.5	5.3	--	3.0	--	97	.13	320	52	0	22	.4	120	7.5
Sept. 22-30.....	33.0	--	--	53	34	39	322	0	22	47	--	1.4	--	355	.48	32	270	6	24	1.0	636	8.2
Weighted average..	215	--	--	24	11	9.2	b123	--	4.4	12	--	2.8	--	136	0.18	79	105	4	16	0.4	221	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	80	40	48	35	58	64	66	69	86	90	81
2	72	57	46	44	40	51	65	71	65	94	86	85
3	63	--	42	47	52	47	55	67	64	88	85	86
4	68	48	57	44	43	48	53	65	67	84	77	87
5	70	53	55	44	45	60	48	67	69	92	76	90
6	66	54	55	44	46	47	50	71	80	85	75	82
7	63	59	49	47	48	47	60	68	75	87	84	73
8	60	54	42	50	55	42	52	67	78	89	83	76
9	75	54	35	45	61	54	54	65	82	82	87	78
10	63	48	36	35	61	58	58	67	76	80	86	78
11	74	54	37	40	45	65	64	65	83	90	87	74
12	64	52	41	39	54	63	46	64	77	81	89	76
13	74	50	37	43	57	66	47	63	78	92	88	77
14	67	45	45	37	58	60	48	68	85	90	86	70
15	68	49	46	39	57	62	56	68	70	92	84	66
16	65	51	42	37	50	55	61	77	80	90	84	65
17	72	43	45	40	53	53	62	65	80	90	78	74
18	60	50	40	41	49	57	71	62	75	90	77	76
19	62	48	40	37	47	56	67	63	78	--	78	74
20	68	42	41	52	50	50	63	75	80	90	80	80
21	65	48	48	50	51	48	63	76	77	90	83	67
22	60	45	46	42	57	55	65	68	67	87	82	69
23	58	51	45	39	43	55	60	66	--	84	79	74
24	62	42	43	37	54	50	65	64	74	82	--	63
25	64	45	41	34	56	47	76	66	68	83	86	70
26	56	--	40	33	54	55	65	69	77	84	86	70
27	65	48	40	34	57	47	64	67	79	86	85	67
28	--	48	47	36	60	60	63	72	84	91	86	68
29	69	43	45	32	--	63	65	78	77	92	89	73
30	63	48	51	--	--	58	77	67	77	91	86	70
31	55	--	48	37	--	65	--	67	--	91	83	--
Average	65	50	44	41	51	55	60	68	76	88	84	75

Suspended sediment, May to September 1956

Day	May			June			July		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	12	--	--	13	1,350	47	0.3	38	(t)
2.....	6.5	--	e 50	5.4	391	5.7	.2	41	(t)
3.....	5.4	--	--	7.7	532	11	.2	44	(t)
4.....	4.0	144	1.6	9.7	630	16	.2	57	(t)
5.....	3.2	99	.9	4.9	282	3.5	.1	50	(t)
6.....	2.9	92	.7	2.5	134	.9	11	292	9.3
7.....	2.5	112	.8	2.5	110	.7	2.5	62	.4
8.....	2.5	121	.8	3.2	83	.7	.3	36	(t)
9.....	2.5	109	.7	3.2	106	.9	.3	52	(t)
10.....	2.2	94	.6	3.2	96	.8	.2	66	(t)
11.....	2.2	75	.4	2.5	87	.6	.3	77	.1
12.....	2.2	110	.7	2.2	76	.5	.1	65	(t)
13.....	1.9	79	.4	1.9	82	.4	0	--	0
14.....	1.9	91	.5	1.9	100	.5	0	--	0
15.....	9.7	298	s 7.8	1.9	91	.5	0	--	0
16.....	3.2	97	.8	1.7	102	.5	0	--	0
17.....	1.1	80	.2	1.7	106	.5	2.2	2,140	s 30
18.....	1.1	57	.2	1.1	60	.2	7.1	2,000	38
19.....	1.1	85	.3	.9	75	.2	13	1,980	69
20.....	.9	53	.1	.6	65	.1	5.9	1,600	25
21.....	1.1	63	.2	.5	64	.1	4.5	542	6.6
22.....	1.3	59	.2	.4	92	.1	3.6	228	2.2
23.....	13	272	s 70	.4	64	.1	.4	115	.1
24.....	124	4,700	s 2,640	.7	71	s .3	.3	100	.1
25.....	152	4,120	s 3,360	1.5	93	.4	.3	74	.1
26.....	164	3,080	s 3,400	.7	132	.3	.3	50	(t)
27.....	215	4,580	s 2,980	.4	117	.1	.2	42	(t)
28.....	78	1,480	s 376	.4	91	.1	.1	36	(t)
29.....	15	431	17	.4	85	.1	.1	58	(t)
30.....	9.0	251	6.1	.4	54	(t)	.1	59	(t)
31.....	31	992	s 83	--	--	--	.1	76	(t)
Total.	872.4	--	13,000	77.5	--	92.8	53.9	--	181.2

Total discharge for period May 1 to Sept. 30, 1956 (cfs-days)..... 1,003.8

Total load for period May 1 to Sept. 30, 1956 (tons)..... 13,274.0

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0.1	83	(t)	0.1	34	(t)	0.6	48	0.1
2.....	0	--	0	.1	63	(t)	.6	45	.1
3.....	0	--	0	.1	34	(t)	.6	45	.1
4.....	0	--	0	99	2,500	s 1,740	.5	65	.1
5.....	0	--	0	57	2,510	s 578	.3	59	(t)
6.....	0	--	0	3.6	1,120	11	.6	45	.1
7.....	0	--	0	1.7	480	2.2	.7	39	.1
8.....	0	--	0	.9	320	.8	1.7	73	.1
9.....	0	--	0	.6	201	.3	1.7	91	.4
10.....	0	--	0	.5	150	--	1.7	70	.3
11.....	0	--	0	.4	111	--	1.5	61	.2
12.....	0	--	0	.4	102	--	1.3	75	.3
13.....	0	--	0	.4	103	.1	.9	56	.1
14.....	0	--	0	.4	98	.1	.6	56	.1
15.....	0	--	0	.3	107	.1	.4	48	.1
16.....	0	--	0	.1	82	--	.3	48	(t)
17.....	0	--	0	.1	75	(t)	.2	48	(t)
18.....	0	--	0	.1	98	(t)	1.1	48	.1
19.....	.2	93	.1	.3	95	.1	3.2	346	s 3.9
20.....	0	--	0	.4	89	.1	4.9	301	s 4.2
21.....	0	--	0	.4	85	.1	3.2	84	.7
22.....	0	--	0	.4	83	.1	2.5	155	1.0
23.....	0	--	0	.4	107	.1	2.2	63	.4
24.....	0	--	0	.4	73	.1	1.7	50	.2
25.....	0	--	0	.5	71	.1	1.3	43	.2
26.....	0	--	0	.4	68	--	1.3	47	.2
27.....	0	--	0	.4	65	--	1.3	42	.1
28.....	0	--	0	.5	62	.1	1.3	44	.2
29.....	0	--	0	.6	63	.1	1.3	49	.2
30.....	.8	110	.2	.5	59	.1	1.1	43	.1
31.....	.1	39	(t)	--	--	--	1.7	54	.2
Total.	1.2	--	.3	171.0	--	2,335.2	41.3	--	14.3
Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0.9	55	0.1	2.2	65	0.4	1.9	94	0.5
2.....	.9	64	.2	2.2	67	.4	3.2	95	.8
3.....	.9	59	.1	1.9	74	.4	3.2	83	.7
4.....	2.5	96	--	2.5	66	.4	2.9	86	.7
5.....	2.5	63	--	2.5	78	.5	2.5	83	.6
6.....	2.2	69	.4	1.9	81	.5	2.2	76	.5
7.....	1.7	83	.4	1.9	92	.5	1.9	71	.4
8.....	1.7	79	.4	1.9	95	.5	1.9	63	.3
9.....	1.7	76	.4	1.9	108	.6	1.7	69	.3
10.....	1.5	69	.3	1.9	93	.5	1.9	79	.4
11.....	1.5	62	.3	1.7	85	.4	1.9	84	.4
12.....	1.7	58	.3	1.7	75	.3	1.9	70	.4
13.....	1.9	50	.3	1.7	75	.3	1.7	68	.3
14.....	1.9	55	.3	1.7	78	.4	1.7	63	.3
15.....	1.7	60	.3	1.7	75	.3	1.7	61	.3
16.....	1.3	72	--	1.7	82	.4	1.7	58	.3
17.....	1.1	69	.2	1.7	70	.3	2.2	60	.4
18.....	1.3	78	.3	1.7	78	.4	2.2	66	.4
19.....	1.7	83	.4	1.9	88	.5	1.9	54	.3
20.....	2.2	85	.5	1.7	89	.4	2.5	67	.5
21.....	2.2	64	.4	1.9	91	.5	3.2	231	2.0
22.....	2.9	64	.5	1.9	90	.5	1.7	82	.4
23.....	6.3	63	s 1.3	2.2	98	.6	1.7	76	.3
24.....	5.9	182	--	1.9	90	.5	1.7	79	.4
25.....	2.9	222	--	1.9	104	.5	1.7	62	.3
26.....	1.9	158	.8	1.9	103	.5	1.7	59	.3
27.....	1.9	270	1.4	2.2	94	.6	1.9	62	.3
28.....	1.9	132	.7	1.9	99	.5	1.9	71	.4
29.....	5.4	342	s 4.7	--	--	--	1.9	91	.5
30.....	2.5	566	s 3.9	--	--	--	2.2	153	s .9
31.....	2.2	162	s .5	--	--	--	9.0	2,850	s 75.0
Total.	68.8	--	25.3	53.8	--	12.6	71.3	--	89.6

s Computed by subdivided day.

t Less than 0.05 ton.

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3.6	350	3.4	220	2,730	s 1,910	154	525	s 233
2.....	3.5	826	s 376	256	1,560	4,120	943	4,960	s 16,300
3.....	1,190	10,550	s 43,900	725	4,310	s 12,000	1,230	5,530	s 23,500
4.....	101	--	s 650	98	--	s 193	1,640	4,260	22,600
5.....	20	440	24	67	246	44	483	397	s 560
6.....	8.3	285	6.4	32	113	10	174	--	138
7.....	4.9	110	1.5	23	115	7.1	102	--	74
8.....	2.9	80	.6	74	438	s 226	75	206	42
9.....	2.5	115	.8	458	3,470	s 5,570	60	188	27
10.....	2.2	57	.3	67	423	77	52	169	24
11.....	1.9	86	.4	296	2,250	s 3,230	46	175	22
12.....	2.5	112	.8	244	1,480	s 1,200	41	155	17
13.....	2.5	104	.7	3,340	7,030	s 79,800	38	134	14
14.....	2.9	99	.8	345	1,780	2,230	393	626	6,470
15.....	2.9	84	.7	57	495	76	9,320	5,540	s 128,000
16.....	2.5	89	.6	105	894	s 781	401	2,020	s 2,450
17.....	2.5	74	.5	2,060	--	s 63,400	172	625	302
18.....	2.2	68	.4	3,320	7,400	s 80,900	337	2,300	s 2,340
19.....	129	4,530	s 2,820	376	988	s 1,080	196	1,237	s 682
20.....	204	4,940	s 4,220	86	308	72	114	268	82
21.....	1,030	7,910	s 29,500	170	1,740	s 908	88	191	45
22.....	234	1,700	s 4,230	266	2,040	s 1,970	3,740	--	s 101,000
23.....	2,920	8,240	s 82,400	193	1,220	s 732	2,250	5,300	s 36,400
24.....	165	2,330	s 1,040	4,860	2,610	s 109,000	764	2,320	s 5,620
25.....	40	475	s 58	16,700	6,240	s 280,000	196	657	348
26.....	284	3,340	s 2,810	526	2,640	s 4,480	118	433	138
27.....	78	705	148	166	987	442	96	242	63
28.....	36	208	20	100	394	106	81	214	47
29.....	26	116	8.1	77	260	54	72	193	38
30.....	112	840	s 1,030	250	1,730	1,910	54	169	25
31.....	--	--	--	391	2,460	s 2,780	--	--	--
Total.	6,648.3	--	173,252.0	35,948	--	659,298.1	23,430	--	347,602
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	45	148	18	7.8	163	3.4	4.8	325	4.2
2.....	39	121	13	7.8	107	2.3	5.6	79	1.2
3.....	34	132	12	7.4	101	2.0	4.4	74	.9
4.....	32	117	10	98	3,280	s 1,220	2.9	76	.6
5.....	29	124	9.7	28	488	37	2.6	63	.4
6.....	24	110	7.1	10	183	4.9	2.6	83	.6
7.....	22	115	6.8	7.0	102	1.9	2.9	95	.7
8.....	20	117	6.3	7.0	120	2.3	2.9	111	.9
9.....	20	109	5.9	6.5	121	2.1	2.9	83	.6
10.....	19	132	6.8	6.1	134	2.2	3.3	98	.9
11.....	18	122	5.9	5.6	288	4.4	5.2	166	2.3
12.....	17	115	5.3	5.6	140	2.1	4.0	102	1.1
13.....	16	119	5.1	5.6	124	1.9	4.0	93	1.0
14.....	16	109	4.7	4.8	109	1.4	1,580	2,090	s 5,390
15.....	15	105	4.3	18	--	s 76	2,170	6,270	s 46,500
16.....	14	111	4.2	12	662	s 23	221	1,380	s 1,030
17.....	13	103	3.6	16	669	s 34	32	343	30
18.....	12	108	3.5	6.7	274	6.4	18	120	5.8
19.....	12	107	3.5	6.5	150	2.6	13	116	4.1
20.....	12	103	3.3	6.5	152	2.7	12	--	s 4.7
21.....	12	90	2.9	5.6	142	2.1	1,220	3,270	s 13,500
22.....	14	98	3.7	5.2	136	1.9	156	1,020	s 471
23.....	17	114	5.2	4.8	131	1.7	44	254	60
24.....	14	106	4.0	4.4	132	1.6	21	106	30
25.....	13	134	4.7	4.4	128	1.5	16	81	3.5
26.....	13	103	3.6	4.0	103	1.1	14	82	3.1
27.....	12	87	2.8	4.0	101	1.1	13	82	2.9
28.....	10	81	2.2	3.7	100	1.0	12	85	2.8
29.....	9.2	107	2.7	3.3	72	.6	11	114	3.4
30.....	8.7	130	3.1	2.9	85	.7	10	125	3.4
31.....	8.7	115	2.7	2.9	81	.6	--	--	--
Total.	560.6	--	176.6	320.1	--	1,446.5	5,611.1	--	67,006.1

Total discharge for year (cfs-days)..... 72,925.5

Total load for year (tons)..... 1,251,258.6

s Computed by subdividing day.

a Computed from estimated concentration graph.

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Apr. 23, 1957 .. May 25	3:40 p.m.	1,750	75	5,650	3,080	33	34	43	55	74	67	81	98	100	SPWC
	2:10 p.m.	10,000	73	7,380	4,260	33	37	45	59		88	99	100		SPWC

ARKANSAS RIVER BASIN--Continued
LITTLE RIVER NEAR SASAKWA, OKLA.

LOCATION. --At gaging station on highway bridge, 2½ miles northwest of Sasakwa, Seminole County, and 8.7 miles downstream from Salt Creek.
DRAINAGE AREA. --865 square miles.
RECORDS AVAILABLE. --Chemical analyses: September 1951 to September 1955 (monthly), October 1955 to September 1957 (daily).
Water temperatures: October 1955 to September 1957.
EXTREMES. 1956-57. --Dissolved solids: Maximum, 129,000 ppm Oct. 30-31; minimum, 189 ppm June 11.
Hardness: Maximum, 24,400 ppm Oct. 30-31; Nov. 1-2; minimum, 112 ppm June 11.
Specific conductance: Maximum, 138,000 micromhos Oct. 31; minimum daily, 365 micromhos June 11.
Water temperatures: Maximum, 93°F Aug. 14; minimum, 34°F Jan. 30, Feb. 2.
EXTREMES. 1955-57. --Dissolved solids: Maximum, 129,000 ppm Oct. 30-31, 1956; minimum, 189 ppm June 11, 1957.
Hardness: Maximum, 24,400 ppm Oct. 30-31; Nov. 1-2, 1956; minimum, 112 ppm June 11, 1957.
Specific conductance: Maximum, 138,000 micromhos Oct. 31, 1956; minimum daily, 365 micromhos June 11, 1957.
Water temperatures: Maximum, 93°F July 27, Aug. 14, 1956; minimum, 33°F Dec. 16, 1955, Jan. 18, Feb. 3, 1956.
REMARKS. --Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511, No flow Oct. 1-22, 28-29.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magne-sium (Mg)	Sodium (Na)	Potas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bor-on (B)	Dissolved solids (residue at 180°C)	Hardness as CaCO ₃	Per-cent so-dium ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
Oct. 23, 1956	0.20	--	--	2,330	763	12,200	8,040	93	0	64	25,100	--	--	--	44,600	8,980	75	59,200	7.2
Oct. 24-26	.43	--	--	1,650	575	8,040	73	73	0	39	16,900	--	--	--	30,900	6,420	75	42,600	7.7
Oct. 27	.10	--	--	3,020	794	14,600	49	0	97	30,000	--	--	--	--	52,100	10,800	75	61,600	7.3
Oct. 30-31	14.8	--	--	6,320	893	33,200	60	60	0	228	68,300	--	--	--	129,000	24,400	75	129,000	6.8
Nov. 1-2	9.05	--	--	6,760	1,830	36,300	51	0	246	73,100	--	--	--	--	121,000	24,400	76	101,300	7.1
Nov. 3-4	6.65	--	--	1,800	564	9,630	50	0	85	19,600	--	--	--	--	33,200	6,810	75	45,900	7.2
Nov. 5-7	130	--	--	1,050	241	5,110	22	0	43	10,400	--	--	--	--	18,100	3,590	75	27,600	7.0
Nov. 8-10	20.7	--	--	343	96	1,760	68	0	33	3,540	--	--	--	--	6,380	1,190	75	10,400	7.5
Nov. 11-15	4.78	--	--	343	89	1,750	74	0	37	3,490	--	--	--	--	6,370	1,160	76	10,500	7.5
Nov. 16-20	5.20	--	--	447	118	2,290	74	0	46	4,590	--	--	--	--	8,390	1,540	76	13,500	7.6
Nov. 21-24	2.38	--	--	371	101	1,890	68	0	41	3,790	--	--	--	--	7,100	1,280	75	11,300	7.6
Nov. 25-30	1.03	--	--	746	175	3,500	52	0	49	7,160	--	--	--	--	13,100	2,540	75	30,190	7.6
Dec. 1-3	1.57	--	--	833	207	4,170	48	0	57	8,430	--	--	--	--	16,200	2,890	76	33,200	6.8
Dec. 4	3.30	--	--	597	151	2,980	67	0	49	6,020	--	--	--	--	11,500	2,060	75	28,160	7.7
Dec. 5	2.90	--	--	403	111	2,070	96	0	34	4,140	--	--	--	--	8,020	1,460	75	12,000	7.8
Dec. 6-8	71.4	--	--	1,170	312	6,210	26	0	55	12,500	--	--	--	--	22,300	4,200	76	32,900	6.3
Dec. 9-10	71.0	--	--	1,920	501	9,930	10	0	93	20,100	--	--	--	--	36,800	6,850	76	50,300	4.3
Dec. 11-16	6.82	--	--	1,050	258	5,280	19	0	50	10,700	--	--	--	--	19,600	3,660	76	28,900	6.6
Dec. 17-18	2.25	--	--	104	24	447	60	0	7.4	900	--	--	--	--	1,790	306	73	3,030	7.8
Dec. 19-20	436	--	--	407	98	1,900	52	0	22	3,890	--	--	--	--	7,520	1,420	74	11,700	7.7
Dec. 21-24	66.5	--	--	284	78	1,310	65	0	23	2,700	--	--	--	--	5,180	1,030	73	8,280	7.7

ARKANSAS RIVER BASIN

131

Dec. 25-30, 1956	12.2	565	170	2,720	70	0	37	5,620	--	--	10,700	14.55	352	2,110	2,050	74	26	16,300	7.6
Dec. 31	6.90	814	206	3,720	72	0	45	7,700	--	--	14,500	19.72	270	2,880	2,820	74	30	21,000	7.6
Jan. 1-2, 1957	6.30	960	283	4,510	59	0	50	9,410	--	--	17,500	24.07	301	3,560	3,510	73	33	25,000	7.8
Jan. 3-6	8.60	1,760	518	8,400	31	0	109	17,500	--	--	32,900	44.74	764	6,520	6,490	74	45	43,700	7.1
Jan. 7-10	10.4	2,680	687	12,200	12	0	109	25,400	--	--	47,800	65.01	1,340	9,510	9,500	74	54	60,200	6.3
Jan. 11-20	5.04	2,740	750	13,600	10	0	121	27,500	--	--	52,500	71.40	714	9,920	9,910	75	59	64,600	6.4
Jan. 21-22	31.2	4,150	1,080	21,000	7	0	165	42,800	--	--	79,800	108.53	6,720	14,800	14,800	76	75	92,100	6.3
Jan. 23-24	124	981	249	4,320	69	0	57	9,040	--	--	17,100	23.26	5,730	3,470	3,410	73	32	24,700	7.8
Jan. 25-26	30.0	192	61	1,901	76	0	18	1,850	--	--	3,650	4.96	296	730	668	73	15	5,880	8.0
Jan. 27-28	22.3	320	93	1,480	74	0	26	3,050	--	--	6,110	8.31	368	1,180	1,120	73	19	9,370	7.8
Jan. 30-31	110	383	108	1,660	76	0	27	3,490	--	--	6,550	9.04	1,980	1,400	1,340	72	19	10,400	7.9
Feb. 1-4	45.8	486	140	2,190	78	0	30	4,580	--	--	8,750	11.90	1,080	1,790	1,780	73	23	13,300	7.9
Feb. 5-10	19.3	853	219	3,800	75	0	42	7,940	--	--	15,000	20.40	782	3,030	2,970	73	30	21,800	7.7
Feb. 11-18	8.42	1,230	346	5,900	55	0	58	12,200	--	--	22,600	30.74	544	4,490	4,440	74	38	31,600	7.7
Feb. 19-20	9.30	1,960	571	9,110	24	0	86	19,100	--	--	35,700	46.55	896	7,240	7,220	73	46	47,300	7.0
Feb. 21-27	11.5	2,520	759	12,200	4	0	104	23,400	--	--	47,300	64.53	1,470	9,410	9,410	74	35	60,200	5.8
Feb. 28	9.60	312	83	1,370	88	0	13	2,650	--	--	5,560	7.70	147	1,120	1,050	73	18	6,700	7.9
Mar. 1-6	163	474	111	2,070	88	0	29	4,280	--	--	8,410	11.44	3,700	1,640	1,570	73	22	13,600	8.1
Mar. 7-10	32.0	755	194	3,190	71	0	41	6,750	--	--	12,700	17.27	1,100	2,680	2,620	72	27	19,900	7.8
Mar. 11-14	28.2	833	217	3,690	63	0	48	7,730	--	--	14,500	19.72	1,100	2,970	2,920	73	29	21,700	7.7
Mar. 15-20	65.2	415	106	1,830	94	0	23	3,790	--	--	7,050	9.59	1,240	1,470	1,390	73	21	11,300	8.2
Mar. 21-25	106	597	114	2,670	101	0	42	5,470	--	--	9,490	12.91	2,720	2,040	1,960	74	26	15,600	7.8
Mar. 26	36.0	1,350	392	6,400	89	0	67	13,300	--	--	22,800	31.01	2,220	4,980	4,910	74	39	34,000	8.0
Mar. 27-28, 30	38.3	139	45	606	106	0	12	1,240	--	--	2,290	3.11	237	530	443	71	11	4,190	7.7
Mar. 29, 31	37.5	82	25	293	102	0	12	600	--	4.8	1,210	1.65	123	310	224	67	7.2	2,120	8.0
Apr. 1	1,050	152	56	558	116	0	7.0	1,220	--	--	2,570	3.50	7,290	610	515	67	9.8	4,150	8.0
Apr. 2	431	256	93	933	120	0	16	2,080	--	--	4,400	5.98	5,120	1,020	922	67	13	7,020	8.2
Apr. 3-4	4,565	408	122	1,700	129	0	23	3,600	--	--	6,870	9.34	84,680	1,520	1,410	71	19	10,600	8.1
Apr. 5-10	397	179	180	1,800	130	0	28	4,040	--	--	8,110	11.03	8,690	1,520	1,800	67	18	12,800	7.8
Apr. 11-15	71.2	734	255	2,920	120	0	39	6,450	--	--	12,600	17.14	2,420	2,880	2,780	69	24	19,500	8.0
Apr. 16-17	49.0	104	39	317	136	0	8.6	700	--	1.8	1,630	2.22	216	420	308	62	6.7	2,660	8.0

a Values above 200 ppm reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER NEAR SASAKWA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Potas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl) ₃	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-dium ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH	
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium mag-ne-sium	Non-carbon-ate				
Apr. 18-21, 1957	2,033	--	--	46	17	130	--	96	0	3.7	272	--	2.2	--	686	0.95	3,820	186	108	80	4.1	1,080	7.9
Apr. 22	5,990	--	--	58	19	185	--	100	0	4.5	360	--	4.0	--	888	1.20	14,330	225	142	64	5.4	1,430	8.2
Apr. 23-24	6,320	--	--	218	72	924	--	78	0	14	1,960	--	--	--	3,950	5.37	67,400	840	776	71	14	6,150	7.8
Apr. 25-30	2,160	--	--	196	76	722	--	146	2	18	1,580	--	--	--	3,450	4.69	20,120	800	677	66	11	5,450	8.3
May 1, 4	324	--	--	296	83	1,100	--	156	8	22	2,350	--	--	--	4,410	6.00	3,860	1,080	938	69	15	7,250	8.4
May 2	323	--	--	148	51	507	--	138	4	11	1,100	--	--	--	2,480	3.37	2,160	580	460	66	9.2	3,640	8.4
May 3, 5, 10	277	--	--	224	66	761	--	148	6	25	1,650	--	--	--	3,130	4.26	2,340	830	698	67	11	5,350	8.4
May 6	280	--	--	336	103	1,380	--	100	0	23	2,950	--	--	--	5,510	7.49	4,170	1,260	1,180	70	17	8,850	8.2
May 7-9	172	--	--	469	153	1,840	--	184	0	32	3,980	--	--	--	7,360	10.01	3,420	1,800	1,650	69	19	11,800	8.0
May 11-12	340	--	--	51	15	135	--	106	0	4.1	275	--	2.8	--	856	.89	802	188	101	81	4.3	1,110	8.2
May 13	3,050	--	--	67	25	182	--	120	0	8.4	395	--	3.2	--	882	1.20	7,260	270	172	59	4.8	1,510	8.2
May 14	3,500	--	--	91	32	282	--	132	4	10	600	--	2.2	--	1,250	1.70	11,810	360	246	63	6.5	2,130	8.3
May 15-16	2,865	--	--	122	43	389	--	128	4	13	850	--	2.9	--	1,750	2.38	13,540	480	368	64	7.7	2,890	8.4
May 17-20	12,940	--	--	61	20	184	--	90	0	3.7	400	--	1.6	--	844	1.15	28,580	235	170	63	5.2	1,480	7.5
May 21-22	3,560	--	--	61	18	186	--	78	0	3.7	400	--	1.4	--	872	1.19	8,380	225	160	65	5.5	1,480	8.1
May 23	7,330	--	--	92	41	294	--	80	0	12	680	--	3.2	--	1,410	1.92	27,910	400	334	62	6.4	2,420	8.2
May 24	3,790	--	--	66	23	177	--	120	4	8.4	375	--	1.9	--	860	1.17	8,800	260	135	60	4.8	1,460	8.4
May 25-26	9,915	--	--	36	12	88	--	96	0	2.3	182	--	1.7	--	442	.60	11,830	140	70	58	3.2	1,535	8.2
May 27	21,400	--	--	66	26	172	--	128	0	8.0	375	--	2.2	--	870	1.18	50,270	270	165	58	4.6	1,460	8.1
May 28-31	4,570	--	--	54	19	140	--	116	4	6.4	288	--	1.6	--	684	.93	8,440	210	110	59	4.2	1,160	8.4
June 1	4,210	--	--	47	15	108	--	120	0	5.4	220	--	1.7	--	482	.66	5,480	180	82	57	3.5	814	7.8
June 2-6	6,892	--	--	216	76	682	--	190	8	20	1,520	--	--	--	3,470	4.72	64,570	850	681	64	10	5,040	8.3
June 7-8	1,971	--	--	264	93	897	--	178	0	23	2,000	--	--	--	4,520	6.01	23,520	1,040	894	65	12	6,340	8.2
June 9-10	2,520	--	--	48	21	96	--	116	0	6.6	220	--	2.9	--	567	.77	3,860	205	110	51	2.9	949	8.0
June 11	820	--	--	26	11	106	--	110	0	4.5	58	--	3.0	--	189	.26	4,118	112	22	37	1.3	365	7.8
June 12-13	383	--	--	50	18	106	--	130	0	8.2	222	--	2.3	--	564	.77	583	200	94	53	3.3	957	8.1
June 14	256	--	--	118	44	337	--	168	0	11	750	--	2.6	--	1,700	2.31	1,180	475	338	61	6.7	2,640	8.2
June 15-16	5,660	--	--	36	12	74	--	98	0	3.7	150	--	2.2	--	377	.51	5,760	138	58	54	2.7	671	7.7
June 17-18	6,645	--	--	30	11	43	--	96	0	3.3	93	--	1.8	--	258	.35	4,630	120	42	44	1.7	476	7.9
June 19	6,140	--	--	45	15	89	--	122	0	7.0	185	--	1.8	--	477	.65	7,910	176	76	52	2.9	810	8.0
June 20	3,730	--	--	102	40	292	--	166	0	10	640	--	2.2	--	1,480	2.01	14,910	420	284	60	6.2	2,320	8.2
June 21-30	2,611	18	0.00	228	124	1,010	--	236	0	30	2,150	0.1	--	0.59	4,800	6.53	33,840	1,080	886	67	13	6,730	7.9

July 1-6, 1957.....	174	--	--	336	117	1,350	195	0	36	2,880	--	--	5,280	7.18	2,480	1,320	1,160	69	16	8,640	7.6
July 7-10.....	86.8	--	--	435	152	1,770	213	0	44	3,790	--	--	7,030	9.56	1,650	1,710	1,540	69	19	11,400	7.6
July 11-17.....	55.9	--	--	484	196	2,070	211	0	51	4,480	--	--	8,370	11.38	1,260	2,040	1,870	69	20	13,300	7.8
July 18-19.....	38.5	--	--	1,050	396	4,670	108	0	78	10,100	--	--	17,500	23.80	1,820	4,250	4,160	71	31	27,500	7.9
July 20-21.....	33.5	--	--	581	217	2,660	96	0	52	5,670	--	--	9,720	13.22	879	2,340	2,260	71	24	16,300	7.8
July 22-25.....	576	--	--	128	39	452	128	0	17	950	--	1.6	1,790	2.43	2,780	480	375	67	9.0	3,340	7.7
July 26-31.....	80.3	--	--	240	88	974	190	0	30	2,050	--	--	3,700	5.03	802	960	804	69	14	6,490	7.8
Aug. 1-5.....	37.8	--	--	288	112	1,170	190	0	33	2,500	--	--	4,480	6.09	457	1,180	1,020	68	15	7,750	7.8
Aug. 6-7.....	104	--	--	178	80	766	208	0	41	1,580	--	--	2,870	3.90	806	1,775	604	68	12	5,200	7.8
Aug. 8-10.....	37.0	--	--	244	93	1,030	196	0	35	2,150	--	--	3,810	5.18	381	990	830	69	14	6,760	7.7
Aug. 11-16.....	18.2	--	--	276	115	1,260	148	0	33	2,650	--	--	4,500	6.12	221	1,160	1,040	70	16	7,900	7.7
Aug. 17-18.....	164	--	--	403	162	1,890	134	0	31	3,990	--	--	6,830	9.29	3,020	1,670	1,560	71	20	11,600	7.9
Aug. 19-20.....	70.0	--	--	136	56	1,529	178	0	23	1,100	--	--	2,070	2.82	391	570	424	67	9.6	3,770	7.8
Aug. 21-23.....	28.3	--	--	152	39	531	172	0	30	1,080	--	--	2,000	2.84	160	540	399	68	9.9	3,560	7.9
Aug. 24-27.....	12.0	--	--	188	73	730	176	0	27	1,550	--	--	3,000	4.08	97	770	626	67	11	5,120	7.8
Aug. 28-31.....	6.95	--	--	240	88	964	168	0	26	2,050	--	--	3,820	5.20	72	960	822	69	14	6,490	7.8
Sept. 1-6.....	6.23	--	--	272	105	1,010	180	0	24	2,220	--	--	4,520	6.15	76	1,110	962	66	13	7,430	7.7
Sept. 7-10.....	6.40	--	--	348	129	1,450	200	0	24	3,100	--	--	5,830	7.93	101	1,400	1,240	69	17	9,370	7.8
Sept. 11-14.....	11.0	--	--	376	129	1,550	184	0	25	3,300	--	--	6,020	8.19	179	1,470	1,320	70	18	9,790	7.8
Sept. 15-17.....	4,560	--	--	66	22	218	112	0	8.6	445	--	--	1,060	1.44	13,050	255	164	65	5.9	1,650	7.5
Sept. 16, 19-20.....	2,171	--	--	30	11	60	91	0	8.2	118	--	--	1,320	2.03	1,880	120	46	52	2.4	1,552	7.3
Sept. 18.....	2,360	--	--	98	37	333	108	0	13	720	--	--	1,490	2.03	9,490	395	306	65	7.3	2,490	7.6
Sept. 21.....	1,960	--	--	53	19	341	108	0	8.2	298	--	--	688	.94	3,640	210	124	59	4.2	1,150	7.6
Sept. 22-25.....	3,146	--	--	102	39	334	136	0	12	720	--	--	1,520	2.07	12,910	415	304	64	7.1	2,510	7.7
Sept. 26-27.....	232	--	--	188	61	618	172	0	18	1,350	--	--	2,680	3.64	1,680	720	579	65	10	4,450	7.9
Sept. 28-30.....	114	--	--	248	90	915	198	0	23	1,980	--	--	3,850	5.24	1,180	990	828	67	13	6,210	7.9
Weighted average.....	1,032	--	--	131	48	474	b127	--	12	1,020	--	--	2,150	2.92	5,990	594	420	66	9.0	3,310	--

a Values above 200 ppm reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

LITTLE RIVER NEAR SASAKWA, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	64	47	46	36	--	52	65	75	87	92	87
2	74	62	48	46	34	49	55	67	76	92	91	87
3	69	62	49	47	40	47	54	67	75	90	90	87
4	71	63	52	46	47	46	54	68	76	91	88	87
5	70	61	51	45	48	42	56	67	78	89	87	80
6	74	64	50	46	48	41	60	67	79	89	87	78
7	75	63	52	45	58	40	61	69	82	90	86	75
8	--	53	43	42	58	42	57	69	81	91	85	78
9	69	49	39	42	61	40	60	70	78	90	86	78
10	70	53	38	41	57	50	60	70	78	90	89	78
11	70	57	40	41	57	53	62	71	79	90	89	79
12	71	58	38	38	56	61	55	70	--	91	89	80
13	69	53	38	37	56	60	49	70	79	91	92	82
14	68	54	--	37	57	63	56	71	79	90	93	78
15	72	58	41	36	57	57	58	72	80	91	87	76
16	74	48	42	36	53	56	60	71	79	91	86	75
17	73	50	43	36	52	55	62	71	80	90	85	75
18	70	50	42	36	53	55	67	72	80	90	82	76
19	71	50	41	35	53	54	65	72	78	90	80	--
20	70	47	44	37	49	53	67	72	80	90	85	72
21	70	47	45	36	48	52	67	73	79	89	85	72
22	69	48	46	45	47	52	65	73	80	90	86	71
23	70	48	46	38	48	52	65	73	78	88	87	72
24	68	47	47	38	48	49	65	72	73	87	89	70
25	67	48	47	37	49	48	67	72	75	87	88	70
26	67	47	46	36	49	53	66	73	78	89	89	71
27	68	47	47	35	51	52	67	72	80	89	89	69
28	69	47	--	36	51	53	66	73	79	89	89	70
29	65	48	46	37	--	52	67	72	82	90	88	70
30	64	48	--	34	--	53	67	70	87	91	89	70
31	63	--	48	35	--	53	--	71	--	92	89	--
Average	70	53	45	39	51	51	61	70	79	90	88	76

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER AT CANTON RESERVOIR, NEAR CANTON, OKLA.

LOCATION.--Immediately below dam on North Canadian River, half a mile upstream from gaging station at Canton, 2 miles northwest of Canton, Blaine County, and 4½ miles upstream from Minnehaha Creek.

DRAINAGE AREA.--12,483 square miles above dam, of which 4,883 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954, October 1956 to September 1957.

Water temperatures: October 1951 to September 1954.

EXTREMES, 1951-54.--Dissolved solids: Maximum, 1,150 ppm July 17-19, 1953; minimum, 370 ppm May 25-31, 1954.

Hardness: Maximum, 417 ppm Mar. 1-31, 1953; minimum, 205 ppm May 25-31, 1954.

Specific conductance: Maximum daily, 1,790 micromhos July 17, 1953; minimum daily, 399 micromhos May 26, 1954.

Water temperatures: Maximum, 85°F July 31, Aug. 5, 7, 9, 1952; minimum, freezing point Dec. 20-21, 1951.

REMARKS.--Records of discharge for gaging station at Canton for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 8, 1956	2.4	6.5	0.01	58	27	108	3.7	216	120	130	0.9	1.9	0.08	575	0.78	3.8	255	78	48	3.0	973	7.4
Nov. 1	2.5	8.1	.01	58	29	104	3.6	216	122	130	1.0	1.4	.08	575	.78	4.0	265	88	46	2.8	972	7.4
Dec. 7	3.2	5.5	.01	60	31	108	3.6	228	126	133	1.0	1.1	.10	593	.81	4.7	275	88	46	2.8	1,020	7.5
Jan. 4, 1957	3.5	7.5	.01	66	31	101	--	b238	124	132	1.3	1.6	.05	581	.79	4.7	290	95	43	2.6	1,010	8.5
Feb. 11	2.8	6.5	.00	68	28	101	--	236	125	134	1.1	1.6	.24	582	.79	4.7	285	92	44	2.6	1,020	8.2
Mar. 4	1,470	5.5	.01	66	27	101	--	234	123	132	1.2	1.7	.06	582	.79	695	275	83	44	2.6	1,010	7.2
Apr. 5	.9	5.0	.01	62	27	100	--	226	119	121	1.0	1.4	.17	559	.76	175	265	79	45	2.7	969	7.4
May 3	740	9.0	.01	57	16	84	--	172	99	101	.7	2.8	.16	471	.64	481	210	67	46	2.5	804	7.3
June 4	1,470	14	.00	46	18	53	--	148	76	73	.3	1.8	.17	366	.50	1,420	190	68	38	1.7	618	7.1
July 10	1,740	14	.00	48	13	41	--	148	62	56	.5	1.7	.16	314	.43	1,570	174	52	34	1.3	533	7.5
Aug. 3	1,820	16	.00	54	13	38	--	176	55	50	.6	1.9	.21	356	.48	977	188	44	30	1.2	580	7.6
Sept. 4	.20	14	.01	54	15	38	--	184	59	52	.6	2.0	.13	373	.51	172	196	45	30	1.2	575	7.3

a Includes 10 parts per million of carbonate (CO₃).

b Values above 200 ppm reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR EL RENO, OKLA.

LOCATION.--At gaging station at bridge on U. S. Highway 81, 2 miles north of court house in El Reno, Canadian County, and 2½ miles downstream from Target Creek.

DRAINAGE AREA.--13,042 square miles of which 4,899 is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1957.

Water temperatures: October 1954 to September 1957.

EXTREMES: 1956-57.--Dissolved solids: Maximum, 642 ppm May 11; minimum, 120 ppm Oct. 16-19.

Hardness: Maximum, 316 ppm May 11; minimum, 82 ppm Oct. 16-19.

Specific conductance: Maximum daily, 1,080 micromhos Mar. 19, Apr. 2; minimum daily, 178 micromhos Oct. 17.

Water temperatures: Maximum, 90°F Aug. 27; minimum, 38°F Apr. 13.

EXTREMES: 1954-57.--Dissolved solids: Maximum, 1,160 ppm May 1-10, 1956; minimum, 120 ppm Oct. 16-19, 1956.

Hardness: Maximum, 520 ppm May 1-10, 1956; minimum, 80 ppm May 20, Oct. 3-7, 1955.

Specific conductance: Maximum daily, 1,980 micromhos May 8, 1956; minimum daily, 160 micromhos Oct. 20, 1955.

Water temperatures: Maximum, 94°F June 12, 1956; minimum, freezing point on several days during November, December, and January 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511. No flow Oct. 1-14, 22-31, Nov. 1-4, 7-30, Dec. 1 to Mar. 3.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate	
Oct. 15, 20, 1956	255	--	--	28	8.3	12	110	224	0	20	12	--	2.8	--	156	0.21	104	14	20	0.5	257	7.6	
Oct. 16-19	63.5	--	--	22	6.6	8.7	92	0	13	6.6	--	--	3.2	--	120	.16	21	82	6	19	1.4	196	7.4
Oct. 21	4.60	--	--	34	6.6	29	116	0	35	31	--	--	3.5	--	208	.28	2.6	112	17	36	1.2	418	8.0
Nov. 5	19.0	--	--	54	15	51	164	4	87	51	--	--	3.3	--	392	.53	20	166	55	36	1.6	590	8.4
Nov. 6	4.00	--	--	30	5.1	11	82	0	30	13	--	--	3.6	--	153	.21	1.7	96	29	20	.5	247	8.0
Mar. 4-10, 1957	976	--	--	61	33	99	224	0	125	134	--	--	1.4	--	598	.81	1,580	288	104	43	2.5	1,020	7.9
Mar. 11-20	401	8.0	0.00	66	25	111	238	0	129	128	0.9	1.3	0.13	622	.85	673	268	73	47	2.9	1,050	7.6	
Mar. 21-31	32.5	--	--	54	40	90	236	0	120	126	--	--	1.5	--	597	.81	52	300	106	40	2.3	1,000	8.1
Apr. 1-10	197	10	0.00	61	25	102	226	0	123	111	1.8	1.8	1.17	566	.77	301	254	69	47	2.8	953	7.8	
Apr. 11-19	203	--	--	66	24	115	264	0	118	124	--	--	1.7	--	578	.79	317	264	48	49	3.1	965	8.1
Apr. 20	219	--	--	35	6.9	26	136	0	26	22	--	--	3.8	--	187	.25	111	116	4	33	1.0	341	8.1
Apr. 21-26	891	--	--	30	5.8	22	114	0	26	18	--	--	2.0	--	174	.24	419	99	6	33	1.0	275	7.8
Apr. 27-30	141	--	--	50	12	50	166	0	65	56	--	--	2.6	--	330	.43	126	176	40	38	1.3	566	8.2
May 1-2	324	--	--	51	15	52	156	8	73	57	--	--	2.5	--	371	.50	323	186	46	37	1.6	595	8.5
May 3-6	790	--	--	34	8.5	22	125	0	33	20	--	--	2.5	--	215	.29	459	120	18	28	.9	329	7.6
May 7-8	157	--	--	58	19	57	170	12	89	65	--	--	1.9	--	425	.58	180	222	62	36	1.7	669	8.5
May 9-10	130	--	--	71	30	94	204	22	139	110	--	--	1.5	--	630	.86	221	300	96	40	2.3	956	8.8
May 11	168	--	--	73	33	90	198	22	156	104	--	--	3.9	--	642	.87	291	316	117	38	2.2	986	8.8
May 12	151	--	--	50	17	50	184	12	47	58	--	--	4.3	--	414	.56	169	196	25	36	1.6	597	8.7
May 13-16	123	--	--	72	30	89	214	20	135	104	--	--	1.2	--	621	.84	206	304	95	39	2.2	961	8.7

May 17-20, 1957	748	--	36	12	31	128	9	44	27	--	2.6	--	254	.35	513	138	18	33	1.2	398	8.6
May 21	970	--	30	5.1	16	159	4	22	12	--	4.3	--	169	.23	443	96	8	27	1.7	250	8.4
May 22-30	904	--	34	16	30	148	6	86	76	--	2.8	--	441	.60	1,060	202	70	39	1.9	673	8.5
May 31	1,750	--	40	12	33	118	6	53	42	--	3.0	--	290	.38	1,370	143	42	34	1.3	451	8.5
June 1-10	1,574	20	.07	30	52	136	0	76	72	.7	1.9	.15	365	.50	1,350	188	60	36	1.6	616	7.7
June 11-18	1,634	--	54	14	55	156	0	78	72	--	.8	--	380	.52	1,680	192	64	38	1.7	684	7.8
June 19	2,060	--	37	11	30	124	0	43	58	--	2.0	--	224	.30	1,250	136	34	33	1.1	397	7.6
June 20-23	1,200	--	49	14	48	164	0	65	58	--	.8	--	339	.46	1,100	160	46	37	1.6	571	7.7
June 24-25	1,480	--	42	9.5	26	146	0	33	31	--	2.0	--	219	.30	875	144	22	28	.9	404	7.7
June 26-30	1,606	--	46	19	51	162	0	75	65	--	.7	--	360	.49	1,560	192	59	37	1.6	609	7.6
July 1-10	1,744	--	42	18	46	156	0	67	58	--	1.1	--	353	.48	1,660	180	52	36	1.5	573	7.4
July 11-20	1,742	--	42	17	45	156	0	62	57	--	.5	--	328	.45	1,540	176	48	36	1.1	551	7.5
July 21-31	1,733	--	42	16	45	158	0	59	55	--	.6	--	305	.41	1,430	172	42	36	1.5	545	7.4
Aug. 1-10	1,705	--	44	17	42	166	0	57	54	--	.1	--	301	.41	1,390	180	44	34	1.4	543	7.7
Aug. 11-20	1,280	--	45	16	45	174	0	56	54	--	.4	--	310	.42	1,070	180	38	35	1.5	552	7.7
Aug. 21-31	258	--	44	22	49	190	0	65	60	--	.2	--	347	.47	242	200	44	35	1.5	608	7.3
Sept. 1-10	45.3	--	50	33	71	232	0	98	86	--	.4	--	473	.64	58	260	70	37	1.9	807	7.4
Sept. 11-16	72.2	--	48	32	74	220	0	104	87	--	.5	--	473	.64	92	252	72	39	2.0	798	7.8
Sept. 17-18	123	--	34	13	28	142	0	38	28	--	3.0	--	219	.30	73	138	22	30	1.0	352	7.5
Sept. 19-30	494	--	46	19	50	190	0	63	58	--	.5	--	336	.46	448	194	38	36	1.6	589	7.7
Weighted average	824	--	46	17	51	2165	--	68	63	--	1.1	--	350	0.48	779	185	50	38	1.6	593	--

a Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR EL RENO, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--					--	65	65	69	80	--	79
2	--					--	63	65	64		--	81
3	--					--	54	65	64		--	72
4	--					--	55	60	61		--	75
5	--					43	61	60	65		--	73
6	--					44	--	72	73		80	73
7	--					40	54	75	75		77	65
8	--					45	54	68	75		76	68
9	--					47	58	79	75		77	63
10	--					50	60	69	75		79	69
11	--					59	57	61	78		80	68
12	--					56	42	70	77		81	67
13	--					59	38	78	74		81	65
14	--					57	49	82	78		80	72
15	59					59	57	82	77		79	63
16	60					51	60	85	76		81	63
17	72					53	73	67	76		79	71
18	64					60	78	64	74		76	68
19	59					57	64	66	72		75	72
20	65					49	66	77	73		77	69
21	--					47	60	78	79		77	68
22	--					47	68	76	75		77	65
23	--					49	60	70	74		79	62
24	--					48	63	70	69		80	66
25	--					40	65	68	72		79	69
26	--					58	68	73	73		86	64
27	--					59	63	80	75		90	65
28	--					--	63	77	78		75	74
29	--					67	63	78	82		77	69
30	--					56	62	72	82		75	58
31	--					57	--	69	--		75	--
Average	--					52	60	72	74		79	69

ARKANSAS RIVER BASIN--Continued
NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.

LOCATION. --At gaging station at bridge on U.S. Highway 75, 2.3 miles upstream from Wewoka Creek, and 2½ miles northeast of Wetumka, Hughes County. DRAINAGE AREA. --14,290 square miles, of which 4,899 square miles is probably noncontributing.

RECORDS AVAILABLE. --Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1953 to September 1957.

EXTREMES. 1956-57. --Dissolved solids: Maximum, 7,480 ppm Dec. 11; minimum, 190 ppm May 26-27.

Hardness: Maximum, 1,400 ppm Dec. 11; minimum, 108 ppm May 26-27.

Specific conductance: Maximum daily, 12,200 micromhos Dec. 11; minimum daily, 330 micromhos May 27.

Water temperatures: Maximum, 86°F July 30; minimum, 42°F Jan. 10, 14-18, 23, 26, 28, 30.

EXTREMES. 1953-57. --Dissolved solids: Maximum, 8,195 ppm Feb. 8, 1955; minimum, 190 ppm May 26-27, 1957.

Hardness: Maximum, 4,640 ppm Dec. 31, 1954; minimum, 108 ppm May 26-27, 1957.

Specific conductance: Maximum daily, 37,100 micromhos Dec. 31, 1954; minimum daily, 330 micromhos May 27, 1957.

Water temperatures: Maximum, 92°F Aug. 24-25, 1954; minimum, 42°F Jan. 10, 14-18, 23, 26, 28, 30.

REMARKS. --Records of specific conductance and daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1311. No flow Oct. 1-21.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 22-31, 1956.....	13.2	9.0	0.06	94	26	461	7.4	80	0	76	860	0.6	5.2	0.36	1,690	2.30	60	340	274	74	3,030	7.2
Nov. 1-7.....	44.6	--	--	112	39	610	--	92	0	79	1,140	--	--	--	2,170	2.95	261	440	364	75	3,910	7.6
Nov. 8.....	85.0	--	--	186	48	963	--	108	0	54	1,850	--	--	--	3,340	4.54	767	660	572	76	5,850	7.9
Nov. 9-10.....	93.5	--	--	84	27	344	--	128	0	61	1,030	--	13	--	1,310	1.78	331	320	215	70	2,410	8.0
Nov. 11.....	78.0	--	--	100	26	431	--	132	0	64	780	--	22	--	1,590	2.16	335	355	247	73	2,820	8.1
Nov. 12-17.....	41.5	--	--	84	20	287	--	124	0	69	920	--	9.9	--	1,150	1.56	129	290	188	68	2,070	7.9
Nov. 18-20.....	33.0	--	--	118	31	427	--	158	0	79	800	--	12	--	1,680	2.28	150	420	290	69	2,950	8.1
Nov. 21-24.....	27.8	--	--	158	43	647	--	200	0	90	1,220	--	--	--	2,460	3.35	185	570	406	71	4,320	8.0
Nov. 25-30.....	23.2	--	--	192	54	802	--	214	0	119	1,520	--	--	--	3,010	4.09	189	700	524	71	5,270	8.2
Dec. 1.....	22.0	--	--	212	56	889	--	220	4	132	1,680	--	--	--	3,300	4.49	196	760	573	72	5,700	8.3
Dec. 2-6.....	23.2	--	--	256	73	1,120	--	236	0	140	2,150	--	7.1	--	4,180	5.68	262	940	746	72	7,050	8.2
Dec. 7.....	158	--	--	88	20	347	--	122	0	45	640	--	--	--	1,350	1.84	576	300	200	72	2,380	7.9
Dec. 8.....	82.0	--	--	41	9.1	151	--	54	0	21	280	--	8.5	--	592	.81	131	140	96	70	1,100	7.5
Dec. 9-10.....	71.5	--	--	144	39	595	--	128	0	83	1,150	--	--	--	2,240	3.05	432	520	415	71	4,030	7.9
Dec. 11.....	40.0	--	--	419	86	2,070	--	120	0	23	4,090	--	--	--	7,480	10.17	808	1,400	1,300	76	12,200	8.0
Dec. 12-20.....	49.3	--	--	216	49	958	--	186	0	127	1,800	--	--	--	3,430	4.66	457	740	588	74	5,950	8.1
Dec. 21-22.....	116	--	--	128	32	530	--	112	0	69	1,020	--	--	--	2,060	2.80	645	450	358	72	3,580	7.8
Dec. 23.....	95.0	--	--	184	42	768	--	84	0	44	1,550	--	--	--	2,870	3.90	736	630	561	73	5,010	7.8

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bon-ate (HCO ₃)	Car-bon-ate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃) (B)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-lidum adsorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, mag-ne-sium	Non-carbon-ate				
Dec. 24-26, 1956....	64.7	--	--	136	37	569	132	0	66	1,100	--	--	--	--	2,180	2.96	381	480	382	72	11	3,810	7.9
Dec. 27-28.....	68.0	--	--	208	46	826	160	0	115	1,600	--	--	--	--	3,150	4.28	578	710	579	72	13	5,520	8.1
Dec. 29-31.....	50.0	--	--	130	28	515	134	0	60	975	--	--	15	--	1,940	2.64	262	440	330	72	11	3,420	7.9
Jan. 1-2, 1957.....	45.5	--	--	151	59	498	166	2	108	1,030	--	--	--	--	2,180	2.96	268	620	480	64	8.7	3,680	8.3
Jan. 3-4.....	47.5	--	--	180	63	680	184	4	122	1,350	--	--	--	--	2,800	3.81	359	710	552	68	11	4,670	8.3
Jan. 5-10.....	59.2	--	--	212	80	816	182	0	112	1,680	--	--	--	--	3,430	4.66	548	860	711	67	12	5,630	8.1
Jan. 11-20.....	47.9	14	0.02	184	43	748	174	0	101	1,440	0.6	--	--	0.39	3,060	4.16	396	635	492	72	13	4,930	7.3
Jan. 21-22.....	62.0	--	--	192	73	781	168	0	108	1,580	--	--	--	--	3,230	4.39	541	780	642	69	12	5,310	8.2
Jan. 23, 25.....	131	--	--	62	28	238	82	0	30	460	--	--	15	--	1,060	1.44	375	270	203	66	6.3	1,760	8.0
Jan. 24.....	124	--	--	124	51	495	84	0	45	1,050	--	--	--	--	2,020	2.75	676	520	451	67	9.4	3,560	7.8
Jan. 26, 29.....	136	--	--	188	63	794	138	0	83	1,600	--	--	--	--	3,280	4.46	1,200	730	617	70	13	5,290	8.2
Jan. 27-28.....	182	--	--	264	76	1,080	150	6	100	2,200	--	--	--	--	4,380	5.96	2,150	970	837	71	15	7,260	8.4
Jan. 30-31.....	197	--	--	108	46	425	92	0	70	860	--	--	27	--	1,820	2.48	968	460	384	67	8.6	3,000	8.0
Feb. 1-5.....	88.8	--	--	112	37	408	92	0	41	840	--	--	17	--	1,820	2.48	436	430	354	67	8.5	2,930	8.1
Feb. 6-10.....	59.6	--	--	196	76	754	168	0	105	1,520	--	--	--	--	3,220	4.38	518	750	612	69	12	5,200	8.2
Feb. 11-20.....	45.6	--	--	280	27	871	216	2	122	1,700	--	--	--	--	3,530	4.80	435	810	630	70	13	5,850	8.3
Feb. 21-28.....	48.4	--	--	272	37	902	235	4	118	1,750	--	--	--	--	3,660	4.98	478	830	630	70	14	6,030	8.3
Mar. 1-2.....	47.0	--	--	240	40	1,160	208	24	351	1,920	--	--	--	--	4,050	5.51	514	765	556	77	18	6,540	8.8
Mar. 3-6.....	51.2	--	--	224	56	873	222	12	113	1,680	--	--	--	--	3,740	5.09	517	780	588	71	14	5,740	8.4
Mar. 7-10.....	54.0	--	--	220	66	886	220	8	123	1,720	--	--	--	--	3,710	5.05	541	820	626	70	13	6,000	8.7
Mar. 11-12.....	50.5	--	--	218	60	923	225	8	125	1,750	--	--	--	--	3,760	5.11	513	790	592	72	14	6,000	8.4
Mar. 13.....	48.0	--	--	232	59	1,010	208	12	116	1,920	--	--	--	--	3,840	5.22	498	820	631	73	15	6,330	8.4
Mar. 14-15, 17-19.....	50.8	--	--	204	66	873	223	0	95	1,700	--	--	--	--	3,620	4.92	497	780	598	71	14	5,710	8.1
Mar. 16, 20.....	50.4	--	--	188	68	892	208	8	106	1,700	--	--	--	--	3,599	4.88	426	750	568	72	14	5,650	8.3
Mar. 21-29.....	75.1	--	--	212	61	934	203	0	101	1,800	--	--	--	--	3,540	4.81	718	780	614	72	15	5,950	8.2
Mar. 30-31.....	64.0	--	--	152	44	661	172	2	72	1,280	--	--	--	--	2,450	3.33	423	560	416	72	12	4,310	8.3
Apr. 1-2.....	44.0	--	--	156	38	601	168	4	68	1,180	--	--	--	--	2,400	3.26	2,950	545	401	71	11	4,030	8.3
Apr. 3-5.....	3.97	--	--	62	12	98	118	0	14	1,170	--	--	3.0	--	432	1.58	4,500	140	144	60	3.6	798	8.0
Apr. 6-7.....	453	--	--	80	20	178	108	0	23	335	--	--	7.8	--	746	1.01	912	205	116	66	5.4	1,310	7.9
Apr. 8-10.....	413	--	--	160	46	270	104	0	33	323	--	--	12	--	1,140	1.55	1,270	280	187	68	7.0	1,990	7.9
Apr. 11-12.....	164	--	--	160	46	942	116	0	34	1,160	--	--	--	--	2,540	3.45	1,120	390	494	67	9.7	4,130	7.7
Apr. 13-14.....	162	--	--	115	32	400	136	0	44	800	--	--	6.3	--	1,820	2.46	694	420	308	67	8.5	2,950	7.9

Apr. 15-16, 1957....	162	--	--	144	37	518	148	0	46	1,040	--	--	2,390	3.25	1,050	510	388	69	10	3,690	8.2
Apr. 17	135	--	--	188	54	742	140	12	51	1,500	--	--	3,110	4.23	1,130	690	556	70	12	4,790	8.5
Apr. 18-20	500	--	--	220	78	958	174	0	58	1,950	--	--	3,990	5.43	5,390	870	728	71	14	6,330	8.1
Apr. 21	4,740	--	--	98	21	301	112	0	16	600	--	4.6	1,420	18.17	10,170	305	212	68	7.5	2,180	8.2
Apr. 22-26	4,472	--	--	45	7.7	80	124	0	10	145	--	3.2	431	.59	5,200	144	42	55	2.9	738	8.1
Apr. 27-30	1,675	--	--	76	10	196	140	0	36	355	--	7.1	898	1.22	4,060	230	118	65	5.6	1,450	8.0
May 1	1,290	--	--	58	12	136	112	16	13	250	--	6.2	628	.65	2,190	194	76	60	4.2	1,100	8.5
May 2-5	1,155	--	--	82	21	242	128	20	48	442	--	6.6	996	1.35	3,110	290	152	65	6.2	1,790	8.6
May 6-10	1,293	--	--	64	18	156	138	28	66	240	--	5.8	676	.92	2,360	230	72	59	4.5	1,200	8.4
May 11-13	2,483	--	--	68	17	143	152	0	49	260	--	11	686	.93	4,600	240	116	56	4.0	1,210	8.1
May 14	7,740	--	--	50	6.6	87	114	0	12	164	--	4.4	445	.61	9,300	152	58	55	3.1	748	8.2
May 15	2,660	--	--	43	8.9	44	126	0	12	85	--	4.8	285	.39	2,050	144	40	40	1.6	493	8.0
May 16	1,480	--	--	70	12	88	176	0	34	162	--	6.2	506	.69	2,020	220	78	46	2.6	824	7.6
May 17	3,380	--	--	61	12	120	130	2	29	223	--	6.3	618	.84	5,640	200	90	57	3.7	987	8.3
May 18	13,900	--	--	48	7.8	61	124	0	11	117	--	9.1	370	.50	13,890	152	50	47	2.2	571	8.1
May 19	14,000	--	--	37	5.7	42	120	0	9.5	68	--	4.0	234	.32	8,850	116	18	44	1.7	400	8.0
May 20	6,210	--	--	47	6.4	60	116	4	18	106	--	5.0	342	.47	5,730	144	42	47	2.2	577	8.3
May 21	3,050	--	--	54	10	86	134	4	21	156	--	6.5	459	.62	3,780	176	60	52	2.8	779	8.4
May 22	3,430	--	--	69	13	111	160	0	25	215	--	6.0	609	.83	5,640	225	93	52	3.2	974	7.7
May 23	8,680	--	--	38	6.4	83	114	0	9.5	72	--	3.7	270	.37	6,330	124	30	53	1.7	452	7.9
May 24	4,020	--	--	50	1.7	82	158	0	19	156	--	5.0	482	.66	5,230	196	66	48	2.5	738	7.6
May 25	25,000	--	--	49	7.2	46	148	0	17	81	--	3.2	296	.90	19,980	152	30	47	1.7	457	7.7
May 26-27	29,600	--	--	37	3.8	29	116	0	7.0	46	--	1.8	190	.26	15,180	108	13	37	1.2	353	8.0
May 28	12,600	--	--	49	6.2	42	138	0	9.5	81	--	3.7	301	.41	10,240	148	35	38	1.5	505	7.8
May 29	5,040	--	--	66	11	72	172	0	28	138	--	3.8	474	.64	6,450	210	69	43	2.2	744	7.8
May 30	2,760	--	--	79	15	112	154	6	38	230	--	4.3	685	.93	5,180	260	124	46	3.0	1,090	8.4
May 31	2,360	--	--	94	18	170	168	4	43	345	--	4.2	1,000	1.36	6,370	310	166	54	4.2	1,490	8.3
June 1	5,450	--	--	120	37	282	168	8	44	610	--	8.3	1,480	2.01	21,780	450	289	53	5.8	2,250	8.3
June 2-7	8,615	--	--	51	9.0	55	138	0	22	104	--	2.5	333	.45	7,730	164	51	42	1.9	603	8.0
June 8-10	4,637	--	--	73	16	102	164	0	47	200	--	4.3	591	.60	7,400	230	114	47	2.8	1,010	8.1

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-nes-ium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-trate (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per-cent so-lidum	So-lidum adsorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, mg/l	Non-carbon-ate			
June 11, 1957	5,140	--	--	58	8.6	60	186	0	21	105	105	--	3.1	--	358	0.49	4,970	180	42	1.9	609	7.4
June 12-14	3,240	--	--	76	14	126	168	0	66	220	220	--	3.6	--	621	.84	5,430	245	108	3.5	1,110	8.0
June 15-20	8,448	--	--	48	7.8	57	130	0	27	99	99	--	2.4	--	320	.44	7,300	152	46	2.0	592	7.8
June 21-23	4,553	--	--	67	10	103	148	0	44	185	185	--	3.4	--	541	.74	6,650	210	86	3.1	941	7.9
June 24-27	6,048	--	--	48	7.8	58	132	0	23	102	102	--	2.5	--	321	.44	5,240	152	44	2.0	589	7.8
June 28-30	2,660	--	--	69	12	115	156	0	41	210	210	--	5.8	--	568	.77	4,080	220	94	3.4	1,010	8.0
July 1-10	1,960	16	0.07	63	27	122	181	0	73	215	215	0.5	3.0	0.31	636	.86	3,370	265	118	50	1,120	7.9
July 11-20	1,703	--	--	70	16	106	166	0	68	185	185	--	1.6	--	618	.84	2,840	240	104	3.0	1,020	8.0
July 21-31	1,828	--	--	58	17	89	168	0	72	138	138	--	2.8	--	480	.65	2,370	215	78	47	847	7.6
Aug. 1-5	1,892	--	--	48	21	80	164	0	60	130	130	--	2.2	--	450	.61	2,300	210	74	46	801	7.6
Aug. 6-7	1,620	--	--	65	28	157	158	0	59	300	300	--	4.0	--	745	1.01	3,260	275	146	55	1,350	7.7
Aug. 8-10	1,610	--	--	53	19	86	170	0	60	138	138	--	2.0	--	467	.64	2,030	210	72	47	832	7.6
Aug. 11-18	1,662	--	--	56	16	76	168	0	60	118	118	--	2.3	--	430	.58	1,830	205	66	45	764	7.7
Aug. 19-20	1,598	--	--	66	22	112	188	0	54	202	202	--	3.9	--	567	.80	948	255	100	49	1,040	7.8
Aug. 21-29	619	--	--	70	26	131	204	0	61	235	235	--	3.3	--	667	.91	1,110	280	113	50	1,170	7.8
Aug. 30-31	273	--	--	78	36	203	204	0	57	395	395	--	2.2	--	943	1.28	703	345	177	56	1,690	7.8
Sept. 1-10	196	--	--	92	60	373	188	0	60	760	760	--	1.4	--	1,560	2.12	826	480	324	63	2,780	7.5
Sept. 11-14	205	--	--	82	69	466	132	0	64	940	940	--	2.2	--	1,780	2.42	985	490	380	68	3,190	7.6
Sept. 15-20	2,145	--	--	46	14	101	132	0	36	171	171	--	5.5	--	478	.65	2,770	172	64	56	808	7.4
Sept. 21-30	1,076	--	--	51	22	95	156	0	41	175	175	--	6.0	--	494	.67	1,440	215	88	49	902	7.4
Weighted average	1,626	--	--	57	13	--	b143	--	32	179	179	--	--	--	503	0.68	2,210	196	78	51	863	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	53	38	47	34	45	56	67	72	82	83	81
2	--	57	52	37	37	51	56	68	68	82	86	83
3	--	50	51	39	45	50	--	69	66	85	86	80
4	--	51	53	44	43	47	50	62	67	83	82	80
5	--	51	54	42	45	45	50	62	69	75	80	75
6	--	49	59	--	45	45	55	64	71	78	79	70
7	--	50	45	47	49	40	59	64	70	81	--	70
8	--	41	40	50	53	36	51	68	70	82	79	69
9	--	42	38	50	52	41	54	67	--	82	79	72
10	--	58	34	32	55	51	55	70	68	82	81	75
11	--	61	39	40	51	60	--	65	71	83	83	72
12	--	51	39	35	50	56	40	70	74	84	83	72
13	--	55	55	38	50	54	37	67	78	83	83	72
14	--	60	36	32	--	53	55	68	78	85	84	72
15	--	52	40	32	56	50	55	70	74	85	79	64
16	--	45	48	32	46	50	55	72	75	83	81	69
17	--	41	42	32	42	52	59	71	75	85	82	70
18	--	51	34	32	45	52	60	63	75	85	77	71
19	--	49	42	33	46	48	63	65	72	85	75	69
20	--	56	42	44	45	49	64	67	72	85	77	76
21	--	41	42	54	41	48	62	70	78	84	78	72
22	57	41	43	47	41	48	58	72	74	83	79	67
23	58	41	44	32	40	48	60	62	74	85	79	67
24	60	40	37	33	45	45	65	62	69	83	79	67
25	65	42	34	37	45	45	64	62	70	82	79	76
26	50	38	38	32	45	--	65	67	76	82	79	67
27	51	36	39	--	42	47	66	68	75	84	77	68
28	51	39	39	32	45	50	65	70	77	84	78	65
29	59	34	40	34	--	52	65	71	80	84	78	65
30	60	36	44	32	--	55	66	72	80	86	77	66
31	53	--	41	34	--	61	--	72	--	84	79	--
Average	--	47	43	38	46	49	58	67	73	83	80	71

ARKANSAS RIVER BASIN--Continued

DEEP FORK NEAR BEGGS, OKLA.

LOCATION --At gaging station at highway bridge, 3 miles upstream from Adams Creek, 4 miles south of Beggs, Okmulgee County, and 8 miles downstream from Flat Rock (Cuckersford) Creek.

DRAINAGE AREA --2,018 square miles.

RECORDS AVAILABLE --Chemical analyses: November 1951 to September 1957.

Water temperatures: November 1951 to September 1957.

EXTREMES, 1956-57 --Dissolved solids: Maximum, 3,690 ppm Nov. 8-10; minimum, 126 ppm May 21-31.

Hardness: Maximum, 1,090 ppm Sept. 14; minimum, 45 ppm Apr. 3-6.

Specific conductance: Maximum daily, 6,440 micromhos Nov. 9; minimum daily, 113 micromhos May 27.

Water temperatures: Maximum, 92° F July 30; minimum, 33° F Jan. 15-16, 26-27.

EXTREMES, 1951-57 --Dissolved solids: Maximum, 5,340 ppm Mar. 26, 1954, Jan. 11-17, 1955; minimum, 87 ppm Sept. 27, 1955.

Hardness: Maximum, 1,310 ppm July 21, 1955; minimum, 16 ppm Sept. 27, 1955.

Specific conductance: Maximum daily, 10,500 micromhos Jan. 12, 1955; minimum daily, 113 micromhos May 27, 1957.

Water temperatures: Maximum, 97° F July 28, Aug. 6, 16, 18, 1956; minimum, freezing point on many days during winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1946 to September 1957 given in WSP 1511. No flow Oct. 1 to Nov. 5, Nov. 27-30.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-day	Calcium magnesium	Non-carbonate		
Nov. 6, 1956	55.0	--	--	50	24	129	129	142	0	27	255	--	0.7	596	0.81	225	108	56	3.7
Nov. 7	49.0	--	--	29	72	29	185	182	0	30	370	--	1.0	851	1.16	300	151	57	4.6
Nov. 8-10	8.67	--	--	272	42	960	960	13	0	34	2,050	--	1.0	3,690	5.02	88	850	71	14
Nov. 11-20	.65	--	--	208	39	755	755	32	0	11	1,620	--	.9	2,920	3.97	5.1	680	71	13
Nov. 21-26	.12	6.4	0.00	198	45	813	7.6	40	0	10	1,700	0.0	.8	3,060	4.16	1.0	680	72	14
Dec. 1-4	5.12	--	--	208	49	742	742	46	0	12	1,620	--	.7	2,930	3.98	41	720	69	12
Dec. 5-6	8.00	--	--	90	26	353	353	84	0	13	720	--	.6	3,390	1.89	30	330	70	6.5
Dec. 7-11	12.6	--	--	49	21	137	137	170	0	34	235	--	.7	609	.83	21	210	70	59
Dec. 12-14	14.0	--	--	42	21	101	101	150	0	39	175	--	.5	495	.67	19	192	69	33
Dec. 15, 15	9.75	--	--	58	22	172	172	138	0	31	330	--	.2	747	1.02	20	235	61	4.9
Dec. 16-17	8.75	--	--	80	32	221	221	162	0	41	450	--	.1	1,020	1.39	24	330	59	5.3
Dec. 18	12.0	--	--	104	39	292	292	166	0	55	610	--	.1	3,320	1.80	43	420	60	6.2
Dec. 19-20	16.0	--	--	61	22	195	195	104	0	47	300	--	1.9	876	1.19	38	245	56	4.0
Dec. 21-22	33.0	--	--	54	24	114	114	146	0	102	180	--	2.2	623	.85	56	235	51	3.2
Dec. 23	32.0	--	--	88	29	277	277	126	0	72	540	--	2.2	1,290	1.75	111	340	64	6.5
Dec. 24	24.0	--	--	152	40	494	494	124	0	77	1,020	--	2.1	2,270	3.09	147	545	66	9.2
Dec. 25-26	22.5	--	--	58	27	139	139	102	0	52	390	--	2.0	976	1.33	59	255	63	5.4
Dec. 27-31	20.0	--	--	55	23	130	130	132	0	83	225	--	2.2	676	.96	37	230	55	3.7
Jan. 1-10, 1957	20.1	5.0	.03	51	22	113	113	174	0	87	170	.5	2.9	594	.81	32	220	78	53
Jan. 11-20	14.8	--	--	51	24	118	118	198	0	83	162	--	5.0	585	.80	23	225	53	3.4

ARKANSAS RIVER BASIN

145

Jan. 21-31, 1957.....	19.1	--	--	45	22	119	176	0	78	167	--	2.8	--	566	77	29	205	60	56	3.6	964	7.5
Feb. 1-4.....	33.0	--	--	48	18	113	130	0	51	195	--	4.8	--	591	.80	53	192	86	56	3.6	979	8.0
Feb. 5-10.....	21.7	--	--	62	24	181	150	0	67	320	--	5.2	--	859	1.17	50	255	131	61	4.9	1,430	7.8
Feb. 11-20.....	19.7	--	--	57	31	154	204	0	79	250	--	4.2	--	781	1.06	42	270	103	55	4.1	1,310	8.1
Feb. 21-28.....	13.5	--	--	89	6.8	121	230	0	78	170	--	5.1	--	584	.79	21	250	62	51	3.3	1,070	7.7
Mar. 1-10.....	12.6	--	--	58	28	137	232	8	77	192	--	3.8	--	660	.90	22	260	56	53	3.7	1,150	8.5
Mar. 11-12.....	9.50	--	--	58	28	137	226	12	77	192	--	3.9	--	659	.90	17	260	55	53	3.7	1,150	8.7
Mar. 13-20.....	7.40	--	--	67	30	172	238	6	74	270	--	3.3	--	823	1.12	16	290	87	56	4.4	1,380	8.4
Mar. 21-22.....	5.60	--	--	58	32	166	224	8	71	262	--	3.6	--	736	1.00	11	280	81	57	4.4	1,350	8.5
Mar. 23.....	16.0	--	--	54	30	147	216	14	72	210	--	6.0	--	642	.87	28	255	56	56	4.0	1,170	8.7
Mar. 24-26.....	33.0	--	--	218	62	822	166	2	48	1,700	--	4.0	--	3,300	4.49	294	800	660	69	13	5,580	8.3
Mar. 27-31.....	28.8	--	--	31	36	315	200	0	59	580	--	3.3	--	1,340	1.82	104	375	211	95	7.1	2,330	8.2
Apr. 1.....	202	--	--	130	38	544	62	0	17	1,130	--	3.6	--	2,230	3.06	1,230	480	429	71	11	3,720	7.7
Apr. 2.....	197	--	--	58	21	164	172	4	54	270	--	4.0	--	731	.99	389	230	82	61	4.7	1,300	8.4
Apr. 3-6.....	3,032	--	--	10	4.9	28	36	0	3.7	50	--	2.6	--	148	.20	1,210	45	16	58	1.8	251	7.5
Apr. 7-10.....	1,193	--	--	26	9.5	52	86	0	18	89	--	3.9	--	269	.37	801	104	34	52	2.2	501	7.9
Apr. 11-17.....	1,195	--	--	33	13	71	106	0	19	128	--	3.8	--	364	.50	192	136	49	53	2.6	665	7.8
Apr. 18-20.....	2,307	--	--	24	2.2	44	42	0	6.4	87	--	2.5	--	227	.31	1,410	69	34	58	2.3	407	7.5
Apr. 21-30.....	4,890	8.0	--	14	5.1	28	52	0	14	42	0.1	2.8	.04	154	.21	2,030	56	14	52	1.6	260	6.7
May 1-10.....	3,000	--	--	25	8.6	43	102	0	12	66	--	2.8	--	242	.33	1,960	98	14	49	1.9	399	8.2
May 11-12.....	853	--	--	35	13	60	116	4	10	112	--	3.1	--	349	.47	804	142	40	48	2.2	609	8.5
May 13-18.....	3,432	--	--	20	6.6	22	62	0	8.2	44	--	2.9	--	163	.22	1,510	77	26	38	1.1	269	8.0
May 19-20.....	7,925	--	--	14	5.6	20	52	0	8.2	34	--	1.8	--	146	.20	3,120	58	16	42	1.1	218	8.0
May 21-31.....	15,080	6.8	--	13	4.0	16	52	0	12	24	.1	2.3	.05	126	.17	5,130	49	6	42	1.0	180	6.9
June 1-10.....	8,294	--	--	23	8.6	35	102	4	14	45	--	2.3	--	203	.28	4,550	93	3	45	1.6	322	8.3
June 11-20.....	11,890	--	--	21	6.9	23	80	0	5.8	40	--	2.8	--	166	.23	5,330	81	16	38	1.1	282	7.2
June 21-30.....	6,510	--	--	25	8.4	27	92	0	5.8	51	--	2.0	--	199	.27	3,500	97	22	37	1.2	338	7.1
July 1-3.....	4,667	--	--	27	9.6	33	98	0	8.6	62	--	3.0	--	230	.31	3,020	107	26	40	1.4	421	7.4
July 4-6.....	1,758	--	--	44	19	52	168	0	15	104	--	3.1	--	367	.50	1,740	188	50	38	1.7	651	7.0
July 7-8.....	499	--	--	53	25	89	199	0	40	158	--	3.9	--	482	.68	649	235	73	45	2.5	871	7.9

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
DEEP FORK NEAR BEGGS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-lidum absorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magne-sium &	Non-carbon-ate				
July 9-12, 1957.....	257	--	--	58	36	123		212	0	23	255	--	2.6	--	645	0.88	448	290	118	48	3.1	1,170	7.8
July 13-20.....	148	--	--	70	49	173		254	0	30	360	--	5.8	--	875	1.19	350	275	166	50	3.9	1,570	7.7
July 21-24.....	100	--	--	90	45	202		240	0	35	435	--	2.8	--	1,010	1.37	273	410	214	52	4.3	1,830	7.7
July 25-31.....	96.4	--	--	61	43	147		232	0	32	300	--	2.6	--	771	1.05	201	330	140	49	3.5	1,420	7.7
Aug. 1-10.....	59.8	--	--	88	49	207		286	0	40	420	--	2.8	--	990	1.35	160	420	186	52	4.4	1,820	7.8
Aug. 11-18.....	87.8	--	--	56	48	156		272	0	41	290	--	1.3	--	783	1.08	188	335	113	50	3.7	1,470	8.1
Aug. 19-20.....	66.0	--	--	132	62	423		210	0	32	920	--	3.6	--	1,860	2.53	331	585	413	61	7.6	3,240	8.0
Aug. 21-31.....	33.3	9.4	0.01	90	43	238		260	0	39	470	0.5	2.0	0.35	1,190	1.62	107	400	187	56	5.2	1,960	7.7
Sept. 1-10.....	16.5	--	--	96	40	231		286	0	35	450	--	1.0	--	1,090	1.48	49	405	170	55	5.0	1,950	7.9
Sept. 11-13.....	24.3	--	--	90	44	227		282	0	38	445	--	1.0	--	1,090	1.48	72	405	174	55	4.9	1,940	8.2
Sept. 14.....	54.0	--	--	274	99	818		202	0	22	1,900	--	1.0	--	3,210	4.37	468	1,090	924	62	11	6,120	8.2
Sept. 15.....	930	--	--	72	22	223		62	0	9.1	490	--	5.1	--	1,020	1.39	2,560	270	219	64	5.9	1,760	7.5
Sept. 16-26.....	1,477	--	--	23	6.4	34		84	0	15	50	--	2.3	--	181	.25	722	64	15	46	1.6	325	7.2
Sept. 27-30.....	380	--	--	37	12	51		134	0	20	84	--	1.8	--	292	.40	300	140	30	44	1.9	519	7.8
Weighted average...	1,914	--	--	20	7.0	30		b78	--	11	47	--	2.5	--	183	0.25	946	79	15	45	1.5	301	--

a. Values above 200 ppm are reported to the nearest 5 ppm.

b. Includes equivalent of individual carbonate values shown above.

ARKANSAS RIVER BASIN--Continued

DEEP FORK NEAR BEGGS, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	65	52	52	42	57	64	71	73	84	88	83
2	84	62	61	46	39	--	64	70	64	88	90	83
3	81	63	67	47	43	51	56	68	69	87	92	84
4	79	57	69	43	46	53	52	65	72	87	86	86
5	80	56	68	44	51	50	54	67	77	84	82	82
6	81	54	52	47	51	48	67	69	78	87	83	82
7	79	52	45	50	52	42	55	71	80	88	83	80
8	76	51	41	57	52	49	54	69	82	88	83	74
9	77	52	41	44	61	56	55	73	78	--	84	73
10	74	59	42	45	60	63	60	69	86	88	86	76
11	77	59	46	44	57	63	61	73	85	89	86	74
12	76	59	44	46	62	55	48	78	81	89	89	74
13	74	62	63	40	62	57	51	74	79	90	90	75
14	--	63	64	35	64	51	54	76	80	91	87	76
15	74	54	47	33	58	56	55	78	84	88	85	67
16	77	51	54	33	51	57	65	77	83	89	87	69
17	76	52	42	35	57	51	63	69	82	89	78	74
18	64	62	41	37	51	52	70	66	76	87	80	75
19	67	61	45	39	50	53	71	71	78	89	81	77
20	70	50	44	42	--	51	71	77	80	90	86	79
21	70	49	42	52	56	52	70	79	82	88	82	71
22	69	50	45	39	53	51	73	69	79	88	85	72
23	72	55	43	40	51	51	67	69	74	89	82	70
24	71	55	42	39	54	50	67	73	74	86	82	71
25	68	51	45	34	55	49	75	78	78	82	84	71
26	65	45	46	33	51	56	68	74	77	85	85	71
27	66	47	52	33	51	51	69	79	80	89	86	72
28	64	46	54	35	55	58	70	74	81	91	83	72
29	71	43	54	35	--	61	68	72	85	91	84	69
30	62	52	57	36	--	63	70	74	84	92	83	69
31	64	--	54	39	--	63	--	73	--	89	82	--
Average	73	55	50	41	53	54	63	72	79	88	85	75

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.

LOCATION.--At gaging station at bridge on State Highway 2, three-quarters of a mile north of Whitefield, Haskell County, and 5½ miles upstream from Snake Creek.

DRAINAGE AREA.--47 576 square miles, of which 9 700 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: September 1944 to February 1945; September 1946 to September 1957.

Water temperatures: September 1944 to February 1945; September 1946 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 15 000 ppm Nov. 10-11; minimum, 181 ppm May 28.

Hardness: Maximum, 3 080 ppm Nov. 10; minimum, 88 ppm Feb. 9-11.

Specific conductance: Maximum, 22 900 microhms Nov. 11; minimum daily, 335 microhms May 28.

Water temperatures: Maximum, 86°F July 29; minimum, freezing point Jan. 17.

EXTREMES, 1944-57.--Dissolved solids: Maximum, 15 000 ppm Nov. 10-11, 1957; minimum 89 ppm Jan. 2, 5-7, 1948.

Hardness: Maximum, 3 080 ppm Nov. 10, 1956; minimum 18 ppm Feb. 17, 1948.

Specific conductance: Maximum daily, 22 900 microhms Nov. 11, 1956; minimum daily, 71.7 microhms Jan. 2, 1948.

Water temperatures: Maximum, 88°F Sept. 4, 1944; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent ad-sorp-tion ratio	So-lu-men-tion (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-magne-sium				
Oct. 1-10, 1956.....	1.01	16	0.01	196	71	603	6.9	168	0	23	1,340	0.1	--	0.25	2,650	3.60	72	780	642	62	9.4	4,400	7.8
Oct. 11-20.....	2.98	--	--	204	66	573	--	176	0	20	1,320	--	--	--	2,580	3.51	21	780	636	62	8.9	4,420	7.6
Oct. 21-31.....	2.63	--	--	204	61	582	--	176	0	20	1,320	--	--	--	2,570	3.50	18	760	616	62	9.2	4,380	7.9
Nov. 1-3.....	8.00	--	--	204	63	583	--	174	0	19	1,330	--	--	--	2,750	3.74	59	770	628	62	9.1	4,370	8.0
Nov. 4-7.....	40.2	--	--	152	42	437	--	166	0	22	950	--	2.6	--	2,040	2.77	221	550	414	63	8.1	3,320	7.9
Nov. 8-9.....	212	--	--	226	66	978	--	116	0	71	1,980	--	--	--	3,710	5.05	2,120	835	740	72	15	6,140	7.9
Nov. 10.....	270	--	--	833	244	4,030	--	123	0	64	8,280	--	--	--	15,000	20.40	10,940	3,080	2,980	74	32	22,400	7.8
Nov. 11.....	260	--	--	806	226	4,150	--	79	0	69	8,380	--	--	--	15,000	20.40	10,530	2,940	2,880	75	33	22,900	7.6
Nov. 12.....	229	--	--	486	126	2,440	--	98	0	86	4,880	--	--	--	8,930	12.14	5,520	1,730	1,650	75	25	14,100	7.8
Nov. 13-15.....	178	--	--	335	93	1,700	--	92	0	60	3,390	--	--	--	6,290	8.55	3,020	1,220	1,140	75	21	10,200	7.6
Nov. 16-20.....	97.2	--	--	204	56	973	--	112	0	54	1,920	--	--	--	3,550	4.83	932	740	648	74	16	6,090	7.7
Nov. 21.....	402	--	--	182	53	806	--	140	0	49	1,600	--	--	--	3,070	4.18	3,330	670	556	72	14	3,070	7.9
Nov. 22-23.....	507	--	--	80	29	306	--	108	0	21	820	--	1.4	--	1,250	1.70	1,710	320	232	68	7.4	2,200	7.8
Nov. 24-25.....	260	--	--	108	29	449	--	100	0	26	890	--	2.3	--	1,750	2.38	1,230	380	308	71	9.9	3,050	7.6
Nov. 26-30.....	113	--	--	162	43	680	--	120	0	40	1,360	--	--	--	2,650	3.60	809	580	482	72	12	4,600	7.8
Dec. 1-10.....	64.6	10	.00	194	55	731	9.9	170	0	49	1,500	.1	--	.30	3,020	4.11	527	710	570	69	12	5,240	7.1
Dec. 11.....	242	--	--	188	59	815	--	156	4	60	1,620	--	--	--	3,110	4.23	2,030	710	576	71	13	5,140	8.3
Dec. 12.....	310	--	--	280	59	1,200	--	128	0	53	2,400	--	--	--	4,510	6.13	3,770	940	835	73	17	7,370	8.1
Dec. 13-14.....	284	--	--	355	86	1,680	--	94	0	48	3,390	--	--	--	6,290	8.55	4,820	1,240	1,160	75	21	10,300	7.9
Dec. 15-16.....	172	--	--	439	115	2,150	--	102	0	47	4,340	--	--	--	8,050	10.95	3,740	1,570	1,490	75	24	12,900	7.9

Dec. 17-18, 1956 ...	114	--	--	324	90	1,540	122	0	44	3,100	--	--	5,810	7.90	1,790	1,180	1,080	74	19	9,570	8.1
Dec. 19-20	108	--	296	73	1,350	138	138	0	44	2,700	--	--	5,080	6.91	1,460	1,040	927	74	18	8,460	8.1
Dec. 21	678	--	304	71	1,360	144	144	0	44	2,720	--	--	5,060	6.88	1,480	1,050	926	74	18	8,140	8.3
Dec. 22-23	1,320	--	204	59	1,978	112	112	0	38	1,950	--	--	3,710	5.05	13,220	750	658	74	16	6,130	8.1
Dec. 24-31	342	--	160	49	694	116	116	0	38	1,400	--	--	2,740	3.73	2,530	600	505	72	12	4,630	7.9
Jan. 1-10, 1957	138	--	174	48	685	164	164	0	63	1,330	--	--	2,830	3.85	1,050	630	496	70	12	4,440	7.9
Jan. 11-20	102	--	196	59	782	168	168	0	80	1,520	--	--	3,240	4.41	892	730	592	69	12	5,080	8.1
Jan. 21-22	118	--	186	54	718	156	156	8	71	1,440	--	--	3,100	4.22	988	685	544	70	12	4,820	8.5
Jan. 23	1,570	--	124	24	421	110	110	2	37	840	12	--	1,680	2.28	7,120	410	316	69	9.0	2,870	8.3
Jan. 24	1,730	--	66	17	198	98	98	0	17	400	4.8	--	897	1.22	4,190	235	154	65	5.6	1,550	8.2
Jan. 25-27	1,254	--	106	23	402	76	76	0	25	810	5.4	--	1,640	2.23	5,550	360	298	71	9.2	2,770	8.0
Jan. 28	652	--	304	66	1,300	60	60	0	35	2,680	--	--	5,140	6.99	9,050	1,030	981	73	18	8,090	7.9
Jan. 29	556	--	558	138	2,600	66	66	0	45	5,330	--	--	10,100	13.74	15,160	1,960	1,910	74	26	15,200	8.0
Jan. 30	1,150	--	351	108	1,700	74	74	0	37	3,490	--	--	6,570	8.94	20,400	1,320	1,260	74	20	10,300	8.1
Jan. 31	2,510	--	80	21	278	82	82	0	21	565	5.5	--	1,250	1.70	8,470	285	218	68	7.2	2,010	8.1
Feb. 1	2,840	--	60	16	190	64	64	0	19	390	5.5	--	860	1.17	6,590	215	162	66	5.6	1,470	7.9
Feb. 2	2,480	--	80	20	290	60	60	0	22	590	7.1	--	1,240	1.69	8,300	280	231	69	7.5	2,070	7.8
Feb. 3	1,950	--	66	13	219	50	50	0	21	445	5.9	--	1,000	1.36	5,260	220	179	68	6.4	1,620	7.6
Feb. 4	1,500	--	94	28	348	56	56	0	26	730	5.9	--	1,540	2.09	6,240	350	304	68	8.1	2,580	7.8
Feb. 5-6	6,205	--	46	9.0	97	98	98	0	10	190	5.2	--	502	.68	8,410	152	72	58	3.4	819	8.1
Feb. 7-8	7,040	--	31	6.4	64	60	60	0	9.5	129	3.3	--	364	.50	6,920	104	55	57	2.7	572	7.8
Feb. 9-11	3,700	--	28	4.4	53	52	52	0	14	102	4.0	--	307	.42	3,070	88	46	57	2.5	474	7.8
Feb. 12-13	1,290	--	42	11	116	56	56	0	19	238	4.6	--	615	.84	2,140	152	106	62	4.1	959	7.9
Feb. 14-16	585	--	62	15	190	72	72	0	23	385	5.2	--	934	1.27	1,480	215	157	66	5.6	1,480	7.8
Feb. 17-20	385	--	82	11	304	86	86	0	32	570	4.6	--	1,350	1.84	1,400	250	180	73	8.4	2,120	7.9
Feb. 21-28	340	.03	114	28	400	120	120	0	41	810	3	5.5	1,760	2.39	1,620	400	302	69	8.7	2,880	7.9
Mar. 1-4	327	--	132	32	479	118	118	0	47	960	3.2	--	2,160	2.94	1,910	460	364	69	9.7	3,310	8.0
Mar. 5-9-10	1,900	--	80	23	309	80	80	0	25	620	4.0	--	1,340	1.82	6,870	295	230	69	7.8	2,780	7.1
Mar. 6-8	6,827	--	47	42	133	76	76	0	22	262	2.2	--	643	.87	11,850	168	106	83	4.5	1,090	7.9
Mar. 11-16	686	--	95	27	381	88	88	0	31	760	3.6	--	1,520	2.07	2,820	350	278	70	8.9	2,690	7.9

a Values above 200 ppm are reported to the nearest 5 ppm.

ARKANSAS RIVER BASIN--Continued
CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Per-cent so-dium	So-dium adorp-tion ratio	Specific conductance (micro-mhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per acre-foot	Calcium	Non-carbonate				
Mar. 17, 1957	634	--	--	123	42	531	94	2	57	1,060	--	--	--	--	2,110	2.87	3,610	480	400	71	11	3,570	8.3
Mar. 18	2,860	--	--	74	24	229	108	4	62	440	--	--	4.2	--	1,030	1.40	7,950	285	190	64	5.9	1,760	8.4
Mar. 19-20	4,495	--	--	29	7.7	74	64	0	26	130	--	--	1.9	--	328	4.45	3,980	104	52	61	3.1	1,562	8.0
Mar. 21-23	6,390	--	--	51	11	152	64	0	18	305	--	--	2.2	--	749	1.02	12,920	173	120	66	5.0	1,200	7.8
Mar. 24-26	6,577	--	--	31	9.8	91	56	0	14	180	--	--	1.6	--	456	.62	8,100	118	72	63	3.6	756	7.8
Mar. 27-29	2,763	--	--	50	11	160	62	0	19	315	--	--	2.4	--	727	.99	5,420	170	119	67	5.3	1,050	7.9
Mar. 30-31	3,440	--	--	34	9.7	100	58	0	14	188	--	--	1.8	--	504	.69	4,680	125	78	64	3.9	821	7.9
Apr. 1-2	2,625	--	--	67	15	195	94	0	37	380	--	--	3.3	--	922	1.25	6,530	230	153	65	5.6	1,540	8.0
Apr. 3-10	32,770	--	--	37	7.7	59	100	0	16	107	--	--	2.4	--	334	.45	29,550	124	42	51	2.3	576	8.0
Apr. 11-15	3,672	--	--	54	16	145	116	0	42	285	--	--	4.4	--	671	.91	6,650	200	105	61	4.5	1,130	8.1
Apr. 16-17	8,825	--	--	31	9.4	55	51	0	19	122	--	--	3.3	--	379	.52	9,030	116	74	51	2.2	566	8.0
Apr. 18-19	6,885	--	--	44	13	116	76	0	23	232	--	--	2.4	--	609	.83	11,320	164	102	61	3.9	971	7.8
Apr. 20	17,600	--	--	29	6.7	49	81	0	13	88	--	--	3.3	--	302	.41	14,350	100	34	51	2.1	448	8.2
Apr. 21	41,600	--	--	59	18	182	94	0	12	370	--	--	5.0	--	914	1.24	102,700	220	143	64	5.3	1,400	8.2
Apr. 22	59,100	--	--	46	10	104	118	4	15	186	--	--	4.4	--	537	.73	85,690	158	55	59	3.6	829	8.3
Apr. 23-30	57,450	--	--	32	6.8	44	98	0	15	74	--	--	2.8	--	286	.39	44,360	108	28	47	1.8	437	7.9
May 1-5	25,320	--	--	43	11	75	108	0	35	135	--	--	2.3	--	430	.58	29,400	154	66	51	2.6	723	7.7
May 6-7	13,900	--	--	62	17	133	134	0	66	235	--	--	3.8	--	673	.92	25,260	225	114	56	3.9	1,130	7.8
May 8-10	9,053	--	--	54	17	102	134	0	72	168	--	--	3.9	--	566	.77	13,830	205	94	52	3.1	940	8.0
May 11-12	4,905	--	--	60	18	137	136	6	67	232	--	--	4.3	--	685	.93	9,070	225	102	57	4.0	1,120	8.4
May 13	6,760	--	--	107	34	309	144	6	81	610	--	--	6.3	--	1,520	2.07	27,740	405	277	62	6.7	2,330	8.3
May 14	39,300	--	--	59	14	134	128	0	57	232	--	--	6.9	--	687	.91	70,780	205	101	59	4.1	1,090	8.2
May 15-17	20,870	--	--	42	9.5	78	111	0	20	142	--	--	2.8	--	432	.59	24,340	144	53	54	2.8	698	8.1
May 18-20	99,300	--	--	36	7.3	52	108	0	17	88	--	--	2.9	--	239	.41	80,160	120	32	48	2.1	510	7.8
May 21-22	38,900	--	--	46	9.0	60	122	4	27	104	--	--	1.9	--	351	.48	36,870	152	46	46	2.1	613	8.4
May 23	128,000	--	--	39	6.7	45	110	4	16	75	--	--	4.4	--	256	.35	88,470	125	28	44	1.7	474	8.5
May 24	84,800	--	--	39	6.7	57	94	8	12	102	--	--	3.1	--	299	.41	68,460	125	34	50	2.2	553	8.4
May 25-27	105,600	--	--	34	7.1	41	109	8	9	98	--	--	1.9	--	261	.35	74,420	114	18	44	1.7	429	8.5
May 28	91,200	--	--	34	3.6	32	102	8	3	85	--	--	2.2	--	181	.25	44,570	100	3	41	1.4	335	8.5
May 29-31	51,070	--	--	41	10	59	116	8	38	88	--	--	2.0	--	343	.47	47,300	145	36	47	2.1	573	8.4

ARKANSAS RIVER BASIN

151

June 1-4, 1957.....	68,950	--	--	40	7.8	54	112	0	25	92	--	1.8	--	299	0.41	55,660	132	40	47	2.0	537	8.0
June 5-6.....	75,200	--	--	37	8.6	44	113	0	21	96	--	1.8	--	232	.34	11,170	128	36	43	1.7	467	7.8
June 7-8.....	38,900	--	--	38	10	37	114	0	26	97	--	1.9	--	504	.41	21,930	136	42	47	2.1	533	7.8
June 9-10.....	24,050	--	--	46	11	24	121	0	37	128	--	2.4	--	377	.51	24,460	160	61	50	2.5	702	7.9
June 11.....	43,300	--	--	63	20	139	115	0	64	270	--	2.6	--	616	.84	72,250	240	146	56	3.9	1,130	7.9
June 12-14.....	25,270	--	--	41	9.1	67	110	0	22	120	--	3.6	--	356	.48	24,290	140	50	51	2.5	635	7.8
June 15-16.....	83,600	--	--	39	8.4	45	114	0	24	178	--	2.2	--	262	.36	59,140	132	38	43	1.7	488	7.9
June 17-20.....	38,620	--	--	40	7.8	61	108	0	16	116	--	2.3	--	331	.45	34,510	132	44	51	2.4	590	7.8
June 21-30.....	26,940	14	.01	37	12	8	115	0	26	113	.5	2.4	.32	372	.51	27,060	142	47	48	2.2	600	7.8
July 1-8.....	8,794	--	--	56	15	86	132	0	31	175	--	3.1	--	509	.69	12,090	200	94	48	2.6	902	7.7
July 9-10.....	3,920	--	--	75	28	135	172	0	53	280	--	6.2	--	776	1.06	8,210	300	161	49	3.4	1,320	8.0
July 11-20.....	2,532	--	--	85	26	183	172	2	60	360	--	1.0	--	943	1.28	6,450	315	174	56	4.4	1,570	8.3
July 21-25, 28, 30-31	2,375	--	--	80	25	158	164	0	56	320	--	4.2	--	871	1.18	5,590	305	170	53	3.9	1,490	7.5
July 26-27, 29	4,933	--	--	94	33	254	144	0	51	530	--	3.6	--	1,120	1.52	14,920	370	252	60	5.7	2,070	7.9
Aug. 1-6.....	2,605	--	--	69	20	123	172	0	60	225	--	3.6	--	620	.84	4,360	255	115	51	3.4	1,120	7.6
Aug. 7-8.....	2,443	--	--	73	22	184	146	0	42	360	--	3.0	--	818	1.11	5,400	270	152	60	4.9	1,470	7.5
Aug. 10-14.....	4,156	--	--	88	34	210	206	0	144	348	--	8.3	--	972	1.32	10,910	360	191	56	4.8	1,690	7.3
Aug. 15-19.....	2,948	--	--	69	24	137	184	0	103	218	--	6.4	--	672	.91	5,350	270	121	52	3.6	1,200	7.1
Aug. 20.....	2,800	--	--	78	25	187	176	0	64	315	--	5.5	--	795	1.08	5,580	295	152	55	4.2	1,410	7.4
Aug. 21-25.....	2,410	--	--	92	32	217	200	0	90	405	--	3.8	--	1,000	1.36	6,510	360	196	57	5.0	1,740	7.7
Aug. 26-31.....	1,842	--	--	83	29	184	216	0	136	285	--	6.6	--	859	1.17	4,270	325	148	55	4.4	1,500	7.6
Sept. 1-3.....	679	--	--	79	29	194	206	0	96	330	--	3.0	--	912	1.24	1,670	315	147	57	4.7	1,460	8.1
Sept. 4-7.....	491	--	--	99	38	242	241	0	87	455	--	3.1	--	1,160	1.58	1,540	405	208	57	5.2	1,970	8.2
Sept. 8-10.....	417	--	--	111	43	297	233	0	79	585	--	3.2	--	1,460	1.99	1,640	455	264	59	6.1	2,270	8.1
Sept. 11-14.....	452	--	--	109	43	315	216	0	63	630	--	4.9	--	1,530	2.08	1,870	450	273	60	6.5	2,470	7.9
Sept. 15.....	5,140	--	--	76	24	191	148	0	37	385	--	3.2	--	953	1.30	13,230	290	168	59	4.9	1,540	8.0
Sept. 16-21.....	13,620	--	--	38	17	80	117	0	17	158	--	2.4	--	434	.59	15,860	164	68	52	2.7	778	7.8
Sept. 22-24.....	24,100	--	--	37	3	74	114	0	23	104	--	2.8	--	319	.43	20,760	106	12	60	3.1	579	7.5
Sept. 25-26.....	14,750	--	--	42	8.5	37	148	0	17	56	--	2.2	--	236	.32	9,400	140	38	36	1.4	421	7.6
Sept. 27-30.....	3,595	--	--	41	14	76	121	0	28	138	--	2.2	--	386	.52	3,750	160	61	51	2.6	694	7.4
Weighted average ..	11,560	--	--	42	10	74	b 113	--	24	134	--	--	--	397	0.54	12,390	146	54	52	2.7	872	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	54	40	45	41	42	60	68	70	79	84	77
2	70	58	40	40	38	52	57	67	70	81	84	77
3	69	53	47	40	43	51	61	69	68	83	85	78
4	69	54	--	47	48	50	57	65	69	83	83	78
5	68	55	58	45	47	50	53	62	69	81	78	75
6	67	54	62	46	48	47	54	62	72	78	77	75
7	64	55	54	42	48	43	58	65	74	78	74	72
8	62	50	43	48	52	38	53	65	77	80	76	66
9	62	43	35	45	57	44	52	67	79	82	78	67
10	64	46	35	35	55	48	55	70	73	84	80	68
11	62	52	39	37	54	59	58	--	77	82	81	71
12	65	54	38	37	52	55	57	68	78	84	81	70
13	69	52	34	40	50	53	54	70	76	85	82	71
14	69	50	40	38	52	59	48	67	79	84	82	72
15	65	48	42	35	54	49	53	68	78	83	80	67
16	66	45	36	34	48	50	55	72	76	84	79	--
17	65	42	42	32	45	52	58	70	79	84	79	--
18	64	44	40	33	50	53	61	67	78	85	77	69
19	65	48	46	33	48	52	65	63	77	83	--	72
20	63	47	49	38	48	51	65	66	77	82	77	74
21	60	42	49	54	44	50	64	70	78	82	78	72
22	60	41	46	52	48	50	64	73	75	82	76	68
23	60	43	48	38	47	49	64	68	74	83	75	64
24	62	42	39	38	49	49	64	67	72	82	79	65
25	65	45	38	43	51	49	64	67	72	80	72	65
26	57	40	40	34	50	45	65	67	75	78	77	67
27	55	38	41	34	44	48	65	68	70	82	79	68
28	54	41	43	34	40	47	66	72	73	85	71	67
29	58	--	40	38	--	52	66	72	80	86	76	65
30	63	--	43	36	--	50	66	72	78	85	76	65
31	57	--	44	38	--	55	--	72	--	83	77	--
Average	63	48	43	39	48	50	59	68	75	82	78	70

ARKANSAS RIVER BASIN--Continued

POTEAU RIVER AT WISTER RESERVOIR, NEAR WISTER, OKLA.
(Formerly Published as Poteau River near Wister, Okla.)

LOCATION (revised).--At release gate at Wister Dam, 700 feet upstream from gaging station, 2 miles south of Wister, Le Flore County.

DRAINAGE AREA (revised).--993 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1948, October 1956 to September 1957.

Water temperatures: October 1947 to September 1948. Maximum, 108 ppm July 1-10, 1948; minimum, 56 ppm May 1-10, 1948.

Hardness: Maximum, 39 ppm Aug. 1-10, 1948; minimum, 14 ppm May 1-10, 1948.

Specific conductance: Maximum daily, 229 micromhos Apr. 18, 1948; minimum daily, 44.2 micromhos Feb. 27-29, Mar. 2-3, 6-7, 1948.

Water temperatures: Maximum, 86° F June 18, July 22, 27, 31, 1948; minimum, 34° F Jan. 23, 29, 30, 1948.

REMARKS.--Records of discharge for gaging station near Wister for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1, 1956.....	0.4	2.6	0.09	4.5	2.9	7.3	2.5	24	11	5.8	0.3	2.0	0.00	58	0.08	0.7	23	4	38	0.7	86.5	6.8
Nov. 1.....	.7	1.3	.03	5.0	3.0	6.9	2.7	26	9.7	5.4	.0	1.6	.10	49	.07	.1	25	4	34	.6	92.0	6.4
Dec. 5.....	.3	1.3	.03	5.2	2.7	6.9	2.7	24	9.9	5.5	.1	1.8	.11	48	.07	46	24	4	35	.6	90.8	6.2
Jan. 4, 1957.....	98	2.5	.06	4.8	2.2	3.6	--	18	9.7	4.7	.1	2.0	.14	49	.07	129	21	6	28	.3	74.3	5.9
Feb. 14.....	5,700	6.5	.08	4.0	1.0	3.7	--	11	6.8	3.0	.2	2.5	.04	58	.08	379	14	5	36	.4	50.5	6.5
Mar. 8.....	3,570	7.5	.07	4.0	1.9	4.6	--	14	8.2	4.5	.1	2.4	.04	58	.08	322	18	6	36	.5	63.4	6.6
Apr. 1.....	1,910	7.2	.10	3.2	1.2	5.4	--	12	12	4.0	.1	1.3	.06	51	.07	391	13	3	47	.6	50.4	5.8
May 2.....	4,240	7.4	.12	2.8	1.2	4.9	--	14	11	3.5	.1	1.3	.09	46	.06	505	12	0	47	.6	44.6	5.9
June 6.....	8,100	6.4	.04	4.8	1.5	3.9	--	19	6.3	3.8	.6	3.0	.30	50	.07	395	18	2	32	.4	63.7	6.0
July 3.....	1,110	6.3	.01	4.0	1.7	3.6	--	18	5.4	3.0	.1	2.2	.16	46	.06	708	17	2	32	.4	56.9	5.8
Aug. 8.....	143	6.8	.01	8.0	3.6	4.1	--	32	11	2.8	.1	3.2	.15	68	.09	364	35	9	20	.3	95.8	5.9
Sept. 2.....	14	5.6	.05	9.2	3.6	5.9	--	2	43	3.0	.2	2.8	.12	87	.12	311	38	36	25	.4	121	4.7

ARKANSAS RIVER BASIN--Continued

POTEAU RIVER AT CAUTHRON, ARK.

LOCATION.--At gaging station at bridge on county road at Cauthron, Scott County, 8 miles downstream from Jones Creek.
 DRAINAGE AREA.--200 square miles.
 RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.
 REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, December 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./ liter	Non-carbonate			
Dec. 12, 1956	56			3.5	1.7	3.9	2.0	14	7.6	4.0		3.2	50	16	4	68.8	6.4	35
Jan. 2, 1957	23			3.5	1.7	4.1	1.5	15	7.2	4.5		2.3	52	16	3	67.7	6.5	25
Jan. 24	416			2.8	1.0	3.2	1.0	9	6.4	2.8		2.6	44	11	4	50.6	6.3	15
Feb. 14	124			3.7	1.6	4.1	1.2	10	11	3.8		1.7	46	16	8	70.5	6.4	30
Mar. 25	483			2.6	1.6	3.7	1.0	12	9.2	1.2		2.0	49	13	3	50.4	6.4	--
Apr. 18	220			2.5	1.7	3.5	.8	14	4.8	2.5		.8	42	13	2	47.1	7.0	--
May 6	218			2.0	1.9	2.9	1.0	16	4.0	2.0		.7	41	13	0	44.8	6.9	3
June 24	21			3.8	2.4	3.9	1.2	24	4.4	2.5		1.2	50	19	0	56.6	7.2	--
Aug. 15	275			2.3	1.1	2.2	2.2	10	4.0	2.0		1.7	78	10	2	36.2	6.6	--
Sept. 9	3.6			3.4	2.6	3.5	1.8	26	3.0	2.7		1.4	52	19	0	56.7	6.6	24

ARKANSAS RIVER BASIN--Continued

LEE CREEK NEAR VAN BUREN, ARK.

LOCATION.--At gaging station, 300 feet west of Arkansas-Oklahoma State line, 3.2 miles downstream from Webbers Creek, 6½ miles northwest of Van Buren, Crawford County, and 7.9 miles upstream from mouth.

DRAINAGE AREA.--427 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, December 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conduct- ance (micro- mhos at 25°C)	pH	Color
														Calcium, mg- nesium	Non- carbon- ate			
Dec. 20, 1956	36			11	2.5	4.5	1.0	39	6.8	6.0		1.7	58	38	6	105	7.1	13
Jan. 9, 1957	26			14	2.9	5.4	.8	34	6.8	16		1.2	76	47	19	131	7.3	5
Feb. 12	672			8.2	1.5	3.2	.3	25	6.2	3.8		3.9	46	27	6	75.9	7.4	5
Mar. 13	702			8.3	1.6	2.5	.9	32	2.6	3.5		1.4	55	27	1	75.5	7.0	1
Mar. 13	268			8.4	1.7	2.8	.9	30	5.0	4.0		1.1	49	28	3	77.0	7.5	1
May 1	2,590			7.1	1.1	1.7	1.0	23	4.0	2.2		1.4	48	22	3	59.5	7.4	5
May 14	2,810			7.2	1.3	1.9	1.1	28	4.4	2.0		1.0	54	23	0	58.9	7.4	2
July 3	215			10	1.8	3.0	1.4	41	1.2	3.5		1.6	58	32	0	82.9	7.2	--
Aug. 13	3,010			5.4	1.7	1.1	2.3	18	3.8	2.0		2.1	43	16	2	44.0	6.7	45
Sept. 4	31			11	2.0	3.1	1.5	43	2.0	4.0		1.3	58	36	0	87.4	7.1	2

ARKANSAS RIVER BASIN--Continued
ARKANSAS RIVER AT VAN BUREN, ARK.

LOCATION.--At gaging station at bridge on U. S. Highways 64 and 71, at Van Buren, Crawford County, 1.3 miles downstream from Lee Creek, 8.6 miles downstream from Poteau River, and at mile 353.4.

DRAINAGE AREA.--150,483 square miles, of which 22,241 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1957.

Water temperatures: October 1945 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 3,970 ppm Nov. 17; minimum, 110 ppm Mar. 22.

Hardness: Maximum, 725 ppm Nov. 17; minimum, 46 ppm Feb. 11-18.

Specific conductance: Maximum daily, 6,060 micromhos Nov. 17; minimum daily, 156 micromhos Feb. 14.

Water temperatures: Maximum, 86°F July 31; Aug. 2, 3; minimum, freezing point Jan. 16.

EXTREMES 1945-57.--Dissolved solids: Maximum, 5,830 ppm Apr. 1, 1954; minimum, 110 ppm Mar. 22, 1957.

Hardness: Maximum, 1,100 ppm Apr. 1, 1954; minimum, 40 ppm Mar. 20, 1955.

Specific conductance: Maximum daily, 8,986 micromhos Apr. 1, 1954; minimum daily, 132 micromhos May 11, 1948.

Water temperatures: Maximum, 92°F Aug. 6, 1956; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue of 180°C)			Hardness as CaCO ₃		Percent non-dissolved	Sediment adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Oct. 1-6, 1956	422	5.8	0.00	89	19	264	13	190	78	450	0.1	5.1	0.00	1,180	1.60	1,410	300	144	64	6.6	1,940	7.4	5
Oct. 7-10	401	--	--	83	19	182	--	220	48	315	--	3.3	.05	847	1.15	917	285	104	58	4.7	1,450	8.1	7
Oct. 11-19	426	--	--	67	19	161	--	190	49	265	--	3.7	.00	730	.99	840	245	90	59	4.5	1,270	8.1	7
Oct. 20-22	598	--	--	79	21	230	--	180	66	390	--	3.7	.05	962	1.31	1,550	284	136	64	5.9	1,670	8.2	5
Oct. 23-24	582	--	--	93	23	353	--	170	91	605	--	3.4	--	1,370	1.86	2,150	326	187	70	8.5	2,390	8.0	10
Oct. 25-28	600	--	--	81	19	266	--	166	76	460	--	4.3	--	1,080	1.47	1,750	280	144	67	6.9	1,900	8.1	10
Oct. 29-31	599	--	--	71	19	200	--	161	62	340	--	5.8	.00	857	1.17	1,390	255	123	63	5.4	1,500	8.0	10
Nov. 1-4-6	1,133	--	--	70	19	210	--	137	59	380	--	4.1	.10	911	1.24	2,780	252	140	64	5.8	1,570	7.9	7
Nov. 7-8	1,877	--	--	85	20	312	--	153	77	540	--	3.3	.10	1,200	1.63	2,880	294	168	70	7.9	2,110	8.0	10
Nov. 8, 10	1,174	--	--	105	27	449	--	126	80	810	--	3.8	--	1,710	2.33	5,420	373	270	72	10	2,950	7.9	7
Nov. 9	1,240	--	--	--	--	--	--	117	114	1,040	--	2.0	--	2,220	3.02	7,430	450	354	--	--	3,700	8.1	--
Nov. 11-14	1,298	--	--	79	18	292	--	136	67	510	--	3.9	.10	1,150	1.56	4,030	271	180	70	7.7	2,000	8.0	10
Nov. 15	1,997	--	--	--	--	--	--	120	54	600	--	2.1	--	1,480	2.01	3,860	350	252	--	--	2,480	8.2	--
Nov. 16, 18	1,104	--	--	148	38	618	--	106	65	1,220	--	4.5	--	2,310	3.14	6,890	526	439	72	12	4,130	7.6	5
Nov. 17	1,220	--	--	200	55	950	--	94	70	1,880	--	4.4	--	3,970	5.40	13,080	725	648	74	15	6,060	7.8	5
Nov. 19, 22	1,285	--	--	103	30	452	--	120	62	830	--	3.7	.10	1,770	2.41	6,140	380	262	72	10	2,940	7.8	5
Nov. 20-21, 23	1,467	--	--	90	22	331	--	120	59	640	--	5.1	.10	1,350	1.84	5,350	315	216	71	8.6	2,390	7.7	5
Nov. 24-30	1,529	4.6	0.00	64	17	200	11	120	49	368	.1	5.1	.15	873	1.19	3,600	230	131	64	5.7	1,510	7.8	5
Dec. 1-9	1,319	4.6	0.00	67	15	177	8.9	140	43	316	.1	3.9	.10	797	1.08	2,840	226	114	62	5.1	1,370	7.5	5
Dec. 10-13	1,990	--	--	58	12	142	--	125	54	235	--	2.5	.05	595	.81	3,200	194	92	61	4.4	1,060	7.7	5

Dec. 14-15, 1956..	2,960	--	--	45	11	118	--	97	42	205	--	2.3	--	513	.70	4,100	158	78	62	4.1	921	8.0	10
Dec. 16 a.....	2,520	--	--	--	--	--	--	115	54	285	--	2.1	--	840	1.14	5,720	234	140	--	--	1,400	8.2	--
Dec. 17-18.....	1,837	--	--	90	16	303	--	116	47	570	--	3.7	.00	1,250	1.70	6,200	291	196	69	7.7	2,110	7.9	10
Dec. 20-21, 25-27.	2,442	--	--	104	30	392	--	110	49	760	--	4.4	.15	1,630	2.22	10,750	383	293	69	8.7	2,690	7.6	10
Dec. 22, 24.....	3,710	--	--	48	10	130	--	86	34	235	--	3.1	--	623	.85	6,240	161	90	64	4.5	1,040	7.7	10
Dec. 23 a.....	3,820	--	--	--	--	--	--	66	46	142	--	1.0	--	386	.52	3,880	112	58	--	--	644	7.7	--
Dec. 23-31.....	2,180	--	--	89	20	319	--	110	52	580	--	3.8	.15	1,280	1.74	7,530	304	214	70	7.9	2,200	7.6	10
Jan. 1-7, 1957....	1,730	5.1	--	73	16	208	11	126	60	385	.1	5.2	.15	950	1.29	4,440	248	144	63	5.7	1,590	8.0	5
Jan. 8-13.....	1,673	--	--	62	17	189	--	119	54	310	--	3.5	.05	772	1.05	3,490	224	127	62	4.9	1,330	7.8	10
Jan. 14-19.....	1,283	--	--	71	22	207	--	137	60	380	--	3.7	.00	921	1.25	3,180	268	156	63	5.5	1,570	8.0	10
Jan. 20-21.....	1,275	--	--	65	15	163	9.8	137	53	302	--	1.5	--	828	1.13	2,850	224	112	60	4.7	1,280	7.7	6
Jan. 22-23.....	3,215	--	--	28	5.0	106	7.6	108	41	188	--	5.1	--	474	.64	4,110	165	76	57	3.6	890	7.7	7
Jan. 24-28, 30....	7,192	--	--	20	5.7	44	4.3	44	25	80	--	5.1	.15	228	.31	4,430	73	37	55	2.2	396	6.8	8
Jan. 29, 31, Feb. 3-6, 8-10...	14,880	--	--	17	2.8	27	3.8	38	20	47	--	3.0	.10	184	.25	7,390	54	23	50	1.6	270	6.6	9
Feb. 1-2, 7.....	14,870	--	--	24	5.9	64	4.9	40	18	126	--	4.0	.05	341	.46	13,690	84	51	61	3.0	535	7.2	7
Feb. 11-18.....	11,520	--	--	12	3.9	20	3.0	34	21	30	--	4.9	.05	134	.18	4,170	46	18	47	1.3	197	6.6	8
Feb. 19-26.....	6,753	2.5	--	41	7.7	65	3.1	90	48	112	.1	2.4	.10	359	.49	6,550	134	60	54	2.8	610	7.1	15
Feb. 27-28, Mar. 1-2, 6-7...	9,508	--	--	20	6.6	29	3.7	52	30	50	--	3.0	--	192	.26	4,930	77	34	44	1.4	304	7.1	8
Mar. 3-5, 8-11...	10,820	2.0	--	30	6.9	55	3.0	62	28	100	.0	2.8	.05	299	.41	8,730	103	52	53	2.4	491	7.0	17
Mar. 12, 16-18, 20	7,106	--	--	39	8.8	77	6.8	83	37	139	--	3.3	.10	432	.59	8,290	134	66	54	2.9	677	7.2	3
Mar. 13-15.....	6,660	--	--	43	9.1	111	7.7	76	40	212	--	3.1	.10	551	.75	9,910	145	86	61	4.0	886	7.2	5
Mar. 19 a.....	8,070	--	--	--	--	--	--	51	36	60	--	1.0	--	217	.30	4,730	81	39	--	--	362	8.2	--
Mar. 21, 23-24, 26, 30-31.....	18,230	--	--	20	6.2	42	2.8	51	28	72	--	2.6	.10	230	.31	11,320	75	34	54	2.1	362	7.7	40
Mar. 22 a.....	15,600	--	--	--	--	--	--	43	16	22	--	1.2	--	110	.15	4,630	79	44	--	--	183	8.0	--
Mar. 25, 27-29, Apr. 1.....	19,100	--	--	14	4.5	27	2.5	41	18	46	--	2.8	.10	160	.22	8,250	53	20	51	1.6	258	7.7	10
Apr. 2-6.....	97,560	--	--	33	5.5	52	4.4	90	24	82	--	4.6	.10	271	.37	71,380	105	31	51	2.2	462	8.0	25

a Not included in weighted average. Dissolved solids and loads estimated from specific conductance.

ARKANSAS RIVER BASIN--Continued
 ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue of 180°C)			Hardness as CaCO ₃		Percent so- lution ratio	Specific conductance (microhmhos at 25°C)	pH	Col- or	
														Parts per million	Tons per acre- foot	Tons per day	Calcium, magnesium	Non-carbon- ate					
Apr. 7, 1957 a....	97,800	--	--	--	--	--	--	b78	12	54	--	0.9	--	203	0.28	53,600	65	1	--	338	8.3	--	
Apr. 8 a....	89,400	--	--	--	--	--	--	c93	18	55	--	1.1	--	223	.30	53,830	112	36	--	371	8.3	--	
Apr. 9-15, 17....	54,840	--	--	38	7.8	75	5.0	100	37	124	--	4.1	0.10	374	.51	55,380	127	45	55	2.9	641	8.0	20
Apr. 16, 18-20, 24, 27-30.....	117,900	3.4	0.08	35	5.4	49	3.0	91	30	80	0.3	2.2	.05	282	.38	89,310	110	35	48	2.0	466	8.0	25
Apr. 21 a.....	96,600	--	--	--	--	--	--	77	17	59	--	1.3	--	217	.30	56,600	97	34	--	362	8.2	--	
Apr. 22-23, 25-26.	162,000	--	--	40	7.2	69	4.8	108	28	112	--	3.9	.05	363	.49	158,800	130	41	53	2.6	641	7.9	20
May 1-4.....	136,200	--	--	33	6.8	55	4.4	90	33	84	--	3.2	.05	286	.39	105,200	110	37	51	2.3	490	8.0	20
May 5, 10-11....	85,970	--	--	43	7.2	67	5.4	112	47	106	--	3.6	.00	372	.51	86,350	137	45	50	2.5	600	7.5	10
May 6-9.....	97,660	--	--	49	9.6	129	7.4	104	66	206	--	6.1	.00	570	.78	150,300	162	77	62	4.4	977	7.8	15
May 12, 14, 16-20..	128,700	3.7	.18	46	8.6	99	4.8	107	54	163	.0	4.2	.10	486	.66	166,900	150	63	58	3.5	816	8.2	20
May 13, 15.....	72,900	--	--	53	10	168	10	106	72	275	--	4.3	--	697	.95	137,200	173	86	66	5.6	1,100	7.8	25
May 21-23.....	273,300	--	--	49	7.4	100	5.8	116	57	153	--	2.9	.00	480	.65	354,200	152	58	58	3.5	774	7.8	7
May 24-26, 30-31..	323,200	--	--	39	5.0	48	4.2	104	33	73	--	2.9	.05	288	.39	251,300	118	33	46	1.9	476	7.9	8
May 27-29.....	460,300	--	--	38	3.1	29	3.6	100	27	42	--	4.0	.00	238	.32	295,800	108	26	36	1.2	358	7.3	8
June 1-2, 4, 9-11..	234,000	--	--	38	6.8	45	4.2	102	37	70	--	2.7	.02	293	.40	185,100	123	39	43	1.8	458	7.4	10
June 3, 5-8.....	256,200	--	--	41	7.7	58	4.4	110	38	90	--	3.4	.10	344	.47	238,000	134	44	47	2.2	548	7.5	10
June 12-16.....	222,800	--	--	44	7.1	58	4.7	102	45	94	--	3.0	.15	344	.47	206,900	139	56	46	2.1	541	7.5	9
June 17-20.....	223,200	--	--	36	6.3	32	4.4	102	29	52	--	1.8	.05	260	.35	156,700	116	32	36	1.3	393	7.4	12
June 21-23, 26-28.	194,000	3.9	.07	46	8.6	67	5.6	110	44	112	.4	2.9	.00	384	.52	201,100	150	60	48	2.4	627	7.4	12
June 24-25, 28-30..	176,800	--	--	41	7.5	47	5.2	109	43	70	--	2.3	.02	307	.42	146,500	133	44	42	1.8	483	7.9	8
July 1-5.....	159,000	--	--	41	7.4	49	6.0	110	40	76	--	2.6	.01	315	.43	135,200	133	43	43	1.8	505	7.6	8
July 6 a.....	140,000	--	--	--	--	--	--	129	60	180	--	2.2	--	544	.74	205,600	192	86	--	--	907	8.0	--
July 7 a.....	141,000	--	--	--	--	--	--	101	50	110	--	1.8	--	369	.50	140,500	138	55	--	--	615	7.8	--
July 8-16.....	107,900	7.4	.00	39	6.8	42	4.7	101	39	64	.4	1.8	.00	283	.38	82,450	125	42	41	1.6	460	7.5	14
July 17-27.....	37,430	--	--	46	8.7	78	5.4	104	56	123	--	2.0	.00	411	.56	41,540	151	66	52	2.8	673	7.7	10
July 28-30.....	24,670	--	--	57	13	134	7.4	114	76	225	--	2.2	.00	630	.86	41,960	196	102	59	4.2	1,050	7.7	8
July 31, Aug 1....	20,800	--	--	66	18	194	8.8	123	104	320	--	1.6	--	862	1.17	48,410	238	138	63	5.4	1,430	7.9	10
Aug. 2-4.....	16,630	--	--	52	12	110	6.6	117	66	182	--	2.0	.05	545	.74	24,470	179	84	56	3.6	926	7.5	12
Aug. 5-7.....	12,330	--	--	65	17	149	8.3	146	90	242	--	2.0	.05	691	.94	23,000	232	112	57	4.3	1,170	8.0	10
Aug. 8-12, 15.....	12,120	--	--	81	18	238	11	148	113	390	--	1.8	.05	971	1.32	31,780	276	154	64	6.2	1,870	8.0	8

[illegible]

a Not included in weighted average. Dissolved solids and loads estimated from specific conductance.

^b Includes 1 part per million of carbonate (CO₃).

c Includes 3 parts per million of carbonate (CO_3).

c includes 3 parts per million of carbonate (CO_3).

LOWER MISSISSIPPI RIVER BASIN

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	55	45	48	41	47	55	69	72	77	85	80
2	72	58	44	38	40	49	57	67	71	83	86	81
3	72	57	44	38	42	49	59	69	71	80	86	80
4	73	61	49	44	--	48	52	64	73	85	85	80
5	70	58	55	44	44	48	53	65	71	84	83	79
6	71	56	49	45	46	49	52	67	71	83	81	76
7	70	55	55	42	48	46	53	66	74	82	80	74
8	65	49	49	44	50	46	50	67	78	80	83	75
9	64	46	43	50	51	46	51	68	74	81	82	74
10	64	52	38	48	58	48	54	72	74	82	84	73
11	64	57	41	42	52	52	57	68	76	82	84	75
12	62	54	43	43	52	50	50	70	73	83	83	74
13	63	52	41	47	51	58	51	70	74	84	84	74
14	70	60	44	38	51	58	54	70	77	85	83	74
15	68	58	44	37	51	55	50	71	79	84	84	73
16	62	46	42	32	51	55	54	75	72	83	80	75
17	65	48	44	34	51	52	58	71	79	84	79	70
18	66	51	42	34	50	52	60	73	78	85	80	75
19	65	48	44	35	48	50	62	69	71	83	79	74
20	70	54	46	38	--	50	64	69	78	82	80	75
21	65	44	46	44	43	49	63	70	78	82	80	73
22	64	47	44	50	48	51	64	72	79	83	80	73
23	65	42	45	38	47	49	64	73	77	82	79	70
24	65	47	41	41	50	50	66	68	75	81	79	--
25	65	43	45	41	51	50	65	69	75	82	79	68
26	57	40	41	39	49	46	66	71	75	80	81	70
27	65	39	41	40	46	47	66	74	76	82	81	69
28	61	46	39	39	47	47	72	73	78	84	81	69
29	60	37	45	40	--	49	67	74	80	85	80	69
30	62	38	45	39	--	51	69	73	81	85	81	68
31	58	--	44	40	--	54	--	73	--	86	81	--
Average	66	50	44	41	48	50	59	70	75	83	82	74

ARKANSAS RIVER BASIN--Continued
MULBERRY RIVER NEAR MULBERRY, ARK.

LOCATION --At gaging station, a quarter of a mile upstream from Mill Creek, 5 miles northeast of Mulberry, Crawford County, and 11.3 miles upstream from mouth. DRAINAGE AREA --372 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1955 to September 1956. Maximum, 126 ppm July 6; minimum, 25 ppm Dec. 1-10, Jan. 23.

EXTREMES, 1955-56 --Dissolved solids: Maximum, 10 ppm Jan. 11-20, Jan. 23, Feb. 1-10, Mar. 1-10, May 1-10.

Hardness: Maximum, 44 ppm July 6; minimum, 10 ppm Jan. 11-20, Jan. 23, Feb. 1-10, Mar. 1-10, May 1-10.

Specific conductance: Maximum daily, 146 micromhos July 6; minimum daily, 24.3 micromhos Feb. 18.

Water temperatures: Maximum, 88°F July 15, 16; minimum, 34°F Dec. 16-19, Jan. 20, 21.

REMARKS --Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evap- oration at 180°C)	Hardness as CaCO ₃		Specific conductance (micro- mhos at 25°C)	pH	Color
														Calcium, mg-n nesium	Non- carbon- ate			
Nov. 8, 1956	36			4.9	1.5	3.6	0.7	26	1.6	3.5		1.3	28	18	0	62.9	7.3	5
Dec. 20	67			2.8	1.2	2.4	.4	14	2.8	2.8		.8	26	12	1	41.8	7.3	15
Jan. 9, 1957	61			2.5	1.0	2.4	.4	12	3.2	2.8		.4	25	10	1	41.8	6.9	10
Feb. 21	825			2.1	1.1	2.0	.4	7	4.4	2.0		.8	26	10	4	35.3	7.1	15
Mar. 14	258			1.8	1.2	1.4	.6	11	.8	2.0		.5	28	9	0	29.2	7.1	2
Apr. 5	4,330			1.8	1.2	.9	.7	9	.8	1.5		.9	34	9	2	28.5	6.8	1
May 16	1,830			1.6	1.1	1.0	.7	12	2.0	1.5		.5	32	8	0	27.1	7.0	2
June 12	1,130			2.1	.9	1.3	.6	13	1.6	1.5		1.1	29	9	0	27.7	7.3	--
July 10	45			3.0	1.6	1.4	.9	18	1.0	2.0		.5	37	14	0	36.2	7.2	1
Aug. 7	4.3			4.1	1.8	1.9	1.0	24	1.2	2.5		.8	34	18	0	47.5	7.5	7
Sept. 5	15			3.6	2.0	2.0	1.2	20	1.8	2.5		.7	29	17	0	43.2	6.6	1

ARKANSAS RIVER BASIN--Continued

PINEY CREEK NEAR DOVER, ARK.

LOCATION.--At gaging station, 7½ miles downstream from Indian Creek, and 10 miles north of Dover, Pope County.

DRAINAGE AREA.--274 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1955 to September 1956.

EXTREMES, 1955-56.--Dissolved solids: Maximum, 72 ppm Aug. 16; minimum, 34 ppm June 21-30.

Hardness: Maximum, 44 ppm Sept. 21-30; minimum, 14 ppm Feb. 1-10.

Specific conductance: Maximum daily, 152 micromhos Sept. 23; minimum daily, 27.0 micromhos Feb. 17.

Water temperatures: Maximum, 92°F July 15, Aug. 16; minimum, 36°F Jan. 18.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Nov. 8, 1956	0.5			12	2.6	3.1	1.0	50	2.4	2.0		3.1	52	41	0	102	7.8	5
Dec. 19	33			6.5	1.8	2.3	.3	28	3.4	2.5		.8	38	24	1	63.5	7.4	5
Jan. 8, 1957	36			7.0	1.8	3.0	.4	26	6.0	2.0		.4	33	25	4	66.8	7.2	10
Feb. 20	653			4.4	1.2	1.5	.2	16	3.2	2.0		.9	26	16	3	48.9	6.9	7
Mar. 15	148			4.8	1.7	1.1	.7	21	3.0	1.5		.5	30	19	2	39.7	7.4	1
Apr. 4	7,810			2.6	1.5	.8	.9	14	.4	3.0		.7	34	13	1	31.1	6.9	1
May 16	1,440			3.7	1.6	.9	.8	18	2.4	3.0		.3	30	16	1	35.0	7.2	1
June 12	1,010			3.9	1.1	.8	.7	16	2.4	1.2		.6	30	14	1	36.3	7.6	7
July 10	66			6.0	1.5	1.2	.9	28	2.0	1.0		.6	37	21	0	50.1	7.5	2
Aug. 6	13			9.8	2.3	1.6	.9	43	1.4	1.2		.6	48	34	0	71.8	7.4	5
Sept. 4	92			8.2	1.4	1.7	1.2	34	2.2	1.5		.5	39	26	0	60.5	7.5	4

ARKANSAS RIVER BASIN--Continued
ILLINOIS BAYOU NEAR SCOTTSVILLE, ARK.

LOCATION--At gaging station at bridge on county road, 1½ miles north of Scottsville, Pope County, and 3 miles downstream from North Fork Illinois Bayou.

DRAINAGE AREA--242 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1955 to September 1956. Oct. 22, minimum, 25 ppm Nov. 21-30; Jan. 11-20.

EXTREMES: 1955-56.--Dissolved solids: Maximum, 86 ppm Oct. 22, minimum, 8 ppm Jan. 1-10.

Hardness: Maximum, 22 ppm Oct. 22, Aug. 29, minimum, 8 ppm Jan. 1-10.

Specific conductance: Maximum daily, 37.9 micromhos Oct. 22, minimum daily, 22.1 micromhos Feb. 18.

Water temperatures: Maximum, 88 F July 4, Aug. 7; minimum, 54 F Jan. 19-21.

REMARKS--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Nov. 8, 1956	0.4			3.8	2.3	2.9	0.5	22	4.2	3.5		0.6	30	19	1	57.2	7.0	5
Dec. 18	58			3.1	1.1	2.2	.5	14	3.6	2.0		1.1	18	12	1	39.2	7.2	10
Jan. 9, 1957	51			2.9	.9	2.2	.3	13	2.2	2.5		1.0	22	11	0	37.5	7.0	30
Feb. 8	3,970			2.3	.6	1.6	.4	11	2.0	1.0		.8	25	8	0	30.6	7.0	5
Mar. 14	156			1.8	1.1	1.0	.6	10	2.8	2.0		.7	26	9	1	27.6	7.3	2
Apr. 3	21,900			2.3	1.0	.5	1.1	8	3.2	1.0		2.2	39	10	3	29.2	6.1	2
May 15	1,170			1.8	1.2	1.2	.8	12	1.8	1.5		.8	32	9	0	24.6	7.2	2
June 11	1,390			2.4	1.2	.9	.7	12	3.0	1.2		.7	28	11	1	28.4	6.9	5
Aug. 5	8.2			3.0	1.7	1.5	.8	20	1.2	1.2		.6	33	14	0	40.5	7.1	8
Sept. 4	74			3.5	1.2	1.5	1.1	18	1.0	1.9		.8	32	14	0	34.9	7.2	7
Sept. 10	40			2.5	1.7	1.1	.8	16	2.0	1.5		.7	30	17	0	31.7	6.7	2

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT DARDANELLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 7, at Dardanelle, Yell County, 1 mile upstream from Whig Creek, 4.7 miles downstream from Illinois Bayou, and at mile 255.8.

DRAINAGE AREA.--153,707 square miles, of which 22,241 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1957.

Water temperatures: October 1948 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, not determined; minimum, 119 ppm Apr. 3-4.

Hardness: Maximum, 510 ppm Nov. 24; minimum, 44 ppm Apr. 3-4.

Specific conductance: Maximum daily, 4,100 microhos Nov. 24; minimum daily, 130 microhos Apr. 3.

Water temperatures: Maximum, 90°F Aug. 2, 3; minimum, 35°F Jan. 17.

Hardness: Maximum, 583 ppm Apr. 4-6, 1954; minimum, 32 ppm Feb. 18, 1956.

Specific conductance: Maximum daily, 5,310 microhos Apr. 4, 1954; minimum daily, 107 microhos Mar. 21, 1955.

Water temperatures: Maximum, 94°F Aug. 17, 1952; minimum, freezing point Jan. 30, 1949, Feb. 1-3, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year

October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color	
														Parts per million	Tons per acre-foot 3	Tons per day	Calcium, magnesium	Non-carbonate					
Oct. 1-3, 1956 ..	644	--	--	66	19	139	--	182	45	240	--	3.2	--	680	0.92	1,180	242	94	56	3.9	1,160	7.9	10
Oct. 4-5	632	--	--	72	19	230	--	159	60	390	--	4.1	--	960	1.31	1,640	258	127	66	6.2	1,630	7.8	5
Oct. 6-7	532	--	--	82	30	346	--	142	82	610	--	4.0	--	1,390	1.89	2,000	328	212	70	8.3	2,380	7.7	10
Oct. 8-12	493	--	--	101	30	483	--	138	100	845	--	5.0	--	1,740	2.37	2,320	376	262	74	11	3,130	7.4	5
Oct. 13-17	441	--	--	81	23	302	--	176	80	510	--	4.5	--	1,240	1.69	1,480	296	152	69	7.7	2,100	7.9	7
Oct. 18-20	541	--	--	81	20	240	--	194	69	395	--	3.4	--	983	1.35	1,450	284	125	65	6.2	1,730	7.9	10
Oct. 21-31	668	6.5	0.00	69	18	147	8.4	197	47	255	0.1	4.4	--	718	.98	1,290	246	84	55	4.1	1,240	7.9	5
Nov. 1-2, 7-9 ...	1,133	--	--	73	15	197	--	174	62	325	--	2.8	--	840	1.14	2,570	244	101	64	5.5	1,460	8.0	10
Nov. 3-6, 10	980	--	--	79	18	242	--	174	71	410	--	2.9	--	999	1.36	2,640	271	128	66	6.4	1,730	8.0	5
Nov. 11-13	1,367	--	--	71	19	225	--	146	57	390	--	1.3	--	938	1.28	3,460	255	136	66	6.1	1,580	7.9	13
Nov. 14, 18-22 ..	1,505	--	--	79	22	274	--	136	56	500	--	1.2	--	1,140	1.55	4,630	288	176	67	7.0	1,940	7.7	8
Nov. 15-17	1,440	--	--	99	29	431	--	138	63	780	--	1.0	--	1,690	2.30	6,570	366	253	72	9.8	2,830	7.8	13
Nov. 23, 25	1,880	--	--	109	38	489	--	112	94	920	--	1.2	--	1,920	2.81	10,260	428	336	71	10	3,210	7.7	13
Nov. 24	1,880	24 a.	--	--	--	--	--	104	44	1,180	--	1.8	--	62,450	3.33	612,440	510	425	--	--	4,100	7.7	--
Nov. 26-29	2,062	--	--	80	22	300	--	115	35	570	--	1.2	--	1,270	1.73	7,070	290	196	69	7.7	2,130	7.6	15
Nov. 30, Dec. 1-6	1,607	--	--	63	15	186	--	124	33	340	--	1.9	--	849	1.15	3,680	218	117	65	5.5	1,400	7.9	15
Dec. 7-9	3,393	--	--	32	7.1	78	--	70	20	140	--	1.9	--	398	.54	3,650	109	52	61	3.2	648	7.6	22
Dec. 10-21	2,898	--	--	44	11	108	--	96	37	196	--	1.0	--	514	.70	4,920	155	76	60	3.8	884	7.7	13
Dec. 22-24, 26, 28	3,676	--	--	53	16	154	--	88	28	298	--	1.0	--	698	.95	6,930	198	126	63	4.8	1,190	7.8	10
Dec. 25, 29-31 ...	3,598	--	--	74	22	279	--	86	32	555	--	1.3	--	1,190	1.62	11,560	275	204	69	7.3	2,010	7.5	17
Dec. 27 a	4,780	--	--	--	--	--	--	80	24	195	--	2.2	--	5,505	.69	66,520	142	76	--	--	845	8.1	--

	Jan. 1-3, 1957...	2,803	--	--	78	20	273	--	88	26	540	--	1.5	1,180	1.58	8,780	276	204	68	7.2	1,970	7.4	10
Jan. 4-6	2,327	--	--	--	67	17	222	--	98	37	415	--	1.7	948	1.28	5,960	237	136	67	6.3	1,820	7.5	12
Jan. 7-13	2,326	7.4	--	--	58	15	169	8.4	114	46	305	1.1	3.5	998	1.22	5,640	206	112	63	5.1	1,300	8.2	5
Jan. 14-20	1,824	--	--	--	56	13	145	--	114	36	285	--	1.7	642	.87	6,160	163	100	62	4.5	1,140	7.6	15
Jan. 21 a	1,880	--	--	--	--	--	--	--	c 118	18	280	--	2.4	b 712	.97	63,610	209	112	--	--	1,190	8.4	--
Jan. 22-23, 25	12,700	--	--	--	17	4.6	38	3.1	46	20	58	--	2.6	173	.24	5,830	61	24	56	2.1	296	7.2	30
Jan. 24 a	9,640	--	--	--	--	--	--	--	82	12	156	--	1.1	b 426	.58	61,090	131	64	--	--	713	8.2	--
Jan. 26-28, 31...	11,760	--	--	--	22	6.1	53	3.6	54	23	88	--	3.0	239	.33	7,390	80	36	58	2.6	419	7.7	33
Feb. 1-2, 6, 9	23,700	--	--	--	19	5.0	43	3.0	42	16	78	--	2.6	227	.31	14,530	68	34	57	2.3	359	7.4	40
Feb. 3, 5	13,900	--	--	--	26	6.1	70	3.7	46	22	131	--	3.1	348	.47	13,060	90	52	62	3.2	552	7.5	15
Feb. 4 a	14,000	--	--	--	--	--	--	--	52	8.0	300	--	1.0	b 676	.92	625,550	171	128	--	--	1,130	7.9	--
Feb. 7-8, 10-16	25,410	--	--	--	17	3.6	22	2.9	44	13	41	--	3.3	154	.21	10,370	57	21	44	1.3	247	7.2	10
Feb. 17, 22-23, 25	13,180	--	--	--	21	6.8	43	2.7	54	32	72	--	2.8	201	.27	7,150	80	36	53	2.1	375	7.5	15
Feb. 18-21, 26-28	16,230	--	--	--	14	5.0	25	2.2	40	19	40	--	1.7	132	.18	5,780	56	23	48	1.5	228	7.3	30
Feb. 24 a	11,300	--	--	--	--	--	--	--	65	16	103	--	.7	b 316	.43	6,640	113	60	--	--	528	8.0	--
Mar. 1 a	18,800	--	--	--	--	--	--	--	39	6.0	31	--	1.0	b 125	.17	6,340	56	24	--	--	209	7.9	--
Mar. 2-8	13,270	--	--	--	21	5.6	34	3.0	54	24	56	--	2.2	186	.25	6,660	75	31	48	1.7	332	7.4	10
Mar. 9, 13-14, 19-23	11,780	--	--	--	29	7.5	58	4.4	68	33	100	--	2.5	297	.40	9,450	103	47	54	2.5	511	7.5	15
Mar. 10-12, 15-18	12,070	--	--	--	37	9.6	89	4.9	68	35	170	--	3.6	470	.64	15,320	132	76	58	3.4	740	7.2	23
Mar. 24 a	23,600	--	--	--	--	--	--	--	51	11	39	--	.8	b 160	.22	310,200	72	30	--	--	268	7.9	--
Mar. 25-31	27,260	--	--	--	20	5.5	43	3.2	50	19	72	--	2.1	226	.31	16,630	72	32	55	2.2	366	7.5	40
Apr. 1-2, 5-8	104,600	--	--	--	29	4.4	39	3.2	78	18	67	--	2.6	240	.33	67,780	90	27	47	1.8	405	6.8	7
Apr. 3-4	129,100	--	--	--	15	1.5	10	2.1	41	7.6	18	--	2.4	119	.16	41,480	44	10	32	.7	154	6.9	7
Apr. 10-18, 23-24, 26	83,690	3.1	--	--	36	6.6	57	3.9	90	33	94	.2	2.3	309	.42	69,820	117	43	50	2.3	548	6.9	9
Apr. 20-22, 25	168,900	--	--	--	30	4.9	40	3.6	80	23	66	--	2.3	228	.31	104,000	95	29	47	1.8	373	7.7	7
May 1-5	144,800	--	--	--	32	6.4	51	3.8	89	31	78	--	1.9	267	.36	143,100	106	33	50	2.2	459	7.0	8
May 7-8, 11, 17-20	118,000	--	--	--	46	8.0	95	5.3	105	45	155	--	3.9	449	.61	143,100	148	62	57	3.4	760	6.9	7
May 9-10, 16	91,400	--	--	--	50	10	138	6.8	100	73	215	--	2.5	596	.81	147,100	166	84	63	4.7	1,020	7.5	7

c Includes equivalent of 4 parts per million of carbonate (CO₃).

a Not included in weighted average.

b Dissolved solids and loads estimated from specific conductance.

ARKANSAS RIVER BASIN--Continued
 ARKANSAS RIVER AT DARDANELLE ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent adsorbed	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate					
May 12-15, 1957...	74,920	--	--	33	6.3	69	4.1	80	41	105	--	1.7	--	332	0.45	67,160	108	43	57	2.9	557	7.7	12
May 21, 23-25...	300,200	--	--	39	6.2	64	3.8	106	29	104	--	1.5	--	335	--	--	123	36	52	2.5	563	7.9	6
May 22, 23-25...	270,000	--	--	--	--	--	--	134	90	180	--	2.2	--	b 538	73	b 392,200	179	69	--	--	900	7.9	--
May 26-31, June 1-2	387,100	--	--	36	4.8	34	3.3	110	25	50	--	1.6	--	238	--	--	110	19	39	1.4	394	7.5	3
June 3-17	251,700	--	--	40	6.8	49	3.7	108	34	78	--	1.3	--	227	--	--	128	39	45	1.9	452	7.7	7
June 18-21	226,800	--	--	34	5.4	30	3.8	99	24	46	--	1.6	--	283	--	--	107	28	37	1.3	369	7.5	7
June 22-26	190,200	--	--	39	6.4	41	4.2	108	30	70	--	1.5	--	285	--	--	124	35	41	1.6	444	7.5	8
June 27-29	187,300	--	--	47	7.5	75	5.2	110	51	120	--	1.6	--	402	--	--	148	58	51	2.7	612	7.7	7
June 30, July 1-6	166,000	--	--	40	8.4	47	5.0	108	38	72	--	1.8	--	297	--	--	128	38	44	1.8	478	7.4	7
July 7-8	143,500	--	--	52	8.4	85	6.3	116	60	136	--	1.8	--	453	--	--	164	70	52	2.9	705	7.7	7
July 9-15	126,600	--	--	40	6.3	41	4.4	100	39	64	--	2.3	--	281	--	--	126	44	40	1.6	457	7.4	7
July 16-18	58,930	--	--	44	7.5	52	4.7	106	48	82	--	1.5	--	321	--	--	141	54	43	1.9	540	7.8	8
July 19-25	39,640	6.7	0.03	50	7.8	80	5.9	114	64	126	0.2	2.1	--	437	--	--	157	64	51	2.8	752	7.4	10
July 26-29	29,100	--	--	54	10	100	5.8	116	65	162	--	1.0	--	507	--	--	176	80	54	3.3	809	7.8	8
July 30-31, Aug. 1	24,330	--	--	66	11	140	6.8	124	69	242	--	1.2	--	642	--	--	210	108	58	4.2	1,100	7.6	5
Aug. 2-4	21,330	--	--	67	18	182	7.5	130	95	305	--	8	--	807	--	--	241	134	61	5.1	1,380	7.9	8
Aug. 5-10	14,650	--	--	56	13	121	6.0	134	69	195	--	8	--	572	--	--	193	83	57	3.8	959	7.8	7
Aug. 11-12	13,050	--	--	73	17	182	7.8	156	86	305	--	8	--	799	--	--	252	124	60	5.0	1,350	7.7	7
Aug. 13-17	41,100	--	--	--	--	--	--	90	96	150	--	1.6	--	b 985	--	--	134	66	--	--	861	7.6	--
Aug. 14-17	30,420	--	--	41	11	104	5.2	89	52	175	--	1.9	--	481	--	--	148	74	59	3.7	956	7.6	--
Aug. 18-20	31,530	--	--	33	7.3	61	3.8	88	36	94	--	1.0	--	313	--	--	112	49	59	2.5	856	7.5	10
Aug. 19-20	19,320	--	--	41	9.8	98	4.6	103	54	152	--	1.1	--	437	--	--	142	59	59	4.6	758	7.7	8
Aug. 21-23	15,120	--	--	48	11	134	5.9	110	57	218	--	1.1	--	573	--	--	165	75	63	4.5	995	7.9	8
Aug. 24-26	11,800	--	--	60	14	165	7.4	128	74	272	--	8	--	717	--	--	207	102	62	5.0	1,100	7.6	8
Sept. 1-3, 9-10	8,768	--	--	65	18	185	8.6	152	92	305	--	1.8	--	834	--	--	236	112	62	5.3	1,370	7.7	8
Sept. 4-8, 11	7,167	--	--	55	15	130	7.3	142	64	215	--	1.6	--	655	--	--	196	82	58	4.0	1,060	7.7	5
Sept. 12-16, 21	13,500	--	--	64	17	192	8.2	140	72	330	--	1.6	--	892	--	--	230	115	63	5.5	1,410	7.8	10
Sept. 19-20, 22-23	39,380	--	--	56	13	143	6.8	125	47	285	--	3.7	--	650	--	--	193	90	61	4.5	1,100	7.8	10
Sept. 24, 27-30	40,100	--	--	45	9.0	100	5.7	103	56	158	--	3.0	--	458	--	--	150	65	58	3.6	976	7.9	13
Sept. 25-26	51,200	--	--	41	8.4	59	4.7	121	33	97	--	2.2	--	391	--	--	137	38	47	2.2	570	8.1	10
Weighted average	d 61,050	--	--	38	6.6	56	--	100	34	88	--	1.9	--	312	0.42	51,430	122	40	50	2.2	513	--	14

a Not included in weighted average.

b Dissolved solids and loads estimated from specific conductance.

d Mean discharge for water year October 1956 to September 1957 was 60,460 cfs.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	65	44	47	42	53	58	69	74	79	88	84
2	74	61	45	43	42	51	61	69	72	80	90	81
3	77	60	47	43	41	51	59	68	72	82	90	83
4	79	64	49	44	41	50	58	67	72	83	85	83
5	79	63	50	46	41	50	56	66	72	84	85	83
6	80	62	57	47	42	49	57	66	74	85	83	80
7	77	62	54	46	47	48	57	67	75	85	83	76
8	74	54	53	47	53	47	55	67	77	85	84	76
9	73	52	44	48	55	49	57	68	76	84	85	77
10	72	53	--	45	55	49	56	70	76	84	86	78
11	73	58	46	44	55	51	59	70	78	84	84	79
12	74	55	45	44	55	49	54	74	77	85	80	77
13	73	57	45	44	54	52	54	70	77	84	79	79
14	74	60	43	40	54	52	54	70	77	85	83	79
15	73	60	48	39	51	56	53	71	78	86	84	74
16	74	52	47	36	50	55	54	73	77	86	84	77
17	74	52	48	35	50	49	58	74	77	87	81	76
18	74	51	46	37	49	55	60	73	78	87	81	76
19	72	49	46	36	49	56	62	73	79	87	81	75
20	71	50	48	38	50	53	57	70	79	86	82	76
21	71	49	48	45	49	51	63	71	79	84	82	74
22	73	45	47	49	50	51	64	72	77	83	82	73
23	74	46	47	45	52	50	63	72	76	85	82	73
24	73	48	45	42	53	52	66	70	77	85	81	72
25	69	47	44	41	53	51	65	69	76	84	83	72
26	68	44	45	39	51	50	65	72	76	85	84	72
27	64	44	46	39	52	50	65	71	76	85	84	73
28	65	44	45	40	52	51	65	72	76	87	84	72
29	65	42	44	41	--	54	68	73	78	88	84	72
30	62	42	46	41	--	55	69	73	79	87	84	72
31	64	--	46	41	--	55	--	74	--	88	85	--
Average	72	53	47	42	50	51	60	70	76	85	84	76

ARKANSAS RIVER BASIN--Continued
ARKANSAS RIVER AT LITTLE ROCK, ARK.

LOCATION.--At gaging station at Missouri Pacific Railroad bridge at Little Rock, Pulaski County, at mile 165.5.
DRAINAGE AREA.--158,201 square miles, of which 22,241 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1957.

Water temperatures: October 1945 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,830 ppm Nov. 29; minimum, 105 ppm Mar. 3.

Hardness: Maximum, 410 ppm Nov. 29; minimum, 46 ppm Feb. 2-4, 9, 12-18.

Specific conductance: Maximum, 410 micromhos Nov. 29; minimum daily, 173 micromhos Feb. 4.

Water temperatures: Maximum, 88°F Aug. 3; minimum, 35°F Jan. 16, 17.

EXTREMES, 1945-57.--Dissolved solids: Maximum, 2,400 ppm Nov. 28-29, 1953; minimum, 105 ppm Mar. 3, 1957.

Hardness: Maximum, 556 ppm Nov. 28-29, 1953; minimum, 46 ppm Feb. 2-4, 9, 12-18, 1957.

Specific conductance: Maximum daily, 5,050 micromhos Apr. 8, 1954; minimum daily, 173 micromhos Feb. 4, 1957.

Water temperatures: Maximum, 98°F Aug. 16, 1954, July 5, 1956; minimum, freezing point Dec. 19, 1945, Feb. 10, 11, 1947, Jan. 28, 29, 1948.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Color
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Oct. 1-4, 1956 ..	1,288	--	--	54	15	85	--	180	32	138	--	1.6	--	445	0.61	1,510	196	48	49	2.6	779	8.0	8
Oct. 5-11	1,363	6.9	0.00	43	11	70	5.0	138	23	116	0.1	3.2	--	374	.51	1,380	132	40	49	2.5	658	8.2	5
Oct. 12-14	1,153	--	--	44	13	103	--	120	38	178	--	1.7	--	471	.64	1,470	164	65	56	3.5	850	8.0	8
Oct. 15-16	940	--	--	62	15	175	--	137	48	300	--	4.2	--	710	.97	1,800	216	104	64	5.2	1,300	7.9	7
Oct. 17-21	970	--	--	58	21	252	--	147	56	430	--	4.4	--	982	1.34	2,570	256	136	66	6.9	1,760	7.6	7
Oct. 22-27	1,133	--	--	58	17	157	--	160	46	265	--	3.0	--	652	.89	1,990	214	84	61	4.7	1,230	7.6	8
Oct. 28-31	1,162	--	--	58	15	118	--	171	32	195	--	4.1	--	527	.72	1,650	201	61	56	3.6	984	8.0	7
Nov. 1-8	1,285	--	--	54	14	100	--	165	36	168	--	3.3	--	449	.61	1,680	192	57	53	3.1	882	8.0	10
Nov. 9-19	1,691	--	--	65	18	174	--	160	57	300	--	3.6	--	733	1.00	3,330	236	105	62	4.9	1,350	7.9	7
Nov. 20, 24-28 ..	2,173	--	--	71	22	236	--	145	62	415	--	2.7	--	963	1.31	5,650	268	148	66	6.3	1,690	7.7	7
Nov. 21-23, 30 ..	1,920	--	--	83	25	314	--	136	69	580	--	3.7	--	1,240	1.69	6,430	310	198	89	7.8	2,250	7.7	8
Nov. 29 a	2,510	--	--	--	--	--	--	111	62	890	--	1.7	--	1,830	2.49	12,400	410	319	--	--	3,110	8.0	--
Dec. 1-4	1,952	--	--	70	23	263	--	120	54	480	--	4.0	--	1,020	1.39	5,380	269	170	68	7.0	1,880	7.5	13
Dec. 5-8	2,464	--	--	56	16	154	--	119	44	280	--	4.7	--	637	.87	4,240	206	108	62	4.7	1,220	7.7	7
Dec. 10-16	4,717	--	--	26	7.5	60	--	66	29	103	--	2.7	--	279	.38	3,550	96	42	58	2.7	518	7.6	23
Dec. 17-20, 24, 30	4,198	--	--	34	8.6	83	--	79	32	146	--	2.0	--	345	.47	3,910	120	56	60	3.3	876	7.3	10
Dec. 21-23, 25-27	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
31	4,511	--	--	41	9.1	110	--	79	38	196	--	4.9	--	434	.59	5,290	140	76	63	4.0	841	7.2	10
Dec. 28 a	6,200	--	--	--	--	--	--	87	24	365	--	1.4	--	823	1.12	13,780	204	133	--	--	1,400	8.0	--

	Jan. 1-7, 1957...	3,706	--	59	17	206	8.6	81	31	405	--	4.3	950	1.29	9,510	217	150	66	6.1	1,530	7.6	5
Jan. 8-10.....	3,383	--	--	47	15	153	6.9	88	40	285	--	5.8	592	.94	6,320	179	107	64	5.0	1,120	7.8	12
Jan. 11-21.....	2,758	3.0	--	48	12	130	4.6	105	43	235	.1	3.1	582	.81	4,410	170	84	62	4.3	985	7.6	12
Jan. 22 a.....	4,100	--	--	--	--	--	--	101	20	131	--	3.1	363	.52	4,240	139	56	--	--	652	8.2	--
Jan. 23 a.....	10,900	--	--	--	--	--	--	67	40	76	--	2.5	232	.32	6,330	92	37	--	--	395	7.9	--
Jan. 24-25, 27-31	29,700	--	--	13	4.0	21	1.8	36	11	36	--	3.0	244	.33	11,230	49	19	47	1.3	202	7.0	45
Jan. 26 a.....	22,400	--	--	--	--	--	--	46	34	91	--	3.8	244	.33	14,760	84	46	--	--	415	7.8	--
Feb. 1-5, 7-8, 10-11	45,130	--	--	15	4.5	32	2.6	39	14	60	--	1.5	205	.28	24,980	56	24	54	1.9	288	7.5	38
Feb. 2-4, 9, 12-18	34,280	--	--	13	3.4	21	2.2	39	11	34	--	2.8	138	.19	12,770	46	14	48	1.3	209	7.1	5
Feb. 6 a.....	34,100	--	--	--	--	--	--	42	8.0	140	--	2.9	329	.45	30,280	90	56	--	--	560	7.7	--
Feb. 19, 24-27	21,260	--	--	17	4.9	35	2.4	45	18	56	--	2.4	188	.26	10,780	53	26	54	1.9	301	7.9	20
Feb. 20-23, 28	22,460	--	--	14	4.5	21	1.9	40	17	36	--	2.2	136	.18	8,250	53	21	45	1.2	223	7.6	30
Mar. 1, 4-10.....	22,400	--	--	17	4.1	26	2.4	42	20	44	--	2.6	142	.19	8,580	59	25	48	1.5	256	7.8	15
Mar. 2 a.....	30,400	--	--	--	--	--	--	36	12	32	--	3.0	114	.16	9,360	50	40	--	--	194	7.8	--
Mar. 3 a.....	28,200	--	--	--	--	--	--	40	36	27	--	2.6	105	.14	8,280	50	7	--	--	179	7.8	--
Mar. 11, 14-19	15,970	--	--	23	6.5	55	2.8	52	22	98	--	1.5	276	.38	11,900	85	42	58	2.6	464	7.5	20
Mar. 12-13	22,400	--	--	33	8.4	72	6.2	60	20	148	--	1.8	410	.56	24,300	117	68	56	2.9	679	7.4	18
Mar. 20-25, 27-30	32,240	--	--	17	4.8	39	2.8	42	28	62	--	2.9	190	.26	18,540	62	28	56	2.2	320	7.7	30
Mar. 26 a.....	43,200	--	--	--	--	--	--	44	6.0	29	--	2.8	114	.16	13,900	52	16	--	--	194	7.8	--
Mar. 31 a.....	35,400	--	--	--	--	--	--	38	10	48	--	3.8	146	.20	13,950	58	27	--	--	248	7.7	--
Apr. 1-5.....	83,860	--	--	17	4.0	25	2.4	50	14	40	--	2.0	161	.22	40,800	59	18	47	1.4	248	6.9	25
Apr. 6-11.....	163,200	--	--	28	4.8	27	3.1	77	20	60	--	2.3	215	.29	95,000	90	26	46	1.7	329	7.3	20
Apr. 12-16, 20	71,900	5.1	--	27	6.1	50	3.4	74	26	80	.2	1.8	261	.35	54,800	92	32	53	2.3	440	7.7	10
Apr. 18, 21-23	93,200	--	--	27	5.2	38	3.2	72	26	58	--	2.5	217	.30	55,780	86	30	47	1.8	338	7.3	18
Apr. 24-26	215,600	--	--	32	4.7	52	3.5	86	25	84	--	3.2	277	.38	161,200	98	29	52	2.3	460	7.8	18
Apr. 28-30	217,700	--	--	--	--	--	--	74	27	64	--	2.2	228	.31	132,800	88	28	49	1.9	388	7.0	15
May 1-5.....	173,300	--	--	37	7.0	56	4.0	98	28	92	--	2.6	306	.42	143,200	121	41	49	2.2	518	7.9	15
May 6-8.....	166,900	--	--	--	7.3	100	5.3	107	46	156	--	2.1	453	.62	205,000	138	50	60	3.7	769	7.4	15
May 9-12, 17-24	183,000	--	--	37	5.7	60	4.0	86	39	90	--	2.3	303	.41	149,700	106	35	54	2.5	512	7.1	15
May 13-16, 25-26	183,000	--	--	33	4.2	36	3.9	96	30	54	--	2.7	232	.32	250,100	100	31	41	1.5	379	7.5	12
May 27-31, June 1-4	395,200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

a Not included in weighted averages. Dissolved solids and loads estimated from specific conductance.

ARKANSAS RIVER BASIN--Continued
 ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃	Per- cent sodium carbonate	So- dium adsorption ratio	Specific conductance (micro-mhos at 25°C)	Col- or		
														Parts per million	Tons per acre-foot	Tons per day						Calcium, magnesium	Non-carbonate
June 5-10, 16-17, 1957	288,100	--	--	38	6.4	54	4.8	102	34	86	--	3.5		316	0.43	245,800	121	38	48	2.1	497	8.0	12
June 11-15, 18-19, 25-27	235,800	--	--	35	5.8	42	4.1	99	29	66	--	2.7		259	.35	164,800	111	30	44	1.7	424	8.0	15
June 20-22	230,300	--	--	32	6.4	28	4.3	92	23	48	--	2.2		216	.29	134,300	106	31	35	1.2	343	7.1	15
June 23-24, 28-30	202,600	--	--	43	7.9	62	5.2	102	44	102	--	2.5		370	.50	202,400	140	56	51	2.5	582	7.5	15
July 1-7, 10	168,200	--	--	44	7.2	46	5.0	122	44	74	--	.9		314	.43	142,600	139	39	41	1.7	544	7.3	7
July 8-9	148,000	--	--	54	7.0	73	6.1	132	56	120	--	1.9		434	.59	173,400	164	56	48	2.5	707	7.4	8
July 11-19	107,500	6.8	0.00	43	6.6	40	4.9	116	39	62	0.2	2.0		286	.39	83,010	134	39	38	1.5	478	7.4	5
July 20-28	47,500	--	--	46	7.0	64	4.8	106	49	106	--	.9		387	.50	47,070	144	57	48	2.3	620	7.6	7
July 29-31, Aug. 1	39,370	--	--	44	10	88	5.0	107	56	140	--	.6		441	.60	46,880	151	64	55	3.1	728	7.7	7
Aug. 2-6, 7	27,200	--	--	50	13	124	5.6	110	62	205	--	1.2		572	.78	42,010	178	88	59	4.0	928	7.8	7
Aug. 3-5, 8-10	22,100	--	--	54	12	121	5.3	118	66	205	--	1.0		547	.74	32,640	184	88	58	3.9	966	8.0	7
Aug. 11-15	42,340	--	--	40	9.3	81	4.2	97	44	135	--	1.4		374	.51	42,750	138	58	55	3.0	689	8.0	7
Aug. 16-20	69,580	--	--	25	4.1	53	3.6	64	29	95	--	1.4		267	.36	50,160	79	27	58	2.6	464	7.8	7
Aug. 21, 29-31	30,020	--	--	20	7.3	67	4.1	79	31	112	--	1.5		314	.43	25,450	105	40	57	2.8	563	7.6	10
Aug. 22-25	41,950	--	--	25	6.2	49	3.6	76	26	75	--	2.0		243	.33	27,460	98	26	54	2.3	428	7.6	7
Aug. 26-28	28,330	--	--	34	7.4	73	5.2	88	27	124	--	.6		374	.51	28,610	116	44	57	3.0	647	7.6	8
Sept. 1-3, 7-8	15,840	--	--	44	11	105	5.1	111	55	168	--	.3		472	.64	20,190	155	64	59	3.7	834	7.6	8
Sept. 4-6	113,230	--	--	44	13	116	5.1	110	59	153	--	.6		532	.77	21,470	164	74	60	3.9	861	7.6	8
Sept. 8-13	10,630	--	--	44	12	106	5.0	124	54	170	--	.5		468	.67	14,300	164	83	57	3.6	865	7.5	10
Sept. 14-15, 17-19	12,180	--	--	57	14	148	6.2	138	68	245	--	.8		680	.80	21,700	200	86	61	4.6	1,140	7.6	7
Sept. 16-20	36,830	--	--	56	13	142	5.8	127	53	245	--	.8		650	.84	64,810	198	84	60	4.4	1,070	7.6	7
Sept. 20-24	50,700	--	--	42	8.9	86	4.3	110	46	136	--	2.0		421	.57	57,630	142	52	56	3.1	684	7.4	7
Weighted average	b72,510	--	--	35	6.1	53	--	93	33	85	--	2.3		295	0.40	57,750	112	36	51	2.2	488	--	12

a Not included in weighted averages. Dissolved solids and loads estimated from specific conductance.

b Mean discharge for water year October 1956 to September 1957 was 71,120 cfs.

ARKANSAS RIVER BASIN--Continued

ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	63	46	46	42	54	57	69	74	79	87	81
2	73	61	47	42	43	51	60	70	73	79	87	80
3	74	61	52	43	45	50	59	69	74	81	88	80
4	75	63	55	43	54	50	60	66	74	83	86	81
5	76	64	59	46	51	49	55	67	74	83	85	81
6	77	64	62	45	53	49	56	69	75	83	83	80
7	73	63	61	45	52	47	58	68	76	84	84	77
8	70	55	49	47	53	48	56	68	76	85	84	76
9	70	53	49	54	55	49	57	68	76	85	84	75
10	69	55	48	45	55	49	58	70	78	84	84	76
11	70	65	48	45	54	54	59	70	79	84	84	75
12	70	65	48	47	55	54	52	72	79	84	82	76
13	70	65	46	46	54	51	55	70	80	85	81	77
14	71	65	41	39	56	56	56	73	80	85	82	78
15	70	65	48	40	55	56	55	74	80	86	79	75
16	71	55	48	35	50	56	55	74	81	84	81	75
17	71	55	50	35	50	54	57	75	80	86	80	76
18	70	52	50	36	49	57	59	75	81	84	81	76
19	70	51	47	38	48	56	63	74	81	86	80	76
20	69	56	49	39	48	53	65	75	81	85	81	78
21	68	51	49	46	48	51	65	74	81	84	81	75
22	70	48	49	50	49	51	65	73	78	84	81	73
23	70	48	48	46	52	52	64	73	79	84	81	74
24	70	49	46	44	53	54	66	73	72	83	78	73
25	70	47	45	45	53	--	67	71	79	84	81	74
26	66	44	46	41	51	51	66	71	78	84	81	73
27	63	44	47	39	50	51	66	71	78	84	--	73
28	60	--	46	40	53	53	67	72	79	84	83	73
29	64	42	46	41	--	55	68	72	80	86	83	71
30	63	44	47	40	--	56	70	74	80	84	83	73
31	63	--	47	40	--	55	--	74	--	85	83	--
Average	70	56	49	43	51	52	61	71	78	84	83	76

ARKANSAS RIVER BASIN—Continued
MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN KANSAS

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Bicar- bonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conduct- ance (micro- mhos at 25° C)	pH
								Calcium magne- sium	Non- carbonate				
MEDICINE LODGE RIVER NEAR KIOWA, BARBER COUNTY													
Jan. 8, 1957.....	26.6	90	17	40	208	12	56	a 295	106	23	1.0	767	8.5
Feb. 12.....	46.0	50	18	58	126	0	60	a 200	96	39	1.8	749	7.5
Mar. 18.....	62.2	51	21	54	108	0	62	a 210	124	36	1.6	728	7.4
July 9.....	105	144	32	86	148	0	98	a 490	368	28	1.7	1,290	8.0
Sept. 24.....	201	152	31	67	232	0	84	a 505	315	22	1.3	1,130	8.2

a Values above 200 ppm reported to the nearest 5 ppm.

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957

Date	Water discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
LITTLE ARKANSAS RIVER AT VALLEY CENTER			
July 11, 1957	202	148	81
Sept. 16	43	58	6.7
Sept. 27	36	89	8.7
Sept. 27	36	150	15
Sept. 28	34	87	8.0
Sept. 29	33	59	5.3
Sept. 30	31	44	3.7

ARKANSAS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicar- bonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conduct- ance (micro- mhos at 25°C)	pH
								Calcium magne- sium	Non- carbonate				
SALT FORK ARKANSAS RIVER AT TONKAWA, KAY COUNTY, OKLA.													
Nov. 14, 1956.....	6.52	126	38	--	196	0	1,800	470	310	--	--	6,280	8.2
Nov. 27.....	4.21	191	59	--	249	8	3,240	718	500	--	--	10,600	8.3
Dec. 11.....	7.45	191	64	--	275	8	3,490	738	499	--	--	11,400	8.4
Jan. 3, 1957.....	7.97	187	64	--	217	0	3,990	728	550	--	--	12,800	8.2
Feb. 5.....	12.6	199	59	--	275	0	3,790	738	512	--	--	12,200	8.2
Mar. 6.....	32.1	151	76	2,910	103	0	4,630	687	602	90	48	14,400	8.2
Apr. 11.....	52.6	41	17	583	38	16	820	174	116	88	19	3,540	8.9
July 24.....	2,020	57	16	155	130	0	225	208	102	62	4.7	1,190	7.3
Aug. 9.....	226	100	58	1,070	176	0	1,500	490	346	83	21	5,870	8.1
Sept. 10.....	90.8	124	52	1,440	170	0	2,080	525	386	86	27	7,850	8.0

RED ROCK CREEK NEAR RED ROCK, NOBEL COUNTY, OKLA.

Nov. 14, 1956.....	0.10	23	6.4	21	124	0	17	84	0	35	1.0	263	8.0
Jan. 3, 1957.....	1.38	32	12	28	154	0	41	130	4	32	1.1	372	8.2
Apr. 11.....	32.1	33	8.4	24	92	20	29	102	0	34	1.0	325	8.5
May 1.....	20.5	33	11	26	126	0	42	126	22	31	1.0	372	7.9
May 17.....	31.4	62	3.2	6.1	38	0	6.2	34	3	28	1.5	93.0	6.9
July 25.....	31.4	62	21	87	202	0	108	240	74	44	2.4	880	7.9
Aug. 8.....	3.60	29	34	101	304	0	82	214	0	51	3.0	853	8.0

POLECAT CREEK NEAR HEYBURN, CREEK COUNTY, OKLA.

Feb. 25, 1957.....	2.03	22	10	31	48	0	65	98	58	41	1.4	371	7.0
Mar. 27.....	1.03	25	8.1	30	83	0	66	96	28	40	1.3	367	6.9
Apr. 18.....	598	19	8.1	28	9	0	64	81	74	43	1.4	390	6.1

DOUBLE CREEK NEAR RAMONA, WASHINGTON COUNTY, OKLA.

Apr. 18, 1957.....	58	58	4.7	28	128	0	67	164	60	26	0.9	479	7.7
Apr. 18.....	35	35	3.0	--	94	0	32	100	23	--	--	283	7.5
Apr. 21.....	44	44	4.4	18	108	0	362	128	40	23	.7	362	7.5
Apr. 23.....	44	44	4.4	--	112	0	40	128	36	--	--	346	7.5
Apr. 23.....	42	42	4.6	--	108	0	40	124	36	--	--	341	7.4

ARKANSAS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Bicar- bonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conduct- ance (micro- mhos at 25°C)	pH
								Calcium magne- sium	Non- carbonate				
DOUBLE CREEK NEAR RAMONA, WASHINGTON COUNTY, OKLA.--Continued													
May 15, 1957.....	3.10	53	4.9	9.5	147	0	35	152	32	12	0.3	371	7.8
May 16		39	4.0	--	116	0	26	114	19	--	--	291	7.5
May 18		37	3.8	--	108	0	20	108	20	--	--	274	7.4
May 21		34	3.2	9.6	110	0	14	98	6	18	--	247	7.5
June 12		26	2.2	--	82	0	7.2	74	7	--	--	176	7.3
June 23		26	3.2	4.5	92	0	7.1	78	2	11	.2	186	7.3
CANEY RIVER NEAR RAMONA, WASHINGTON COUNTY, OKLA.													
Mar. 26, 1957.....	152	132	24	240	0	0	490	430	430	53	5.0	2,310	3.3
May 2	9,490	24	3.4	16	0	0	30	74	74	22	.8	605	3.0
June 25	--	20	3.4	8.2	26	0	18	64	42	22	.4	180	7.0
SPRING RIVER NEAR QUAPAW, OTTAWA COUNTY, OKLA.													
Oct. 2, 1956	43.0	70	8.6	13	138	0	14	a210	97	12	0.4	456	7.5
Dec. 10	102	66	8.6	16	121	0	16	a200	101	15	.5	449	7.7
Jan. 8, 1957	84.7	68	19	13	92	0	21	a250	172	10	.4	522	7.0
Feb. 6	177	69	6.8	14	102	0	11	a200	116	13	.4	471	7.3
July 15	329	64	3.8	3.8	154	0	3.5	175	49	5	.1	366	7.3
ELK RIVER NEAR TIFF, McDONALD COUNTY, MO.													
May 7, 1957.....	995	42	1.9	1.9	130	0	4.2	113	6	3	0.1	237	8.2
Aug. 21.....	199	46	4.4	3.4	138	0	3.8	133	20	5	.1	263	7.8
BIG CABIN CREEK NEAR BIG CABIN, CRAIG COUNTY, OKLA.													
Oct. 2, 1956	221	46	6.1	14	158	0	21	140	10	18	0.5	334	6.9
Dec. 8	84	62	16	190	98	0	325	220	140	65	5.6	1,410	7.4
Jan. 7, 1957	4.17	27	6.0	4.2	50	0	18	92	51	9	.2	314	6.3
Jan. 23	2.98	35	13	14	88	0	16	142	70	18	.5	331	7.6
Mar. 12	301	47	11	11	6	0	16	164	159	13	.4	406	6.3
Apr. 10	203	34	8.9	5.9	44	0	8.0	124	88	9	.2	299	6.6
July 9	30.9	41	9.1	5.7	96	0	9.0	140	62	8	.2	319	6.9
Sept. 17	6.80	50	11	14	112	0	18	172	80	15	.5	403	7.6
a Values above 200 ppm are reported to the nearest 5 ppm.													

a Values above 200 ppm are reported to the nearest 5 ppm.

PRYOR CREEK NEAR PRYOR, MAYES COUNTY, OKLA.

Jan. 25, 1957	0.16	34	17	38	0	0	50	156	156	32	1.3	578	3.6
Feb. 4	2.04	70	36	526	64	0	980	322	270	78	13	3,350	7.0
Mar. 28	39.6	27	8.4	23	0	0	14	102	102	23	1.0	423	3.3
May 6	1.51	16	8.3	11	30	0	9.9	74	50	24	.6	213	6.6
July 9	12.3	23	11	30	51	0	36	101	59	39	1.3	360	6.5
July 23	9.12	42	15	68	57	0	70	105	118	47	2.3	1,510	6.5
July 23	1.99	30	22	53	80	0	105	184	98	41	1.8	654	7.3
Aug. 13	9.32	58	15	80	30	0	88	206	182	46	2.4	899	5.7
Aug. 13	.36	40	25	95	96	0	170	202	124	51	2.9	1,120	6.9
Sept. 20	12.4	23	10	72	88	0	109	100	28	61	3.7	587	7.4

ARKANSAS RIVER NEAR MUSKOGEE, MUSKOGEE COUNTY, OKLA.

Nov. 9, 1956	84	21	298	142	0	550	295	178	69	7.5	2,120	7.8
Nov. 9	126	37	600	146	0	1,100	470	350	74	12	3,890	7.9

ILLINOIS RIVER NEAR WATTS, ADAIR COUNTY, OKLA.

Nov. 19, 1956	49.8	46	2.2	5.4	93	0	7.8	124	43	8	0.2	290	7.2
Jan. 24, 1957	1.14	24	3.6	2.5	2.0	0	3.4	75	74	7	.1	177	4.7
Mar. 27	110	28	2.9	3.0	56	0	6.8	82	36	7	.1	168	6.8
June 24	1.08	27	5.0	3.5	96	0	6.8	88	10	8	.2	195	7.2

FLINT CREEK NEAR KANSAS, DELAWARE COUNTY, OKLA.

Nov. 19, 1956	6.60	42	1.2	4.2	130	0	5.2	110	4	8	0.2	238	7.7
Dec. 17	20.9	39	2.6	4.3	120	0	7.6	108	10	8	.2	232	7.1
Jan. 31, 1957	113	36	1.2	3.2	46	0	7.6	95	58	7	.1	233	6.8
June 24	224	27	2.3	2.6	7	0	4.4	77	72	7	.1	174	5.8

DEER CREEK NEAR HYDRO, CADDO COUNTY, OKLA.

May 8, 1957	35.4	120	12	26	120	0	13	350	252	14	0.6	955	7.9
May 15	48.6	100	17	13	160	0	11	320	172	8	.3	643	8.1
July 1	20.4	116	112	31	112	0	15	390	298	15	.7	992	7.8
July 28	9.68	88	26	30	128	0	16	325	220	17	.7	772	8.0
Aug. 16	7.78	72	20	23	170	0	13	260	120	16	.6	622	8.1
Sept. 5	6.60	98	16	18	266	0	12	310	92	11	.4	672	8.0

ARKANSAS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium	Non- carbonate				
Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued													
LITTLE RIVER NEAR NORMAN, CLEVELAND COUNTY, OKLA.													
Dec. 31, 1956	0.20	21	42	16	286	12	12	226	0	13	0.5	471	8.5
Mar. 26, 1957	1.64	12	42	13	236	18	13	204	0	12	.4	430	8.7
LITTLE RIVER NEAR TECUMSEH, POTTAWATOMIE COUNTY, OKLA.													
Dec. 31, 1956	1.37	41	38	232	246	6	370	260	48	66	6.3	1,780	8.4
Feb. 5, 1957	2.53	50	30	188	200	12	300	248	64	62	5.2	1,450	8.6
Mar. 6	3.43	23	40	288	198	0	340	220	58	69	6.7	1,580	7.8
Mar. 26	3.28	21	43	206	210	0	325	228	56	66	3.9	1,510	7.7
SALT CREEK NEAR DEWRIGHT, SEMINOLE COUNTY, OKLA.													
Nov. 13, 1956	1.78	1,730	371	--	4	0	17,900	5,840	5,840	--	--	43,800	6.0
Feb. 5, 1957	4.44	2,150	571	10,400	66	0	17,100	7,710	7,660	75	52	51,400	7.9
July 10	15.2	791	476	5,070	75	0	9,760	3,930	3,870	74	35	27,200	7.7
NORTH CANADIAN RIVER NEAR GUYMON, TEXAS COUNTY, OKLA.													
Oct. 30, 1956	1.25	28	15	17	148	0	7.3	130	8	22	0.6	327	7.9
Dec. 5	6.46	44	21	21	236	0	10	198	4	19	.6	455	7.6
Feb. 4, 1957	7.70	51	30	31	256	0	12	252	42	21	.9	559	7.6
June 28	10.4	72	34	26	112	0	16	320	228	15	.6	677	7.0
COLDWATER CREEK NEAR HARDESTY, TEXAS COUNTY, OKLA.													
Dec. 5, 1956	1.57	64	38	46	256	0	30	315	105	24	1.1	799	7.8
Feb. 4, 1957	4.66	54	58	44	248	0	29	375	171	20	1.0	837	8.2
June 28	27.0	60	49	41	254	0	31	350	142	20	1.0	819	7.4
PALO DURO CREEK NEAR RANGE, TEXAS COUNTY, OKLA.													
Dec. 5, 1956	2.29	69	34	144	254	0	205	310	102	50	3.6	1,330	7.9
May 15, 1957	8.27	75	49	198	230	0	255	388	200	53	4.4	1,560	7.7
KIOWA CREEK NEAR SLAPOUT, BEAVER COUNTY, OKLA.													
Dec. 20, 1956	7.10	70	18	67	268	0	90	250	30	37	1.8	801	7.6
Feb. 11, 1957	7.63	19	19	67	162	0	92	192	59	43	2.1	712	7.6

a. Values above 200 ppm are reported to the nearest 5 ppm.

a Values above 200 ppm are reported to the nearest 5 ppm.

CLEAR CREEK NEAR MAY, HARPER COUNTY, OKLA.

Dec. 20, 1956.....	7.75	68	9.2	40	226	0	52	210	25	29	1.2	603	8.0
Sept. 26, 1957.....	6.53	59	11.2	42	224	0	56	192	8	32	1.3	585	8.0

WOLF CREEK NEAR FORT SUPPLY, WOODWARD COUNTY, OKLA.

Apr. 1, 1957.....	605	60	35	143	226	0	165	292	107	52	3.7	1,100	8.0
Apr. 23.....	1,140	53	14	67	132	0	95	190	82	43	2.1	720	7.3
June 27.....	4.03	33	4.3	14	106	0	17	100	13	23	.6	269	7.1
Sept. 17.....	546	63	13	47	128	0	66	212	107	32	1.4	650	7.5

NORTH CANADIAN RIVER NEAR SEILING, DEWEY COUNTY, OKLA.

Apr. 1, 1957.....	3.44	82	18	12	112	0	14	280	188	8	.3	560	8.2
Apr. 1.....	3.44	63	24	99	156	16	137	254	100	46	2.7	568	8.5
Apr. 3.....	1,710	69	14	34	190	0	46	228	72	25	1.0	573	8.2
Apr. 8.....	201	74	24	115	188	6	162	282	118	47	3.0	1,090	8.3
Apr. 15.....	30.7	96	39	143	206	0	210	400	231	44	3.1	1,450	8.2
Apr. 21.....	696	66	16	55	208	0	66	232	62	34	1.6	666	8.1
Apr. 22.....	508	74	20	70	192	0	88	268	110	36	1.9	800	7.5
Apr. 29.....	228	72	19	73	188	0	104	358	104	38	2.0	844	8.2
May 1.....	179	111	34	91	192	0	120	415	258	32	1.9	1,170	8.2
May 3.....	1.11	73	17	57	168	0	76	252	114	33	1.6	744	8.1
May 6.....	1.96	62	16	67	212	0	86	220	46	40	2.0	716	8.1
May 17.....	7,230	61	12	22	160	0	28	200	69	19	.7	433	7.5
May 31.....	1,690	58	13	51	176	0	66	196	52	36	1.6	613	8.1
June 24.....	9,290	44	8.3	16	136	0	18	144	32	20	.6	337	7.8
June 25.....	12,900	43	8.4	22	148	0	21	142	20	25	.8	359	8.0
July 2.....	7,920	46	12	32	156	0	36	164	36	30	1.1	449	8.0
July 16.....	966	50	11	36	160	0	44	172	41	31	1.2	490	8.0
Aug. 7.....	297	82	19	58	212	0	80	232	58	35	1.7	728	8.2
Aug. 13.....	491	56	15	48	218	0	63	208	30	33	1.4	640	8.1
Sept. 16.....	505	56	12	32	164	0	48	190	56	27	1.0	549	7.9
Sept. 24.....	84.2	61	17	45	220	0	68	222	42	31	1.3	651	8.1

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN OKLAHOMA AND MISSOURI--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
WEWOKA CREEK NEAR WETUMKA, HUGHES COUNTY, OKLA.													
Nov. 14, 1956	0.88	316	76	--	42	0	3,300	1,100	1,070	--	--	9,800	7.5
Dec. 31, 1956	2.89	160	42	--	46	0	1,600	570	532	--	--	5,070	7.5
Feb. 5, 1957	541	30	10	135	22	0	278	118	100	71	5.4	991	7.3
Mar. 25	41.2	121	14	573	86	0	1,060	360	290	78	13	3,710	7.6
July 9	19.4	596	351	3,060	103	0	5,720	2,850	69	25	25	17,700	7.8
Sept. 5	3.29	604	229	2,910	95	0	5,470	2,440	2,360	72	26	17,000	7.8
CAPTAIN CREEK NEAR WELLSTON, LINCOLN COUNTY, OKLA.													
Mar. 25, 1957	15	16	40	28	230	5	50	204	7	23	0.9	540	8.4
June 25	24.9	42	39	23	326	0	23	264	0	16	.6	559	8.1
DEEP FORK NEAR WELTY, CREEK COUNTY, OKLA.													
Jan. 3, 1957	19.9	48	23	97	120	44	155	214	42	50	2.9	968	--
July 9	230	58	24	61	240	0	117	244	48	35	1.7	783	8.0
Sept. 5	9.60	42	45	146	280	12	225	292	42	52	3.7	1,260	8.4
LITTLE DEEP FORK CREEK NEAR EDNA, CREEK COUNTY, OKLA.													
Feb. 7, 1957	1.16	208	54	869	52	0	1,750	a740	698	72	14	5,670	7.9
Mar. 25	7.42	174	45	636	108	0	1,340	a620	532	69	11	4,410	7.7
July 9	33.9	206	38	615	202	0	1,200	a720	554	65	10	4,360	8.2
Sept. 5	1.51	416	122	1,470	158	0	2,900	a1,540	1,410	67	16	9,490	8.1
MONTEZUMA CREEK NEAR SCHULTER, OKMULGEE COUNTY, OKLA.													
Feb. 6, 1957	0.40	216	59	24	88	0	1,900	a760	760	72	12	5,840	7.4
Mar. 25	1.72	157	42	674	88	0	1,400	a565	493			4,440	7.6
SALLISAW CREEK NEAR SALLISAW, SEQUOYAH COUNTY, OKLA.													
Oct. 1, 1956	0.09	37	3.3	2.9	124	0	3.1	106	4	6	0.1	219	6.7
Jan. 8, 1957	8.44	28	1.9	4.4	82	0	7.8	78	11	11	.2	169	7.6
Feb. 5	2.54	14	.7	2.2	35	0	.5	38	10	12	.2	94.4	6.8
Mar. 6	111	24	1.9	2.7	69	0	2.5	68	12	8	.1	150	6.7
Mar. 25	602	20	4.9	2.4	44	0	3.0	70	34	7	.1	121	7.2
June 3	1,670	17	2.3	2.8	6	0	2.0	52	47	10	.2	115	6.5
July 29	25.9	32	1.5	3.2	56	0	3.8	86	40	8	.2	189	7.2

a Values above 200 ppm are reported to the nearest 5 ppm.

a Values above 200 ppm are reported to the nearest 5 ppm.

FOURCHE MALINE NEAR RED OAK, LATIMER COUNTY, OKLA.

Dec. 26, 1956.....	3.39	25	6.2	32	44	0	18	88	52	44	1.5	356	6.9
Jan. 22, 1957.....	69.9	9.6	2.2	2.7	0	0	2.7	33	33	13	.2	159	3.9
Feb. 6	924	2.6	2.8	3.8	5	0	3.0	18	14	32	.4	56.8	6.1
Mar. 4	121	3.5	2.6	3.5	12	0	4.1	19	9	28	.3	74.4	6.5
Mar. 18	809	3.4	1.6	3.2	5	0	2.7	15	11	32	.4	62.4	5.7
Apr. 3	7,520	4.6	6.4	3.1	0	0	2.1	38	38	6	.1	651	3.0
June 5	1,430	3.4	2.8	2.5	0	0	3.5	20	20	18	.2	70.5	4.0
July 3	4.00	14	9.0	18	37	0	8.0	72	42	35	.9	280	6.6

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Bo- ron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Per- cent so- dium ad- sorption ratio	Specific conduct- ance (micro- mhos at 25°C)		
														Parts per mil- lion	Tons per acre- foot	Calcium, mag- nesium	Non-carbon- ate				
Oct. 3, 1956	1.94	84		47	34	133		a 269	92	112	3.2	79		716	0.97	258	38	53	3.6	1,170	8.4
Nov. 1	36.1	--		--	--	--	--	300	90	118	--	--	--	--	--	288	42	--	--	1,190	8.2
Dec. 6	10.0	80		56	35	125	--	314	96	100	2.6	62	60	b 745	97	284	26	49	3.2	1,140	7.8
Jan. 17, 1957	22.2	74		62	40	183	--	522	102	90	2.6	60	60	871	1.18	318	0	56	4.5	1,280	7.6
Feb. 20	13.3	74		--	--	122	--	--	88	100	2.8	72	--	--	--	--	--	--	--	1,310	8.2
Mar. 21	15.1	74		54	33	124	--	246	85	110	--	117	--	718	.98	270	68	50	3.3	--	--
Apr. 23	22.5	70		61	34	114	--	245	78	108	--	131	--	716	.97	292	91	46	2.9	1,260	--
May 20	9.29	90		57	38	129	--	c 321	106	95	2.8	80	80	756	1.03	298	65	49	3.3	1,100	8.6
June 20	10.2	90		32	39	135	--	d 254	123	100	1.6	65	711	.97	.97	240	46	55	3.8	1,070	8.4
July 16	14.9	63		58	38	109	--	364	83	80	4.0	37	651	.89	.89	301	2	44	2.7	1,040	8.0
Aug. 26	20.8	35		45	20	73	--	201	63	65	2.0	32	434	.59	.59	194	30	45	2.3	707	8.2
Sept. 16	14.8	56		58	35	135	--	404	92	88	3.6	26	693	.94	.94	288	0	50	3.4	1,140	7.5

a Includes equivalent of 10 parts per million of carbonate (CO₃).

b Residue on evaporation at 180°C.

c Includes equivalent of 18 parts per million of carbonate (CO₃).d Includes equivalent of 8 parts per million of carbonate (CO₃).

EAST AMARILLO CREEK NEAR AMARILLO

RED RIVER BASIN

SALT FORK RED RIVER NEAR HEDLEY, TEX.

LOCATION.--Half a mile downstream from Whitefish Creek, $2\frac{1}{2}$ miles upstream from Jesse Arroyo and about 9 miles northeast of Hedley, Donley County.
DRAINAGE AREA.--868 square miles, of which 209 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: March 1936 to August 1937.

EXTREMES, 1936-37.--Dissolved solids: Maximum, 2,520 ppm Jan. 18; minimum, 231 ppm Aug. 29.

Water temperatures: March 1936 to August 1937.
Hardness: Maximum, 1,440 ppm Jan. 10-12, 18, 25; minimum, 26 ppm Aug. 29.

Specific conductance: Maximum daily, 3,530 micromhos Jan. 23; minimum daily, 382 micromhos Aug. 29.

Water temperatures: Maximum, 95°F June 30; minimum, freezing point Jan. 16-18, 1937.

EXTREMES, March 1936 to August 1937.--Dissolved solids: Maximum, 2,600 ppm Apr. 30, 1936; minimum, 231 ppm Aug. 29, 1937.

Hardness: Maximum, 1,640 ppm Apr. 30, 1936; minimum, 126 ppm Aug. 29, 1937.

Specific conductance: Maximum daily, 3,530 micromhos Jan. 23, 1937; minimum daily, 382 micromhos Aug. 29, 1937.

Water temperatures: Maximum, 95°F June 30, 1937; minimum, freezing point Jan. 16-18, 1937.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation. Concentrations more than 1,000 ppm are calculated from sums of determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. (No discharge records available). No flow Oct. 1 to Dec. 19, July 2-21, Aug. 1-4, 10-28, Sept. 15-30.

Chemical analyses, in parts per million, December 1936 to August 1937

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids			Hardness as CaCO ₃	Percent sodium carbonate	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
													Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate		
Dec. 20-23, 25-26																			
28-31, 1936																			
Feb. 1-14, 16-18																			
Feb. 19-28																			
Mar. 1-11, 13																			
Mar. 14-20																			
Mar. 21-23, 25-31																			
Apr. 1-10																			
Apr. 11-19																			
Apr. 19-23																			
Apr. 24-27, 29-30																			
Apr. 28																			
May 1-14																			
May 15-16																			

a Calculated from determined constituents.

RED RIVER BASIN--Continued

SALT FORK RED RIVER NEAR HEDLEY, TEX.--Continued

Chemical analyses, in parts per million, December 1956 to August 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium ad- sor- ption ratio	Specific conductance (micro-mhos at 25°C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
May 17-27, 1957.		31		112	28	115		191	272	143	0.7	2.5	856	1.16		394	238	39	2.5	1,250	7.8
May 28-31, June 1		22		71	15	60		155	140	66	.7	2.8	476	.65		238	112	36	1.7	711	7.6
June 2-5		41		86	23	107		164	225	120	.8	2.0	709	.96		309	174	43	2.6	1,060	8.2
June 6-16		41		94	35	154		126	336	182	1.0	2.0	a 907	1.23		378	275	47	3.4	1,370	8.1
June 17-25		44		102	39	158		110	386	185	1.0	3.0	a 972	1.32		415	325	45	3.4	1,460	8.0
June 26-30, July 1		49		98	42	168		94	417	190	1.0	1.8	1,010	1.37		417	340	47	3.6	1,510	8.2
July 22-23		38		153	42	181		143	510	208	1.2	2.2	1,210	1.65		554	442	41	3.3	1,770	8.2
Aug. 5-8		32		112	31	135		156	317	168	1.2	1.8	920	1.25		407	279	42	2.9	1,380	8.2
Aug. 9		44		110	41	160		125	386	200	1.0	1.5	a 1,000	1.36		443	340	44	3.3	1,540	8.1
Aug. 29		15		38	7.5	30		111	57	25	.8	3.0	a 231	.31		128	35	34	1.1	382	8.0

a Calculated from determined constituents.

RED RIVER BASIN--Continued

SALT FORK RED RIVER NEAR HEDLEY, TEX.--Continued

Temperature (°F) of water, December 1956 to August 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	58	49	59	52	60	62	92	--	
2			--	46	46	50	75	60	66	--	--	
3			--	42	45	49	59	60	66	--	--	
4			--	51	44	47	60	60	70	--	--	
5			--	50	46	40	62	68	79	--	75	
6			--	51	48	40	66	64	83	--	74	
7			--	48	49	54	60	64	88	--	74	
8			--	47	55	66	68	63	87	--	77	
9			--	50	48	63	60	62	72	--	78	
10			--	47	50	65	48	70	69	--	--	
11			--	47	49	65	45	64	70	--	--	
12			--	48	51	--	43	63	75	--	--	
13			--	48	69	64	58	66	80	--	--	
14			--	35	68	62	60	67	87	--	--	
15			--	33	--	54	61	69	86	--	--	
16			--	32	55	65	73	80	84	--	--	
17			--	32	59	67	75	72	84	--	--	
18			--	32	46	64	72	72	83	--	--	
19			--	38	49	52	70	--	88	--	--	
20			38	40	45	48	54	77	85	--	--	
21												
22			36	37	47	58	66	80	84	--	--	
23			52	34	42	59	62	78	86	84	--	
24			48	43	44	51	70	80	70	85	--	
25			35	44	45	--	68	73	71	--	--	
26			35	34	41	40	70	73	74	--	--	
27												
28			34	34	46	41	70	78	75	--	--	
29			36	34	45	59	73	78	93	--	--	
30			38	34	49	58	60	79	94	--	--	
31			54	34	--	68	60	80	94	--	77	
			41	35	--	65	58	74	95	--	--	
			42	36	--	55	--	75	--	--	--	
Average			--	41	49	56	63	70	80	--	--	

RED RIVER BASIN--Continued
BEAVER CREEK NEAR WAURIKA, OKLA.

LOCATION.--At gaging station at bridge on State Highway 5, 4.5 miles northwest of Waurika, Jefferson County, 6.2 miles upstream from Cow Creek.

DRAINAGE AREA.--563 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.

Water temperatures: October 1955 to September 1957.

Sediment records: May to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,200 ppm July 1-10; minimum, 142 ppm May 18.

Hardness: Maximum, 585 ppm July 1-10; minimum, 58 ppm Apr. 21-30.

Specific conductance: Maximum daily, 1,910 microhms Dec. 30; minimum daily, 185 microhms Apr. 22.

Water temperatures: Maximum, 88°F Aug. 1; minimum, freezing point Dec. 10, Jan. 16-18, 22, 27-28, 31.

Sediment concentrations: Maximum daily, 2,600 ppm June 18; minimum, 49 ppm Sept. 20-21.

Sediment loads: Maximum daily, 75,000 tons May 26; minimum daily, 0.2 ton on several days.

EXTREMES, 1955-57.--Dissolved solids: Maximum, 1,210 ppm May 16, 18, 20, 1956; minimum, 125 ppm July 4-8, 1956.

Hardness: Maximum, 640 ppm Dec. 11-20, 1955; minimum, 58 ppm Apr. 21-30, 1957.

Specific conductance: Maximum daily, 2,000 microhms May 16, 1956; minimum daily, 185 microhms Apr. 22, 1957.

Water temperatures: Maximum, 88°F Aug. 1, 1957; minimum, freezing point on several days during December and January.

REMARKS.--Records of specific conductance of daily samples are available in district office at Oklahoma City, Okla. Records of discharge for water year

October 1956 to September 1957 are given in WSP 1511. No flow Oct. 1-14, 29, Nov. 21-30, Dec. 1-18, 29-31, Jan. 1-30.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃	Percent sodium	Sodium adsorption ratio	Specific conductance (microhms at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium per million	Non-carbonate			
Oct. 15-20, 1956	161	--	--	32	7.3	8.9	4.0	110	0	29	8.5	--	1.3	--	146	0.20	110	20	15	259	7.4
Oct. 21-28, 30-31	43.7	8.0	0.04	34	8.0	8.8	17	122	0	24	11	0.5	1.8	0.28	160	0.22	118	18	13	274	7.5
Nov. 1-10	85.1	--	--	29	7.7	17	19	130	0	18	11	--	1.4	--	148	0.20	104	0	27	252	8.0
Nov. 11-20	30	--	--	27	6.9	45	19	110	0	28	12	--	1.7	--	149	0.20	96	6	30	248	7.7
Dec. 19-20	5.65	--	--	42	15	55	19	190	0	71	29	--	1.8	--	314	0.43	188	12	37	518	8.2
Dec. 21-24	10.3	--	--	40	15	55	17	178	0	90	34	--	2.4	--	338	0.48	180	14	43	561	8.0
Dec. 25-26	70	--	--	66	24	59	22	232	4	69	103	--	1.2	--	474	0.64	284	68	33	815	8.3
Dec. 27-28	20	--	--	116	39	206	97	270	0	57	425	--	1.1	--	1,100	1.50	450	228	50	1,870	8.2
Jan. 31, 1957	29.0	--	--	82	31	108	97	196	8	71	205	--	4.4	--	684	0.93	330	156	39	1,100	8.6
Feb. 1-11	4.60	14	.03	90	21	108	108	212	0	73	205	.3	4.0	.36	678	.92	310	136	43	1,130	8.1
Feb. 12-20	2.31	--	--	112	17	32	34	254	0	148	40	--	.8	--	509	.69	330	142	16	778	7.8
Feb. 21-28	3.59	--	--	120	22	34	34	280	8	190	34	--	.8	--	573	.78	380	172	16	835	8.4
Mar. 1-10	6.96	--	--	85	27	34	280	0	168	31	--	--	1.4	--	519	.71	325	144	19	826	8.0
Mar. 11-20	3.67	--	--	96	28	34	280	0	168	31	--	--	1.2	--	553	.75	355	174	15	753	8.2
Mar. 21-22	85.0	--	--	110	35	18	26	246	2	214	22	--	1.2	--	586	.80	420	215	9	806	8.3
Mar. 23-31	15.0	--	--	55	15	26	26	140	0	92	31	--	2.3	--	345	.47	200	85	22	505	8.0

DATE	1-10, 1957	5.42	--	--	144	39	39	238	0	345	36	--	0.5	--	755	1.03	11	520	325	14	.7	1,040	8.2
Apr. 11-20	1,166	7.76	10	--	141	38	45	240	0	339	36	.3	1.2	.15	753	1.02	16	510	314	16	.9	1,050	8.1
Apr. 21-30	2,166	7.76	--	--	141	38	28	68	0	27	23	--	2.5	--	148	.20	866	58	2	51	1.6	1,050	8.1
May 1-10	1,994	--	--	--	37	11	26	124	0	33	38	--	2.5	--	230	.31	1,240	136	34	29	1.0	388	7.8
May 11-12	334	--	--	--	37	11	115	244	10	74	228	--	6.4	--	459	1.11	739	370	154	40	2.6	1,280	8.3
May 13	505	--	--	--	59	20	58	192	0	40	108	--	2.0	--	459	.62	626	225	70	35	1.6	714	7.3
May 14-15	1,164	--	--	--	50	11	35	160	0	42	51	--	1.6	--	320	.44	1,010	172	41	31	1.2	493	7.5
May 16	180	--	--	--	78	25	55	200	16	34	134	--	2.5	--	601	.82	292	300	108	29	1.4	930	8.4
May 17	477	--	--	--	42	12	60	132	0	76	69	--	3.0	--	332	.45	428	156	48	46	2.1	506	8.0
May 18	9,260	--	--	--	18	3.6	15	60	0	7.8	25	--	1.9	--	142	.19	3,550	60	11	36	.9	197	7.1
May 19-20	7,935	--	--	--	43	8.9	24	136	0	35	33	--	1.8	--	249	.34	5,330	144	32	27	.9	393	7.5
May 21	819	--	--	--	70	25	53	192	14	65	100	--	3.2	--	492	.87	1,090	275	95	30	1.4	767	8.5
May 22	345	--	--	--	96	44	74	276	8	119	152	--	2.8	--	761	1.03	709	420	180	28	1.6	1,200	8.3
May 23	1,450	--	--	--	66	21	42	172	4	70	84	--	4.0	--	451	.61	1,770	250	102	27	1.2	700	8.3
May 24-27	6,448	--	--	--	38	9.0	10	116	0	37	14	--	1.8	--	193	.26	3,360	132	37	15	.4	311	8.1
May 28	1,050	--	--	--	80	25	40	202	16	91	73	--	3.0	--	492	.67	1,390	305	112	22	1.0	748	8.5
May 29	347	--	--	--	59	37	61	146	4	154	102	--	3.1	--	678	.82	635	300	174	31	1.5	1,050	8.3
May 30	422	--	--	--	61	21	28	160	8	77	53	--	3.3	--	393	.53	448	240	96	20	.8	587	8.4
May 31	2,050	--	--	--	38	10	8.3	124	0	37	10	--	2.3	--	197	.27	1,090	138	36	12	.3	301	8.0
June 1-2	3,160	--	--	--	45	11	14	138	0	40	21	--	2.2	--	215	.29	1,830	156	43	16	.5	364	7.9
June 3-6	1,447	--	--	--	61	20	28	196	0	68	45	--	2.5	--	347	.47	1,360	235	76	21	.8	567	7.8
June 7-8	308	--	--	--	86	33	89	276	0	151	111	--	4.3	--	646	.88	537	350	124	36	2.1	1,030	7.6
June 9-10	210	--	--	--	77	58	112	238	0	227	170	--	4.8	--	837	1.14	475	430	236	36	2.3	1,300	7.6
June 11-15	190	--	--	--	96	67	106	310	0	230	175	--	5.0	--	895	1.22	459	515	261	31	2.0	1,420	7.7
June 16-20	467	--	--	--	81	28	49	220	0	115	86	--	2.6	--	493	.67	622	320	138	25	1.2	810	7.9
June 21	151	--	--	--	109	46	63	332	0	163	109	--	3.2	--	704	.96	287	460	188	23	1.3	1,120	7.5
June 22-30	96.3	--	--	--	83	74	113	256	0	245	205	--	3.3	--	947	1.29	246	510	300	33	2.2	1,460	7.8

a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued
BEAVER CREEK NEAR WAURIKA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-dium	So-dium ad-sorp-tion ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
July 1-10, 1957.....	46.3	24	0.00	88	89	131	1	318	0	277	230	0.3	2.9	0.40	1,200	1.63	150	585	324	33	2.4	1,640	8.0
July 11-20.....	25.3	--	--	80	76	125	1	276	0	269	195	--	2.6	--	917	1.25	63	510	286	35	2.4	1,470	7.7
July 21-23.....	20.0	--	--	77	73	81	1	296	0	212	145	--	1.6	--	855	1.16	46	490	250	26	1.6	1,370	7.8
July 23-25.....	18.6	--	--	78	26	56	1	168	0	103	124	--	2.6	--	520	.71	26	300	162	29	1.4	900	7.9
July 26-28.....	156	--	--	45	12	26	1	150	0	40	37	--	3.0	--	244	.33	103	160	39	26	.9	452	7.6
July 29-31.....	21.0	--	--	74	31	50	1	258	0	107	68	--	2.9	--	466	.63	26	310	100	26	1.2	809	8.0
Aug. 1-10.....	11.9	--	--	88	54	76	1	308	0	226	82	--	1.8	--	713	.97	23	440	188	27	1.6	1,130	8.1
Aug. 11-20.....	10.3	--	--	104	51	89	1	384	0	217	98	--	1.4	--	757	1.03	21	470	172	29	1.8	1,220	8.0
Aug. 21-31.....	3.96	--	--	86	57	65	1	386	0	193	63	--	1.0	--	664	.90	7.1	450	150	24	1.3	1,080	7.9
Sept. 1-10.....	1.47	--	--	77	57	94	1	400	0	197	68	--	.8	--	695	.95	2.8	425	97	32	2.0	1,130	7.3
Sept. 11-20.....	1.71	--	--	66	65	105	1	386	0	235	68	--	.8	--	738	1.00	3.4	430	114	35	2.2	1,170	8.1
Sept. 21.....	1.40	--	--	34	64	108	1	298	0	233	65	--	.8	--	669	.91	2.5	350	106	40	2.5	1,140	8.2
Sept. 22.....	633	--	--	86	20	16	1	154	0	156	28	--	3.6	--	412	.56	704	300	170	11	.4	635	7.9
Sept. 23-30.....	71.0	--	--	61	19	20	1	172	0	85	15	--	3.1	--	302	.41	58	215	73	17	.6	482	7.3
Weighted average..	442	--	--	40	12	25	1	b127	--	45	36	--	2.3	--	253	0.34	302	150	46	26	0.9	398	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

RED RIVER BASIN--Continued

BEAVER CREEK NEAR WAURIKA, OKLA.--Continued

Temperature (° F) water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	61	44	45	39	49	57	67	76	83	88	82
2	--	59	45	44	40	51	59	68	69	83	86	81
3	--	59	45	45	42	49	58	71	67	84	85	81
4	--	56	44	44	42	48	57	61	67	84	83	81
5	--	54	44	45	42	49	--	67	74	83	82	80
6	--	55	45	45	43	48	58	62	74	84	81	77
7	--	54	43	45	44	46	58	68	76	84	80	75
8	--	51	40	45	44	--	59	66	78	82	79	70
9	--	45	34	40	45	45	--	72	80	83	81	70
10	--	43	32	41	45	46	61	66	84	83	82	73
11	--	43	36	42	46	47	61	67	83	82	82	75
12	--	42	39	41	50	45	55	68	--	84	83	75
13	--	42	41	41	50	45	54	68	80	84	82	75
14	--	41	40	40	51	47	55	69	81	--	83	75
15	70	41	41	40	50	47	55	75	83	84	83	73
16	71	41	41	32	51	--	56	76	79	84	83	74
17	69	43	42	32	50	51	56	70	76	84	80	73
18	69	45	42	32	51	55	59	68	76	82	78	73
19	70	45	43	35	52	59	60	72	73	84	78	72
20	68	45	44	34	51	57	60	77	79	84	84	73
21	65	45	45	33	50	56	62	74	79	83	81	70
22	64	46	44	32	50	55	62	75	74	83	81	67
23	67	46	45	35	48	51	64	71	77	77	79	67
24	62	45	45	35	50	52	70	68	77	83	79	61
25	62	44	44	36	49	50	69	73	79	79	78	67
26	60	40	45	33	50	49	69	74	77	--	80	67
27	64	36	45	32	51	47	70	73	80	83	81	68
28	64	37	44	32	50	50	71	74	77	84	82	67
29	63	37	43	34	--	50	70	--	77	86	80	68
30	62	39	44	34	--	57	72	72	82	84	80	67
31	61	--	44	32	--	51	--	72	--	84	81	--
Average	--	46	42	38	47	50	61	70	77	83	81	73

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

BEAVER CREEK NEAR WAURIKA, OKLA.--Continued

Suspended sediment, May to September 1957

Day	May			June			July		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,720	900	4,180	4,020	719	s 7,950	64	250	43
2.....	1,770	993	s 4,720	2,300	690	s 3,700	53	270	42
3.....	2,120	798	s 4,560	1,420	1,070	s 3,960	56	275	42
4.....	5,060	767	s 10,300	1,730	620	s 2,880	51	290	40
5.....	4,950	550	s 7,350	1,700	630	2,890	46	280	35
6.....	2,480	470	s 2,770	938	768	s 1,890	43	282	33
7.....	298	693	s 590	359	698	s 677	39	276	29
8.....	166	470	s 211	257	610	423	37	264	26
9.....	365	1,490	s 1,540	221	530	316	35	265	25
10.....	1,010	1,620	s 4,390	200	430	232	34	267	25
11.....	462	793	s 1,020	196	430	228	33	271	24
12.....	206	460	s 257	180	430	209	31	256	21
13.....	505	1,510	s 2,390	202	490	267	30	250	20
14.....	1,510	1,810	s 6,550	206	545	303	27	247	18
15.....	818	820	s 1,870	165	440	s 260	26	246	17
16.....	180	530	s 260	626	1,810	s 2,960	24	219	14
17.....	477	1,610	s 3,050	183	980	490	22	205	12
18.....	9,260	1,110	s 27,000	223	2,600	s 1,610	21	207	12
19.....	11,800	1,050	s 33,900	885	2,280	s 5,310	20	197	11
20.....	4,070	440	s 4,840	419	873	s 1,050	19	190	9.7
21.....	819	730	s 1,590	151	618	s 255	19	176	9.0
22.....	345	800	s 868	123	463	154	21	170	9.6
23.....	1,450	1,850	s 6,580	109	392	130	320	2,420	s 2,390
24.....	1,860	716	s 3,390	116	378	119	125	1,570	s 580
25.....	1,300	1,850	s 9,080	114	342	105	112	890	s 286
26.....	17,900	1,420	s 75,000	93	362	91	336	1,810	s 1,670
27.....	4,730	427	s 5,820	87	340	80	96	825	s 227
28.....	1,050	654	s 1,750	81	285	62	37	480	48
29.....	347	579	s 545	75	260	53	25	245	17
30.....	422	1,900	s 2,860	69	220	41	20	170	9.2
31.....	2,050	1,360	s 7,010	--	--	--	18	170	8.3
Total.	81,500	--	236,241	17,448	--	33,695	1,845	--	5,752.8
Day	August			September					
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	16	192	8.3	1.4	78	0.3			
2.....	15	187	7.6	1.2	63	.2			
3.....	13	181	6.4	1.0	90	.2			
4.....	12	203	6.6	1.0	90	.2			
5.....	12	201	6.5	1.2	118	.4			
6.....	12	213	6.9	1.5	82	.3			
7.....	12	181	5.9	1.6	99	.4			
8.....	10	191	5.2	1.8	71	.3			
9.....	8.8	160	3.8	1.8	137	.7			
10.....	8.5	154	3.5	2.0	84	.5			
11.....	8.5	166	3.8	1.9	112	.6			
12.....	8.6	145	3.4	1.4	100	.4			
13.....	8.3	170	3.8	1.4	104	.4			
14.....	10	140	3.8	1.5	99	.4			
15.....	15	150	6.1	1.8	102	.5			
16.....	9.8	112	3.0	2.5	100	.7			
17.....	13	216	7.6	2.1	81	.5			
18.....	14	94	3.6	1.6	64	.3			
19.....	8.0	--	a 2.2	1.4	52	.2			
20.....	7.4	121	2.4	1.5	49	.2			
21.....	6.8	139	2.6	1.4	49	.2			
22.....	6.5	136	2.4	641	3,840	s 6,570			
23.....	5.8	108	1.7	716	1,340	2,590			
24.....	5.1	76	1.0	84	1,110	s 260			
25.....	4.3	63	.7	32					
26.....	3.9	110	1.2	18					
27.....	3.3	108	1.0	13					
28.....	2.9	62	.5	11	--	a 20			
29.....	2.3	80	.5	9.6					
30.....	1.5	90	.4	8.3					
31.....	1.2	66	.2	--					
Total.	265.5	--	112.6	1,565.9	--	9,547.9			

Total discharge for period May to September (cfs-days)..... 102,624.4

Total load for period May to September (tons)..... 290,349.3

s Computed by subdividing day.

a Computed from estimated concentration graph.

RED RIVER BASIN--Continued

BEAVER CREEK NEAR WAURIKA, OKLA.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature per- ature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
April 24, 1957..	4:00 p.m.	3,540		940	2,070	82	74	96	97	99	100					BWC
May 4	1:00 a.m.	2,410	59	893	2,230	71	80	86	94	98	100					BWC
May 4	6:35 p.m.	5,850		630	1,750	84	94	96	98	99	100					SPWC
May 26	10:05 a.m.	19,300		1,070	3,250	--	90	91	94	97	98	99	100			

Particle-size of bed material, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Bed material											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.031	0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000		16.000
April 24, 1957..	5:40 p.m.	3,600					25	55	77	84	88	90	100			S
May 4	2:00 a.m.	2,560					21	48	81	85	89	93	100			S
May 26	3:10 p.m.	1,810					7	24	83	95	97	100	--			S

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 77, a quarter of a mile downstream from Gulf, Colorado, and Santa Fe Railway bridge, 5 miles downstream from Fish Creek, and 7 miles north of Gainesville, Cooke County.

DRAINAGE AREA.--30,782 square miles of which 5,936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1957.

Water temperatures: October 1952 to September 1957.

EXTREMES, 1944-46.--Dissolved solids: Maximum, 4,260 ppm Sept. 11-12; minimum, 335 ppm Apr. 26-30.

Hardness: Maximum, 1,250 ppm Aug. 11-12; minimum, 158 ppm Apr. 26-30.

Specific conductance: Maximum daily, 7,130 micromhos Sept. 10; minimum daily, 461 micromhos Apr. 27.

Water temperatures: Maximum, 91 F July 13; minimum, freezing point Jan. 16-17.

EXTREMES, 1944-46, 1952-57.--Dissolved solids: Maximum, 6,480 ppm Apr. 11, 1953; minimum, 250 ppm Sept. 30, Oct. 1-3, 1945.

Hardness: Maximum, 1,510 ppm Apr. 11, 1953; minimum, 120 ppm Sept. 30, Oct. 1-3, 1945.

Specific conductance: Maximum daily, 9,890 micromhos Apr. 11, 1953; minimum daily, 325 micromhos Oct. 1, 1945.

Water temperatures (1952-57): Maximum, 95 F July 13, 1954; minimum, freezing point on Dec. 23, 1953, Jan. 21, 1954, Jan. 16-17, 1957.

REMARKS.--Records of specific conductance of daily samples for period May 1944 to April 1946 available in district office at Austin, Tex. Records of specific conductance of daily samples for period October 1952 to September 1957 available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonylate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Oct. 1-10, 1955.....	103	16	0.02	254	95	779	7.4	134	0	726	1,340	0.5	--	0.70	3,440	4.68	957	1,050	940	62	10	5,440	7.8
Oct. 11-13, 16-17.....	415	--	--	264	95	699	140	140	0	879	1,240	--	--	--	3,270	4.45	3,660	1,050	936	59	9.4	5,120	7.8
Oct. 14-15, 18, 20.....	1,586	--	--	108	21	198	110	0	212	335	198	--	3.3	--	1,000	1.36	4,280	335	265	55	4.6	1,670	7.5
Oct. 19.....	3,090	--	--	69	19	128	128	0	125	205	205	--	4.8	--	659	0.90	5,500	250	145	53	3.5	1,070	7.6
Oct. 21.....	3,320	--	--	120	27	238	116	0	260	395	--	--	4.8	--	1,170	1.59	10,490	410	315	56	3.1	1,940	7.5
Oct. 22-23.....	4,455	--	--	78	18	132	128	0	139	245	--	--	3.8	--	741	1.01	8,870	270	163	55	4.0	1,260	7.8
Oct. 24-25.....	2,690	--	--	176	34	370	126	0	386	620	--	--	6.0	--	1,720	2.34	12,490	580	476	58	6.7	2,800	7.8
Oct. 26-30.....	1,164	--	--	134	26	251	112	0	314	400	--	--	3.5	--	1,250	1.70	3,950	440	348	55	5.2	2,040	7.6
Oct. 31.....	628	--	--	156	33	418	118	0	347	690	--	--	3.8	--	1,760	2.39	2,960	525	428	53	7.9	2,870	7.9
Nov. 1.....	548	--	--	168	32	455	122	0	350	760	--	--	3.3	--	1,910	2.60	2,830	550	450	64	8.4	3,160	7.6
Nov. 2-10.....	2,076	--	--	68	18	143	100	0	118	248	--	--	2.2	--	705	.96	3,950	245	163	56	4.0	1,220	7.4
Nov. 11-13.....	669	--	--	92	22	221	104	0	168	382	--	--	--	--	986	1.34	1,780	320	235	60	5.4	1,750	8.0
Nov. 14-15.....	370	--	--	124	27	293	134	0	230	500	--	--	2.4	--	1,300	1.77	1,300	420	310	60	6.2	2,260	7.9
Nov. 16-18.....	271	--	--	160	29	368	152	0	286	635	--	--	2.2	--	1,640	2.23	1,200	520	396	61	7.0	2,780	8.1
Nov. 19-20.....	228	--	--	198	45	511	180	4	365	890	--	--	1.9	--	2,200	2.99	1,350	680	526	62	8.5	3,680	8.4
Nov. 21-24.....	198	--	--	216	49	576	180	0	431	990	--	--	1.4	--	2,460	3.35	1,320	740	592	63	9.2	4,070	8.1
Nov. 25-30.....	162	--	--	244	71	692	180	0	515	1,220	--	--	--	--	2,950	4.01	1,290	900	752	63	10	4,860	8.1
Dec. 1-7.....	140	--	--	260	81	732	184	0	550	1,310	--	--	--	--	3,200	4.35	1,210	980	829	62	10	5,160	7.9

Dec. 8-10, 1957	313	--	--	178	57	471	132	8	353	860	--	1.9	--	2,130	2.90	1,800	680	558	60	7.8	3,510	8.3
Dec. 11-19	171	--	--	240	68	603	212	0	461	1,090	--	--	--	2,700	3.67	1,250	880	706	60	8.8	4,400	8.0
Dec. 20	2,040	--	--	154	43	349	136	8	255	655	--	1.2	--	1,670	2.27	9,200	560	435	58	6.4	2,760	8.6
Dec. 21-22	4,150	--	--	66	21	152	98	4	107	270	--	2.8	--	1,930	3.99	3,170	450	368	57	4.2	1,270	8.6
Dec. 23-27	984	--	--	124	34	302	136	6	204	545	--	6.5	--	1,420	1.93	3,770	250	328	59	6.2	2,350	8.5
Dec. 28-31	401	--	--	180	56	479	178	2	354	850	--	6.2	--	2,170	2.95	2,350	680	530	60	8.0	3,550	8.3
Jan. 1-10, 1957	215	11	--	202	53	532	220	0	380	940	.3	4.6	.30	2,400	3.26	1,390	720	540	62	8.6	3,830	7.5
Jan. 11-13	155	--	--	224	83	620	180	0	458	1,150	--	1.3	--	2,910	3.96	1,220	900	752	60	9.0	4,500	8.2
Jan. 14-20	126	--	--	264	98	701	218	0	523	1,320	--	--	--	3,350	4.56	1,140	1,060	882	59	9.4	5,080	7.2
Jan. 21-25	180	--	--	264	85	721	206	4	520	1,320	--	--	--	3,240	4.41	1,570	1,010	834	61	9.9	5,090	8.3
Jan. 26-28-29	171	--	--	168	56	412	184	6	319	745	--	2.0	--	2,160	2.94	997	650	489	58	7.0	3,210	8.4
Jan. 27, 30-31	161	--	--	236	76	604	206	12	428	1,120	--	--	--	2,890	3.93	1,260	900	711	59	8.8	4,380	8.6
Feb. 1-5	224	--	--	264	85	702	176	6	501	1,320	--	--	--	3,360	4.57	2,030	1,010	856	60	9.6	5,050	8.4
Feb. 6	700	--	--	192	66	516	164	12	385	936	--	6.0	--	2,480	3.37	4,690	750	596	60	8.2	3,690	8.6
Feb. 7	1,080	--	--	156	46	394	142	10	275	715	--	12	--	1,980	2.69	5,770	580	447	60	7.1	2,980	8.6
Feb. 8, 10	1,470	--	--	106	34	244	120	4	170	460	--	5.0	--	1,280	1.74	5,080	405	300	57	5.3	2,040	8.3
Feb. 9	1,410	--	--	78	22	165	110	4	119	328	--	4.5	--	930	1.56	3,540	285	188	58	4.8	1,480	8.4
Feb. 11-15	732	--	--	80	24	200	112	0	133	335	--	3.7	--	961	1.33	1,990	300	208	59	5.0	1,620	8.2
Feb. 16	306	--	--	124	34	300	136	8	205	540	--	3.8	--	1,490	2.03	1,230	450	325	59	6.2	2,320	8.6
Feb. 17-18	286	--	--	154	43	421	154	6	282	740	--	3.8	--	1,930	2.62	1,390	560	424	62	7.7	3,040	8.4
Feb. 19-20	213	--	--	188	61	533	178	6	353	960	--	2.8	--	2,540	3.45	1,460	720	564	62	8.6	3,860	8.4
Feb. 21-28	201	--	--	240	76	710	188	6	466	1,280	--	--	--	3,270	4.45	1,770	910	746	63	10	4,940	8.4
Mar. 1	216	--	--	248	102	821	234	0	538	1,470	--	--	--	3,400	4.62	1,980	1,040	848	63	11	5,530	7.9
Mar. 2-3	390	--	--	204	71	663	160	0	443	1,170	--	--	--	2,780	3.78	2,930	800	669	64	10	4,500	7.7
Mar. 4	1,300	--	--	115	40	336	108	0	208	620	--	2.4	--	1,550	2.11	5,440	450	362	62	6.9	2,590	7.6
Mar. 5-6	1,390	--	--	75	25	206	96	0	128	370	--	3.0	--	987	1.34	3,700	290	210	61	5.3	1,660	7.5
Mar. 7-10	907	--	--	101	32	333	118	0	170	590	--	3.2	--	1,400	1.90	3,430	385	288	65	7.4	2,400	7.5
Mar. 11	790	--	--	120	35	411	136	0	226	700	--	5.2	--	1,670	2.27	3,560	445	334	67	8.5	2,810	7.7
Mar. 12-16	524	--	--	152	54	561	136	0	310	980	--	3.5	--	2,930	3.07	3,200	600	488	67	10	3,770	7.3
Mar. 17	300	--	--	200	68	706	136	0	456	1,240	--	--	--	2,260	3.98	2,370	780	668	66	11	4,700	7.8
Mar. 18-19	284	--	--	224	88	823	134	0	519	1,460	--	--	--	3,400	4.62	2,610	920	810	66	12	5,450	7.5
Mar. 20	254	--	--	144	49	494	110	0	316	860	--	4.4	--	2,080	2.83	1,430	560	470	66	9.1	3,490	7.6

a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-lidum adsorp-tion ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium, magne-sium	Non-carbon-ate				
Mar. 21, 1957.....	270	--	--	200	68	723		168	0	447	1,240	--	--	--	2,860	3.89	2,080	780	642	67	11	4,720	7.7
Mar. 22-23.....	1,930	--	--	122	43	388		124	0	223	700	--	2.3	--	1,730	2.35	9,020	480	378	64	7.7	2,850	7.5
Mar. 26-29.....	1,368	--	--	82	30	239		120	0	124	435	--	6.6	--	1,130	1.54	4,170	330	230	61	5.7	1,840	7.5
Mar. 30-31.....	554	--	--	120	43	379		138	0	255	650	--	3.5	--	1,710	2.33	2,560	475	362	63	7.6	2,780	7.6
Apr. 1.....	781	--	--	94	37	233		122	8	178	420	--	3.0	--	1,170	1.59	2,470	390	274	57	5.1	1,920	8.3
Apr. 2.....	572	--	--	130	48	411		128	10	291	700	--	2.4	--	1,770	2.41	2,730	520	398	63	7.8	2,930	8.4
Apr. 3.....	1,540	--	--	58	10	85		128	0	64		--	1.4	--	482	.66	2,000	186	81	50	2.7	827	8.2
Apr. 4.....	1,760	--	--	83	27	224		112	0	143	400	--	3.0	--	1,060	1.44	5,040	320	228	60	5.5	1,780	8.2
Apr. 5-6.....	809	--	--	136	49	472		126	0	278	830	--	2.2	--	2,000	2.72	4,370	540	436	66	8.8	3,300	7.9
Apr. 7.....	740	--	--	232	61	701		156	0	553	1,170	--	--	--	3,100	4.22	6,190	830	702	65	11	4,790	7.8
Apr. 8-9.....	2,270	--	--	160	49	392		116	8	421	640	--	2.3	--	2,210	3.01	13,550	600	492	59	7.0	3,530	8.3
Apr. 10-13.....	968	--	--	138	32	343		146	0	296	580	--	4.8	--	1,580	2.15	4,130	475	356	61	6.8	2,620	8.1
Apr. 14-15.....	724	--	--	115	29	263		130	2	221	450	--	3.9	--	1,250	1.70	2,440	405	295	59	5.7	2,120	8.3
Apr. 16-20.....	434	--	--	174	45	402		164	4	330	715	--	3.2	--	1,900	2.58	2,230	620	479	59	7.0	3,130	8.4
Apr. 21.....	1,590	--	--	91	20	171		132	4	124		--	2.3	--	804	1.09	3,450	310	196	55	4.2	1,540	8.4
Apr. 22-25.....	31,580	--	--	75	16	118		134	0	131	185	--	2.4	--	660	.90	55,920	230	142	51	3.3	1,100	8.2
Apr. 26-30.....	49,580	--	--	51	7.5	49		130	0	58	67	--	2.4	--	333	.46	44,850	138	32	40	1.7	553	8.2
May 1-2.....	58,700	--	--	120	20	195		122	0	248	300	--	2.2	--	976	1.33	154,700	380	280	51	4.1	1,640	8.0
May 3-10.....	44,140	--	--	86	13	110		140	0	131	182	--	1.9	--	614	.84	73,180	270	156	47	2.9	1,080	8.0
May 11-15.....	44,880	--	--	116	26	162		128	0	242	275	--	2.4	--	937	1.27	113,500	395	290	47	3.5	1,570	7.9
May 16-17.....	29,900	--	--	98	13	111		148	0	164	175	--	2.2	--	670	.91	54,090	300	178	45	2.8	1,130	8.2
May 18.....	60,000	--	--	68	11	63		140	6	809	99	--	5.0	--	444	.60	71,930	215	90	39	1.9	704	8.4
May 19-20.....	91,500	--	--	100	20	112		116	0	209	185	--	1.4	--	722	.98	178,400	330	235	43	2.7	1,200	7.9
May 21-24.....	53,600	--	--	85	14	95		130	4	144	150	--	2.0	--	584	.79	84,520	270	157	43	2.5	992	8.4
May 25-27.....	40,500	--	--	74	13	75		144	4	103	120	--	1.6	--	486	.66	53,140	240	116	40	2.1	837	8.3
May 28-31.....	36,900	--	--	132	17	132		144	0	173	215	--	1.9	--	745	1.01	74,220	315	197	48	3.2	1,270	8.2
June 1-2.....	40,750	--	--	64	16	63		144	0	83	110	--	2.9	--	429	.58	47,200	225	106	38	1.8	756	7.9
June 3.....	70,000	--	--	86	20	130		116	0	130	245	--	2.9	--	774	1.05	146,300	300	201	49	3.3	1,330	7.9
June 4-10.....	45,660	--	--	160	32	253		136	0	372	410	--	2.2	--	1,370	1.86	168,900	530	418	51	4.8	2,220	7.9
June 11-12.....	12,900	--	--	116	62	303		148	0	347	510	--	2.4	--	1,510	2.05	52,590	545	424	55	5.6	2,470	8.0

RED RIVER BASIN

193

	9,085	--	--	208	51	437	168	0	478	740	--	2.8	--	2,060	2.80	50,250	750	582	57	7.0	3,340	8.0
June 13-14, 1957 ..	7,508	--	--	232	54	528	172	0	515	900	--	2.6	--	2,410	3.26	48,650	800	659	59	8.1	3,910	7.9
June 15-20	17,400	--	--	166	40	357	136	0	380	600	--	3.2	--	1,700	2.31	79,870	580	488	57	6.4	2,810	7.9
June 21	6,842	--	--	140	32	240	148	0	260	430	--	3.6	--	1,270	1.73	23,460	460	358	52	4.8	2,100	7.9
June 22-27	3,180	--	--	176	67	456	130	0	437	810	--	4.2	--	2,090	2.84	17,940	715	608	58	7.4	3,480	7.9
June 28	2,760	--	--	256	54	583	236	0	514	960	--	2.5	--	2,610	3.55	19,590	860	666	59	8.3	4,180	7.9
June 29	2,700	--	--	264	81	714	176	0	625	1,240	--	--	--	3,160	4.30	23,040	990	846	61	9.9	5,050	7.8
July 1-10	1,605	24	.03	264	88	792	184	0	672	1,300	.3	--	.47	3,320	4.52	14,390	1,020	869	63	11	5,280	7.9
July 11-20	823	--	--	224	124	836	144	0	686	1,450	--	--	--	3,660	4.98	8,130	1,070	952	65	11	5,780	7.6
July 21-25	854	--	--	232	88	722	162	0	590	1,250	--	--	--	3,170	4.31	7,140	940	807	63	10	5,050	7.9
July 26-30	3,552	--	--	162	59	448	148	0	408	760	--	--	--	2,050	2.79	19,660	645	524	60	7.7	3,290	7.8
July 31	3,580	--	--	108	41	301	144	0	272	490	--	1.7	--	1,390	1.89	13,440	440	322	60	6.2	2,180	7.8
Aug. 1-4	1,725	--	--	133	34	283	136	0	317	455	--	3.2	--	1,500	2.04	6,990	470	358	57	5.7	2,430	7.5
Aug. 5-8	760	--	--	172	51	452	160	0	403	760	--	1.7	--	2,070	2.82	4,360	640	509	61	7.8	3,260	7.5
Aug. 9-10	665	--	--	248	93	759	168	0	652	1,300	--	--	--	3,310	4.50	5,940	1,000	862	62	10	5,200	7.7
Aug. 11-12	1,975	--	--	368	81	726	162	0	964	1,200	--	--	--	3,590	4.88	19,140	1,220	1,120	56	8.9	5,330	8.0
Aug. 13-16	1,332	--	--	272	59	479	150	0	652	1,820	--	--	--	2,470	3.36	8,680	920	797	53	6.9	3,820	7.9
Aug. 17-20	763	--	--	312	71	822	136	0	741	1,400	--	3.9	--	2,550	4.83	7,310	1,070	958	63	11	5,600	7.8
Aug. 21-31	499	--	--	288	88	814	154	0	719	1,400	--	--	--	3,580	4.94	4,800	1,080	954	62	11	5,590	7.7
Sept. 1-10	431	--	--	312	93	891	156	0	794	1,520	--	--	--	3,680	5.25	5,010	1,160	1,030	63	11	6,050	7.7
Sept. 11-12	445	--	--	364	69	1,020	118	0	917	1,700	--	--	--	4,260	5.79	5,120	1,240	1,140	64	13	6,630	7.6
Sept. 13-20	402	--	--	292	66	699	142	0	637	1,220	--	--	--	3,180	4.32	3,450	1,000	884	60	9.6	5,000	7.8
Sept. 21-25	565	--	--	210	72	555	158	0	469	1,000	--	--	--	2,530	3.44	3,660	820	690	60	8.4	4,070	7.8
Sept. 26-30	1,962	--	--	142	33	272	136	0	324	445	--	5.2	--	1,390	1.88	7,310	490	378	55	5.3	2,260	7.6
Weighted average	7,484	--	--	107	23	169	b 136	--	209	283	--	--	--	917	1.25	16,530	360	250	50	3.9	1,520	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	64	50	46	42	60	65	66	71	85	89	88
2	72	62	52	--	45	53	66	67	70	87	88	88
3	74	63	52	--	45	57	63	65	69	87	89	89
4	75	64	58	50	50	52	56	62	69	88	89	85
5	74	62	60	49	50	51	58	--	71	86	--	82
6	73	62	58	51	50	48	64	63	75	88	86	83
7	76	58	52	50	51	45	69	68	78	87	85	80
8	75	53	46	56	59	50	59	67	80	89	86	79
9	74	55	40	52	62	54	58	68	78	88	85	78
10	72	54	42	48	59	61	63	70	--	88	87	77
11	72	55	44	45	56	65	68	70	80	89	88	78
12	73	57	46	46	58	62	42	70	80	90	89	76
13	72	58	45	48	57	66	47	68	82	91	86	75
14	72	64	48	39	56	61	55	72	82	89	86	79
15	70	60	48	36	62	60	57	72	82	88	87	78
16	71	52	49	32	56	59	58	75	82	89	85	79
17	70	50	46	32	56	56	70	75	83	88	84	80
18	70	54	40	40	52	61	72	70	81	90	86	80
19	69	--	44	47	50	60	72	70	83	88	87	82
20	68	52	44	53	54	52	73	74	80	90	89	82
21	69	50	42	56	54	53	67	74	82	88	85	78
22	68	52	43	43	53	56	67	78	--	86	84	75
23	67	50	42	39	46	59	66	74	80	87	90	72
24	67	52	43	38	50	50	68	74	80	89	87	75
25	68	50	45	39	54	46	69	72	82	88	88	74
26	65	48	44	35	53	51	65	72	81	87	87	72
27	66	48	45	34	55	56	67	74	83	87	87	72
28	65	46	44	37	55	47	65	75	85	89	85	73
29	65	42	42	40	--	59	65	75	84	89	86	70
30	63	44	45	40	--	59	64	75	86	90	85	72
31	64	--	41	42	--	64	--	74	--	88	85	--
Average	70	55	46	44	53	56	63	71	79	88	87	78

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.

LOCATION.--At gaging station at county highway bridge, 0.4 mile downstream from Oak Creek, 2½ miles west of Stratford, and 6 miles north of Foss, Washita County.

DRAINAGE AREA.--1,551 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1956 to April 1957.

Sediment records: March 1956 to April 1957.

EXTREMES, October 1956 to April 1957.--Water temperatures: Maximum, 65°F Apr. 20, 22-24; minimum, freezing point Dec. 11, 13, Jan. 15, 16, 24.

Sediment concentrations: Maximum daily, 24,900 ppm Apr. 4, minimum daily, no flow on many days.

Sediment loads: Maximum daily, 228,000 tons Apr. 19; minimum daily, less than 0.05 ton on many days.

EXTREMES, March 1956 to April 1957.--Water temperatures: Maximum, 79°F July 4, 5, 1956; minimum, freezing point Dec. 11, 13, 1956. Jan. 15, 16, 24, 1957.

Sediment concentrations: Maximum daily, 24,900 ppm Apr. 4, 1957; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 228,000 tons Apr. 19, 1957; minimum daily, 0 tons on many days.

REMARKS.--Records of chemical analyses and water temperatures available June 1946 to September 1948 at site 2 miles upstream published as Washita River at Foss Dam site near Foss. Records of discharge for water years 1956 and 1957 given in WSP 1441 and 1511 respectively. No flow May 20-24, July 3-5, 7-9, Aug. 5-20, 22-31, Sept. 1-21, 24-30, Oct. 1-13, 1956.

Temperature (°F) of water, March to September 1956
/Once-daily measurement between 7 a.m. and 9:30 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	50	61	68	74	71	51
2						--	62	64	72	76	69	56
3						--	--	61	72	77	68	57
4						--	50	62	71	79	65	--
5						--	50	67	74	79	68	--
6						--	53	70	73	75	70	--
7						--	48	67	73	77	69	--
8						--	49	65	74	77	70	--
9						--	45	72	73	75	70	--
10						--	48	--	75	74	69	--
11						--	48	65	74	70	68	--
12						--	50	72	74	71	66	--
13						--	56	72	--	75	66	--
14						--	62	59	73	76	68	--
15						--	55	59	72	73	70	--
16						--	55	60	--	73	69	--
17						--	53	63	76	74	67	--
18						--	52	65	76	69	66	--
19						--	57	65	74	63	--	--
20						--	55	70	75	72	55	--
21						--	57	68	77	72	55	--
22						41	58	69	77	72	58	--
23						47	56	74	75	68	63	55
24						49	52	68	75	70	68	--
25						55	56	68	75	69	65	--
26						58	64	68	73	71	60	--
27						50	65	65	77	72	61	--
28						47	68	68	74	71	62	--
29						48	55	74	77	69	60	--
30						50	57	77	78	69	60	--
31						59	--	74	--	69	56	--
Average						--	55	67	74	73	--	--

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.--Continued

Temperature (°F) of water, October 1956 to April 1957
 /Once-daily measurement between 8 a.m. and 9 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	34	39	40	35	47	53					
2	--	34	38	38	37	50	53					
3	--	47	39	46	42	45	50					
4	--	48	46	45	41	49	48					
5	--	48	44	42	42	51	45					
6	--	48	47	44	38	35	50					
7	--	51	35	39	46	46	53					
8	--	43	34	39	52	35	45					
9	--	41	34	45	55	42	50					
10	--	46	34	34	49	53	51					
11	--	48	32	34	50	53	54					
12	--	51	34	35	47	48	40					
13	--	47	32	37	46	49	39					
14	--	56	34	33	48	46	45					
15	42	43	34	32	55	44	52					
16	40	38	36	32	46	45	52					
17	42	38	40	34	44	55	64					
18	42	43	34	35	49	55	60					
19	44	44	39	35	45	47	60					
20	43	44	40	35	42	50	65					
21	35	38	39	40	44	49	64					
22	36	--	40	39	38	48	65					
23	36	40	39	35	--	49	a 65					
24	36	38	38	32	40	40	65					
25	37	41	35	35	45	41	--					
26	33	37	36	34	44	40	--					
27	34	36	39	34	40	46	--					
28	38	38	39	35	44	44	--					
29	43	36	39	36	--	49	--					
30	42	37	40	33	--	54	--					
31	34	--	41	35	--	55	--					
Average	--	43	38	37	45	47	54					

a Reading obtained at 4 p.m.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.--Continued

Suspended sediment, March to September 1956

Day	March			April			May		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	2.5			0.9	136	0.3	0.5	192	0.3
2.....				.9	152	.4	1.2	182	.5
3.....				.8	150	.3	40	950	s 123
4.....				.8	138	.3	51	1,100	s 522
5.....				.8	144	.3	175	14,000	s 6,960
6.....	2.2			.8	136	.3	80	7,000	s 1,530
7.....				.6	117	.2	48	3,850	s 464
8.....				.6	184	.3	32	1,900	164
9.....				.7	113	.2	25	1,160	76
10.....				.7	132	.2	21	709	40
11.....	2.0	--	e 0.8	.7	107	.2	17	456	21
12.....	2.0			.6	113	.2	13	326	11
13.....	1.9			.5	122	.2	10	253	6.8
14.....	2.0			.2	113	.1	8.0	220	3.6
15.....	2.5			.1	140	(t)	3.5	149	1.4
16.....	2.4			.1	120	(t)	2.0	142	.8
17.....	1.9			.2	136	.1	1.0	150	.4
18.....	1.6			.2	134	.1	.5	157	.2
19.....	1.2			.1	141	(t)	.2	153	.1
20.....	1.3			.1	120	(t)	0	--	0
21.....	2.4			.4	130	.1	0	--	0
22.....	2.4	146	.9	.4	133	.1	0	--	0
23.....	8.9	139	2.6	.2	146	.1	0	--	0
24.....	13	127	4.5	.3	157	.1	0	--	0
25.....	8.9	110	2.6	.4	163	.2	52	6,060	s 1,680
26.....	8.1	136	2.2	.2	160	.1	271	12,200	s 9,070
27.....	4.5	156	1.9	.1	143	(t)	557	17,800	s 33,400
28.....	3.9	148	1.6	.1	180	(t)	757	19,100	s 39,700
29.....	3.3	137	1.2	.1	180	(t)	180	11,600	s 5,870
30.....	2.4	138	.9	.1	170	(t)	122	6,300	2,080
31.....	1.6	142	.6	--	--	--	88	3,300	784
Total..	98.7	--	35.8	12.7	--	4.7	2,551.9	--	102,511.1
	June			July			August		
1.....	31	2,220	188	0.4	66	0.1	18	2,740	s 163
2.....	19	873	45	.2	87	(t)	2.9	568	s 4.9
3.....	14	378	14	0	--	0	.8	77	.2
4.....	11	236	7.0	0	--	0	.2	42	(t)
5.....	9.1	506	12	0	--	0	0	--	0
6.....	5.8	158	2.5	.5	88	.1	0	--	0
7.....	4.5	115	1.4	0	--	0	0	--	0
8.....	4.5	104	1.3	0	--	0	0	--	0
9.....	5.6	152	2.3	0	--	0	0	--	0
10.....	3.9	89	.9	16	5,350	s 1,080	0	--	0
11.....	3.1	82	.7	518	19,600	s 31,100	0	--	0
12.....	2.5	84	.6	188	12,400	s 5,750	0	--	0
13.....	2.2	84	.5	80	7,700	s 1,740	0	--	0
14.....	2.0	87	.4	19	1,800	92	0	--	0
15.....	1.6	62	.3	7.1	259	4.9	0	--	0
16.....	1.2	68	.2	3.9	480	4.8	0	--	0
17.....	.9	96	.2	2.5	230	1.6	0	--	0
18.....	204	4,920	s 8,490	1.8	66	.3	0	--	0
19.....	218	9,460	s 7,050	142	12,500	s 6,340	0	--	0
20.....	20	1,270	89	59	7,720	s 1,400	0	--	0
21.....	7.6	182	3.7	18	1,330	s 91	3.0	80	.6
22.....	3.7	76	.8	8.3	475	s 17	0	--	0
23.....	2.5	44	.3	26	5,120	s 421	0	--	0
24.....	2.0	24	.1	5.3	1,280	18	0	--	0
25.....	1.8	24	.1	3.3	236	2.1	0	--	0
26.....	1.6	38	.2	2.0	103	.6	0	--	0
27.....	1.2	43	.1	1.3	103	.4	0	--	0
28.....	1.0	54	.1	.9	28	.1	0	--	0
29.....	.8	37	.1	.7	45	.1	0	--	0
30.....	.5	47	.1	a 1.0	79	.2	0	--	0
31.....	--	--	--	17	4,700	s 239	0	--	0
Total..	586.6	--	15,889.9	a 1,102.2	--	48,303.3	24.9	--	168.7

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

a Revised.

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.--Continued

Suspended sediment, March to September 1956--Continued

Date	Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
Sept. 22, 1956.....	0.4	327	0.4
Sept. 23.....	.2	319	.2
Total for September.....	.6	--	.6
Total discharge for period March to September 1956 (cfs-days)..... 4,377.6			
Total load for period March to September 1956 (tons) .....166,914.1			

Suspended sediment, October 1956 to April 1957

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	18	3,500	170	0.8	25	0.1
2.....	0	--	0	7.1	516	9.9	.8	41	.1
3.....	0	--	0	4.3	221	2.6	.8	31	.1
4.....	0	--	0	10	376	11	.8	45	.1
5.....	0	--	0	3.7	144	1.5	.8	46	.1
6.....	0	--	0	2.7	50	.4	.8	69	.1
7.....	0	--	0	2.5	37	.3	.9	86	.2
8.....	0	--	0	2.2	28	.2	1.0	32	.1
9.....	0	--	0	1.9	20	.1	1.0	95	.3
10.....	0	--	0	1.8	27	.1	1.2	92	.3
11.....	0	--	0	1.6	18	.1	1.2	49	.2
12.....	0	--	0	1.4	22	.1	1.2	52	.2
13.....	0	--	0	1.3	15	.1	.9	103	.3
14.....	103	2,370	s 2,480	1.0	39	.1	.9	87	.2
15.....	1,830	15,400	s 70,700	1.0	37	.1	.8	51	.1
16.....	273	10,500	s 8,480	.9	21	.1	.8	47	.1
17.....	40	4,700	531	.9	22	.1	.8	80	.2
18.....	16	902	41	.9	16	(t)	.7	52	.1
19.....	9.7	227	6.0	1.2	18	.1	.7	34	.1
20.....	7.8	124	2.6	1.0	36	.1	.8	22	.1
21.....	6.3	69	1.2	1.0	15	(t)	.8	24	.1
22.....	5.0	47	.6	.8	22	(t)	.7	22	(t)
23.....	3.9	40	.4	.9	18	(t)	.6	23	(t)
24.....	2.9	67	.5	.8	17	(t)	.5	29	(t)
25.....	2.2	34	.2	.9	20	(t)	.5	18	(t)
26.....	1.8	30	.1	.8	24	.1	.4	38	(t)
27.....	1.3	30	.1	.8	20	(t)	.5	13	(t)
28.....	1.2	22	.1	.8	41	.1	.5	24	(t)
29.....	1.1	34	s .1	.8	28	.1	.4	22	(t)
30.....	12	574	s 3,040	.8	26	.1	.5	37	(t)
31.....	192	17,100	s 11,200	--	--	--	.5	34	(t)
Total.	2,509.2	--	96,483.9	73.8	--	197.3	23.6	--	3.5

s Computed by subdividing day.

t Less than 0.05 ton.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.--Continued

Suspended sediment, October 1956 to April 1957--Continued

Day	January			February			March		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	3.0	42	s 0.4	2.0	15	0.1	1.0	51	0.1
2.....	1.3	25	.1	1.8	7	(t)	6.9	279	s 6.4
3.....	1.2	26	.1	1.6	10	(t)	4.3	160	s 2.3
4.....	1.4	40	.2	1.4	9	(t)	2.4	62	.4
5.....	1.6	53	.2	1.4	11	(t)	2.2	35	.2
6.....	1.4	61	.2	1.4	15	.1	2.9	44	.3
7.....	1.4	62	.2	1.6	11	(t)	2.7	33	.2
8.....	1.4	45	.2	1.3	11	(t)	2.2	44	.3
9.....	1.4	56	.2	1.3	10	(t)	1.9	27	.1
10.....	1.4	75	.3	1.2	11	(t)	1.9	21	.1
11.....	1.4	86	.3	1.0	9	(t)	1.8	32	.2
12.....	1.3	77	.3	1.0	10	(t)	1.3	24	.1
13.....	1.3	41	.1	.9	21	.1	1.2	46	.1
14.....	1.3	75	.3	.8	26	.1	1.0	27	.1
15.....	1.2	67	.2	.8	36	.1	1.0	17	.1
16.....	1.3	94	.3	.7	30	.1	1.0	24	.1
17.....	.9	86	.2	.6	31	.1	1.2	21	.1
18.....	1.3	67	.2	1.3	14	.1	1.2	20	.1
19.....	1.3	66	.2	2.4	35	.2	.9	57	.1
20.....	1.3	44	.2	1.9	16	.1	1.9	33	.2
21.....	1.2	52	.2	1.9	29	.1	4.1	53	.6
22.....	1.0	34	.1	1.9	42	.2	2.4	9	.1
23.....	.9	61	.1	1.6	42	.2	65	3,020	s 852
24.....	1.0	56	.2	1.8	37	.2	31	2,390	s 209
25.....	.9	48	.2	1.8	35	.2	13	1,030	46
26.....	.8	57	.1	1.6	20	.1	6.6	167	3.0
27.....	.7	103	.2	1.2	35	.1	4.8	55	.7
28.....	.8	97	.2	1.2	65	.2	4.3	41	.5
29.....	.9	82	.2	--	--	--	3.7	31	.3
30.....	1.0	128	.3	--	--	--	3.5	38	.4
31.....	2.7	68	.5	--	--	--	3.7	68	.7
Total.	40.0	--	6.7	39.4	--	2.8	183	--	1,124.9
April									
1.....	3.1	46	0.4						
2.....	2.7	91	.7						
3.....	1,020	17,100	s 82,700						
4.....	790	24,900	s 56,400						
5.....	109	11,100	s 3,472						
6.....	49	4,600	677						
7.....	30	1,480	124						
8.....	23	576	38						
9.....	18	276	14						
10.....	16	151	7.0						
11.....	14	91	3.4						
12.....	13	107	3.2						
13.....	11	73	2.2						
14.....	10	92	2.5						
15.....	10	87	2.3						
16.....	11	89	2.6						
17.....	11	57	1.7						
18.....	275	2,900	sa 20,200						
19.....	4,900	14,800	sa 228,000						
20.....	2,140	16,000	sa 112,000						
21.....	1,030	20,000	sa 56,400						
22.....	780	14,500	sa 44,100						
23.....	3,210	18,600	sa 165,000						
24.....	793	12,600	sa 31,900						
25.....	--	--	--						
26.....	--	--	--						
27.....	--	--	--						
28.....	--	--	--						
29.....	--	--	--						
30.....	--	--	--						
31.....	--	--	--						
Total.	15,268.8	--	801,051.0						

Total discharge for period (cfs-days) 18,137.8
 Total load for period (tons) 898,870.1

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from partly estimated concentration graph.

RED RIVER BASIN--Continued

WASHITA RIVER NEAR FOSS, OKLA.--Continued

Particle-size analyses of suspended sediment, May 1956 to April 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of Collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
May 11, 1956.....	12:35 p.m.	17	65	394	633	72	79	85	92	98	100	--	--	--	BCW	
May 26.....	11:00 a.m.	353	70	14,600	2,720		43	54	69	77	81	83	85	97	100	SPCW
July 11.....	11:15 a.m.	1,230	71	23,900	3,180		47	61	75	85	91	93	96	100		SPCW
July 13.....	6:00 p.m.	60	75	8,330	1,960		86	92	98	99	100	--	--	--	--	SPCW
July 19.....	3:30 p.m.	210	72	18,200	3,680		50	64	84	93	98	99	100	--	--	SPCW
Oct. 16.....	11:00 a.m.	255	40	11,500	3,990		67	82	94	98	100	--	--	--	--	SPCW
Apr. 5, 1957.....	5:00 p.m.	90	51	9,200	2,770		78	89	94	97	98	99	100	--	--	SPCW
Apr. 18.....	1:00 p.m.	3,550	52	14,300	9,400		42	53	67	81	86	92	96	100		SPCW

RED RIVER BASIN--Continued
WASHITA RIVER NEAR FOSS, OKLA.--Continued

Particle-size analyses of bed material, May to October 1956.
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of Collection	Time	Discharge (cfs)	Water temperature (° F)	Bed material												Methods of analysis
				Depth	Station	Percent finer than indicated size, in millimeters										
						0.031	0.062	0.125	0.250	0.500	1.000	2.000	3.32	6.68 a	16.0	
May 11, 1956.....	12:45 p.m.	17		1.15	26		1.8	3.7	8.4	75	91	93	94	96	100	S
May 11.....	12:45 p.m.	17		1.15	33		1.7	3.3	6.2	43	77	76	81	86	100	S
May 11.....	12:45 p.m.	17		1.45	40		1.6	3.9	10	81	95	98	99	100	--	S
May 26.....	11:25 a.m.	353		4.0	48		.7	1.6	7.4	72	33	97	98	99	100	S
May 26.....	11:25 a.m.	353		4.9	60		1.2	2.6	8.1	60	81	88	92	95	100	S
May 26.....	11:25 a.m.	353		4.2	74		.6	1.5	5.1	67	91	96	97	99	100	S
June 5.....	3:15 p.m.	8.5		.45	14		.9	2.5	6.0	62	83	87	91	93	100	S
June 5.....	3:15 p.m.	8.5		.70	22		.7	1.8	6.2	60	78	84	89	95	100	S
June 5.....	3:15 p.m.	8.5		.60	26		1.1	2.6	4.0	48	84	93	96	97	100	S
July 11.....	12:10 p.m.	1,230		--	18		1.0	3.2	23	97	100	--	--	--	--	S
July 11.....	12:10 p.m.	1,230		--	29		4.3	12	52	94	98	99	100	--	--	S
July 11.....	12:10 p.m.	1,230		--	54		.8	1.8	8.1	52	80	87	90	93	100	S
July 13.....	6:00 p.m.	60		1.55	11		.3	1.9	8.9	63	82	88	93	96	100	S
July 13.....	6:00 p.m.	60		1.50	20		.6	1.2	4.7	50	82	91	95	97	100	S
July 13.....	6:00 p.m.	60		.85	30		.5	1.2	4.8	56	90	96	98	99	100	S
July 19.....	4:00 p.m.	210		3.0	11		3.1	6.8	18	71	90	94	97	98	100	S
July 19.....	4:00 p.m.	210		2.2	21		2.3	4.8	13	66	89	94	97	98	100	S
July 19.....	4:00 p.m.	210		1.4	39		2.6	5.5	14	61	87	93	98	99	100	S
Oct. 17.....	11:30 a.m.	--		1.5	40		59	71	75	94	100	--	--	--	--	S
Oct. 17.....	11:30 a.m.	--		3.0	58		.2	.5	4.6	48	73	78	81	86	100	S
Oct. 17.....	11:30 a.m.	--		.3	70		.3	1.2	18	99	100	--	--	--	--	S

^a Pebbles of various sizes.

RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.

LOCATION.--At gaging station at bridge on State Highway 9, 1,300 feet upstream from Running Creek, and 2.7 miles east of Carnegie, Caddo County. DRAINAGE AREA.--3,129 square miles including that of Running Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1953 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,870 ppm Sept. 21.

Hardness: Maximum, 1,150 ppm Feb. 11-20; minimum, 120 ppm Sept. 21.

Specific conductance: Maximum daily, 2,450 micromhos Feb. 9; minimum daily, 222 micromhos Sept. 21.

Water temperatures: Maximum, 89°F July 28, 31; Aug. 1-2; minimum, 33°F Jan. 27.

EXTREMES, 1953-57.--Dissolved solids: Maximum, 2,460 ppm May 9-10, 1956; minimum, 163 ppm Sept. 21, 1957.

Hardness: Maximum, 1,480 ppm May 9-10, 1956; minimum, 120 ppm Sept. 21, 1957.

Specific conductance: Maximum daily, 3,530 micromhos Aug. 26, 1954; minimum daily, 222 micromhos Sept. 21, 1957.

Water temperatures: Maximum, 90°F July 14, 30-31, 1955, July 5, 1956; minimum, freezing point on several days during January, February and March 1954, February 11, 1955.

REMARKS.--Records of specific conductance of daily samples are available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 are given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
															Parts per million	Tons per acre-foot	Calcium, mg./l.	Non-carbonate					
Oct. 1-10, 1956.....	0.92	18	0.02	188	37	56	3.9	306	0	404	58	0.4	2.0	0.18	947	1.29	620	369	16	1.0	1,280	8.0	
Oct. 11-15.....	43.7	--	--	174	40	38	9.4	280	0	375	43	--	1.8	--	840	1.14	600	370	12	1.7	1,150	7.9	
Oct. 16-20.....	831	--	--	80	20	22	8.0	140	0	163	10	--	2.9	--	389	.53	280	166	7	.2	562	7.6	
Oct. 21-23.....	43.7	--	--	80	22	29	8.0	126	0	169	18	--	3.0	--	393	.46	290	186	6	.2	578	7.7	
Oct. 24-31.....	42.1	--	--	118	27	29	7.9	168	0	265	38	--	2.6	--	599	.81	405	268	14	.6	858	7.7	
Nov. 1-2.....	95.5	--	--	154	37	59	15	176	0	379	88	--	1.9	--	884	1.20	535	391	19	1.1	1,280	7.7	
Nov. 3.....	86.0	--	--	88	26	15	12.4	124	0	208	26	--	3.5	--	461	.63	325	224	9	.4	672	7.5	
Nov. 4-10.....	36.1	--	--	154	38	23	10.0	180	0	382	31	--	2.8	--	765	1.04	575	540	9	.4	1,040	7.6	
Nov. 11-14.....	20.5	--	--	158	33	48	7.9	200	4	358	62	--	3.6	--	842	1.15	47	530	360	16	.9	1,140	8.3
Nov. 15-20.....	18.0	--	--	184	39	79	7.9	250	0	417	106	--	3.7	--	1,060	1.44	52	620	415	22	1.4	1,410	8.1
Nov. 21-30.....	18.0	--	--	240	49	117	11.7	286	10	542	168	--	2.4	--	1,400	1.90	68	800	549	24	1.8	1,850	8.3
Dec. 1-10.....	18.2	--	--	276	56	161	16.1	342	0	647	222	--	2.9	--	1,670	2.27	82	920	640	28	2.3	2,210	8.2
Dec. 11-20.....	19.3	--	--	284	71	147	14.7	320	12	697	220	--	2.2	--	1,740	2.37	91	1,000	718	24	2.0	2,280	8.3
Dec. 21-31.....	19.5	--	--	288	64	162	16.2	336	0	729	210	--	2.4	--	1,750	2.38	92	980	704	26	2.3	2,280	8.0
Jan. 1-10, 1957.....	17.0	--	--	290	82	110	11.0	326	8	730	182	--	2.4	--	1,740	2.37	80	1,060	780	18	1.5	2,220	8.3
Jan. 11-20.....	14.3	--	--	292	88	120	12.0	310	14	751	205	--	3.0	--	1,790	2.43	69	1,090	812	19	1.6	2,310	8.5
Jan. 21-31.....	15.2	--	--	298	82	118	11.8	326	12	749	190	--	3.1	--	1,730	2.35	71	1,080	793	19	1.6	2,300	8.4
Feb. 1-10.....	20.2	--	--	268	103	134	13.4	336	0	779	208	--	1.1	--	1,870	2.54	102	1,090	814	21	1.8	2,360	8.2
Feb. 11-20.....	21.4	--	--	280	110	100	10.0	328	8	789	185	--	2.0	--	1,840	2.50	106	1,150	868	16	1.3	2,310	8.3
Feb. 21-28.....	25.2	--	--	252	120	101	10.1	292	22	781	175	--	3.0	--	1,720	2.34	117	1,120	844	16	1.3	2,240	8.5

RED RIVER BASIN

203

Mar. 1-10, 1957.....	29.8	--	264	107	90	322	0	765	165	--	2.8	--	1,760	2.39	142	1,100	836	15	1.2	2,220	8.1
Mar. 11-20.....	21.4	--	232	110	73	308	0	719	132	--	1.7	--	1,580	2.16	92	1,030	778	13	1.0	2,020	8.2
Mar. 21-31.....	32.8	--	248	102	97	248	16	766	160	--	2.0	--	1,660	2.26	147	1,040	814	17	1.3	2,130	8.4
Apr. 1-2.....	28.0	--	234	74	85	208	28	739	62	--	1.2	--	1,430	1.94	108	890	673	17	1.2	1,700	9.0
Apr. 3-4.....	3,015	--	45	9.1	16	109	6	64	12	--	1.9	--	237	.32	1,930	150	50	19	.6	358	8.7
Apr. 5-10.....	639	--	90	29	32	144	10	238	20	--	2.8	--	511	.69	882	345	210	17	.7	733	8.6
Apr. 11-18.....	64.4	--	146	37	41	196	6	356	43	--	4.0	--	796	1.08	138	515	344	15	.8	1,090	8.3
Apr. 19-20.....	1,548	--	79	20	17	168	0	146	18	--	1.1	--	409	.56	1,710	280	142	11	.4	610	8.1
Apr. 21-25.....	7,448	--	49	6.2	8.5	114	0	59	6.8	--	2.4	--	196	.27	3,940	148	54	11	.3	334	7.7
Apr. 26-30.....	1,661	--	85	19	20	162	0	172	16	--	2.3	--	434	.59	1,950	290	159	13	.5	640	8.1
May 1.....	2,020	--	56	28	21	132	4	144	22	--	7.5	--	393	.53	2,140	255	142	15	.6	585	8.3
May 2-5.....	8,872	--	43	9.8	6.4	108	0	158	8.8	--	2.8	--	218	.30	5,220	148	60	9	.2	321	7.4
May 6-7.....	4,905	--	65	18	27	188	0	112	15	--	4.5	--	342	.47	4,530	235	82	20	.8	510	8.0
May 8-9.....	1,315	--	98	33	16	136	6	210	30	--	6.5	--	579	.79	2,060	300	252	5	.2	812	8.3
May 10-12.....	2,827	--	72	23	16	144	0	149	23	--	6.0	--	424	.58	3,240	275	156	11	.4	607	8.1
May 13.....	3,800	--	46	16	22	120	0	104	12	--	7.1	--	266	.36	2,730	182	84	21	.7	384	8.2
May 14-16.....	2,243	--	73	28	20	160	0	168	20	--	5.8	--	490	.61	2,730	295	165	13	.5	644	8.2
May 17.....	789	--	108	46	21	186	8	276	35	--	3.3	--	695	.95	1,480	460	284	9	.4	994	8.4
May 18-20.....	2,760	--	59	21	19	154	0	111	20	--	4.8	--	334	.48	2,640	230	106	15	.5	532	8.2
May 21-23.....	1,640	--	88	33	24	176	0	208	30	--	6.5	--	527	.72	2,330	355	212	13	.6	787	8.2
May 24-27.....	2,915	--	67	23	16	144	0	142	19	--	5.4	--	390	.53	3,070	260	144	12	.4	586	8.2
May 28-29.....	1,325	--	95	40	24	176	4	250	26	--	7.2	--	597	.81	2,140	400	250	12	.5	827	8.3
May 30-31.....	3,430	--	82	20	19	144	4	158	22	--	8.2	--	439	.58	3,970	285	162	12	.5	633	8.3
June 1-2.....	4,950	--	66	14	20	136	0	113	24	--	5.4	--	332	.45	4,440	225	112	16	.6	500	7.6
June 3-4.....	5,470	--	51	11	15	128	0	72	15	--	3.9	--	248	.34	3,660	172	87	16	.5	388	7.5
June 5.....	4,040	--	61	22	17	154	0	112	24	--	5.1	--	348	.47	3,800	245	118	13	.5	511	7.6
June 6-8.....	1,543	--	122	38	41	224	0	282	46	--	9.6	--	693	.94	2,890	460	276	16	.8	975	7.8
June 9-10.....	700	--	147	82	65	210	0	452	78	--	10	--	951	1.29	1,800	620	448	18	1.1	1,330	7.7
June 11-20.....	626	22	168	56	72	234	0	472	76	--	8.7	.53	1,030	1.40	1,740	650	458	19	1.2	1,370	8.2
June 21-30.....	576	--	149	41	46	208	0	377	51	--	6.4	--	879	1.20	1,370	540	370	16	.9	1,140	8.1

a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium-adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per acre-foot	Calcium, magnesium ^a	Non-carbonate				
July 1-10, 1957.....	172	--	--	228	83	109		232	0	747	125	--	3.3	--	1,590	2.16	738	910	720	21	1.6	1,920	8.0
July 11-20.....	99.5	28	0.07	248	107	130		240	0	836	144	0.3	3.5	0.77	1,710	2.33	459	1,060	864	21	1.7	2,110	8.0
July 21-22.....	136	--	--	236	80	139		154	0	862	175	--	3.0	--	1,690	2.30	621	970	844	24	1.9	2,110	7.9
July 23-26.....	289	--	--	164	37	43		166	0	434	45	--	3.7	--	888	1.21	645	560	424	14	.8	1,160	7.9
July 27-31.....	101	--	--	216	55	92		214	0	622	98	--	3.7	--	1,290	1.75	352	765	590	21	1.4	1,590	8.0
Aug. 1-10.....	61.0	--	--	266	87	115		240	0	814	158	--	2.8	--	1,720	2.34	283	1,020	824	20	1.6	2,110	8.1
Aug. 11-20.....	50.2	--	--	262	84	141		230	0	831	178	--	2.9	--	1,780	2.42	241	1,000	812	23	1.9	2,170	8.0
Aug. 21-31.....	33.8	--	--	260	83	133		244	0	808	168	--	1.6	--	1,750	2.38	160	990	790	23	1.8	2,160	7.9
Sept. 1-7.....	44.4	--	--	262	75	148		232	0	796	185	--	2.4	--	1,730	2.35	207	960	770	25	2.1	2,180	8.0
Sept. 8-9.....	57.5	--	--	188	42	59		176	0	498	72	--	4.5	--	1,060	1.44	165	640	498	17	1.0	1,320	7.9
Sept. 10-12.....	47.7	--	--	324	76	89		206	0	952	108	--	2.4	--	1,800	2.45	232	1,120	951	15	1.2	1,910	8.0
Sept. 13-15.....	35.3	--	--	200	59	62		234	0	569	63	--	2.0	--	1,150	1.56	110	740	546	15	1.0	1,400	8.1
Sept. 16.....	180	--	--	252	76	139		178	0	800	185	--	2.8	--	1,700	2.31	826	940	794	24	2.0	2,110	7.9
Sept. 17-20.....	58.2	--	--	131	25	21		136	0	315	22	--	5.7	--	644	.88	101	430	318	9	.4	862	7.8
Sept. 21.....	658	--	--	38	6.1	5.3		120	0	26	1.5	--	5.2	--	163	.22	290	120	22	9	.2	248	7.7
Sept. 22-25.....	578	--	--	78	17	27		124	0	177	42	--	6.2	--	435	.59	679	265	162	18	.7	610	7.8
Sept. 26.....	67.0	--	--	144	23	32		152	0	339	30	--	4.9	--	742	1.01	134	455	330	13	.6	938	7.9
Sept. 27-30.....	50.8	--	--	204	51	47		230	0	514	67	--	4.5	--	1,090	1.48	150	720	532	12	.8	1,340	8.0
Weighted average....	616	--	--	76	21	23		b148	--	160	24	--	4.3	--	423	0.58	704	275	154	15	0.6	604	--

a Values above 200 ppm are reported to the nearest 5 ppm.

b Includes equivalent of individual carbonate values shown above.

RED RIVER BASIN--Continued

WASHITA RIVER AT CARNEGIE, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	60	48	47	44	52	63	65	--	86	89	82
2	70	59	49	44	44	54	61	65	65	--	89	83
3	75	55	50	45	46	53	53	67	64	88	86	83
4	77	53	51	45	45	51	53	63	67	85	85	81
5	76	55	54	44	44	53	54	63	--	84	85	81
6	74	57	55	46	46	47	55	65	75	85	83	80
7	70	55	48	47	47	46	55	65	78	85	83	75
8	73	55	39	52	58	49	56	64	79	86	83	72
9	70	53	39	47	59	53	58	67	80	86	84	76
10	70	51	40	39	55	59	59	66	82	85	85	75
11	69	56	44	41	56	58	58	66	82	87	85	72
12	70	56	45	44	57	60	48	66	80	85	87	77
13	70	56	41	--	57	63	49	68	80	87	86	76
14	72	60	43	38	58	59	54	69	81	87	83	75
15	70	53	45	36	59	59	55	72	81	87	85	74
16	59	49	46	34	54	57	59	74	80	85	84	74
17	63	49	43	36	53	58	66	73	80	85	80	74
18	57	50	39	37	51	60	66	67	78	86	79	73
19	60	53	41	39	50	58	67	68	75	85	82	77
20	63	49	45	44	48	54	67	70	77	82	87	75
21	60	48	46	49	47	52	64	73	79	86	80	63
22	63	43	47	44	45	55	64	72	80	86	82	68
23	63	48	47	36	41	55	68	71	73	83	83	69
24	64	48	42	42	46	51	67	70	76	83	82	68
25	62	47	44	39	52	47	70	70	73	84	81	68
26	61	46	45	34	53	51	67	73	75	83	82	71
27	60	47	47	33	52	50	67	71	79	85	83	71
28	60	45	46	37	49	54	66	72	83	89	81	71
29	63	44	48	38	--	58	64	75	79	88	82	72
30	61	46	48	37	--	57	65	70	86	--	81	72
31	61	--	48	40	--	63	--	70	--	89	82	--
Average	66	52	46	41	51	55	61	69	77	86	84	75

RED RIVER BASIN--Continued
WASHITA RIVER NEAR PAULS VALLEY, OKLA.

LOCATION.--At gaging station at bridge on U.S. Highway 77, 2 miles northwest of Pauls Valley, Garvin County, 6 miles downstream from Owl Creek, and 7 miles upstream from Washington Creek.
DRAINAGE AREA.--5,330 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to August 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to August 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25°C)	pH
								Calcium, magnesium	Non- carbonate				
Oct. 15, 1956.....	0.69	45	63	80	372		67	420	115	29	1.7	1,120	7.5
Oct. 31.....	100	77	21	18	134		18	280	170	12	.5	636	7.2
Nov. 5.....	1,140	40	10	8.4	140		8.6	142	28	12	.3	328	7.8
Nov. 14.....	66.5	58	18	22	110		21	220	130	18	.6	524	6.8
Dec. 3.....	39.3	158	38	49	272		68	550	327	16	.9	1,240	8.2
Jan. 9, 1957.....	62.5	172	56	102	268		126	680	440	25	1.7	1,520	7.8
Jan. 22.....	80.1	178	72	97	308		72	740	488	22	1.6	1,590	7.7
Feb. 11.....	69.6	144	56	69	184		73	590	439	20	1.2	1,390	7.6
Feb. 28.....	127	162	65	75	254		86	670	462	20	1.3	1,570	7.7
Mar. 13.....	64.4	140	61	71	200		76	600	436	20	1.3	1,410	7.8
Mar. 29.....	167	152	59	78	260		70	620	407	21	1.4	1,400	7.6
Apr. 8.....	2,330	69	15	9.4	160		12	230	101	8	.3	485	7.3
Apr. 17.....	237	112	34	41	200		32	420	256	17	.9	889	7.4
Apr. 22.....	3,520	86	26	12	188		14	320	166	8	.3	638	8.0
May 2.....	3,580	96	31	16	234		14	365	173	9	.4	674	7.8
May 7.....	5,950	75	19	8.4	226		8.8	265	79	7	.2	473	7.7
May 13.....	7,200	122	34	11	296		16	445	201	5	.2	748	7.3
May 16.....	4,220	107	31	14	232		13	395	205	7	.3	748	7.4
June 18.....	3,470	115	45	21	266		24	470	252	9	.4	906	7.5
July 1.....	1,160	114	46	26	252		23	475	268	11	.5	924	7.4
Aug. 1.....	309	118	65	45	222		48	580	378	15	.8	1,230	7.4
Aug. 14.....	157	136	76	49	302		54	650	402	14	.8	1,360	7.7

a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued

ROCK CREEK NEAR DOUGHERTY, OKLA.

LOCATION.--At gaging station at bridge on State Highway 7-C, 1 mile east of Dougherty, Murray County, and 1 mile upstream from mouth. DRAINAGE AREA.--138 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,760 ppm Oct. 1-10; minimum, 145 ppm May 17-18.

Hardness: Maximum, 470 ppm Dec. 1-7; minimum, 110 ppm Sept. 23-24.

Specific conductance: Maximum daily, 3,250 micromhos Oct. 2; minimum daily, 171 micromhos Sept. 21.

Water temperatures: Maximum, 96°F July 27, 29, 31, Aug. 1, 2; minimum, freezing point on several days during November, December, and January.

REMARKS.--Records of specific conductance of daily samples are available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 are given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lid adorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium-magne-sium	Non-carbon-ate				
Oct. 1-10, 1956.....	0.90	12	0.02	84	51	467	9.4	254	0	135	790	0.6	2.3	0.79	1,760	2.39	4.3	420	212	70	3,060	7.9	
Oct. 11-20.....	2.88	--	--	93	55	425	--	274	0	129	740	--	1.6	--	1,650	2.24	13	460	236	67	2,920	7.8	
Oct. 21-29.....	4.23	--	--	102	43	394	--	276	0	138	680	--	1.0	--	1,580	2.15	18	430	204	67	2,800	8.0	
Oct. 30-31.....	10.5	--	--	85	37	314	--	244	0	106	550	--	1.7	--	1,280	1.74	36	365	165	65	2,300	7.7	
Nov. 1-3.....	4.97	--	--	100	37	306	--	246	0	124	530	--	3.7	--	1,300	1.77	17	400	198	62	2,270	7.9	
Nov. 4-5.....	70.0	--	--	66	28	103	--	180	0	77	198	--	7.2	--	625	.85	118	280	132	44	1,070	7.9	
Nov. 6-9.....	9.25	--	--	81	38	146	--	192	0	103	285	--	5.7	--	808	1.10	20	360	202	47	1,480	7.8	
Nov. 10.....	4.80	--	--	92	29	251	--	150	0	127	450	--	3.2	--	1,080	1.47	14	350	227	61	2,910	7.9	
Nov. 11-12.....	6.65	--	--	96	38	236	--	250	0	107	400	--	3.6	--	1,040	1.41	19	395	190	57	2,870	8.2	
Nov. 13-19.....	18.9	--	--	116	40	309	--	292	0	118	550	--	1.9	--	1,340	1.82	68	455	216	60	2,350	8.0	
Nov. 20.....	246	--	--	62	21	115	--	180	0	44	205	--	1.8	--	577	.78	383	240	92	51	1,030	7.9	
Nov. 21.....	28.0	--	--	54	8.6	57	--	156	0	25	98	--	3.3	--	345	.47	26	170	42	42	1,612	8.1	
Nov. 22-25.....	3.12	--	--	76	27	131	--	200	0	79	245	--	3.6	--	686	.95	5.9	300	136	49	3.3	1,240	7.9
Nov. 26-30.....	3.60	--	--	106	33	226	--	280	0	107	398	--	4.2	--	1,070	1.46	10	400	170	55	4.9	1,870	8.0
Dec. 1-7.....	9.00	--	--	122	40	296	--	306	10	125	530	--	3.0	--	1,360	1.85	33	470	202	58	5.9	2,360	8.5
Dec. 8.....	8.20	--	--	76	22	141	--	208	6	61	275	--	5.2	--	760	1.03	17	280	100	52	3.7	1,310	8.4
Dec. 9-10.....	6.55	--	--	104	32	226	--	256	10	95	390	--	4.6	--	1,070	1.46	19	390	184	56	5.0	1,840	8.5
Dec. 11-18.....	7.68	--	--	116	35	246	--	304	0	119	470	--	4.2	--	1,230	1.67	26	435	186	55	5.1	2,130	8.1
Dec. 19-20.....	332	--	--	62	9.7	24	--	138	0	23	42	--	3.2	--	234	.32	210	145	32	26	.9	389	8.0
Dec. 21.....	41.0	--	--	69	14	70	--	196	0	53	117	--	7.5	--	465	.63	51	230	70	40	2.0	782	8.2

^a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued
ROCK CREEK NEAR DOUGHERTY, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-lidum absorp-tion ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, mg/l.	Non-carbonate				
Dec. 22-25, 1956...	23.8	--	--	90	23	122		254	0	77	202	--	28	--	709	0.96	46	320	112	45	3.0	1,190	8.2
Dec. 26-31.....	20.2	7.5	0.01	104	35	181		312	0	97	315	--	6.0	--	982	1.34	54	405	150	49	3.9	1,660	8.2
Jan. 1-10, 1957....	9.72			84	49	234		314	0	101	390	0.3	2.9	0.38	1,090	1.48	29	410	154	55	5.0	1,900	8.1
Jan. 11-17.....	4.60	--	--	107	45	269		310	8	108	480	--	6.8	--	1,260	1.71	16	450	182	56	5.5	2,100	8.4
Jan. 18.....	4.20	--	--	68	17	120		160	4	52	215	--	6.6	--	614	.84	7.0	240	102	52	3.4	1,070	8.4
Jan. 19-20.....	4.20	--	--	98	35	222		242	8	103	390	--	5.1	--	1,100	1.50	12	390	178	55	4.9	1,820	8.4
Jan. 21-22.....	14.8	--	--	101	38	235		264	12	113	400	--	4.0	--	1,170	1.59	47	410	174	55	5.0	1,910	8.4
Jan. 23-31.....	14.2	--	--	83	32	138		244	0	81	250	--	3.8	--	817	1.11	31	340	140	47	3.3	1,310	8.2
Feb. 1-4.....	20.5	--	--	78	23	83		236	4	62	145	--	3.0	--	566	.77	31	290	90	38	2.1	952	8.3
Feb. 5.....	718	--	--	42	5.6	9.7		135	2	11	13	--	6.5	--	180	.24	349	128	14	14	.4	269	8.3
Feb. 6-7.....	93.5	--	--	65	17	31		195	0	39	66	--	5.7	--	366	.50	92	230	70	23	.9	582	8.2
Feb. 8-10.....	36.7	--	--	86	23	57		256	0	55	115	--	4.5	--	529	.72	52	310	100	28	1.4	867	8.1
Feb. 11-14.....	18.0	--	--	90	28	98		262	8	70	178	--	2.6	--	674	.92	33	340	112	39	2.3	1,090	8.4
Feb. 15-20.....	14.7	--	--	90	34	121		276	0	77	228	--	1.4	--	761	1.03	30	355	139	42	2.8	1,260	8.2
Feb. 21-28.....	14.0	6.5	.00	83	35	156		296	0	84	255	.4	1.7	.24	813	1.11	31	350	108	49	3.9	1,400	8.1
Mar. 1-4.....	23.0	--	--	86	27	130		266	8	70	212	--	4.3	--	734	1.00	46	325	94	46	3.1	1,240	8.4
Mar. 5.....	451	--	--	48	7.3	12		162	2	8.6	17	--	8.5	--	215	.29	262	150	14	15	.4	357	8.3
Mar. 6-7.....	65.0	--	--	69	12	63		214	4	36	63	--	5.9	--	344	.47	60	220	38	30	1.3	614	8.4
Mar. 8-10.....	30.7	--	--	85	21	67		264	10	56	108	--	2.4	--	540	.73	45	300	67	33	1.7	952	8.5
Mar. 11-20.....	25.2	7.5	.01	74	25	110		260	0	67	170	.3	2.0	.19	629	.86	43	290	75	45	2.8	1,060	8.0
Mar. 21.....	169	--	--	44	9.7	13		166	0	9.1	21	--	3.2	--	197	.27	90	150	14	15	.4	371	8.2
Mar. 22-31.....	48.5	--	--	74	17	59		250	0	44	92	--	2.5	--	438	.60	55	235	49	34	1.6	761	8.2
Apr. 1-2.....	866	--	--	51	14	22		186	6	25	28	--	3.5	--	260	.35	608	184	22	20	.7	438	8.5
Apr. 3-4.....	581	--	--	53	7.8	12		180	2	12	17	--	3.2	--	218	.30	342	164	13	14	.4	371	8.3
Apr. 5-10.....	75.8	--	--	82	16	46		270	4	42	70	--	2.9	--	432	.89	88	270	44	27	1.2	710	8.3
Apr. 11-19.....	37.0	8.0	.00	69	21	69		252	0	50	116	.1	1.6	.18	503	.68	50	260	54	37	1.9	836	8.1
Apr. 20-30.....	1,022	--	--	64	11	16		220	0	24	22	--	3.5	--	270	.37	745	205	24	15	.5	448	8.2
May 1-4.....	776	--	--	66	8.6	17		184	18	34	20	--	2.3	--	285	.36	555	200	19	15	.5	419	8.7
May 5-10.....	148	--	--	69	19	29		216	10	42	51	--	4.0	--	368	.50	147	250	56	20	.8	618	8.4
May 11-12.....	49.0	--	--	46	15	40		164	8	42	51	--	1.3	--	296	.40	39	178	30	33	1.3	545	8.4

RED RIVER BASIN

209

May 13, 1957.....	2,920	--	--	40	5.8	9.0	130	8	9.9	7.2	--	3.6	--	153	21	1,210	124	4	14	4	253	8.5
May 14-16.....	499	--	--	62	17	31	220	8	35	42	--	3.1	--	336	46	453	295	30	23	9	415	8.4
May 17-18.....	9,430	--	--	--	40	5.1	124	10	10	7.5	--	2.3	--	145	20	3,890	150	12	8	2	251	8.4
May 19-20.....	584	--	--	54	15	19	186	8	31	26	--	3.7	--	282	38	445	196	30	18	6	318	8.4
May 21.....	251	--	--	70	25	24	276	6	38	35	--	4.0	--	357	49	242	275	40	16	6	622	8.3
May 22-24.....	1,272	--	--	42	16	23	162	8	32	28	--	4.5	--	282	40	1,000	172	26	23	8	526	8.4
May 25.....	3,820	--	--	56	5.7	8.7	136	12	8.2	8.0	--	4.4	--	189	22	1,580	136	4	12	3	274	8.6
May 26-28.....	378	--	--	45	12	16	188	12	21	17	--	2.3	--	289	39	295	188	14	15	5	400	8.5
May 29-30.....	468	--	--	64	13	19	202	4	38	28	--	3.6	--	285	40	373	210	40	17	6	477	8.3
May 31.....	1,430	--	--	50	9.0	14	148	12	26	15	--	5.0	--	206	28	795	162	20	16	5	347	8.6
June 1-4.....	1,065	--	--	61	9.7	11	220	0	15	12	--	2.5	--	221	30	635	192	12	11	3	381	7.7
June 5-10.....	311	--	--	67	15	31	252	0	28	35	--	2.6	--	304	41	255	230	22	21	8	547	7.6
June 11-20.....	190	16	.07	57	23	44	260	0	35	63	1.3	1.3	.42	368	50	189	235	23	29	1.2	623	7.9
June 21-30.....	70.6	--	--	62	22	51	244	0	38	80	--	2.2	--	392	53	75	245	44	31	1.4	679	7.0
July 1-10.....	41.9	--	--	62	27	83	270	0	38	131	--	1.2	--	491	67	56	265	44	40	2.2	876	7.6
July 11-20.....	28.0	--	--	54	29	109	234	0	42	178	--	2.0	--	547	74	41	250	60	48	3.0	989	7.8
July 21.....	27.0	--	--	51	34	124	244	0	42	205	--	2.2	--	580	80	43	265	60	50	3.3	1,130	7.8
July 22-26.....	44.4	--	--	40	17	45	164	0	21	78	--	2.3	--	305	41	37	170	36	37	1.5	808	7.6
July 27-31.....	25.8	--	--	52	27	102	236	0	40	160	--	1.6	--	505	89	35	240	46	48	2.9	932	7.7
Aug. 1-10.....	20.1	--	--	56	33	121	256	0	43	200	--	1.6	--	621	84	34	275	66	49	3.2	1,110	7.8
Aug. 11-20.....	18.3	--	--	57	33	128	260	0	44	208	--	2.0	--	635	86	31	275	63	50	3.4	1,170	7.8
Aug. 21-31.....	16.4	--	--	60	37	141	278	0	43	235	--	2.0	--	696	95	31	300	72	50	3.5	1,270	7.6
Sept. 1-10.....	16.2	--	--	56	38	150	280	0	43	245	--	1.6	--	695	98	30	295	66	52	3.8	1,250	7.8
Sept. 11-14.....	19.0	--	--	59	37	141	284	0	43	225	--	2.4	--	665	90	34	300	57	51	3.5	1,210	7.8
Sept. 15-16.....	526	--	--	40	7.8	22	146	0	15	30	--	2.6	--	210	29	296	130	12	26	8	346	7.4
Sept. 17-18.....	23.0	--	--	70	22	73	266	0	35	118	--	2.5	--	475	65	29	265	46	38	2.0	820	7.8
Sept. 19-20.....	16.5	--	--	75	34	100	506	0	40	178	--	2.6	--	560	80	26	350	77	40	2.4	1,060	7.8
Sept. 21-22.....	172	--	--	36	5.4	9.7	128	0	3.4	11	--	3.0	--	233	21	71	110	7	18	4	235	7.4
Sept. 23-24.....	4,200	--	--	69	12	26	238	0	24	38	--	3.3	--	198	41	3,380	220	25	20	8	501	7.7
Sept. 25-30.....	56.0	--	--	78	23	59	308	0	37	87	--	2.2	--	445	61	67	280	36	31	1.5	768	7.7
Weighted average	222	--	--	55	12	22	b196	--	22	34	--	3.1	--	262	0.36	157	186	26	20	0.7	446	--

a Values above 200 ppm are reported to the nearest 5 ppm.
b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

ROCK CREEK NEAR DOUGHERTY, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	52	34	51	--	60	56	62	75	90	96	88
2	75	51	55	41	39	50	58	66	68	94	96	89
3	70	43	43	49	45	52	52	64	69	94	93	95
4	69	51	51	43	43	45	47	66	68	--	86	--
5	67	51	53	47	40	44	55	64	76	90	92	89
6	--	51	65	50	39	41	58	67	79	--	94	92
7	62	49	53	50	40	43	61	66	85	90	91	--
8	70	41	41	58	58	39	50	63	88	95	90	--
9	63	39	32	--	62	50	56	70	86	--	93	80
10	65	49	--	36	59	62	57	67	85	91	94	--
11	63	--	--	39	50	61	57	62	87	94	95	78
12	62	48	33	47	58	60	46	69	81	89	92	79
13	72	52	32	40	58	60	46	64	86	91	91	78
14	68	--	37	34	53	57	57	--	88	90	--	73
15	65	50	40	34	58	57	52	85	--	90	90	67
16	64	39	47	32	52	53	55	79	85	93	91	65
17	65	34	39	32	55	50	67	64	85	92	94	83
18	64	41	39	35	40	60	61	61	84	94	92	69
19	63	44	44	32	45	55	--	68	85	94	93	79
20	61	42	45	35	50	47	61	71	85	--	90	75
21	59	43	45	40	43	64	59	85	85	90	88	69
22	58	55	53	39	44	53	62	67	87	--	90	71
23	60	51	47	36	49	51	61	63	78	95	75	61
24	61	50	48	41	50	41	61	69	84	--	79	61
25	64	44	52	32	55	38	68	69	80	--	70	70
26	55	32	52	32	49	49	61	71	85	--	75	71
27	55	32	52	32	50	43	61	70	86	96	88	67
28	62	40	--	32	50	59	60	--	87	94	88	72
29	60	32	43	32	--	60	60	--	87	96	90	64
30	62	41	35	32	--	58	65	--	91	94	92	63
31	59	--	52	35	--	58	--	--	--	96	86	--
Average	64	45	45	39	49	52	58	68	83	--	89	75

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.

LOCATION. ---At gaging station at bridge on State Highway 18, 1.3 miles downstream from Caddo Creek, and 4 miles north of Durwood, Carter County. DRAINAGE AREA. ---7,202 square miles.

RECORDS AVAILABLE. ---Chemical analyses: May 1944 to September 1957.

Water temperatures: April 1947 to September 1957.

EXTREMES 1956-57. ---Dissolved solids: Maximum, 1,170 ppm Jan. 23; minimum, 169 ppm May 17-20.

Hardness: Maximum, 540 ppm July 11-20; minimum, 98 ppm Oct. 15.

Specific conductance: Maximum daily, 1,830 microhos Jan. 23; minimum daily, 234 microhos Oct. 15.

Water temperatures: Maximum, 85°F July 28-31, Aug. 2-3; minimum, freezing point on Jan. 15-17, 26.

EXTREMES 1944-57. ---Dissolved solids: Maximum, 1,170 ppm Jan. 23, 1957; minimum, 70 ppm Nov. 2, 1951.

Hardness: Maximum, 715 ppm Dec. 11-20, 1955; minimum, 41 ppm Nov. 2, 1951.

Specific conductance: Maximum daily, 1,830 microhos Jan. 23, 1957; minimum daily, 94.9 microhos Nov. 2, 1951.

Water temperatures (1947-57): Maximum, 87°F Aug. 6, 1950; minimum, freezing point, on many days during winter months.

REMARKS. ---Records of specific conductance of daily samples are available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1957 given in WSP 1511. No flow on Oct. 1, 7-12.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium	Non-carbonate			
Oct. 2-3, 1956.....	16.2	--	--	34	55	64	382	0	23	78	78	--	1.9	--	428	0.80	310	0	31	811	8.1
Oct. 4-6.....	6.67	--	--	48	18	28	190	0	55	30	30	--	2.9	--	284	.39	196	40	24	487	7.8
Oct. 13-14.....	10.6	--	--	62	29	38	286	0	60	44	44	--	1.9	--	377	.51	275	40	24	651	7.9
Oct. 18.....	11.0	--	--	30	5.6	8.0	100	0	13	10	10	--	4.9	--	145	.20	43	16	15	234	7.1
Oct. 18-17.....	2.20	--	--	18	18	25	186	0	42	25	25	--	3.7	--	236	.35	13	180	28	444	7.6
Oct. 18-20.....	3.60	--	--	69	33	42	318	0	72	43	43	--	4.2	--	422	.57	41	48	23	717	7.9
Oct. 21.....	7.20	--	--	58	29	45	278	0	76	38	38	--	3.3	--	384	.52	75	37	27	1,240	8.0
Oct. 22.....	62	--	--	82	39	142	198	0	175	230	230	--	5.2	--	811	1.10	365	202	46	1,340	7.8
Oct. 23-24.....	876	--	--	112	34	50	140	0	322	52	52	--	7.6	--	678	.92	420	308	21	969	7.8
Oct. 25-31.....	181	--	--	80	23	32	132	0	192	36	36	--	5.9	--	456	.62	295	187	19	683	7.7
Nov. 1-3.....	107	--	--	74	21	36	152	0	143	50	50	--	4.9	--	419	.57	121	146	22	681	8.0
Nov. 4.....	305	--	--	86	28	66	156	0	144	135	135	--	5.1	--	590	.80	486	330	30	946	8.1
Nov. 5-10.....	893	--	--	44	11	26	122	0	67	28	28	--	2.8	--	244	.33	588	156	26	415	7.6
Nov. 11-20.....	109	12	0.00	62	22	34	149	0	136	42	42	--	4.3	0.12	390	.53	115	245	23	633	7.0
Nov. 21.....	294	--	--	80	21	99	188	0	88	178	178	--	4.0	--	590	.80	468	285	43	1,030	8.1
Nov. 22-24.....	80.7	--	--	72	15	43	170	0	96	65	65	--	3.0	--	387	.53	84	240	28	654	7.9
Nov. 25-30.....	58.2	--	--	108	34	62	218	0	234	85	85	--	3.0	--	656	.80	103	410	232	1,020	8.1
Dec. 1-6.....	51.2	--	--	104	39	62	220	0	242	84	84	--	3.7	--	711	.97	98	420	24	1,060	8.2
Dec. 7-9.....	246	--	--	50	10	26	142	0	55	34	34	--	3.7	--	270	.37	179	170	52	449	8.1
Dec. 10.....	114	--	--	102	26	50	204	10	187	61	61	--	5.4	--	587	.80	181	360	23	878	8.5

a Values above 200 ppm are reported to the nearest 5 ppm.

RED RIVER BASIN--Continued
WASHITA RIVER NEAR DURWOOD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per-cent so-dium	So-dium ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium, magne-sium	Non-carbon-ate				
Dec. 11-18, 1956...	90.6	--	--	124	35	79		252	0	246	114	--	3.7	--	762	1.06	455	248	27	1.6	1,190	8.0
Dec. 19-20.....	3,075	--	--	42	5.6	14		136	0	51	14	--	5.6	--	190	.26	1,580	128	16	1.6	278	8.2
Dec. 21-22.....	1,127	--	--	63	13	27		190	0	22	39	--	6.4	--	330	.45	1,000	210	54	22	526	8.2
Dec. 23-31.....	232	--	--	100	27	232		54	0	148	80	--	4.0	--	606	.82	380	360	152	25	915	7.7
Jan. 1-10, 1957.....	101	--	--	115	40	80		264	0	231	117	--	2.7	--	722	.98	197	450	234	28	1,150	7.7
Jan. 11-20.....	74.1	2.5	0.07	144	39	99	--	300	0	291	135	0.3	3.0	0.13	915	1.24	183	520	274	29	1,360	7.7
Jan. 21-22.....	116	--	--	128	46	86		244	8	298	122	--	1.7	--	947	1.29	297	510	296	27	1,290	8.3
Jan. 23.....	188	--	--	100	49	182		164	4	269	300	--	2.3	--	1,170	1.59	594	450	309	47	1,830	8.4
Jan. 24-25.....	298	--	--	98	32	63		204	4	205	98	--	7	--	688	.95	562	375	202	27	1,975	8.3
Jan. 26-27.....	144	--	--	62	18	29		172	2	83	44	--	1.4	--	385	.52	150	230	86	22	571	8.3
Jan. 28-31.....	126	--	--	97	29	42		190	6	151	90	--	1.4	--	655	.89	223	360	194	20	930	8.4
Feb. 1-4.....	342	--	--	64	48	40		214	18	128	72	--	3.2	--	503	.68	464	355	150	20	837	8.5
Feb. 5-7.....	1,723	--	--	42	28	14		164	8	49	34	--	3.8	--	274	.37	1,270	220	72	12	489	8.5
Feb. 8-10.....	551	--	--	54	43	22		212	16	85	48	--	5.1	--	413	.56	614	310	112	13	690	8.5
Feb. 11-20.....	208	--	--	96	31	39		214	8	149	76	--	2.6	--	525	.71	296	370	179	19	889	8.4
Feb. 21-28.....	168	--	--	107	43	52		206	10	206	108	--	1.9	--	670	.91	304	440	256	20	1,090	8.4
Mar. 1-4.....	198	--	--	107	40	41		182	0	209	108	--	1.4	--	671	.91	359	430	281	17	1,070	7.7
Mar. 5-8.....	922	--	--	75	17	30		192	2	66	64	--	3.85	--	385	.52	958	255	95	20	640	8.5
Mar. 9-10.....	363	--	--	98	40	33		238	12	151	76	--	3.3	--	608	.83	596	410	195	15	901	8.5
Mar. 11-20.....	251	--	--	--	36	36		208	0	166	80	--	2.3	--	588	.30	398	380	210	17	887	8.1
Mar. 21.....	1,790	--	--	44	8.8	28		128	4	49	29	--	3.7	--	31	1.10	146	34	29	1.0	392	8.4
Mar. 22-25.....	783	--	--	61	18	45		172	6	70	69	--	2.0	--	401	.55	848	225	75	30	643	8.5
Mar. 26-31.....	288	--	--	92	37	62		218	4	190	92	--	2.0	--	687	.87	495	380	195	26	988	8.5
Apr. 1-2.....	2,605	--	--	51	12	24		166	2	55	31	--	1.4	--	280	.38	1,970	190	50	21	474	8.3
Apr. 3-5.....	7,840	--	--	48	9.7	16		168	0	26	20	--	2.9	--	209	.28	4,420	160	22	18	376	8.2
Apr. 6-10.....	2,486	--	--	71	18	23		174	0	111	29	--	3.6	--	356	.48	2,390	250	110	17	586	8.1
Apr. 11-12.....	1,060	--	--	15	15	20		152	0	83	24	--	4.2	--	294	.40	841	205	82	17	488	8.2
Apr. 13-20.....	535	--	--	92	23	31		192	0	161	45	--	4.8	--	486	.66	702	325	168	17	756	8.1
Apr. 21-30.....	18,160	13	.02	32	19	13		152	0	38	17	--	3.6	.06	224	.30	10,980	160	36	15	360	7.9
May 1-10.....	11,080	--	--	55	13	19		160	0	59	26	--	3.2	--	282	.38	8,440	190	59	18	442	8.0

May 11-16, 1957.....	11,510	--	--	58	14	21	160	0	72	29	--	3.3	--	300	.41	9,320	205	73	18	0.6	479	7.6
May 17-20.....	64,550	--	--	56	7.5	15	130	0	18	8.8	--	2.5	--	169	.23	29,430	121	14	13	.3	268	8.1
May 21-25.....	16,240	--	--	62	14	15	174	0	61	26	--	3.6	--	307	.42	13,460	210	70	14	.5	376	8.1
May 26-27.....	36,200	--	--	49	13	15	194	0	46	13	--	3.2	--	250	.34	24,440	178	52	9	.3	377	8.2
May 28-29.....	10,050	--	--	62	18	15	164	6	123	26	--	3.8	--	426	.58	11,560	260	136	10	.4	593	8.3
May 30.....	8,690	--	--	91	20	42	190	2	142	63	--	5.7	--	538	.73	12,580	310	151	23	1.0	788	8.3
May 31.....	28,200	--	--	61	16	15	160	0	78	24	--	5.2	--	323	.44	24,590	220	87	13	.4	491	8.2
June 1-6.....	18,880	--	--	54	13	21	160	0	59	27	--	3.1	--	302	.41	15,390	188	57	19	.7	446	8.1
June 7-10.....	7,770	--	--	71	19	27	186	0	106	35	--	3.6	--	435	.59	9,130	255	104	19	.7	595	8.1
June 11-14.....	3,348	--	--	89	29	44	210	0	170	61	--	3.7	--	556	.76	5,030	340	170	22	1.0	822	8.1
June 15-20.....	8,013	--	--	60	17	25	166	0	85	33	--	4.3	--	330	.45	7,140	220	84	20	.7	521	8.0
June 21-30.....	3,221	--	--	89	30	39	208	0	175	52	--	3.5	--	581	.79	5,050	345	174	20	.9	799	8.1
July 1-10.....	1,180	--	--	--	98	41	214	0	245	72	--	1.9	--	708	.96	2,260	415	238	22	1.2	988	8.1
July 11-20.....	760	22	.01	79	96	73	304	0	324	96	--	1.6	.68	849	1.15	1,740	540	291	24	1.5	1,240	7.9
July 21-22.....	700	--	--	104	58	60	200	0	320	93	--	1.6	--	829	1.13	1,570	500	336	21	1.2	1,160	8.0
July 23-29.....	1,514	--	--	66	31	38	196	0	138	47	--	3.7	--	490	.67	2,000	290	130	22	1.0	689	8.0
July 30-31.....	735	--	--	116	51	57	210	0	324	80	--	2.4	--	810	1.10	1,610	500	328	20	1.1	1,030	8.0
Aug. 1-10.....	409	--	--	108	61	62	242	0	318	9.0	--	8	--	833	1.13	920	520	322	21	1.2	1,200	8.0
Aug. 11-20.....	297	--	--	85	69	71	266	0	281	99	--	5	--	778	1.06	624	485	277	24	1.4	1,180	8.1
Aug. 21-31.....	210	--	--	152	33	76	284	0	297	109	--	.8	--	884	1.20	501	515	298	24	1.4	1,240	8.0
Sept. 1-10.....	163	--	--	104	58	87	276	0	297	108	--	1.2	--	825	1.12	383	500	274	27	1.7	1,260	8.1
Sept. 11-17.....	715	--	--	96	58	79	280	0	251	108	--	1.2	--	770	1.03	1,490	480	242	26	1.6	1,200	8.0
Sept. 18-20.....	434	--	--	47	16	31	148	0	64	42	--	2.8	--	283	.38	332	182	60	27	1.0	500	7.7
Sept. 21.....	10,800	--	--	78	43	53	198	0	212	71	--	3.3	--	585	.80	17,060	370	208	24	1.2	921	7.9
Sept. 22-30.....	4,755	--	--	77	21	19	170	0	140	24	--	3.2	--	379	.52	4,870	280	140	13	.5	598	7.6
Weighted average...	3,555	--	--	54	16	20	b162	--	70	26	--	3.2	--	303	0.41	2,850	200	68	18	0.6	465	--

a Values above 200 ppm are reported to the nearest 5 ppm.
b Includes equivalent of individual carbonate values shown above.

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

WASHITA RIVER NEAR DURWOOD, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	69	56	42	45	39	48	60	67	69	82	84	78
2	69	58	42	43	--	52	60	69	69	83	85	79
3	--	52	46	43	50	52	60	65	62	84	85	78
4	70	53	52	46	45	50	56	61	68	84	83	78
5	69	50	55	45	46	48	52	61	69	81	80	77
6	68	50	59	47	47	48	53	65	72	79	79	78
7	66	50	52	44	50	48	59	65	75	83	75	--
8	65	49	46	51	54	42	54	65	76	80	76	--
9	63	45	37	38	58	45	52	--	79	82	77	--
10	65	47	37	40	57	53	55	68	80	83	79	72
11	66	50	43	38	55	59	55	67	79	84	80	66
12	63	52	39	40	52	52	51	62	80	84	83	68
13	69	53	37	37	52	56	54	66	78	84	81	70
14	69	61	40	35	50	57	57	67	80	84	82	73
15	65	55	41	32	58	51	54	69	79	84	80	72
16	66	42	39	32	52	54	56	72	75	82	78	72
17	68	43	43	32	48	55	59	68	77	--	78	75
18	67	45	42	46	51	54	65	65	76	82	76	67
19	65	49	39	39	49	53	65	65	75	83	75	70
20	64	--	45	50	48	53	66	62	77	82	76	70
21	60	46	46	52	45	50	62	71	79	82	77	70
22	59	45	48	37	50	50	63	74	79	81	76	67
23	63	43	45	38	45	55	62	68	79	79	71	67
24	64	43	43	37	45	52	64	67	73	81	80	68
25	65	46	40	34	50	48	65	69	73	81	83	68
26	57	42	42	32	50	49	64	68	74	81	83	68
27	50	40	42	33	46	48	63	69	74	83	82	67
28	57	42	44	36	49	45	65	72	79	85	78	65
29	60	38	43	35	--	42	65	72	83	83	76	65
30	62	39	43	38	--	55	65	73	83	85	78	65
31	56	--	43	40	--	59	--	70	--	85	78	--
Average	64	48	44	40	50	51	59	67	76	83	79	71

RED RIVER BASIN--Continued

RED RIVER AT DENISON DAM, NEAR DENISON, TEX.

LOCATION.--Immediately below dam on Red River, 1.7 miles upstream from Sand Creek, 4 miles northwest of Denison, Grayson County, and 3 miles upstream from gaging station near Colbert, Bryan County, Okla.

DRAINAGE AREA.--39,719 square miles above dam, 39,777 square miles above gaging station, of which 5,936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1957.

Water temperatures: October 1945 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,380 ppm Dec. 1-31; minimum, 696 ppm June 1-30.

Hardness: Maximum, 465 ppm Dec. 1-31; minimum, 256 ppm June 1-30.

Specific conductance: Maximum daily, 2,430 micromhos Mar. 20; minimum daily, 1,040 micromhos June 19, July 5.

EXTREMES, 1944-57.--Dissolved solids: Maximum, 1,430 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 464 ppm Oct. 21-31, 1945.

Hardness: Maximum, 522 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 233 ppm Dec. 21-31, 1945; Jan. 11-20, 1946.

Specific conductance: Maximum daily, 3,520 micromhos Aug. 14, 1944; minimum daily, 656 micromhos Oct. 16, 1945.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues of evaporation concentrations more than 1,000 ppm are calculated from determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Colbert, Okla., for water year October 1956 to September 1957 given in WSP 1511. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956	66.7	12		132	32	299		124	333	470		0.8		1,340	1.82	241	461	360	59	6.1	2,200	8.0
Nov. 1-30	79.6	10		131	32	306		122	340	475		.8		1,350	1.84	290	458	358	59	6.2	2,240	7.7
Dec. 1-31	677	12		134	32	311		123	342	485		.7		1,380	1.88	2,520	465	364	59	6.3	2,290	7.8
Jan. 1-31, 1957	2,115	9.8		130	32	311		126	330	485		.8		1,360	1.85	7,770	455	352	60	6.3	2,260	7.9
Feb. 1-28	1,513	9.6		135	30	310		124	330	488		.5		1,360	1.85	5,560	460	359	59	6.3	2,320	8.2
Mar. 1-31	1,481	9.2		133	32	298		124	323	478		.5		1,330	1.81	5,320	464	362	58	6.0	2,260	7.8
Apr. 1-30	3,201	11		130	31	284		123	324	445		3.0		1,290	1.75	11,150	452	351	58	5.8	2,170	8.0
May 1-31	34,840	11		97	22	200		113	218	315		3.5		986	1.34	92,750	332	240	57	4.8	1,600	7.5
June 1-30	66,910	11		78	15	133		107	165	202		1.8		696	.95	125,700	256	168	53	3.6	1,130	7.6
July 1-31	12,610	14		92	17	155		117	195	238		1.5		822	1.12	27,990	300	204	53	3.9	1,310	7.7
Aug. 1-31	2,453	12		95	18	176		126	207	265		1.0		882	1.20	5,840	311	208	55	4.3	1,420	7.7
Sept. 1-30	4,872	10		90	18	164		130	188	250		1.2		849	1.15	11,170	298	192	54	4.1	1,350	8.0
Weighted average	10,890	11		89	18	167		112	195	258		2.2		840	1.14	24,700	296	204	55	4.2	1,370	--

RED RIVER BASIN--Continued

RED RIVER AT DENISON DAM, NEAR DENISON, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

[illegible]

RED RIVER BASIN--Continued
CLEAR BOGGY CREEK NEAR CANEY, OKLA.

LOCATION.--At gaging station at bridge on U.S. Highways 69 and 75, half a mile downstream from Caney Creek, and 1.5 miles north of Caney, Atoka County.
DRAINAGE AREA.--720 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.

Water temperatures: October 1955 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,120 ppm July 21-24; minimum, 105 ppm July 25.

Hardness: Maximum, 444 ppm July 9-20; minimum, 62 ppm July 25.

Specific conductance: Maximum, 2,030 micromhos July 21-24; minimum daily, 70.1 micromhos Sept. 22.

Water temperatures: Maximum, 87°F Aug. 3, 6; minimum, 35°F Jan. 28.

EXTREMES, 1955-57.--Dissolved solids: Maximum, 1,690 ppm Nov. 11-20, 1955; minimum, 105 ppm July 25, 1957.

Hardness: Maximum, 675 ppm Nov. 11-20, 1955; minimum, 52 ppm June 1-2, 1956.

Specific conductance: Maximum, 3,010 micromhos Nov. 12, 1955; minimum daily, 70.1 micromhos Sept. 22, 1957.

Water temperatures: Maximum, 87°F Aug. 3, 6, 1957; minimum, freezing point on several days during December 1955 and February 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year

October 1956 to September 1957 given in WSP 1511. No flow on Oct. 1-31, Nov. 1-5, 22-30, Dec. 1-18.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-lidum	So-lidum adsorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium mag-nesium	Non-carbon-ate				
Nov. 6, 1956.....	43.0	--	--	39	14	65		104	0	69	110	--	1.9	--	372	0.51	43	156	71	48	2.3	687	7.9
Nov. 7-10.....	41.0	--	--	32	7.8	43		78	0	19	84	--	1.3	--	255	.35	28	112	48	45	1.8	431	7.8
Nov. 11-20.....	1.58	6.5	0.07	45	8.1	47	3.9	102	0	28	98	0.4	2.4	0.10	313	.43	1.3	146	62	40	1.7	546	7.4
Nov. 21.....	.10	--	--	48	11	49		124	0	29	97	--	.6	--	312	.42	.1	164	62	39	1.7	377	7.9
Dec. 1.....	.10	--	--	51	15	51		144	0	31	99	--	.4	--	329	.45	.1	190	72	37	1.6	612	7.7
Dec. 20-21.....	484	--	--	22	5.1	19		76	0	10	26	--	2.6	--	139	.19	182	76	14	35	1.0	236	7.8
Dec. 22.....	172	--	--	43	8.9	51		110	0	14	103	--	3.7	--	312	.42	145	144	54	44	1.8	553	7.9
Dec. 23-25.....	47.3	--	--	72	18	118		148	0	22	260	--	3.9	--	632	.86	81	255	134	50	3.2	1,140	8.0
Dec. 26-31.....	12.4	--	--	58	13	46		178	0	28	79	--	4.0	--	324	.44	11	198	52	34	1.4	600	7.9
Jan. 1-10, 1957.....	4.80	--	--	66	15		34	200	0	32	72	--	3.1	--	379	.52	4.9	228	64	24	1.0	609	7.2
Jan. 11-20.....	2.03	--	--	72	18	31		218	0	36	72	--	2.6	--	400	.54	2.2	252	74	21	.9	642	7.9
Jan. 21-25.....	22.7	--	--	63	15	40		190	2	39	76	--	.5	--	383	.52	23	220	61	28	1.2	617	8.3
Jan. 26-29.....	26.0	--	--	109	29	166		200	8	63	360	--	1.0	--	952	1.29	67	390	212	48	3.7	1,610	8.4
Jan. 30.....	37.0	--	--	70	21	84		154	2	54	182	--	1.7	--	563	.77	56	260	130	41	2.3	928	8.3
Jan. 31.....	50.0	--	--	50	11	39		126	0	41	77	--	2.5	--	334	.45	45	172	68	33	2.3	525	8.2
Feb. 1-4.....	162	--	--	55	12	47		144	0	37	94	--	1.7	--	384	.52	168	188	70	35	1.5	605	8.2
Feb. 5-8.....	1,702	--	--	39	1.1		3.0	100	0	5.8	13	--	2.6	--	142	.19	653	102	20	6	.1	232	8.1
Feb. 9-10.....	402	--	--	46	7.5	14		146	0	20	24	--	2.4	--	212	.29	230	146	26	17	.5	341	8.2
Feb. 11-20.....	85.0	10	.04	78	11	31		220	8	39	55	.3	3.9	.09	376	.51	86	240	46	22	.9	603	8.5
Feb. 21-28.....	41.4	--	--	77	20			232	0	46	72	--	1.6	--	396	.54	44	274	84	20	.8	687	8.1

RED RIVER BASIN--Continued

CLEAR BOGGY CREEK NEAR CANEY, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Mar. 1-5, 1957.....	145	--	--	70	14	45	196	0	45	86	--	--	1.0	--	425	0.58	166	232	72	30	1.3	660	7.9
Mar. 6-10.....	621	--	--	49	8.1	18	160	0	22	28	--	--	2.8	--	244	.33	409	156	25	20	.6	375	7.7
Mar. 11-17.....	100	--	--	78	13	28	226	8	40	47	--	--	1.8	--	355	.48	96	248	50	19	.8	580	8.5
Mar. 18-20.....	926	--	--	38	6.6	15	114	4	18	25	--	--	2.4	--	194	.26	485	122	22	22	.6	308	8.3
Mar. 21-25.....	1,420	--	--	36	4.9	12	122	0	14	14	--	--	2.2	--	166	.23	636	110	10	19	.5	261	8.2
Mar. 26-27.....	308	--	--	58	10	12	174	8	16	27	--	--	2.0	--	282	.38	235	186	30	12	.4	416	8.6
Mar. 28-31.....	612	--	--	44	7.3	18	134	4	21	28	--	--	2.0	--	221	.30	365	140	24	22	.7	348	8.5
Apr. 1-2.....	1,365	--	--	40	6.8	16	128	2	24	20	--	--	1.4	--	190	.26	700	128	20	21	.6	331	8.3
Apr. 3-6.....	5,665	--	--	26	2.7	6.9	86	0	9.9	6.4	--	--	1.3	--	113	.15	1,730	76	6	16	.3	179	8.0
Apr. 7-10.....	387	--	--	67	10	19	196	12	30	25	--	--	2.3	--	287	.39	300	208	28	16	.6	463	8.7
Apr. 11-18.....	170	--	--	70	15	27	222	4	39	47	--	--	1.3	--	346	.47	159	238	50	20	.8	589	8.4
Apr. 19-30.....	8,618	12	0.06	35	4.5	42	106	0	13	71	0.1	0.1	2.0	0.04	243	.33	5,650	106	19	46	1.8	439	7.5
May 1-5.....	5,902	--	--	34	5.6	9.9	120	2	8.2	12	--	--	2.3	--	164	.22	2,610	108	6	17	.4	251	8.3
May 6-11.....	788	--	--	82	12	27	232	14	26	49	--	--	1.8	--	356	.48	757	252	38	19	.7	589	8.6
May 12-16.....	1,661	--	--	53	6.3	21	152	8	19	31	--	--	1.7	--	232	.32	1,040	158	20	22	.7	393	8.6
May 17-20.....	3,568	--	--	34	5.6	12	120	2	10	15	--	--	1.6	--	152	.21	1,460	108	6	20	.5	256	8.4
May 21.....	5,720	--	--	41	5.2	10	138	2	9.1	13	--	--	1.7	--	158	.21	2,440	124	8	15	.4	266	8.3
May 22-23.....	1,305	--	--	69	11	29	216	0	21	55	--	--	2.5	--	296	.40	1,040	216	39	22	.9	532	7.9
May 24.....	5,920	--	--	50	7.1	14	160	0	15	25	--	--	3.8	--	206	.28	3,200	154	23	17	.5	348	8.2
May 25-26.....	13,700	--	--	19	4.5	5.1	76	0	44.1	6.0	--	--	1.7	--	110	.15	4,070	66	4	14	.3	151	7.3
May 27-28.....	6,990	--	--	34	4.1	5.1	114	0	66.0	8.9	--	--	1.4	--	141	.19	2,660	102	8	10	.2	218	7.8
May 29.....	2,240	--	--	66	9.6	20	196	10	17	37	--	--	2.0	--	290	.39	1,750	204	27	18	.6	472	8.3
May 30-31.....	944	--	--	86	18	31	260	2	30	76	--	--	2.4	--	415	.56	1,060	288	72	19	.8	685	8.3
June 1.....	6,260	--	--	45	4.7	19	136	0	7.8	36	--	--	2.8	--	185	.27	3,300	132	20	24	.7	324	7.6
June 2-6.....	9,158	--	--	30	5.1	6.4	110	0	6.2	8.8	--	--	1.3	--	136	.18	3,360	96	6	13	.3	214	7.9
June 7.....	4,370	--	--	50	7.5	13	176	0	9.5	20	--	--	1.6	--	216	.29	2,550	156	12	15	.4	338	8.2
June 8.....	1,320	--	--	61	11	25	184	8	20	46	--	--	2.0	--	304	.41	1,080	198	34	21	.8	547	8.4
June 9-10.....	664	--	--	102	9.6	36	284	0	28	78	--	--	1.7	--	425	.58	762	294	63	21	.9	715	8.2
June 11-15.....	351	--	--	90	18	58	256	0	35	126	--	--	1.7	--	487	.66	462	300	90	29	1.4	849	8.1
June 16.....	2,670	--	--	43	4.9	12	144	0	8.2	26	--	--	2.6	--	187	.25	1,350	140	22	15	.4	313	7.7
June 17.....	3,940	--	--	26	3.6	9.0	90	0	3.3	13	--	--	4.4	--	128	.17	1,360	80	6	20	.4	198	7.8
June 18.....	4,960	--	--	37	3.3	11	118	0	4.9	18	--	--	3.3	--	162	.22	2,170	106	10	18	.5	253	8.0
June 19.....	830	--	--	75	11	39	210	10	19	76	--	--	3.3	--	378	.51	847	234	46	26	1.1	623	8.4
June 20.....	418	--	--	88	19	67	266	0	31	135	--	--	2.2	--	510	.69	576	298	80	33	1.7	954	8.2

June 21-22, 1957 ...	300	--	--	70	20	81	188	0	34	172	--	3.1	--	556	.76	450	258	104	41	2.2	920	8.2
June 23-27	727	--	--	64	11	38	194	0	19	75	--	1.6	--	345	.47	677	204	45	29	1.2	576	8.2
June 28-30	168	--	--	85	19	72	252	0	28	150	--	1.7	--	520	.71	236	282	86	35	1.8	922	8.2
July 1-8	99.1	--	--	69	35	132	234	0	37	282	--	1.4	--	681	.93	182	314	122	48	3.2	1,260	7.7
July 9-20	56.0	14	--	.07	90	53	274	0	34	445	.1	.7	.26	1,090	1.48	165	444	220	50	4.1	1,780	7.9
July 21-24	75.2	--	--	--	87	49	254	0	27	495	--	1.7	--	1,120	1.52	227	420	212	55	5.0	2,030	7.7
July 25	318	--	--	--	20	2.9	73	0	5.8	14	--	5.0	--	105	.14	90	62	2	31	.7	178	7.0
July 26-27	182	--	--	--	56	22	204	0	19	132	--	2.3	--	427	.58	210	232	65	38	1.9	799	7.6
July 28-29	73.0	--	--	--	35	10	118	0	12	64	--	1.7	--	225	.31	44	130	34	35	1.2	432	7.3
July 30-31	42.0	--	--	--	48	25	53	0	17	113	--	1.4	--	373	.51	42	222	63	34	1.6	702	7.4
Aug. 1-10	32.0	--	--	--	60	42	104	0	20	200	--	.4	--	609	.83	53	322	78	41	2.5	1,100	7.3
Aug. 11-19	38.7	--	--	--	69	43	101	0	15	230	--	.4	--	674	.92	70	348	122	39	2.3	1,200	7.8
Aug. 20-31	28.4	--	--	--	46	40	90	0	12	185	--	.6	--	538	.73	41	280	78	41	2.3	979	8.0
Sept. 1-14	25.4	--	--	--	68	34	81	0	12	187	--	.8	--	552	.75	38	310	100	36	2.0	1,030	7.6
Sept. 15-20	1,338	--	--	--	32	7.3	9.7	0	11	20	--	1.9	--	147	.20	531	110	20	16	.4	276	7.1
Sept. 21	5,060	--	--	--	55	10	25	0	22	42	--	2.2	--	230	.31	3,140	178	30	23	.8	439	7.9
Sept. 22-26	12,040	--	--	--	26	3.6	6.0	0	6.8	8.9	--	1.6	--	109	.15	3,540	80	8	14	.3	132	7.4
Sept. 27-28	345	--	--	--	82	13	30	0	25	60	--	1.7	--	348	.47	324	260	47	20	.8	619	7.7
Sept. 29-30	184	--	--	--	99	23	41	0	31	94	--	1.4	--	465	.63	231	340	76	21	1.0	818	7.7
Weighted average...	1,437	--	--	--	36	5.6	20	--	11	33	--	1.9	--	188	.26	729	113	16	28	0.8	317	--

a Includes equivalent of individual carbonate values as shown above.

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

CLEAR BOGGY CREEK NEAR CANEY, OKLA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	55	45	44	40	50	58	67	70	83	85	79
2	69	55	46	43	40	53	62	68	70	83	85	81
3	71	54	48	43	43	53	64	68	70	85	87	80
4	69	53	50	45	48	53	59	66	70	85	86	81
5	69	54	50	46	47	51	55	63	71	84	83	80
6	69	52	60	47	48	48	55	62	72	81	87	81
7	67	52	55	45	49	46	60	--	72	83	80	77
8	61	52	47	49	52	46	58	68	73	83	78	72
9	62	49	42	52	56	45	56	68	78	83	81	71
10	64	49	40	45	58	51	58	71	79	85	82	71
11	64	50	40	43	56	57	60	71	80	85	84	74
12	65	50	40	42	53	57	57	70	81	85	84	72
13	66	53	41	42	53	57	48	70	78	85	85	75
14	67	60	42	40	53	59	47	68	80	86	84	77
15	67	58	42	39	59	55	55	70	80	85	85	68
16	66	48	41	39	53	55	56	72	75	85	83	68
17	67	47	41	38	50	56	60	70	78	85	83	69
18	64	46	41	38	52	55	63	70	76	85	80	70
19	67	46	43	38	50	54	66	67	77	85	79	72
20	63	46	46	38	49	55	68	68	78	83	79	75
21	63	45	46	45	47	50	66	72	80	85	80	75
22	64	44	47	50	49	51	65	76	79	86	81	69
23	64	44	47	43	48	53	65	72	77	83	81	67
24	64	44	42	42	50	53	66	69	72	83	82	68
25	64	44	41	42	55	51	65	70	73	79	82	67
26	59	45	41	38	53	46	67	69	74	83	81	68
27	56	43	42	37	49	50	64	71	76	83	82	69
28	57	42	43	35	49	46	68	73	78	84	82	69
29	60	41	42	36	--	51	68	74	81	85	82	67
30	64	44	43	38	--	55	67	75	83	86	81	67
31	65	--	43	39	--	57	--	73	--	86	80	--
Average	64	49	44	42	50	52	61	69	76	84	82	73

RED RIVER BASIN--Continued

LITTLE RIVER NEAR HORATIO, ARK.

LOCATION.--At gaging station at bridge on State Highway 41, 0.9 mile downstream from Rolling Fork, 2 miles southwest of Horatio, Sevier County, and 28.5 miles upstream from Cossatot River.

DRAINAGE AREA.--2,674 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1957.

Water temperatures: October 1953 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 399 ppm Oct. 21-31; minimum, 40 ppm Mar. 1-10.

Hardness: Maximum, 70 ppm Oct. 21-31; minimum, 11 ppm Feb. 1-10.

Specific conductance: Maximum daily, 685 micromhos Nov. 1; minimum daily, 26.1 micromhos Sept. 25.

Water temperatures: Maximum, 88°F July 18, 19; minimum, 35°F Jan. 17.

EXTREMES, 1953-57.--Dissolved solids: Maximum, 399 ppm Oct. 21-31, 1956; minimum, 40 ppm Mar. 1-10, 1957.

Hardness: Maximum, 70 ppm Oct. 21-31, 1956; minimum, 10 ppm Jan. 1-8, 1955.

Specific conductance: Maximum daily, 685 micromhos Nov. 1, 1956; minimum daily, 26.1 micromhos Sept. 25, 1957.

Water temperatures: Maximum, 89°F July 14-18, 1954; minimum, 35°F Dec. 25, 1953 Jan. 17, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1956	2.84	5.0	0.00	17	5.2	88	4.4	26	6.4	165	0.0	1.7	389	64	42	658	6.4	7
Oct. 11-20	2.32	--	--	19	4.9	97	--	25	6.0	180	--	5	380	68	5	659	6.5	8
Oct. 21-31	3.46	--	--	19	5.3	99	--	25	6.0	180	--	2.0	399	70	5	674	7.2	8
Nov. 1-5	168	--	--	19	5.2	98	--	26	5.6	178	--	1.9	392	69	5	663	7.3	8
Nov. 6, 11-20	367	--	--	7.2	1.3	11	2.2	20	8.4	18	--	1.6	80	23	7	115	7.2	25
Nov. 7-8	1,295	--	--	14	4.1	74	--	50	15	109	--	1.2	274	52	11	491	7.0	17
Nov. 9	795	--	--	--	--	--	--	5	9.0	32	--	12	4119	39	55	188	6.2	--
Nov. 10	583	--	--	--	--	--	--	27	11	42	--	1.6	4125	34	12	209	7.2	--
Nov. 21-30	652	--	--	5.6	1.3	9.2	2.0	20	3.2	14	--	1.9	68	19	3	92.9	6.7	25
Dec. 1-7	316	--	--	5.1	1.4	8.6	1.9	18	4.8	12	--	1.6	64	18	4	83.9	6.9	25
Dec. 8-19	1,748	--	--	4.5	1.1	4.2	1.5	16	5.2	6.5	--	1.5	46	16	3	58.9	6.4	23
Dec. 20-31	1,537	--	--	3.9	.6	4.2	1.2	12	4.6	5.5	--	1.7	43	12	2	53.0	6.7	23
Jan. 1-10, 1957	1,762	2.9	.08	3.7	1.1	5.0	.6	14	4.0	6.0	.2	1.3	45	14	2	54.3	6.6	27
Jan. 11-20	900	--	--	4.2	.7	4.2	.9	12	3.6	7.0	--	1.2	52	13	4	56.4	6.7	23
Jan. 21-31	8,936	--	--	3.6	.9	2.8	.9	12	4.0	3.5	--	.7	49	13	3	44.8	6.5	15
Feb. 1-10	11,900	--	--	3.6	.4	2.0	.9	12	2.0	3.0	--	1.3	41	11	1	39.4	6.4	33
Feb. 11-20	3,928	--	--	4.0	.9	2.8	.9	14	3.6	3.5	--	2.0	42	14	2	47.9	6.6	23
Feb. 21-28	1,936	--	--	5.9	.4	4.2	.9	16	4.8	6.5	--	1.3	44	16	3	59.5	6.8	23
Mar. 1-10	2,588	--	--	4.6	1.0	3.6	.7	16	5.0	5.0	--	.8	40	18	2	53.7	7.0	22
Mar. 11-20	8,104	--	--	3.8	1.0	3.1	.9	14	4.8	4.5	--	1.8	43	14	2	48.8	6.6	33
Mar. 21-31	13,320	--	--	3.7	.7	2.1	.9	14	3.6	2.5	--	1.0	44	12	1	40.6	6.6	55

a Estimated from specific conductance.

RED RIVER BASIN--Continued

LITTLE RIVER NEAR HORATIO, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Apr. 1-10, 1957	19,940	1.8	0.05	3.8	0.7	3.1	0.7	15	2.8	2.0	0.3	1.9	42	12	0	40.0	6.5	30
Apr. 11-20	4,997	--	--	4.1	1.6	3.6	1.0	12	5.0	3.8	--	1.2	46	13	3	50.3	6.4	8
Apr. 21-30	44,050	--	--	3.1	1.0	2.1	1.2	14	3.2	2.0	--	1.2	41	12	0	37.1	6.9	10
May 1-10	18,520	--	--	5.0	.7	2.7	1.2	16	3.4	3.5	--	1.6	54	15	1	49.3	6.6	10
May 11-20	14,330	--	--	4.3	.9	2.9	1.0	16	3.0	3.2	--	2.0	53	14	1	48.7	6.9	20
May 21-31	24,990	--	--	3.6	1.1	2.6	1.1	14	2.8	3.5	--	1.3	52	14	2	45.1	6.5	12
June 1-10	17,620	--	--	4.0	1.0	2.7	1.0	17	2.6	3.0	--	1.3	51	14	0	46.9	6.6	15
June 11-20	2,856	--	--	4.1	1.8	4.8	1.0	20	3.2	7.0	--	1.3	56	18	1	64.0	6.8	15
June 21-30	911	--	--	6.6	1.9	8.8	1.0	26	2.8	13	--	1.7	126	24	3	95.1	6.7	12
July 1-10	333	4.4	.00	7.3	2.2	14	1.2	31	4.4	2.0	--	1.4	86	27	2	130	6.8	13
July 11-20	147	--	--	8.4	2.5	22	1.3	32	6.0	31	--	2.4	116	31	5	163	7.2	15
July 21-31	271	--	--	9.7	2.0	19	1.8	35	5.4	28	--	1.2	100	32	4	164	7.4	10
Aug. 1-10	128	--	--	18	4.2	22	1.9	39	6.2	52	--	1.5	172	62	30	239	6.6	10
Aug. 11-20	300	--	--	11	2.6	28	2.1	38	6.8	45	--	.8	134	38	7	232	6.8	8
Aug. 21-31	147	--	--	9.3	1.9	21	1.7	35	5.4	31	--	1.7	104	31	2	177	7.0	8
Sept. 1-10	70.3	--	--	9.2	2.5	24	1.8	33	4.6	38	--	.9	122	33	6	198	7.0	10
Sept. 11-16, 19	293	--	--	10	2.0	24	2.1	34	5.6	39	--	1.6	119	33	5	204	6.7	10
Sept. 17-18, 20-30	6,643	--	--	3.8	1.1	3.5	1.3	15	5.2	4.5	--	1.0	49	14	2	48.2	6.7	9
Average	6,080	--	--	7.5	1.8	20	1.4	21	5.2	33	--	1.7	110	26	9	165	--	18

RED RIVER BASIN--Continued

LITTLE RIVER NEAR HORATIO, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	61	43	45	45	51	56	66	72	84	87	84
2	73	63	43	44	46	52	58	66	72	84	87	82
3	72	62	44	43	47	51	62	66	72	84	87	82
4	72	72	47	48	49	53	59	65	71	86	87	82
5	72	64	51	45	50	52	57	63	70	87	86	82
6	72	62	58	45	51	51	57	64	70	84	84	83
7	71	60	60	44	52	53	57	63	71	84	82	81
8	71	60	57	46	53	47	58	65	72	84	83	77
9	69	54	53	50	59	48	56	66	74	85	83	76
10	69	53	49	47	55	50	55	67	75	86	84	74
11	68	54	50	46	56	53	56	69	77	87	85	76
12	68	54	49	44	55	52	59	71	77	87	83	77
13	70	55	49	45	53	52	55	70	72	87	83	76
14	70	57	48	46	54	55	54	68	80	87	84	76
15	70	60	49	44	55	54	55	68	80	87	86	77
16	70	57	46	41	54	53	56	67	80	86	85	75
17	68	52	48	35	52	55	57	70	81	85	85	75
18	68	50	49	37	53	54	60	71	81	88	83	74
19	68	51	48	37	52	52	61	71	80	88	82	73
20	68	55	50	43	51	53	64	72	81	84	82	74
21	67	52	49	42	49	54	63	75	81	84	82	77
22	66	51	48	47	50	51	63	74	81	84	82	74
23	66	49	42	47	51	53	63	70	80	84	81	70
24	66	48	40	47	53	--	64	70	77	83	82	68
25	67	46	42	46	53	--	63	70	77	82	83	68
26	68	46	42	46	54	50	65	69	78	80	83	68
27	63	44	43	44	52	49	64	69	78	80	84	68
28	64	44	43	43	51	50	64	70	80	85	83	68
29	64	44	43	45	--	50	64	70	82	85	83	67
30	65	43	43	44	--	51	65	70	83	86	83	67
31	62	--	43	44	--	55	--	71	--	86	84	--
Average	68	54	47	44	52	52	60	69	77	85	84	73

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.

LOCATION.--At gaging station at bridge on U. S. Highway 67 at Fulton, Miller County, 0.3 mile downstream from Missouri Pacific Railroad bridge, 2½ miles downstream from Little River, and at mile 463.0.

DRAINAGE AREA.--52 380 square miles of which 5 936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1952 to September 1957.

Water temperatures: October 1946 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,260 ppm Oct. 1-10; minimum, 54 ppm Dec. 11-16.

Hardness: Maximum, 445 ppm Oct. 1-10; minimum, 17 ppm Dec. 11-16.

Specific conductance: Maximum daily, 2,210 microhmhos Oct. 5; minimum daily, 50.5 microhmhos Dec. 12.

Water temperatures: Maximum, 86°F on several days during July and August; minimum, 41°F Jan. 18-20.

EXTREMES, 1952-57.--Dissolved solids: Maximum, 1,380 ppm Sept. 21-30, 1956; minimum, 44 ppm Nov. 1-3, 1954, Dec. 11-16, 1956.

Hardness: Maximum, 468 ppm Sept. 21-30, 1956; minimum, 17 ppm Dec. 11-16, 1956.

Specific conductance: Maximum daily, 2,210 microhmhos Oct. 5, 1956; minimum daily, 48.8 microhmhos Mar. 8, 1953.

Water temperatures: Maximum, 88°F July 30, 1955; minimum, 35°F Dec. 23, 24, 26, 1953, Dec. 16, 1955.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1956.....	1,392	6.9	0.00	124	33	241	13	146	284	400	0.1	3.5	1,260	445	326	1,900	7.4	8
Oct. 11-18.....	598	---	---	91	31	190	---	168	190	292	---	2.9	997	354	217	1,570	7.4	8
Oct. 19-31.....	452	---	---	65	34	132	---	204	125	210	---	3.0	755	302	135	1,220	7.8	8
Nov. 1.....	805	---	---	---	---	---	---	170	148	190	---	7	820	270	131	1,280	8.2	---
Nov. 2-7.....	820	---	---	62	27	107	---	203	91	160	---	2.1	615	286	101	1,000	7.5	7
Nov. 8-10.....	2,317	---	---	18	5.2	26	---	68	15	38	---	.9	161	66	11	271	7.3	18
Nov. 11-13.....	1,767	---	---	24	6.9	53	---	68	21	92	---	.9	273	88	32	457	7.2	13
Nov. 14-24.....	1,388	---	---	54	14	77	---	174	56	116	---	1.3	437	192	50	736	8.0	10
Nov. 25-29.....	1,288	---	---	21	3.8	29	---	76	13	44	---	1.6	182	76	14	304	7.2	10
Nov. 30.....	1,240	---	---	---	---	---	---	b160	24	60	---	1.2	a312	156	25	480	8.3	---
Dec. 1-8.....	1,019	---	---	51	13	45	---	182	29	72	---	3.7	345	180	32	560	8.0	15
Dec. 9.....	2,320	---	---	---	---	---	---	33	17	30	---	.9	a135	54	27	207	7.8	---
Dec. 10.....	4,410	---	---	---	---	---	---	23	12	12	---	1.0	a60	23	4	92.8	7.3	---
Dec. 11-16.....	2,692	---	---	4.8	1.2	5.7	---	17	7.4	7.0	---	1.0	54	17	3	66.9	8.6	15
Dec. 17-18, 22-25, 29-30	2,815	---	---	11	3.1	17	---	33	17	21	---	1.1	110	40	13	174	6.7	23
Dec. 19-21, 26-28, 31-	3,716	---	---	21	3.9	27	---	46	28	43	---	1.5	188	68	31	283	6.9	10
Jan. 1-2, 10-11, 13-14, 1957.....	4,120	---	---	14	3.6	26	---	27	29	37	---	1.5	149	50	28	247	7.4	20

Jan. 3-4, 16, 1957 ...	3,450	--	--	32	8.2	60	--	--	52	67	90	--	1.3	318	114	71	541	7.0	10
Jan. 5 ...	2,980	--	--	--	--	--	--	--	64	153	160	--	.8	a570	182	130	876	7.8	--
Jan. 6-9, 12, 17, 25-26, 31 ...	9,164	--	--	11	2.6	20	--	--	22	21	28	--	1.5	117	38	20	177	6.9	10
Jan. 15 ...	4,070	--	--	--	--	--	--	--	34	36	142	--	.9	a232	79	51	357	7.5	--
Jan. 18-23 ...	3,853	5.6	--	66	17	123	7.0	--	70	154	205	--	3.9	680	234	177	1,130	7.7	5
Jan. 24, 27-30 ...	16,540	--	--	10	1.4	13	--	--	22	14	18	--	1.9	96	31	13	1,145	6.9	23
Feb. 1-7 ...	22,140	--	--	--	7.7	--	--	--	19	8.6	13	--	1.7	79	25	9	113	6.8	15
Feb. 8-10 ...	33,970	--	--	15	2.6	18	--	--	38	20	23	--	1.4	136	48	17	191	7.4	30
Feb. 11-17 ...	22,280	--	--	--	8.7	9.0	--	--	24	12	12	--	1.5	82	29	9	119	7.0	23
Feb. 18-19 ...	6,825	--	--	16	3.8	28	--	--	43	29	38	--	1.7	160	56	20	262	7.4	35
Feb. 20-25, 27-28 ...	5,308	--	--	49	9.7	92	--	--	64	111	138	--	1.2	478	162	110	769	7.4	23
Feb. 26 ...	5,300	--	--	--	--	--	--	--	56	125	93	--	1.9	a355	122	76	545	7.9	--
Mar. 1-7 ...	6,236	--	--	47	11	84	--	--	67	109	128	--	1.3	462	162	108	730	7.2	10
Mar. 8 ...	9,650	--	--	--	--	--	--	--	59	105	94	--	1.9	a350	123	75	538	7.9	--
Mar. 9, 15-16 ...	6,817	--	--	23	6.0	42	--	--	42	51	58	--	4.6	244	82	48	384	7.4	35
Mar. 10-14, 17-18 ...	8,714	--	--	19	3.2	27	--	--	41	29	36	--	1.5	167	61	27	263	7.3	25
Mar. 19-20, 22, 28-31	34,420	--	--	15	2.8	17	--	--	37	21	22	--	1.2	124	49	19	191	7.1	25
Mar. 21, 23-28 ...	40,730	--	--	12	1.7	10	--	--	32	11	14	--	1.3	97	37	11	141	7.2	37
Apr. 1-3, 8-9, 15 ...	55,550	--	--	16	2.2	12	--	--	44	17	14	--	1.3	117	49	13	164	7.4	35
Apr. 4-7, 16, 20 ...	64,080	--	--	25	3.2	19	--	--	66	26	24	--	1.9	166	76	21	249	7.6	30
Apr. 10-14 ...	52,520	--	--	11	1.5	6.6	--	--	36	8.2	7.0	--	1.7	90	34	4	102	7.3	35
Apr. 17-19 ...	17,700	--	--	34	6.6	47	--	--	62	64	72	--	1.8	296	112	61	461	7.6	30
Apr. 21-22, 24-30 ...	116,200	2.8	.27	24	3.1	12	1.8	--	73	16	14	.4	2.6	148	73	13	196	7.2	25
Apr. 23 ...	63,600	--	--	--	--	--	--	--	83	125	115	--	1.7	a436	169	101	670	8.0	--
May 1-4 ...	195,200	--	--	23	3.0	10	2.2	--	68	16	13	--	1.0	138	70	14	195	7.0	10
May 5 ...	165,000	--	--	--	--	--	--	--	77	55	39	--	2.2	a187	94	31	287	8.1	--
May 6-9 ...	146,500	--	--	42	9.6	56	4.0	--	87	73	86	--	1.6	353	144	73	557	7.6	15
May 10-15 ...	90,630	--	--	58	15	92	5.5	--	93	120	150	--	3.0	562	206	130	880	7.9	20
May 16, 21-25 ...	99,420	--	--	53	13	80	5.0	--	98	101	124	--	1.2	478	186	105	773	7.4	15
May 17-19, 26-27 ...	111,200	--	--	32	9.0	27	3.6	--	85	40	48	--	1.3	225	117	47	310	7.5	45
May 20, 28-31 ...	146,400	--	--	24	5.8	16	2.4	--	84	22	23	--	1.3	168	84	15	241	7.2	25

a Estimated from specific conductance.

b Includes equivalent of 2 parts per million of carbonate (CO₃).

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, mg./nesium	Non-carbonate			
June 1-12, 1957	182,600	--	--	46	8.4	44	3.8	106	62	69	--	1.1	308	149	62	503	7.4	20
June 13-23	103,100	--	--	65	11	75	5.1	124	99	119	--	.8	474	207	106	781	7.4	12
June 24-30	73,330	--	--	77	14	102	6.2	125	150	156	--	1.0	605	250	147	976	7.5	10
July 1-10	58,300	--	--	79	15	105	6.6	124	156	162	--	1.5	638	258	157	1,020	7.5	10
July 11-20	9,751	3.9	0.01	83	16	104	6.6	152	152	155	0.4	1.9	652	273	147	1,010	7.4	3
July 21-31	6,759	--	--	80	18	96	6.2	172	135	148	--	.8	598	274	132	887	7.7	10
Aug. 1-13	6,904	--	--	91	19	115	7.4	182	157	185	--	1.8	710	305	156	1,110	7.4	10
Aug. 14-17	5,175	--	--	66	15	78	4.8	150	100	122	--	.3	511	226	103	829	8.0	8
Aug. 18-31	3,864	--	--	91	18	108	6.6	190	135	170	--	1.8	676	301	146	1,080	7.8	8
Sept. 1-12	3,149	--	--	96	21	123	7.0	194	158	195	--	2.2	746	326	167	1,180	8.2	8
Sept. 13-19	5,371	--	--	84	18	95	5.3	192	131	145	--	1.1	616	284	126	997	8.1	10
Sept. 20-28	32,180	--	--	33	6.4	29	2.8	89	39	46	--	2.4	221	109	36	356	7.2	15
Sept. 29-30	74,340	--	--	26	2.6	10	2.4	81	16	13	--	1.6	150	76	9	204	7.2	10
Average	35,500	--	--	42	10	59	--	89	72	91	--	1.7	359	146	73	565	--	17

RED RIVER BASIN--Continued

RED RIVER AT FULTON, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	60	43	46	45	53	56	66	--	79	86	82
2	73	61	--	46	45	53	55	67	72	80	86	82
3	73	62	45	44	47	53	55	66	73	80	86	82
4	72	63	56	44	50	53	60	66	73	--	86	82
5	72	63	--	46	50	50	60	66	75	80	84	82
6	71	62	58	45	50	50	60	67	75	79	82	82
7	71	62	--	45	50	50	60	67	75	80	80	80
8	67	62	61	45	53	48	59	68	75	80	82	79
9	67	53	49	53	55	49	58	69	75	82	82	78
10	67	51	50	47	56	55	58	70	77	82	82	76
11	67	53	52	47	55	53	59	70	78	83	81	74
12	67	53	53	47	55	54	60	70	78	82	81	74
13	70	53	50	47	55	55	56	70	78	83	81	76
14	69	53	50	47	55	56	58	70	78	83	82	76
15	69	52	56	43	55	55	57	70	78	85	83	76
16	69	52	--	42	54	55	58	70	78	85	82	74
17	68	52	50	42	54	55	59	70	78	85	82	74
18	68	52	50	41	54	55	62	72	78	85	82	74
19	68	53	50	41	52	54	63	72	78	85	81	76
20	66	54	45	41	50	52	64	72	78	85	80	76
21	66	--	50	42	50	53	60	72	79	85	80	76
22	64	49	--	42	50	53	65	72	78	85	80	76
23	64	48	50	44	50	53	63	--	77	86	80	75
24	64	50	--	44	50	54	65	72	76	86	80	73
25	66	52	--	47	55	54	65	72	75	86	82	70
26	64	50	45	47	53	53	65	72	76	86	82	68
27	60	47	45	45	50	54	65	72	77	86	82	68
28	60	46	--	45	52	54	65	72	78	86	82	67
29	63	45	45	45	--	54	66	72	79	86	82	67
30	63	43	45	44	--	55	66	73	79	86	80	67
31	60	--	46	44	--	55	--	--	--	86	82	--
Average	67	54	--	45	52	53	61	70	77	84	82	75

RED RIVER BASIN--Continued

RED RIVER NEAR HOSSTON, LA.

LOCATION --At gaging station at bridge on State Highway 2, at Millers Bluff, 3½ miles east of Houston, and 4 miles downstream from Dry Bayou.

DRAINAGE AREA --57,041 square miles.

RECORDS AVAILABLE --Chemical analyses: March to September 1957.

Water temperatures: March to September 1957.

EXTREMES, March to September 1957.--Dissolved solids: Maximum 700 ppm Sept. 11-21; minimum, 133 ppm Sept. 27-30.

Hardness: Maximum, 292 ppm Sept. 11-21; minimum, 69 ppm Mar. 28-31.

Specific conductance: Maximum daily, 1,130 micromhos Sept. 20; minimum daily, 187 micromhos Apr. 13.

Water temperatures: Maximum, 90°F Sept. 3, 4.

REMARKS --Records of specific conductance of daily samples available in subdistrict office at Baton Rouge, La. Records of discharge for this station not available.

Chemical analyses, in parts per million, March to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per- cent so- dium ad- sorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Mar. 28-31, 1957.		11	0.30	22	3.4	23		59	22	33	0.5	1.0		a 145	0.20	69	21	43	1.2	261	7.4
Apr. 1-10.....	9.0	12	.42	25	3.9	19		73	21	26	.6	1.2		a 142	.19	78	19	35	1.0	250	7.7
Apr. 11-18.....	9.0	12	.09	25	3.4	19		75	17	27	.4	.2		a 141	.19	76	15	35	1.0	243	7.6
Apr. 19-24.....		9.0	.04	37	5.5	42		83	47	63	.4	.2		a 245	.33	115	47	44	1.7	433	7.6
Apr. 25-30, May 1-5.....		11	.08	29	4.1	14		90	16	19	.5	.2		a 138	.19	89	15	25	.6	235	7.7
May 6-10.....		9.2	.03	40	6.9	44		94	49	67	.5	.5		288	.39	128	51	43	1.7	473	7.7
May 11-18.....		9.6	.03	53	11	76		101	85	120	.5	.5		436	.59	177	94	48	2.5	726	7.7
May 19-21, 25, 28-31.....		14	.01	31	4.7	27		85	29	39	.4	.5		a 188	.26	97	27	38	1.2	331	7.5
May 22-24, 26, 27.		12	.02	46	10	79		74	85	126	.4	.2		a 395	.54	156	96	52	2.7	711	7.3
June 2-9.....		13	.02	35	6.1	45		75	49	68	.6	.5		260	.35	112	51	47	1.8	446	7.3
June 10-20.....		12	.02	50	8.4	61		100	73	94	.6	1.0		368	.50	160	68	46	2.1	622	7.5
June 21-30.....		12	.01	60	11	80		109	100	122	.6	1.0		469	.64	194	106	47	2.5	771	7.6
July 1-10.....		13	.01	59	12	89		98	116	132	.4	.8		a 470	.64	196	116	49	2.7	821	7.6
July 11-20.....		14	.01	50	8.5	83		120	64	75	.2	.5		340	.46	160	62	41	1.8	571	7.9
July 21-31.....		13	.01	49	8.3	46		132	52	66	.2	.5		287	.39	156	48	39	1.6	535	7.7
Aug. 1-10.....		14	.02	53	8.8	54		144	56	76	.4	.5		342	.47	168	50	41	1.8	575	8.1

	Aug. 11-20, 1957.	Aug. 21-31.	Sept. 1-10.	Sept. 11-21.	Sept. 22-25.	Sept. 27-30.	Weighted average
10	.03	58	9.8	59	154	65	84
14	.03	83	12	132	170	76	103
16	.01	81	17	108	b 196	116	158
18	.01	86	19	110	191	141	161
15	.01	86	19	117	215	134	171
7	.6	21	36	7	0	40	55
8	.47	26	7.0	39	100	40	85
8	.8	41	26	15	105	17	84
12	0.07	49	9.0	57	117	64	84
							0.4
							0.7
							347
							0.47
							159
							63
							44
							1.9
							584
							--

a Calculated from determined constituents.

b Includes equivalent of 6 ppm of carbonate (CO₃).

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

RED RIVER NEAR HOSSTON, LA.--Continued

Temperature (°F) of water, March to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	60	67	--	85	89	88
2						--	63	70	76	85	89	88
3						--	64	70	75	--	87	90
4						--	64	69	75	--	--	90
5						--	60	66	76	--	84	88
6						--	60	67	76	85	84	88
7						--	63	68	77	86	84	84
8						--	62	70	78	86	87	81
9						--	63	--	78	88	87	81
10						--	63	70	78	88	84	81
11						--	63	70	79	--	84	81
12						--	62	75	78	85	--	81
13						--	61	76	81	85	--	81
14						--	--	76	82	87	87	81
15						--	62	77	81	87	88	81
16						--	63	77	--	87	88	81
17						--	62	--	82	87	86	81
18						--	66	75	83	88	--	81
19						--	66	77	81	88	84	81
20						--	67	77	87	86	84	81
21						--	68	77	82	88	85	80
22						--	69	77	81	87	85	80
23						--	69	78	82	--	84	80
24						--	69	78	83	--	83	78
25						--	69	78	--	84	87	78
26						--	70	76	--	84	87	--
27						--	68	76	85	84	87	74
28						53	68	77	86	86	85	72
29						55	67	75	83	85	86	72
30						58	68	76	87	85	86	72
31						58	--	76	--	89	84	--
Average						--	65	74	80	86	86	81

RED RIVER BASIN--Continued

BLACK BAYOU NEAR GILLIAM, LA.

LOCATION:--At gaging station near left bank on downstream side of bridge on State Highway 170, 0.2 mile downstream from Red Bayou and 2 miles southwest of Gilliam, Caddo Parish.

DRAINAGE AREA:--364 square miles.

RECORDS AVAILABLE:--Chemical analyses: October 1954 to September 1957.

REMARKS:--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Oct. 11, 1956 . . .	3.8	11	0.02	232	133	5,290	343	30	8,740	--	--	--	--	14,800	19.9	150	1,130	845	91	69	23,100	7.1
Oct. 24	5.1	--	--	233	142	5,140	353	--	8,450	--	--	--	--	--	--	--	1,170	876	91	65	23,000	7.4
Nov. 15	8.1	12	.02	184	97	3,180	162	26	5,400	--	--	--	--	8,980	12.2	189	858	725	89	47	15,100	7.2
Nov. 20	82	6.5	--	42	20	437	115	19	720	290	5.0	--	--	1,310	1.78	290	186	92	84	14	2,450	7.2
Dec. 5	5.8	18	.02	239	114	4,490	391	37	7,430	391	--	--	--	12,500	17.0	198	1,070	745	90	60	20,300	7.4
Jan. 7, 1957	9.4	11	.06	120	55	1,390	329	39	2,300	2,300	--	--	--	4,080	5.55	104	525	256	85	26	7,410	7.0
Feb. 2	792	11	.34	30	8.8	179	46	8.2	322	305	2.2	2.2	585	80	1,250	108	112	74	78	7.4	1,130	6.8
Apr. 12	815	9.2	.20	32	6.8	155	12	5.4	325	322	.5	.5	520	.71	1,140	108	98	76	6.5	1,030	6.3	
May 16	156	7.4	.71	15	4.4	83	28	3.8	147	158	1.8	1.8	277	.38	831	117	56	33	76	4.8	546	6.3
June 12	1,080	8.2	.72	19	3.8	82	18	2.6	158	158	1.2	1.2	285	.39	831	63	48	74	4.5	573	5.9	
July 9	36	10	.03	55	22	588	134	11	980	980	2.2	2.2	1,730	2.35	168	228	118	85	17	3,300	7.0	
Sept. 4	5.2	12	.00	171	103	3,240	390	64	5,330	5,330	--	--	--	9,110	12.4	128	850	530	89	48	15,300	7.6

RED RIVER BASIN--Continued

RED RIVER AT SHREVEPORT, LA.

LOCATION.--At gaging station at Illinois Central Railroad bridge at Shreveport, half a mile downstream from Cross Bayou.
DRAINAGE AREA.--60.613 square miles, of which 5.936 square miles above Denison Dam is noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.

Water temperatures: October 1955 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,220 ppm Oct. 1-10; minimum, 122 ppm Apr. 11-18.

Hardness: Maximum, 451 ppm Oct. 1-10; minimum, 70 ppm Feb. 5-7, 11-16.

Specific conductance: Maximum daily, 2,190 micromhos Nov. 4; minimum daily, 186 micromhos Apr. 14.

Water temperatures: Maximum, 89°F July 29, Aug. 2, 4; minimum, 41°F Jan. 17.

EXTREMES, 1955-57.--Dissolved solids: Maximum, 1,220 ppm Sept. 21-30, Oct. 1-10, 1956; minimum, 122 ppm Apr. 11-18, 1957.

Hardness: Maximum, 451 ppm Oct. 1-10, 1956; minimum, 70 ppm Feb. 5-7, 11-16, 1957.

Specific conductance: Maximum daily, 2,190 micromhos Nov. 4, 1956; minimum daily, 186 micromhos Apr. 14, 1957.

Water temperatures: Maximum, 91°F Aug. 9, 16, 17, 1956; minimum, 40°F Jan. 19, 1956.

REMARKS.--Records of specific conductance of daily samples available in subdistrict office at Baton Rouge, La. Records of discharge for water year

October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 1-10, 1956...	1,650	8.4	0.02	128	32	264	185	283	410	0.3	1.2	1.2	1,220	1.66	5,440	451	300	56	5.4	2,010	8.2
Oct. 11-20.....	969	14	.02	119	33	238	208	248	368	.3	1.2	1.2	1,120	1.52	2,930	432	262	54	5.0	1,850	8.2
Oct. 21-31.....	759	15	.01	87	34	166	260	144	250	.2	1.5	1.5	1,826	1.12	1,690	357	144	50	3.8	1,430	8.1
Nov. 1-12.....	1,120	16	.00	72	32	179	244	96	282	.3	1.5	1.5	2,420	1.09	2,420	310	110	56	4.4	1,430	8.3
Nov. 13-20.....	1,760	11	.01	51	14	69	170	47	103	.2	.5	.5	380	.52	1,830	184	44	45	2.2	675	8.2
Nov. 21-30.....	1,320	10	.01	69	18	98	234	53	149	.3	.5	.5	513	.70	1,790	246	54	46	2.7	911	8.0
Dec. 1-12.....	1,320	9.8	.00	54	15	56	213	25	82	.3	.2	.2	347	.47	1,240	196	22	38	1.7	628	8.1
Dec. 13-20.....	3,320	10	.07	26	8.1	23	135	17	30	.5	1.0	1.0	161	.22	1,440	191	13	35	1.0	283	7.7
Dec. 21-28.....	2,400	12	.03	39	8.6	38	134	31	55	.4	.5	.5	252	.34	1,630	138	28	38	1.4	438	7.7
Dec. 29-31.....	6,000	11	.02	51	12	86	104	91	130	.4	1.5	1.5	434	.59	7,030	177	92	52	2.8	748	7.7
Jan. 1-10, 1957.....	3,370	9.0	.05	49	12	94	84	101	143	.4	.5	.5	450	.61	4,090	172	103	54	3.1	783	7.7
Jan. 11-19.....	4,900	9.6	.04	49	12	102	74	107	156	.3	.8	.8	473	.64	6,260	172	112	56	3.4	841	7.7
Jan. 20-26.....	5,170	9.8	.02	85	22	192	99	213	295	.3	.8	.8	867	1.18	12,100	302	221	58	4.8	1,470	7.8
Jan. 27-31, Feb. 2-4, 8-10.....	23,800	8.2	.58	29	5.8	41	60	44	63	.4	1.2	1.2	223	.30	14,300	96	47	48	1.8	405	7.7
Feb. 5-7, 11-16.....	30,600	10	.88	22	3.8	18	57	21	27	.4	1.5	1.5	133	.18	11,100	70	23	36	.9	231	7.5
Feb. 17-22.....	14,200	9.8	.12	22	4.3	39	61	31	53	.4	.8	.8	190	.26	7,280	73	23	54	2.0	337	7.4
Feb. 23-28.....	9,280	11	.08	38	9.0	79	67	79	118	.4	.8	.8	a 386	.52	9,670	132	77	57	3.0	660	7.5
Mar. 1-11.....	8,640	11	.07	38	10	79	67	81	119	.4	.5	.5	a 389	.53	9,070	137	82	56	2.9	667	7.4
Mar. 12-21.....	12,000	11	.12	30	5.9	43	62	46	65	.5	1.0	1.0	a 254	.35	8,230	98	47	49	1.9	417	7.4

Mar. 22-31, 1957...	43,800	9.6	.35	25	3.4	22	66	23	32	.7	0.5	149	.20	17,600	77	23	39	1.1	262	7.3
Apr. 1-10	82,100	8.8	.47	26	3.9	17	74	21	24	.5	1.0	139	.19	30,800	81	20	32	.8	247	7.8
Apr. 11-18	65,400	11	.36	24	3.1	14	76	14	17	.6	1.0	122	.17	21,500	73	10	30	.7	204	7.8
Apr. 19-22, 24-25.	50,800	11	.13	31	4.6	30	81	32	42	.6	1.0	182	.26	26,200	96	30	40	1.3	337	7.9
Apr. 23, 26-30,																				
May 1-5	165,000	10	.44	28	4.1	14	92	16	16	.7	1.2	a 135	.18	60,100	87	11	26	.7	229	7.9
May 6-10	200,000	11	.16	41	6.5	39	95	46	61	.6	1.2	253	.34	137,000	129	51	40	1.5	451	7.7
May 12-17	128,000	9.8	.04	55	11	85	99	93	132	.5	1.0	a 436	.59	151,000	182	101	50	2.7	780	7.8
May 18-22, 28-29	122,000	12	.07	38	5.9	40	42	40	60	.5	1.5	a 245	.33	80,700	118	44	42	1.6	422	7.5
May 23-27	118,000	12	.02	55	9.8	80	101	87	125	.5	1.5	a 433	.59	138,000	177	44	50	2.6	742	7.7
May 30-31, June 1-2	161,000	10	.16	29	5.6	19	95	20	25	.5	1.5	a 163	.22	70,900	96	18	30	.8	270	7.5
June 3-9	162,000	11	.04	43	5.4	46	97	50	68	.6	1.5	274	.37	120,000	130	50	44	1.8	474	7.5
June 11-20	162,000	10	.03	51	8.8	60	102	72	95	.6	1.5	a 364	.50	159,000	164	80	44	2.0	631	7.5
June 21-30	92,500	9.6	.02	59	11	80	107	100	121	.6	1.5	a 448	.61	112,000	191	104	48	2.5	759	7.8
July 1-12	73,600	11	.01	64	11	88	113	113	130	.4	1.5	a 481	.75	95,600	204	112	48	2.7	825	7.7
July 13-21	23,600	11	.05	50	8.0	56	123	67	76	.4	1.2	a 333	.45	21,200	158	57	43	1.9	578	7.8
July 22-31	16,800	11	.04	48	7.8	46	131	52	63	.4	.8	283	.40	13,300	152	44	40	1.6	515	7.8
Aug. 1-10	14,000	14	.02	52	8.8	53	144	58	71	.3	.8	a 342	.47	12,900	166	48	41	1.8	568	8.1
Aug. 11-20	10,900	15	.02	55	9.3	57	152	59	79	.3	.5	a 360	.49	10,600	175	50	41	1.9	605	8.1
Aug. 21-31	7,780	13	.02	63	11	69	167	71	99	.4	.8	a 428	.58	8,990	202	65	43	2.1	713	8.0
Sept. 1-12	5,390	11	.01	80	16	105	b 203	105	153	.3	1.7	a 624	.85	9,080	266	99	46	2.8	971	8.3
Sept. 13-20	3,770	13	.01	83	19	114	209	121	166	.3	1.0	a 666	.91	6,780	285	114	47	2.9	1,060	8.1
Sept. 21-30	43,500	7.2	.05	41	7.5	47	108	51	65	.4	1.6	a 301	.41	35,400	133	45	43	1.8	477	8.0
Weighted average.	40,700	11	0.12	53	12	78	128	77	117	0.4	1.0	420	0.57	46,200	186	82	48	2.3	716	--

a Residue on evaporation at 180° C.

b Includes equivalent of 4 parts per million of carbonate (CO₃).

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

RED RIVER AT SHREVEPORT, LA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once daily measurement, usually between 4 and 6 p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	67	51	52	--	59	82	70	--	83	87	86
2	--	--	55	48	47	56	87	70	--	85	89	84
3	77	65	56	47	53	56	65	71	--	85	88	81
4	76	69	58	53	58	55	65	68	--	86	89	85
5	77	67	64	53	56	54	66	67	--	86	85	85
6	77	--	66	52	56	54	64	69	--	84	84	80
7	74	68	70	52	55	51	67	69	--	85	--	78
8	74	50	66	50	58	51	61	71	--	86	86	78
9	73	--	51	62	61	54	62	71	--	86	86	78
10	73	57	52	52	59	58	65	73	--	87	82	79
11	73	59	55	52	56	60	65	--	81	87	84	80
12	74	62	60	52	60	62	63	71	83	87	85	78
13	74	63	54	54	58	63	57	72	--	88	86	80
14	74	66	53	48	60	62	62	73	82	87	86	80
15	74	65	54	47	61	61	59	72	81	87	87	80
16	74	63	53	42	56	61	63	77	82	87	87	79
17	73	65	55	41	56	59	62	71	82	--	86	79
18	73	55	55	43	54	62	65	75	82	88	85	80
19	73	69	55	43	53	63	70	78	81	88	85	81
20	70	63	54	53	51	59	--	79	81	86	85	82
21	69	58	54	53	53	58	69	81	81	87	85	81
22	70	53	57	56	54	61	68	81	--	86	85	77
23	72	54	53	46	57	59	67	81	81	84	85	76
24	72	53	54	45	58	57	69	80	79	82	84	75
25	72	53	--	47	60	52	70	75	79	85	84	73
26	68	49	51	45	55	54	70	76	80	86	86	72
27	68	49	52	45	55	53	67	72	77	87	87	72
28	69	48	51	48	58	55	68	77	81	88	86	71
29	70	45	50	49	--	56	72	77	82	89	86	71
30	68	49	52	45	--	57	69	78	83	86	83	70
31	65	--	55	50	--	60	--	76	--	86	84	--
Average	72	59	56	49	56	57	65	74	81	86	86	78

RED RIVER BASIN--Continued

BAYOU DORCHEAT NEAR MINDEN, LA.

LOCATION.--At gaging station on left bank, 500 feet upstream from bridge on U. S. Highway 80, three-quarters of a mile upstream from Louisiana and Arkansas Railway bridge, 3 miles west of Minden, and 28 miles upstream from Bisteneau Dam.

DRAINAGE AREA.--1,097 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to August 1957.

REMARKS:--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, November 1956 to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Nov. 14, 1956.....	3.5	6.0	0.01	28	6.7	132		24	5.0	255		0.8		446	0.61	4.2	98	78	75	5.8	900	6.3
Dec. 12.....	20	8.8	.02	57	14	329		16	11	632		.2		1,060	1.44	57	200	187	78	10	2,030	6.9
Jan. 7, 1957.....	57	7.6	.05	52	12	312		15	12	590		.2		993	1.35	153	178	166	79	10	1,950	6.6
Feb. 5.....	1,230	10	.18	27	7.3	150		5	7.6	292		.5		497	.68	1,850	98	94	77	6.6	966	5.6
Mar. 11.....	1,090	13	.06	21	5.0	103		6	6.8	202		.6		354	.48	1,050	74	69	75	5.2	701	5.9
Apr. 11.....	10,800	8.8	.18	7.9	2.5	39		9	4.8	72		.8		140	.19	4,080	30	23	74	3.1	288	5.9
May 15.....	3,400	5.8	.20	4.8	1.4	12		9	1.0	24		.8		54	.07	486	18	10	59	1.2	106	5.7
June 5.....	2,290	9.6	.32	34	2.8	15		8	3.2	84		.5		153	.21	946	96	89	25	0.7	322	5.5
July 12.....	94	13	.38	20	4.4	87		14	2.2	172		.5		306	.42	78	68	56	74	4.6	606	6.1
Aug. 6.....	32	7.6	.02	19	4.8	85		24	3.0	163		.2		295	.40	25	67	48	73	4.5	582	6.3
Aug. 27.....	2.2	8.8	.02	19	5.0	88		22	4.8	168		.2		305	.41	1.8	68	50	74	4.7	595	6.4

RED RIVER BASIN--Continued

CYPRESS BAYOU NEAR BENTON, LA.

LOCATION.--At gaging station at bridge on State Highway 162, 2 miles upstream from Little Caney Bayou and 3 miles east of Benton, Bossier Parish.
DRAINAGE AREA.--91 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to August 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1631.

Chemical analyses, in parts per million, November 1956 to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Nov. 16, 1956 ...	0.6	7.8	0.15	5.1	1.8	5.8	3.5	10	16	7.0	0.2	0.2		52	0.07	0.08	20	12	33	0.5	84.0	5.9
Dec. 12 ...	.5	15	.48	5.1	1.8	6.8	3.7	16	11	9.8	.3	.2		62	.08	.09	20	7	37	.7	88.6	6.1
Jan. 8, 1957 ...	21	14	.62	2.2	1.1	9.7	2.5	16	6.0	9.0	.6	.5		54	.07	3.1	10	0	62	1.3	76.4	6.1
Feb. 4 ...	344	7.4	.39	2.9	1.4	10		5	4.6	18	--	.8		47	.06	44	13	9	63	1.2	84.2	5.3
Mar. 12 ...	101	12	.53	8.4	2.5	30		10	6.0	58	--	1.2		124	.17	34	31	23	68	2.4	228	5.8
Apr. 4 ...	588	8.2	.35	3.9	1.7	7.5	1.3	11	3.6	14	.5	.8		47	.06	75	17	8	47	.8	80.6	5.8
Apr. 29 ...	5,400	4.0	.22	1.7	.7	1.5	2.0	7	1.9	2.2	.4	1.0		19	.03	277	7	1	25	.2	31.4	5.4
June 5 ...	.572	9.2	.52	2.3	1.3	6.2	1.9	8	1.2	13	--	1.0		41	.06	63	11	4	50	.8	69.9	5.5
July 15 ...	.1	10	1.1	12	3.2	33		26	2.6	63	--	1.2		139	.19	.04	43	22	62	.22	271	6.1
Aug. 5 ...	.1	6.0	.31	6.3	1.8	11		26	4.2	14	--	1.0		58	.08	.02	23	2	50	1.0	109	6.1

RED RIVER BASIN--Continued
LOGGY BAYOU NEAR NINOCK, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 71, a quarter of a mile downstream from Flat River, 2 miles southeast of Ninock, and 6 miles downstream from Life Bistreau Dam.
DRAINAGE AREA.--2,628 square miles.
RECORDS AVAILABLE.--Chemical analyses: November 1954 to September 1957.
REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses , in parts per million, water year October 1956 to September 1957																							
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium	So- dium adorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non-carbon- ate					
Oct. 15, 1956	7.74	6.6	0.00	61	44	242		286	91	375		1.2		692	1.31	14	344	100		61	5.7	1,700	7.5
Nov. 19	19	7.0	.03	51	28	92		245	60	126		.5		485	.66	25	241	40		45	2.6	867	7.8
Dec. 13	200	9.6	.94	32	9.0	136		135	30	192		.5		476	.65	257	116	6		72	5.5	864	7.4
Jan. 9, 1957	447	8.8	.88	35	6.7	153		149	37	202		.8		517	.70	624	114	0		74	6.2	929	7.3
Feb. 6	2,050	9.8	.33	16	4.9	67		30	9.2	122		.5		245	.33	1,360	60	35		71	3.8	474	6.5
Mar. 13	2,320	6.0	.25	21	5.5	102		26	13	185		.2		346	.47	2,170	75	54		75	5.1	682	6.7
Apr. 9	6,150	6.0	.08	16	4.5	80		14	6.6	151		.5		272	.37	4,520	58	47		75	4.5	544	6.3
May 3	6,800	6.8	.14	7.6	2.4	23		18	3.4	42		1.0		95	.13	1,740	29	14		63	1.8	181	6.2
June 6	7,300	5.6	.37	6.5	2.4	8.8	3.0	24	2.4	18		2.0		81	.08	1,200	26	6		39	.8	115	6.1
July 18	1,140	6.2	1.1	11	2.9	13		40	3.0	22		2.0		81	.11	249	39	6		43	.9	153	6.3
Aug. 29	49.4	9.2	.02	60	22	83		256	54	109		1.2		464	.63	62	240	30		43	2.3	825	7.4
Sept. 12	52.2	14	.06	64	27	92		271	65	128		.5		524	.71	74	270	48		43	2.4	916	7.8

RED RIVER BASIN--Continued
SALINE BAYOU NEAR LUCKY, LA.

LOCATION.--At gaging station at bridge on State Highway 4, 0.7 mile downstream from Sixmile Creek and 1.0 mile east of Lucky, Bienville Parish.
DRAINAGE AREA.--154 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957																						
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 23, 1956 ...	13	13	0.22	1.9	0.3	2.8	1.2	7	1.8	4.0	--	0.2		28	0.04	1.0	6	0	45	0.5	31.4	6.0
Nov. 28 ...	18	15	.25	1.2	.7	3.5	1.1	8	1.2	4.8	--	.2		32	.04	1.6	6	0	51	.6	34.9	6.2
Dec. 18 ...	46	15	.46	2.0	.7	3.2	1.2	7	1.4	5.5	0.3	.2		33	.04	4.1	8	2	42	.5	38.0	6.0
Jan. 17, 1957 ...	32	15	.88	1.9	.8	15		8	3.4	22	--	.2		63	.09	5.4	8	1	81	2.4	89.6	6.2
Jan. 31 ...	515	9.4	.46	2.0	.7	4.8	1.5	4	4.4	7.0	.7	.8		34	.05	47	8	5	51	.7	42.6	5.4
Feb. 19 ...	259	9.6	.60	1.4	.9	4.7	.9	6	1.2	7.0	.7	.8		31	.04	22	7	2	55	.8	40.7	5.4
Mar. 20 ...	106	--	--	--	--	--	--	10	--	17	--	--		--	--	--	5	0	--	--	80.2	6.2
Apr. 11 ...	183	14	.52	2.7	1.3	--	13	10	5.2	18	--	.8		61	.08	30	12	4	69	1.6	95.5	5.9
May 29 ...	793	11	.42	1.6	.8	2.8	1.2	8	2.0	3.8	.3	.5		28	.04	60	7	1	41	.4	34.8	5.8
June 5 ...	430	7.6	.40	.9	.9	1.6	1.1	4	1.4	2.0	.6	2.0		20	.03	23	6	3	32	.3	32.8	5.1
July 19 ...	16	15	.99	2.5	.7	16		9	1.4	24	--	.8		65	.09	2.8	9	2	79	2.3	97.6	5.8
Aug. 29 ...	9.0	13	.32	1.6	.4	11		11	.4	14	--	.8		47	.06	1.1	6	0	81	2.1	68.6	6.3
Sept. 25 ...	47	16	.35	1.7	.9	4.1	1.0	6	1.2	6.8	.6	.5		36	.05	4.6	8	3	49	.6	42.2	6.0

Chemical analyses, in parts per million, water year October 1956 to September 1957

RED RIVER BASIN--Continued

BLACK LAKE BAYOU NEAR CASTOR, LA.

LOCATION.--At gaging station at bridge on State Highway 4, 2.8 miles downstream from Four Mile Bayou, 2.8 miles northeast of Castor, Bienville Parish, and 6.0 miles southeast of Ringgold.

DRAINAGE AREA.--423 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 26° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./nesium	Non-carbonate				
Oct. 15, 1956	7.9	15	0.23	1.8	0.6	3.6	1.5	9	2.2	4.5	--	0.2		34	0.05	0.7	7	0	47	0.6	35.2	6.3
Nov. 19	28	16	.25	2.4	1.0	4.6	1.9	9	4.0	6.5	0.3	.5		41	.06	3.1	10	3	45	0.6	52.1	6.0
Dec. 13	45	15	.28	2.5	1.4	20		12	3.4	30	--	.2		79	.11	9.6	12	2	79	2.5	122	6.3
Jan. 9, 1957	190	14	.27	5.7	1.9	86		8	8.8	137	--	.2		258	.35	132	22	15	89	8	487	6.0
Feb. 6	1,000	12	.29	3.6	1.7	16		4	9.0	27	--	.5		72	.10	194	16	13	69	1.8	126	5.4
Mar. 13	555	12	.44	3.6	1.6	20		8	8.8	30	--	1.0		81	.11	121	16	9	73	2.2	141	6.0
Apr. 11	1,520	10	.29	2.7	1.4	14		10	6.0	20	--	.2		60	.08	246	12	4	71	1.7	100	6.2
June 4	1,010	12	.48	3.2	1.6	14		14	2.8	21	--	.2		62	.08	169	15	3	67	1.5	104	6.2
June 24	295	15	.62	3.5	2.0	55		7	6.4	87	--	1.0		174	.24	139	17	11	87	5.8	336	5.5
July 18	35	17	1.1	5.7	2.0	84		10	4.4	136	--	1.2		256	.35	24	22	14	89	7.7	491	5.9
Aug. 7	43	14	.46	2.8	.7	29		13	5.6	40	--	.8		99	.13	11	10	0	87	4	165	6.1
Sept. 16	52	14	.28	2.0	1.0	5.1	1.8	9	3.2	7.0	.6	.8		40	.05	5.6	9	0	50	.7	50	6.2

RED RIVER BASIN--Continued

RED RIVER AT ALEXANDRIA, LA.

LOCATION.--At gaging station at old bridge on U. S. Highway 165 between Alexandria, Rapides Parish, and Pineville, 1.7 miles downstream from Bayou Rigolette. DRAINAGE AREA.--67,500 square miles, of which 5,936 square miles above Denison Dam is noncontributing.

RECORDS AVAILABLE.--Chemical analyses, October 1952 to September 1957.

Water samples collected October 1954 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,130 ppm Oct. 1, 3-9, 11-20; minimum, 144 ppm Apr. 11-20.

Hardness: Maximum, 464 ppm Oct. 11-20; minimum, 65 ppm Feb. 17-21.

Specific conductance: Maximum daily, 2,020 micromhos Oct. 8; minimum daily, 231 micromhos Apr. 17.

Water temperatures: Maximum, 89°F Aug. 12, 17; minimum, 46°F Jan. 19, 11-20, 1956; minimum, 91 ppm June 1-9, 1953.

EXTREMES, 1952-57.--Dissolved solids: Maximum, 1,130 ppm Oct. 1, 3-9, 11-20, 1956; minimum, 57 ppm June 1-9, 1953.

Hardness: Maximum, 464 ppm Oct. 11-20, 1956; minimum, 2,020 micromhos Oct. 8, 1956; minimum daily, 133 micromhos June 24, 1953.

Specific conductance: Maximum daily, 2,020 micromhos Oct. 8, 1956; minimum, 45°F Dec. 25, 1953.

Water temperatures: Maximum, 93°F Aug. 2, 8, 10, 1956; minimum, 45°F Dec. 25, 1953.

REMARKS.--Records of specific conductance of daily samples available in subdistrict office at Baton Rouge, La. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1, 3-9, 1956.	2,140	16	0.00	121	35	234		210	237	380	--	1.2	1.2	1,130	1.54	6,530	446	274	53	4.8	1,870	8.2
Oct. 11-20.	1,660	18	.01	123	38	227		220	250	365	--	1.2	1.2	1,130	1.54	5,060	484	293	52	4.6	1,930	8.3
Oct. 21-31.	1,090	15	.01	122	37	206		288	194	330	--	1.0	1.0	1,050	1.43	3,090	456	220	50	4.2	1,790	8.2
Nov. 1-10.	1,210	17	.00	86	33	161		269	131	242	0.2	1.5	1.5	804	1.09	2,630	350	129	50	3.7	1,390	8.3
Nov. 11-20.	1,820	14	.00	88	32	166		6316	81	280	.2	1.0	1.0	797	1.08	3,920	352	92	51	3.8	1,400	8.3
Nov. 21-23, 25-30.	1,840	12	.01	65	19	101		228	55	151	.2	.5	.5	516	.70	2,560	240	53	48	2.8	909	7.9
Dec. 1-12.	1,640	11	.00	74	22	134		270	51	208	--	.2	.2	633	.86	2,800	276	54	51	3.5	1,150	7.7
Dec. 13-20.	3,580	9.8	.11	43	13	60		170	25	90	--	1.2	1.2	326	.44	3,150	162	22	45	2.1	584	7.8
Dec. 21-31.	4,860	11	.38	27	7.3	45		98	19	66	--	1.0	1.0	225	.31	2,950	97	17	50	2.0	401	7.4
Jan. 1-10, 1957.	5,030	9.0	.13	39	12	76		110	59	114	--	1.2	1.2	c 386	.52	5,240	148	58	53	2.7	653	7.4
Jan. 11-12, 14-20.	4,720	8.8	.13	45	13	101		94	85	155	--	.8	.8	c 480	.65	6,120	165	88	57	3.4	819	7.7
Jan. 21-30.	8,000	8.8	.09	55	15	125		90	116	194	--	.8	.8	c 577	.78	12,500	198	124	58	3.9	989	7.7
Jan. 31, Feb. 1-6.	29,200	8.0	.09	30	6.8	52		73	40	81	--	1.2	1.2	255	.35	20,100	104	44	52	2.2	466	7.6
Feb. 7-16.	36,800	8.6	.15	23	4.6	29		63	24	43	--	1.0	1.0	164	.22	16,200	76	24	45	1.4	293	7.6
Feb. 17-21.	28,700	10	.21	19	4.2	29		59	18	43	--	.8	.8	153	.21	11,900	65	17	49	1.6	276	7.5
Feb. 22-27.	22,700	9.4	.21	21	4.0	59		54	21	95	--	.8	.8	238	.32	14,600	73	29	64	3.0	444	7.3
Feb. 28, Mar. 1-7.	18,000	9.4	.19	27	7.0	84		50	42	137	--	.5	.5	332	.45	14,300	96	55	65	3.7	625	7.2
Mar. 8-15.	17,800	9.4	.14	26	7.3	76		54	47	118	--	.2	.2	311	.42	14,900	95	50	63	3.4	568	7.4
Mar. 16-23.	21,100	11	.20	25	5.2	57		53	31	93	--	.5	.5	249	.34	14,200	83	60	80	2.7	464	7.2
Mar. 24-31.	53,600	9.6	.35	25	4.0	31		66	20	50	--	.8	.8	173	.24	25,000	79	25	46	1.5	320	7.5

Apr. 1-10, 1957...	77,400	9.6	.38	25	4.5	28	69	21	44	--	.8	167	.23	34,900	81	24	43	1.3	307	7.3
Apr. 11-20	83,700	11	.35	24	3.9	21	75	14	32	--	.8	144	.20	32,500	76	14	38	1.1	259	7.8
Apr. 21-30	82,300	11	.27	29	4.5	25	86	23	35	--	1.0	171	.23	38,000	91	20	37	1.1	304	7.9
May 1-10	177,000	9.8	.31	32	4.9	14	101	17	21	--	1.0	150	.20	71,700	100	17	24	.6	265	7.8
May 11-17	177,000	10	.17	42	7.4	46	96	51	73	--	1.0	278	.38	133,000	135	57	43	1.7	502	7.7
May 18-20, 25-29.	145,000	12	.03	49	8.8	67	98	70	106	--	1.2	c383	.52	150,000	159	78	48	2.3	644	7.6
May 21-24, 30-31.	145,000	13	.09	37	6.2	40	91	40	62	--	1.2	c254	.33	99,400	117	42	43	1.6	425	7.6
June 1-5	147,000	11	.10	32	5.0	27	97	29	34	--	1.5	c188	.26	74,600	101	22	36	1.2	308	7.6
June 6-15	162,000	11	.04	38	6.7	45	98	45	66	--	1.2	c269	.37	118,000	123	43	44	1.8	464	7.5
June 16-21	165,000	10	.04	47	8.1	54	100	62	85	--	1.5	c326	.44	145,000	151	69	44	1.9	563	7.7
June 22-30	134,000	9.8	.11	49	8.5	60	101	72	92	--	1.5	c361	.49	131,000	158	75	45	2.1	601	7.7
July 1-10	102,000	15	.02	57	9.6	73	102	96	111	--	1.2	c424	.58	117,000	182	96	47	2.4	721	7.6
July 11-18	56,600	13	.06	51	8.8	59	106	75	86	--	1.2	c354	.48	53,500	163	74	44	2.0	614	7.5
July 19-31	23,800	11	.06	46	7.9	45	122	52	64	--	1.2	c290	.39	18,600	147	47	40	1.6	508	7.5
Aug. 1-10	18,600	15	.03	51	8.6	46	142	50	67	--	.5	c322	.44	16,200	162	46	38	1.6	533	8.2
Aug. 11-13, 15-20.	13,400	13	.03	53	9.7	55	158	54	74	--	.5	c352	.48	12,700	172	42	41	1.8	584	8.1
Aug. 21-31	10,200	15	.02	59	10	60	175	58	81	--	.2	c384	.52	10,600	188	44	41	1.9	640	8.1
Sept. 1-10	8,600	15	.03	69	14	67	d189	69	99	--	1.0	c462	.63	10,700	230	66	39	1.9	752	8.3
Sept. 11-20	5,820	15	.02	82	18	86	235	86	130	--	.5	c572	.78	8,990	278	86	40	2.2	924	8.2
Sept. 21-28	19,200	13	.03	80	17	94	e221	94	137	--	1.2	c584	.79	30,300	270	88	43	2.5	945	8.3
Sept. 29-30	77,700	8.4	.27	31	5.7	20	105	24	24	--	2.0	167	.23	35,000	102	16	30	.9	297	8.0
Weighted average.	46,800	12	0.11	53	13	79	136	67	121	--	0.9	422	0.57	54,000	186	74	48	2.4	726	--

c Residue on evaporation at 180°C.

d Includes equivalent of 4 parts per million of carbonate (CO₃).e Includes equivalent of 3 parts per million of carbonate (CO₃).

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

RED RIVER AT ALEXANDRIA, LA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily measurement, usually between 3 and 4 p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	70	56	--	54	59	63	71	77	85	87	85
2	--	70	--	53	52	60	69	73	76	85	87	87
3	80	72	56	50	54	62	65	71	78	84	88	83
4	82	72	55	55	55	59	66	70	76	85	87	85
5	86	73	59	54	57	59	65	69	78	87	86	85
6	81	74	65	51	59	59	64	69	78	87	86	85
7	81	72	67	53	60	57	63	70	76	--	87	85
8	77	69	65	60	61	55	60	71	80	85	88	83
9	78	64	56	62	62	57	64	72	81	85	86	85
10	--	64	57	61	64	58	62	73	79	84	85	84
11	79	64	60	58	61	60	65	74	81	87	86	84
12	78	65	62	57	60	58	65	76	81	87	89	84
13	77	65	62	--	58	62	64	75	82	88	86	87
14	76	69	60	51	--	64	61	76	82	85	--	86
15	78	66	60	52	63	68	62	76	83	87	88	85
16	75	62	61	50	59	60	61	77	84	87	86	78
17	71	60	60	47	58	64	64	73	82	86	89	79
18	75	59	60	49	57	65	66	78	83	87	88	74
19	78	63	58	46	56	63	68	79	84	87	85	83
20	78	62	60	56	54	64	68	77	83	86	85	88
21	77	62	61	58	55	64	68	80	83	87	86	80
22	74	60	61	56	56	64	70	81	82	86	84	83
23	74	60	60	52	58	65	72	80	84	85	83	79
24	75	--	59	50	58	60	73	80	83	86	86	80
25	74	57	56	53	58	58	74	81	82	86	85	86
26	72	55	54	50	56	55	72	80	83	85	85	76
27	73	54	53	50	57	56	72	79	82	86	85	74
28	74	56	55	51	59	57	73	77	80	84	86	72
29	73	54	52	59	--	55	70	78	81	82	85	72
30	72	54	55	53	--	56	70	79	82	87	--	70
31	70	--	54	55	--	62	--	77	--	85	86	--
Average	76	64	59	54	58	60	67	76	81	86	86	82

RED RIVER BASIN--Continued

OUACHITA RIVER AT ARKADDELPHIA, ARK.

LOCATION --At gaging station at bridge on State Highway 8 at Arkadelphia, Clark County, 800 feet upstream from Missouri Pacific Railroad bridge. DRAINAGE AREA --2,311 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1957.

Water temperatures: October 1948 to September 1957.

EXTREMES, 1956-57 --Dissolved solids: Maximum, not determined; minimum, 41 ppm Apr. 2-10. Hardness: Maximum, 77 ppm June 20; minimum, 18 ppm Apr. 2-10.

Specific conductance: Maximum daily, 240 micromhos June 24; minimum daily, 45.6 micromhos May 28.

Water temperatures: Maximum, 85°F July 19, 20; minimum, 44°F on several days during January.

EXTREMES, 1948-57 --Dissolved solids: Maximum, 266 ppm Jan. 16, 1956; minimum, 30 ppm Mar. 17-21, 23, 25-28, 1955.

Hardness: Maximum, 77 ppm June 20, 1957; minimum, 11 ppm Jan. 25-31, 1949.

Specific conductance: Maximum daily, 390 micromhos Jan. 16, 1956; minimum daily, 26.7 micromhos Jan. 27, 1949.

Water temperatures: Maximum, 99°F July 7, 1955; minimum, 36°F Jan. 30, 31, Feb. 1, 2, 1951.

REMARKS --Records of specific conductance of daily samples available in district office at Fayetteville, Ark. Records of discharge for water year October 1956 to September 1957 furnished by district office, Corps of Engineers, Vicksburg, Miss.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 1, 3-10, 1956 ...	1,648	--	--	9.5	2.5	3.4	--	38	2.6	3.5	--	6.3	60	34	3	84.2	7.3	7
Oct. 2	1,540	--	--	--	--	--	--	38	5.0	14	--	8	282	40	9	117	7.6	--
Oct. 11-13, 15-20 ...	2,221	--	--	10	2.5	3.6	--	41	3.6	4.2	--	3.8	62	35	2	187.9	7.1	7
Oct. 14	2,110	--	--	--	--	--	--	42	4.0	16	--	1.3	290	41	7	129	7.4	--
Oct. 21-26, 28-31 ...	1,534	--	--	9.9	2.7	4.3	--	40	4.8	4.8	--	2.4	60	36	3	94.6	6.5	8
Oct. 27	2,080	--	--	--	--	--	--	40	7.0	24	--	.3	112	50	17	160	7.4	--
Nov. 1-10	1,565	2.4	0.00	9.8	2.7	3.2	1.1	36	7.2	4.0	0.1	1.9	60	36	6	91.4	7.3	8
Nov. 11-20	1,351	--	--	10	2.5	4.0	--	36	7.2	4.5	--	4.3	73	35	6	96.6	6.8	5
Nov. 21-30	2,068	--	--	9.8	2.6	4.1	--	37	7.2	5.0	--	2.4	70	35	5	96.0	7.0	7
Dec. 1-10	615	--	--	10	2.3	4.5	--	40	5.6	2.5	--	1.7	72	34	2	97.1	7.0	7
Dec. 11-20	631	--	--	11	3.0	5.2	--	38	8.8	6.5	--	3.6	74	40	9	103	7.1	7
Dec. 21-31	321	--	--	12	2.7	6.3	--	36	13	6.5	--	5.7	79	41	12	117	6.5	8
Jan. 1-10, 1957	649	2.8	.00	11	2.4	5.8	1.0	38	6.0	7.0	.1	1.5	64	37	6	110	7.0	10
Jan. 11-16, 18-20 ...	881	--	--	10	2.5	4.5	--	39	5.6	5.0	--	4.2	69	35	3	96.1	7.0	6
Jan. 17	1,630	--	--	--	--	--	--	37	9.0	18	--	.3	94	42	12	134	7.4	--
Jan. 21-31	5,508	--	--	--	9.4	2.8	--	31	7.2	5.0	--	2.3	64	35	10	85.2	7.3	13
Feb. 1-10	8,744	--	--	7.4	1.5	3.1	--	22	7.6	3.5	--	2.3	58	25	7	69.4	7.2	23
Feb. 11-17, 19-20 ...	3,224	--	--	7.9	2.1	3.0	--	28	6.8	3.0	--	2.0	58	28	5	71.0	6.7	23
Feb. 18	1,810	--	--	--	--	--	--	26	8.0	9.5	--	.3	65	30	9	92.6	7.2	--
Feb. 21-22, 24-28 ...	2,191	--	--	9.4	1.4	3.4	1.1	26	7.2	6.0	--	1.5	54	29	8	79.2	7.2	15

a Estimated from specific conductance.

RED RIVER BASIN--Continued

OUMACHITA RIVER AT ARKADAPHA, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180° C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium, mg-nestum	Non-carbonate			
Feb. 23, 1957	1,940	--	--	--	--	--	--	28	8.0	26	--	0.3	a106	40	17	151	7.2	--
Mar. 1-14	1,546	--	--	8.4	1.6	2.8	0.8	28	8.0	3.5	--	2.1	46	28	5	72.8	7.0	5
Mar. 15-31	5,854	--	--	7.0	1.0	2.1	1.1	22	6.2	3.0	--	1.3	44	22	4	56.4	7.0	30
Apr. 1	9,370	--	--	--	--	--	--	22	3.0	9.8	--	2.4	a64	26	8	91.8	7.7	--
Apr. 2-10	18,730	3.0	0.00	5.2	1.3	3.3	.8	20	3.2	2.5	0.3	1.9	41	18	2	54.8	6.7	17
Apr. 11-18, 20	9,274	--	--	7.7	1.2	2.0	1.2	26	4.0	3.0	--	1.1	43	24	3	62.3	7.4	15
Apr. 19	8,720	--	--	--	--	--	--	32	7.0	16	--	2.2	a85	37	11	122	7.7	--
Apr. 21-30	19,330	--	--	5.7	1.6	2.3	.9	24	4.4	2.0	--	1.1	44	21	1	67.7	6.8	25
May 1-10	12,000	--	--	6.4	2.4	2.9	1.0	26	5.2	3.8	--	1.3	58	26	4	68.0	6.6	7
May 11-20	10,220	--	--	7.9	1.8	3.8	1.4	30	4.6	6.0	--	.8	62	27	2	81.9	6.2	5
May 21-31	17,860	--	--	6.5	1.9	3.1	1.3	24	4.8	4.5	--	.7	55	24	4	66.9	7.1	10
June 1-10	10,380	--	--	7.8	1.5	2.4	1.0	31	3.6	2.8	--	.6	49	26	0	70.4	7.1	7
June 11-19	8,022	--	--	7.3	1.9	2.5	1.0	32	3.6	2.5	--	1.0	44	26	0	67.2	7.2	7
June 20	5,600	--	--	--	--	--	--	14	2.0	47	--	2.6	a141	77	66	201	6.4	--
June 21-23, 25-30	5,529	--	--	7.9	1.8	2.2	1.0	32	2.8	2.8	--	.8	42	27	1	68.6	7.1	5
June 24	6,640	--	--	--	--	--	--	16	2.0	55	--	3.2	a168	66	53	240	6.2	--
July 1-7	2,230	--	--	7.9	2.2	3.1	1.0	34	4.8	3.8	--	.8	45	29	1	75.6	6.8	10
July 8-18	725	3.1	.00	9.0	2.4	5.3	1.1	35	6.4	6.5	.3	1.8	62	32	4	95.3	6.8	9
July 19-23, 25-31	1,189	--	--	8.4	2.5	3.9	1.3	35	5.2	5.2	--	.9	50	31	3	85.6	7.2	8
July 24	770	--	--	--	--	--	--	36	2.0	17	--	1.0	a85	37	7	121	7.2	--
Aug. 1-10	1,563	--	--	8.6	2.1	3.8	1.3	32	6.2	5.5	--	1.4	50	30	4	84.2	7.0	8
Aug. 11-20	2,164	--	--	8.4	1.9	3.0	1.1	31	5.6	3.5	--	1.2	45	29	3	75.3	7.1	7
Aug. 21-31	1,946	--	--	8.2	2.2	3.0	1.2	32	6.0	4.2	--	1.2	44	30	3	76.5	7.3	7
Sept. 1-10	1,994	--	--	8.2	2.0	1.98	1.3	30	6.6	3.0	--	.6	58	29	4	73.4	7.2	5
Sept. 11-20	1,943	--	--	8.3	2.2	2.6	1.3	30	6.4	4.0	--	.5	55	30	5	73.9	7.0	6
Sept. 21-30	2,414	--	--	8.2	1.8	2.9	1.2	29	5.0	4.0	--	.6	56	28	4	72.2	7.2	6
Average	4,763	--	--	8.6	2.1	3.5	--	31	5.7	8.7	--	1.8	67	30	4	95.4	--	10

a Estimated from specific conductance.

RED RIVER BASIN--Continued

OUACHITA RIVER AT ARKADELPHIA, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	62	51	45	46	52	59	68	68	73	81	75
2	68	61	52	44	45	51	--	--	67	73	82	76
3	68	60	53	46	46	52	60	68	68	73	83	76
4	67	60	51	45	53	52	60	64	66	73	83	76
5	68	60	51	45	52	52	59	62	68	76	78	73
6	68	61	52	50	53	53	60	62	69	77	79	73
7	68	60	62	50	52	53	56	63	69	77	78	74
8	68	60	62	51	52	53	57	63	70	83	76	74
9	67	55	54	50	52	52	58	64	70	83	76	72
10	68	55	54	55	53	55	58	64	71	84	78	71
11	68	56	55	54	52	48	59	68	73	84	78	70
12	68	57	55	55	52	54	59	68	74	80	76	73
13	69	57	52	45	53	55	55	68	74	80	76	72
14	69	60	52	46	53	55	54	64	73	82	77	73
15	70	58	51	45	50	53	56	63	73	83	77	73
16	70	58	52	44	49	54	56	65	73	80	76	70
17	70	58	52	44	48	54	60	68	71	82	76	70
18	69	57	51	45	51	54	60	69	72	84	77	71
19	66	57	51	47	52	--	63	69	74	85	78	71
20	65	56	50	56	49	52	64	68	73	85	78	72
21	65	55	49	56	50	53	64	68	74	84	78	72
22	65	56	52	56	52	55	62	69	70	84	72	68
23	65	55	51	55	51	56	62	70	70	83	72	68
24	64	54	50	47	51	56	62	72	72	84	72	67
25	64	53	48	46	55	54	62	72	73	--	74	66
26	66	51	49	44	56	55	63	72	73	84	76	66
27	67	50	50	44	56	55	63	72	72	84	76	67
28	67	53	51	45	56	--	63	73	72	83	77	68
29	68	52	51	44	--	53	63	69	72	84	77	66
30	67	55	54	46	--	54	64	70	73	80	76	66
31	68	--	55	45	--	54	--	70	--	80	78	--
Average	67	57	52	48	51	53	60	68	71	81	77	71

RED RIVER BASIN--Continued
OUACHITA RIVER NEAR FELSENTHAL, ARK.

LOCATION.--At U. S. Engineers Lock No. 6, 3 miles south of Felsenthal, Union County.

DRAINAGE AREA.--10,787 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1957.

Water temperatures: October 1949 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 76 ppm Apr. 16-24.

Hardness: Maximum, 522 ppm Jan. 27; minimum, 21 ppm Apr. 10-15, 16-24.

Specific conductance: Maximum daily, 4,390 micromhos Jan. 27; minimum daily, 76.9 micromhos May 11.

Water temperatures: Maximum, 90°F Aug. 1; minimum, 45°F Feb. 2.

EXTREMES 1949-57.--Dissolved solids: Maximum, 2,730 ppm Jan. 27, 1957; minimum, 5 ppm May 8, 1956.

Hardness: Maximum, 522 ppm Jan. 27, 1957; minimum, 5 ppm May 8, 1956.

Specific conductance: Maximum daily, 7,610 micromhos Oct. 7 1954; minimum daily, 55.7 micromhos Mar. 4, 1950.

Water temperatures: Maximum, 96°F June 9, 1953, Aug. 29, 1954; minimum, 35°F Feb. 3, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Fayetteville, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-6, 1956				58	16	271	19	15	15	540	--	8.4	1,060	210	195	1,880	6.6	8
Oct. 7-14, 1956	5.6		0.00	51	14	225	9.6	24	12	455	0.1	7.7	1,060	184	165	1,610	7.4	5
Oct. 15								30	12	345	--	3.7	1,060	156	131	1,250	7.2	--
Oct. 16-19				62	17	282	--	21	17	585	--	10	1,130	224	208	1,980	6.8	8
Oct. 20-21, 28-31				41	17	220	--	27	10	425	--	9.6	872	172	150	1,490	6.5	25
Oct. 22-27								23	12	510	--	9.6	1,030	201	182	1,770	6.4	8
Nov. 1-3, 5-6				51	14	226	--	28	11	445	--	8.1	912	184	163	1,580	7.0	10
Nov. 4								33	12	265	--	1.5	611	126	99	962	7.4	--
Nov. 7-11				62	17	277	--	28	9.4	560	--	6.6	1,120	224	202	1,900	6.7	9
Nov. 12-20				79	20	376	--	22	13	740	--	8.1	1,450	279	261	2,490	6.6	7
Nov. 13-14								20	12	1,000	--	9.7	1,940	356	339	3,210	6.8	8
Nov. 21-22, 24-27				98	27	508	--	24	12	495	--	6.6	993	198	179	1,730	6.6	10
Nov. 23				55	15	252	--	34	12	310	--	2.0	709	138	110	1,140	7.4	--
Nov. 28								20	12	800	--	3.9	1,620	300	284	2,600	7.2	--
Nov. 29-30				106	31	534	--	5	12	1,090	--	11	2,140	392	388	3,490	6.1	8
Dec. 1								6	12	830	--	4.7	1,770	324	319	2,840	6.6	--
Dec. 2								19	17	640	--	3.8	1,370	252	236	2,200	7.1	--
Dec. 3-7				48	13	220	--	22	11	430	--	5.6	898	174	156	1,520	7.0	10
Dec. 8-13, 19-20				37	12	150	--	30	14	302	--	2.7	686	142	118	1,120	7.0	10
Dec. 14-18				44	14	203	--	31	20	388	--	3.2	871	168	142	1,400	7.6	15

	35	10	134	--	33	19	265	--	3.5	562	128	102	987	7.0	10
Dec. 21-28, 1956	--	10	134	--	33	19	265	--	3.5	562	128	102	987	7.0	10
Dec. 29-31	--	13	216	--	34	18	415	--	4.3	873	176	148	1,480	7.0	10
Jan. 1-5, 1957	--	19	292	--	32	21	597	--	4.5	1,190	245	219	2,000	6.6	12
Jan. 6-8, 1957	4.3	20	352	13	33	20	750	.2	8.5	1,590	286	276	2,530	6.9	25
Jan. 16-19	--	26	507	--	10	18	1,020	--	12	2,060	374	366	3,350	7.6	20
Jan. 20-22	--	21	379	--	12	17	780	--	12	1,590	291	281	2,640	6.4	20
Jan. 23-26	--	20	314	--	18	17	620	--	8.6	1,300	242	226	2,120	6.7	20
Jan. 27	--	--	--	--	2	13	1,360	--	5.5	a 2,730	522	520	4,390	5.1	--
Jan. 28	--	--	--	--	24	17	285	--	2.6	a 659	123	103	1,060	7.2	--
Jan. 29-31, Feb. 1	--	7.5	107	5.3	18	11	225	--	1.0	549	98	84	839	6.6	45
Feb. 2-3	--	5.5	63	3.5	18	11	130	--	1.3	320	62	48	531	6.6	50
Feb. 4-6, 19-20	--	4.3	35	2.6	12	9.6	72	--	1.3	184	41	31	312	6.2	45
Feb. 7-18	--	2.8	19	2.0	10	7.8	38	--	1.2	117	27	19	182	7.2	30
Feb. 21-28	--	6.3	40	2.6	14	10	86	--	1.3	222	56	44	350	6.9	35
Mar. 1, 3-9	--	5.5	48	2.8	14	10	96	--	1.9	254	53	41	403	6.4	45
Mar. 2	--	--	--	--	9	20	132	--	4.5	a 322	71	64	517	7.1	--
Mar. 10-15	--	5.7	57	2.9	14	8.8	116	--	2.1	306	61	49	475	6.6	45
Mar. 16-20	--	2.9	74	3.2	13	12	148	--	2.4	348	64	54	577	6.9	40
Mar. 21	--	--	--	--	16	10	262	--	4.0	a 600	114	101	964	7.2	--
Mar. 22-26	--	4.1	38	2.4	15	9.8	74	--	1.6	203	44	32	335	7.0	30
Mar. 27-31	--	3.0	27	2.1	16	6.2	52	--	1.8	150	33	20	235	7.1	25
Apr. 1-9	2.2	9.4	29	1.9	15	12	50	.4	1.7	163	35	22	224	7.0	40
Apr. 10-15	--	2.1	16	2.0	13	6.0	27	--	2.1	100	21	11	140	6.6	25
Apr. 16-24	--	1.7	11	1.8	17	4.6	17	--	2.4	76	21	7	108	6.6	45
Apr. 25-30	--	5.6	21	2.2	20	5.2	42	--	2.2	142	32	16	204	6.7	40
May 1-6	--	3.2	31	2.5	20	7.0	59	--	1.4	169	41	24	244	6.7	40
May 7-21	--	--	--	--	16	3.0	70	--	.8	a 84	26	13	151	6.0	--
May 8-21	--	1.1	8.4	1.6	18	4.0	17	--	1.6	86	25	10	116	6.8	45
May 22-31	--	1.9	19	2.1	26	4.4	35	--	1.4	116	33	11	173	7.1	40
June 1-10	--	2.5	24	2.2	24	2.6	47	--	1.6	136	38	18	195	7.1	40

a Estimated from specific conductance.

RED RIVER BASIN--Continued
OAUCHITA RIVER NEAR FELSETHAL, ARK.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (residue on evaporation at 180°C)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
June 11-20, 1957.....		--	--	11	1.8	20	2.1	24	4.0	38	--	1.1	121	35	15	182	7.1	40
June 21-29.....		--	--	12	3.1	23	2.2	28	4.0	47	--	1.4	151	43	20	216	7.0	40
June 30.....		--	--	--	--	--	--	23	7.0	83	--	1.1	a 202	58	39	324	6.5	--
July 1-4, 6-10.....		--	--	17	5.2	51	3.0	22	4.0	108	--	1.8	263	64	46	412	6.7	25
July 5.....		--	--	--	--	--	--	10	6.0	165	--	2.9	a 368	120	112	591	6.3	--
July 11-18.....		3.9	0.01	15	5.0	49	3.0	27	5.6	98	0.2	2.0	255	58	36	385	6.8	22
July 19-22.....		--	--	19	4.6	61	3.2	31	5.2	120	--	.8	281	66	41	464	7.1	12
July 23-28.....		--	--	24	5.6	90	3.8	28	6.8	175	--	2.4	402	83	60	663	7.2	8
July 29-31.....		--	--	40	11	178	5.8	19	9.2	362	--	3.4	763	145	130	1,230	7.1	10
Aug. 1-2.....		--	--	67	18	324	11	5	13	660	--	5.4	1,380	241	237	2,150	5.3	8
Aug. 3.....		--	--	--	--	--	--	10	3.0	362	--	4.7	a 1,000	179	171	1,610	6.7	--
Aug. 4-6.....		--	--	36	8.7	159	5.8	16	9.0	315	--	4.2	677	126	113	1,150	6.5	8
Aug. 7-8, 15-16.....		--	--	31	7.7	122	5.0	22	7.2	250	--	5.1	537	109	91	896	7.1	8
Aug. 9-14.....		--	--	22	5.1	81	3.4	26	6.8	158	--	3.7	365	76	54	612	7.0	10
Aug. 17-21.....		--	--	38	11	161	5.4	18	3.2	328	--	7.9	692	140	125	1,140	6.9	7
Aug. 22-31.....		--	--	21	4.6	71	3.3	26	12	140	--	3.6	337	71	50	561	7.3	8
Sept. 1-8.....		--	--	25	6.1	92	3.4	26	8.0	180	--	4.2	418	88	66	668	7.1	10
Sept. 9-12.....		--	--	31	7.1	127	4.3	24	9.4	245	--	5.8	513	106	87	887	7.0	8
Sept. 13-15, 19-20, 25, 28		--	--	37	9.5	156	5.2	19	11	310	--	8.0	653	132	116	1,100	6.6	8
Sept. 16-18, 21-22, 24.....		--	--	50	9.7	208	6.1	19	10	412	--	8.1	831	165	150	1,410	7.1	8
Sept. 23, 27.....		--	--	64	15	292	8.0	15	14	580	--	12	1,170	221	208	1,960	6.9	7
Sept. 26, 29-30.....		--	--	24	6.0	95	3.6	25	6.2	185	--	5.0	427	84	64	734	7.1	7
Average.....		--	--	37	10	159	--	20	10	338	--	4.5	721	134	117	1,190	--	21

^a Estimated from specific conductance.

RED RIVER BASIN--Continued

OUACHITA RIVER NEAR FELSENTAL, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	65	52	52	48	55	59	75	76	80	90	85
2	75	65	50	50	45	56	62	72	78	80	88	82
3	75	67	50	50	--	55	64	71	75	80	87	83
4	75	65	50	50	50	55	55	--	75	80	87	82
5	75	67	50	50	51	55	54	68	75	80	87	--
6	75	67	52	53	52	55	65	69	78	80	87	82
7	75	68	50	50	54	55	65	69	78	84	87	82
8	74	65	57	50	55	58	65	69	78	81	86	80
9	72	--	55	55	55	50	56	69	75	84	85	79
10	75	60	53	50	58	55	65	60	75	82	85	80
11	72	62	55	54	55	57	--	60	58	84	86	80
12	70	61	58	53	55	55	62	70	--	80	85	80
13	70	60	55	55	56	57	60	71	58	85	86	80
14	72	60	--	50	55	58	--	72	--	81	85	75
15	72	60	54	52	57	56	--	75	59	--	85	80
16	72	58	54	50	55	57	60	74	59	85	86	77
17	70	58	55	46	55	58	63	75	59	85	76	75
18	70	58	55	48	55	57	63	--	60	87	85	80
19	70	60	54	48	55	60	64	75	60	85	85	78
20	72	60	55	50	55	58	65	--	60	85	--	77
21	72	60	55	52	55	60	68	74	62	85	85	--
22	73	55	56	50	51	60	65	--	60	85	--	79
23	73	55	55	50	54	60	68	75	60	85	85	76
24	70	55	55	50	--	60	68	75	58	85	85	75
25	70	55	54	48	--	55	70	76	58	85	85	75
26	69	53	55	48	52	55	70	76	60	85	82	75
27	70	52	55	48	--	55	71	--	69	85	82	--
28	65	52	55	50	55	55	--	75	69	85	83	75
29	70	52	55	50	--	55	70	75	69	85	85	70
30	68	50	55	46	--	55	71	76	80	89	84	73
31	65	--	52	46	--	55	--	76	--	88	83	--
Average	72	59	54	50	--	56	64	72	67	84	85	78

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

CORNIE BAYOU NEAR THREE CREEKS, ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 4½ miles downstream from Pidgeon Roost Creek and 6 miles southwest of town of Three Creeks, Union County.

DRAINAGE AREA.--180 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1955. (Specific conductance, chloride, and pH: May 1950 to September 1952, February 1956 to September 1957.)

Water temperatures: May 1950 to September 1955, February 1956 to September 1957.

EXTREMES, 1956-57.--Specific conductance: Maximum, 20,100 micromhos Nov. 6; minimum 316 micromhos May 1.

Water temperatures: Maximum, 88°F July 10, 12, 16; minimum, freezing point on several days during winter months.

EXTREMES, 1950-57.--Dissolved solids (1952-55): Maximum, 20,600 ppm July 15-21, 1954; minimum, 287 ppm Apr. 28-30, 1953.

Hardness (1952-55): Maximum, 6,270 ppm July 15-21, 1954; minimum, 62 ppm Apr. 28-30, 1953.

Specific conductance: Maximum daily, 33,200 micromhos Dec. 9, 1954; minimum daily, 316 micromhos May 1, 1957.

Water temperatures: Maximum, 95°F July 8, 1953; minimum, freezing point on several days during winter months.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Specific conductance, chloride, and pH, water year October 1956 to September 1957

Day	October				November				December			
	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH
1	0	14,600	5,050	3.50	1.6	13,500	4,700	3.80	9.1	--	--	--
2	0	14,400	4,950	3.65	1.9	14,200	5,000	3.75	8.2	6,700	2,100	4.35
3	0	14,300	5,000	3.65	4.6	12,900	4,400	3.90	7.4	7,100	2,300	4.35
4	0	--	--	--	7.8	14,200	4,900	3.90	7.1	7,520	2,400	4.35
5	0	14,100	4,950	3.55	15	17,500	6,200	3.70	7.1	7,560	2,450	4.35
6	0	14,000	4,950	3.50	44	20,100	7,300	4.15	7.2	7,860	2,600	4.30
7	0	13,900	4,800	3.50	54	12,100	4,100	4.55	7.4	8,150	2,700	4.30
8	0	13,600	4,600	3.55	70	16,000	5,600	4.35	7.4	8,470	2,800	4.25
9	0	13,600	4,750	3.55	66	8,800	2,900	4.45	8.6	9,660	3,200	4.20
10	.2	13,300	4,500	3.50	40	8,650	2,900	4.35	8.9	9,680	3,200	4.20
11	.1	13,200	4,550	3.55	20	7,340	2,500	4.40	8.0	9,740	3,200	4.05
12	.1	13,200	4,600	3.55	14	7,870	2,600	4.35	8.6	9,390	3,100	4.25
13	0	12,600	4,400	3.55	8.6	7,870	2,600	4.30	9.1	9,370	3,100	4.25
14	0	13,100	4,550	3.65	5.8	7,900	2,600	4.35	12	7,670	2,500	4.40
15	0	12,900	4,450	3.65	5.6	8,900	3,000	4.30	11	11,000	3,700	4.35
16	0	13,000	4,550	3.65	5.0	8,870	3,000	4.30	20	11,000	3,750	4.35
17	0	13,100	4,600	3.60	4.7	10,100	3,400	4.20	28	11,000	3,750	4.20
18	0	14,500	5,100	3.65	4.8	10,100	3,500	4.25	28	10,100	3,400	4.40
19	0	13,200	4,600	3.75	6.9	10,800	3,600	4.40	28	14,500	4,700	4.30
20	0	13,300	4,700	3.65	10	10,800	3,700	4.30	35	14,600	5,000	4.30
21	0	13,100	4,500	3.70	16	9,600	3,200	4.35	58	11,700	3,850	4.00
22	.1	13,000	4,500	3.65	44	9,100	3,000	4.35	50	11,500	3,900	3.95
23	0	13,000	4,500	3.60	108	9,250	3,000	4.35	35	11,500	3,900	3.90
24	.2	13,000	4,600	3.55	108	5,010	1,550	4.45	28	10,000	3,300	4.25
25	.5	13,100	4,600	3.55	62	5,830	1,850	4.45	26	10,000	3,300	4.30
26	.5	13,200	4,600	3.65	32	5,820	1,900	4.45	28	7,360	2,400	4.25
27	.6	13,100	4,100	3.70	14	5,960	1,950	4.50	26	7,300	2,350	4.30
28	.8	13,000	4,500	3.65	15	6,140	2,000	4.45	21	7,420	2,400	4.25
29	.7	13,100	4,600	3.75	12	6,300	2,050	4.45	18	7,420	2,320	4.30
30	.7	13,300	4,700	3.75	9.7	6,370	2,100	4.40	15	7,390	2,380	4.25
31	.8	13,400	4,600	3.80	--	--	--	--	14	7,380	2,350	4.25
Average	0.17	13,400	4,650	--	27.0	9,930	3,370	--	18.9	9,330	3,080	--

RED RIVER BASIN--Continued

CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1956 to September 1957--Continued

Day	January				February				March			
	Mean dis-charge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	12	7,290	2,400	4.10	345	1,780	535	4.40	96	3,540	1,080	4.45
2	12	7,410	2,400	4.10	470	989	275	4.8	80	3,660	1,100	4.30
3	11	7,610	2,550	4.20	1,350	1,230	345	4.6	102	3,650	1,130	4.40
4	18	7,480	2,450	4.15	1,470	1,140	315	4.6	161	2,310	970	4.5
5	66	8,960	3,050	4.20	937	916	258	4.6	203	3,150	850	4.5
6	120	2,580	800	4.50	620	1,040	292	4.7	232	2,500	730	4.40
7	154	4,410	1,420	4.35	496	1,920	550	4.6	242	2,560	750	4.6
8	133	5,070	1,620	4.30	375	1,940	560	4.6	203	2,440	740	4.5
9	80	5,370	1,750	4.40	252	2,170	630	4.5	147	3,230	960	4.40
10	50	4,930	1,600	4.30	154	2,590	760	4.40	126	3,230	980	4.6
11	37	4,830	1,550	4.35	108	3,340	1,020	4.30	108	3,580	1,080	4.45
12	32	5,420	1,750	4.25	85	3,400	1,030	4.25	85	4,290	1,330	4.5
13	25	5,380	1,750	4.35	70	3,830	1,160	4.25	80	3,930	1,200	4.5
14	22	6,530	2,250	4.20	58	4,050	1,230	4.30	85	4,210	1,280	4.40
15	19	6,570	2,150	4.10	54	4,100	1,250	4.20	80	4,760	1,490	4.40
16	16	7,290	2,420	4.20	48	3,990	1,220	4.10	66	4,640	1,440	4.20
17	17	7,280	2,420	4.35	48	4,130	1,270	4.20	66	4,820	1,490	4.20
18	15	7,440	2,450	4.20	73	3,350	990	4.25	147	3,010	900	4.6
19	14	7,400	2,450	4.20	360	1,290	360	4.6	252	1,430	420	4.8
20	13	7,420	2,450	4.25	426	811	230	5.0	285	2,310	670	4.6
21	12	7,560	2,500	4.20	446	981	280	5.1	319	2,220	650	4.9
22	18	7,400	2,450	4.15	496	1,190	340	4.9	375	1,600	465	5.0
23	28	6,950	2,300	4.15	570	1,300	380	4.9	375	1,590	465	4.7
24	44	6,610	2,200	4.20	488	1,580	480	4.7	391	1,760	510	4.7
25	90	5,700	1,850	4.30	345	1,820	530	4.6	375	1,480	430	4.7
26	108	7,780	2,600	4.30	212	2,720	810	4.40	375	1,590	455	4.6
27	102	6,830	2,250	4.30	147	2,140	630	4.5	360	1,770	515	4.6
28	114	4,260	1,400	4.30	120	3,530	1,080	4.30	345	1,880	540	4.6
29	140	4,220	1,350	4.30	--	--	--	--	286	1,960	570	4.5
30	177	4,220	1,300	4.30	--	--	--	--	212	2,010	580	4.30
31	252	3,650	1,150	4.35	--	--	--	--	232	1,990	595	4.6
Average	62.9	8,190	2,030	--	379	2,260	672	--	210	2,810	844	--
Day	April				May				June			
	Mean dis-charge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	555	738	210	5.3	1,560	316	86	6.1	169	1,260	370	4.6
2	1,140	612	166	5.6	1,070	412	112	5.6	177	1,100	315	4.6
3	1,760	599	167	5.1	937	579	166	5.6	194	1,750	510	4.40
4	1,560	690	193	5.1	768	759	218	5.2	203	1,900	550	4.25
5	1,220	606	170	5.0	620	773	220	4.9	203	2,170	620	4.35
6	1,070	787	222	5.2	530	842	242	4.7	194	1,890	550	4.5
7	937	867	250	5.2	408	1,090	314	6.3	161	1,880	550	4.40
8	684	862	245	5.0	274	1,220	350	4.6	90	1,800	520	4.15
9	496	1,030	298	5.2	169	1,450	430	4.6	58	2,050	590	4.10
10	391	1,410	402	4.8	161	1,200	350	4.6	42	2,240	660	4.15
11	259	1,790	525	4.7	126	1,830	555	4.20	40	2,480	720	4.10
12	154	2,170	650	4.5	96	2,050	620	4.15	35	2,980	890	4.00
13	102	2,850	870	4.40	75	2,070	620	4.20	28	2,450	720	4.00
14	90	2,520	740	4.30	85	1,970	595	4.25	30	2,790	830	4.00
15	80	2,740	825	4.30	154	1,640	485	4.6	33	2,280	670	4.25
16	80	2,740	830	4.40	212	1,930	580	4.40	38	2,960	890	4.20
17	80	2,740	830	4.40	263	1,510	445	5.6	26	3,370	1,020	2.95
18	85	2,740	820	4.40	319	1,350	395	4.8	17	3,660	1,100	3.95
19	177	1,590	455	4.7	319	1,420	420	4.6	13	3,670	1,100	3.90
20	154	2,790	840	4.5	263	1,570	465	4.45	12	3,660	1,120	3.90
21	252	1,690	485	4.7	89	1,870	560	4.10	12	3,580	1,070	4.00
22	331	860	240	5.3	50	2,260	680	3.85	11	3,490	1,040	3.90
23	319	942	295	5.3	46	2,610	810	3.60	34	2,830	840	4.45
24	319	1,890	560	4.7	46	2,690	820	3.65	299	378	85	6.0
25	360	964	270	5.1	58	1,420	415	4.45	470	409	110	6.7
26	470	594	164	5.5	185	2,370	725	4.00	620	758	160	5.6
27	1,010	558	154	5.6	345	842	240	5.2	496	842	240	5.4
28	5,380	492	136	5.7	426	847	245	5.2	446	747	205	5.0
29	5,380	573	162	5.6	530	751	210	5.5	331	698	190	5.3
30	2,740	337	89	5.9	470	988	285	5.2	222	1,010	285	5.9
31	--	--	--	--	242	1,110	315	4.8	--	--	--	--
Average	921	1,390	409	--	351	1,410	418	--	157	2,100	617	--

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1956 to September 1957--Continued

Day	July				August				September			
	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	120	3,220	960	3.85	6.7	4,500	1,450	4.10	0.1	3,910	1,310	4.00
2	66	3,280	990	3.75	5.7	4,470	1,390	4.05	.4	4,110	1,270	3.95
3	42	3,280	990	3.70	4.7	4,500	1,390	4.00	.5	4,080	1,290	4.05
4	30	3,470	1,030	3.90	4.7	4,470	1,430	4.05	.6	4,110	1,290	4.00
5	25	3,460	1,050	3.90	5.0	4,260	1,370	4.05	.7	4,160	1,310	3.95
6	19	3,160	950	4.00	5.0	4,300	1,330	3.90	.5	4,160	1,310	4.00
7	16	2,190	650	4.20	9.4	4,070	1,270	3.90	.4	4,220	1,310	3.95
8	13	1,720	510	4.6	13	4,110	1,290	3.95	.5	4,160	1,270	3.95
9	12	3,260	970	3.90	8.4	5,020	1,590	3.90	.6	4,210	1,310	4.00
10	10	3,310	1,010	3.80	6.2	5,080	1,670	3.95	1.6	4,800	1,550	4.00
11	9.3	3,310	1,010	3.85	5.1	6,020	1,920	3.80	7.1	4,840	1,510	4.00
12	8.4	3,430	1,050	3.90	4.2	5,880	1,940	3.90	9.7	4,850	1,520	4.00
13	6.9	3,500	1,070	3.80	4.1	6,000	1,950	3.85	8.6	4,220	1,330	4.00
14	6.3	3,600	1,090	3.85	3.7	5,010	1,730	3.80	10	3,820	1,190	4.30
15	6.0	3,770	1,150	3.75	3.4	5,270	1,730	3.85	21	2,670	800	4.10
16	5.7	3,820	1,170	3.80	3.3	4,890	1,510	3.85	24	5,170	1,660	4.15
17	5.2	3,770	1,150	3.80	3.4	4,140	1,260	3.80	15	3,660	1,130	4.20
18	5.0	3,850	1,170	3.75	3.0	3,970	1,200	3.80	9.1	3,940	1,210	4.10
19	4.7	3,840	1,170	3.85	2.4	3,970	1,210	3.90	6.3	5,070	1,590	4.00
20	4.6	3,860	1,190	3.80	2.1	4,020	1,270	3.90	5.0	4,900	1,430	4.10
21	4.4	3,920	1,190	3.80	1.5	4,090	1,250	3.85	3.8	3,980	1,250	4.30
22	4.4	3,910	1,190	3.85	1.5	4,010	1,250	3.85	3.4	3,610	1,190	4.15
23	5.1	3,890	1,170	3.85	1.4	4,020	1,270	4.00	9.5	3,810	1,210	4.10
24	6.9	3,890	1,190	3.85	1.3	4,120	1,290	4.05	32	5,800	1,870	4.00
25	32	2,810	830	4.10	1.1	4,160	1,290	3.90	33	2,830	870	4.30
26	38	2,790	850	4.20	1.1	4,160	1,290	3.80	25	2,650	790	4.35
27	42	2,490	730	4.6	.6	4,180	1,290	3.85	15	1,980	620	4.40
28	32	4,490	1,370	4.00	.4	3,880	1,290	3.85	9.3	1,950	570	4.6
29	19	2,820	830	4.10	.2	4,140	1,290	3.90	6.7	1,880	540	4.7
30	12	4,100	1,270	4.10	.1	4,220	1,290	3.80	5.1	1,980	570	4.6
31	8.2	4,490	1,390	4.05	.1	4,230	1,310	3.90	--	--	--	--
Average	20.0	3,440	1,040	--	3.64	4,490	1,420	--	8.82	3,850	1,200	--

RED RIVER BASIN--Continued

CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	47	--	33	34	38	45	53	73	81	87	82
2	69	53	--	33	32	37	48	52	72	80	87	80
3	65	51	39	32	--	37	51	52	74	85	84	80
4	--	53	40	39	37	38	49	43	73	84	85	77
5	67	52	44	35	42	37	46	45	75	84	85	78
6	65	51	43	38	44	41	44	42	87	85	83	80
7	65	55	49	37	46	37	47	46	78	84	84	75
8	64	50	50	40	49	33	46	49	78	82	84	72
9	62	45	48	43	48	34	--	50	78	87	85	70
10	64	40	46	34	48	37	42	53	82	88	80	72
11	57	43	42	39	45	39	42	57	84	87	83	70
12	57	58	43	36	47	34	64	54	83	88	85	75
13	55	65	45	36	46	49	42	52	82	87	87	76
14	63	48	41	34	44	46	43	56	85	83	85	77
15	54	48	44	32	45	45	42	58	84	90	84	74
16	55	44	43	--	41	46	43	54	82	88	84	77
17	59	48	40	--	38	44	43	58	85	87	86	73
18	50	44	42	--	35	43	45	63	84	85	82	74
19	55	49	40	--	--	41	49	64	84	89	85	75
20	55	44	41	--	32	43	49	69	85	85	83	75
21	57	41	43	35	--	40	52	65	82	84	83	81
22	59	40	41	56	33	42	50	73	82	83	81	77
23	53	39	43	53	36	43	51	65	80	83	83	72
24	51	39	34	33	40	43	57	66	70	83	80	74
25	54	38	36	31	40	42	53	64	71	83	78	70
26	53	36	38	31	40	36	52	64	75	82	83	73
27	53	32	36	--	41	39	50	63	75	84	77	71
28	50	31	37	31	34	39	50	65	76	85	76	70
29	53	32	35	--	--	41	49	73	76	82	81	67
30	55	34	35	33	--	42	50	73	79	82	78	67
31	54	--	--	32	--	43	--	74	--	--	80	--
Average	58	45	41	--	41	40	48	59	79	85	83	74

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

THREE CREEK NEAR THREE CREEKS. ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 2½ miles southwest of town of Three Creeks, Union County, and 2½ miles upstream from small tributary.

DRAINAGE AREA (revised).--46 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1955. (Specific conductance, chloride, and pH: May 1950 to September 1952, February 1956 to September 1957).

Water temperatures: May 1950 to September 1955, February 1956 to September 1958.

EXTREMES, 1956-57.--Specific conductance: Maximum daily, 4,930 micromhos Dec. 26; minimum daily, 83.1 micromhos Apr. 25.

Water temperatures: Maximum, 83°F July 4; minimum, freezing point Jan. 17-19.

EXTREMES, 1950-57.--Dissolved solids (1952-55): Maximum, 13,200 ppm July 29-31, 1953; minimum, 133 ppm Apr. 28-30, 1953.

Hardness (1952-55): Maximum, 4,390 ppm July 29-31, 1953; minimum, 30 ppm Apr. 28-30, May 12-15, 1953.

Specific conductance: Maximum daily, 20,300 micromhos Sept. 4, 1952; minimum daily, 45.7 micromhos Feb. 1, 1952.

Water temperatures: Maximum, 89°F Sept. 1, 1951, Aug. 4, 1953; minimum, freezing point Dec. 16, 1952, Jan. 17-19, 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Specific conductance, chloride and pH, water year October 1956 to September 1957

Day	October				November				December			
	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	pH
1	1.0	602	70	8.3	1.4	1,230	315	8.0	1.3	2,290	640	7.6
2	1.3	--	--	--	1.3	607	120	7.1	1.3	2,300	640	7.4
3	2.6	484	56	8.3	4.9	594	120	8.0	1.0	2,320	660	7.6
4	2.6	548	80	8.2	8.3	1,290	355	7.0	.8	2,160	620	7.6
5	1.8	756	146	8.2	8.5	1,290	352	6.8	.6	2,060	570	7.7
6	1.2	766	146	8.2	7.0	1,390	398	7.3	1.1	1,930	540	7.8
7	1.2	597	98	8.2	16	1,360	390	7.1	1.4	1,850	510	7.4
8	1.2	762	144	8.1	14	1,350	395	6.4	1.3	1,730	480	7.8
9	1.0	707	128	8.1	7.9	3,480	1,040	6.3	1.5	1,340	340	7.8
10	1.0	833	175	8.2	2.8	6,700	2,170	6.4	1.7	1,360	350	7.7
11	1.0	1,500	380	7.9	2.0	6,790	2,180	6.0	1.5	976	235	7.4
12	.9	1,460	375	8.0	2.2	4,370	1,360	6.1	1.5	1,060	260	7.7
13	.9	937	200	8.2	1.9	4,330	1,350	6.0	2.0	1,180	300	7.5
14	1.0	910	200	8.3	1.9	4,320	1,360	6.1	3.8	1,130	285	7.9
15	1.2	915	195	8.2	2.0	4,310	1,340	6.4	2.8	1,120	285	7.5
16	1.2	583	85	8.2	1.9	1,910	550	7.3	4.0	1,010	240	7.8
17	1.0	577	80	8.3	1.8	1,870	535	7.0	4.4	1,020	235	7.4
18	1.0	579	80	8.0	1.8	1,860	535	7.5	8.7	1,430	398	7.4
19	1.0	559	74	8.2	2.4	1,880	530	7.2	7.2	1,420	392	7.4
20	1.1	530	68	8.2	4.0	1,410	390	7.0	5.7	1,480	400	7.3
21	2.2	617	66	8.2	5.4	910	235	7.0	5.4	2,600	760	7.3
22	2.7	640	108	7.7	7.5	1,200	305	6.7	7.0	2,400	700	7.1
23	2.2	646	110	8.2	5.9	1,180	302	6.8	6.6	3,340	1,000	6.9
24	1.4	540	76	8.3	4.5	1,710	500	6.7	5.7	3,360	1,000	6.9
25	1.0	611	106	8.0	3.9	1,440	410	7.1	4.7	4,900	1,540	6.8
26	1.2	730	144	8.0	2.3	1,920	560	7.1	4.0	4,930	1,530	6.9
27	1.2	808	170	7.6	1.8	2,240	650	7.1	3.0	3,910	1,210	6.9
28	1.2	807	170	7.6	1.3	2,660	810	6.7	2.7	3,370	990	7.3
29	1.3	815	170	8.0	1.7	2,820	850	6.8	2.3	4,170	1,290	7.8
30	1.1	1,750	470	7.9	1.3	2,660	795	7.2	2.2	4,140	1,250	6.9
31	1.2	1,690	460	7.7	--	--	--	--	2.0	4,260	1,300	6.8
Average	1.35	809	161	--	4.32	2,370	707	--	3.20	2,340	676	--

RED RIVER BASIN

RED RIVER BASIN--Continued

THREE CREEK NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1956 to September 1957--Continued

Day	January				February				March			
	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	1.9	--	--	--	345	728	205	5.5	12	2,030	600	5.9
2	1.8	4,250	1,290	7.6	468	433	120	5.7	12	2,290	680	6.2
3	1.9	4,310	1,330	7.6	485	357	92	6.3	31	1,310	370	6.1
4	6.8	3,200	950	7.7	342	327	86	6.2	55	1,320	380	6.2
5	34	1,390	380	7.8	83	720	198	5.8	45	1,850	540	5.6
6	84--	2,110	620	5.9	38	1,090	315	5.4	24	1,220	350	5.8
7	33	2,270	660	5.0	24	1,370	390	5.4	19	1,270	360	6.1
8	13	2,110	600	5.6	18	1,540	445	5.4	19	1,260	360	6.3
9	7.2	2,100	610	6.4	15	1,710	495	5.6	18	1,820	520	6.4
10	6.4	2,140	620	6.8	12	1,630	470	6.1	14	1,820	530	6.1
11	5.4	2,200	640	7.0	11	1,930	560	6.1	12	1,860	540	6.2
12	3.9	2,260	660	7.2	9.1	2,120	620	6.2	13	2,360	690	6.3
13	3.8	2,220	630	7.3	7.7	2,120	620	6.4	12	2,420	660	5.8
14	3.3	2,220	640	7.3	6.6	2,270	670	6.5	12	1,980	590	6.1
15	3.2	2,210	630	7.6	6.3	2,300	670	6.6	10	1,900	550	6.7
16	2.8	2,300	670	7.4	7.0	2,180	630	6.6	8.5	2,210	640	6.2
17	2.6	2,270	640	7.7	5.9	1,780	510	7.0	7.9	2,310	700	6.5
18	2.2	2,250	650	7.7	47	1,690	480	7.0	50	1,100	305	6.7
19	1.9	1,980	550	7.6	380	350	86	6.8	132	1,060	285	6.4
20	1.8	1,970	550	7.7	398	580	158	6.5	83	1,020	292	5.6
21	1.8	1,940	535	7.6	342	495	134	6.4	64	899	252	6.0
22	4.7	1,770	495	7.7	104	629	162	6.3	164	650	185	6.1
23	13	1,250	340	7.6	36	903	250	6.4	137	727	200	6.0
24	25	1,370	360	7.8	27	1,190	325	6.4	72	657	180	6.2
25	30	3,110	920	6.0	23	1,200	340	6.3	79	723	195	5.9
26	34	4,130	1,240	5.1	19	1,370	385	6.2	53	978	280	5.6
27	35	1,880	550	5.0	17	1,490	430	6.7	28	870	240	5.9
28	36	2,150	630	4.7	15	1,770	505	6.3	20	971	270	6.0
29	40	1,880	535	5.3	--	--	--	--	16	1,100	310	6.2
30	65	2,510	735	5.4	--	--	--	--	16	1,190	335	6.5
31	188	1,730	500	4.8	--	--	--	--	104	780	215	5.4
Average	22.4	2,320	672	--	118	1,300	370	--	43.3	1,420	407	--

LOWER MISSISSIPPI RIVER BASIN

RED RIVER BASIN--Continued

THREE CREEK NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1956 to September 1957--Continued

Day	April				May				June			
	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	516	307	79	6.2	328	212	49	6.5	13	949	260	7.1
2	835	346	93	6.0	264	366	98	6.6	36	1,130	315	7.4
3	550	248	62	6.0	236	387	104	6.2	70	1,130	320	7.5
4	440	244	64	6.1	126	589	184	5.8	78	1,700	508	5.1
5	470	364	96	6.2	60	542	146	6.6	48	1,040	295	6.2
6	328	317	82	6.3	28	679	188	6.7	24	874	240	6.9
7	107	440	122	6.3	17	779	215	6.7	17	876	245	7.0
8	41	676	200	6.1	13	842	235	6.5	13	711	190	7.1
9	30	787	215	6.0	12	953	275	6.9	9.2	1,070	300	7.4
10	21	940	235	5.5	22	950	270	7.1	6.7	1,160	320	7.7
11	16	1,050	300	6.1	24	1,060	310	6.3	5.5	1,290	360	7.4
12	14	1,200	340	6.1	15	1,270	365	6.6	5.0	1,350	380	7.6
13	13	1,200	340	6.3	11	2,340	720	5.6	4.9	1,350	385	7.8
14	12	1,220	365	6.5	15	2,540	790	5.6	5.3	1,370	390	7.8
15	12	1,210	335	6.5	14	2,010	610	6.0	5.2	1,410	390	7.7
16	13	971	270	6.4	16	2,360	735	5.9	3.8	1,510	418	7.9
17	11	1,180	330	6.3	13	1,230	340	5.7	2.7	1,280	343	8.1
18	12	1,370	395	6.2	9.0	1,100	310	6.7	2.5	1,710	470	8.1
19	186	485	125	6.3	7.0	1,190	330	6.3	2.8	1,920	550	7.9
20	154	686	185	6.4	6.2	1,280	365	7.0	3.4	2,050	590	7.8
21	126	1,030	290	6.0	5.8	1,380	410	7.0	2.8	2,040	600	8.0
22	223	813	230	6.2	5.0	1,470	438	6.9	3.2	2,010	580	8.0
23	294	462	115	5.9	5.2	1,320	385	7.4	9.6	1,450	400	8.0
24	264	488	124	5.8	9.8	1,160	330	7.4	86	464	112	8.1
25	311	83.1	14	5.8	36	1,380	400	7.0	250	651	180	7.8
26	561	407	110	6.0	56	1,340	396	5.7	179	551	146	7.7
27	1,380	--	--	--	233	401	104	6.8	40	824	215	7.5
28	1,310	147	32	5.8	247	449	124	6.1	144	466	122	7.6
29	1,100	237	56	6.0	64	570	158	6.4	111	1,360	395	7.5
30	510	175	41	6.0	19	746	212	5.7	34	795	220	7.4
31	--	--	--	--	11	894	255	6.7	--	--	--	--
Average	329	658	181	--	62.2	1,090	317	--	40.5	1,220	341	--
	July				August				September			
	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH	Mean dis-charge (cfs)	Specific conduct-ance (micro-mhos at 25°C)	Chloride (Cl)	pH
1	13	877	245	6.3	2.1	1,370	410	7.3	1.7	1,130	265	8.1
2	9.8	1,010	285	6.8	1.8	1,160	340	7.5	1.8	1,130	265	8.2
3	5.8	1,140	325	6.7	1.7	1,270	355	7.5	1.9	1,140	280	8.3
4	4.9	1,230	345	6.9	1.5	877	210	8.0	1.7	959	230	8.3
5	3.8	1,320	380	6.8	1.8	926	215	8.1	1.5	1,010	225	8.3
6	2.9	1,420	400	7.0	1.8	835	185	8.2	1.5	875	175	8.3
7	2.1	1,470	420	7.1	2.1	726	145	8.2	1.5	806	150	8.4
8	2.3	1,460	410	6.8	2.2	652	135	8.2	2.5	604	105	8.4
9	2.0	1,450	410	6.9	2.3	727	180	8.2	3.1	596	100	8.4
10	2.0	1,860	540	7.3	2.2	1,710	485	8.0	2.4	575	98	8.2
11	1.8	1,940	560	7.7	1.9	1,720	480	8.0	2.4	911	202	8.2
12	1.7	1,730	490	7.6	1.7	1,740	475	7.9	2.7	1,000	235	8.2
13	1.8	1,620	450	7.8	1.6	1,820	530	7.8	2.6	1,000	230	8.2
14	1.6	1,540	420	7.2	1.6	1,730	512	7.8	2.2	1,490	415	8.1
15	1.4	1,500	400	7.7	1.4	1,480	415	7.9	2.4	1,500	420	7.8
16	1.4	1,370	360	7.6	1.1	1,270	330	7.5	2.6	1,550	415	7.5
17	1.3	1,250	320	7.5	1.4	1,150	270	7.9	3.4	1,250	330	8.0
18	1.5	1,070	250	7.4	1.8	1,010	225	7.6	2.6	1,200	325	8.1
19	1.4	959	220	8.3	1.7	802	175	8.0	2.3	1,990	570	8.1
20	1.2	965	215	7.6	1.7	833	175	7.9	2.1	2,070	575	8.1
21	1.3	892	190	7.6	1.7	812	170	7.8	1.9	2,080	570	8.0
22	1.7	825	175	7.6	1.5	804	180	8.0	2.2	2,110	605	7.9
23	1.9	661	115	7.5	1.2	712	130	8.0	1.8	1,810	505	7.9
24	2.2	651	115	7.5	1.2	557	74	7.4	1.7	1,970	555	8.0
25	3.5	586	105	7.5	1.3	546	70	7.8	1.7	1,910	555	7.8
26	6.0	586	110	7.2	1.3	551	73	8.0	1.5	1,800	490	7.9
27	3.9	1,510	420	7.1	1.4	521	61	7.6	1.5	1,330	405	8.1
28	2.7	1,520	410	7.2	1.4	456	54	7.7	1.5	1,610	425	8.1
29	2.2	1,520	420	7.5	1.4	489	50	7.4	1.2	1,460	390	7.8
30	1.9	1,530	420	7.0	1.5	691	110	7.6	1.0	1,510	385	8.0
31	1.8	1,550	430	6.9	1.5	798	165	7.5	--	--	--	--
Average	2.99	1,260	334	--	1.64	992	238	--	2.03	1,350	350	--

RED RIVER BASIN--Continued

THREE CREEK NEAR THREE CREEKS, ARK.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	54	33	--	46	47	59	70	73	80	--	78
2	--	58	41	46	47	49	61	69	60	81	80	78
3	69	60	45	41	51	51	67	69	--	80	81	78
4	69	60	48	48	54	50	64	65	73	83	80	78
5	61	60	50	50	56	51	64	62	72	80	80	76
6	63	64	60	--	58	53	57	60	72	71	75	75
7	67	63	63	49	57	51	60	61	73	79	73	72
8	59	57	62	52	59	44	63	60	75	80	77	73
9	58	48	56	56	63	46	56	62	73	81	78	72
10	59	44	46	54	64	50	54	70	76	81	79	67
11	59	46	56	45	--	57	59	71	77	81	79	69
12	62	49	--	46	56	55	58	73	78	78	79	78
13	59	54	55	--	55	54	54	75	76	80	80	71
14	60	60	49	47	55	60	53	71	79	80	81	70
15	61	63	50	43	55	56	53	73	79	80	81	70
16	60	48	45	39	54	53	57	73	80	80	81	72
17	60	48	48	32	48	58	58	75	80	81	82	72
18	59	46	51	31	49	56	66	75	82	80	80	73
19	60	45	53	31	47	54	65	78	82	80	77	74
20	63	53	54	41	46	56	67	72	77	79	76	74
21	62	54	53	49	43	54	68	76	72	79	75	75
22	59	53	56	55	46	53	68	73	80	79	74	70
23	59	41	--	48	50	57	71	78	72	79	74	69
24	59	41	46	45	53	57	68	75	74	79	75	65
25	61	43	44	44	55	55	67	75	72	77	75	65
26	59	44	39	45	57	50	66	73	70	80	76	64
27	56	38	40	43	50	47	--	72	74	80	74	62
28	56	36	44	43	48	58	--	70	72	81	74	63
29	56	39	46	49	--	52	--	67	78	80	74	63
30	59	38	48	46	--	54	68	69	77	80	76	65
31	58	--	42	46	--	58	--	70	--	--	77	--
Average	61	50	49	45	53	53	62	70	75	80	77	71

RED RIVER BASIN--Continued

OQUACHITA RIVER AT MONROE, LA.

LOCATION.--At gaging station at bridge on U. S. Highway 80 at Monroe, 0.4 mile upstream from Illinois Central Railroad bridge and 5½ miles upstream from lock and dam no. 4.

DRAINAGE AREA.--15,298 square miles.

RECORDS AVAILABLE.--Chemical analyses: August 1954 to September 1957.

Water temperatures: August 1954 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,200 ppm Dec. 1-10; minimum, 22 ppm Apr. 20 to May 1.

Hardness: Maximum, 254 ppm Dec. 1-10; minimum, 22 ppm Apr. 20 to May 1.

Specific conductance: Maximum daily, 3,230 micromhos Dec. 8; minimum daily, 93.4 micromhos Apr. 24.

Water temperatures: Maximum, 89°F Aug. 1, 3; minimum observed, 51°F Nov. 29.

EXTREMES, 1954-57.--Dissolved solids: Maximum, 2,860 ppm Oct. 16-18, 1954; minimum, 60 ppm Apr. 20 to May 1, 1957.

Hardness: Maximum, 558 ppm Oct. 16-18, 1954; minimum, 22 ppm Apr. 20 to May 1, 1957.

Specific conductance: Maximum daily, 6,070 micromhos Oct. 17, 1954; minimum daily, 93.4 micromhos Apr. 24, 1957.

Water temperatures: Maximum, 95°F Aug. 11, 1956; minimum, 40°F Jan. 18, 1956.

REMARKS.--Records of specific conductance of daily samples available in subdistrict office at Baton Rouge, La. Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Oct. 1-10, 1956..	1,640	7.2	0.02	64	15	334	10	14	650	0.2	10	10		1,100	1.50	4,870	221	213	77	9.8	2,130	6.5
Oct. 11-20.....	2,080	6.6	0.01	54	14	256	18	11	505	3	11	11		1,867	1.18	4,870	192	177	74	8.0	1,700	6.7
Oct. 21-31.....	2,270	6.0	0.04	53	15	245	22	13	485	4	11	11		839	1.14	5,140	194	176	73	7.6	1,660	6.9
Nov. 1-12.....	2,700	7.0	0.06	50	12	237	30	13	455	4	11			800	1.09	5,830	175	150	75	7.8	1,540	7.2
Nov. 13-24.....	2,200	5.8	0.08	67	17	342	30	13	662	5	7.8			1,130	1.54	6,710	237	212	76	9.7	2,140	6.7
Nov. 25-30.....	2,180	5.6	0.02	54	13	263	28	13	508	5	5.2			1,876	1.19	5,160	187	164	75	8.4	1,670	7.1
Dec. 1-10.....	1,770	5.6	0.02	74	17	359	20	18	702	3	9.6			1,200	1.63	5,730	254	238	75	9.8	2,340	6.3
Dec. 11-15.....	1,200	6.1	0.02	63	15	304	12	16	595	4	16			1,020	1.39	3,300	219	209	75	8.9	1,970	6.6
Dec. 16-31.....	2,060	7.0	0.04	42	9.0	181	31	16	345	3	7.6			1,823	.85	3,500	143	118	73	6.6	1,220	7.2
Jan. 1-3, 1957...	1,630	8.4	0.04	34	8.2	139	28	16	268	5	3.8			851	.72	2,340	116	95	72	5.6	1,959	7.1
Jan. 7-9.....	6,300	7.2	0.03	51	12	244	27	19	468	5	3.8			1,211	1.50	15,100	177	155	75	8.0	1,880	6.7
Jan. 11-26.....	4,050	6.6	0.12	51	13	261	16	14	505	5	7.2			866	1.16	9,470	180	167	76	8.5	1,670	6.7
Jan. 30-31, Feb. 1-2	17,400	6.5	0.13	22	5.3	98	15	9.6	187	5	2.5			339	.46	15,900	76	64	74	4.9	660	6.6
Feb. 4-16.....	27,100	5.2	0.24	8.7	2.5	31	10	6.4	58	5	1.0			119	.16	8,710	32	24	68	2.4	234	6.7
Feb. 18-23.....	34,400	6.2	0.17	6.3	2.5	25	12	7.2	43	5	.8			98	.13	9,100	26	16	67	2.1	180	6.6
Feb. 25-Mar. 5...	33,200	7.4	0.15	9.2	2.7	37	12	7.2	68	4	.8			139	.19	12,500	34	24	70	2.8	271	6.5
Mar. 6-15.....	29,700	7.8	0.16	11	3.3	47	13	9.6	87	4	1.0			173	.24	13,900	42	31	71	3.2	336	6.6
Mar. 16-23.....	25,600	8.0	0.11	17	4.1	67	12	10	129	7	2.2			244	.33	16,900	60	50	71	3.8	477	6.6
Mar. 25-30.....	25,900	7.6	0.12	11	2.8	39	14	7.4	73	7	1.8			150	.20	10,500	40	29	68	2.7	289	6.5

a Residue on evaporation at 180°C.

RED RIVER BASIN--Continued

OUACHITA RIVER AT MONROE, LA.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent adsorption	Sodium ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Apr. 1-9, 1957 ..	30,300	6.4	0.20	9.6	2.6	31		14	7.8	56	0.6	1.2		122	0.17	9,980	35	23	66	2.3	235
Apr. 12-19	42,900	5.6	.19	7.0	2.1	25		14	5.6	43	.5	.8		97	.13	11,200	26	15	67	2.1	180
Apr. 20-May 1 ..	48,000	4.2	.20	5.7	1.8	13		16	4.0	22	.5	.5		60	.08	7,780	22	8	57	1.2	114
May 2-10	53,600	6.0	.21	8.4	2.3	23		18	6.2	40	.6	1.5		97	.13	14,000	30	16	62	1.8	183
May 13-17	58,900	6.0	.31	7.6	2.2	23		18	4.6	40	.7	.8		94	.3	14,900	28	13	64	1.9	174
May 18-21	59,400	7.3	.10	7.6	2.2	14		16	3.4	29	--	--		73	.10	11,700	28	15	52	1.2	139
May 22-29	56,900	8.9	.19	6.8	2.0	12		20	4.2	20	.5	1.0		66	.09	10,100	25	9	51	1.0	113
June 1-10	51,900	8.2	.19	7.8	2.2	15		22	3.6	27	.5	1.0		76	.10	10,600	28	10	54	1.3	142
June 11-20	47,900	8.2	.21	9.3	2.5	21		22	4.2	30	.5	1.0		97	.13	12,500	34	15	58	1.6	182
June 21-29	43,500	9.0	.24	9.0	2.5	19		22	4.0	35	.5	1.0		91	.12	10,700	33	15	56	1.4	171
July 1-10	37,900	13	.15	10	2.6	23		24	4.6	41	.4	1.8		109	.15	11,200	36	18	58	1.6	195
July 11-20	31,100	12	.07	13	3.0	36		23	3.6	70	.3	2.5		151	.21	12,700	45	26	64	2.4	295
July 23-31	18,600	12	.09	17	4.2	58		24	4.4	112	.3	2.5		222	.30	11,100	60	40	68	3.2	441
Aug. 1-2, 9-14 ..	5,020	12	.06	27	6.7	127		18	7.8	242	.3	8.4		440	.60	5,960	95	80	74	5.7	851
Aug. 3, 5-7, 10-14 ..	6,080	13	.05	43	10	225		11	8.6	435	.3	5.7		746	1.01	12,200	146	140	77	8.0	1,430
Aug. 15-18, 21-29, 31	4,510	9.4	.09	20	5.2	77		22	9.4	145	.4	7.6		265	.39	3,470	71	53	70	4.0	568
Aug. 19-26	4,480	10	.04	30	8.0	135		18	8.8	262	.4	8.3		472	.64	5,710	108	93	73	5.6	945
Sept. 1-10	4,020	8.8	.07	19	5.0	78		19	9.0	146	.4	6.6		282	.38	3,060	68	52	71	4.1	554
Sept. 11-20	5,560	7.8	.08	28	6.7	123		17	7.8	238	.4	7.1		427	.58	6,410	98	84	73	5.4	841
Sept. 21-24, 28-29	6,220	6.4	.39	30	7.3	141		18	10	270	.4	6.8		481	.85	8,080	105	90	75	6.0	942
Sept. 25-27, 30 ...	6,580	6.6	.52	46	11	224		17	9.8	435	.4	9.9		751	1.02	13,300	160	146	75	7.7	1,460
Time-weighted average	20,700	7.6	0.12	28	7.1	127		19	9.2	241	0.4	5.0		439	0.60	24,500	99	84	74	4.8	848

a Residue on evaporation at 180°C.

RED RIVER BASIN--Continued

OUACHITA RIVER AT MONROE, LA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	81	70	52		--	--	62	--	74	81	89	84
2	83	65	--		--	63	64	--	--	80	86	83
3	79	68	54		--	--	68	--	75	80	89	83
4	75	--	54		--	55	66	--	--	83	--	80
5	75	71	58		--	57	--	--	75	84	84	81
6	81	69	60		--	58	64	--	74	80	85	82
7	--	67	60		--	53	--	--	--	--	85	82
8	78	63	59		--	53	64	--	--	87	--	78
9	68	65	--		--	--	64	--	--	82	86	78
10	75	66	56		--	58	--	--	79	83	85	78
11	78	--	--		--	65	--	--	79	84	85	81
12	76	63	--		--	62	65	--	80	82	85	81
13	76	62	--		--	--	60	--	79	85	84	80
14	76	64	--		--	--	--	--	82	--	86	78
15	76	60	--		--	57	63	--	80	86	86	80
16	75	61	--		--	62	63	--	--	84	86	79
17	74	58	--		--	--	--	--	81	85	86	78
18	--	--	--		56	60	67	--	81	85	86	79
19	70	59	--		54	--	65	--	80	85	84	77
20	75	62	--		62	61	--	--	80	85	86	77
21	--	59	--		60	61	--	--	--	--	84	79
22	70	58	--		55	61	--	--	80	--	84	80
23	72	54	--		57	62	--	77	--	81	84	78
24	75	57	--		--	--	--	78	80	83	83	78
25	63	--	--		58	57	--	75	77	83	84	77
26	67	54	--		56	59	--	75	80	84	83	77
27	66	53	--		54	60	--	72	77	83	84	76
28	--	52	--		56	57	--	75	82	--	83	75
29	69	51	--		--	60	--	75	79	83	83	73
30	71	52	--		--	60	--	--	--	79	--	72
31	68	--	--		--	--	--	--	--	75	84	--
Average	74	61	--		--	59	--	--	79	83	85	79

RED RIVER BASIN--Continued
BOEUF RIVER NEAR GIRARD, LA.

LOCATION.--At gaging station on upstream side of pier on Illinois Central Railroad bridge and 0.5 mile east of Girard, Richland Parish.
DRAINAGE AREA.--1,226 square miles, arbitrarily determined.
RECORDS AVAILABLE.--Chemical analyses: October 1954 to August 1957.
REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, October 1956 to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 15, 1956	55	14	0.00	71	30	74		263	72	113	--	0.2		509	0.69	76	300	74	35	1.8	868	8.3
Nov. 5	46	12	.01	73	37	84		280	88	139	--	.2		571	.78	71	334	104	35	2.0	994	8.0
Dec. 4	144	8.6	.03	47	19	53		171	40	92	--	.5		344	.47	134	196	56	37	1.7	824	7.5
Jan. 7, 1957	624	8.8	.27	15	4.4	7.4	4.9	53	15	11	0.7	1.2		95	.13	180	55	12	21	.4	146	7.0
Feb. 6	1,180	5.8	.31	5.5	2.0	3.1	3.8	26	4.2	4.0	.5	.8		43	.06	138	22	1	20	.3	66.1	6.3
Mar. 4	498	6.0	.42	7.6	2.3	3.0	3.6	36	3.6	2.8	.5	.5		48	.07	65	28	0	16	.2	77.1	6.6
Apr. 6	1,290	4.6	.34	7.1	2.2	2.7	3.0	31	4.0	3.0	.5	1.0		43	.06	150	27	1	16	.2	71.2	6.5
May 20	90	10	.75	24	7.6	10	5.5	104	10	12	--	1.5		127	.17	31	91	6	20	.5	228	7.3
June 10	271	6.6	.39	10	3.4	5.1	4.5	45	6.4	7.2	.5	3.2		70	.10	51	40	3	19	.4	124	6.6
July 1	376	8.4	.26	15	4.2	8.0	27	58	7.8	12	.5	3.2		93	.13	94	55	7	22	.5	159	6.6
Aug. 6	105	9.6	.02	38	14			158	24	40	--	.8		231	.31	65	132	23	28	1.0	413	7.5
Aug. 27	78	14	.01	45	16	28		185	13	53	--	.2		260	.35	55	178	26	26	.9	512	7.8

RED RIVER BASIN--Continued
TENSAS RIVER AT TENDAL, LA.

LOCATION.--At gaging station near left bank on upstream side of bridge on U. S. Highway 80 at Tendal, 200 feet upstream from Illinois Central Railroad bridge and 3 miles east of Waverly.
DRAINAGE AREA.--309 square miles, arbitrarily determined.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to August 1957.
REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, October 1956 to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 16, 1956	4.0	14	0.01	57	22	34		341	5.1	16	--	0.8	317	0.43	3.4	233	0	24	1.0	553	8.0
Nov. 6, 1956	6.8	12	.03	52	25	39		344	5.4	21	--	.8	324	.44	5.9	232	0	27	1.1	580	7.7
Dec. 5, 1956	7.7		.02	46	19	25		263	9.8	15	--	.8	252	.34	5.2	194	0	22	.8	451	7.7
Jan. 8, 1957	197	10	.26	27	8.2	6.4	4.9	122	12	4.8	--	1.2	135	.18	72	100	0	12	.3	233	7.3
Feb. 6, 1957	1,170	11	.43	17	4.6	3.4	5	70	11	2.8	0.5	1.2	91	.12	287	61	4	10	.2	149	6.8
Mar. 5, 1957	342	8.8	.36	11	2.9	1.6	3.4	48	3.7	1.5	.4	.2	58	.08	54	39	0	7	.1	94.8	--
Apr. 6, 1957	1,840	10	.35	11	2.7	2.0	3.7	50	3.7	.6	.5	.2	60	.08	298	39	0	9	.1	90.7	6.7
May 20, 1957	46	11	.01	55	19	17		275	13	8.5	--	1.2	260	.35	32	215	0	15	.5	460	7.6
June 11, 1957	89	13	.04	35	11	12		163	12	6.2	--	3.0	172	.23	41	132	0	16	.4	312	6.9
July 2, 1957	1,320	12	.41	17	3.9	3.4	6.6	74	4.2	3.0	.7	2.2	89	.12	317	58	0	10	.2	151	6.6
Aug. 7, 1957	32	17	.01	54	17	27		294	7.0	10	--	1.2	278	.38	25	204	0	22	.8	481	7.6
Aug. 28, 1957	23	21	.01	63	24	36		368	6.4	18	1.0	1.0	350	.48	22	256	0	24	1.0	588	8.0

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE RED RIVER BASIN IN OKLAHOMA

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25° C)	pH
								Calcium, magnesium	Non- carbonate				

GYPSUM CREEK NEAR OLUSTEE, JACKSON COUNTY

Oct. 1, 1956.....	1.99	710	141	--	132	0	1,300	2,350	2,240	--	--	7,180	8.1
Oct. 30.....	10.1	220	32	177	86	2	1,232	a 890	604	--	--	1,980	8.3
Dec. 4.....	3.16	660	147	--	120	0	1,230	a 2,300	2,150	--	--	6,900	8.0
Jan. 4, 1957.....	3.49	680	147	--	92	0	1,350	a 2,300	2,220	--	--	7,110	7.9
Jan. 19.....	2.25	750	116	926	54	0	1,370	a 2,350	2,310	46	8.3	7,110	7.9
Mar. 19.....	4.00	664	156	894	70	0	1,360	a 2,300	2,240	46	8.1	7,110	7.7
Apr. 16.....	10.7	628	166	128	80	0	1,190	a 2,250	2,180	41	6.7	6,560	7.7

TURKEY CREEK NEAR OLUSTEE, JACKSON COUNTY

Oct. 1, 1956.....	0.86	520	190	419	136	0	720	a 2,080	1,970	30	4.0	4,920	8.1
Oct. 30.....	15.5	92	12	29	110	0	46	a 280	190	18	.8	678	8.1
Dec. 4.....	2.97	384	107	175	190	0	315	a 1,400	1,240	21	2.0	2,970	8.2
Jan. 4, 1957.....	4.94	568	181	322	92	0	550	a 2,160	2,080	24	3.0	4,360	7.8
Feb. 20.....	3.81	620	149	352	72	0	620	a 2,160	2,100	26	3.3	4,520	7.6
Mar. 19.....	2.93	272	25	135	88	0	235	a 780	708	27	2.1	2,010	7.7
Apr. 16.....	2.69	280	163	262	84	0	395	a 1,370	1,300	29	3.1	3,320	7.7
June 12.....	8.26	440	195	310	80	0	395	a 1,900	1,830	26	3.1	4,200	7.8

ALTUS LUGERT RESERVOIR AT LUGERT, KIOWA COUNTY

Oct. 1, 1956.....	166	48	128	116	116	0	195	a 610	515	31	2.3	1,680	7.8
Oct. 1.....	172	46	126	120	120	0	200	a 620	522	31	2.2	1,720	8.2
Dec. 18.....	170	48	138	142	142	2	205	a 620	500	33	2.4	1,700	8.3
Jan. 3, 1957.....	162	43	131	108	160	0	200	a 600	512	32	2.3	1,780	8.1
Feb. 19.....	172	59	154	160	160	0	208	a 670	539	34	2.7	1,770	8.2
Mar. 19.....	184	66	141	88	88	0	215	a 680	608	31	2.4	1,820	7.8
Apr. 16.....	184	85	112	162	162	0	200	a 760	627	24	1.8	1,740	7.9
May 15.....	108	27	72	112	112	0	104	a 380	288	29	1.6	1,991	7.8
June 11.....	124	32	87	138	138	0	120	a 440	327	30	1.8	1,400	7.8

ELK CREEK NEAR HOBART, KIOWA COUNTY

Oct. 30, 1956.....	19.4	30	6.6	5.5	122	0	5.5	a 102	2	11	0.2	240	7.7
Feb. 19, 1957.....	1.17	78	48	162	280	0	176	a 390	160	47	3.6	1,440	8.1
June 11.....	64.4	61	79	101	190	0	100	a 475	320	32	2.0	1,530	8.0

SANDSTONE CREEK NEAR CHEYENNE, ROGER MILLS COUNTY

Feb. 6, 1957.....	0.80	304	171	100	260	0	32	a 1,460	1,250	13	1.1	2,420	7.9
Mar. 27.....	1.27	272	132	76	236	0	22	a 1,220	1,080	12	.9	2,110	7.3
May 4.....	--	126	29	15	172	0	6.6	a 485	284	7	.3	707	7.7
June 20.....	--	138	63	49	156	0	19	a 605	477	15	.9	1,270	7.8

POND CREEK NEAR FT. COBB, CADDO COUNTY

Oct. 18, 1956.....	5.81	132	27	27	184	6	20	a 440	279	12	0.6	920	8.4
Oct. 30.....	13.4	67	21	28	126	0	18	a 255	152	19	.8	626	8.0
Dec. 3.....	10.8	96	20	27	208	0	17	a 320	150	15	.7	718	8.0
Apr. 2, 1957.....	24.3	46	27	27	142	0	17	a 230	112	20	.8	613	8.1
Apr. 16.....	26.6	48	29	37	118	0	17	a 240	144	25	1.0	682	7.8
May 15.....	37.2	46	35	36	134	0	16	a 260	150	23	1.0	629	7.9
June 11.....	31.8	62	26	39	120	0	18	a 260	162	25	1.1	880	7.8

SUGAR CREEK NEAR GRACEMONT, CADDO COUNTY

Apr. 16, 1957.....	5.10	75	32	29	238	0	15	320	125	16	0.7	675	8.2
May 15.....	9.74	86	26	40	176	0	23	320	176	21	1.0	922	8.1
June 11.....	11.1	72	55	53	150	0	28	405	282	22	1.1	1,130	8.0

FINN CREEK NEAR STORY, MCCLAIN COUNTY

Oct. 2, 1956.....	0.04	68	38	35	408	0	17	a 325	0	19	0.8	726	7.7
Nov. 14.....	.12	59	27	26	326	0	12	a 260	0	18	.7	558	8.0
Feb. 11, 1957.....	.39	38	47	29	392	0	13	a 290	0	18	.7	676	8.1
Mar. 14.....	.06	24	48	36	306	0	13	a 260	7	23	1.0	714	7.9
Aug. 1.....	2.26	52	79	43	550	0	21	a 455	4	17	.9	934	7.7

RUSH CREEK NEAR MAYSVILLE, GARVIN COUNTY

Oct. 31, 1956.....	17.8	66	28	105	52	0	208	280	238	45	2.7	1,100	7.3
Jan. 9, 1957.....	4.10	59	56	146	158	0	325	378	378	46	3.3	1,440	8.1
Mar. 14.....	4.35	90	74	206	186	0	445	530	378	46	3.9	2,060	7.8
May 16.....	46.9	80	52	108	196	0	225	414	254	38	2.3	1,480	7.6
June 21.....	83.6	119	77	154	352	0	280	615	326	35	2.7	1,800	7.4

* Values above 200 ppm reported to the nearest 5 ppm.

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magnesium (mg)	Sodium (Na)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro- mhos at 25° C)	pH
								Calcium, magnesium	Non- carbonate				
WILDHORSE CREEK NEAR HOOVER, GARVIN COUNTY													
Nov. 28, 1956.....	0.15	56	13	19	208	0	28	195	24	48	0.6	458	7.8
Feb. 11, 1957.....	44.5	50	11	3.1	180	0	8.7	172	24	4	1	335	7.9
Mar. 14.....	22.8	46	8.0	7.9	174	0	12	148	6	10	3	403	7.8
July 31.....	4.96	58	23	44	248	0	69	240	37	28	1.2	663	7.6
ROCK CREEK NEAR DOUGHERTY, MURRAY COUNTY													
Nov. 28, 1956.....	4.82	100	32	209	272	0	385	380	157	54	4.7	1,840	7.7
Dec. 20.....	140	51	8.0	35	140	0	66	160	46	32	1.2	523	8.1
BLUE CREEK AT MILBURN, JOHNSTON COUNTY													
Jan. 21, 1957.....	25.6	44	41	3.0	332	0	3.2	280	8	2	0.1	502	7.9
Mar. 13.....	46.7	19	32	4.9	210	0	4.2	178	6	6	2	368	8.2
July 31.....	92.0	26	48	3.2	308	0	3.5	262	10	3	1	456	7.8
BLUE RIVER NEAR BLUE, BRYAN COUNTY													
Oct. 29, 1956.....	5.68	45	39	6.6	232	0	8.0	274	84	5	0.2	513	7.2
Jan. 8, 1957.....	22.2	39	23	3.9	209	0	6.7	192	20	4	1	380	7.7
Feb. 20.....	42.2	46	50	10	264	6	8.8	240	14	8	3	452	8.3
Mar. 28.....	736	38	8.5	1.6	100	0	3.8	130	48	3	1	279	7.4
Apr. 3.....	3,160	39	7.9	1.5	128	0	1.3	130	25	3	1	262	7.3
Apr. 30.....	--	26	5.6	3.3	84	0	2.0	88	19	7	1	188	7.3
July 3.....	160	42	46	3.3	260	0	5.6	296	83	2	1	532	7.5
Aug. 5.....	83.3	24	51	3.4	276	0	5.4	270	44	3	1	485	7.8
Aug. 29.....	--	37	27	8.9	248	0	10	204	1	9	3	472	8.0
NORTH BOGGY CREEK NEAR STRINGTOWN, ATOKA COUNTY													
Dec. 18, 1956.....	0.16	11	3.8	4.3	33	0	4.0	43	16	18	0.3	128	6.8
Jan. 8, 1957.....	15.7	6.4	3.4	5.1	28	0	3.2	30	7	27	4	72.5	6.6
Mar. 12.....	54.4	10	3.2	5.6	30	0	5.6	34	10	26	4	102	6.2
June 17.....	54.4	10	3.2	5.1	23	0	4.6	38	19	22	4	104	6.1

CHICKASAW CREEK NEAR STRINGTOWN, ATOKA COUNTY

Dec. 18, 1956.....	--	13	4.5	4.6	64	0	1.5	51	0	16	0.3	134	7.2
Jan. 8, 1957.....	--	7.6	4.1	2.9	41	0	3.4	36	2	15	.2	97.0	7.3
Mar. 12.....	7.97	4.0	2.9	3.8	19	0	5.0	22	6	28	.4	66.2	6.7
June 17.....	9.13	4.7	2.8	3.7	26	0	3.8	23	2	26	.3	76.1	6.7

MCGEE CREEK NEAR STRINGTOWN, ATOKA COUNTY

Oct. 1, 1956.....	--	8.4	4.6	6.4	54	0	6.5	40	0	26	0.4	125	7.0
Dec. 18.....	--	7.0	3.5	4.0	42	0	2.0	32	0	21	.3	88.7	7.4
Jan. 8, 1957.....	2.50	5.2	2.4	1.9	15	0	4.8	23	10	15	.2	82.7	7.1
Mar. 12.....	18.5	4.4	1.9	5.9	18	0	6.8	19	4	41	.6	73.2	6.3
June 17.....	23.3	11	3.0	3.5	46	0	4.6	40	2	16	.2	106	6.6

MUDDY BOGGY CREEK NEAR FARRIS, ATOKA COUNTY

Oct. 17, 1956.....	19.2	21	7.7	20	41	0	20	84	50	34	0.9	294	7.2
Dec. 13.....	9.53	11	4.0	9.3	5	0	6.5	44	40	31	.6	164	6.2
Jan. 7, 1957.....	28.2	6.4	3.4	8.3	22	0	13	30	12	38	.7	124	7.3
Feb. 25.....	90.1	8.0	2.9	7.7	9	0	9.2	32	24	34	.6	119	6.4
Mar. 28.....	4,880	8.4	4.6	6.5	0	0	8.0	40	40	16	.4	236	3.2
Apr. 4.....	14.0	4.4	1.5	3.5	12	0	3.4	17	7	31	.4	54.6	6.2
Apr. 20.....	6.00	10	3.2	6.8	15	0	7.0	38	26	28	.5	121	6.3
July 5.....	--	37	14	33	86	0	68	152	82	32	1.2	463	6.6
Aug. 5.....	14.0	18	16.6	11	0	0	22	72	72	19	.6	219	3.2
Aug. 28.....	7.86	30	18	84	84	0	47	146	79	55	3.0	683	7.6

BUCK CREEK NEAR MOYERS, PUSHMATAHA COUNTY

Oct. 1, 1956.....	--	5.2	2.7	23	38	0	20	24	0	68	2.0	137	6.3
Dec. 4.....	0.83	7.2	1.0	9.9	24	0	14	22	2	49	.9	109	6.7
Jan. 21, 1957.....	5.56	4.0	1.5	4.6	14	0	4.2	16	4	38	.5	81.5	7.1
Mar. 12.....	34.3	3.2	1.7	6.0	22	0	6.7	15	0	46	.7	58.0	6.9
July 30.....	.84	7.6	3.2	9.4	39	0	9.0	32	0	39	.7	103	6.9

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE RED RIVER BASIN IN OKLAHOMA--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Discharge (cfs)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Bicar- bonate (HCO ₃)	Carbonate (CO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conduct- ance (micro- mhos at 25°C)	pH
								Calcium, magne- sium	Non- carbonate				
TENMILE CREEK NEAR MILLER, PUSHMATAHA COUNTY													
Dec. 18, 1956.....	--	8.8	7.8	5.1	55	0	3.4	54	9	17	0.3	125	6.9
Jan. 8, 1957.....	10.2	2.8	1.7	3.2	10	0	6.6	14	6	33	.4	52.8	6.4
Mar. 12.....	15.6	9.6	1.9	7.7	20	0	7.0	32	16	34	.6	73.1	6.6
Apr. 26.....	3,760	5.6	3.4	3.1	18	0	2.2	28	13	19	.2	46.3	6.8
June 17.....	10.2	10	8.0	5.9	40	0	3.9	58	25	18	.3	96.5	6.9

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN LOUISIANA

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
													Boron (B)	Tons per acre-foot		Calcium, magnesium	Non-carbonate		
														Parts per million	Tons per day				
STATE LINE CREEK ON STATE HIGHWAY 1, 1.6 MILES NORTH OF RODESSA																			
Oct. 23, 1956				64	12	177		23	3	21	130				64	45		493	
Nov. 20	19										400	0.2	694	0.94	210	208	65	1,340	
TYSON BRANCH ON STATE HIGHWAY 1, NEAR RODESSA																			
Oct. 23, 1956				7,080	926	21,800		0		49,200					21,400	21,400	69	91,700	
Nov. 20	15			1,310	186	4,060	3	3		9,090			14,700	19.99	4,030	4,030	69	22,900	
STATE LINE CREEK ON STATE HIGHWAY 168, NEAR RODESSA																			
Oct. 24, 1956				4,550	590	14,700		0		32,800					13,800	13,800	70	68,200	
Nov. 20	12			1,120	154	3,310	0	0		7,460			12,100	16.46	3,430	3,430	68	19,500	
BLACK BAYOU ON STATE HIGHWAY 1, SOUTH OF RODESSA																			
Oct. 23, 1956				281	43	1,210		0		2,050					878	878	75	6,270	
Nov. 20	12			424	58	1,350		0		3,000			4,860	6.61	1,300	1,300	69	8,600	
BLACK BAYOU LAKE AT DAM, NEAR HOSSTON																			
Oct. 24, 1956		22		101	22	868		10	3.3	1,310		0.9	2,160	2.94	342	334	81	4,120	
Nov. 20	20			100	23	718		6	2.3	1,370		2.0	2,240	3.05	344	339	82	4,090	
CADDO LAKE IN CADDO PARISH																			
Oct. 23, 1956		11		51	26	992	11	12	4.1	1,670		0.6	2,770	3.77	234	224	90	5,200	
Nov. 20	10			66	33	1,230	12	12	25	2,080			3,450	4.69	300	290	90	6,170	

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN LOUISIANA--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent adsorption	Specific conductance (micro-mhos at 25° C)
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		

CADDO LAKE AT BRIDGE ON STATE HIGHWAY 1, NEAR MOORINSPOUT

Oct. 23, 1956 ...		11		16	7.1	123	4.2	26	12	219	0.6	0.3		406	0.55		70	48	78	6.4	800	6.8
Nov. 20, 1956 ...		11		18	7.1	122	3.8	18	15	223		.2		409	.56		73	58	77	6.2	772	6.6

BAYOU DORCHEAT ON STATE HIGHWAY 2, NEAR SAREPTA

Oct. 24, 1956 ...		8.7		89	19	528	6.9	23	3.5	1,030		0.5		1,700	2.31		300	281	79	13	3,280	6.6
Nov. 21, 1956 ...		8.6		89	22	161		41	8.1	1,120		4.0		1,880	2.56		312	279	81	15	3,460	6.9

BAYOU DORCHEAT ON STATE HIGHWAY 160, NEAR COTTON VALLEY

Oct. 24, 1956 ...		8.6		39	8.7	172	4.6	20	2.1	352	0.3	0.3		598	0.81		134	118	73	6.5	1,210	6.4
Nov. 21, 1956 ...		7.1		35	8.4	161		14	4.0	322		.2		545	.74		121	110	74	6.4	1,080	6.4

BAYOU BODCAU NEAR SAREPTA

Oct. 4, 1956 ...	3.7	7.2		12	5.2	25	4.8	40	3.7	53		1.0		132	0.20	1.3	52	19	48	1.5	254	6.6
Nov. 21, 1956 ...	331	8.3		40	5.0	155	4.1	191	21	198		0.5		526	.72	470	120	0	73	6.2	934	7.3

BAYOU BODCAU AT STATE HIGHWAY 157, NEAR BELLEVUE

Oct. 24, 1956 ...								42		21							37	3			150	7.4
Oct. 24, 1956 ...		7.2		9.2	3.2	10	4.7	42	1.6	20		1.0		78			36	2	34	0.7	148	6.6

BAYOU BARTHOLOMEW NEAR BEEKMAN

Oct. 25, 1956 ...		15		26	8.3	23	3.0	148	3.9	20		1.2		173	0.24		100	0	32	1.0	159	7.7
Nov. 22, 1956 ...		10		21	5.5	15	3.1	108	4.2	15		.2		126	.17		75	0	29	.8	210	8.1

LITTLE BAYOU BOEUF ON STATE HIGHWAY 554, SOUTHWEST OF BASTROP

Oct. 26, 1956	...			96	8.3	396		556	392			274	0	76	10	2,180	7.0
Nov. 22	.....	20		98	9.3	351		447	63	422		282	0	73	9.1	2,010	7.0

BAYOU L'OUTRE ON DIRT ROAD JUST SOUTH OF ARKANSAS

Oct. 25, 1956	.....			394	92	2,720	30	208	70	5,000		8,420	11.5	81	32	14,300	7.3
Nov. 22	.....			166	34	941		60	50	1,740		554	4.04	79	17	5,310	6.9

LION CREEK SOUTH OF ARKANSAS BORDER

Oct. 25, 1956	.....				5.4	2.3	5.3	26	4.8			11	0	29	0.5	62	6.6
Nov. 22	.....	18						9	7.2		1.9	23	16			86	5.6

BAYOU L'OUTRE NEAR LARAN

Oct. 25, 1956	.....	12		363	84	2,380	28	106	81	4,490		7,480	10.2	242	80	29	12,800	7.3
Nov. 22	.....	76		139	28	743		37	33	1,430	3.0	2,400	3.26	492	462	432	4,350	6.9

BAYOU L'OUTRE AT DE LOUIRE

Oct. 25, 1956	.....			356	86	2,200		81	--	4,220		--	--		79	27	12,200	7.7
Nov. 22	.....			85	17	448		24	26	870	0.2	1,470	2.00		282	78	2,760	7.2
Nov. 22	.....			79	18	423		22	22	820	.2	1,380	1.88		272	77	2,620	6.8

THREE CREEKS ON DIRT ROAD, JUST SOUTH OF ARKANSAS BORDER

Oct. 25, 1956	.....			31	4.6	148	4.0	126	11	223	0.4	488	0.67		76	6.5	950	7.5
Nov. 21	.....			176	23	341		11	8.6	900	.0	1,460	1.99		530	58	2,820	6.5

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN LOUISIANA--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
													Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
BEAVER CREEK ON STATE HIGHWAY 167, SOUTH OF JUNCTION CITY																					
Oct. 25, 1956....		17		3.3	1.4		5.2	12	16	9.5		0.8		52	0.07	13	3	39	0.6	82	6.1
Nov. 22.....								10	6.6							14	6		0.6	63	6.0
CORNEY LAKE ON STATE HIGHWAY 9, AT BRIDGE NEAR SUMMERFIELD																					
Oct. 25, 1956....		8.0		368	46	822	25	0	7.4	2,100				3,350	4.56	1,110	1,110	61	11	6,410	3.7
Nov. 21.....		9.0		443	52	919			11	2,350				3,780	5.14	1,320	1,320	60	11	6,850	4.6
CORNEY LAKE AT SPILLWAY, NEAR LILLIE																					
Oct. 25, 1956....		0.2		181	20	353	9.8	1	4.3	910	0.1	0.2		1,460	1.99	484	482	61	7.0	2,960	4.8
Nov. 21.....		1.4		172	22	344		0	5.6	910		.0		1,460	1.99	520	520	59	6.6	2,800	4.6
BIG CORNEY BAYOU NEAR LILLIE																					
Oct. 25, 1956....				137	26	295		4		780				1,020	1.39	449	446	59	6.0	2,490	5.8
Nov. 22.....		2.8		120	16	243		2	9.1	625		0.2				366	364	59	5.5	1,980	5.1
LITTLE CORNEY BAYOU NEAR LILLIE																					
Oct. 25, 1956....		2.6		14	3.8	143	4.0	16	3.0	246	0.5	0.2		424	0.58	51	40	85	8.7	851	6.5
Nov. 22.....		14		20	4.7	88	4.6	6	6.4	181		.2		322	.44	70	65	72	4.6	608	5.9
MIDDLE FORK BAYOU D'ARBOIS ON STATE HIGHWAY 9, NEAR SUMMERFIELD																					
Nov. 21, 1956....		3.2		3.1	0.8	3.7	4.0	6	10	6.0		0.7		34	0.05	11	6	33	0.5	57	5.8
Nov. 21.....		8.0		10	3.2	39	5.4	11	13	77		.2		161	.22	38	29	65	2.8	301	6.6

OUACHITA RIVER NEAR STERLINGTON

Oct. 25, 1956 ...		11		50	13		397	37	14	460		4.5		1,320	1.80		178	150		10	1,590	6.8
Nov. 22				79	19			27		780							276	254	76		2,500	6.7

BOEUF RIVER ON STATE HIGHWAY 2, NEAR GIRARD

Oct. 25, 1956 ...		6.4		70	38	101	4.3	249	99	117	0.4	0.3		618	0.84		331	127	39	2.4	1,110	7.7
Nov. 23		14		48	18	56	4.8	167	41	99		.5		361	.49		188	51	39	1.8	638	8.0

BAYOU MACON ON STATE HIGHWAY 2, NEAR OAK GROVE

Oct. 25, 1956 ...		14		48	16	20	4.2	226	20	21		1.0		255			185	0	19	0.6	445	7.6
Nov. 23		12		32	11	11	6.0	152	13	14		1.2		175	0.24		125	0	15	.4	297	8.2

MISSISSIPPI RIVER MAIN STEM

MISSISSIPPI RIVER NEAR ST. FRANCISVILLE, LA.

LOCATION.--At ferry on State Highway 10 crossing, 2 miles southwest of St. Francisville, West Feliciana Parish.

RECORDS AVAILABLE.--Chemical analyses: August 1954 to September 1957.

Water temperatures: August 1954 to September 1957.

EXTREMES, 1954-57.--Dissolved solids: Maximum, 280 ppm Nov. 1-10; minimum, 111 ppm Feb. 11-19.

Hardness: Maximum, 167 ppm Oct. 11-20, Nov. 1-10; minimum, 75 ppm Feb. 11-19.

Specific conductance: Maximum daily, 489 microhos May 22; minimum daily, 179 microhos Feb. 19.

Water temperatures: Maximum, 84°F on several days during July and August; minimum, 40°F Jan. 19.

EXTREMES, 1954-57.--Dissolved solids: Maximum, 320 ppm Oct. 11-20, 1953; minimum, 111 ppm Feb. 11-19, 1957.

Hardness: Maximum, 185 ppm Jan. 21-31, 1956; minimum, 75 ppm Feb. 11-19, 1937.

Specific conductance: Maximum daily, 683 microhos Oct. 16, 1953; minimum daily, 173 microhos Apr. 15, 1955.

Water temperatures: Maximum, 87°F July 12, Aug. 12, 1955; Aug. 8, 11-13, 1956; minimum, 40°F Jan. 19, 1957.

REMARKS.--Records of specific conductance of daily samples available in Subdistrict office at Baton Rouge, La. No discharge records available.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per- so- ad- orp- tion ratio	Specific conduct- ance (micro- mos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mag- nesium	Non-carbon- ate				
Oct. 1-10, 1956 ..		7.8	0.00	43	12		26	131	72	20	0.4	3.0		252	0.34		157	50	27	0.9	413	7.9
Oct. 11-20		5.8	0.00	46	13		32	141	81	25	4	1.8		274	.37		167	51	30	1.1	444	7.8
Oct. 21-31		5.4	0.00	44	13		29	146	70	20	4	1.8		258	.35		162	41	28	1.0	426	7.7
Nov. 1-10		6.0	0.01	44	14		33	152	76	22	5	2.2		280	.38		167	42	30	1.1	459	7.8
Nov. 11-20		6.6	0.01	42	13		32	142	70	24	4	2.0		265	.36		157	41	30	1.1	435	8.1
Nov. 21-30		5.8	0.01	41	14		27	140	62	26	5	2.2		266	.36		160	45	27	.9	427	8.1
Dec. 1-10		7.0	0.01	41	12		27	136	57	26	5	1.8		249	.34		152	41	28	.9	404	7.6
Dec. 11-20		6.0	0.03	40	12		29	128	55	32	5	2.2		248	.38		148	43	30	1.0	401	7.7
Dec. 21-31		5.8	0.11	34	10		22	95	53	27	5	2.2		202	.27		127	49	27	.8	345	7.6
Jan. 1-10, 1957 ..		7.8	0.05	30	7.8		17	84	41	21	2	3.0		184	.25		107	38	26	.7	300	7.7
Jan. 11-20		7.8	0.07	31	8.5		16	92	40	20	2	2.5		184	.25		112	37	24	.7	300	7.5
Jan. 21-31		6.8	0.10	31	8.4		16	94	38	20	2	2.5		186	.25		112	35	24	.7	305	7.5
Feb. 1-10		7.2	0.17	27	6.2		14	80	30	16	2	3.5		158	.21		93	27	24	.6	258	7.7
Feb. 11-19		6.6	0.19	23	4.5		7.1	64	22	10	2	3.8		111	.15		75	23	17	.4	197	7.7
Feb. 20-28		6.8	0.24	22	5.1		7.2	66	25	8.5	3	3.2		113	.15		77	23	16	.4	199	7.6
Mar. 1-10		8.6	0.13	25	5.9		7.2	72	28	9.2	4	3.2		125	.17		87	28	15	.3	212	7.6
Mar. 11-20		8.2	0.07	28	7.4		11	85	33	11	4	4.5		156	.21		100	31	19	.5	249	7.7
Mar. 21-31		7.4	0.07	29	7.5		11	83	35	14	4	3.2		149	.20		103	35	19	.5	259	7.6
Apr. 1-10		8.4	0.10	30	8.4		19	95	36	22	5	3.2		188	.26		109	32	27	.8	299	7.5
Apr. 11-20		8.2	0.20	29	7.3		15	89	32	18	5	3.2		176	.24		102	29	24	.7	273	7.6
Apr. 21-30		7.4	0.15	29	7.4		15	87	35	16	5	4.5		175	.24		103	32	24	.6	265	7.5

May 1-10, 1957..	12	.11	29	8.9	19	92	36	24	.3	3.2	195	.27	108	33	28	.8	319	7.3
May 11-20	12	.06	31	9.9	21	105	34	28	.3	2.8	207	.28	118	32	28	.8	339	7.4
May 21	11	.06	34	12	31	118	39	43	.3	3.5	250	.34	134	37	34	1.2	418	7.6
June 1-10	12	.17	33	7.8	19	103	30	25	.6	3.8	a182	.25	114	30	26	.8	335	7.4
June 11-20	9.8	.18	33	7.8	15	103	30	20	.6	2.2	a170	.23	114	30	22	.6	309	7.3
June 21-30	7.8	.23	32	7.8	17	102	29	22	.7	2.8	a169	.23	112	28	25	.7	304	7.4
July 1-10	12	.07	35	8.7	22	115	34	27	.4	2.8	206	.28	123	29	28	.9	338	7.8
July 11-20	11	.06	35	8.7	20	116	33	23	.4	3.8	197	.27	123	28	26	.8	327	7.7
July 21-31	11	.08	38	9.6	19	127	37	21	.5	3.8	206	.28	134	30	24	.7	339	7.5
Aug. 1-10	12	.04	38	11	25	134	42	25	.5	6.3	240	.33	140	30	28	.9	380	7.8
Aug. 11-20	12	.04	39	11	23	135	44	23	.4	3.8	231	.31	143	32	26	.8	371	8.0
Aug. 21-31	9.4	.06	38	10	30	133	44	31	.4	2.8	240	.33	136	27	33	1.1	392	8.1
Sept. 1-10	11	.04	39	12	28	144	51	24	.4	1.5	a238	.32	147	29	29	1.0	409	8.0
Sept. 11-20	9.8	.04	42	12	29	151	57	23	.4	1.5	a249	.34	154	30	29	1.0	424	8.1
Sept. 21-30	8.4	.09	39	13	35	148	61	28	.4	1.5	a259	.35	151	29	33	1.2	446	8.0
Average	8.6	0.08	35	9.7	21	112	44	22	0.4	2.9	204	0.28	127	35	26	0.8	342	--

a Calculated from determined constituents.

LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAINSTEM--Continued

MISSISSIPPI RIVER AT ST. FRANCISVILLE, LA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	64	47	52	52	52	--	67	74	81	84	83
2	73	66	50	50	49	50	59	68	73	81	84	83
3	73	68	50	48	50	53	59	68	73	--	84	83
4	74	68	50	52	48	53	59	68	74	--	84	83
5	74	68	53	52	47	50	60	65	74	--	84	82
6	73	68	54	--	47	50	57	65	74	79	82	80
7	72	67	55	51	49	50	62	65	74	78	--	78
8	71	65	54	50	49	48	62	68	--	--	--	79
9	69	59	53	53	50	48	64	69	76	82	83	80
10	70	59	49	54	51	49	65	70	76	82	82	82
11	71	62	52	48	50	53	60	72	77	82	83	81
12	69	60	55	50	51	--	60	72	77	82	82	78
13	72	60	52	51	49	--	57	72	78	82	83	78
14	71	60	54	52	51	54	55	72	78	82	83	78
15	70	62	53	--	52	52	55	73	78	82	83	79
16	70	60	54	--	51	50	60	73	--	82	84	78
17	69	59	54	42	49	52	60	74	79	83	84	78
18	68	59	56	43	50	54	60	74	79	83	84	78
19	69	59	55	40	50	54	60	74	79	83	84	76
20	72	62	56	46	49	54	60	74	80	83	82	78
21	76	55	--	47	48	56	62	75	80	83	79	78
22	70	55	55	47	51	55	62	77	80	83	80	78
23	69	55	55	45	53	57	61	77	79	83	80	78
24	68	55	50	44	52	55	65	78	80	--	81	--
25	67	54	50	--	--	54	65	78	81	84	80	--
26	69	53	50	47	52	53	--	78	79	83	81	75
27	69	47	50	47	51	55	65	76	80	83	81	73
28	69	49	48	49	52	55	--	76	80	84	81	73
29	69	49	--	49	--	56	--	73	80	84	81	73
30	68	48	50	49	--	56	67	73	80	85	81	70
31	67	--	49	57	--	58	--	--	--	84	81	--
Average	70	59	52	49	50	53	61	72	78	82	82	78

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER FERRY NEAR ABBEVILLE, LA.

LOCATION.--At Bancker Ferry about 6 miles south of Abbeville, Vermilion Parish.

RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1957.

Water temperatures: January 1949 to September 1957.

EXTREMES, 1956-57.--Specific conductance: Maximum daily, 15,500 micromhos Nov. 5;

minimum daily, 49.4 micromhos May 3.

Water temperatures: Maximum, 88°F July 31; minimum, 49°F Jan. 23.

EXTREMES, 1949-57.--Specific conductance: Maximum daily, 21,200 micromhos Sept. 18, 1954;

minimum daily, 47.7 micromhos May 20, 1953.

Water temperatures: Maximum, 98°F Aug. 9, Sept. 3, 1951; minimum, 38°F Jan. 30, 1951.

Specific conductance (micromhos at 25°C) and chloride, in parts per million,
water year October 1956 to September 1957

Day	October		November		December	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	10,500	3,390	8,760	2,720	3,030	--
2	5,110	--	12,000	--	2,610	--
3	--	--	12,800	--	3,450	--
4	5,370	--	14,300	--	3,350	--
5	6,410	--	15,500	--	4,130	1,240
6	6,260	1,900	14,100	--	3,640	--
7	5,420	--	12,400	4,070	3,390	990
8	5,390	--	2,170	580	2,720	--
9	7,290	--	929	215	509	112
10	7,320	--	4,070	1,250	506	--
11	7,560	--	4,720	--	2,010	560
12	10,000	--	3,410	--	2,140	--
13	10,100	3,250	3,310	960	1,870	515
14	8,380	--	5,250	1,620	513	118
15	8,280	--	6,020	--	344	65
16	6,210	--	880	220	466	--
17	5,780	1,740	1,480	425	472	--
18	5,960	--	1,550	--	796	210
19	8,480	--	1,070	--	110	20
20	9,480	--	1,050	288	110	--
21	7,660	--	491	119	93.5	--
22	7,020	--	2,480	728	88.7	16
23	10,200	--	2,230	--	132	--
24	10,700	--	2,240	--	141	--
25	12,300	--	1,740	490	177	--
26	10,700	--	771	196	190	39
27	7,720	2,400	1,090	--	187	--
28	8,450	--	2,010	--	188	--
29	10,200	--	2,620	755	180	--
30	11,500	--	644	161	182	--
31	13,200	4,390	--	--	157	--

LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCER FERRY NEAR ABBEVILLE, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million,
water year October 1956 to September 1957--Continued

Day	January		February		March	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	160	22	250	--	176	--
2	199	--	240	--	180	--
3	204	--	140	--	175	--
4	171	--	140	26	180	--
5	162	--	315	73	159	--
6	173	--	298	--	149	20
7	164	--	188	--	173	--
8	217	42	194	--	192	32
9	180	--	192	--	334	78
10	164	--	192	--	271	55
11	195	--	199	--	250	50
12	209	--	212	38	184	--
13	218	--	204	--	216	--
14	218	--	180	--	194	--
15	242	50	179	--	193	--
16	177	32	201	--	177	--
17	164	--	211	--	194	--
18	320	--	213	--	151	--
19	253	--	266	47	51.6	9.0
20	338	77	214	--	80.3	13
21	159	28	327	60	157	36
22	187	--	243	--	138	--
23	196	--	318	--	141	--
24	262	--	188	31	161	--
25	281	--	210	--	126	22
26	288	66	162	32	223	48
27	196	--	186	--	162	--
28	256	--	185	--	142	--
29	369	--	--	--	138	--
30	381	92	--	--	125	--
31	381	--	--	--	129	--
Day	April		May		June	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	141	21	105	18	364	59
2	157	26	138	--	195	34
3	156	--	49.4	7.2	151	--
4	137	--	85.0	--	142	21
5	221	47	203	47	159	--
6	174	--	127	--	149	--
7	168	30	114	--	201	--
8	145	--	115	--	226	--
9	173	--	170	--	174	--
10	180	--	131	--	239	38
11	163	27	138	23	276	--
12	170	--	140	--	263	--
13	146	--	146	--	287	46
14	195	--	156	--	285	--
15	221	--	183	--	215	--
16	143	21	195	--	207	--
17	256	62	229	45	224	--
18	66.4	11	164	21	219	--
19	84.2	--	171	--	210	27
20	98.3	--	215	31	204	--
21	152	--	223	--	227	--
22	186	--	205	29	213	--
23	154	--	217	--	232	--
24	132	--	255	--	174	--
25	192	36	259	--	132	--
26	172	--	273	--	188	--
27	152	--	350	60	151	17
28	135	--	311	--	468	102
29	133	20	303	--	229	45
30	141	--	313	--	162	26
31	--	--	331	--	--	--

MISSISSIPPI RIVER DELTA

279

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER FERRY NEAR ABBEVILLE, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million,
water year October 1956 to September 1957--Continued

Day	July		August		September	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	154	--	162	22	443	88
2	145	--	195	31	348	--
3	143	--	--	--	307	--
4	134	22	--	--	288	46
5	159	--	--	--	342	--
6	157	--	--	--	343	--
7	163	--	--	--	329	--
8	186	27	290	52	313	--
9	172	--	268	--	320	--
10	179	--	253	--	315	--
11	188	--	253	--	342	54
12	183	--	253	37	303	--
13	195	25	171	25	223	--
14	189	--	191	--	166	22
15	192	--	227	--	271	--
16	210	--	270	--	309	--
17	225	31	356	65	234	--
18	196	--	274	--	248	--
19	204	--	256	--	233	--
20	219	--	319	60	283	--
21	203	--	294	--	186	25
22	489	116	292	--	314	--
23	168	--	312	--	219	--
24	193	--	304	49	188	--
25	239	50	304	--	213	--
26	142	20	304	--	196	--
27	182	--	316	--	168	--
28	164	--	306	--	141	17
29	160	--	334	--	212	--
30	166	--	525	118	230	--
31	147	--	403	80	--	--

LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER DELTA--Continued

VERMILION RIVER AT BANCKER FERRY, LA.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Once-daily measurement, usually between 6 and 10 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	72	54	56	66	60	65	76	83	83	87	85
2	78	74	56	55	66	60	68	75	79	83	87	85
3	--	74	56	55	66	62	68	77	76	85	--	85
4	78	75	56	58	65	62	70	72	77	85	--	84
5	78	75	58	58	67	62	69	70	78	85	--	83
6	77	74	60	59	66	60	68	69	80	85	--	82
7	77	74	60	59	67	59	69	69	80	84	--	83
8	77	72	61	60	69	55	70	71	81	85	84	82
9	76	69	60	60	70	56	65	72	81	85	85	80
10	77	68	60	62	70	58	66	72	81	86	84	80
11	77	68	60	60	71	59	65	74	82	86	84	81
12	76	67	61	60	70	60	66	76	83	85	83	80
13	76	66	62	63	69	61	66	77	84	86	82	78
14	76	68	62	64	68	63	65	78	85	87	83	77
15	76	68	62	62	69	65	66	79	85	86	84	78
16	75	66	63	60	68	64	67	79	85	86	85	76
17	75	62	64	51	66	65	66	80	85	86	86	78
18	74	61	65	50	66	64	67	80	85	86	86	76
19	75	62	64	50	62	65	70	81	85	85	85	77
20	75	63	64	50	60	67	71	81	85	85	85	78
21	74	63	65	52	57	65	73	82	85	84	85	80
22	73	62	66	53	57	65	75	83	84	83	85	80
23	73	60	66	49	57	66	75	83	83	84	84	80
24	74	60	63	51	58	65	76	83	83	84	83	78
25	75	58	60	55	60	63	77	83	81	84	84	77
26	76	57	58	56	59	62	76	82	82	84	85	70
27	74	59	53	58	58	61	77	81	79	85	85	75
28	74	58	52	60	58	62	78	81	82	86	86	73
29	73	56	55	62	--	61	77	83	81	86	85	78
30	74	54	55	64	--	62	75	83	83	87	85	70
31	73	--	55	65	--	64	--	83	--	88	85	--
Average	75	66	60	57	64	62	70	78	82	85	85	79

MISSISSIPPI RIVER DELTA.--Continued

TICKFAW RIVER AT HOLDEN, LA.

LOCATION.--On U. S. Highway 190, half a mile west of Holden and 4½ miles upstream from Big Branch. DRAINAGE AREA.--242 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to August 1956, December 1956 to September 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1511.

Chemical analyses, in parts per million, December 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Dec. 31, 1956 ...	95	12	0.34	1.4	1.0	3.7	1.2	12	1.0	5.0	--	0.6		32	0.04	8.2	8	0	47	0.6	36.2	6.4
Jan. 23, 1957 ...	98	13	.60	1.9	.8	3.7	.9	12	.0	6.0	--	.2		33	.04	8.7	8	0	44	.6	42.3	6.7
Mar. 1 ...	142	9.4	.18	1.5	.8	3.7	1.1	11	.4	4.4	0.3	.5		27	.04	10	7	0	49	.6	39.3	6.2
Mar. 20 ...	436	8.2	.15	1.6	.9	3.2	1.6	8	2.0	4.5	--	1.2		28	.04	33	8	1	42	.5	35.1	5.9
May 21 ...	106	11	.08	1.5	.4	3.5	1.4	10	.2	4.2	--	.5		28	.04	8.0	5	0	51	.6	34.8	5.5
June 13 ...	95	12	.24	1.5	1.0	3.3	.9	10	.2	4.5	.3	.5		29	.04	7.4	8	0	44	.5	35	6.0
July 11 ...	89	12	.28	1.5	.9	3.6	1.4	10	.2	5.2	.4	.8		31	.04	7.4	7	0	46	.6	35.2	6.1
Sept. 3 ...	77	10	.08	0.9	.7	3.3	.8	9	.2	4.0	--	--		24	.03	5.0	5	0	54	.6	32.2	6.5

PART 8. WESTERN GULF OF MEXICO BASINS

MERMENTAU RIVER BASIN

MERMENTAU RIVER AT LAKE ARTHUR, LA.

LOCATION.--At bridge on State Highway 14, about half a mile east of Lake Arthur, Jefferson Davis Parish.

RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1957.

Water temperatures: January 1949 to September 1952.

EXTREMES, 1956-57.--Specific conductance: Maximum, 573 micromhos Nov. 25; minimum, 22.2 micromhos Sept. 12.

EXTREMES, 1949-57.--Specific conductance: Maximum, 6,330 micromhos June 30, 1952; minimum, 22.2 micromhos Sept. 12, 1956.

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1956 to September 1957

Day	October		November		December	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	502	86	453	--	511	--
2	457	--	449	83	497	--
3	--	--	454	--	504	--
4	441	82	460	--	500	101
5	450	--	476	88	512	--
6	444	--	443	--	508	--
7	450	--	439	--	507	--
8	448	--	468	--	510	--
9	447	--	451	--	509	--
10	446	--	446	--	512	103
11	444	81	451	--	550	--
12	443	--	447	--	552	107
13	450	--	443	82	378	63
14	446	--	444	--	462	--
15	444	82	450	--	485	--
16	450	--	451	--	512	--
17	442	--	553	109	513	--
18	453	--	516	--	221	50
19	453	--	508	--	227	--
20	452	--	509	--	220	--
21	448	--	506	--	221	--
22	--	--	505	--	223	50
23	445	83	509	--	102	16
24	470	--	--	--	98.3	--
25	446	--	573	--	95.4	--
26	479	--	511	--	95.6	--
27	477	--	570	115	95.6	--
28	461	--	509	--	95.6	16
29	457	--	509	101	89.7	--
30	484	--	--	--	91.8	--
31	446	--	--	--	89.9	--
Day	January		February		March	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	961	--	140	--	245	--
2	97.5	--	140	--	245	47
3	98.0	--	270	--	171	--
4	93.1	16	276	--	170	--
5	92.6	--	276	63	170	--
6	108	--	279	--	184	--
7	108	--	--	--	179	--
8	108	--	--	--	181	--
9	99.4	17	--	--	181	--
10	158	25	--	--	173	32
11	96.3	--	--	--	182	36
12	94.3	15	--	--	157	--
13	99.4	--	--	--	160	--
14	99.7	--	217	--	163	--
15	101	16	224	--	148	--
16	98.6	--	244	--	149	30
17	98.3	--	219	--	133	--
18	98.0	--	226	39	135	--
19	98.3	--	223	--	135	--
20	102	--	246	--	133	26
21	103	16	250	--	111	18
22	104	--	252	51	104	--
23	105	--	--	--	105	--
24	105	--	210	--	106	--
25	106	--	207	--	87.7	--
26	105	--	210	--	87.7	--
27	138	--	205	--	86.8	15
28	140	--	237	46	89.9	--
29	141	23	--	--	82.8	--
30	140	--	--	--	84.3	--
31	140	--	--	--	102	--

MERMENTAU RIVER BASIN--Continued

MERMENTAU RIVER AT LAKE ARTHUR, LA.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million.
water year October 1956 to September 1957--Continued

Day	April		May		June	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	104	--	86.5	--	483	130
2	105	--	81.8	--	101	16
3	103	14	79.7	--	105	--
4	103	--	81.0	--	99.7	--
5	103	--	79.3	13	124	--
6	104	--	112	--	123	--
7	104	--	88.3	--	135	--
8	107	--	120	24	122	--
9	110	--	93.2	--	155	24
10	96.7	22	85.6	--	131	--
11	94.7	--	85.6	15	125	--
12	97.4	--	96.3	--	127	--
13	101	20	102	--	165	27
14	87.2	--	109	--	133	17
15	87.2	--	90.9	--	126	--
16	87.2	--	168	32	126	--
17	93.9	--	89.7	--	128	--
18	87.6	--	--	--	124	--
19	88.8	--	--	--	140	--
20	68.0	10	99.1	--	140	--
21	67.3	--	99.1	--	134	--
22	96.9	19	96.8	15	135	21
23	58.6	8.0	97.1	--	128	--
24	77.1	--	103	--	118	--
25	60.2	--	104	--	--	--
26	59.3	--	103	--	--	--
27	78.2	--	105	--	--	--
28	64.3	--	102	--	--	--
29	69.0	--	113	18	107	16
30	75.8	--	102	--	111	--
31	--	--	99.1	--	--	--
Day	July		August		September	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
1	103	--	181	--	181	24
2	98.5	18	180	26	222	--
3	133	20	--	--	273	--
4	127	--	201	27	277	--
5	123	--	--	--	276	--
6	115	--	--	--	278	--
7	115	--	185	--	278	--
8	120	--	198	--	278	48
9	--	--	187	--	279	--
10	--	--	193	--	311	54
11	143	--	169	--	25.8	2
12	150	19	176	--	22.2	2
13	144	--	172	--	--	--
14	145	--	--	--	--	--
15	136	--	166	23	--	--
16	128	--	172	--	188	28
17	123	--	175	--	195	--
18	125	--	185	24	190	--
19	121	--	174	--	192	--
20	120	16	170	--	196	--
21	174	--	170	23	193	--
22	183	--	175	--	193	--
23	177	--	182	--	206	32
24	176	--	196	26	198	--
25	182	--	179	--	180	24
26	173	25	186	--	213	31
27	175	--	176	--	189	--
28	208	32	176	--	189	--
29	181	--	178	--	183	--
30	183	--	174	--	184	--
31	179	--	176	--	--	--

CALCASIEU RIVER BASIN

WHISKEY CHITTO CREEK NEAR OBERLIN, LA.

LOCATION.--At gaging station near left bank on downstream side of bridge on State Highway 26, 1 mile downstream from Tennile Creek, 8 miles upstream from Bundick Creek, and 10 miles northwest of Oberlin, Allen Parish.
DRAINAGE AREA.--510 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to July 1957.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, October 1956 to July 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 25, 1956	102	29	0.13	4.3	0.8	6.4	1.4	25	0.9	6.0	--	0.2		61	0.08	17	14	0	47	0.7	63.0	6.9
Nov. 29	150	23	.19	2.4	1.0	5.7	1.3	16	1.2	6.0	0.2	.2		49	.07	20	10	0	52	.8	51.3	6.5
Dec. 20	1,940	5.2	.45	1.0	.7	2.1	1.5	7	2.2	3.0	--	.8		20	.03	105	5	0	38	.4	26.4	5.8
Jan. 24, 1957	423	18	.28	2.0	1.0	4.1	1.0	11	1.8	6.0	--	.2		39	.05	45	9	0	46	.6	40.4	6.4
Feb. 18	345	22	.29	2.1	.9	4.8	.9	15	.4	5.5	--	.2		44	.06	41	9	0	51	.7	46.3	6.5
Mar. 21	2,300	6.8	.28	1.0	.6	2.4	.9	6	1.0	3.2	.1	.8		20	.03	124	5	0	46	.5	28.1	5.7
Apr. 17	1,280	8.0	.25	.9	.6	2.7	.8	7	.2	3.0	.3	.5		20	.03	69	5	0	51	.6	26.7	6.0
May 29	230	26	.14	2.7	1.0	6.1	1.2	21	.2	6.0	--	.2		54	.07	34	11	0	52	.8	56.2	6.6
July 16	210	28	.34	2.7	1.1	5.9	1.4	19	.2	6.5	.4	.2		56	.08	32	11	0	50	.8	55.4	6.2

CALCASIEU RIVER BASIN--Continued
BUNDICK CREEK NEAR DRY CREEK, LA.

LOCATION.--At gaging station at bridge on State Highway 113, 1 mile northeast of town of Dry Creek, Beauregard Parish, and 8 miles upstream from mouth.
DRAINAGE AREA.--238 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1955 to July 1957.
REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, October 1956 to July 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium	So- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 24, 1956	59	38	0.34	4.0	1.0	13		36	1.3	8.0	--	0.2		84	0.11	13	14	0	67	1.5	97.8	6.6
Nov. 28	73	27	.26	4.3	1.3	12		30	3.4	9.0	--	.5		73	.10	14	16	0	61	1.3	88.2	6.7
Dec. 19	506	13	.45	2.4	1.0	5.1	1.6	10	4.6	6.8	--	.9		41	.06	56	10	2	48	.7	51.3	6.0
Jan. 20, 1957	114	24	.39	3.5	1.3	8.0	1.5	24	2.8	7.8	--	.2		61	.08	19	14	0	52	.9	69.8	6.4
Feb. 17	114	24	.39	3.4	1.0	11		27	1.8	7.8	--	.8		63	.09	19	13	0	65	1.3	76.5	6.4
Mar. 20	1,240	5.0	.33	1.2	.6	3.2	1.1	6	1.6	3.8	0.5	.8		21	.03	70	5	1	50	.6	32.5	5.7
Apr. 16	317	9.0	.23	1.2	.7	3.4	.8	10	.6	3.2	.2	.8		25	.03	21	6	0	52	.6	34.9	6.0
May 28	95	36	.23	3.4	1.3	11		32	1.2	7.5	--	.2		77	.10	18	14	0	64	1.3	79.8	6.5
July 16	85	37	.39	3.5	1.0	12		30	1.4	9.2	--	.5		80	.11	18	13	0	67	1.5	84.3	6.0

SABINE RIVER BASIN

SABINE RIVER NEAR TATUM, TEX.

LOCATION. --At gaging station at bridge on State Highway 43, 5 miles upstream from Potter Creek, 5.2 miles northeast of Tatum, Rusk County, 7 miles downstream from Cherokee Bayou, and at mile 339.

DRAINAGE AREA. --3,586 square miles.

RECORDS AVAILABLE. --Chemical analyses: February 1952 to September 1957.

Water temperatures: February 1952 to September 1957.

EXTREMES. 1956-57. --Dissolved solids: Maximum, 805 ppm Oct. 21-31; minimum, 74 ppm Apr. 24-30.

Hardness: Maximum, 97 ppm Oct. 21-31; minimum, 22 ppm Apr. 24-30.

Specific conductance: Maximum daily, 1,590 micromhos Nov. 7; minimum daily, 98 micromhos Apr. 29.

Water temperatures: Maximum, 90°F on several days during July; minimum, 43°F Jan. 18.

EXTREMES. 1952-57. --Dissolved solids: Maximum, 936 ppm Aug. 21-31, 1956; minimum, 74 ppm Apr. 24-30, 1957.

Hardness: Maximum, 106 ppm Sept. 1-10, 1954; minimum, 22 ppm Apr. 24-30, 1957.

Specific conductance: Maximum daily, 1,850 micromhos Oct. 29, 1954, Aug. 31, 1956; minimum daily, 98 micromhos Apr. 29, 1957.

Water temperatures: Maximum, 98°F Aug. 13, 1956; minimum, 42°F Feb. 19, 1956.

REMARKS. --Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium			Non-carbonate
Oct. 1-10, 1956 ..	10.2	5.6	20	7.8	246	145	18	340	0.8	494	82	0	730	0.99	20.1	82	0	87	12	1,320
Oct. 11-20	12.0	4.2	21	8.6	244	111	21	358	.2	723	88	0	805	.98	23.4	88	0	86	11	1,340
Oct. 21-31	32.5	4.4	24	9.0	273	148	26	385	.0	805	97	0	805	1.09	70.6	97	0	86	12	1,480
Nov. 1-13, 15	154	7.0	25	8.3	249	81	36	378	1.0	753	1.02	313	753	1.02	313	96	30	85	11	1,430
Nov. 14, 25-30	146	13	18	4.5	83	58	30	116	1.8	320	.44	126	64	.44	126	64	16	74	4.5	550
Nov. 16-24	238	9.2	13	3.1	38	42	24	48	1.2	215	.21	102	45	.21	102	45	12	64	2.4	280
Dec. 1-10	61.6	14	22	6.0	143	70	31	212	1.8	494	.67	82.2	80	.67	82.2	80	22	80	7.0	872
Dec. 11-20	76.1	15	20	5.6	127	61	31	188	1.8	438	.60	90.0	73	.60	90.0	73	22	79	6.5	775
Dec. 21-31	118	14	21	6.0	147	57	33	222	1.0	490	.67	156	77	.67	156	77	30	81	7.3	886
Jan. 1-11, 1957 ..	162	15	18	6.3	94	39	39	144	1.5	360	.49	157	71	.49	157	71	39	74	4.9	639
Jan. 12-20	139	11	23	6.9	143	47	46	220	1.2	504	.69	189	86	.69	189	86	48	78	6.7	911
Jan. 21-31	362	12	19	5.8	105	36	37	164	1.8	388	.53	369	72	.53	369	72	42	76	5.4	700
Feb. 1-5, 7-9	1,552	10	13	3.2	65	15	23	105	2.5	429	.31	960	46	.31	960	46	34	75	4.1	427
Feb. 6, 10-14	1,920	11	17	3.7	32	28	21	47	2.0	314	.19	736	43	.19	736	43	20	62	2.1	251
Feb. 15-28	625	16	17	5.2	71	29	32	115	1.5	472	.37	459	64	.37	459	64	41	71	3.9	497
Mar. 1-11	534	17	23	8.0	105	18	46	180	1.2	439	.53	561	90	.53	561	90	76	72	4.8	741
Mar. 12-18	893	11	18	4.0	60	36	28	79	1.6	470	.29	506	63	.29	506	63	34	63	2.7	398
Mar. 19-24	1,359	13	18	8.1	80	21	35	134	1.5	428	.41	1,090	70	.41	1,090	70	53	71	4.2	573
Mar. 25-31	3,524	9.6	11	3.2	26	27	19	38	1.0	412	.10	1,150	41	.10	1,150	41	18	56	1.8	222

Apr. 1-11, 1957 ..	4,752	13	14	3.9	32	32	32	24	50	1.0	a154	.21	1,980	51	26	58	2.0	285	6.1
Apr. 12-23	5,842	13	11	3.4	24	36	15	35	35	.8	a120	.16	1,890	41	12	56	1.6	214	6.1
Apr. 24-30	18,580	8.2	4.7	2.5	16	14	12	23	23	.8	a74	.10	3,710	22	11	61	1.5	133	5.8
May 1-10	45,700	9.8	12	2.9	18	40	11	25	25	1.2	a100	.14	12,340	42	9	48	1.2	177	6.6
May 11-21	14,210	14	18	3.4	32	58	13	46	46	2.8	a158	.21	6,060	59	11	54	1.8	282	6.9
May 22-31	8,104	12	17	3.1	18	54	11	26	26	1.8	a116	.16	2,540	55	11	41	1.0	211	6.6
June 1-10	18,960	11	12	2.8	19	42	12	25	25	1.2	a104	.14	5,320	41	7	50	1.3	181	6.7
June 11-20	15,430	12	17	3.3	19	56	10	28	28	1.5	a119	.16	4,960	56	10	42	1.1	212	6.8
June 21-30	4,045	14	16	4.4	40	42	15	67	67	1.5	a179	.24	1,950	58	24	60	2.3	333	6.7
July 1-10	467	21	21	5.9	76	47	25	126	126	1.0	a299	.41	377	77	38	68	3.8	568	7.0
July 11-20	180	21	23	6.7	98	60	23	160	160	.5	398	.54	193	85	36	72	4.6	675	7.1
July 21-31	286	21	20	6.8	117	48	23	190	190	.5	439	.60	339	78	38	77	5.8	763	6.8
Aug. 1-10	294	23	17	5.7	93	48	22	145	145	2.5	359	.49	285	66	26	75	5.0	598	7.2
Aug. 11-20	228	18	13	4.4	72	38	22	107	107	1.5	282	.38	174	51	19	75	4.4	473	7.0
Aug. 21-31	89.2	16	14	4.9	81	48	21	120	120	.5	296	.40	71.3	55	16	76	4.7	511	7.1
Sept. 1-5	134	19	16	5.2	96	63	18	142	142	.5	330	.45	119	62	10	77	5.3	586	7.5
Sept. 6-20	131	17	18	6.3	143	41	19	232	232	1.0	497	.68	176	71	38	81	7.4	875	7.4
Sept. 21-27, 29-30 ..	521	14	15	5.4	118	42	19	185	185	8	412	.56	580	60	25	81	6.6	728	7.0
Sept. 28	908	16	7.2	3.9	--	25	--	--	107	1.2	--	--	--	34	14	--	--	396	7.0
Weighted average	3,968	11	13	3.2	25	41	13	37	37	1.4	126	0.17	1,350	46	12	54	1.6	226	--

a Calculated from determined constituents.

WESTERN GULF OF MEXICO BASINS

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR TATUM, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	70	54	55	--	66	57	70	79	--	--	89
2	84	70	--	53	50	64	65	--	77	83	89	89
3	78	70	--	50	50	64	63	--	76	84	89	87
4	80	70	--	52	52	60	64	--	77	90	89	85
5	80	66	57	53	56	60	62	68	76	90	87	87
6	85	65	--	54	54	57	65	--	76	87	84	86
7	78	65	60	54	55	53	66	--	78	85	82	86
8	79	65	--	56	57	54	63	--	80	85	87	85
9	76	64	52	60	56	55	60	71	82	90	87	75
10	78	63	54	52	57	57	60	75	80	90	87	76
11	77	62	55	52	57	68	65	75	82	90	87	75
12	79	--	--	53	56	63	64	77	80	90	87	76
13	77	62	55	54	57	63	61	76	80	90	88	78
14	77	63	--	53	60	66	--	77	80	90	88	78
15	76	62	55	49	56	63	62	77	81	86	88	78
16	78	62	55	47	55	64	62	80	81	86	88	82
17	78	60	56	44	55	67	62	78	83	86	86	81
18	78	63	57	43	55	67	68	77	84	87	86	81
19	77	66	54	46	54	70	64	77	83	85	86	--
20	76	65	53	47	52	67	--	80	84	90	86	--
21	76	60	54	50	54	57	68	80	84	87	--	80
22	76	56	54	50	54	67	--	79	84	87	86	78
23	--	59	54	46	55	64	70	80	84	87	86	76
24	75	58	--	45	55	57	67	80	80	85	86	76
25	74	56	53	47	60	53	66	79	79	85	87	74
26	74	54	52	50	57	53	69	79	79	86	87	71
27	74	52	53	45	53	56	70	78	79	86	89	76
28	74	53	53	47	56	55	70	79	82	86	89	72
29	74	--	53	50	--	55	70	79	81	85	88	70
30	--	53	54	50	--	55	69	79	83	86	88	68
31	74	--	57	--	--	58	--	79	--	86	88	--
Average	77	62	--	50	55	61	65	77	80	87	87	79

SABINE RIVER BASIN--Continued
SABINE RIVER NEAR RULIFF, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from Kansas City Southern Railway bridge, 4.5 miles downstream from Cypress Creek and at mile 40.

DRAINAGE AREA.--9,440 square miles: October 1945 to September 1946, October 1947 to September 1957.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1957.

Water temperatures: October 1947 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 250 ppm Dec. 1-12; minimum, 47 ppm Dec. 22-26, 28.

Hardness: Maximum, 52 ppm Aug. 1-10; minimum, 10 ppm Sept. 27-29.

Specific conductance: Maximum daily, 555 micromhos Dec. 5; minimum daily, 53.7 micromhos Dec. 23.

Water temperatures: Maximum, 90° F Aug. 4; minimum, 45° F Jan. 21.

EXTREMES, 1945-46, 1947-57.--Dissolved solids: Maximum, 411 ppm Dec. 26-27, 1948; minimum, 35 ppm June 5-11, 1950.

Hardness: Maximum, 65 ppm Dec. 21-22, 1954; minimum, 8 ppm May 20-24, 1953.

Specific conductance: Maximum daily, 774 micromhos Dec. 26, 1948; minimum daily, 32.9 micromhos May 22, 1953.

Water temperatures (1947-57): Maximum, 95° F Aug. 12, 1953; minimum, 34° F Jan. 26, 1948.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
Oct. 1-10, 1956...	280	21		8.2	2.8	37		48	4.9	47		1.0		146	0.20	114	32	0	71	2.8	244	7.3
Oct. 11-20	277	21		8.0	2.4	36		46	4.7	46		.5		151	.21	113	30	0	72	2.8	240	7.2
Oct. 21-31	287	22		7.8	2.5	40		44	5.0	53		.8		152	.22	126	30	0	74	3.2	263	7.6
Nov. 1-10	463	20		7.4	2.3	38		41	5.8	50		.5		144	.20	180	28	0	75	3.1	251	7.4
Nov. 11-16, 20-24	738	17		6.2	2.1	39		32	7.0	54		.2		142	.19	283	24	0	78	3.5	246	6.8
Nov. 17-19, 25-30	991	15		8.6	3.1	76		50	9.6	105		.2		242	.33	648	34	0	83	5.7	450	7.1
Dec. 1-12	561	15		10	4.0	76		56	12	105		.5		250	.34	379	42	0	80	5.1	472	7.6
Dec. 13-20	2,720	12		6.0	1.7	32		20	8.5	46		.4		117	.16	859	22	6	76	2.9	207	6.6
Dec. 21-26, 28 ..	10,520	7.8		3.2	1.0	10		11	6.8	13		.2		47	.06	1,330	12	3	65	1.3	71.6	6.3
Dec. 27, 29-31	4,602	12		4.8	1.5	17		14	11	22		.8		76	.10	944	18	6	67	1.7	125	6.3
Jan. 1-10, 1957...	1,901	16		4.2	1.8	23		20	8.8	28		2.2		94	.13	482	18	2	73	2.3	146	6.8
Jan. 11-20	1,358	18		5.6	2.2	24		28	9.6	29		.8		103	.14	378	23	0	69	2.1	169	6.7
Jan. 21-31	1,651	18		6.4	2.4	33		28	10	45		.8		130	.18	580	26	3	73	2.8	219	6.8
Feb. 1-10	3,648	15		7.8	2.8	41		20	18	60		1.0		156	.21	1,540	31	14	74	3.2	276	6.7
Feb. 11-20	3,808	14		9.4	3.0	41		16	20	64		1.8		161	.22	1,660	36	23	71	3.0	285	6.6
Feb. 21-28	7,958	12		7.6	2.0	14		15	12	23		1.5		79	.11	1,700	27	14	54	1.2	133	6.5
Mar. 1-13	5,485	11		6.2	2.2	19		14	15	27		1.2		89	.12	1,320	24	13	63	1.7	183	6.3
Mar. 14-27	15,280	7.8		3.9	1.5	13		10	8.8	18		1.0		59	.08	2,430	16	8	64	1.4	102	6.1
Mar. 28-31	14,100	11		6.8	2.2	18		14	15	26		1.0		87	.12	3,310	26	14	60	1.5	154	6.5

a Residue on evaporation at 180°C.

SABINE RIVER BASIN--Continued
SABINE RIVER NEAR RULIFF, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Apr. 1-10, 1957..	14,860	11		6.4	2.5	17		16	15	25		1.2	86	0.12	3,450	26	14	59	1.5	147	6.4
Apr. 11-20	17,170	12		7.8	2.5	19		17	16	27		2.5	95	.13	4,400	30	16	57	1.5	172	5.7
Apr. 21-30	13,020	12		8.6	2.6	21		29	16	26		1.5	102	.14	3,580	32	8	59	1.6	174	5.9
May 1-12	32,580	9.8		4.6	1.6	8.6	3.0	14	8.2	13	0.4	1.0	57	.08	5,010	18	6	46	.9	91.1	6.1
May 13-23	47,960	10		5.6	2.0	12		20	8.8	16		1.0	65	.09	8,420	22	6	55	1.2	112	6.1
May 24-31	41,320	12		11	3.3	19		44	8.0	26		1.2	102	.14	11,380	40	4	51	1.3	171	7.5
June 1-10	23,860	13		13	3.4	17		46	9.6	25		1.5	106	.14	6,830	46	9	44	1.1	186	6.9
June 11-20	18,220	10		10	2.7	15		34	9.6	21		1.8	87	.12	4,280	36	8	48	1.1	157	6.7
June 21-30	27,860	8.8		10	2.8	15		38	8.2	20		1.2	85	.12	6,390	36	6	47	1.1	153	6.6
July 1-9	29,080	13		11	3.1	16		42	8.0	22		1.0	95	.13	7,460	40	6	47	1.1	164	6.4
July 10-20	3,404	19		13	4.1	25		48	12	36		1.0	134	.18	1,230	50	10	52	1.5	238	7.1
July 21-31	2,915	18		12	3.4	28		39	14	41		.5	136	.18	1,070	44	12	58	1.8	238	6.5
Aug. 1-10	2,029	20		14	4.2	40		46	15	61		1.5	179	.24	981	52	15	62	2.4	317	7.3
Aug. 11-20	1,523	20		12	4.4	37		48	14	53		1.0	165	.24	728	48	8	63	2.4	291	7.1
Aug. 21-31	1,134	19		12	4.1	39		46	13	57		1.0	168	.25	560	47	10	65	2.5	299	7.1
Sept. 1-10	1,109	19		11	3.5	41		44	12	58		.5	a177	.24	530	42	6	68	2.7	287	7.3
Sept. 11-25	1,313	16		9.2	3.0	41		38	10	59		.5	a166	.23	588	36	4	72	3.0	276	7.1
Sept. 26-30	4,900	11		5.6	1.5	24		22	7.6	32		.5	93	.13	1,210	20	2	72	2.3	156	7.1
Sept. 27-29	8,757	6.4		2.6	.9	14		10	5.6	18		.5	53	.07	1,250	10	2	75	1.9	81.1	6.5
Weighted average	9,645	11		8.0	2.5	17		27	10	24		1.2	88	0.12	2,280	30	8	55	1.3	151	--

a Residue on evaporation at 180°C.

SABINE RIVER BASIN--Continued

SABINE RIVER NEAR RULIFF, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily temperature measurement, usually between 7 and 8 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	80	68	52	55	61	60	64	73	77	83	88	86
2	80	68	52	56	61	60	66	73	77	84	--	86
3	80	69	52	56	61	60	65	76	76	84	89	83
4	80	69	55	55	61	60	68	75	--	84	90	84
5	80	70	57	57	62	61	68	75	78	85	89	85
6	80	70	58	57	62	62	68	72	--	85	--	86
7	--	70	60	--	62	63	64	72	78	85	85	86
8	80	75	62	59	63	--	66	72	78	85	80	86
9	--	66	64	56	62	64	64	74	78	85	89	86
10	--	66	62	56	62	65	64	73	78	86	80	86
11	--	63	60	58	61	64	65	73	78	87	80	87
12	82	60	63	59	62	64	65	72	81	88	80	87
13	82	60	62	57	62	65	60	74	81	88	86	87
14	84	60	61	57	61	65	60	75	82	88	86	87
15	84	60	60	54	63	65	60	75	83	88	87	87
16	84	58	60	52	61	--	64	75	84	88	85	87
17	84	50	60	50	62	--	71	76	84	88	89	86
18	84	58	60	49	60	65	71	76	83	88	88	86
19	84	58	60	48	57	65	72	76	83	88	88	85
20	83	59	60	46	55	64	71	76	83	88	88	84
21	83	68	60	45	56	64	72	77	83	88	87	82
22	80	58	60	56	56	66	73	78	82	88	86	80
23	78	57	60	54	57	66	74	78	82	85	86	80
24	76	57	58	--	62	62	75	78	82	86	88	79
25	74	56	56	55	58	58	79	--	82	85	87	76
26	72	54	54	55	57	57	75	78	80	--	87	75
27	72	52	52	56	57	59	75	79	80	85	87	73
28	72	52	52	57	56	65	73	78	79	--	87	70
29	72	52	53	58	--	59	69	78	82	88	86	70
30	70	52	54	60	--	--	72	--	84	88	86	71
31	70	--	55	61	--	65	--	70	--	88	86	--
Average	79	61	58	55	60	63	68	75	81	86	86	82

SABINE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SABINE RIVER BASIN IN TEXAS

Periodic determinations and particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature per- centage (°F)	Suspended sediment										Methods of analysis			
				Concentration of sample analyzed (ppm)	Concentration of suspension analyzed (ppm)	Dis-charge (tons per day)	Percent finer than indicated size, in millimeters										
							0.002	0.004	0.008	0.016	0.031	0.062	0.125		0.250	0.350	0.500
SABINE RIVER NEAR BON WEIR																	
Apr. 4, 1957 May 13	2:30 p. m. 2:00 p. m.	12,800 38,700	67 75	402 631	3,290 2,350	13,900 65,900	-- 16	54 19	59 21	65 22	72 27	81 32	93 58	99 71	100 89	100 100	SPWCM SBWCM

Particle-size analyses of bed material, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material										Methods of analysis
				Percent finer than indicated size, in millimeters										
				0.062	0.125	0.250	0.500	1.000	2.000	4.000				
Apr. 4, 1957	2:30 p.m.	12,800		0	2	11	68	96	99	100				S
May 13.....	2:00 p.m.	38,700		1	8	24	67	98	99	100				S

SABINE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SABINE RIVER BASIN IN LOUISIANA
Chemical analyses, in parts per million, January to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
BAYOU SAN PATRICIO NEAR NOBLE																						
Apr. 19, 1957	66	15	0.87	6.0	3.2	21	19	18	28			0.8		102	0.14	18	28	13	62	1.8	172	6.5
May 15	62	16	.69	7.3	3.5	30	28	9.4	45			1.5		128	.17	21	33	10	67	2.3	223	6.2
June 14	29	16	2.1	7.3	2.8	31	24	10	46			2.2		129	.18	10	30	10	69	2.5	229	5.9
July 8	5.8	18	3.0	9.5	4.1	38	40	11	55			2.2		161	.22	2.5	41	8	67	2.6	280	6.2
Sept. 3 .....	.5	5.4	.20	13	6.4	29	77	.4	41			1.0		134	.18	.2	59	0	52	1.6	295	7.2
BAYOU SAN MIGUEL NEAR ZWOLLE																						
Jan. 31, 1957	268	6.4	0.50	1.8	1.5	4.0	2.9	6	7.6	5.5	0.7	0.8		35	0.05	25	11	6	38	0.5	49.0	5.4
Mar. 1	24	15	.81	5.5	3.0	15	14	24	16			.5		87	.12	5.6	26	15	56	1.3	140	6.3

NECHES RIVER BASIN

ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION--At gaging station at bridge on U. S. Highway 59, 200 feet upstream from Procella Creek, 1½ miles downstream from Bayou Loco, 1.5 miles upstream from Southern Pacific Railroad bridge, and 8 miles north of Lufkin, Angelina County.

DRAINAGE AREA.--1,630 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1957.

Water temperatures: October 1954 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 365 ppm Jan. 11-20; minimum, 42 ppm Apr. 25-28, 30, May 1-2.

Hardness: Maximum, 65 ppm Oct. 21-31; minimum, 15 ppm Apr. 25-28, 30, May 1-2.

Specific conductance: Maximum daily, 728 microhmhos Dec. 24; minimum daily, 39 microhmhos Apr. 25.

Water temperatures: Maximum, 89°F July 9; minimum, 41°F Jan. 18, 19.

EXTREMES, 1954-57.--Dissolved solids: Maximum, 412 ppm Nov. 4-18, 26-30, 1954; minimum, 42 ppm Apr. 25-28, 30, May 1-2, 1957.

Hardness: Maximum, 76 ppm Nov. 4-18, 26-30, 1954; minimum, 15 ppm Apr. 25-28, 30, May 1-2, 1957.

Specific conductance: Maximum daily, 895 microhmhos Nov. 10, 1954; minimum daily, 39 microhmhos Apr. 25, 1957.

Water temperatures: Maximum, 89°F July 9, 1957; minimum, 40°F Jan. 24, 1955, Jan. 19-20, 24, 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1956 ..	1.58	9.6	0.09	12	6.0	58	52	13	88			0.8		a 220	0.30	0.94	55	11	70	3.5	391	6.9
Oct. 11-20	1.30	8.8	.02	12	6.4	62	56	13	93			.5		a 226	.31	.79	56	11	70	3.6	423	6.7
Oct. 21-31	1.31	7.8	.02	14	7.2	64	51	13	105			.5		a 243	.33	.86	65	22	69	3.5	451	7.6
Nov. 1-14	15.2	7.8	.06	11	6.7	70	38	15	115			.2		245	.33	10.1	55	25	73	4.1	482	7.1
Nov. 15-20	21.3	9.8	.11	7.5	4.2	44	37	12	62			.5		a 171	.23	9.83	36	6	72	3.2	293	7.4
Nov. 21-30	17.4	8.8	.12	5.1	3.5	23	27	15	27			.8		96	.13	4.51	27	5	65	1.9	174	7.3
Dec. 1-10	26.3	13	.14	7.5	3.7	30	24	35	30			.5		132	.18	9.37	34	14	66	2.2	224	7.2
Dec. 11-19	26.4	15	.20	6.6	3.3	28	32	30	24			.2		123	.17	8.77	30	4	67	2.2	203	7.3
Dec. 20-31	59.6	17	.09	14	6.9	85	22	50	127			.2		a 339	.46	54.6	64	46	74	4.6	568	6.9
Jan. 1-10, 1957 ..	49.6	21	.05	13	5.6	80	16	38	125			.2		a 310	.42	41.5	56	42	76	4.7	545	6.6
Jan. 11-20	46.3	17	.08	14	6.3	99	16	37	159			.2		a 365	.50	45.6	61	48	78	5.5	649	6.9
Jan. 21-31	112	15	.09	10	4.7	71	16	29	110			.0		a 260	.35	78.6	44	31	78	4.6	470	6.6
Feb. 1-10	255	16	.14	9.6	4.4	62	8	30	98			.5		a 243	.33	167	42	35	76	4.1	416	6.7
Feb. 11-19	182	15	.07	13	5.9	92	8	32	155			.2		a 250	.48	172	57	52	78	5.3	608	6.6
Feb. 20-28	283	11	.18	8.6	4.0	60	10	27	93			.2		a 231	.31	177	38	30	77	4.2	391	6.6
Mar. 1-11	341	13	.10	9.6	4.9	69	8	29	112			.2		a 263	.36	242	44	37	77	4.5	450	6.3
Mar. 12-20	277	13	.09	8.7	5.2	72	10	30	114			.2		a 271	.37	203	43	35	79	4.8	462	6.3
Mar. 21-31	615	12	.18	6.9	4.6	55	10	26	86			.2		196	.27	325	36	28	77	4.0	362	6.3

Apr. 1-10, 1957	1,124	13	24	7.6	3.9	37	9	27	56	.5	149	.20	452	35	28	70	2.7	255	6.6
Apr. 11-23	546	16	32	9.9	5.2	49	16	28	78	.8	207	.27	305	46	33	70	3.2	345	6.7
Apr. 24-29, May 3-9	13,040	13	34	5.8	2.6	15	22	12	19	.5	79	.11	2,780	26	8	55	1.2	117	6.7
Apr. 25-28, 30,																			
May 1-2	12,450	11	75	2.5	2.1	3.4	15	6.4	5.0	.5	42	.06	1,410	15	3	28	.4	55	6.6
May 3-10	3,740	15	51	8.0	3.9	13	32	10	19	1.8	87	.12	879	36	10	44	1.0	144	6.8
May 11-20	832	14	73	8.9	4.1	17	34	13	23	1.8	100	.14	225	39	11	46	1.2	154	6.9
May 21-31, June 1-3																			
June 4-10	3,149	13	78	5.2	2.5	7.5	18	10	12	1.0	64	.09	544	23	8	38	.7	93	6.4
June 11-14, 16-20	4,376	14	67	7.0	3.1	13	26	10	19	1.0	81	.11	957	30	9	49	1.1	128	6.5
June 21-24	3,140	15	96	8.3	3.7	30	32	11	44	1.2	130	.18	1,100	36	10	64	2.2	233	7.0
June 25-30, July 1	1,403	16	1	7.5	3.7	12	35	9.4	15	1.5	83	.11	314	34	5	44	.9	137	6.7
July 2-10	435	18	1	9.9	4.3	21	42	14	27	1.5	118	.16	139	42	8	52	1.4	187	6.7
July 11-23	114	22	64	10	4.7	28	42	16	38	1.8	142	.19	43.7	44	10	58	1.9	235	7.0
July 24-31	469	14	52	5.4	2.5	13	16	18	14	1.2	77	.10	97.5	24	11	55	1.2	116	6.5
Aug. 1-10	249	16	44	7.1	3.2	19	21	22	22	1.0	101	.14	67.9	31	14	57	1.5	161	7.0
Aug. 11-20	157	19	37	7.2	3.0	26	31	17	30	1.0	119	.16	50.4	30	5	65	2.0	183	7.2
Aug. 21-31	63.7	18	40	8.0	3.0	29	40	12	35	.5	126	.17	21.7	32	0	66	2.2	202	7.2
Sept. 1-10	57.0	17	33	8.2	3.5	30	44	10	37	.5	129	.18	19.9	35	0	65	2.2	206	7.3
Sept. 11-20	89.2	14	38	5.4	3.5	22	34	14	22	1.5	100	.14	24.1	28	0	63	1.8	159	7.4
Sept. 21-30	114	13	45	5.0	3.0	17	28	14	17	1.0	84	.11	25.9	25	2	60	1.5	135	7.2
Weighted average	1,089	13	0.54	6.0	3.1	17	22	12	23	0.8	88	0.12	259	28	10	57	1.4	138	--

a Residue on evaporation at 180°C.

WESTERN GULF OF MEXICO BASINS

NECHES RIVER BASIN--Continued

ANGELINA RIVER NEAR LUFKIN, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally at 8:30 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	59	45	50	52	55	60	67	76	80	84	83
2	72	61	45	49	51	56	65	71	75	81	85	82
3	72	59	47	48	53	56	69	72	73	82	85	82
4	73	61	51	54	52	57	65	71	72	82	85	80
5	73	63	58	51	59	59	64	68	74	82	84	80
6	73	63	59	51	60	56	61	67	74	84	82	80
7	73	64	63	52	59	52	64	67	75	83	80	79
8	66	61	61	51	60	49	65	69	78	83	81	76
9	66	54	54	59	52	50	60	70	79	89	82	76
10	64	56	51	55	63	55	61	--	80	84	81	75
11	64	53	52	--	63	58	64	73	80	85	81	74
12	66	55	54	52	62	58	66	75	82	85	82	75
13	66	55	55	54	59	58	56	76	81	86	82	76
14	66	63	53	55	58	61	59	75	80	86	83	76
15	68	65	58	50	62	58	60	76	81	85	83	78
16	68	55	51	48	61	57	62	76	81	85	84	76
17	67	53	54	44	58	61	--	77	81	85	84	76
18	66	53	57	41	57	62	68	--	80	86	--	77
19	67	54	56	41	55	59	68	74	80	85	83	77
20	69	61	56	46	53	61	69	75	78	85	81	78
21	68	57	54	52	52	60	69	--	72	84	81	81
22	64	51	56	56	52	59	70	78	79	83	80	77
23	68	51	54	47	55	64	73	78	79	82	82	74
24	64	50	52	48	52	59	69	77	76	80	80	78
25	64	50	49	48	58	56	70	79	76	78	81	70
26	65	56	--	48	55	57	71	77	78	80	82	71
27	61	47	--	--	53	55	72	76	76	80	82	71
28	60	45	48	49	54	56	70	75	76	82	83	70
29	61	45	48	54	--	55	68	76	79	82	83	70
30	66	45	46	50	--	59	68	75	80	83	82	69
31	--	--	47	50	--	61	--	76	--	83	83	--
Average	67	56	53	50	56	57	66	74	78	83	82	76

NECHES RIVER BASIN--Continued

NECHES RIVER AT EVADALE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 96, 200 feet upstream from Gulf, Colorado and Santa Fe Railway bridge at Evadale, Jasper County, 600 feet downstream from Mill Creek, 15 miles upstream from Village Creek and at mile 55.
DRAINAGE AREA.--7,908 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1957.

Water temperatures: October 1947 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 222 ppm Oct. 21-31; minimum, 50 ppm May 3-15.

Hardness: Maximum, 48 ppm Oct. 11-20, 21-31, Aug. 1-10, 11-20; minimum, 14 ppm May 3-15.

Specific conductance: Maximum daily, 422 micromhos Jan. 25; minimum, 40 micromhos Mar. 19.

Water temperatures: Maximum, 93°F July 29-31; minimum, 40°F Jan. 18.

EXTREMES 1947-57.--Dissolved solids: Maximum, 222 ppm Oct. 21-31, 1956; minimum, 36 ppm May 5-12, 26-27, 1953.

Hardness: Maximum, 70 ppm Nov. 1-10, 1947; minimum, 14 ppm May 3-15, 1957.

Specific conductance: Maximum daily, 422 micromhos Jan. 25, 1957; minimum daily, 49 micromhos May 9, 1953.

Water temperatures: Maximum, 94°F June 29, 1953; minimum, 37°F Jan. 30-31, 1948, Jan. 31, 1949.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium	So- dium ad- sorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Oct. 1-10	170	22		11	4.2	51		76	14	55	0.4	1.0		196	0.27	90.0	45	0	71	3.2	327	7.2
Oct. 11-20	194	22		13	3.9	194		84	12	52	.5	1.5		196	.27	103	48	0	70	3.2	325	7.3
Oct. 21-31	169	22		13	3.6	61		99	10	61	.5	1.8		222	.30	101	48	0	73	3.8	369	7.2
Nov. 1-10	131	24		13	3.5	131		94	9.8	48	.4	1.8		196	.27	69.3	47	0	69	3.1	326	7.9
Nov. 11-20	125	24		13	3.2	37		79	8.6	36	.4	1.2		162	.22	54.7	46	0	64	2.4	258	7.9
Nov. 21-30	72.3	24		13	3.0	29		67	9.0	29	.4	1.0		141	.19	27.5	45	0	59	1.9	224	7.7
Dec. 1-10	90.7	22		13	3.1	25		56	10	28	.2	1.2		130	.18	31.8	45	0	55	1.6	206	7.5
Dec. 11-20	91.6	21		13	3.0	24		58	11	26	.2	.5		128	.17	31.7	45	0	54	1.6	201	7.2
Dec. 21-31	239	18		8.8	2.4	24		33	17	28	.2	.5		115	.16	74.2	32	5	62	1.9	181	6.7
Jan. 1-12, 1957 ..	115	20		11	2.7	21		37	14	27	.5	.8		119	.16	35.7	38	8	54	1.5	180	7.0
Jan. 13-20	131	21		12	3.3	47		62	15	55	.5	.8		185	.25	65.4	44	0	70	3.1	317	7.2
Jan. 21-31	228	19		12	2.9	61		62	18	72	.6	.5		216	.29	133	42	0	76	4.1	374	7.3
Feb. 1-11	189	18		12	2.6	51		45	17	67	.6	.8		191	.26	97.5	40	3	74	3.5	332	7.2
Feb. 12-22	140	22		13	2.5	140		44	14	55	.5	.8		170	.23	64.3	43	6	68	2.7	280	6.9
Feb. 23-28	1,237	15		10	2.5	47		44	25	52	.6	.5		175	.24	584	36	0	74	3.4	294	7.2
Mar. 1-9	1,833	38		8.7	2.5	39		31	26	43	.8	1.0		174	.24	861	32	6	72	3.0	288	6.8
Mar. 10-17	2,855	14		7.4	2.6	30		19	23	36	.8	1.8		134	.17	956	28	13	70	2.5	207	6.9
Mar. 18-21	4,845	8.2		4.0	1.5	18		12	13	15	.8	.8		63	.09	824	16	6	66	1.6	99	6.4
Mar. 22-31	5,943	12		7.4	2.4	26		19	34	8	.8	.5		111	.15	1,780	28	13	67	2.2	183	6.5
Apr. 1-10	7,069	13		7.6	2.2	18		15	19	24	.4	.5		92	.13	1,760	28	16	59	1.5	157	5.9

NECHES RIVER BASIN--Continued
NECHES RIVER AT EVADALE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate			
Apr. 11-20, 1957..	4,430	13		7.2	2.4	18		15	19	24	0.4	0.8		92	0.13	1,100	28	16	59	157	5.9
Apr. 21-30	5,544	14		8.6	2.8	24		16	24	32	.6	1.2		115	.16	1,720	33	20	61	188	5.7
May 1-2, 16-20 ..	30,870	12		4.8	2.4	16		16	13	18	.7	3.8		79	.11	6,580	22	9	61	124	6.2
May 3-15	43,430	10		3.0	1.6	6.7	3.3	10	9.2	9.0	.7	1.2		50	.07	5,880	14	6	45	176	6.1
May 21-31	15,340	14		8.6	3.3	13		34	10	16	.6	1.0		84	.11	3,480	35	7	45	140	6.9
June 1-10	6,217	14		11	4.0	15		42	11	20	.5	1.2		98	.13	1,650	44	10	42	168	6.7
June 11-22	8,133	14		9.0	3.4	15		31	13	19	.5	1.2		90	.12	1,980	36	11	47	151	6.5
June 23-30	14,550	9.6		6.6	2.6	10		22	9.6	14	.5	.8		65	.09	2,550	27	9	45	113	6.5
July 1-10	6,182	16		9.2	3.3	13		38	8.4	16	.5	.8		86	.12	1,440	36	6	43	136	6.6
July 11-22, 30-31..	1,091	18		12	3.9	16		48	11	19	.5	.8		105	.14	309	46	6	42	187	7.0
July 23-29	1,060	14		8.8	3.1	12		33	11	14	.5	.5		80	.11	229	34	8	42	132	6.7
Aug. 1-10	1,294	19		12	4.5	20		54	11	24	.4	1.0		119	.16	416	48	4	47	183	7.4
Aug. 11-20	1,744	18		12	4.7	20		54	13	23	.4	.5		118	.16	237	48	4	48	194	7.3
Aug. 21-31	1,032	14		10	4.4	25		52	14	28	.4	.5		123	.17	343	44	2	55	206	7.2
Sept. 1-10	1,662	16		11	4.0	25		53	13	28	.4	.5		124	.17	222	44	0	55	204	7.5
Sept. 11-25	540	17		11	3.9	25		54	12	28	.4	.2		124	.17	181	44	0	55	203	7.4
Sept. 26-30	1,464	11		6.8	2.7	19		30	11	22	.4	.5		88	.12	348	28	4	59	138	6.9
Weighted average	4,607	12		6.2	2.5	15		21	12	17	0.6	1.4		78	0.11	970	26	9	56	127	--

NECHES RIVER BASIN--Continued
NECHES RIVER AT EVADALE, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
(Recorder with temperature attachment, continuous thermograph)

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
1.....	80	74	69	60	--	--	63	55	65	60	58	62	60	70	70	81	80	82	81	90	89	87	84	
2.....	81	75	69	64	--	a 66	57	61	65	62	61	60	64	62	70	80	79	84	82	90	88	88	85	
3.....	80	74	71	64	--	a 62	56	50	63	61	61	60	65	64	70	79	78	85	84	90	88	88	84	
4.....	80	75	72	67	--	a 56	62	56	68	63	60	60	66	65	70	78	78	86	85	90	88	84	82	
5.....	80	72	--	a 70	--	a 54	59	54	70	65	60	60	66	65	70	69	78	87	86	90	89	85	82	
6.....	83	72	--	a 70	--	a 68	58	53	70	66	60	59	66	64	69	68	79	88	87	90	89	86	83	
7.....	83	71	--	a 64	--	a 71	61	57	68	65	59	58	65	64	68	68	80	79	88	87	89	87	83	
8.....	a 68	--	--	a 64	--	a 68	63	58	70	65	58	56	65	64	68	68	80	79	87	87	88	86	84	
9.....	--	a 68	--	a 60	--	a 56	66	62	74	65	58	55	65	63	70	68	81	80	88	87	88	86	82	
10.....	--	a 68	--	a 45	--	a 56	65	56	78	68	58	57	64	63	71	70	82	81	88	87	86	84	82	
11.....	--	a 68	--	a 55	--	a 55	56	53	71	66	60	58	64	63	72	71	82	82	89	88	84	83	82	
12.....	--	a 73	--	a 68	--	a 68	57	55	66	63	61	60	66	64	72	72	82	82	90	88	86	84	79	
13.....	--	a 71	--	a 72	--	a 69	62	57	70	61	61	60	66	64	73	72	83	82	90	89	87	85	81	
14.....	--	--	--	a 72	--	a 65	63	59	71	61	62	60	64	63	74	73	84	83	90	89	88	86	82	
15.....	78	70	--	a 72	--	a 65	59	52	71	63	62	61	64	63	75	74	84	83	90	88	89	86	83	
16.....	75	70	--	a 73	--	a 60	52	46	68	62	62	61	64	64	76	75	84	84	90	88	89	86	82	
17.....	75	69	--	--	--	a 60	48	42	62	57	62	62	66	64	78	76	84	84	92	89	90	86	82	
18.....	74	69	--	a 65	--	a 60	51	40	57	55	63	61	68	66	78	76	84	83	92	89	90	88	82	
19.....	73	70	--	a 68	--	a 54	48	43	56	56	63	62	70	68	76	76	84	83	90	87	89	87	83	
20.....	74	71	--	a 68	--	a 63	55	43	61	54	63	62	72	70	76	76	84	83	90	87	89	86	83	
21.....	71	69	--	a 65	--	61	58	54	60	52	64	62	72	71	77	76	83	82	89	87	89	86	85	
22.....	72	65	--	a 54	--	61	58	53	59	54	65	63	73	72	78	77	82	80	87	85	87	84	80	
23.....	74	65	--	a 56	--	60	58	53	59	58	65	64	75	73	79	78	80	80	85	84	87	84	80	
24.....	74	65	--	a 57	--	60	56	53	51	59	58	64	75	74	79	79	80	80	85	83	87	84	79	
25.....	76	67	--	a 57	--	56	56	53	51	59	59	62	76	74	80	79	80	79	86	84	86	85	76	
26.....	75	66	--	a 53	--	55	52	53	52	59	58	61	76	76	80	80	79	79	86	86	87	85	76	
27.....	73	62	--	a 53	--	55	51	56	53	58	57	60	76	76	80	79	78	77	98	86	87	86	72	
28.....	73	64	--	--	--	55	51	60	55	59	57	60	76	73	80	79	78	77	90	87	89	87	71	
29.....	73	66	--	a 54	--	55	48	65	59	--	--	60	59	73	72	80	79	80	93	89	89	87	71	
30.....	70	67	--	a 58	--	58	48	64	61	--	--	60	60	72	71	81	80	81	90	87	85	71	71	
31.....	70	63	--	--	--	61	49	66	61	--	--	61	60	--	81	81	--	--	93	90	86	85	--	
Average.....	--	69	--	62	--	59	58	53	65	61	61	60	69	67	75	74	81	80	88	87	88	86	81	78

a No pen trace, daily measurements taken at 7:30 a.m., used as the minimum.

TRINITY RIVER BASIN
CLEAR FORK TRINITY RIVER AT FORT WORTH, TEX.

LOCATION --Temperature recorder at gaging station, at bridge on Vickery Boulevard, Fort Worth, Tarrant County, 100 feet upstream from East-West Expressway bridge, 310 feet downstream from Texas and Pacific Railway bridge, 3 miles upstream from mouth, 5 miles downstream from Marys Creek, and 10 miles downstream from Bendrock Dam.

DRAINAGE AREA --326 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1952.

Water temperatures: October 1948 to September 1953, October 1954 to September 1957.

EXTREMES, 1936-57. --Maximum, 94° F July 30, Aug. 1; minimum, 38° F Jan. 17.

EXTREMES, 1948-53, 1954-57. --Water temperatures: Maximum, 98° F Aug. 28, 1956; minimum, freezing point on several days in January 1949.

REMARKS --No flow on many days. No temperature record, Sept. 17-30. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Day	Temperature (°F) of water, water year October 1956 to September 1957											
	October		November		December		January		February		March	
	max	min	max	min	max	min	max	min	max	min	max	min
1.....	--	--	--	--	--	--	49	47	42	40	58	53
2.....	--	--	62	60	--	--	--	--	43	42	57	55
3.....	--	--	60	57	--	--	48	47	49	43	59	55
4.....	--	--	57	52	51	49	52	48	51	49	60	56
5.....	77	73	57	54	55	51	50	49	51	50	60	57
6.....	--	--	55	55	--	--	52	49	50	47	57	54
7.....	--	--	59	55	58	54	51	50	52	49	55	51
8.....	--	--	--	--	--	--	54	50	57	52	54	50
9.....	--	--	--	--	--	--	57	54	62	56	57	51
10.....	--	--	--	--	--	--	--	--	62	60	58	55
11.....	--	--	--	--	--	--	48	47	61	58	66	58
12.....	--	--	--	--	--	--	50	47	62	58	64	60
13.....	74	72	--	--	--	--	51	48	60	58	63	60
14.....	72	71	--	--	--	--	49	46	61	60	63	61
15.....	72	69	--	--	47	45	47	44	67	60	63	56
16.....	72	64	--	--	46	44	44	39	62	56	61	58
17.....	65	63	--	--	49	46	42	38	57	55	61	59
18.....	66	65	--	--	46	43	42	39	56	54	64	61
19.....	68	65	--	--	43	42	42	41	54	63	59	68
20.....	68	65	--	--	45	43	44	42	57	53	62	58
21.....	--	--	--	--	46	44	49	44	55	53	60	57
22.....	--	--	--	--	48	46	52	48	56	54	62	57
23.....	--	--	--	--	47	45	47	42	53	52	63	61
24.....	--	--	--	--	47	44	43	42	53	50	57	54
25.....	--	--	--	--	47	44	43	41	57	53	67	66
26.....	--	--	--	--	47	44	41	39	56	53	58	52
27.....	--	--	--	--	48	45	40	37	56	52	57	53
28.....	--	--	--	--	48	46	40	37	56	52	54	50
29.....	--	--	--	--	49	46	40	39	--	--	57	58
30.....	64	63	--	--	49	47	40	39	--	--	58	56
31.....	--	--	--	--	50	47	41	39	--	--	58	57
Average.....	--	--	--	--	--	--	46	44	56	53	60	56
	--	--	--	--	--	--	62	72	64	80	77	90
	--	--	--	--	--	--	86	88	85	81	88	85

TRINITY RIVER BASIN--Continued

ELM FORK TRINITY RIVER NEAR MUENSTER, TEX.

LOCATION.--At gaging station at bridge on Farm Road 373, 2.5 miles south of Muenster, Cooke County, 2.5 miles downstream from Long Branch, and 6.5 miles upstream from Brushy Elm Creek.

DRAINAGE AREA.--46.0 square miles, of which 30.97 square miles are above flood-detention structures.

RECORDS AVAILABLE.--Water temperatures: October 1956 to September 1957.

Sediment records: October 1956 to September 1957.

EXTREMES, 1956-57.--Water temperatures: Maximum, 83°F July 7.

Sediment concentrations: Maximum daily, 3,000 ppm Apr. 26; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 14,000 tons Apr. 26; minimum daily, no flow on many days.

REMARKS.--No flow October, November, January, February and March; tabulation omitted for these months. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Temperature (°F) of water, April to July 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--	68	70	77		
2							--	66	70	78		
3							65	64	67	78		
4							--	64	69	77		
5							--	60	69	78		
6							--	60	69	79		
7							--	59	70	83		
8							--	68	72	79		
9							--	69	73	78		
10							--	65	74	79		
11							--	65	75	77		
12							--	71	75	77		
13							--	65	74	78		
14							--	64	76	--		
15							--	66	76	--		
16							--	69	75	--		
17							--	70	76	--		
18							--	65	75	--		
19							--	65	70	--		
20							--	67	--	--		
21							--	71	76	--		
22							--	79	76	--		
23							61	70	77	--		
24							65	67	69	--		
25							--	68	69	--		
26							63	67	73	--		
27							--	68	73	--		
28							64	68	74	--		
29							63	69	75	--		
30							--	69	78	--		
31							--	69	--	--		
Average							--	67	73	--		

Suspended sediment, water year October 1956 to September 1957

Month	Mean discharge (cfs)	Tons per day
Dec. 19	14	a 2.0
20	32	a 6.5
21	8.9	a 1.2
22	2.4	a .3
23	1.2	a .2
24 .....	.5	a .1
Total	59	10.3

Computed from water-sediment discharge curve.

TRINITY RIVER BASIN--Continued

ELM FORK TRINITY RIVER NEAR MUENSTER, TEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	270	544	sb 507	d 384	1,280	s 2,530
2.....	0	--	0	275	410	304	d 381	1,710	sb 7,820
3.....	2.5	--	a .3	266	800	s 697	253	714	488
4.....	8.0	--	a 1.0	217	452	265	258	885	703
5.....	15	--	a 2.2	185	242	121	201	526	285
6.....	8.9	--	a 1.2	177	209	100	185	448	224
7.....	5.8	--	a .7	166	244	109	169	310	141
8.....	3.4	--	.4	154	190	79	158	335	143
9.....	2.2	--	a .3	167	334	s 156	150	329	133
10.....	1.4	--	a .1	146	267	105	146	255	101
11.....	.9	--	a .1	210	892	s 716	132	287	102
12.....	.6	--	a .1	148	262	105	114	315	97
13.....	.3	--	a .1	263	871	s 806	100	160	35
14.....	.2	--	(at)	160	618	267	88		
15.....	.2	--	(at)	142	388	149	79		
16.....	.2	--	(at)	136	240	88	72		
17.....	.1	--	(at)	156	497	sb 448	62	114	15
18.....	.1	--	(at)	566	1,340	sb 3,470	64		
19.....	.5	--	a .1	198	483	258	61		
20.....	1.1	--	a .1	175	380	180	54		
21.....	61	--	a 19	160	386	167	37	127	9.1
22.....	65	--	a 21	147	395	157	34		
23.....	469	2,290	sb 4,010	213	725	sb 555	73		
24.....	156	350	147	285	712	sb 675	32		
25.....	290	954	sc 3,420	878	2,080	sb 6,340	28	80	4.4
26.....	1,520	3,000	sb 14,000	d 270	582	424	25		
27.....	432	--	a 2,500	204	464	256	24		
28.....	399	1,040	s 1,920	191	388	200	23		
29.....	407	1,170	sb 1,630	174	279	131	22	--	--
30.....	278	--	a 700	221	581	sb 698	19		
31.....	--	--	--	243	866	sb 711	--		
Total.	4,128.4	--	28,373.9	d 7,163	--	19,244	3,428	--	7,099.3
	July			August			September		
1.....	16	80	3.5	0.3			0.1		
2.....	18			.2			.1		
3.....	16			0			.1		
4.....	15			0			.1		
5.....	15	88	2.5	0.1			.1		
6.....	15			0			.1		
7.....	15			.1			.2		
8.....	9.6			0			.1		
9.....	4.4	150	1.3	0			.1		
10.....	3.7			0			.1		
11.....	3.2			.1			.6		
12.....	2.6	165	1.2	.1			.5		
13.....	2.2	103	.6	.2			.1		
14.....	1.8	--	a .2	1.0			3.9		
15.....	1.5	--	a .2	.3			2.3		
16.....	1.2	--	a .2	.2			.7		
17.....	1.0	--	a .1	.2			.3		
18.....	.8	--	a .1	.2			.2		
19.....	.6	--	a .1	.2			.2		
20.....	.6	--	a .1	.2			.2		
21.....	.8	--	a .1	.2			.2		
22.....	.9	--	a .1	.2			1.2		
23.....	1.0	--	a .1	.2			.4		
24.....	1.4	--	a .2	.2			.2		
25.....	1.2	--	a .2	.1			.3		
26.....	.9	--	a .1	.1			.3		
27.....	.6	--	a .1	.1			.3		
28.....	.5	--	a .1	.1			.2		
29.....	.4	--	a .1	.1			.2		
30.....	.4	--	a .1	.1			.2		
31.....	.3	--	a .1	.1			--		
Total.	151.6	--	34.4	4.8	--	a 1.0	13.6	--	a 2.5

Total discharge for year (cfs-days)..... d 14,948.4

Total load for year (tons)..... 54,765.4

s Computed by subdividing day.

t Less than 0.05 ton.

a Computed from water-sediment discharge curve.

b Computed from partly estimated concentration graph.

c Computed from estimated concentration graph.

d Revised.

TRINITY RIVER BASIN--Continued
ELM FORK TRINITY RIVER NEAR MUENSTER, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Apr. 23, 1957	7:00 a. m.	510	61	2,100	1,490	52	57	62	72	84	94	98	99	100	--	SBWCM
Apr. 26	9:00 a. m.	560	63	2,060	1,050	44	48	54	56	64	82	82	98	99	100	SBWCM
May 1	9:30 p. m.	465	67	1,640	1,190	33	34	50	52	63	76	89	97	100	--	SBWCM
May 11	8:20 a. m.	345	76	2,020	1,640	40	43	49	52	55	67	78	91	99	100	SBWCM
May 13	10:45 a. m.	535	66	1,420	520	38	42	44	47	51	65	82	97	100	--	SBWCM
May 18	5:30 a. m.	735	65	1,660	659	43	47	50	56	64	77	92	98	99	100	SBWCM
May 24	6:10 a. m.	485	67	2,330	1,420	42	47	51	57	64	76	90	98	100	--	SBWCM
June 1	6:10 p. m.	1,270	72	4,810	3,090	46	51	54	65	76	88	96	99	100	--	SBWCM

TRINITY RIVER BASIN
TRINITY RIVER NEAR ROSSER, TEX.

LOCATION --At gaging station at bridge on State Highway 34, 2.5 miles south of Rosser, Kaufman County, 8.5 miles downstream from East Fork and at mile 451.

DRAINAGE AREA --8 162 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1954 to September 1957.

Water temperatures: October 1954 to September 1957.

EXTREMES 1956-57 --Dissolved solids: Maximum, 1,730 ppm Oct. 1-10; minimum, 190 ppm June 21-30.

Hardness: Maximum, 310 ppm Oct. 11-20; minimum, 119 ppm June 21-30.

Specific conductance: Maximum daily, 2,960 micromhos Oct. 13; minimum daily, 279 micromhos Apr. 27.

Water temperatures: Maximum, 84°F July 27; minimum, 41°F Jan. 18.

EXTREMES 1954-57 --Dissolved solids: Maximum, 1,800 ppm Apr. 21-31, 1956; minimum, 190 ppm June 21-30, 1957.

Hardness: Maximum, 310 ppm Oct. 11-20, 1956; minimum, 199 ppm June 21-30, 1957.

Specific conductance: Maximum daily, 2,990 micromhos Oct. 13, 1956; minimum daily, 279 micromhos Apr. 27, 1957.

Water temperatures: Maximum, 97°F July 1, 1955; minimum, 34°F Jan. 20, 1956.

REMARKS --Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Nit- rate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- adorp- tion ratio	Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1956 ..	118	28		94	18	496		213	353	555		78		1,730	2.35	551	308	134	78	12	2,740	8.0
Oct. 11-20	181	24		93	19	485		223	329	548		84		1,690	2.30	826	310	128	77	12	2,730	7.8
Oct. 21-31	127	18		82	15	362		174	332	362		67		1,320	1.80	453	266	124	75	9.7	2,150	7.1
Nov. 1-3, 5	380	21		82	16	396		206	279	430		80		1,400	1.90	1,440	270	101	76	10	2,340	7.4
Nov. 4, 6	637	9.6		52	4.6	86		163	78	81		8.7		4,400	5.4	688	148	14	56	3.1	698	7.6
Nov. 7-17	207	15		75	10	262		150	251	262		52		1,000	1.36	559	227	104	71	7.6	1,850	7.8
Nov. 18-30	131	22		73	13	390		272	328	328		71		1,360	1.85	481	236	13	78	11	2,190	7.1
Dec. 1-10	134	27		67	13	375		206	324	318		100		1,320	1.80	478	220	51	79	11	2,120	7.2
Dec. 11-20	176	28		69	13	391		191	344	338		104		1,380	1.88	656	226	70	79	11	2,230	7.7
Dec. 21-31	273	14		64	7.9	209		140	226	175		62		849	1.15	626	193	78	70	6.5	1,350	7.2
Jan. 1-10, 1957 ..	157	22		69	12	297	18	192	266	282		81		1,140	1.55	483	222	64	73	8.7	1,880	7.0
Jan. 11-20	148	20		66	12	315	18	192	280	280		94		1,190	1.62	476	214	56	74	9.3	1,990	7.2
Jan. 21-31	170	20		66	12	322	19	184	299	285		99		1,210	1.65	555	214	63	75	9.6	2,030	7.1
Feb. 1-10	348	16		69	7.5	218		152	224	185		74		925	1.26	869	204	80	70	6.6	1,430	7.1
Feb. 11-19	176	16		65	8.0	214		183	204	175		64		863	1.17	410	195	45	70	6.7	1,390	6.9
Feb. 20-28	198	18		67	8.0	294		289	241	200		84		1,050	1.43	564	199	0	76	9.1	1,680	7.1
Mar. 1-10	186	24		68	8.2	258		179	242	212		82		992	1.35	498	202	56	74	7.9	1,560	7.3
Mar. 11-19, 21 ..	375	18		63	8.0	252		194	215	214		87		973	1.32	985	190	31	74	8.0	1,540	7.5
Mar. 20, 22-24 ..	860	14		53	4.0	112		146	114	90		33		506	.69	1,170	148	28	62	4.0	1,821	7.3
Mar. 25-31	338	15		68	6.1	162		183	160	146		49		711	.97	649	194	60	64	3.0	1,160	7.1

Apr. 1-11, 21, 1957	2,363	12	65	3.9	50	153	77	49	16	366	.50	2,340	178	52	38	1.6	587	7.5
Apr. 12-20	342	17	89	3.9	152	196	176	139	46	745	1.01	688	246	86	57	4.2	1,170	7.1
Apr. 22-30	26,870	11	46	2.6	19	125	37	14	7.1	210	.29	15,240	126	23	24	.7	334	7.3
May 1-10	20,920	11	51	3.2	25	140	35	27	6.3	241	.33	13,610	141	26	27	.9	390	7.7
May 11-20	22,380	9.8	49	3.2	24	137	33	27	3.8	222	.30	13,410	135	23	28	.9	368	7.3
May 21-31	34,950	8.4	46	3.0	20	133	25	22	3.2	203	.28	19,160	126	17	25	.8	336	7.3
June 1-10	35,510	13	46	3.3	15	136	24	16	3.0	196	.27	18,780	128	17	21	.6	319	7.8
June 11-20	14,640	12	45	3.7	21	135	24	24	3.5	216	.29	8,540	128	17	26	.8	348	7.5
June 21-30	10,020	11	42	3.4	21	130	21	24	3.5	a190	.26	5,140	119	12	28	.8	333	7.7
July 1-10	8,808	16	46	3.6	20	140	22	24	2.5	214	.29	5,090	130	15	25	.8	350	7.8
July 11-20	6,132	14	43	3.3	21	130	22	25	2.5	209	.28	3,460	121	14	28	.8	344	7.7
July 21-31	6,216	14	43	3.5	21	132	22	24	3.0	202	.27	3,390	122	14	27	.8	344	7.6
Aug. 1-10	5,916	14	45	3.7	21	139	23	23	3.5	218	.30	3,480	128	14	26	.8	351	8.1
Aug. 11-20	6,157	13	45	3.5	24	142	23	25	3.5	218	.30	3,620	127	10	29	.9	353	8.1
Aug. 21-31	2,455	9.2	46	4.0	25	155	25	21	4.0	220	.30	1,460	131	4	29	1.0	367	7.8
Sept. 1-10	922	14	52	4.3	61	170	57	49	15	368	.50	916	147	8	48	2.2	582	8.2
Sept. 11-20	506	14	51	4.4	81	172	65	69	20	a389	.53	531	145	4	55	2.9	670	8.1
Sept. 21-30	583	12	51	4.4	89	159	89	70	20	452	.61	724	145	14	57	3.2	701	7.8
Weighted average	5,805	12	47	3.4	26	136	33	27	5.6	231	0.31	3,620	131	20	30	1.0	378	--

a Calculated from determined constituents.

WESTERN GULF OF MEXICO BASINS

TRINITY RIVER BASIN--Continued

TRINITY RIVER NEAR ROSSER, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily temperature measurement usually between 7 and 8 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	74	65	48	50	47	55	--	68	--	80	82	81
2	74	64	47	50	49	56	--	68	75	80	81	82
3	75	62	56	50	52	56	63	71	75	81	82	80
4	77	66	54	53	56	57	62	70	75	81	81	--
5	76	60	57	52	54	57	60	67	74	81	80	82
6	76	55	59	53	54	55	60	67	76	81	79	83
7	74	56	62	52	56	52	63	66	78	80	79	80
8	72	57	57	57	59	51	62	67	79	81	78	77
9	72	56	51	59	62	52	--	67	80	79	80	77
10	72	55	49	54	62	58	--	69	81	80	81	76
11	71	57	53	52	62	59	64	72	81	81	79	77
12	71	56	51	50	61	59	61	73	79	80	80	78
13	72	59	51	52	61	61	57	71	79	81	82	79
14	72	61	49	52	62	62	55	70	80	80	82	80
15	73	62	49	49	64	59	60	73	80	80	82	80
16	70	57	48	44	62	59	61	74	80	79	81	77
17	70	54	52	44	59	61	--	75	80	80	81	78
18	71	53	49	41	57	62	66	74	79	80	81	77
19	72	57	50	43	56	59	67	72	78	80	80	--
20	72	60	51	45	54	59	68	74	79	80	79	80
21	70	57	--	52	53	56	66	76	79	80	82	81
22	69	54	--	55	55	57	66	77	79	81	81	78
23	69	54	--	50	53	59	65	75	79	79	80	75
24	70	52	--	47	54	58	66	73	77	79	82	72
25	70	53	--	48	55	53	65	74	76	80	82	71
26	66	53	--	47	56	51	66	73	80	80	82	--
27	65	49	--	45	54	49	67	74	78	84	83	73
28	64	50	--	44	54	50	67	74	79	82	81	72
29	66	46	--	46	--	56	66	74	80	81	81	72
30	67	47	--	45	--	60	68	76	81	81	81	71
31	64	--	--	46	--	62	--	77	--	82	81	--
Average	71	56	--	49	57	57	64	72	78	80	81	77

TRINITY RIVER BASIN--Continued
CEDAR CREEK NEAR MABANK, TEX.

LOCATION.--At gaging station at bridge on State Farm Highway 85, 2 miles downstream from Lacy's Fork and 5½ miles southwest of Mabank, Kaufman County. DRAINAGE AREA.--734 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1956 to September 1957 (discontinued).

Water temperatures: April 1956 to September 1957 (discontinued).

EXTREMES, 1956-57.--Dissolved solids: Maximum, 471 ppm Jan. 14-21; minimum, 17 ppm Feb. 24-25, Apr. 20, 23-28.

Hardness: Maximum, 172 ppm June 28-30, July 1, 23-25; minimum, 17 ppm Feb. 24-25.

Specific conductance: Maximum daily, 894 micromhos Jan. 17; minimum daily, 50.7 micromhos Apr. 20.

Water temperatures: Maximum, 79°F June 27, Aug. 19, 21-22; minimum, 44°F Jan. 27-28.

EXTREMES, April 1956-September 1957.--Dissolved solids: Maximum, 471 ppm Jan. 14-21, 1957; minimum, 17 ppm Feb. 24-25, 1957.

Hardness: Maximum, 172 ppm June 28-30, July 1, 23-25, 1957; minimum, 17 ppm Feb. 24-25, 1957.

Specific conductance: Maximum daily, 894 micromhos Jan. 17, 1957; minimum daily, 50.7 micromhos Apr. 20, 1957.

Water temperatures: Maximum, 83°F on several days during May and June 1956; minimum, 44°F Jan. 27-28, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Nov. 4-17, 1956	a 551	8.4	--	13	2.6	15		43	19	11	0.6	2.9	94	0.13	42	7	44	150	7.4
Nov. 18-30, 1956			--	18	3.4	20		63	26	16	.7	1.5	127	.17	60	8	42	1.1	7.5
Dec. 1-15, 1956	.22	10	--	18	3.3	20	8.2	25	15	7.8	--	1.0	60	.08	30	10	37	103	7.2
Dec. 16-31, 1956	65.9	6.0	--	6.6	3.3	20		25	15	7.8	--	1.0	60	.08	30	10	37	103	7.2
Dec. 19-31, 1956	23.8	10	--	22	4.4	56		83	44	55	.5	2.2	235	.32	15.1	73	5	62	2.8
Dec. 22-31, 1956	10.9	9.6	--	18	3.7	31		72	27	27	.7	1.0	153	.21	4.50	61	2	52	1.7
Jan. 1-5, 1957	50.7	7.4	--	20	4.6	108		55	29	160	.7	1.8	358	.49	49.0	69	24	5.7	6.9
Jan. 6-13, 1957	1.30	9.6	--	26	7.1	142		65	23	230	.5	1.2	471	.64	1.65	95	42	7.7	7.2
Jan. 14-21, 1957			--	26	7.1	142		65	23	230	.5	1.2	471	.64	1.65	95	42	7.7	7.2
Jan. 22-24, 30-31, 1957	1,295	8.2	--	8.7	1.6	7.2	4.1	34	11	5.2	.5	2.0	66	.09	23	0	32	.6	6.8
Jan. 1-4, 1957	72.4	8.4	--	18	2.8	18		56	30	10	.6	3.8	120	.16	23.5	56	10	4.1	7.1
Jan. 25-29, 1957			--	18	2.8	18		56	30	10	.6	3.8	120	.16	23.5	56	10	4.1	7.1
Feb. 5-9, 1957	66.8	10	--	17	3.6	22		63	22	31	.5	2.2	127	.17	22.9	57	5	4.5	7.4
Feb. 10-18, 1957	6.90	12	--	23	5.5	30		79	33	31	.5	1.2	175	.24	3.26	80	15	4.5	304
Feb. 19-23, 1957	8.90	14	--	23	8.1	43		66	37	63	.6	1.2	232	.30	5.33	91	37	5.1	406
Feb. 24-25, 1957	72.1	5.8	--	3.3	2.1	8.4	3.4	18	7.8	8.2	.8	2.0	51	.07	0.93	17	2	4.6	6.7
Feb. 26-28, 1957			--	3.3	2.1	8.4	3.4	18	7.8	8.2	.8	2.0	51	.07	0.93	17	2	4.6	6.7
Mar. 1-2, 1957	110	7.8	--	11	2.8	18		45	14	15	.6	2.5	94	.13	27.9	38	1	50	1.2
Mar. 3-7, 1957	7.72	13	--	20	5.6	39		66	30	49	.6	2.8	192	.26	4.00	74	20	53	2.0
Mar. 8-16, 1957	3.92	8.8	--	32	9.4	52		87	64	65	.5	1.0	276	.38	2.92	118	47	49	2.1
Mar. 17, 21-22, 24, 1957	1,713	8.8	--	9.1	3.0	11		35	13	10	.6	1.5	74	.10	342	35	6	41	8
Mar. 18-20, 23, 1957	2,340	9.6	--	11	3.4	22		41	19	22	.6	2.2	110	.15	695	41	7	53	1.5
Mar. 25-31, 1957			--	11	3.4	22		41	19	22	.6	2.2	110	.15	695	41	7	53	1.5
Apr. 1-2, 1957	356	12	0.44	20	3.3	20		66	22	18	.8	3.5	132	.18	127	64	10	40	1.1

a No flow Oct. 1-31, Nov. 1-3, Dec. 16-18, July 2-22, 26-31, Aug. 1-9, 14-31, Sept. 1-21, 30.

TRINITY RIVER BASIN--Continued
CEDAR CREEK NEAR MABANK, TEX.--Continued

Chemical analyses, in parts per million, November 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium in solution	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Apr. 3-7, 1957 ..	4,100	9.0	0.58	9.1	2.5	11	35	34	8.6	11	0.7	2.5		72	0.10	797	33	5	41	0.8	117	7.2
Apr. 8-19	64.1	17	.18	26	6.9	35		78	43	41	.4	2.5		210	.29	36.3	94	30	45	1.6	362	7.2
Apr. 20, 23-28 ..	17,590	8.2	.22	6.5	1.9	3.8	4.8	29	4.0	5.0	.5	2.2		51	.07	2,420	24	0	21	.3	84	6.4
Apr. 21-22, 29-30	12,920	11	.18	11	3.0	6.0	5.0	50	5.2	7.5	.5	3.2		78	.13	2,720	41	0	22	.4	130	6.7
May 1-5,	4,364	12	.23	17	3.0	11		67	8.2	8.5	.5	3.0		96	.13	1,130	55	0	31	.7	162	7.0
May 6-12,	4,455	13	.40	23	4.6	31		79	24	36	.5	2.5		174	.24	214	76	11	47	1.6	300	7.1
May 13-20,	2,392	11	.36	16	3.5	19		58	17	18	.5	3.2		118	.16	762	54	6	43	1.1	196	6.6
May 21-24, 26-29	3,344	6.4	.57	10	2.3	7.4	5.2	35	10	9.8	.5	3.2		72	.10	650	35	6	28	.5	119	6.6
May 25, 30-31 ..	2,383	11	.56	26	3.7	16		86	21	16	.4	3.5		142	.19	914	80	10	33	.9	240	6.9
June 1-3,	1,019	7.8	.47	24	2.9	13		81	14	11	.7	2.5		116	.16	319	71	5	29	.7	202	7.4
June 4-7,	2,500	8.6	.36	11	3.2	13		40	12	14	.8	1.5		84	.11	567	41	8	41	.9	143	7.1
June 8-10, 12-13	1,120	15	.28	28	5.1	25		88	28	28	.7	2.0		175	.24	56.7	91	19	37	1.1	300	7.5
June 11, 14-16 ..	26.2	16	.18	36	8.7	42		97	54	56	.6	1.2		263	.36	18.6	126	48	42	1.6	462	7.6
June 17-24,	3.45	17	.08	46	13	58		112	79	84	.5	1.5		354	.48	3.30	168	78	43	1.9	617	7.8
June 25-27,	8.33	12	.02	18	3.9	24		67	21	24	.5	2.0		138	.19	3.10	61	6	46	1.3	238	7.2
June 28-30, July 1, 23-25	3.63	20	.04	49	12	61		143	69	79	.5	2.2		5386	.52	3.78	172	55	43	2.0	622	7.9
Aug. 9-13,	40.0	14	.38	19	4.5	26		70	25	26	.6	2.0		151	.21	16.3	66	9	47	1.4	251	7.7
Aug. 15-22,	c 0	16	.10	30	6.4	32		95	46	29	.7	1.8		5223	.36	---	101	23	40	1.4	346	7.8
Sept. 22-26,	612	9.2	.61	11	2.5	11		43	17	14	.6	2.5		96	.13	159	33	2	51	1.3	134	7.1
Sept. 27-30,	5.65	9.6	.57	16	2.8	24		56	23	22	.6	1.8		128	.17	1.95	51	6	51	1.5	211	7.1
Weighted average	911	9.2	--	11	2.5	12		42	8.7	9.4	.5	2.6		76	0.10	187	38	3	41	0.8	127	--

b Residue at 180°C.

c Includes days of less than 0.05 cubic feet per second.

TRINITY RIVER BASIN--Continued

CEDAR CREEK NEAR MABANK, TEX.--Continued

Temperature (°F) of water, November 1956 to September 1957
Once-daily measurement, usually at about 4 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		--	--	59	52	58	57	56	--	77	--	--
2		--	--	59	53	57	57	57	--	77	--	--
3		--	--	58	53	57	57	57	--	78	--	--
4		--	--	59	55	56	56	—	71	78	--	--
5		--	--	60	56	56	56	57	70	78	--	--
6		--	--	58	56	55	56	57	69	--	--	--
7		57	--	58	58	56	56	57	69	--	--	--
8		60	--	59	58	56	56	57	71	--	--	--
9		60	--	59	59	56	51	57	76	--	76	--
10		58	--	58	60	56	--	58	78	--	77	--
11		58	--	--	60	58	--	57	70	--	--	--
12		58	--	--	60	58	56	57	71	--	76	--
13		61	--	--	60	58	55	57	76	--	78	--
14		60	--	--	59	59	56	58	78	--	77	--
15		60	--	--	59	58	55	58	73	--	78	--
16		61	--	--	57	57	57	57	76	--	77	--
17		60	--	--	58	57	57	58	72	--	78	--
18		61	--	--	56	58	56	57	76	--	78	--
19		61	--	--	60	57	56	57	74	--	79	--
20		60	--	--	58	57	55	--	71	--	78	--
21		59	60	--	60	57	55	58	74	--	79	--
22		59	59	--	59	58	56	58	73	--	79	--
23		59	59	--	55	57	56	58	73	--	--	70
24		60	58	49	56	55	56	59	76	--	--	69
25		58	58	45	57	53	56	59	76	--	--	69
26		57	58	45	56	56	56	58	77	--	--	69
27		57	59	44	57	57	57	58	79	--	--	69
28		56	58	44	58	58	56	58	70	--	--	68
29		55	60	45	--	58	56	--	--	--	--	69
30		--	60	48	--	58	56	58	76	--	--	68
31		--	60	50	--	57	--	59	--	--	--	--
Average		--	--	--	57	57	56	58	73	--	--	--

WESTERN GULF OF MEXICO BASINS

TRINITY RIVER BASIN--Continued

PIN OAK CREEK NEAR HUBBARD, TEX.

LOCATION.--At gaging station at bridge on State Highway 171, 5.8 miles southeast of Hubbard, Hill County, and 9 miles upstream from Elm Creek.

DRAINAGE AREA.--17.6 square miles.

RECORDS AVAILABLE.--Water temperatures: January to September 1957.

Sediment records: October 1956 to September 1957.

EXTREMES, 1956-57.--Water temperatures: (January to September 1957), Maximum, 77°F June 12.

Sediment concentrations: Maximum daily, 5,160 ppm June 4, minimum daily, no flow on many days.

Sediment loads: Maximum daily, 12,200 tons Apr. 20; minimum daily, no flow on many days.

REMARKS.--No flow October 1956, July to August 1957; tabulation omitted for these periods.

Maximum observed sediment concentration during water year, 114,000 ppm Apr. 19. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Temperature (°F) of water, January to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				--	49	--	58	69	72			--
2				--	47	--	65	67	71			--
3				--	50	--	68	68	70			--
4				--	60	--	59	68	70			--
5				--	55	--	52	60	72			--
6				--	54	--	47	58	73			--
7				--	55	--	62	60	73			--
8				--	62	--	53	63	73			--
9				--	62	--	53	66	76			--
10				--	61	--	55	67	76			--
11				--	62	--	--	69	76			--
12				--	62	58	--	69	77			--
13				--	59	58	--	71	--			--
14				--	62	58	--	68	--			--
15				--	--	--	--	71	--			--
16				--	--	--	--	73	--			--
17				--	--	63	--	73	--			--
18				--	50	59	--	70	--			--
19				--	49	55	68	66	--			--
20				--	48	56	64	68	--			--
21				--	--	59	64	73	--			--
22				--	56	55	68	75	--			71
23				--	51	61	63	75	--			66
24				--	47	50	66	74	--			64
25				--	53	46	65	75	--			--
26				--	51	--	67	74	--			--
27				34	48	51	62	72	--			--
28				37	--	49	67	69	--			--
29				49	--	55	66	69	--			--
30				--	--	60	67	70	--			--
31				43	--	61	--	71	--			--
Average				--	--	--	--	69	--			--

TRINITY RIVER BASIN--Continued

PIN OAK CREEK NEAR HUBBARD, TEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	November			December			January		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	0	--	0	0	--	0
2.....	0	--	0	0	--	0	0	--	0
3.....	1.5	--	a. 7	0	--	0	0	--	0
4.....	847	4,150	sb7,900	0	--	0	0	--	0
5.....	27	1,100	80	0	--	0	0	--	0
6.....	1.3	250	.9	0	--	0	0	--	0
7.....	0	--	0	0	--	0	0	--	0
8.....	0	--	0	0	--	0	0	--	0
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	0	--	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	.4	--	a. 1	0	--	0
20.....	0	--	0	5.6	517	s 7.2	0	--	0
21.....	0	--	0	.5	410	.6	0	--	0
22.....	0	--	0	.1	200	.1	0	--	0
23.....	0	--	0	0	--	0	0	--	0
24.....	0	--	0	0	--	0	0	--	0
25.....	0	--	0	0	--	0	0	--	0
26.....	0	--	0	0	--	0	0	--	0
27.....	0	--	0	0	--	0	7.1	1,150	s 36
28.....	0	--	0	0	--	0	5.3	635	9.1
29.....	0	--	0	0	--	0	3.8	220	2.3
30.....	0	--	0	0	--	0	2.7	135	1.0
31.....	--	--	0	0	--	0	4.1	1,000	11
Total..	876.8	--	7,981.6	6.6	--	8.0	23.0	--	59.4
Day	February			March			April		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	180	2,760	sb1,890	0	--	0	24	900	58
2.....	9.0	350	8.5	0	--	0	2.3	195	1.2
3.....	3.2	178	1.5	0	--	0	3.4	353	s 3.5
4.....	1.6	125	.5	0	--	0	1.7	195	.9
5.....	.7	86	.2	0	--	0	.3	129	.1
6.....	.3	78	.1	0	--	0	.1	118	(t)
7.....	.1	20	(t)	0	--	0	0	--	0
8.....	0	--	0	0	--	0	0	--	0
9.....	0	--	0	0	--	0	0	--	0
10.....	0	--	0	0	--	0	0	--	0
11.....	0	--	0	1.3	--	a. 5	0	--	0
12.....	0	--	0	.5	198	.3	0	--	0
13.....	0	--	0	0	--	0	0	--	0
14.....	0	--	0	0	--	0	0	--	0
15.....	0	--	0	0	--	0	0	--	0
16.....	0	--	0	0	--	0	0	--	0
17.....	0	--	0	45	1,210	s 590	0	--	0
18.....	0	--	0	54	1,000	146	0	--	0
19.....	0	--	0	5.7	196	3.0	205	3,270	s 4,800
20.....	0	--	0	40	896	s 664	1,970	1,940	s 12,200
21.....	.1	18	(t)	195	1,240	s 1,130	428	4,100	sb 3,940
22.....	.2	10	(t)	4.6	246	3.1	84	1,480	s 468
23.....	1.9	100	.5	2.1	135	.8	1,080	2,550	8,360
24.....	1.3	220	.8	1.0	84	.2	449	2,580	s 5,410
25.....	.6	110	.2	.7	70	.1	86	1,350	s 710
26.....	.1	100	(t)	.6	66	.1	151	1,190	s 1,960
27.....	0	--	0	22	3,290	s 814	372	1,000	1,000
28.....	0	--	0	8.6	1,200	28	51	2,070	s 445
29.....	--	--	--	2.4	325	2.1	53	850	122
30.....	--	--	--	1.0	195	.5	7.2	150	2.9
31.....	--	--	--	8.0	1,240	s 74	--	--	--
Total..	199.1	--	1,902.3	392.5	--	3,456.7	4,968.0	--	39,281.6

s Computed by subdividing day.

t Less than 0.05 tons.

a Computed from water-sediment discharge curve.

b Computed from partly estimated concentration graph.

TRINITY RIVER BASIN--Continued

PIN OAK CREEK NEAR HUBBARD, TEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	May			June			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	53	2,060	sb495	5.2	400	5.6	0		0
2.....	53	520	74	19	1,440	sc172	0		0
3.....	110	1,920	s1,430	238	2,620	s3,030	0		0
4.....	19	700	36	348	5,160	s5,510	0		0
5.....	3.2	144	1.2	83	1,000	224	0		0
6.....	.2	137	.1	1.7	258	1.2	0		0
7.....	.1	134	(t)	.4	225	.2	0		0
8.....	0	--	0	.1	270	.1	0		0
9.....	13	2,190	s143	0	--	0	0		0
10.....	1.6	290	1.3	0	--	0	0		0
11.....	218	2,350	s3,300	0	--	0	0		0
12.....	304	900	739	0	--	0	0		0
13.....	919	2,680	s8,000	0	--	0	0		0
14.....	13	460	16	0	--	0	0		0
15.....	3.0	146	1.2	0	--	0	0		0
16.....	1.3	182	.6	0	--	0	0		0
17.....	.6	195	.3	0	--	0	0		0
18.....	.3	205	.2	0	--	0	0		0
19.....	.3	222	.2	0	--	0	0		0
20.....	.1	197	.1	0	--	0	0		0
21.....	.1	172	(t)	0	--	0	0		0
22.....	0	--	0	0	--	0	5.6	1,060	sb51
23.....	.4	232	.3	0	--	0	0		0
24.....	3.5	331	3.2	0	--	0	0		0
25.....	11	1,850	s244	0	--	0	0		0
26.....	7.6	1,250	26	0	--	0	0		0
27.....	2.8	300	2.3	0	--	0	0		0
28.....	.7	220	.4	0	--	0	0		0
29.....	.2	224	.1	0	--	0	0		0
30.....	.1	252	.1	0	--	0	0		0
31.....	57	5,130	s1,830	--	--	--	--		--
Total.	1,796.1	--	16,344.7	695.4	--	8,943.1	5.4	--	51

Total discharge for year (cfs-days)..... 8,963.1
 Total load for year (tons) 78,028.4

s Computed by subdividing day.

b Computed from partly estimated concentration graph.

t Less than 0.05 tons.

c Computed from estimated concentration graph.

TRINITY RIVER BASIN--Continued
PIN OAK CREEK NEAR HUBBARD, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Nov. 4, 1956	7:45 a.m.	1,030	--	3,740	2,870	--	77	84	90	94	97	99	100	SPWCM
Nov. 4	1:00 p.m.	1,870	--	3,040	2,420	73	81	86	92	96	97	99	100	SPWCM
Nov. 4	3:00 p.m.	1,470	--	1,840	79	86	89	93	96	97	98	99	100	SPWCM
Dec. 20	1:30 p.m.	4.1	--	780	609	97	98	99	99	99	99	99	100	SPWCM
Jan. 27, 1957	1:30 p.m.	22	36	4,140	3,210	--	85	91	94	98	99	99	100	SPWCM
Feb. 1	6:00 a.m.	484	49	5,830	4,390	--	66	71	80	85	96	99	100	SPWCM
Mar. 17	6:30 p.m.	48	62	1,290	810	76	82	84	88	90	91	93	98	SPWCM
Mar. 17	10:30 p.m.	258	62	4,670	3,070	68	73	80	87	89	95	98	99	SPWCM
Mar. 18	10:00 a.m.	33	61	1,773	1,462	83	90	91	96	98	98	99	100	SPWCM
Mar. 21	7:00 a.m.	252	57	1,560	1,000	70	76	81	87	94	96	99	100	SPWCM
Mar. 27	7:00 p.m.	124	52	26,200	4,050	--	33	62	78	83	96	99	100	SPN
Mar. 27	7:00 p.m.	124	52	26,200	4,210	--	72	78	84	95	97	99	100	SPWCM
Mar. 27	9:00 p.m.	96	51	8,110	2,760	--	75	81	--	98	99	100	--	SPWCM
Mar. 31	6:30 p.m.	8.5	60	3,920	2,500	79	87	89	94	96	98	99	100	SPWCM
Apr. 20	8:00 a.m.	3,310	64	2,100	1,350	75	81	86	94	97	98	99	100	SPWCM
Apr. 20	7:00 p.m.	81	71	1,980	1,420	66	74	81	85	88	96	99	100	SPWCM
Apr. 23	6:00 a.m.	215	63	6,280	4,160	--	70	73	77	88	95	99	100	SPWCM
Apr. 23	7:00 a.m.	988	62	9,070	2,340	--	70	73	82	90	98	100	--	SPWCM
Apr. 24	5:00 p.m.	926	66	14,200	4,800	--	72	79	88	96	98	100	--	SPWCM
Apr. 24	7:00 p.m.	1,260	66	4,870	3,360	--	73	80	88	95	97	99	100	SPWCM
May 3	7:00 p.m.	425	70	2,810	1,550	58	64	72	77	86	93	99	99	SPWCM
May 25	7:00 p.m.	96	75	13,500	4,840	--	62	66	72	79	99	99	100	SPWCM
May 25	7:00 p.m.	96	75	13,500	4,800	--	13	57	70	81	98	99	100	SPN
May 31	6:00 a.m.	168	71	8,700	5,860	--	79	85	90	96	98	100	--	SPWCM
June 3	3:30 p.m.	252	73	15,000	5,280	--	12	69	81	91	96	99	100	SPN
June 3	3:30 p.m.	252	73	15,000	5,510	--	74	82	87	94	99	99	100	SPN
Sept. 22	4:00 p.m.	27	71	2,360	1,650	45	65	80	92	96	98	100	--	SPN
Sept. 22	4:00 p.m.	27	71	2,360	1,920	17	77	82	87	93	95	97	99	SPWCM

TRINITY RIVER BASIN--Continued

RICHLAND CREEK NEAR FAIRFIELD, TEX.

LOCATION.--At bridge on State Farm Highway 488, 4 miles upstream from mouth, 4 miles downstream from Chambers Creek and 16 miles north of Fairfield, Freestone County.

RECORDS AVAILABLE.--Chemical analyses: April 1956 to September 1957.

Water temperatures: April 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 12,200 ppm Oct. 11-17; minimum, 131 ppm Apr. 21-30.

Hardness: Maximum, 460 ppm Oct. 18; minimum, 79 ppm Nov. 5-8.

Specific conductance: Maximum daily, 20,000 micromhos Oct. 10-11; minimum daily, 157 micromhos Apr. 25.

Water temperatures: Maximum, 98°F Aug. 3; minimum, 40°F Jan. 19.

EXTREMES, April 1956 to September 1957.--Dissolved solids: Maximum, 13,500 ppm Aug. 11-31, 1956; minimum, 131 ppm Apr. 21-30, 1957.

Hardness: Maximum, 460 ppm Oct. 18, 1956; minimum, 79 ppm Nov. 5-8, 1956.

Specific conductance: Maximum daily, 22,000 micromhos Aug. 22, 1956; minimum daily, 157 micromhos Apr. 25, 1957.

Water temperatures: Maximum, 98°F Aug. 3, 1957; minimum, 40°F Jan. 19, 1957.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- onate (CO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent adorp- tion	So- lution ratio	Specific conduct- ance (micro- mhos at 25° C)	pH
															Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium	Non-carbon- ate				
Oct. 1-10, 1956.....		--	--	--	--	--	--	502	40	--	6,730	--	--	--	292	--	--	292	--	--	--	18,800	8.5
Oct. 11-17.....		--	--	--	--	--	--	533	41	--	7,110	--	--	--	12,200	--	--	296	0	--	--	19,500	8.6
Oct. 18.....		--	--	--	--	--	--	424	29	--	3,700	--	--	--	--	--	--	460	64	--	--	11,100	8.6
Oct. 19-20.....		8.4	--	40	4.1	393	831	135	0	63	580	0.8	3.0	--	1,140	1.55	--	116	6	88	16	2,080	7.8
Oct. 21-26.....		9.6	--	44	6.6	831	831	159	0	58	1,240	0.8	1.5	--	2,270	3.09	--	136	6	93	31	4,160	8.2
Oct. 27-31, Nov. 1-4..		6.0	--	52	17	2,420	320	15	15	39	3,640	0.6	--	--	6,350	8.64	--	200	0	96	75	10,900	8.5
Nov. 5-8.....		7.8	--	27	3.0	43	103	0	24	31	43	0.5	1.5	--	6,222	30	--	79	0	54	2.1	358	7.9
Nov. 9-12.....		9.4	--	55	4.4	187	142	0	31	260	5	1.5	--	--	635	86	--	154	38	70	5.9	1,120	8.0
Nov. 13-20.....		9.6	--	78	8.6	480	172	0	38	770	0.5	1.5	--	--	1,470	2.00	--	225	84	82	14	--	8.0
Nov. 21-25.....		13	--	116	19	1,390	322	0	41	2,180	0.8	--	--	--	3,920	5.33	--	368	104	89	31	6,890	8.2
Nov. 26-30, Dec. 1-10.		6.6	--	91	27	2,530	395	0	45	3,870	0.8	--	--	--	6,780	9.19	--	338	14	94	60	11,500	7.8
Dec. 11-18.....		--	--	--	--	--	--	313	10	--	3,130	--	--	--	--	--	--	419	--	--	--	14,500	8.3
Dec. 20-21.....		--	--	--	--	--	--	191	0	--	800	--	--	--	--	--	--	138	--	--	--	2,770	7.7
Dec. 22.....		--	--	--	--	--	--	151	0	--	64	--	--	--	--	--	--	128	--	--	--	545	7.9
Dec. 23-31.....		9.4	--	54	5.3	229	229	138	0	83	318	0.8	3.8	--	787	1.06	--	156	43	76	8.0	1,420	7.7
Jan. 1-5, 1957.....		8.0	--	70	9.9	761	761	220	0	59	1,150	0.7	4.1	--	2,170	2.95	--	215	34	88	23	3,910	8.1
Jan. 6-12.....		4.3	--	75	18	1,740	339	10	51	2,620	0.7	--	--	--	4,680	6.38	--	281	0	94	47	8,230	8.4
Jan. 13-22.....		2.9	--	110	22	2,760	472	17	58	4,170	0.9	--	--	--	7,370	10.0	--	385	0	94	63	12,600	8.4
Jan. 23.....		9.6	--	30	2.8	165	122	0	28	222	0.8	--	2.5	--	a 521	0.71	--	87	0	80	7.7	988	7.9
Jan. 24-25.....		12	--	53	5.7	439	439	162	0	38	660	0.8	6.7	--	1,300	1.77	--	156	23	86	15	2,430	7.8

TRINITY RIVER BASIN

315

Jan. 26-31, 1957.....	12	--	66	11	1,070	246	0	32	1,630	.8	4.0	2,950	4.01	210	8	92	32	5,370	8.1
Feb. 1, 10-13.....	14	--	70	7.6	389	208	0	54	580	.6	6.0	1,220	1.66	206	36	80	12	2,200	8.2
Feb. 2-5.....	12	--	35	2.7	118	0	28	23	23	.7	4.4	208	.28	99	2	40	1.3	523	7.8
Feb. 6-9.....	15	--	54	4.9	126	172	0	43	168	.7	3.7	1.69	3.69	154	67	64	4.4	511	7.7
Feb. 14-20.....	6.2	--	76	14	1,040	221	0	66	1,600	.6	1.4	2,910	3.96	248	67	90	29	5,180	7.7
Feb. 21-22.....	2.4	--	70	21	1,850	314	0	52	2,820	.5	--	4,970	6.76	261	4	94	50	8,880	7.6
Feb. 23-26, Mar. 1-3..	15	--	94	22	1,890	344	9	68	2,880	.6	--	5,150	7.00	324	27	93	46	8,990	8.3
Mar. 4-11.....	9.0	--	48	5.7	282	152	0	44	412	.5	3.8	882	1.20	143	18	81	10	1,640	7.9
Mar. 12-19.....	8.6	--	57	9.0	733	227	0	31	1,100	.5	2.7	2,050	2.79	180	0	90	24	3,750	8.0
Mar. 20, 26, 30-31...	10	.06	40	3.4	83	140	0	27	1,06	.6	1.8	382	.49	114	0	61	3.4	634	7.6
Mar. 21-25, 27-29...	11	.11	38	2.6	24	119	0	27	20	.6	3.2	200	.27	106	8	33	1.0	324	7.5
Apr. 1-7.....	13	.06	42	3.0	47	131	0	33	51	.8	4.0	289	.37	117	10	48	1.9	435	7.8
Apr. 8-10, 20.....	14	.05	57	4.2	92	173	0	42	120	.8	2.5	430	.58	160	18	56	3.2	731	7.8
Apr. 11-15.....	15	.03	81	9.0	348	221	7	63	518	.8	4.7	1,160	1.58	239	58	76	9.8	2,050	8.5
Apr. 16-19.....	14	.02	98	11	691	289	0	66	1,050	.8	5.5	2,080	2.83	290	52	84	18	3,730	8.1
Apr. 21-30.....	9.6	.27	29	2.5	14	99	0	14	10	.8	2.0	a131	.18	83	2	27	.7	217	7.9
May 1-7.....	14	.04	44	3.7	16	138	0	25	12	.5	3.2	202	.27	125	12	22	.6	313	7.2
May 8-12.....	14	.01	76	4.5	46	200	0	50	58	.5	9.9	376	.51	208	44	32	1.4	608	7.7
May 13-15.....	12	.03	45	3.4	23	130	0	33	23	.5	3.8	226	.31	127	20	29	.9	366	7.8
May 16-17, 24-27...	12	.02	42	2.4	17	119	0	29	13	.5	3.8	188	.26	114	16	24	.7	299	7.6
May 18-23.....	15	.02	86	5.0	55	210	0	70	70	.4	12	444	.60	235	63	34	1.6	705	7.8
May 28-31.....	14	.02	60	3.0	28	180	0	39	32	.4	6.2	281	.38	162	31	27	1.0	446	7.6
June 1-6.....	11	.06	46	3.2	22	136	0	38	22	.7	3.8	235	.31	128	25	28	.9	354	7.3
June 9-13.....	15	.02	72	4.9	63	186	0	56	84	.7	7.2	403	.55	200	47	41	2.0	681	7.8
June 14-28.....	16	.02	78	6.0	170	201	0	67	245	.7	9.7	704	.96	219	54	63	5.0	1,230	7.7
June 29-30, July 1-9..	16	.00	73	7.6	325	182	0	90	468	.5	7.8	1,080	1.47	214	56	77	9.6	1,940	8.0
July 10-20.....	12	.04	85	11	715	247	0	79	1,060	.7	2.5	2,110	2.87	257	54	86	19	3,600	7.9
July 21-29.....	15	.01	72	15	1,190	259	0	72	1,800	.6	2.0	3,290	4.47	241	28	91	33	5,930	8.2
July 30-31, Aug. 1-6, 12-13.....	11	.01	54	8.3	610	266	0	70	850	.7	2.5	1,740	2.37	168	0	89	20	3,130	8.2

a. Calculated from determined constituents.

TRINITY RIVER BASIN--Continued

RICHLAND CREEK NEAR FAIRFIELD, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Aug. 7-11, 1957.....		10	0.02	60	11	1,120	291	0	53	1,860	0.8	2.0			3,060	4.16		194	0	93	35	5,530	8.1
Aug. 14-19, 25.....		7.4	.05	43	7.6	574	173	2	34	852	.7	2.0			1,610	2.19		139	0	90	21	2,960	8.3
Aug. 20-24, 26-31,		5.6	.03	81	14	1,120	282	7	46	1,700	.8	1.5			3,100	4.22		260	17	90	30	5,630	8.4
Sept. 1-2.....		5.6	.02	96	22	2,160	379	13	46	3,300	.7	--			5,830	7.93		330	0	93	52	10,000	8.4
Sept. 3-10.....																							
Sept. 11-22.....		5.2	.02	74	27	2,990	415	14	29	4,540	--	--			7,880	10.7		296	0	96	76	13,100	8.4
Sept. 23.....		11	.14	38	4.0	538	172	2	35	470	.8	2.0			9,986	1.34		112	0	87	14	1,840	8.3
Sept. 24-28.....		10	.14	30	2.5	118	128	0	24	148	.5	3.5			440	.60		186	0	75	5.6	739	8.2
Sept. 29-30.....		13	.11	41	4.3	322	188	0	39	440	.7	2.5			975	1.33		119	0	85	13	1,770	8.1

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued

RICHLAND CREEK NEAR FAIRFIELD, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	64	--	51	52	62	63	67	77	86	92	92
2	78	--	49	53	51	56	60	72	74	89	94	90
3	86	64	46	59	53	61	62	74	80	87	98	93
4	82	62	--	58	58	60	66	69	75	90	89	91
5	71	56	62	51	59	59	61	69	77	89	91	93
6	--	56	--	55	60	58	65	69	77	86	93	89
7	75	56	66	--	58	55	67	65	80	89	90	90
8	76	58	62	60	61	56	60	66	80	87	89	89
9	--	54	60	60	62	50	65	70	84	90	94	87
10	75	--	63	50	64	54	69	76	86	89	93	88
11	75	56	59	--	66	58	72	72	85	--	94	87
12	76	56	52	--	65	60	64	71	84	88	95	89
13	72	--	53	52	67	59	66	71	--	90	90	88
14	78	58	--	50	66	58	69	76	87	90	--	88
15	76	62	--	46	70	61	63	77	88	93	--	85
16	68	53	--	44	64	57	66	78	87	89	--	87
17	75	59	56	48	57	57	58	80	84	94	--	84
18	73	--	52	43	53	62	62	76	89	90	90	88
19	66	60	53	40	56	60	67	75	83	89	95	84
20	69	--	--	46	57	56	65	77	86	91	94	89
21	75	60	--	58	58	58	69	79	89	91	91	82
22	--	56	--	57	58	60	66	80	86	90	96	89
23	70	51	--	58	56	64	64	79	82	91	94	87
24	73	54	--	52	53	60	63	75	89	95	92	81
25	68	--	--	52	60	59	60	77	84	90	91	82
26	68	55	--	47	55	62	68	79	83	90	95	85
27	67	56	--	48	60	58	67	80	85	91	92	90
28	73	52	--	46	61	63	67	79	86	90	88	82
29	--	57	--	49	--	59	68	80	87	92	90	80
30	--	--	--	48	--	60	74	80	84	91	93	74
31	65	--	--	50	--	64	--	81	--	89	90	--
Average	--	--	--	51	59	60	65	75	83	80	92	87

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ROMAYOR, TEX.

LOCATION--At gaging station at bridge on State Highway 105, 1.9 miles south of Romayor, Liberty County, 2.0 miles downstream from Gulf, Colorado and Santa Fe Railway bridge and at mile 94.
DRAINAGE AREA--17,192 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1945 to November 1949, February 1950 to September 1951, April 1953 to September 1957.

Water temperatures: February 1950 to September 1951, April 1953 to September 1957.

EXTREMES, 1956-57--Dissolved solids: Maximum, 1,730 ppm Oct. 21-31; minimum, 105 ppm Apr. 18-19, 26-27, 29-30.

Hardness: Maximum, 258 ppm Oct. 21-31; minimum, 49 ppm Apr. 18-19, 26-27, 29-30.

Specific conductance: Maximum daily, 3,800 micromhos Oct. 30; minimum daily, 125 micromhos Apr. 27.

Water temperatures: Maximum, 90°F July 12, 17, 20-21; minimum, 48°F Nov. 28, Jan. 18.

EXTREMES, 1945-50, 1953-57--Dissolved solids: Maximum, 1,900 ppm Nov. 7, 1953; minimum, 82 ppm July 31, 1954.

Hardness: Maximum, 258 ppm Oct. 21-31, 1956; minimum, 32 ppm Nov. 1-3, 1953.

Specific conductance: Maximum daily, 3,800 micromhos Oct. 30, 1956; minimum daily, 103 micromhos Nov. 9, 1946.

Water temperatures (1953-57): Maximum, 98°F July 18, 27, 1953; minimum, 38°F Jan. 18, 1956.

REMARKS--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent sodium chloride ratio	Specific conduct- ance (micro- mhos at 25°C)	pH
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, magnesium	Non-carbon- ate			
Oct. 1-10, 1956 ..	158 17			65	9.7	374		195	104	528		1.0	1,190	1.62	508	202	42	80	11	2,080	8.1
Oct. 11-20	155 18			83	12	493		246	167	675		1.2	1,570	2.14	657	256	55	81	13	2,680	8.1
Oct. 21-31	224 18			82	13	554		248	165	770		1.2	1,730	2.35	1,050	258	59	82	15	2,930	8.0
Nov. 1-8	371 13			70	13	519		206	192	700		.8	1,610	2.19	1,610	228	59	83	15	2,850	8.2
Nov. 9-19	2,911 8.8			36	3.4	88		118	46	106		2.8	356	.48	2,800	105	8	65	3.7	641	7.8
Nov. 20-30	372 12			40	3.5	86		113	50	109		2.5	360	.49	362	114	22	62	3.5	645	7.6
Dec. 1-13	270 12			36	4.1	93		92	50	129		.5	390	.53	284	107	32	65	3.9	671	7.5
Dec. 14-17, 22-28	606 12			54	6.0	193		145	63	278		1.2	733	1.00	1,200	159	40	72	6.6	1,250	7.8
Dec. 18-21, 29-31	652 13			79	11	453		189	194	610		12	1,460	2.00	2,570	241	86	37	13	2,590	8.2
Jan. 1, 1957	677 24			--	--	134		50	51	202		.2	--	--	--	88	47	77	6.2	864	7.5
Jan. 2, 6, 8-10, 12-17	384 22			62	7.7	322		169	148	412		14	1,070	1.46	1,110	186	48	79	10	1,900	7.9
Jan. 3-5, 7, 11	424 18			74	12	538		220	172	730		18	1,670	2.27	1,910	234	54	83	15	2,960	8.1
Jan. 18-31	602 18			62	10	252		173	146	308		19	941	1.28	1,530	196	54	77	7.8	1,600	7.8
Feb. 1-2, 6-7	3,168 20			67	10	322		151	119	458		18	1,090	1.48	9,320	209	86	77	9.6	1,940	7.7
Feb. 3-5, 8-9	3,404 15			40	4.1	115		131	58	136		10	484	.66	4,450	118	10	68	4.6	781	7.8
Feb. 10-19	1,901 15			37	3.8	66		106	42	82		5.6	a 303	.41	1,560	107	20	57	2.8	529	7.8
Feb. 20-28	1,348 14			38	4.4	83		97	50	111		5.5	a 354	.48	1,290	112	32	62	3.4	622	7.6
Mar. 1-12	1,301 17			40	4.9	123		94	63	169		7.1	496	.67	1,740	119	42	69	4.9	834	7.7

Mar. 13-19, 22-23, 27-28, 1857,	4,190	16	27	2.6	59	79	35	72	4.7	a255	.35	2,880	79	14	62	2.9	438	7.7
Mar. 20-21, 24-26	5,660	13	31	3.6	114	81	51	153	6.6	a415	.56	6,340	93	36	73	5.1	739	7.3
Mar. 28-31,	10,750	16	26	2.0	34	87	29	31	2.2	a180	.24	5,220	74	3	50	1.7	294	7.6
Apr. 1-6,	7,462	15	30	2.5	39	82	25	52	4.5	a208	.28	4,190	86	19	49	1.8	353	7.4
Apr. 7-17,	8,125	22	41	3.7	42	118	38	49	5.0	260	.35	5,700	117	20	44	1.7	432	7.6
Apr. 18-19, 26-27, 29-30,	3,357	11	17	1.6	16	54	13	18	1.5	a105	.14	952	49	4	42	1.0	164	7.3
Apr. 20-23, 25, 28	13,640	14	32	2.2	29	79	24	42	2.0	a184	.25	6,780	88	24	41	1.3	312	7.4
Apr. 24,	8,340	14	51	4.9	78	106	49	124	4.0	a377	.51	8,490	146	59	54	2.8	671	8.0
May 1-10,	73,890	15	29	2.6	17	98	18	15	1.0	a146	.20	29,130	84	4	31	.8	247	7.3
May 11-20,	73,950	15	41	3.2	19	126	24	18	1.8	a184	.25	36,740	115	12	26	.8	312	7.5
May 21-31,	40,330	16	47	3.7	25	144	27	27	1.8	234	.32	25,480	132	14	29	.9	371	7.4
June 1-9,	40,970	29	26	1.7	19	77	21	19	1.2	164	.22	18,140	72	9	36	1.0	240	7.4
June 10-20,	54,970	20	33	2.5	20	96	23	23	1.5	178	.24	26,420	93	14	32	.9	279	7.4
June 21-30,	38,010	19	29	2.3	27	87	23	31	1.0	180	.24	18,470	82	10	41	1.3	284	7.6
July 1-10,	13,050	45	27	.7	36	b90	22	36	1.5	234	.32	8,240	70	0	53	1.9	304	8.9
July 11-20,	9,376	30	34	1.7	35	c105	25	39	1.0	237	.32	6,000	92	6	45	1.6	345	8.7
July 21-31,	7,111	33	27	.5	40	b85	25	42	1.0	233	.32	4,470	70	0	55	2.1	330	9.1
Aug. 1-10,	7,210	43	29	1.4	42	d97	23	46	1.2	234	.32	4,560	78	0	54	2.1	353	8.9
Aug. 11-20,	18,650	26	25	1.4	27	82	15	31	1.0	180	.24	9,060	68	1	46	1.4	287	8.2
Aug. 21-31,	5,061	16	42	4.3	39	138	27	46	2.0	a244	.33	3,330	122	10	41	1.3	424	7.9
Sept. 1-10,	2,513	15	39	4.1	43	134	26	50	1.2	250	.34	1,700	114	4	45	1.8	417	8.0
Sept. 11-18, 21-22	1,286	13	36	3.9	59	121	27	76	.2	282	.38	979	106	7	55	2.5	484	7.8
Sept. 19-20, 23-30	1,741	5.4	47	5.1	91	150	41	121	.2	390	.53	1,830	138	16	59	3.4	693	7.8
Weighted average	12,690	19	33	2.6	30	103	24	33	1.7	201	0.27	6,890	93	8	41	1.3	325	--

a Calculated from determined constituents.

b Includes equivalent of 18 parts per million of carbonate (CO₃).c Includes equivalent of 9 parts per million of carbonate (CO₃).d Includes equivalent of 10 parts per million of carbonate (CO₃).

WESTERN GULF OF MEXICO BASINS

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ROMAYOR, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	84	70	58	60	52	60	62	--	82	86	88	85
2	84	70	60	58	54	60	62	--	--	86	88	80
3	80	70	60	58	60	60	62	--	82	86	88	85
4	82	70	60	55	60	65	62	--	82	89	88	85
5	80	70	60	55	62	62	62	--	82	89	88	85
6	80	70	60	55	65	60	65	--	80	89	88	--
7	80	70	60	55	62	60	65	--	82	89	88	82
8	78	68	60	60	60	60	65	--	84	88	88	82
9	80	68	58	62	62	--	65	--	82	88	88	83
10	78	64	58	60	--	60	65	--	83	88	78	82
11	80	60	60	60	64	62	65	--	82	88	79	82
12	80	60	60	60	64	--	65	--	82	90	83	81
13	78	60	60	60	64	68	62	--	85	89	83	81
14	78	60	62	60	66	68	62	78	85	89	83	81
15	80	60	60	60	66	66	62	78	85	89	83	81
16	80	58	60	60	64	64	65	78	85	89	85	--
17	78	60	60	50	60	84	68	78	85	90	84	82
18	75	60	60	48	58	66	68	78	85	89	85	82
19	75	62	60	58	58	68	70	78	85	89	85	84
20	75	62	60	60	58	65	70	79	85	90	87	84
21	72	56	60	60	58	66	70	79	85	90	87	82
22	72	58	--	60	58	68	70	80	85	85	87	82
23	75	60	--	56	58	66	70	80	85	85	87	80
24	75	58	--	52	60	66	70	82	85	89	87	82
25	75	58	--	55	60	62	72	82	85	86	82	79
26	75	55	--	--	60	62	72	82	85	88	80	76
27	72	50	55	52	60	--	70	82	85	88	82	74
28	68	48	60	54	60	62	70	82	85	88	85	73
29	70	50	69	62	--	62	70	82	85	88	85	75
30	72	54	60	58	--	62	72	82	85	88	82	74
31	72	--	54	60	--	62	--	82	--	88	83	--
Average	77	62	60	57	60	63	67	--	84	88	85	81

TRINITY RIVER BASIN--Continued
TRINITY RIVER NEAR MOSS BLUFF, TEX.

LOCATION.--At Devers Pumping Plant No. 1, 1 mile west of Moss Bluff, Liberty County.

RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,670 ppm Nov. 1-12; minimum, 114 ppm Apr. 16-30.

Hardness: Maximum, 470 ppm Oct. 1-3; minimum, 48 ppm Apr. 16-30.

Specific conductance: Maximum daily, 5,840 micromhos Oct. 1; minimum daily, 187 micromhos Apr. 17.

EXTREMES, 1949-57.--Dissolved solids: Maximum, 3,930 ppm Aug. 26-31, 1956; minimum, 110 ppm Oct. 4-10, 1949.

Hardness: Maximum, 790 ppm Aug. 26-31, 1956; minimum, 40 ppm Apr. 9-13, 1955.

Specific conductance: Maximum daily, 7,630 micromhos Aug. 27, 1952; minimum daily, 127 micromhos Oct. 7, 1949.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents, unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-3, 1956 ...														--	--	--	470	280	--	--	4,080	8.2
Oct. 4-13, 1956 ...	18	--		80	20	389	--	256	112	558		1.2		1,310	1.78	282	282	58	75	10	2,270	8.2
Oct. 14-31, 1956 ...	16	18		77	17	345	227	272	98	512		1.5		1,180	1.60	282	282	76	74	9.3	2,070	8.0
Nov. 1-12, 1956 ...	15	15	12	524	264	162	730	1.8	276	60	80	14		1,670	2.27	276	276	60	80	14	2,940	7.9
Nov. 13, 14, 16, 18	7.8			34	3.2	85	104	3.5	114	337	.46	5.5		460	.63	133	133	28	65	4.3	611	7.8
Nov. 19-30, 1956 ...	11			45	4.7	115		128	63	148						154	154	32	60	3.8	814	7.5
Dec. 1-16, 24, 1956 ...	13			53	5.5	108		148	56	147		2.2		479	.65	178	178	66	71	6.6	1,310	7.5
Dec. 17-23, 25-31	11			60	6.7	202		137	89	290		4.0		771	1.05							
Jan. 1-8, 10-13, 1957 ...	14			78	12	402	199	162	548			19		1,330	1.81	245	245	82	78	11	2,340	7.9
Jan. 9, 1957 ...	8.4			85	11	363	192	157	510			7.5		1,240	1.69	256	256	98	76	9.9	2,210	7.9
Jan. 15, 22-31, 1957 ...	16			58	8.4	244		180	128	295		17		878	1.19	180	180	32	75	7.9	1,510	7.7
Feb. 1, 8, 10, 1957 ...	13			36	4.1	126	118	66	146			10		503	.68	106	106	10	72	5.3	831	7.6
Feb. 2, 7, 9, 1957 ...	18			87	9.2	337	145	143	480	24		24		1,130	1.54	204	204	85	78	10	1,960	7.8
Feb. 11-26, 1957 ...	12			35	3.6	86	99	39	84			5.9		3294	.40	102	102	21	58	2.8	527	7.8
Mar. 1-10, 14-16, 1957 ...	13			32	3.9	75	51	96	42			4.2		3233	.44	104	104	28	61	3.2	597	7.2
Mar. 11-13, 25-26, 1957 ...	15			38	4.9	114	82	61	187			7.5		4355	.56	110	110	43	60	4.7	796	7.5
Mar. 17-24, 27-30, 1957 ...	11			26	3.0	57		77	32	72		4.5		3244	.33	77	77	14	82	2.8	445	7.4
Apr. 1-10, 1957 ...	13			31	3.8	45	90	30	30	59		2.5		3228	.31	93	93	19	51	2.0	415	8.9
Apr. 11-15, 1957 ...	11			24	2.7	29	72	26	32			2.2		3162	.22	70	70	11	47	1.5	283	8.8
Apr. 16-30, 1957 ...	9.6			16	2.2	20	46	17	24			1.5		3114	.16	46	46	9	48	1.3	206	8.5

a. Calculated from determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER NEAR MOSS BLUFF, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Chemical analyses, in parts per million, water year October 1950 to September 1971—Continued																						
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Per cent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
May 3-9, 11-12, 1957.....		11		29	2.9		17	97	15	19		1.2		a143	0.19		85	6	31	0.8	255	6.7
May 10, 13-20..		12		34	3.8		24	111	19	30		1.2		200	.27		101	10	34	1.1	319	6.7
May 21-31.....		12		45	3.4		26	138	24	30		1.8		231	.31		126	13	31	1.0	371	7.1
June 1-14.....		12		45	3.7		23	138	22	28		2.8		221	.30		128	14	28	.9	372	7.2
June 15-24, 27-31		11		47	4.2		30	141	22	41		3.0		240	.33		134	19	32	1.1	408	7.1
July 1-4, 8.....		11		51	4.2		35	151	29	46		3.5		a234	.35		144	21	35	1.3	459	7.6
July 11-20.....		12		48	3.9		34	143	26	44		3.5		a241	.33		136	19	35	1.3	435	7.9
July 21-22, 24-31		10		47	4.0		32	136	28	43		3.5		a234	.32		134	22	34	1.2	429	7.4
Aug. 1-8.....		13		46	3.7		37	144	26	44		3.0		a244	.33		130	12	38	1.4	425	7.9
Aug. 9-15.....		9.2		26	2.0		22	83	15	25		1.8		a142	.19		73	5	39	1.1	250	7.7
Aug. 16-31.....		13		46	3.8		88	144	24	48		2.2		248	.34		130	12	39	1.4	432	7.6
Sept. 2-10.....		13		51	4.2		49	170	28	57		2.8		300	.41		144	5	43	1.8	510	7.9
Sept. 11-20.....		7.0		49	4.4		53	160	26	68		1.0		298	.41		140	10	45	1.9	522	7.7
Sept. 21-27.....		6.0		46	4.2		54	145	28	72		.8		a139	.41		132	14	47	2.0	520	8.0
Sept. 28-30.....		5.8		19	1.5		30	62	14	37		2.0		a139	.19		54	3	55	1.8	254	7.3

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
OLD RIVER NEAR COVE, TEX.

LOCATION.--At Barber Hill Pumping Plant, 5 miles northwest of Cove, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to June 1957, and September 1957.
EXTREMES, 1956-57.--Dissolved solids: Maximum 11,300 ppm Oct. 14-29; minimum, 77 ppm Apr. 29, May 1-2.
Hardness: Maximum, 2,460 ppm Oct. 14-29; minimum, 34 ppm Apr. 29, May 1-2.
Specific conductance: Maximum daily, 18,000 microhos Oct. 15-17; minimum daily, 101 microhos Apr. 29.
EXTREMES, 1949-57.--Dissolved solids: Maximum 11,300 ppm Oct. 14-29, 1956; minimum, 77 ppm Apr. 29, May 1-2, 1957.
Hardness: Maximum, 2,460 ppm Oct. 14-29, 1956; minimum, 34 ppm Apr. 29, May 1-2, 1957.
Specific conductance: Maximum daily, 18,000 microhos Oct. 15, 17, 1956; minimum daily, 101 microhos Apr. 29, 1957.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Oct. 1-13, 1956 ..		15		218	251	2,490		191	619	4,390		--	--	8,080	10.99		1,580	1,420	77	27	13,200	8.0	
Oct. 14-29.....		14		354	384	3,400		174	868	6,240		--	--	11,300	15.37		2,460	2,320	75	30	17,900	7.8	
Oct. 30.....		--	--	--	--	--	--	355	150	1,180		--	--	--	--		110	--	--	--	--	973	8.1
Oct. 31.....		--	--	--	--	--	--	378	--	--		--	--	--	--		575	--	--	--	--	4,110	8.2
Nov. 1-13.....		12		270	226	2,160		206	554	3,940		--	--	7,260	9.87		1,600	1,430	75	23	11,900	7.9	
Nov. 14-20.....		12		104	61	794		183	239	1,300		6.5		2,610	3.55		510	360	77	15	4,480	7.7	
Nov. 21-30.....		13		82	49	540		148	166	910		4.2		1,840	2.50		406	284	74	12	3,350	8.1	
Dec. 1-3.....		10		155	191	1,820		164	470	3,200		--		5,930	8.06		1,170	1,040	77	23	10,000	8.0	
Dec. 4-25.....		20		69	51	527		107	151	910		.5		1,780	2.42		382	294	75	12	3,220	7.9	
Dec. 26-27, 30-31		26		44	19	186		95	71	312		1.5		706	.96		188	110	68	5.9	1,300	7.8	
Dec. 28-29.....																							
Jan. 1-12, 1957...		12		64	23	330		128	105	535		1.8		1,130	1.54		254	149	74	9.0	2,090	7.9	
Jan. 13-19, 21...		11		88	31	463		151	149	760		3.0		1,580	2.15		346	222	74	11	2,870	7.9	
Jan. 22-31.....																							
Feb. 1-4.....		12		105	65	732		168	208	1,250		5.5		2,460	3.35		530	392	75	14	4,360	8.2	
Feb. 5-18.....		9.2		83	37	505		163	166	810		11		1,700	2.31		359	226	75	12	3,120	8.1	
Feb. 19-27.....		8.2		19	5.8	81		54	31	119		3.0		294	.40		71	27	71	4.2	561	7.5	
Feb. 28, Mar. 1-8		12		42	11	147		106	51	232		4.2		551	.75		150	63	68	5.2	1,020	8.0	
Mar. 9-17.....		14		43	8.8	138		93	58	215		6.0		529	.72		144	68	68	5.0	963	7.8	
Mar. 18-28.....		12		19	3.4	35		57	19	49		1.2		167	.23		61	15	55	1.9	296	7.4	
Mar. 29-31.....																							
Apr. 1-3, 6-12...		17		19	3.3	32		67	14	43		2.8		164	.22		62	7	53	1.8	292	7.1	
Apr. 4-5, 13.....		14		16	2.5	19		53	10	25		2.2		115	.16		49	6	46	1.2	204	7.0	
Apr. 14-22, 28....		16		21	3.4	35		72	17	45		2.0		174	.24		66	7	53	1.9	308	7.1	

TRINITY RIVER BASIN--Continued

OLD RIVER NEAR COVE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Per- cent so- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate	
Apr. 23-27, 1957.		16		24	4.5	45		85	17	61		3.0		212	0.29		79	9	55	2.2	383	7.3
Apr. 28, May 1-2		11		11	1.7	12		44	5.4	12		1.5		77	.10		34	0	43	.9	131	6.8
Apr. 30		--		--	--	--	--	120	--	177		--		--	--		149	50	--	--	833	7.6
May 3-10		16		17	2.8	20		74	6.4	20		2.5		121	.16		53	0	46	1.2	208	7.0
May 11-20		15		18	2.9	21		80	6.6	19		2.8		124	.17		56	0	45	1.2	209	7.2
May 21-31		16		24	3.3	21		97	9.6	20		2.0		144	.20		73	0	39	1.1	250	7.3
June 1-9		10		33	4.7	39		125	19	45		2.0		a238	.32		102	0	46	1.7	396	7.8
June 10		--		--	--	--	--	289	--	101		--		--	--		134	0	--	--	614	8.2
June 11-25		16		36	5.0	41		140	19	45		1.2		a242	.33		110	0	45	1.7	405	7.9
June 26-30		15		22	2.9	21		79	11	25		2.0		138	.19		67	2	41	1.1	235	7.4
Sept. 9-23		14		46	5.0	55		158	24	71		1.0		a306	.42		136	6	47	2.1	525	8.2
Sept. 24-30		15		28	4.0	29		100	17	35		.8		a195	.27		86	4	42	1.4	309	8.0

a Residue on evaporation at 180°C

TRINITY RIVER BASIN--Continued
TRINITY RIVER AT ANAHUAC, TEX.

LOCATION:--At Lone Star Pumping Plant in Anahuac, Chambers County.

RECORDS AVAILABLE:--Chemical analyses: Short periods during summers of 1946 to 1949, December 1949 to September 1957.

EXTREMES, 1956-57:--Hardness: Maximum, 4,140 ppm Oct. 1, 8, 15; minimum, 61 ppm Sept. 30.

Specific conductance: Maximum daily, 36,300 micromhos Oct. 1; minimum daily, 236 micromhos May 1.

EXTREMES, 1949-57:--Dissolved solids (1949-56): Maximum, 18,400 ppm Aug. 1-31, 1956; minimum, 140 ppm Apr. 12-19, 1955.

Hardness: Maximum, 4,140 ppm Oct. 1, 8, 15, 1956; minimum, 45 ppm Apr. 12-19, 1955.

Specific conductance: Maximum daily, 36,300 micromhos Oct. 1, 1956; minimum daily, 199 micromhos Apr. 15, 1955.

REMARKS:--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bor- on (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium adsorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non-carbon- ate				
Oct. 1, 8, 15, 1956...		--		--	--	--	--	124	--	12,100		--		--	--	--	4,140	--	--	32,600	8.1	
Oct. 22, 29 ..		--		--	--	--	--	158	--	8,860		--		--	--	--	3,100	--	--	24,800	7.7	
Nov. 6, 12, 19, 26...		--		--	--	--	--	153	--	4,710		--		--	--	--	1,670	--	--	14,500	7.6	
Dec. 3, 17		--		--	--	--	--	133	--	8,630		--		--	--	--	2,960	--	--	24,300	7.9	
Dec. 10		--		--	--	--	--	144	--	3,820		--		--	--	--	1,410	--	--	11,900	8.0	
Dec. 24		--		--	--	--	--	144	--	1,970		--		--	--	--	745	--	--	6,670	8.0	
Dec. 31		--		--	--	--	--	117	--	840		--		--	--	--	348	--	--	3,060	7.9	
Jan. 7, 14, 1957...		--		--	--	--	--	122	--	8,180		--		--	--	--	2,710	2,610	--	22,800	8.1	
Jan. 9	8.6			98	129	1,280		112	352	2,200	3.7			4,130	5.62		775	683	78	7,210	7.5	
Jan. 21, 28		--		--	--	--	--	151	--	8,180		--		--	--	--	2,710	2,590	--	22,700	8.0	
Feb. 4		--		--	--	--	--	143	--	1,050		--		--	--	--	400	283	--	3,870	8.2	
Feb. 11		--		--	--	--	--	136	--	540		--		--	--	--	210	98	--	2,140	8.0	
Feb. 18		--		--	--	--	--	106	--	4,280		--		--	--	--	1,440	1,350	--	13,000	8.0	
Feb. 25		--		--	--	--	--	104	--	3,280		--		--	--	--	1,200	1,020	--	10,500	7.8	
Mar. 4		--		--	--	--	--	105	--	2,820		--		--	--	--	1,000	914	--	8,950	7.9	
Mar. 11		--		--	--	--	--	91	--	830		--		--	--	--	318	244	--	2,930	8.0	
Mar. 18		--		--	--	--	--	80	--	275		--		--	--	--	114	48	--	1,150	7.7	
Mar. 25		--		--	--	--	--	72	--	208		--		--	--	--	108	49	--	873	7.8	
Apr. 1, 3, 8, 10, 12, 15		13		34	3.6	51		98	31	66	4.8			a 251	.34		100	19	52	455	7.0	
Apr. 17, 19, 22, 24, 26, 29		11		28	2.2	47		74	27	63	3.3			a 218	.30		79	18	56	2.3	405	6.9
May 1, 3, 6, 8, 10, 13, 15		14		27	2.9	31		85	19	40	1.5			a 177	.24		79	10	46	1.5	315	7.2

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ANAHUAC, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio	Specific conductance (micro-mhos at 25 C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
May 17, 20, 22, 24, 27, 28, 31, 1957.....	16			40	3.5		26	125	24	29		1.5		a 201	0.27		114	11	33	1.1	345	7.6
June 3, 5, 7, 10, 12, 14.....	15			47	3.8		29	140	24	39		2.0		240	.33		133	18	32	1.1	391	7.3
June 17, 19, 21, 24, 26, 28.....	13			47	3.7		28	142	24	36		2.5		236	.32		132	16	32	1.1	386	7.3
July 1, 3, 5, 8, 10, 12, 15.....	18			48	4.4		39	148	25	53		2.0		270	.37		138	17	38	1.5	468	7.8
July 17, 19, 22, 26, 29, 31.....	17			49	3.8		50	140	31	69		2.0		308	.42		138	23	44	1.8	524	7.8
Aug. 12, 14, 16, 19, 21, 23.....	11			34	2.8		41	100	30	51		2.0		a 221	.30		96	15	48	1.8	376	7.8
Aug. 2, 5, 7, 9, 26, 28, 30.....	14			47	4.0		61	141	29	85		2.5		341	.46		134	18	50	2.3	566	8.0
Sept. 2.....	--			--	--		156	180	46	228		--		--	--		178	30	66	5.1	1,110	8.1
Sept. 4, 6, 9, 11, 13, 16.....	14			56	4.6		91	167	35	129		1.5		424	.58		158	22	56	3.1	742	8.2
Sept. 18.....	--			--	--		488	172	120	780		--		--	--		370	229	13	10	2,830	8.1
Sept. 20.....	--			--	--		40	164	25	46		--		--	--		138	4	39	1.5	458	8.2
Sept. 21.....	--			--	--		181	181	50	272		--		--	--		191	42	67	5.7	1,220	8.2
Sept. 25.....	--			--	--		127	166	43	185		--		--	--		165	29	63	4.3	960	8.1
Sept. 27.....	--			--	--		69	137	33	93		--		--	--		127	14	54	2.7	601	8.0
Sept. 30.....	--			--	--		42	64	18	58		--		--	--		61	9	60	2.4	334	7.7

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
TRINITY BAY AT MOUTH OF TRINITY RIVER, NEAR ANAHUAC, TEX.

LOCATION.--At four sampling stations in Trinity Bay opposite mouth of Trinity River, near Anahuac, Chambers County. Station 2: In Anahuac Channel immediately below delta. Station 3: In Anahuac Channel about 1½ miles southwest of Station 2. Station 6: In Anahuac Channel at south end. Station 7: In Trinity Bay about 1½ miles west of Station 6.

RECORDS AVAILABLE.--Chemical analyses: October 1950 to September 1957.

Date of collection	Station 2				Station 3				Station 6				Station 7			
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
Oct. 1, 1956	29,100	11,000	29,400	11,100	32,200	12,500	32,200	12,400	32,200	12,400	32,200	12,400	32,200	12,400	32,200	12,400
Oct. 8	32,800	12,300	32,600	11,900	32,700	12,300	32,700	12,100	32,700	12,100	32,700	12,100	32,700	12,100	32,700	12,100
Oct. 15	35,300	13,500	35,200	13,400	35,200	13,400	35,200	13,400	35,200	13,400	35,200	13,400	35,200	13,400	35,200	13,400
Oct. 22	24,600	8,870	24,800	8,970	24,800	8,970	24,800	8,970	24,800	8,970	24,800	8,970	24,800	8,970	24,800	8,970
Oct. 29	36,300	13,900	36,200	13,900	36,200	13,900	36,200	13,900	36,200	13,900	36,200	13,900	36,200	13,900	36,200	13,900
Nov. 6	33,200	12,500	33,200	12,500	33,200	12,500	33,200	12,500	33,200	12,500	33,200	12,500	33,200	12,500	33,200	12,500
Nov. 12	10,300	3,200	10,300	3,170	10,300	3,170	10,300	3,170	10,300	3,170	10,300	3,170	10,300	3,170	10,300	3,170
Nov. 19	10,200	3,220	12,500	4,040	12,500	4,040	12,500	4,040	12,500	4,040	12,500	4,040	12,500	4,040	12,500	4,040
Nov. 26	10,500	3,320	10,600	3,370	10,600	3,370	10,600	3,370	10,600	3,370	10,600	3,370	10,600	3,370	10,600	3,370
Dec. 3	25,300	9,170	28,900	10,600	28,900	10,600	28,900	10,600	28,900	10,600	28,900	10,600	28,900	10,600	28,900	10,600
Dec. 10	22,100	7,800	21,800	7,800	21,800	7,800	21,800	7,800	21,800	7,800	21,800	7,800	21,800	7,800	21,800	7,800
Dec. 17	31,500	11,700	31,100	11,600	31,100	11,600	31,100	11,600	31,100	11,600	31,100	11,600	31,100	11,600	31,100	11,600
Dec. 24	6,610	1,980	6,580	1,980	6,580	1,980	6,580	1,980	6,580	1,980	6,580	1,980	6,580	1,980	6,580	1,980
Dec. 31	2,980	800	2,980	820	2,980	820	2,980	820	2,980	820	2,980	820	2,980	820	2,980	820
Jan. 7, 1957	27,400	10,200	26,500	9,900	26,500	9,900	26,500	9,900	26,500	9,900	26,500	9,900	26,500	9,900	26,500	9,900
Jan. 14	17,900	6,240	28,600	10,800	28,600	10,800	28,600	10,800	28,600	10,800	28,600	10,800	28,600	10,800	28,600	10,800
Jan. 21	29,800	11,300	29,900	11,300	29,900	11,300	29,900	11,300	29,900	11,300	29,900	11,300	29,900	11,300	29,900	11,300
Jan. 28	19,900	7,060	15,900	5,400	15,900	5,400	15,900	5,400	15,900	5,400	15,900	5,400	15,900	5,400	15,900	5,400
Feb. 4	3,010	800	4,320	1,230	4,320	1,230	4,320	1,230	4,320	1,230	4,320	1,230	4,320	1,230	4,320	1,230
Feb. 11	2,100	542	2,160	562	2,160	562	2,160	562	2,160	562	2,160	562	2,160	562	2,160	562
Feb. 18	21,300	7,600	10,700	3,420	10,700	3,420	10,700	3,420	10,700	3,420	10,700	3,420	10,700	3,420	10,700	3,420
Feb. 25	12,000	3,940	4,430	1,320	4,430	1,320	4,430	1,320	4,430	1,320	4,430	1,320	4,430	1,320	4,430	1,320
Mar. 4	1,420	350	1,420	348	1,420	348	1,420	348	1,420	348	1,420	348	1,420	348	1,420	348
Mar. 11	4,960	1,480	2,790	770	2,790	770	2,790	770	2,790	770	2,790	770	2,790	770	2,790	770
Mar. 18	906	193	916	199	916	199	916	199	916	199	916	199	916	199	916	199
Mar. 25	705	164	691	166	691	166	691	166	691	166	691	166	691	166	691	166

TRINITY RIVER BASIN--Continued
TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Station 2		Station 3		Station 6		Station 7	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
Apr. 1, 1957	512	61	580	91	446	59	454	60
Apr. 3	503	71	476	60	580	94	1,030	224
Apr. 5	535	77	531	73	476	61	626	96
Apr. 8	370	62	411	71	417	76	439	84
Apr. 10	363	60	362	60	413	72	470	81
Apr. 12	396	67	600	126	415	72	472	79
Apr. 15	65	65	647	110	546	76	608	95
Apr. 17	696	128	491	66	550	80	518	72
Apr. 19	492	65	473	65	512	71	530	75
Apr. 22	410	81	372	70	367	69	473	96
Apr. 24	529	105	432	83	386	69	389	69
Apr. 26	403	77	395	72	379	68	402	71
Apr. 29	332	59	281	45	--	--	255	39
May 1	367	74	261	41	289	36	251	39
May 3	317	45	259	28	236	38	287	31
May 6	290	37	276	32	336	62	286	34
May 8	272	34	387	65	270	31	260	30
May 10	263	30	279	32	266	30	279	32
May 12	420	67	332	38	291	28	334	41
May 15	348	29	315	29	328	35	315	30
May 20	345	30	465	67	372	36	414	49
May 22	374	34	353	32	502	70	375	34
May 24	365	34	373	36	444	56	372	35
May 27	318	31	328	39	610	32	279	30
May 29	386	36	391	39	614	96	450	52
May 31	432	47	405	39	390	37	391	38
June 3	423	39	419	40	419	40	--	--
June 5	411	40	438	51	485	63	412	42
June 7	488	67	389	39	409	44	444	39
June 10	398	42	427	50	397	43	387	40
June 12	514	75	506	58	404	42	390	40
June 14	398	36	382	36	382	36	385	35
June 17	545	63	484	42	415	41	405	37
June 19	462	40	443	40	391	36	381	35

June 21, 1957	414	38	397	407	43
June 24	--	--	391	408	44
June 26	49	46	434	405	40
June 28	88	90	490	494	91
July 1	444	45	445	464	52
July 3	446	45	441	456	45
July 5	483	50	453	503	58
July 8	471	53	462	484	53
July 10	466	54	523	470	53
July 12	499	60	512	572	76
July 15	480	52	614	487	54
July 17	517	59	491	503	57
July 19	549	73	577	513	82
July 22	513	67	566	526	87
July 23	558	76	544	544	73
July 26	564	81	558	528	72
July 29	540	71	517	526	89
July 31	612	98	560	646	94
Aug. 2	539	78	544	585	86
Aug. 5	551	81	578	553	82
Aug. 7	651	99	628	642	101
Aug. 9	588	88	568	578	88
Aug. 12	445	52	389	487	70
Aug. 14	357	47	337	337	44
Aug. 16	384	56	386	411	62
Aug. 19	346	48	332	336	45
Aug. 21	438	65	387	383	53
Aug. 23	569	101	516	478	69
Aug. 26	539	78	518	502	70
Aug. 28	537	99	513	560	82
Aug. 30	620	98	622	635	101

TRINITY RIVER BASIN--Continued
TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.--Continued

Specific conductance (micromhos at 25°C) and chloride, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Station 2		Station 3		Station 6		Station 7	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
Sept. 2, 1957.....	615	96	628	98	621	97	639	101
Sept. 4, Sept. 6, Sept. 9, Sept. 11, Sept. 13, Sept. 16, Sept. 18, Sept. 20, Sept. 23, Sept. 25, Sept. 27, Sept. 30,	443 757 665 930 776 763 4,160 1,030 1,320 849 581 337	45 128 102 182 134 127 1,220 202 290 156 96 59	443 690 677 912 764 752 4,330 1,000 1,300 843 581 340	46 110 105 166 132 127 1,240 202 288 155 96 58	-- 680 666 862 777 764 4,330 971 1,350 818 583 333	-- 112 102 160 136 131 1,240 190 302 147 95 56	480 787 658 796 734 773 4,440 1,150 1,430 806 589 342	58 141 102 139 121 131 1,270 245 322 143 95 59

MISCELLANEOUS ANALYSES OF STREAMS IN TRINITY RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
NORTH CHANNEL TEHUACANA CREEK AT FM ROAD 488 NEAR FAIRFIELD																						
Nov. 5, 1956		5.4		33	11	450		44	24	738	0.5	2.8		1,290	1.75		128	92	88	17	2,430	6.8
Jan. 10, 1957		.9		194	71	1,800		77	84	3,220	--	--		5,410	7.36		775	712	83	28	9,520	7.3
Feb. 22		4.0		22	9.8			87	20	550	.6	.8		1,010	1.37		96	24	89	16	1,910	7.2
Mar. 19		.9		41	16	576		90	58	910	.5	.8		1,650	2.24		168	94	88	19	3,090	7.8
Mar. 27		9.6		18	5.8			192	60	15	298	.6	1.2	570	.78		69	20	86	10	1,090	7.2
June 4		8.0		69	23	254		69	50	500	--	5.7		944	1.28		266	210	67	6.8	1,780	6.6
SOUTH CHANNEL TEHUACANA CREEK AT FM ROAD 488 NEAR FAIRFIELD																						
Nov. 5, 1956		6.4		19	7.7	298		59	26	460	0.4	3.0		850	1.16		79	30	89	15	1,590	6.9
Feb. 22, 1957		9.2		14	3.6	71		50	24	95	.8	2.8		245	.33		50	9	76	4.4	453	6.7
Mar. 19		9.0		19	5.5	97		64	34	133	.6	2.8		332	.45		69	16	75	5.1	611	7.5
Mar. 27		13		13	4.5	66		59	18	86	.6	5.7		236	.32		51	9	74	4.0	431	6.6
June 4		7.2		49	17	166		70	47	315	--	2.5		638	.87		192	135	65	5.2	1,220	7.5

BRAZOS RIVER BASIN

DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION. --At gaging station at bridge on U. S. Highway 83, 8 miles downstream from Mountain Creek, and 10 miles south of Aspermont, Stonewall County. DRAINAGE AREA. --7,980 square miles, approximately, of which 6,470 square miles is probably noncontributing.

RECORDS AVAILABLE. --Chemical analyses: October 1948 to November 1951, and October 1956 to September 1957.

Water temperatures: November 1949 to November 1951, October 1956 to September 1957.

Sediment records: November 1949 to September 1951.

EXTREMES, 1956-57. --Dissolved solids: Maximum, 4,420 ppm July 9-16; minimum, 689 ppm June 1-7, 13-14, 19-20.

Hardness: Maximum, 2,150 ppm Oct. 1-15; minimum, 220 ppm Aug. 20-21.

Specific conductance: Maximum daily, 6,580 micromhos July 10; minimum daily, 798 micromhos Apr. 30.

Water temperatures: Maximum, 86°F June 8; minimum, freezing point Jan. 16.

EXTREMES, 1948-51. 1956-57. --Dissolved solids: Maximum, 4,740 ppm Aug. 5, 8, 1951; minimum, 646 ppm May 11, 12-13, 1950.

Hardness: Maximum, 2,510 ppm Aug. 5, 8, 1951; minimum, 220 ppm Sept. 9-10, 1948, Aug. 20-21, 1957.

Specific conductance: Maximum daily, 7,200 micromhos Feb. 18, 1949; minimum daily, 798 micromhos Apr. 30, 1957.

Water temperatures (1949-51. 1956-57). Minimum, freezing point Jan. 4, 1950, Jan. 29, 1951, Jan. 16, 1957.

Sediment concentrations (1949-51). Maximum daily, 77,700 ppm May 19, 1951; minimum daily, no flow on many days.

Sediment loads (1949-51). Maximum daily, 565,000 tons May 11, 1950; minimum daily, 0 tons on many days.

REMARKS. --Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bor- on (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	So- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-15, 1956..	a.0.31	17	698	99	563	98	2,010	850	1.5	4,290	5.83	3.59	2,150	2,070	36	5.340	7.6					
Oct. 16-19, 29-31	59.9	12	324	30	134	83	1,861	182	2.8	1,590	2.16	257	832	864	24	1.9	2,050	7.5				
Oct. 20-28	0	12	688	93	525	132	1,910	810	1.2	4,100	5.58	--	2,100	1,960	35	5.210	7.5					
Nov. 1-2	20.7	14	288	27	154	74	1,770	212	4.0	1,500	2.04	83.8	830	769	29	2.3	2,060	7.4				
Nov. 3-15	a.13	12	624	70	448	135	1,680	680	1.8	3,580	4.87	1.26	1,840	1,730	35	4.450	7.7					
Nov. 16-30	0	9.0	712	85	464	145	1,920	720	1.8	3,980	5.41	--	2,130	2,010	32	4.4	4,820	7.8				
Dec. 1-10	0	12	676	80	530	134	1,880	780	2.0	4,030	5.48	--	2,020	1,910	36	4.940	7.8					
Dec. 11-18	0	10	708	82	476	142	1,940	710	1.5	4,000	5.44	--	2,100	1,960	33	4.5	4,840	7.7				
Dec. 19-21	7.53	6.4	270	19	99	56	724	118	1.8	1,270	1.73	25.8	732	708	22	1.6	1,820	7.4				
Dec. 22-31	a.11	11	516	57	339	129	1,390	500	2.5	2,860	3.92	--	1,520	1,420	33	3.8	3,610	7.7				
Jan. 1-10, 1957..	0	10	571	67	394	137	1,520	610	4.1	3,240	4.41	--	1,700	1,590	34	4.2	4,120	7.8				
Jan. 11-20	0	7.8	597	69	392	148	1,590	600	4.0	3,330	4.53	--	1,770	1,660	32	4.0	4,140	7.5				
Jan. 21-31	0	6.4	595	81	366	150	1,630	580	3.5	3,320	4.52	--	1,820	1,690	30	3.7	4,140	7.5				
Feb. 1-5	0	8.6	575	70	404	135	1,470	680	8	3,270	4.44	--	1,720	1,610	34	4.2	4,410	8.2				
Feb. 6-8, 10-11	1,070	13	174	17	142	123	1,467	158	4.2	1,040	1.41	3,000	504	403	38	2.8	1,540	7.9				

Feb. 9, 15-28, 1957	70.5	13	480	64	752	133	1,270	1,180	1.5	3,830	5.18	729	1,460	1,350	53	8.6	5,650	7.9
Feb. 12-14	52.7	11	174	23	309	118	490	420	3.2	1,490	2.03	212	528	432	56	5.8	2,430	8.0
Mar. 1-19	a. 59	15	655	87	674	131	1,780	1,060	1.0	4,340	5.90	6.91	1,980	1,880	42	6.6	5,800	7.9
Mar. 20-22	35.1	9.2	290	21	104	67	738	150	1.8	1,350	1.84	128	810	755	22	1.6	1,810	7.6
Mar. 23-31	56	13	580	70	386	152	1,480	660	.5	3,270	4.45	4.94	1,740	1,610	33	4.1	4,400	7.9
Apr. 1-2, 5-18	13.1	14	560	71	523	102	1,510	830	1.5	3,560	4.84	126	1,690	1,610	40	5.5	4,820	7.4
Apr. 3-4	86.5	20	308	27	288	85	854	385	4.5	1,930	2.62	451	880	810	42	4.2	2,580	7.7
Apr. 19-24	407	15	238	22	203	119	618	272	1.8	1,430	1.94	1,570	685	588	39	3.4	2,070	7.8
Apr. 25-30	2,948	15	168	15	74	115	418	78	1.5	889	1.21	7,070	480	386	25	1.5	1,180	7.4
May 1-4, 9-10	962	13	175	13	87	99	439	98	4.0	1,878	1.19	2,280	480	409	28	1.7	1,280	7.7
May 5-8	100	16	196	22	222	117	536	288	2.5	1,340	1.82	362	580	484	45	4.0	2,060	7.9
May 11-21	2,928	13	133	13	85	108	358	75	2.5	1,780	1.06	6,160	385	296	32	1.9	1,090	7.7
May 22-24, 26-29	545	12	190	21	143	109	504	180	2.5	1,110	1.51	1,630	560	470	36	2.6	1,690	7.8
May 25, 30-31	3,055	9.8	194	9.0	20	72	450	24	2.5	787	1.07	6,490	520	461	8	.4	982	7.4
June 1-7, 13-14,																		
19-20	2,849	16	104	14	89	122	273	87	4.2	688	.94	5,300	317	217	38	2.2	1,020	7.8
June 8-12	390	20	129	19	166	119	350	210	3.5	1,030	1.40	1,080	400	302	47	3.6	1,550	7.8
June 15-18, 23-25,																		
28-29	582	17	171	24	237	117	486	302	1.8	1,310	1.78	2,060	525	429	50	4.5	2,020	7.8
June 21-22, 26-27	248	15	105	15	165	114	320	179	3.2	810	1.24	609	324	230	53	4.0	1,360	7.9
June 30, July 1-8	23.0	22	384	61	688	88	1,120	1,040	1.5	3,360	4.57	209	1,210	1,140	55	8.6	5,050	7.7
July 9-16	4.62	26	588	83	787	59	1,720	1,190	1.6	4,420	6.01	55.1	1,810	1,760	49	8.0	6,020	7.5
July 17-23	1.27	22	588	83	506	61	1,770	720	2.2	3,720	5.06	12.8	1,810	1,760	38	5.2	4,760	7.4
July 24, 27-31	172	15	178	21	231	101	538	275	2.0	1,310	1.78	608	530	448	49	4.4	1,990	7.6
July 25-26	1,730	14	160	16	95	88	440	97	4.2	907	1.23	4,240	465	393	31	1.9	1,270	7.6

a Includes days of less than 0.05 cfs flow.

b Calculated from determined constituents.

c Residue on evaporation at 180°C.

BRAZOS RIVER BASIN--Continued

DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR ASPERMONT, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium ad- sorpt- ion ratio	Specific conductance (micro-mhos at 25° C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Aug. 1-10, 1957..	23.4	18		333	44	504		111	973	710		3.9	2,640	3.59	187	1,010	921	52	6.9	3,880	7.7
Aug. 11-14, 22-26	42.4	16		223	24	283		115	656	348		2.5	1,610	2.19	184	1,655	561	48	4.8	2,400	7.9
Aug. 15-19, 27-28	87.5	19		360	50	520		98	1,140	720		1.2	2,880	3.92	680	1,150	1,070	49	6.6	4,110	8.0
Aug. 20-21	402	20		70	11	162		140	230	152		3.5	720	.98	781	220	105	62	4.7	1,170	8.2
Aug. 29-31	a. 18	20		576	77	493		109	1,680	700		.2	3,600	4.90	1.75	1,750	1,660	38	5.1	4,650	7.9
Sept. 1-7																					
Sept. 8-9, 11-12, 15-19	270	13		179	20	157		107	454	218		2.5	1,100	1.50	802	528	441	39	3.0	1,720	7.7
Sept. 10, 13-14 ..	271	14		107	13	103		117	290	98		9.7	742	1.01	543	320	224	41	2.5	1,070	7.6
Sept. 20-30	1.85	15		456	59	460		107	1,280	680		.5	3,000	4.08	13.0	1,360	1,290	42	5.4	4,130	7.7
Weighted average	352	14		152	16	110		110	400	123		3.0	910	1.24	865	445	355	35	2.3	1,300	--

a Includes days of less than 0.05 cfs flow.

BRAZOS RIVER BASIN--Continued

DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR ASPERMONT, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	79	62	--	41	--	53	69	66	71	82	75	60
2	71	59	53	43	50	64	70	72	65	82	83	72
3	78	55	--	55	53	66	65	71	64	81	79	63
4	77	51	53	56	--	58	60	60	69	82	79	60
5	78	59	56	53	--	58	63	66	76	78	73	62
6	76	60	59	53	51	48	65	70	81	81	73	60
7	71	52	45	58	58	57	67	70	84	80	75	59
8	--	54	39	60	63	60	60	74	86	79	74	54
9	72	56	42	--	66	63	62	71	84	78	76	74
10	74	60	49	41	62	68	66	70	84	81	--	61
11	76	60	53	51	63	68	64	66	84	81	75	--
12	78	--	47	54	62	65	41	67	78	80	61	--
13	76	61	--	58	64	61	42	69	78	82	70	--
14	78	68	47	41	67	62	52	74	84	82	71	--
15	74	--	49	39	62	61	58	76	83	76	68	--
16	71	50	52	32	56	63	67	82	82	73	79	--
17	69	52	49	38	54	63	69	73	79	79	80	--
18	70	61	--	41	53	62	71	68	72	76	66	--
19	73	62	41	47	50	61	68	74	75	--	71	--
20	71	--	53	53	52	57	69	78	70	78	70	74
21	68	49	55	55	58	62	70	80	79	74	69	70
22	69	51	51	50	46	66	73	78	80	75	68	64
23	68	49	49	--	47	50	69	71	78	77	68	68
24	68	51	41	52	62	51	75	76	79	66	69	69
25	62	52	48	39	62	52	65	76	79	69	70	69
26	61	--	51	38	57	53	61	76	80	73	70	76
27	68	55	51	--	52	51	65	79	77	60	67	75
28	68	44	52	39	51	57	62	79	79	73	61	74
29	72	47	54	41	--	60	61	80	82	79	62	74
30	65	--	54	40	--	62	63	81	82	80	62	75
31	64	--	51	47	--	65	--	73	--	75	61	--
Average	72	55	50	47	57	60	64	73	78	77	71	--

BRAZOS RIVER BASIN--Continued
SALT FLAT CREEK AT WEIR B, NEAR ASPERMONT, TEX.

LOCATION.--At mouth, about 20 miles northwest of Aspermont, Stonewall County.
RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Specific conductance (micro- mhos at 25°C)	pH	Density ^a (gm/ml 20°C)
													Parts per million	Tons per acre- foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 9, 1956 . . .	a 0.22					91,400	--	--	3,040	145,000						9,820	--	95	--	--	1.185
Oct. 18 . . . . .	.24					88,900	--	--	3,210	138,000						8,830	--	96	--	--	1.178
Oct. 20 . . . . .	.40					80,400	--	--	3,370	126,000						9,040	--	95	--	--	1.162
Oct. 25 . . . . .	.23					93,500	--	--	3,230	146,000						10,100	--	95	--	--	1.189
Nov. 9 . . . . .	.27					89,500	364	36	3,180	142,000						9,860	9,830	95		7.5	1.182
Nov. 22 . . . . .	.50					90,700	363	32	3,170	144,000						9,970	9,940	95		7.3	1.183
Dec. 7 . . . . .	.30					90,100	--	--	3,010	146,000						10,000	--	95	--	--	1.181
Dec. 20 . . . . .	.72					66,300	--	--	3,970	105,000						8,790	--	94	--	--	1.132
Jan. 11, 1957 . . .	.43					88,100	--	--	3,190	142,000						9,830	--	95	--	--	1.180
Jan. 24	a .44					86,400	--	--	3,060	139,000						10,100	--	95	--	--	1.179
Feb. 20 . . . . .	.60					68,300	--	--	3,540	108,000						8,400	--	95	--	--	1.137
Mar. 7 . . . . .	.41					88,300	--	--	3,250	143,000						9,480	--	95	--	--	1.176
May 15 . . . . .	.47					70,300	--	--	3,300	113,000						8,800	--	95	--	--	1.142
June 25 . . . . .	.60					77,000	--	--	3,460	121,000						9,350	--	95	--	--	1.155
July 11 . . . . .	.43					91,700	--	--	3,080	146,000						10,200	--	95	--	--	1.187
July 23 . . . . .	.73					79,300	--	--	3,620	124,000						8,620	--	95	--	--	1.160
Aug. 21 . . . . .	.62					91,100	--	--	3,050	143,000						9,530	--	95	--	--	1.186
Sept. 11	1.01					86,400	--	--	2,980	138,000						9,080	--	95	--	--	1.178
Sept. 27 . . . . .	.36					89,300	--	--	3,110	143,000						8,950	--	96	--	--	1.184

^a Field estimate.

^b Values expressed in parts per million should be multiplied by the density when computing loads.

BRAZOS RIVER BASIN--Continued
SALT CROTON (DOVE) CREEK, AT WEIR C, NEAR ASPERMONT, TEX.

LOCATION --Half a mile downstream from Salt Flat Creek, about 20 miles northwest of Aspermont, Stonewall County.
RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃	Percent sodium	Specific conductance (micro- mhos at 25°C)	pH	Density (gm/ml at 20°C)
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non- carbon- ate			
Oct. 9, 1956	a 0.47					96,400	--	--	3,100	153,000							9,430	--	--	--	1.198
Oct. 18	a 1.20					94,600	--	--	3,150	148,000							9,640	--	--	--	1.193
Oct. 20	a 1.65					26,200	--	--	2,440	40,500							4,100	--	81,200	--	1.049
Oct. 25 .....	.82					86,100	--	--	3,400	134,000							9,040	--	--	--	1.173
Nov. 9	a. 69					84,300	312	42	3,230	137,000							8,880	8,850	95	7.4	1.171
Nov. 22 .....	.66					93,400	337	35	3,150	147,000							9,180	9,150	95	7.5	1.188
Dec. 7 .....	.70					93,400	--	--	3,330	146,000							9,470	--	--	--	1.188
Dec. 20	2.25					31,600	--	--	2,770	50,200							5,210	--	--	--	1.066
Jan. 11, 1957 ...	.64					93,300	--	--	3,300	147,000							9,320	--	--	--	1.186
Jan. 24 .....	.71					81,900	--	--	3,320	147,000							9,240	--	--	--	1.185
Feb. 20	1.50					69,500	--	--	3,480	112,000							9,060	--	--	--	1.141
Mar. 7 .....	.74					72,600	--	--	3,100	111,000							7,820	--	--	--	1.144
Mar. 22 .....	.96					46,400	--	--	3,010	73,000							6,060	--	--	--	1.089
Apr. 9 .....	.68					92,800	--	--	3,430	147,000							9,650	--	--	--	1.186
May 15 .....	.70					56,300	--	--	2,860	88,800							7,370	--	--	--	1.112
June 25 .....	.88					55,600	--	--	2,800	87,400							7,120	--	--	--	1.110
July 11 .....	.86					95,500	--	--	3,410	150,000							9,740	--	--	--	1.191
July 23	1.01					73,400	--	--	3,770	115,000							8,100	--	--	--	1.148
Aug. 21 .....	.62					94,000	--	--	2,820	150,000							8,800	--	--	--	1.193
Sept. 11 .....	.86					87,500	--	--	2,970	140,000							8,470	--	--	--	1.180
Sept. 27 .....	.56					92,400	--	--	3,150	146,000							8,590	--	--	--	1.187

a. Field estimate.

b. Values expressed in parts per million should be multiplied by the density when computing loads.

BRAZOS RIVER BASIN--Continued

SALT CROTON (DOVE) CREEK, AT WEIR D, NEAR ASPERMONT, TEX.

LOCATION.--About 500 feet upstream from Haystack (Hayrick) Creek, 1,000 feet upstream from gaging station, and about 20 miles northwest of Aspermont, Stonebriar County.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Specific conductance (micro- mhos at 25°C)	pH	Density (gm/ml at 20°C)
														Parts per million	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non- carbon- ate				
Oct. 9, 1956 ...	a 0.33					97,200	--	--	2,800	157,000							10,100	--	95	--	--	1.203
Oct. 18 ...	a 0.84					98,400	--	--	2,900	158,000							9,890	--	96	--	--	1.203
Oct. 19 ...	a 2.20					28,700	--	--	2,490	45,900							4,170	--	93	89,200	--	1.056
Oct. 24 ...	a 0.69					58,500	--	--	3,500	91,600							7,270	--	95	--	--	1.114
Nov. 9 ...	a 0.78					73,700	96	48	3,340	118,000							8,080	--	95	--	7.8	1.145
Nov. 22 ...	a 0.60					96,200	348	38	2,890	152,000							9,210	9,180	96	--	7.5	1.195
Dec. 7 ...	a 0.57					96,600	--	--	3,050	154,000							9,480	--	96	--	--	1.195
Dec. 20 ...	a 2.36					42,500	--	--	2,590	87,000							5,220	--	95	--	--	1.082
Jan. 11, 1957 ...	a 0.53					95,400	--	--	3,420	150,000							9,660	--	96	--	--	1.190
Jan. 24 ...	a 0.71					94,700	--	--	3,250	148,000							9,420	--	96	--	--	1.189
Feb. 20 ...	a 1.62					68,800	--	--	3,120	111,000							7,680	--	95	--	--	1.136
Mar. 7 ...	a 0.69					61,400	--	--	3,160	95,400							7,050	--	95	--	--	1.120
May 15 ...	a 0.8					21,800	--	--	2,270	34,500							4,180	--	92	76,600	--	1.043
May 27 ...	a 0.90					24,400	--	--	2,380	38,900							4,150	--	93	78,400	--	1.048
June 12 ...	a 19.5					4,270	--	--	1,400	6,750							1,470	--	86	19,700	--	1.007
June 24 ...	a 2.40					9,640	--	--	1,470	15,400							2,560	--	90	39,300	--	1.018
July 11 ...	a 0.40					99,800	--	--	2,780	158,000							10,600	--	95	--	--	1.205
July 24 ...	a 0.90					39,600	--	--	3,300	62,200							5,600	--	94	--	--	1.078
Aug. 21 ...	a 0.40					99,100	--	--	2,650	157,000							9,720	--	98	--	--	1.204
Sept. 10 ...	a 0.60					100,000	--	--	2,560	157,000							8,150	--	96	--	--	1.202
Sept. 27 ...	a 0.51					99,500	--	--	2,720	158,000							8,550	--	96	--	--	1.204

a Field estimate.

b Values expressed in parts per million should be multiplied by the density when computing loads.

BRAZOS RIVER BASIN--Continued

HAYSTACK (HAYRICK) CREEK AT WEIR E, NEAR ASPERMONT, TEX.

LOCATION.--About 400 feet upstream from mouth, about 20 miles northwest of Aspermont, Stonewall County.
 RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	Specific conduct- ance (micro- mhos at 25°C)	pH	Den- sity ^b (gm/ml at 20°C)
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non- carbon- ate				
Oct. 9, 1956	a0.12					45,300	--	--	4,910	73,200							7,410	--	93	--	--	1.093
Oct. 18	1.04					41,600	--	--	3,920	65,100							6,350	--	84	--	--	1.083
Oct. 19	a.46					3,650	--	--	2,180	8,880							2,720	--	82	25,300	--	1.012
Oct. 24 .....	.10					39,600	--	--	4,780	61,800							7,080	--	93	--	--	1.080
Nov. 9 .....	.18					32,900	109	79	4,240	52,800							6,150	6,090	92	--	--	1.065
Nov. 22 .....	.18					35,500	118	89	4,370	56,000							6,400	6,330	92	--	--	1.071
Dec. 7 .....	.21					34,600	--	--	4,400	55,100							6,310	--	92	--	--	1.070
Dec. 20 .....	.51					18,600	--	--	3,120	30,100							4,450	--	90	68,200	--	1.038
Jan. 10, 1957 ...	.14					37,400	--	--	4,530	59,500							6,740	--	92	--	--	1.078
Jan. 24 .....	.19					33,800	--	--	4,300	54,300							6,230	--	92	97,700	--	1.068
Feb. 20 .....	.43					28,400	--	--	3,840	45,500							5,600	--	92	85,800	--	1.054
Mar. 7 .....	.17					35,300	--	--	4,370	56,100							6,360	--	93	--	--	1.070
Mar. 20 .....	.90					25,000	--	--	3,200	39,100							4,680	--	92	82,500	--	1.048
Mar. 20	6.97					8,950	--	--	1,510	14,100							2,150	--	90	36,800	--	1.016
May 15 .....	.46					13,800	--	--	3,300	21,700							4,280	--	88	54,100	--	1.029
May 27 .....	.20					15,500	--	--	3,520	24,500							4,650	--	88	56,700	--	1.032
June 12	1.18					4,170	--	--	2,570	6,760							2,890	--	76	20,800	--	1.009
June 24	1.01					5,210	--	--	2,550	8,510							3,170	--	78	25,000	--	1.010
July 11 .....	.16					26,300	--	--	4,650	42,200							6,210	--	90	85,100	--	1.054
July 24 .....	.52					11,100	--	--	3,000	17,900							3,890	--	86	44,700	--	1.032
Aug. 21 .....	.16					30,300	--	--	4,850	48,400							6,020	--	92	94,200	--	1.063
Sept. 10 .....	.40					31,500	--	--	4,420	49,300							5,640	---	92	95,000	--	1.064
Sept. 27 .....	.30					29,200	--	--	4,360	45,300							5,380	---	92	88,400	--	1.060

a. Field estimate.

b. Values expressed in parts per million should be multiplied by the density when computing loads.

BRAZOS RIVER BASIN--Continued

SALT CROTON (DOVE) CREEK, NEAR ASPERMONT, TEX.

LOCATION.--At gaging station just below the mouth of Haystack (Hayrick) Creek and about 20 miles northwest of Aspermont, Stonewall County DRAINAGE AREA, 89 square miles, approximately. 1956 to September 1957.
 RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957 given in WSP 1512 as "Dove Creek near Aspermont".
 REMARKS.--Records of discharge for water year October 1956 to September 1957

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Specific conductance (micro- mhos at 25°C)	pH	Density (gm/ml at 20°C)
														Parts per million	Tons per acre- foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 9, 1956	..					89,700	--	--	3,370	146,000							9,860	--	95	--	--	1.187
Oct. 18	1.79					72,700	--	--	3,530	114,000							8,390	--	95	--	--	1.144
Oct. 19	5.20					34,300	--	--	2,630	53,400							4,730	--	94	99,400	--	1.067
Oct. 24	.64					59,000	--	--	4,080	92,300							7,530	--	94	--	--	1.116
Nov. 8	1.08					56,700	211	53	3,830	91,700							7,420	7,380	94	--	--	1.112
Nov. 22	.72					87,100	303	48	3,460	138,000							9,230	9,190	95	--	--	1.175
Dec. 6	1.00					79,200	--	--	3,440	126,000							8,950	--	95	--	--	1.156
Dec. 20	3.08					38,900	--	--	2,650	61,900							5,210	--	94	--	--	1.075
Jan. 10, 1957	.73					66,000	--	--	4,000	106,000							8,160	--	95	--	--	1.133
Jan. 24	.90					65,300	--	--	3,890	104,000							7,960	--	95	--	--	1.131
Feb. 9	1.96					54,200	--	--	3,420	87,000							6,790	--	95	--	--	1.104
Mar. 7	.51					39,300	--	--	4,250	63,100							6,400	--	93	--	--	1.078
Apr. 3	2.96					36,300	--	--	3,360	57,000							5,510	---	93	--	--	1.070
Apr. 9	.74					67,400	--	--	4,120	107,000							8,280	--	95	--	--	1.135
Apr. 20	50					11,100	--	--	1,840	17,900							2,740	--	90	43,100	--	1.021
Apr. 28	760					3,060	--	--	992	4,980							1,270	--	84	15,000	--	1.004
Apr. 28	2,800					1,100	11	259	1,230	1,730							1,400	1,190	62	7,130	7.2	--
Apr. 28	5,500					888	10	169	988	1,340							1,140	1,000	62	5,760	7.0	--
May 15	1.27					16,700	--	--	2,660	26,100							4,070	--	90	62,200	--	1.033
May 17	50					2,480	--	--	1,260	4,080							1,630	--	77	13,000	--	1.004
May 22	760					17,300	--	--	2,100	28,100							3,540	--	91	60,600	--	1.033
May 27	1.07					20,000	--	--	2,840	31,800							4,340	--	91	67,100	--	1.038
May 31	50					1,110	11	132	1,360	1,700							1,470	1,310	62	7,700	8.1	--
May 31	760					517	12	167	1,450	800							1,580	1,440	41	4,810	6.9	--

	June 1, 1957	.....	2,800	4,520	--	--	1,530	7,140	1,700	--	85	20,700	--	1,008
	June 12	20.7	2,470	2,470	--	--	1,430	3,880	1,510	--	78	12,800	--	1,004
	June 23	760	1,330	1,330	--	--	910	2,040	1,090	982	73	7,870	7.9	--
	June 24	3.44	6,840	6,840	--	--	1,760	10,900	2,410	--	86	29,900	--	1,013
	July 10 .....	.57	85,500	85,500	--	--	3,460	135,000	10,400	--	95	--	--	1,171
	July 20	4.33	38,700	38,700	--	--	3,350	60,400	5,610	--	94	--	--	1,077
	July 25	247	1,940	1,940	--	--	1,660	3,090	1,750	--	71	11,400	--	1,004
	July 25	107	581	581	13	95	1,310	870	1,340	1,260	48	4,700	7.5	--
	July 25	38.6	845	845	--	72	1,450	1,280	1,520	1,460	55	6,120	7.2	--
	Aug. 21 .....	.61	90,500	90,500	--	--	3,280	143,000	9,260	--	95	--	--	1,185
	Sep. 10	1.03	83,800	83,800	--	--	3,220	134,000	7,440	--	96	--	--	1,170
	Sep. 27 .....	.74	83,200	83,200	--	--	3,430	131,000	8,220	--	96	--	--	1,168

a Values expressed in parts per million should be multiplied by the density when computing loads.

BRAZOS RIVER BASIN--Continued

SALT FORK BRAZOS RIVER, NEAR ASPERMONT, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 83, 5½ miles downstream from Salt Croton (Dove) Creek, and 13.2 miles northwest of Aspermont, Stonewall County.

DRAINAGE AREA.--4,830 square miles, approximately, of which 2,770 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1951, October 1956 to September 1957.

Water temperatures: October 1948 to September 1951, October 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 76,900 ppm Feb. 1-6; minimum, 1,280 ppm June 2-4.

Hardness: Maximum, 5,590 ppm Feb. 1-6; minimum, 392 ppm June 2-4.

Specific conductance: Maximum daily, 103,000 micromhos Mar. 22; minimum daily, 1,820 micromhos June 3.

Water temperatures: Maximum, 91°F Sept. 6; minimum freezing point on Jan. 16, 17.

EXTREMES, 1948-51, 1956-57.--Dissolved solids: Maximum, 78,500 ppm Mar. 21, 24-28, 1949; minimum, 1,280 ppm June 2-4, 1957.

Hardness: Maximum, 5,590 ppm Feb. 1-6, 1957; minimum, 372 ppm Mar. 19-23, '24 (12 m.-10 p.m.) 1951.

Specific conductance: Maximum daily, 111,300 micromhos Mar. 22, 25, 1949; minimum daily, 1,820 micromhos June 3, 1957.

Water temperatures (1948-51, 1956-57): Maximum, 91°F Sept. 6, 1957; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1312.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	Density (gm/ml at 20°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate					
Oct. 1-15, 1956 ..	0.20	19	1,540	356	340	18,100	15,900	153	3,610	28,700		--	--	52,400	73.9	29.3	5,310	5,180	88	108	63,300	7.91	1.036
Oct. 16-31	12.2	15	1,340	302	358	17,400	17,100	136	3,050	27,600		--	--	49,800	70.0	1,700	4,590	4,470	89	112	61,200	7.61	1.034
Nov. 1-15	1.42	12	1,210	298	360	16,400	23,200	133	2,870	26,000		--	--	46,900	65.8	186	4,240	4,140	89	110	60,600	7.71	1.032
Nov. 16-30 .....	.35	12	1,410	339	349	15,800	15,500	172	3,370	25,500		--	--	46,500	65.2	45.3	4,910	4,770	87	98	59,800	7.81	1.032
Dec. 1-10 .....	.33	13	1,440	340	340	15,900	15,900	156	3,450	25,400		--	--	46,600	65.4	42.8	4,990	4,860	87	98	59,300	7.71	1.032
Dec. 11-20	3.35	9.7	1,350	358	358	17,100	17,100	147	3,190	27,300		--	--	49,300	68.3	461	4,710	4,590	89	108	61,700	7.61	1.034
Dec. 21-31 .....	.67	10	1,410	360	340	23,200	23,200	149	3,300	36,800		--	--	65,200	92.7	123	5,060	4,970	91	141	77,400	7.61	1.045
Jan. 1-15, 1957 ..	.29	12	1,450	345	345	15,600	15,600	143	1,630	26,400		--	--	45,500	64.0	36.8	5,040	4,860	87	96	60,000	7.71	1.034
Jan. 16-31 .....	.36	12	1,420	349	349	15,500	15,500	173	1,620	26,100		--	--	45,100	63.3	45.3	4,960	4,840	87	95	59,300	7.81	1.033
Feb. 1-6 .....	.68	12	1,490	455	340	27,600	27,600	149	3,190	44,100		--	--	76,900	111	149	5,590	5,470	91	160	86,600	7.91	1.054
Feb. 7, 9	91.0	17	293	46	340	2,100	2,100	135	751	3,270		--	--	6,540	8.91	1,610	920	818	83	30	10,600	8.11	1.002
Feb. 8, 10	158	17	357	56	340	2,850	2,850	102	876	4,480		--	--	8,690	11.9	3,720	1,120	1,040	85	37	13,900	8.01	1.004
Feb. 11-12	9.55	16	475	115	340	5,920	5,920	95	1,140	9,410		--	--	17,100	23.5	445	1,660	1,580	89	63	25,600	8.01	1.010
Feb. 13-18	3.17	9.3	958	230	340	12,000	12,000	132	2,240	19,100		--	--	34,600	48.2	303	3,340	3,230	89	90	46,700	7.91	1.023
Feb. 19-28	3.00	9.1	1,320	375	340	21,800	21,800	135	2,880	34,800		--	--	61,300	87.0	518	4,840	4,720	91	136	73,400	7.91	1.043
Mar. 1-5	46.3	12	544	115	340	6,900	6,900	89	1,200	11,000		--	--	19,800	27.2	2,500	1,830	1,760	89	70	29,300	7.81	1.011
Mar. 6-20 .....	.73	9.7	1,300	327	340	16,900	16,900	147	3,120	26,900		--	--	48,600	68.3	99.0	4,590	4,470	89	108	59,400	7.81	1.033
Mar. 21-31	2.17	9.2	1,470	394	340	22,700	22,700	145	3,230	36,300		--	--	64,200	91.3	393	5,290	5,170	90	136	73,800	7.81	1.046

	30.2	7.2	447	85	3,940	80	1,030	6,310	--	11,900	16.3	976	1,460	1,400	85	45	18,500	7.7	1,006
Apr. 3-5, 1957	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Apr. 6-10	72	8.6	1,130	264	13,200	127	2,770	21,000	--	38,400	53.5	76.4	3,900	3,800	88	82	48,600	7.4	1,024
Apr. 11-20	12.6	12	1,340	322	15,600	129	3,090	25,000	--	45,400	63.6	1,590	4,670	4,560	88	89	61,200	7.6	1,031
Apr. 21-22, 28	1,259	17	1,586	63	2,760	141	1,440	4,330	--	9,260	12.7	31,600	1,720	1,610	78	29	14,600	7.2	1,004
Apr. 23-27, 29	1,339	19	334	32	771	129	822	1,190	3.0	3,230	4.39	11,680	985	860	63	11	5,140	7.5	--
Apr. 30	2,850	18	173	18	283	127	436	412	5.0	1,420	1.93	10,180	505	401	56	5.7	2,250	7.8	--
May 1-8	285	16	332	50	1,700	111	805	2,700	--	5,600	7.70	4,310	1,030	943	78	23	9,360	7.6	--
May 9-10	1,085	20	384	25	465	87	970	700	3.5	2,610	3.55	7,720	1,060	990	49	6.2	3,750	7.8	--
May 11, 17, 25-27, 31	1,325	16	323	42	1,350	114	805	2,120	--	4,710	6.41	16,850	978	885	75	19	7,820	7.9	--
May 12-14, 19-20	4,012	16	156	19	384	114	407	552	7.5	1,600	2.18	17,330	467	374	64	7.7	2,600	7.8	--
May 15-16, 18, 21-24	2,723	16	250	31	669	106	836	1,030	6.0	2,690	3.66	19,780	752	664	66	11	4,370	7.7	--
May 28-30	157	16	359	81	2,400	158	1,010	3,790	--	7,760	10.6	3,300	1,300	1,170	80	29	12,300	7.9	1,002
June 1, 5-10	1,512	15	236	35	854	118	603	1,320	5.0	3,130	4.26	12,780	733	636	72	14	5,110	7.8	--
June 2-4	4,590	15	126	19	300	127	319	428	6.1	1,280	1.74	15,860	392	288	62	6.6	2,080	7.8	--
June 11, 13, 16-17	248	18	346	63	1,740	122	850	2,780	--	5,860	7.97	3,920	1,120	1,020	77	23	9,420	7.9	--
June 12, 14-15, 23-26	520	18	336	41	882	103	898	1,350	2.5	3,580	4.87	5,030	1,010	922	66	12	5,570	7.8	--
June 18-22	1,842	19	129	23	364	122	350	525	4.2	1,470	2.00	7,310	416	316	66	7.8	2,450	7.9	--
June 27-30, July 1-3	56.1	19	411	94	2,080	120	1,100	3,320	--	7,080	9.65	1,070	1,410	1,310	76	24	11,300	7.9	1,002
July 4-10	15.6	19	675	149	4,420	113	1,710	7,110	--	14,100	19.6	606	2,300	2,200	81	40	21,400	7.8	1,020
July 11-23, 25	29.1	17	1,040	232	9,310	105	2,590	14,900	--	18,100	38.9	2,250	3,550	3,460	85	68	38,600	7.7	1,019
July 24, 26, 30-31	140	17	280	48	1,500	120	762	2,320	--	4,990	6.79	1,890	896	798	78	22	8,330	8.0	--
July 27-29	156	18	168	31	567	116	465	850	2.1	2,160	2.94	910	546	452	69	11	3,610	7.8	--

a Values expressed in parts per million should be multiplied by density when computing loads.

BRAZOS RIVER BASIN--Continued

SALT FORK BRAZOS RIVER, NEAR ASPERMONT, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium adsorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	Den- sity (gm/ml at 20°C)	
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, mag- nesium	Non- carbon- ate					
Aug. 1, 6-10, 1957	20.3	15		447	87	2,150		124	1,210	3,390		--		7,360	10.0	404	1,470	1,370	76	24	11,500	7.7	1.002
Aug. 2-5	52.0	14		183	37	784		109	494	1,210		2.8		2,780	3.78	390	608	519	74	14	4,660	7.5	--
Aug. 11, 15-16, 20, 23-25	19.0	16		428	72	1,970		115	1,100	3,120		--		6,760	9.19	347	1,360	1,270	76	23	10,600	7.9	--
Aug. 12, 17-19, 26-27	4.75	13		760	158	5,750		102	1,910	9,200		--		17,800	24.5	231	2,550	2,460	83	50	25,600	7.8	1.011
Aug. 13-14, 21-22 Aug. 28-31, Sept. 1-11	70.5	15		288	37	789		96	808	1,180		3.0		3,170	4.31	603	870	792	66	12	5,020	7.8	--
	1.13	15		1,410	326	14,300		161	3,320	22,900		--		42,400	59.3	133	4,860	4,730	86	89	53,700	7.7	1.028
Sept. 12-13	188	18		354	43	886		152	953	1,340		2.3		3,680	5.00	1,870	1,060	936	65	12	5,690	8.0	--
Sept. 14-15	21.0	14		510	71	3,310		83	1,230	5,250		--		10,400	14.2	592	1,560	1,500	82	36	16,100	7.8	1.004
Sept. 16-18	3.83	12		872	184	7,800		108	2,090	12,500		--		23,500	32.4	246	2,830	2,840	85	33	33,900	7.8	1.014
Sept. 19-30 .....	.53	9.6		1,480	328	16,100		156	3,490	25,700		--		47,200	66.3	69.8	5,040	4,810	87	99	60,600	7.8	1.033
Weighted average	299	17		247	33	882		117	625	1,360		--		3,220	4.38	2,600	752	656	72	14	5,080	--	--

a Values expressed in parts per million should be multiplied by density when computing loads.

BRAZOS RIVER BASIN--Continued

SALT FORK BRAZOS RIVER, NEAR ASPERMONT, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, usually between 7 and 9 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	54	44	43	43	49	--	62	65	76	76	73
2	68	--	43	45	42	54	--	64	64	78	--	74
3	61	45	46	40	45	55	--	62	61	75	79	--
4	69	49	50	48	48	53	--	50	65	85	75	75
5	63	44	52	47	49	--	52	51	68	71	76	--
6	66	50	56	45	50	46	53	65	71	--	74	91
7	58	55	40	41	58	--	57	58	71	88	71	66
8	58	46	41	52	59	38	--	--	75	71	72	63
9	--	62	44	55	59	45	70	64	75	71	74	65
10	62	48	46	35	54	57	62	65	76	--	72	65
11	60	51	--	40	51	--	51	61	70	72	72	--
12	62	59	46	44	51	--	64	60	71	71	74	63
13	59	66	36	44	55	--	46	61	69	71	74	--
14	69	61	41	37	56	--	48	63	75	72	75	70
15	74	50	--	34	56	55	54	67	78	72	74	62
16	65	48	50	32	--	55	60	71	80	70	73	64
17	65	39	41	32	53	59	--	72	73	71	73	65
18	64	40	34	35	49	55	68	64	68	71	74	64
19	62	49	--	44	47	55	62	63	69	74	71	73
20	61	41	46	39	56	51	65	69	74	76	70	64
21	59	39	44	41	49	46	61	70	71	--	71	70
22	58	40	47	44	39	53	64	72	75	77	70	74
23	59	40	38	44	46	52	62	69	69	--	77	--
24	60	40	39	40	52	--	60	69	69	78	70	64
25	55	50	44	35	54	39	61	66	72	75	--	59
26	53	41	54	34	65	--	62	70	74	76	89	--
27	53	39	43	--	46	45	58	70	70	77	72	--
28	56	41	--	39	69	54	58	66	75	78	71	64
29	65	35	55	41	--	55	59	69	77	76	70	82
30	55	44	46	39	--	57	60	81	79	77	70	65
31	51	--	50	42	--	54	--	67	--	78	70	--
Average	61	47	45	41	52	--	59	65	72	75	73	--

BRAZOS RIVER BASIN--Continued
HUBBARD CREEK NEAR BRECKENRIDGE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 183, 2.3 miles downstream from Big Sandy Creek, 6.8 miles northwest of Breckenridge, Stephens County, 7 miles upstream from Gonzales Creek, and 8 miles upstream from Clear Fork Brazos River.

DRAINAGE AREA.--1,087 square miles

RECORDS AVAILABLE.--Chemical analyses: April 1955 to September 1957.

Water temperatures: April 1955 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,810 ppm Aug. 8-31; minimum, 118 ppm Feb. 6-8.

Hardness: Maximum, 766 ppm Sept. 1-11; minimum, 72 ppm Feb. 6-8.

Specific conductance: Maximum daily, 3,920 micromhos July 24; minimum daily, 121 micromhos Apr. 27.

EXTREMES, 1955-57.--Dissolved solids: Maximum, 2,200 ppm Apr. 17-28, 1956; minimum, 118 ppm Feb. 6-8, 1957.

Hardness: Maximum, 866 ppm Apr. 17-28, 1956; minimum, 72 ppm Feb. 6-8, 1957.

Specific conductance: Maximum daily, 5,530 micromhos Apr. 18, 1956; minimum daily, 121 micromhos Apr. 27, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micromhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./necum	Non-carbonate		
Oct. 1-15, 1956....	30.09	6.8		82	14	193		107	14	410	0.4	1.2		774	1.05	0.19	262	174	62	1,500
Oct. 16-31.....	18.8	8.6		52	6.5	62		129	20	114	0.5	1.5		328	45	16.6	155	50	46	2.2
Nov. 1-14.....	198.7	7.0		37	4.3	29		102	14	50	.5	4.5		196	.27	105	110	26	37	1.2
Nov. 15-30.....	a.41	7.6		34	3.6	15		106	12	21	.5	2.0		148	.20	.16	99	12	25	.7
Dec. 1-14.....	a	7.0		39	4.4	17		128	12	22	.7	1.0		166	.23	0	115	10	24	.7
Dec. 15-19, 22-31.	a49.2	6.2		32	3.5	18		100	10	27	.3	1.5		148	.20	19.7	94	12	29	.8
Dec. 20-21.....	370	6.0		38	4.7	54		95	18	93	.4	2.0		263	.36	263	113	35	51	2.2
Jan. 1-13, 1957...	a.04	6.2		32	3.8	23		95	11	38	.4	1.2		163	.22	.02	95	17	34	1.0
Jan. 14-31.....	a	5.2		33	4.0	25		101	10	42	.4	.2		170	.23	0	99	16	36	1.1
Feb. 1-5.....	a5.08	5.2		36	4.3	31		95	10	60	.3	.5		194	.26	2.66	107	29	39	1.3
Feb. 6-8.....	7,473	6.2		25	2.3	15		79	7.0	21	.2	2.0		118	.16	2,380	72	7	31	.7
Feb. 9-28.....	22.4	8.8		46	5.4	33		126	14	62	.2	2.8		234	.32	14.2	137	34	34	1.2
Mar. 1-19.....	a.14	10		62	8.6	46		169	26	86	.5	1.8		324	.44	.12	190	52	34	1.5
Mar. 20-31, Apr. 1-3	14.1	7.4		41	4.5	25		111	18	45	.5	.8		197	.27	7.50	121	30	31	1.0
Apr. 4-22.....	13.2	6.4		59	8.0	75		121	15	160	.5	1.2		385	.52	13.7	180	81	47	2.4
Apr. 23.....	1,140	7.6		64	9.8	103		103	11	230	.7	2.2		479	.65	1,470	200	116	53	3.2
Apr. 24-25.....	382	7.6		42	5.2	46		112	13	82	.7	3.5		255	.35	263	126	34	44	1.8
Apr. 26-30, May 1.	10,510	7.0		29	2.7	16		86	7.6	76	.7	2.5		134	.18	3,800	83	13	30	.8
May 2-7.....	2,734	8.6		38	4.4	30		100	10	58	.7	2.5		201	.27	1,480	113	31	37	1.2
May 8-9, 16-17....	903	10		47	5.9	34		115	16	72	.3	3.5		246	.33	600	142	47	34	1.3

May 10-15, 18-20, 1957.....	5,799	9.2	36	4.0	18	103	9.0	35	.3	2.8	165	.22	2,580	106	22	27	.8	301	7.9
May 21-27.....	6,361	9.6	38	3.9	20	106	9.8	38	.4	3.2	175	.24	3,010	111	24	28	.8	321	7.8
May 28-31, June 1-5	1,008	11	62	9.0	61	129	23	134	.4	5.9	369	.50	1,000	192	86	41	1.9	692	7.7
June 6-8, 13-15...	1,032	9.6	49	6.4	40	114	14	88	.4	3.5	267	.36	744	149	55	36	1.4	511	7.6
June 9-12.....	122	12	88	14	94	156	40	215	.3	8.6	549	.75	181	277	149	42	2.5	1,030	7.9
June 16-21.....	332	13	61	8.7	59	121	31	128	.5	4.2	365	.50	327	188	89	41	1.9	684	8.0
June 22-30.....	30.7	13	102	18	135	153	45	312	.5	11	712	.97	59.0	328	203	47	3.2	1,340	8.1
July 1-12.....	4.70	11	160	32	235	186	93	550	.4	19	1,190	1.62	15.1	530	378	49	4.4	2,170	8.1
July 13-24, 27-31, Aug. 1-4.....	16.6	11	211	43	313	208	150	740	.4	17	1,590	2.16	71.3	704	533	49	5.1	2,870	7.7
July 25-26, Aug. 5-7.....	237	17	40	6.0	36	94	17	73	--	6.3	241	.33	154	125	48	38	1.4	436	8.1
Aug. 8-31.....	50	14	204	51	384	149	259	820	.4	5.9	1,810	2.46	2.44	718	596	54	6.2	3,160	7.8
Sept. 1-11.....	.44	14	218	54	327	176	315	710	.4	4.5	1,730	2.35	2.06	766	632	48	5.1	2,980	7.9
Sept. 14-21.....	7.12	10	129	34	291	110	108	630	.5	2.5	1,260	1.71	24.2	462	372	58	5.9	2,240	7.9
Sept. 22-23.....	652	7.4	70	14	125	108	31	268	.5	2.8	572	.78	1,010	232	144	54	3.6	1,090	7.8
Sept. 12-13, 24-30, weighted average	44.7	9.6	48	7.2	52	109	23	104	.6	2.2	301	.41	36.3	150	60	43	1.9	563	8.0
Weighted average	633	8.4	36	4.1	24	98	10	46	0.5	2.9	180	0.25	308	107	26	33	1.0	331	--

a Includes days of less than 0.05 cfs.

WESTERN GULF OF MEXICO BASINS

BRAZOS RIVER BASIN--Continued

HUBBARD CREEK NEAR BRECKENRIDGE, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily measurement, usually before 10 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	60	43	44	--	--	56	68	71	87	85	80
2	--	--	--	--	41	55	--	87	--	--	--	--
3	67	66	46	40	--	--	57	68	69	83	85	80
4	--	57	--	--	48	57	57	66	69	--	--	--
5	65	52	49	48	--	--	--	64	70	83	83	80
6	--	--	--	47	45	58	56	63	69	--	80	--
7	--	54	53	--	50	--	--	65	73	82	--	--
8	--	--	--	52	56	45	55	66	78	--	82	73
9	65	49	40	--	57	--	--	65	79	82	--	--
10	--	--	--	45	53	57	59	66	82	--	82	73
11	62	51	45	--	57	--	--	68	83	83	--	--
12	--	--	--	44	--	55	57	70	79	82	83	73
13	69	55	40	--	58	--	--	67	78	--	--	--
14	--	--	--	42	--	58	49	67	89	82	82	78
15	67	53	44	--	50	--	--	71	81	--	--	--
16	68	--	--	34	--	55	61	67	80	82	83	73
17	--	45	45	--	--	--	--	76	81	--	--	--
18	68	--	--	35	53	57	70	68	74	82	81	75
19	--	51	43	--	--	--	--	69	75	--	--	--
20	65	--	45	43	50	55	69	71	75	84	79	75
21	--	46	43	--	--	--	--	75	79	--	--	--
22	62	--	46	48	50	56	--	--	--	82	80	72
23	--	45	--	--	--	--	68	70	--	--	--	--
24	62	--	45	47	47	47	67	69	81	80	81	70
25	--	45	--	--	--	--	78	69	79	78	--	--
26	57	--	42	--	54	48	64	70	--	81	81	68
27	--	42	--	35	--	--	63	72	81	--	--	--
28	60	--	42	--	51	48	65	--	--	84	82	68
29	--	40	--	38	--	--	66	72	83	--	--	--
30	63	--	44	--	--	48	70	70	--	85	81	69
31	--	--	--	39	--	--	--	75	--	--	--	--
Average	--	--	--	--	--	--	--	69	77	--	--	--

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT POSSUM KINGDOM DAM, NEAR GRAFORD, TEX.

LOCATION.--Immediately below dam on Brazos River, 2.6 miles upstream from Loving Creek, 11.3 miles southwest of Grafard, Palo Pinto County, and 20 miles upstream from gaging station near Palo Pinto.
 DRAINAGE AREA.--22,550 square miles, approximately, of which 9,240 square miles is probably noncontributing.
 RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1957.

Water temperatures: October 1949 to September 1955.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 2,130 ppm Oct. 1-31; minimum, 331 ppm Apr. 26-30, May 1-10.

Hardness: Maximum, 670 ppm Oct. 1-31; minimum, 135 ppm Apr. 26-30, May 1-10.

Specific conductance: Maximum daily, 3,630 microhmhos Oct. 28; minimum daily, 494 microhmhos May 4.

EXTREMES, 1942-57.--Dissolved solids: Maximum, 2,640 ppm Jan. 1-31, 1956; minimum, 331 ppm Apr. 26-30, May 1-10, 1957.

Hardness: Maximum, 828 ppm Jan. 1-31, 1956; minimum, 135 ppm Apr. 26-30, May 1-10, 1957.

Specific conductance: Maximum daily, 5,720 microhmhos Jan. 7, 1956; minimum daily, 494 microhmhos May 4, 1957.

Water temperatures (1949-55): Maximum, 76°F Sept. 27-30, 1950; minimum, 45°F on several days in February 1951.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Palo Pinto for water year October 1956 to September 1957 given in WSP 1512. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium in hardness	Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956 ..	87.3	12	219	30	219	501	128	518	790	0.8	2,130	2.90	387	565	62	3,430	7.6	8.4	8.4	3,430	7.6	
Nov. 1-30	111	12	200	29	200	430	118	504	660	1.0	1,890	2.57	566	618	60	3,090	7.4	7.5	60	3,090	7.4	
Dec. 1-31	263	9.8	195	28	195	410	114	505	620	1.0	1,820	2.48	1,290	602	59	2,820	7.9	7.3	59	2,820	7.9	
Jan. 1-31, 1957 ..	289	9.6	195	27	195	402	114	498	610	1.0	1,800	2.45	1,450	598	59	2,910	7.9	7.1	59	2,910	7.9	
Feb. 1-28	349	9.6	191	26	191	376	115	466	582	1.0	1,710	2.33	1,610	584	58	2,770	7.7	6.8	58	2,770	7.7	
Mar. 1-31	144	9.4	176	25	176	349	111	427	542	1.0	1,580	2.15	614	542	58	2,590	7.5	6.5	58	2,590	7.5	
Apr. 1-25	198	9.8	182	26	182	367	113	446	568	1.5	1,660	2.26	887	561	59	2,690	7.4	6.7	59	2,690	7.4	
Apr. 26-30, May 1-10	38,920	7.4	45	5.4	45	60	74	73	91	1.8	331	.45	34,780	135	49	573	7.1	2.3	49	573	7.1	
May 11-20	30,840	7.0	53	5.8	53	60	84	84	92	1.8	359	.49	29,890	157	45	611	7.0	2.1	45	611	7.0	
May 21-31	27,800	8.4	64	7.8	64	76	94	112	115	1.8	451	.61	33,850	191	46	759	7.4	2.4	46	759	7.4	
June 1-9	17,730	8.2	55	6.4	55	69	94	87	102	1.8	399	.54	19,100	164	48	688	7.3	2.3	48	688	7.3	
June 10-30	3,200	12	113	12	113	125	100	240	192	1.8	786	1.07	6,700	332	45	1,240	7.4	3.0	45	1,240	7.4	
July 1-31	603	13	114	13	114	118	104	238	185	2.0	769	1.07	1,280	338	43	1,220	7.8	2.8	43	1,220	7.8	
Aug. 1-31	531	12	114	14	114	136	111	252	200	2.5	840	1.14	1,200	342	46	1,290	7.6	3.2	46	1,290	7.6	
Sept. 1-30	367	9.6	112	14	112	144	119	232	220	1.5	831	1.13	823	337	48	1,310	7.5	3.4	48	1,310	7.5	
Weighted average	4,145	8.0	61	7.2	61	79	85	108	119	1.8	443	0.60	4,960	182	49	743	--	2.6	49	743	--	

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT WHITNEY DAM, NEAR WHITNEY, TEX.
(Formerly published as Brazos River near Whitney, Tex.)

LOCATION (revised).--On State Highway 22, 2.4 miles upstream from Coon Creek, 4.0 miles upstream from Iron Creek, 3.4 miles upstream from gaging station and 7.4 miles southwest of Whitney, Hill County, and at mile 442.

DRAINAGE AREA (revised).--26,170 square miles, approximately, of which 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to May 1948, October 1948 to September 1957.

Water temperatures: October 1947 to May 1948, October 1948 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,380 ppm Oct. 1-31; minimum, 337 ppm June 11-20.

Hardness: Maximum, 474 ppm Oct. 1-31; minimum, 148 ppm May 4-9.

Specific conductance: Maximum daily, 2,350 micromhos Dec. 6, 8-9; minimum daily, 538 micromhos June 12.

Water temperatures: Maximum, 92°F July 21, 28, 29; minimum, 42°F Jan. 27, 28.

EXTREMES, 1947-57.--Dissolved solids: Maximum, 1,360 ppm Oct. 1-10, 1948; minimum, 183 ppm June 11-20, 1952.

Hardness: Maximum, 542 ppm Oct. 1-10, 1948; minimum, 96 ppm June 11-20, 1952.

Specific conductance: Maximum daily, 2,660 micromhos Oct. 1, 1948; minimum daily, 203 micromhos May 23, 1952.

Water temperatures: Maximum, 98°F July 8, 1954; minimum, freezing point Jan. 28-29, 1948.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Whitney for water year October 1956 to September 1957 given in WSP 1512. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium carbonate	Sorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg-nestum	Non-carbonate				
Oct. 1-31, 1956 ..	639	13	147	26	303	115	361	470	1.0	1.88	2,380	380	58	6.1	2,230	7.9						
Nov. 1-30	41.3	9.8	149	23	292	114	356	452	.8	1.82	1,340	373	58	5.9	2,260	8.0						
Dec. 1-31	31.8	11	150	23	302	117	363	462	.8	1.370	1.86	118	468	372	58	6.1	2,300	8.0				
Jan. 1-31, 1957 ..	612	8.8	145	21	297	118	351	448	.2	1.330	1.81	2,200	448	352	59	6.1	2,230	7.9				
Feb. 1-28	661	9.6	128	23	282	118	312	430	1.0	1.240	1.89	2,210	415	318	60	6.0	2,150	7.9				
Mar. 1-31	645	9.2	131	20	253	116	295	395	.8	1.160	1.58	2,020	409	314	57	5.4	1,960	7.8				
Apr. 1-30	1,472	8.6	124	19	233	114	266	370	1.6	1.080	1.47	4,290	388	294	57	5.1	1,830	7.6				
May 1-3, 1957	18,790	9.6	68	9.9	115	98	125	176	1.8	.575	.78	29,170	210	130	54	3.5	.976	7.5				
May 4	8,350	--	--	--	--	--	--	87	--	--	--	--	--	148	65	--	--	584	7.6			
May 18-31	43,610	9.8	55	7.0	76	99	82	116	1.5	.416	.57	48,980	166	85	50	2.6	.713	7.6				
June 1-10	38,530	13	53	5.8	53	101	69	86	1.8	.354	.48	36,830	156	73	44	2.0	.579	7.4				
June 11-20	34,260	12	51	5.6	53	104	67	78	1.5	.337	.46	31,170	150	65	44	1.9	.548	7.7				
June 21-30	34,130	10	58	6.6	57	113	71	91	1.2	.380	.52	35,020	172	79	42	1.9	.617	7.4				
July 1-31	3,510	15	72	10	79	141	103	120	2.0	.488	.66	4,620	220	105	44	2.3	.802	7.9				
Aug. 1-31	723	15	77	9.9	86	155	111	125	1.5	.539	.73	1,050	232	106	44	2.5	.863	7.9				
Sept. 1-30	798	11	84	12	101	147	134	155	1.0	.632	.86	1,360	259	138	46	2.7	.997	7.9				
Weighted average	6,213	11	62	7.9	82	106	96	126	1.5	.459	.62	7,700	187	100	49	2.6	.766	--				

BRAZOS RIVER BASIN--Continued
BRAZOS RIVER AT WHITNEY DAM, NEAR WHITNEY, TEX.--Continued
Temperature (°F) of water, water year October 1956 to September 1957

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1.....	79	77	70	67	52	49	52	51	47	46	57	54	58	54	66	65	75	74	80	80	90	84	88	83
2.....	81	76	66	66	51	51	51	50	46	47	56	55	56	54	66	66	76	75	81	80	89	83	88	83
3.....	79	77	66	60	53	52	50	51	47	56	55	56	58	55	66	66	76	73	83	81	89	82	83	82
4.....	80	76	60	58	56	54	50	52	48	59	56	58	57	66	66	66	76	76	82	82	90	83	86	81
5.....	80	76	61	58	62	59	54	51	49	48	57	55	59	55	66	66	76	76	84	82	91	84	85	81
6.....	79	75	63	61	65	62	52	51	50	48	56	55	62	56	66	66	76	75	84	82	87	83	88	82
7.....	78	74	66	63	66	63	52	51	50	48	56	51	69	61	66	66	75	75	83	82	86	80	84	79
8.....	78	73	65	60	63	53	52	50	48	46	56	53	68	56	66	66	75	75	83	81	87	81	79	75
9.....	78	74	60	56	53	45	51	50	57	46	59	54	58	55	66	66	75	75	85	82	86	81	81	75
10.....	77	74	59	56	46	44	51	46	53	49	65	55	58	57	66	66	76	73	85	82	83	82	82	79
11.....	78	73	61	59	50	46	50	48	58	50	56	55	58	57	66	66	76	76	86	82	87	81	83	79
12.....	76	74	65	60	53	50	52	49	56	50	58	56	57	55	66	66	76	76	87	82	85	83	82	79
13.....	77	75	64	62	53	49	53	50	56	51	57	56	56	51	66	66	76	76	89	82	87	81	83	80
14.....	76	74	67	64	49	48	51	48	51	49	57	56	58	53	67	66	76	76	90	84	84	81	85	80
15.....	76	74	67	60	50	49	50	47	53	49	58	55	57	56	67	67	77	76	85	82	86	81	83	81
16.....	76	74	60	55	50	49	48	45	52	50	59	56	57	56	67	67	78	77	86	82	85	82	81	78
17.....	76	74	56	53	52	50	49	44	53	52	59	57	62	56	68	68	79	78	88	82	89	82	82	78
18.....	75	74	55	53	52	48	48	46	53	52	59	57	62	56	68	68	81	79	86	82	89	86	84	79
19.....	77	74	61	55	48	46	47	47	52	50	58	56	61	57	68	68	82	81	89	82	87	83	81	79
20.....	75	74	65	60	48	46	53	47	51	51	58	57	68	57	68	68	82	81	88	83	85	82	81	79
21.....	74	71	60	55	50	48	57	49	52	49	62	57	66	60	69	68	81	80	92	84	85	82	83	79
22.....	74	70	55	52	54	50	53	49	52	50	61	57	66	60	69	69	78	78	89	85	87	82	82	76
23.....	74	71	53	52	54	52	49	45	50	48	62	61	63	60	70	69	81	78	85	82	85	82	79	74
24.....	74	72	53	52	48	48	47	47	52	50	62	57	64	62	70	70	82	81	85	82	88	82	80	76
25.....	73	72	53	52	49	47	47	47	55	53	57	50	65	62	71	70	82	79	88	84	88	82	79	76
26.....	72	69	53	50	48	47	47	44	58	55	57	52	66	63	72	71	80	79	87	83	88	84	79	77
27.....	71	68	50	48	50	48	44	42	56	52	56	54	65	64	72	72	81	80	90	83	87	82	79	77
28.....	72	70	50	49	50	50	46	42	58	53	56	54	65	65	73	72	81	80	92	83	87	82	79	76
29.....	73	71	50	48	51	50	47	46	--	--	56	54	65	65	73	73	80	80	92	84	86	81	80	76
30.....	72	70	49	48	53	50	47	46	--	--	56	55	65	65	74	73	80	80	84	82	86	81	80	74
31.....	71	68	--	--	52	51	47	46	--	--	56	56	--	--	74	74	--	--	85	83	87	81	--	--
Average.....	76	73	60	56	53	50	50	48	53	50	58	55	62	58	68	68	78	77	86	82	87	82	82	78

BRAZOS RIVER BASIN--Continued

LEON RIVER NEAR BELTON, TEX.

LOCATION.--Temperature recorder at gaging station, 1,400 feet upstream from bridge on State Farm to Market Road 817, about three-quarters of a mile upstream from bridge on U. S. Highway 81, 2 miles east of Belton, Bell County, 3.2 miles downstream from Belton Dam, and about 5 miles upstream from Nolan Creek.

DRAINAGE AREA.--3,513 square miles.

RECORDS AVAILABLE.--Water temperatures: March to September 1957.

EXTREMES.--March to September 1957: Water temperatures: Maximum 87°F Apr. 20, 22, 23; minimum, 61°F Apr. 29 to May 4.

REMARKS.--Recorder stopped Aug. 17-22, temperature range, 78°F to 82°F. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Temperature (°F) of water, March to September 1957

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min
1.....							80	77	75	72	61	61	67	67	75	75	84	81	84	81	84	81	84	81
2.....							80	77	74	72	64	61	67	67	76	75	84	80	84	80	84	80	84	78
3.....							81	78	80	73	63	61	77	66	76	76	85	84	84	81	84	81	84	78
4.....							81	78	82	80	63	61	68	67	76	76	84	81	84	81	84	81	84	78
5.....							83	78	85	80	63	63	67	67	77	76	85	85	85	82	85	82	84	78
6.....							82	78	84	80	63	63	68	67	77	76	85	83	83	79	85	82	84	78
7.....							84	78	83	80	63	63	68	68	77	76	83	82	83	79	83	82	84	78
8.....							81	76	86	78	63	63	69	68	78	77	82	82	82	78	82	82	82	76
9.....							78	75	84	78	64	63	69	68	78	78	82	82	82	76	82	82	82	75
10.....							77	74	84	81	64	64	69	68	78	78	83	81	81	75	83	81	75	75
11.....							80	76	84	82	65	64	69	69	78	78	81	80	80	83	81	80	83	75
12.....							82	79	86	82	64	63	71	69	79	78	81	79	81	80	81	79	84	80
13.....							83	80	82	76	69	64	73	69	79	79	81	79	81	80	81	79	81	78
14.....							84	81	83	80	73	69	78	73	79	79	82	79	83	77	82	79	83	77
15.....							83	77	82	81	73	73	79	68	80	79	82	79	82	81	80	82	79	84
16.....							83	81	82	81	73	63	69	69	80	79	82	80	80	83	80	82	80	80
17.....							83	82	83	81	64	63	70	69	80	80	80	80	80	83	80	80	83	79
18.....							86	82	84	83	65	64	70	70	81	80	80	80	80	83	80	80	83	79
19.....							84	79	86	83	64	64	71	70	81	80	80	80	80	83	80	80	83	78
20.....							84	77	87	87	80	64	71	71	81	80	80	80	80	83	80	80	83	78
21.....							82	79	86	80	65	64	71	71	81	81	81	81	81	86	80	80	86	78
22.....							83	81	87	85	65	65	72	71	81	81	81	81	81	86	81	81	86	80
23.....							85	80	87	85	65	65	72	72	81	81	81	81	81	85	80	81	85	80
24.....							83	78	77	66	66	65	73	72	81	81	81	81	81	85	80	81	85	78
25.....							78	74	74	66	66	66	73	73	82	81	81	81	81	85	78	81	85	78
26.....							76	75	78	74	67	66	73	73	82	82	82	82	82	85	82	82	85	82
27.....							75	72	76	68	67	66	74	73	83	83	83	83	83	85	82	81	85	77
28.....							76	71	79	70	66	66	74	74	83	83	83	83	83	85	82	82	85	77
29.....							76	73	73	61	67	66	74	74	84	84	84	84	84	85	82	82	85	79
30.....							73	73	73	61	67	67	75	74	84	84	84	84	84	85	82	82	85	79
31.....							74	73	--	--	67	67	--	--	84	84	84	84	84	85	81	81	--	--
Average.....							81	77	81	76	66	64	72	70	80	79	82	80	82	82	80	82	82	78

BRAZOS RIVER BASIN--Continued
BRAZOS RIVER AT RICHMOND, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59 in Richmond, Fort Bend County, 925 feet downstream from Texas and New Orleans Railroad bridge, and at mile 93.

DRAINAGE AREA.--44,020 square miles, approximately, of which 9,240 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1957.

Water temperatures: November 1950 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,230 ppm Oct. 1-10; minimum, 104 ppm Apr. 24-30.

Hardness: Maximum, 415 ppm Oct. 1-10; minimum, 104 ppm Apr. 24-30.

Specific conductance: Maximum daily, 2,230 micromhos Mat. 1; minimum daily, 224 micromhos Apr. 29.

Water temperatures: Maximum 87°F Aug. 18-19; minimum, 43°F Jan. 18.

EXTREMES, 1945-57.--Dissolved solids: Maximum, 1,400 ppm Sept. 1-10, 1951; minimum, 133 ppm Aug. 27-31, 1947.

Hardness: Maximum, 446 ppm Sept. 1-10, 1948; minimum, 74 ppm Jan. 13-14, 18-20, 1950.

Specific conductance: Maximum daily, 2,540 micromhos Sept. 4, 1951; minimum daily, 187 micromhos Aug. 31, 1947.

Water temperatures (1950-57): Maximum, 91°F Aug. 5, 1951; minimum, 40°F Dec. 24, 1953.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids				Hardness as CaCO ₃		Percent sodium	Specific conductance (micro-mhos at 25°C)	pH	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate					
Oct. 1-10, 1956...	593	12		130	22	275		136	307	412	--	1.0	1,230	1.67	1,970	415	304	59	5.9	2,020	7.9	
Oct. 11-20.....	584	12		121	24	271		146	301	395	--	.5	1,200	1.63	1,890	400	281	60	5.9	1,970	8.1	
Oct. 21-31.....	742	8.8		128	23	274		136	319	402	--	.2	1,220	1.66	2,440	414	302	59	5.9	2,010	8.1	
Nov. 1-10.....	1,237	9.0		118	20	235		132	273	350	--	.9	1,070	1.46	3,570	376	268	58	5.3	1,780	7.7	
Nov. 12-20.....	1,058	8.4		54	8.1	64		135	67	89	--	2.3	367	.50	1,640	168	58	45	2.2	634	8.0	
Nov. 21-30.....	998	6.4		35	8.0	59		171	42	81	--	1.0	347	.47	935	170	30	43	2.0	608	7.7	
Dec. 1-10.....	989	8.8		55	9.0	51		176	37	72	--	1.0	328	.45	876	174	30	39	1.7	587	8.1	
Dec. 11-20.....	947	9.0		56	9.8	54		190	43	74	--	.5	344	.47	880	189	34	38	1.7	619	8.1	
Dec. 21-31.....	1,118	8.6		56	8.9	57		177	43	78	--	.8	346	.47	1,040	176	31	41	1.9	613	8.0	
Jan. 1-9, 1957...	489	11		62	9.8	66		199	63	78	--	1.5	398	.54	525	195	32	43	2.1	674	7.8	
Jan. 10-23.....	680	8.8		90	16	128		233	125	175	--	.5	672	.91	1,230	290	100	49	3.3	1,130	8.0	
Jan. 24-31.....	906	6.2		126	21	241		147	285	360	--	.2	1,110	1.51	2,720	401	280	57	5.2	1,900	8.1	
Feb. 1-10.....	830	15		126	21	229		164	250	358	--	.5	1,080	1.47	2,420	402	268	55	5.0	1,850	7.7	
Feb. 11-20.....	894	6.6		95	17	205		134	186	312	--	.5	a898	1.22	2,170	308	198	59	5.1	1,550	7.5	
Feb. 21-28.....	1,046	11		108	18	238		146	209	372	--	.2	1,030	1.40	2,910	344	224	60	5.6	1,780	7.5	
Mar. 1-10.....	1,222	10		100	17	225		135	193	350	--	3.5	a964	1.31	3,180	320	209	60	5.5	1,700	7.6	
Mar. 11-17.....	1,086	7.8		108	18	216		144	220	330	--	.5	a971	1.32	2,850	344	226	58	5.1	1,680	7.8	
Mar. 18-31.....	6,523	8.6		46	6.0	55		108	57	77	--	2.2	325	.44	5,810	140	51	46	2.0	548	7.5	

a Calculated from determined constituents.

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT RICHMOND, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Chemical analyses, in parts per million, water, July, October, 1950 to September, 1951—Continued																						
Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Apr. 1-11, 1957.	6,491	12		46	5.0	44		4.6	124	39	67	0.6	2.8	305	0.41	5,350	136	34	40	1.6	499	7.7
Apr. 12-23	3,481	9.4		56	7.3	84		118	81	119	.6	1.5	440	.60	4,140	170	73	52	2.8	729	7.6	
Apr. 24-30	61,290	8.2		35	4.1	14		3.2	110	23	.5	3.0	316	.22	26,640	104	14	22	.6	280	7.9	
May 1-5, 9	99,820	14		40	4.4	14		4.0	125	21		1.5	190	.26	51,210	118	16	20	.6	303	7.3	
May 6-8, 10-15	78,540	14		56	7.1	58		58	70	85		3.5	386	.52	81,850	169	70	43	1.9	612	7.3	
May 16-20	81,540	14		43	5.3	24		3.6	123	33		2.8	244	.33	53,720	129	28	28	.9	379	7.3	
May 21-31	61,780	13		54	7.7	61		116	68	92		2.8	390	.53	65,050	166	71	44	2.0	624	7.4	
June 1-10	67,500	13		48	7.0	41		3.7	116	56	63		3.0	300	.41	54,680	149	54	37	1.5	507	7.7
June 11-20	54,840	12		48	6.7	36		3.8	117	52	55		2.5	287	.39	42,500	149	52	34	1.3	477	7.7
June 21-30	32,710	12		51	7.7	42		3.9	121	60	65		2.2	324	.44	46,110	158	60	36	1.5	532	7.6
July 1-10	32,170	14		58	8.3	47		4.2	140	61	73		1.8	361	.49	51,360	178	64	36	1.5	594	7.7
July 11-20	9,518	14		59	7.9	33		4.1	159	46	56		2.2	322	.44	8,270	180	49	28	1.1	530	7.8
July 21-31	6,973	12		54	7.4	28		4.5	163	32	43		1.8	286	.39	5,380	165	32	26	.9	480	7.7
Aug. 1-10	6,679	22		54	8.1	39		4.9	168	42	57		1.5	318	.43	5,730	168	30	33	1.3	527	8.1
Aug. 11-20	1,999	18		62	8.9	44		4.5	194	47	63		1.0	356	.48	1,920	191	32	33	1.4	593	8.2
Aug. 21-31	1,361	16		72	15	80		200	91	110		.5	518	.70	1,900	241	77	42	2.2	839	7.8	
Sept. 1-10	1,034	12		75	16			191	99	118		.2	538	.73	1,500	253	96	41	2.2	866	8.0	
Sept. 11-20	962	12		74	17			194	101	128		.2	568	.77	1,480	254	96	43	2.4	896	7.9	
Sept. 21-30	2,972	11		65	14			168	85	103		.2	475	.65	3,810	220	82	41	2.0	758	7.8	
Weighted average	15,290	13		50	6.9	46		124	54	65		2.5	317	0.43	13,090	154	52	39	1.6	519	--	--
Calculated from determined constituents.																						

a Calculated from determined constituents.

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT RICHMOND, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	--	50	57	64	59	62	71	75	--	86	83
2	78	72	52	57	61	62	67	71	75	--	85	84
3	80	71	55	55	60	65	68	72	76	83	85	85
4	78	72	58	60	65	61	67	73	76	83	85	85
5	76	72	64	--	69	--	67	72	75	83	85	83
6	78	72	66	64	69	61	65	71	75	84	86	83
7	77	72	66	66	70	61	--	70	76	85	84	84
8	78	70	69	65	70	58	--	70	79	85	83	--
9	76	68	59	67	71	--	64	70	79	85	83	78
10	74	57	51	66	71	61	64	71	79	85	--	78
11	74	52	57	64	72	61	65	72	80	85	84	78
12	76	58	58	65	69	66	65	73	80	86	85	80
13	76	60	60	64	70	68	64	73	80	86	84	80
14	76	65	54	64	66	69	62	73	80	86	85	82
15	75	68	56	54	68	65	63	74	80	86	85	82
16	75	61	55	--	70	65	--	75	79	86	85	--
17	75	61	58	50	68	67	67	75	80	--	85	80
18	75	54	60	43	66	65	68	75	80	85	87	80
19	74	60	62	45	57	66	73	75	81	86	87	82
20	75	62	61	52	55	67	75	75	80	86	85	83
21	73	62	58	57	53	66	76	76	80	86	84	83
22	73	57	58	64	56	67	75	76	80	86	84	84
23	72	57	58	55	61	68	76	76	80	85	85	80
24	71	--	52	52	59	67	72	76	81	85	84	75
25	72	55	52	52	60	60	73	--	81	--	84	--
26	71	55	52	53	61	59	73	75	81	--	85	72
27	--	57	51	51	58	60	69	76	81	85	85	72
28	70	50	52	51	58	61	69	75	80	85	--	70
29	72	52	52	52	--	59	74	75	82	86	85	70
30	72	50	53	59	--	60	71	76	82	86	83	71
31	71	--	56	60	--	62	--	76	--	--	83	--
Average	75	62	57	57	64	63	69	74	79	85	85	80

BRAZOS RIVER BASIN--Continued

BRAZOS RIVER AT RICHMOND, TEX.--Continued

Periodic determinations and particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Discharge (tons per day)	Percent finer than indicated size, in millimeters									
							0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Apr. 3, 1957 ... Apr. 24 May 7 May 14	11:30 a.m.	8,460	69	3,880	--	88,600	79	85	90	92	93	97	100	--		SPWCM
	4:30 p.m.	31,800	74	6,760	--	580,000	68	79	84	90	92	96	99	100		SPWCM
	12:00 m.	107,000	72	2,240	8,900	647,000	38	43	48	56	64	77	95	99	100	SPWCM
	10:30 a.m.	59,000	75	3,000	11,600	478,000	51	60	69	79	88	96	99			SPWCM

Particle-size analyses of bed material, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed;
N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material										Methods of analysis
				Percent finer than indicated size, in millimeters										
				0.062	0.125	0.250	0.500	1.000	2.000	4.000				
Apr. 3, 1957	11:30 a. m.	8,460		0	6	52	78	84	86	90				S
Apr. 24	4:30 p. m.	31,800		1	6	44	88	98	99	100				S
May 7	12:00 m.	107,000		--	--	--	--	--	--	--				--
May 14	10:30 a. m.	59,000		0	1	16	56	75	88	98				S

BRAZOS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS
Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			

DOVE CREEK AT WEIR A, 21 MILES NORTHWEST OF ASPERMONT																				
Oct. 20, 1955	0.10	9.0		293	46	780		56	1,190	940		5.9	3,290	4.47	920	874	65	11	4,750	7.2
Oct. 25	.01	2.7		559	80	940		85	1,440	1,500		.5	4,540	6.17	1,640	1,570	55	10	6,600	7.2
Mar. 7, 1957	.02	--		409	34	987		63	947	1,640		--	--	--	1,160	1,110	65	--	6,460	7.7
May 15	.01	--		--	--	847	--	--	1,480	1,360		--	--	--	1,660	--	53	--	6,270	--
June 25	.01	--		--	--	155	8.4	65	1,140	250		--	--	--	1,210	1,160	22	--	2,600	7.8

MILLERS CREEK AT COUNTY ROAD CROSSING 12 MILES SOUTHWEST OF SEYMOUR																				
Feb. 21, 1957	0.00	12		34	5.5	15	128	16	16	13		2.1	161	0.22	108	3	24	0.6	258	8.2
Mar. 22	12.3	11		29	5.9	14	113	15	15	9.0		6.1	146	.20	96	3	24	.6	239	8.1
May 28	--	--		--	--	19	136	31	31	14		--	--	--	123	12	25	--	232	7.8
Aug. 22	.00	--		--	--	--	176	--	--	24		--	--	--	170	26	--	--	444	8.2

COLORADO RIVER BASIN
COLORADO RIVER AT COLORADO CITY, TEX.

LOCATION. --At gaging station at Colorado City, Mitchell County, 3,517 feet upstream from bridge on U. S. Highway 80, 4,100 feet upstream from Texas and Pacific Railway bridge, 1.6 miles upstream from Lone Wolf Creek, and at mile 796.

DRAINAGE AREA. --4,082 square miles, approximately, of which 2,590 square miles is probably noncontributing.

RECORDS AVAILABLE. --Chemical analyses: May 1946 to September 1954; November 1956 to September 1957.

Water temperatures: November 1952 to September 1957.

EXTREMES. 1956-57. --Dissolved solids: Maximum, 19,800 ppm Jan. 24-31, Feb. 1-6; minimum, 208 ppm May 12-14, 17-18.

Hardness: Maximum, 2,390 ppm Jan. 24-31, Feb. 1-6; minimum, 85 ppm May 25-26, 31, June 1-2.

Specific conductance: Maximum daily, 36,500 micromhos Dec. 19; minimum daily, 245 micromhos May 14.

Water temperatures: Maximum, 93°F July 30; minimum, freezing point on several days during December and January.

EXTREMES. 1946-54: 1956-57. --Dissolved solids: Maximum, 32,800 ppm Apr. 1-10, 1953; minimum, 176 ppm Oct. 26, 1947.

Hardness: Maximum, 4,500 ppm Aug. 9-12, 1946; minimum, 65 ppm Sept. 15-20, 1949.

Specific conductance: Maximum daily, 45,800 micromhos Apr. 1-10, 1952; minimum, 245 micromhos May 14, 1957.

Water temperatures: Maximum, 93°F July 30, 1957; minimum, freezing point on several days during December 1956 and January 1957.

REMARKS. --Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, November 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Chemical analyses, in parts per million, averages over 24 hours										Per- cent so- lution	Specific conduct- ance (micro- mhos at 25°C)					
						Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids					Hardness as CaCO ₃				
													Parts per mil- lion	Tons per acre- foot	Tons per day			Calcium, mag- nesium	Non-carbon- ate			
Nov. 15-21, 1956.	a 0.09	4.0	283	115	3,050	4,720	68	644	4,930	7,530	--	--	9,040	12.3	2.20	1,130	1,070	85	39	14,600	7.4	
Nov. 22-30.....	a 0.9	3.5	385	173	4,720	78	1,090	7,530	7,530	--	--	--	13,900	18.9	3.38	1,870	1,610	86	50	21,300	7.6	
Dec. 1-10.....	a 0	2.8	434	188	5,320	82	1,290	8,520	8,520	--	--	--	15,800	21.5	--	1,860	1,790	86	54	23,800	7.5	
Dec. 11-20.....	a 4.05	4.4	489	237	6,360	89	1,360	10,300	10,300	--	--	--	15,800	25.6	206	2,190	2,120	86	59	27,700	7.4	
Dec. 21-31.....	5.30	4.5	376	173	4,310	103	921	7,080	7,080	--	--	--	12,900	17.5	185	1,650	1,560	85	46	20,200	7.6	
Jan. 1-10, 1957....	.78	3.9	428	183	5,050	91	1,180	8,150	8,150	--	--	--	15,000	20.4	31.6	1,820	1,750	86	51	23,200	7.6	
Jan. 11-23.....	.37	5.8	530	222	6,530	105	1,480	10,500	10,500	--	--	--	19,300	26.2	19.3	2,240	2,150	86	60	28,100	7.7	
Jan. 24-31, Feb. 1-6	2.85	4.5	569	235	6,670	122	1,500	10,800	10,800	--	--	--	19,800	26.9	152	2,390	2,290	86	59	28,800	7.6	
Feb. 7.....	676	13	283	102	2,750	80	319	4,760	4,760	--	--	--	8,270	11.2	15,090	1,130	1,060	84	36	14,300	7.5	
Feb. 8.....	1,800	11	36	5.3	101	5	109	35	148	1,400	4.1	4.1	5,400	.54	1,940	111	84	721	7.8	4.2	721	7.8
Feb. 9-10.....	74	8.2	74	18	477	92	114	760	760	2.8	2.8	2.8	1,520	2.07	304	258	183	80	13	2,800	7.5	
Feb. 11-18.....	10.1	8.4	163	52	1,430	92	328	2,350	2,350	--	--	--	4,380	5.96	119	620	545	83	25	7,520	7.8	
Feb. 19-28.....	3.37	6.5	280	90	2,460	102	553	4,040	4,040	--	--	--	7,460	10.1	67.9	1,020	935	84	33	12,300	7.8	
Mar. 1-10.....	.94	4.6	354	122	3,320	111	809	5,750	5,750	--	--	--	10,600	14.4	26.9	1,380	1,290	85	41	16,800	7.8	
Mar. 11-18.....	a 25	1.7	410	124	4,100	91	966	6,640	6,640	--	--	--	12,300	16.7	8.30	1,530	1,460	85	45	19,100	7.6	
Mar. 19-31.....	3.88	5.6	372	146	3,810	94	891	6,240	6,240	--	--	--	11,500	15.6	120	1,530	1,450	84	42	18,000	7.5	

Apr. 1-10, 1957...	a. 33	3.9	394	157	4,020	80	941	6,610	--	12,200	16.6	10.9	1,650	1,560	84	43	18,900	7.3
Apr. 11-18	a 0	3.5	425	172	4,420	67	1,090	7,220	--	13,400	18.2	--	1,770	1,710	84	46	20,500	7.3
Apr. 19-24	a 1.46	8.2	400	155	3,870	75	1,010	6,340	--	11,800	16.0	46.5	1,640	1,580	84	42	18,700	7.1
Apr. 25-27	1,541	11	45	6.7	163	94	49	258	2.2	615	.84	2,950	140	63	72	6.0	1,090	7.4
Apr. 28-30	1,541	11	32	4.3	61	99	27	85	2.2	284	.39	1,180	98	17	58	2.7	494	7.0
May 1, 9-10	376	9.8	44	6.6	151	84	51	242	1.0	585	.81	1,604	136	67	71	5.6	1,010	7.2
May 2-8	22.5	18	140	39	904	123	246	1,500	4.0	2,910	3.96	177	510	409	79	17	5,110	7.3
May 11, 19, 27	776	13	45	6.3	131	114	46	198	3.0	532	.72	1,110	138	44	67	4.9	906	7.6
May 12-14, 17-18	1,919	12	30	3.3	35	99	16	46	3.0	208	.28	1,080	88	7	47	1.6	346	7.4
May 15-16, 20-21, 24, 28-29	59.1	12	57	23	303	124	94	492	2.0	1,040	1.41	166	236	134	74	8.6	1,900	7.6
May 22-23, 30	20.6	13	100	23	535	140	158	870	2.0	1,770	2.41	98.4	344	230	77	13	3,200	7.6
May 25-26, 31, June 1-2	4,784	12	28	3.5	46	104	19	56	2.0	232	.32	3,000	85	0	54	2.2	391	7.3
June 3	289	12	51	7.8	127	114	28	220	3.5	6,504	.69	393	158	64	64	4.4	967	7.8
June 4-6	54.3	15	90	18	374	156	130	600	2.0	1,310	1.78	192	298	170	73	9.4	2,370	8.0
June 7-12, 17, 20	19.0	12	137	47	957	142	334	1,560	2.0	3,140	4.27	161	585	468	78	17	5,490	8.0
June 13-16, 18-19	47.7	13	114	29	647	138	247	1,020	2.0	2,140	2.91	276	404	290	78	14	3,790	8.0
June 21-30	13.6	9.2	160	54	1,090	151	349	1,780	1.5	3,520	4.79	129	621	498	79	19	6,180	8.1
July 1-8	a. 74	6.3	182	68	1,470	119	433	2,400	--	4,620	6.28	9.23	734	638	81	24	7,900	7.8
July 9-22	a 0	11	275	109	2,320	104	737	3,770	--	4,270	9.89	243	1,130	1,050	82	30	11,900	7.7
July 23-30	29.7	3.6	109	36	988	87	275	1,560	2.0	3,080	4.12	243	420	340	84	21	5,330	7.8
July 31, Aug. 2-4	27.8	10	36	7.0	146	94	47	218	3.8	524	.71	39.3	119	42	73	3.8	944	7.7
Aug. 1, 5-8	18.9	6.0	102	35	900	91	239	1,440	2.5	2,770	3.77	141	398	324	83	20	5,000	7.4
Aug. 9-18	a. 08	7.0	110	42	1,140	69	312	1,800	4.0	3,450	4.69	.75	447	390	85	23	6,010	7.8
Aug. 19-25	3.57	5.0	180	74	1,930	48	444	3,150	--	5,810	7.90	56.0	754	714	85	30	9,770	7.5
Aug. 26-31, Sept. 1-6	a. 02	8.2	232	91	2,320	93	564	3,780	--	7,040	9.57	.48	953	877	84	33	11,700	7.7
Sept. 7-8	21.7	6.2	169	50	1,410	112	350	2,300	--	4,340	5.90	254	627	535	83	25	7,510	7.9
Sept. 9-11	11.2	5.2	61	16	483	136	136	740	1.8	1,490	2.03	45.1	218	138	83	14	2,730	7.9
Sept. 12-20	a 1.48	5.6	101	31	909	77	224	1,480	1.3	2,770	3.77	11.1	380	316	84	20	4,980	7.7
Sept. 21-22	8.80	6.4	36	4.8	91	103	32	133	2.1	b 356	.48	8.46	109	24	64	3.8	667	8.0
Sept. 23-30	a 0	5.2	54	10	285	70	90	425	1.0	946	1.29	--	176	118	77	8.7	1,870	7.7
Weighted average.	c 163	12	40	7.4	151	102	42	235	--	555	0.75	244	130	47	72	5.8	946	--

a Includes days of less than 0.05 cfs.

b Calculated from determined constituents.

c Represents more than 99 percent of discharge for the year.

WESTERN GULF OF MEXICO BASINS

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT COLORADO CITY, TEX.--Continued

Temperature (°F) of water, November 1956 to September 1957
Once-daily measurement, usually at 5:30 p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		--	53	55	40	64	69	62	70	90	91	89
2		--	54	52	52	69	76	70	67	89	90	90
3		--	56	51	51	64	65	60	68	90	88	--
4		--	43	56	50	60	60	61	72	89	90	--
5		--	56	58	58	60	51	73	69	86	91	--
6		--	57	59	53	68	68	70	84	89	89	--
7		--	42	63	55	56	74	73	83	90	90	--
8		--	36	65	55	67	72	--	92	91	90	--
9		--	35	65	68	55	73	71	89	88	91	--
10		--	36	58	67	65	76	70	87	90	92	--
11		--	34	48	67	68	80	69	85	90	91	--
12		--	32	60	65	--	72	65	80	91	91	--
13		--	32	60	65	--	69	67	86	91	91	82
14		--	36	52	65	--	62	69	91	90	91	82
15		49	36	36	66	--	70	72	89	91	91	60
16		56	38	32	60	--	71	83	82	91	91	78
17		39	40	34	58	73	75	62	82	92	91	82
18		60	38	36	52	65	80	64	75	89	90	78
19		65	32	48	50	64	62	86	80	90	89	80
20		52	44	55	50	56	65	87	82	89	83	73
21		55	54	48	51	70	69	90	82	88	85	73
22		53	56	34	51	60	72	84	85	89	85	71
23		55	50	33	--	55	65	75	80	89	88	74
24		41	49	32	50	50	68	80	89	89	89	75
25		52	49	31	60	58	60	70	89	87	92	73
26		54	48	30	61	59	55	79	90	88	91	76
27		52	50	30	63	68	60	75	90	90	90	76
28		47	51	28	65	62	58	--	91	91	91	74
29		49	54	30	--	64	62	70	91	92	89	76
30		47	55	40	--	65	69	75	90	93	92	76
31		55	55	48	--	66	--	72	--	90	92	--
Average		--	45	46	57	63	67	73	83	90	90	--

COLORADO RIVER BASIN--Continued
COLORADO RIVER NEAR SILVER, TEX.

LOCATION.--At gaging station at bridge on county road, 5.4 miles southwest of Silver, Coke County, 11 miles upstream from Pecan Creek, 18.5 miles downstream from Big Silver Creek, and at mile 743.
DRAINAGE AREA.--15,480 square miles, approximately, of which 11,600 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Water temperatures: October 1956 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 6,190 ppm Nov. 3-10; minimum, 180 ppm June 1-4.

HARDNESS: Maximum, 1,050 ppm Mar. 14-16; minimum, 93 ppm Apr. 29-30.

Specific conductance: Maximum daily, 12,000 micromhos at 25°C; minimum daily, 202 micromhos June 2.

Water temperatures: Maximum, 85°F, June 21; minimum, 38°F, Dec. 9.

REMARKS.--Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium		Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
						(Na)	(Mg)								Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Oct. 15-16, 1956.	613	11		41	4.7	22		117	42	19	0.5	2.2		204	0.28	338	122	26	28	0.9	326	7.5
Oct. 17-19.....	576	11		42	5.3	17		139	27	13	7	2.5		191	.26	297	127	13	23	.7	312	7.6
Oct. 20-24.....	40.5	10		36	5.1	35		115	36	37	5	2.8		222	.30	24.3	111	17	41	1.5	374	7.9
Oct. 25-29.....	4.66	10		44	7.0	77		117	64	100	6	2.0		358	.49	4.50	140	44	54	2.8	634	7.5
Oct. 30-31.....	212	13		48	4.9	19		133	30	26	5	4.8		211	.29	121	140	31	23	.7	349	7.7
Nov. 1.....	112	18		70	14	150		127	143	214	--	4.5		678	.92	205	233	129	58	4.2	1,160	8.1
Nov. 2.....	37	15		117	29	631		118	314	960	6	5.0		2,130	2.90	213	410	314	77	14	3,640	7.9
Nov. 3-10.....	5.69	7.8		201	98	2,030		79	348	3,470	3	--		6,190	8.42	95.1	904	840	83	29	10,500	7.2
Nov. 11-20.....	a.05	8.2		231	90	1,740		94	462	2,950	3	--		5,530	7.52	.75	946	870	80	25	9,240	7.8
Nov. 21-30.....	a.0	5.8		259	88	1,770		100	547	2,980	3	--		5,700	7.75	--	1,010	926	79	24	9,420	7.6
Dec. 1-9.....	a.0	3.8		251	89	1,840		109	511	3,100	3	--		5,850	7.96	--	992	902	80	25	9,660	7.7
Dec. 10-17.....	a.0	5.0		214	88	1,840		111	381	3,120	--	--		5,700	7.75	--	896	805	82	27	9,610	7.7
Dec. 18.....	a.0	5.6		90	22	483		72	169	800	--	1.8		1,610	2.19	--	315	256	77	12	2,840	7.8
Dec. 19-20.....	440	8.6		39	5.2	20		125	27	21	--	2.2		192	.26	--	118	16	27	.8	325	8.0
Dec. 21, 23-25.....	32.7	6.4		80	27	272		128	218	400	--	7.5		1,070	1.46	--	310	206	66	6.7	1,880	7.4
Dec. 22.....	33	7.0		41	9.4	110		95	89	149	--	1.2		462	.63	--	142	64	63	4.0	805	7.6
Dec. 26-31.....	2.80	7.0		92	30	402		129	296	575	--	2.0		1,470	2.00	11.1	353	248	71	9.3	2,540	7.7
Jan. 1-10, 1957.....	.18	5.8		133	37	572		148	405	840	--	2		2,070	2.82	--	484	362	72	11	3,500	7.9
Jan. 11-20.....	a.0	6.3		229	52	917		164	670	1,380	6	5		3,340	4.54	--	786	651	72	14	5,460	8.0
Jan. 21-28.....	a.0	4.4		217	53	927		174	630	1,400	6	6		3,320	4.52	--	760	617	73	15	5,390	7.8
Jan. 29-31.....																						
Feb. 1-2, 4-5.....	a.03	4.0		284	66	1,350		188	741	2,120	4	--		4,660	6.34	.38	980	826	75	19	7,530	7.8

a Includes days of less than 0.05 cfs.

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SILVER, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Nitre (NO ₃)	Bor- on (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- lution- adsorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, magnesium	Non-carbon- ate				
Feb. 3, 1957.....	0.10	--		111	35	452		156	328	660	0.7	0.5		1,660	2.26	0.45	420	292	70	2,860	8.0	
Feb. 6-7.....	128	8.2		39	6.9	80		90	38	129	.3	2.2		373	.51	129	125	51	58	3.1	659	7.6
Feb. 8-13.....	432	8.2		54	12	284		98	106	430	.5	2.8		6,946	1.29	1,100	184	104	77	9.1	7,170	7.9
Feb. 14-20.....	11.0	7.8		86	21	471		93	180	750	.5	1.0		1,560	2.12	46.3	300	224	77	12	2,770	7.9
Feb. 21-28.....	4.25	6.4		124	32	652		97	272	1,060	.5	.5		2,200	2.99	25.2	441	362	76	14	3,840	7.8
Mar. 1-13.....	.69	6.4		161	42	770		105	368	1,260	.3	1.5		2,660	3.62	4.96	574	488	74	14	4,600	7.7
Mar. 14-16.....	.13	7.4		306	69	1,450		136	749	2,350	.3	--		5,000	6.80	1.76	1,050	936	75	20	8,180	7.8
Mar. 17.....	90	8.8		111	20	320		106	233	510	.5	5.0		1,280	1.71	306	1,358	271	66	7.3	2,180	7.9
Mar. 18-19.....	8.60	20		47	4.5	48		104	52	70	.5	2.5		5,286	.40	6.87	136	51	44	1.8	496	7.9
Mar. 20-23.....	356	12		60	12	134		114	102	203	.5	3.0		616	.84	592	199	106	59	4.1	1,040	7.7
Mar. 24-31, Apr. 1-2, 6....	7.35	11		100	26	444		86	230	715	.7	2.2		1,570	2.14	31.2	356	286	73	10	2,740	8.0
Apr. 3-4.....	101	17		49	7.4	48		136	41	67	.7	6.0		5,303	.41	82.6	152	40	41	1.7	523	8.3
Apr. 5.....	23	7.8		44	4	151		94	81	238	.7	2.8		620	.84	38.5	173	96	66	3.0	1,080	7.6
Apr. 7-16.....	1.48	7.2		169	44	637		108	369	1,380	.6	2.5		2,860	3.89	11.4	602	514	75	15	4,950	7.8
Apr. 17-18.....	1.50	13		228	57	1,100		131	534	1,800	.6	2.5		3,800	5.17	15.4	804	696	75	17	6,400	8.1
Apr. 19.....	4,120	13		50	6.9	50		156	35	67	.7	2.5		311	.42	3,460	154	26	42	1.8	566	8.0
Apr. 20-25.....	141	13		46	6.7	81		105	60	120	.7	3.5		398	.54	152	146	60	55	2.9	682	8.0
Apr. 26.....	4,700	11		65	11	216		142	79	336	.7	2.5		10,320	1.11	10,320	207	90	69	6.6	1,420	7.9
Apr. 27.....	5,970	9.8		37	5.2	53		114	26	74	.7	3.5		275	.37	4,430	114	20	50	2.2	487	7.8
Apr. 28.....	5,480	8.6		43	6.4	71		127	32	104	1.0	3.0		344	.47	5,090	134	30	54	2.7	606	7.8
Apr. 29-30.....	4,555	7.8		30	4.5	39		101	22	49	.7	2.0		206	.28	2,530	93	11	48	1.8	365	7.8
May 1-4.....	329	10		44	6.4	78		106	54	112	.6	3.8		380	.52	338	136	49	55	2.9	645	6.8
May 5-8.....	17.0	12		72	14	226		120	127	352	.6	1.8		1,23	.123	41.4	238	140	67	6.4	1,520	7.7
May 9-10.....	2,445	12		50	8.1	91		135	52	133	.6	3.5		437	.59	8,500	159	48	55	3.1	741	7.4
May 11.....	17,400	11		34	4.4	20		112	23	20	.5	3.2		181	.25	8,500	104	12	30	.9	291	7.3
May 12-15.....	6,902	11		36	6.3	43		121	42	45	.6	3.0		263	.36	4,901	116	17	45	1.8	431	7.2
May 16-17.....	967	11		39	8.5	71		138	65	73	.8	1.8		356	.48	929	132	19	54	2.7	585	7.9
May 18-19.....	6,990	11		35	5.4	40		108	31	52	.5	3.2		246	.33	4,640	110	22	44	1.7	416	7.4
May 20-22.....	907	10		39	7.6	69		119	58	80	.7	2.0		338	.46	828	128	30	53	2.6	573	7.4
May 23-30.....	2,770	11		45	7.2	59		128	51	77	.5	3.2		331	.45	2,480	143	38	47	2.1	560	7.4
May 31.....	4,760	12		39	6.2	52		108	40	73	.5	3.0		296	.40	3,800	123	34	48	2.1	497	7.8

June 1-4, 1957...	7,382	8.4	32	4.9	25	97	26	32	.4	2.5	b180	.24	3,580	100	20	35	1.1	322	7.3
June 5-6	902	27	51	9.1	71	131	68	96	.6	4.8	396	.54	964	164	57	49	2.4	867	7.9
June 7-9	282	24	71	14	155	150	120	225	.5	4.8	710	.97	541	234	112	59	4.4	1,200	8.0
June 10-20	231	20	279	21	487	130	190	430	.4	4.0	1,100	1.50	686	308	202	66	6.9	1,940	7.9
June 21-30	34.8	14	137	33	487	125	331	740	.4	2.2	1,790	2.43	168	478	375	68	9.3	3,080	7.8
July 1-6, 15, 19-20	13.2	15	214	53	738	106	565	1,190	.4	2.0	2,830	3.85	101	752	665	68	12	4,730	7.7
July 7-14, 16-18	10.2	15	273	69	1,250	105	778	1,980	.3	2.5	4,420	6.01	122	964	878	74	18	7,080	7.8
July 21-23, 28-31	18.3	15	248	70	1,150	119	608	1,900	.4	3.0	4,050	5.51	200	907	810	73	17	6,790	7.9
July 24-25	262	12	54	6.7	52	115	64	1,78	.5	5.0	b329	.45	233	162	68	41	1.8	582	7.8
July 26	158	17	65	13	127	113	120	192	.5	3.0	b594	.81	253	216	123	56	3.8	1,040	8.0
July 27	68	14	122	26	345	130	264	550	.5	4.0	1,390	1.89	255	412	305	65	7.4	2,400	8.1
Aug. 1-10	28	8.0	178	48	954	117	440	1,530	.5	3.0	3,220	4.38	243	642	546	76	16	5,570	7.8
Aug. 11-17	8.10	9.8	222	55	1,020	141	572	1,620	.5	3.0	3,570	4.86	78.1	780	664	74	16	6,050	7.8
Aug. 18-19, 22-23	369	13	62	15	195	127	131	280	.6	3.0	b791	1.08	788	216	112	66	5.8	1,400	8.1
Aug. 20-21	118	12	38	8.8	86	106	63	114	.7	3.2	b378	.51	120	130	43	59	3.3	681	8.1
Aug. 24-28	6.30	14	117	28	485	122	290	750	.6	1.5	1,750	2.38	29.8	407	307	72	10	3,020	8.1
Aug. 29-31	3.92	15	195	47	965	147	534	1,520	.5	1.5	3,370	4.58	35.7	680	560	76	16	5,580	7.9
Sept. 1-2	38.2	10	136	29	327	116	326	520	.5	1.5	1,410	1.92	145	458	384	61	6.6	2,350	7.7
Sept. 3-5, 11-13	3.76	10	158	35	636	127	402	990	.5	.5	2,290	3.11	23.2	538	434	72	12	3,830	7.8
Sept. 6-10	5.78	8.6	170	43	813	117	460	1,270	.5	.5	2,820	3.84	44.0	801	505	75	14	4,800	7.7
Sept. 14-19	3.00	12	218	56	1,190	128	624	1,650	.6	3.0	4,010	5.45	32.3	774	670	77	19	6,680	7.9
Sept. 20	1,361	10	45	6.0	42	137	38	32	.6	3.0	b279	.36	1,030	137	23	40	1.6	4,499	7.8
Sept. 21-24	36	16	58	8.6	137	107	100	200	.8	2.5	b378	.78	56.0	180	92	62	4.4	1,040	7.9
Sept. 25-26	9.42	12	82	13	254	122	164	380	.8	2.0	b968	1.32	23.6	238	156	68	6.8	1,700	7.5
Sept. 27-30																			
Weighted average	496	11	41	6.9	64	117	46	68	0.6	2.9	326	0.45	441	131	35	51	2.4	565	--

b Calculated from determined constituents.

WESTERN GULF OF MEXICO BASINS

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SILVER, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally between 6 and 8 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	57	63	51	49	57	61	64	67	82	82	78
2	--	56	47	47	44	67	66	53	65	83	82	80
3	--	53	55	47	48	68	59	68	64	81	83	75
4	--	50	63	50	57	70	58	65	66	76	81	79
5	--	49	68	47	57	57	56	58	70	81	82	80
6	--	53	64	50	56	50	57	64	70	80	80	80
7	--	59	62	51	55	66	60	64	75	80	78	74
8	--	53	43	54	59	45	68	63	82	82	79	68
9	--	49	38	50	60	56	56	65	82	81	77	79
10	--	41	52	46	59	58	76	69	83	82	78	72
11	--	51	50	43	59	60	63	65	81	81	80	84
12	--	51	54	54	62	58	52	70	77	82	79	76
13	--	50	52	50	62	60	43	68	79	82	78	79
14	--	61	51	48	62	53	46	67	69	81	80	83
15	--	51	57	44	59	51	54	64	77	82	79	84
16	--	53	60	42	56	58	75	73	79	81	80	73
17	69	57	53	40	53	71	74	75	81	82	82	79
18	64	48	41	42	52	60	72	64	75	81	80	78
19	63	58	42	42	51	57	64	64	75	82	75	72
20	64	58	44	43	50	56	65	71	80	81	76	84
21	60	53	50	45	51	50	70	73	85	80	75	78
22	61	58	50	43	55	57	68	76	81	79	78	68
23	61	49	45	51	52	63	68	65	79	78	77	66
24	61	51	42	48	52	48	67	70	80	79	75	62
25	60	58	41	44	56	45	71	72	79	76	--	68
26	58	54	40	40	62	53	65	70	80	80	--	70
27	53	59	41	50	61	54	62	70	80	79	77	78
28	53	50	44	56	54	50	65	70	78	80	79	69
29	73	54	44	50	--	54	61	68	80	84	80	65
30	57	58	48	50	--	58	62	74	81	80	79	68
31	51	--	45	45	--	59	--	74	--	82	80	--
Average	--	53	50	47	55	57	63	68	77	81	79	75

COLORADO RIVER BASIN--Continued
COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 190, 5.2 miles downstream from San Saba, 9.2 miles east of San Saba, San Saba County, and at mile 474.

DRAINAGE AREA.--30, 600 square miles, approximately, of which 11,900 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: September 1947 to September 1957.

Water temperatures: September 1947 to September 1957.

Sediment records: December 1950 to September 1957.

EXTREMES, 1936-57.--Dissolved solids: Maximum, 1,100 ppm Aug. 28-31, Sept. 1-5; minimum, 149 ppm Apr. 20-23, 25-29.

Hardness: Maximum, 436 ppm Aug. 28-31, Sept. 1-5; minimum, 89 ppm May 11-20.

Specific conductance: Maximum daily, 2,150 micromhos Aug. 31; minimum daily, 196 micromhos Apr. 23.

Water temperatures: Maximum, 90°F July 28; minimum, 39°F Jan. 17.

Sediment concentrations: Maximum daily, 10,500 ppm Oct. 20; minimum daily, 24 ppm Nov. 19.

EXTREMES, 1947-57.--Dissolved solids: Maximum, 1,530 ppm Oct. 15-19, 1947; minimum, 102 ppm Sept. 23-25, 1955.

Hardness: Maximum, 522 ppm Oct. 15-19, 1947; minimum, 71 ppm June 25-30, 1949.

Specific conductance: Maximum daily, 3,420 micromhos Sept. 20, 1947; minimum daily, 161 micromhos Sept. 11, 1952.

Water temperatures: Maximum, 98°F Aug. 3, 1956; minimum, freezing point Jan. 29, 1948, Jan. 30, 1951.

Sediment concentrations (1950-57): Maximum daily, 10,500 ppm Oct. 20, 1956; minimum, no flow Aug. 27-31, 1954.

Sediment loads (1950-57): Maximum daily, 535,000 tons May 19, 1955; minimum 0 tons Aug. 27-31, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO ₃		Percent sodium carbonate	Specific conductance (micro-mhos at 25° C)	pH		
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
Oct. 1-10, 1956...	11.2	12		47	22	52		239	19	74	0.8			a345	0.47	10.4	209	13	35	1.5	635	7.8
Oct. 11-19	752	11		53	18	56		216	31	83	2.2			365	.50	741	206	29	37	1.7	651	7.8
Oct. 20-31	2,143	10		43	7.7	33		140	26	46	3.8			249	.34	1,440	138	23	34	1.2	434	8.1
Nov. 1-10	628	10		42	7.5	27		133	29	38	2.5			234	.32	397	136	27	30	1.0	391	7.8
Nov. 11-20	77.7	10		42	9.0	27		150	16	42	2.5			a222	.30	46.6	142	19	29	1.0	392	8.0
Nov. 21-30	31.6	12		49	14	34		196	19	50	2.5			a276	.38	23.5	180	20	29	1.1	489	8.2
Dec. 1-10	20.6	12		54	18	41		229	21	62	1.0			344	.47	19.2	208	21	30	1.2	575	8.2
Dec. 11-18, 20 ..	124	10		58	20	47		246	23	72	1.2			367	.50	123	226	25	31	1.4	644	8.2
Dec. 19	928	9.6		26	10	19		123	9.6	26	2.2			a162	.22	406	107	6	28	.8	277	8.3
Dec. 21-24	454	6.0		45	7.5	83		149	26	123	3.2			a367	.50	450	143	22	56	3.0	692	7.9
Dec. 25-31	176	8.0		45	9.3	29		161	25	39	1.5			250	.34	119	151	19	29	1.0	430	8.1
Jan. 1-10, 1957...	69.9	8.2		59	14	40		200	41	61	.8			346	.47	65.3	205	41	30	1.2	582	8.1
Jan. 11-20	47.6	7.6		78	22	54		243	82	83	.2			484	.66	62.2	285	86	29	1.4	774	8.1
Jan. 21-31	44.5	8.2		79	24	60		265	75	93	.5			513	.70	61.6	296	78	31	1.5	822	8.1

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued
COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bohrium (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./nesium	Non-carbonate				
Feb. 1-10, 1957..	48.8	9.4		71	24		61	244	74	93		0.8		472	0.64	62.2	276	76	32	1.6	805	8.0
Feb. 11-19	234	7.0		70	18		86	196	80	135		1.2		520	.91	329	248	88	43	2.4	895	7.9
Feb. 20-28	127	7.8		75	18		85	201	94	130		.2		530	.72	182	262	98	41	2.3	897	7.9
Mar. 1-10	60.1	7.0		71	21		67	229	80	99		.2		482	.66	78.2	264	76	36	1.8	811	8.1
Mar. 11, 21-31...	1,163	10		42	5.2		33	124	27	46		3.5		235	.32	738	126	24	36	1.3	404	7.7
Mar. 12-21	737	8.8		83	21		127	182	124	206		1.5		722	.98	1,440	294	145	48	3.2	1,160	7.9
Apr. 1-6	550	9.2		42	8.6		24	148	21	34		2.8		228	.31	339	140	19	28	.9	381	7.8
Apr. 7-18	206	7.8		62	14		91	156	77	143		1.5		502	.68	279	212	84	48	2.7	845	8.1
Apr. 19, 24, 30	19,090	11		43	5.6		35	134	22	51		2.0		238	.82	12,270	131	21	36	1.3	417	7.5
Apr. 20-23, 25-29	16,020	11		36	3.7		13	120	9.4	16		2.0		149	.20	6,440	104	6	21	.6	253	7.6
May 1-10	8,052	9.8		38	5.0		22	128	16	27		4.0		204	.28	4,440	116	11	29	.9	334	7.3
May 11-20	42,310	10		30	3.5		16	110	11	14		3.0		155	.21	17,710	89	0	28	.7	247	7.6
May 21-31	20,770	10		39	4.0		18	123	16	23		4.0		164	.26	10,880	115	14	25	.7	313	7.4
June 1-9	14,590	10		42	6.0		19	134	20	26		4.0		213	.29	8,390	129	20	24	.7	338	7.5
June 10-20	2,962	13		54	10		33	160	35	53		6.9		315	.43	2,520	176	45	29	1.1	506	7.4
June 21-30	1,134	18		68	15		70	186	69	108		7.6		473	.64	1,450	231	78	40	2.0	780	8.2
July 1-10	1,377	19		68	20		75	210	71	115		8.6		516	.70	525	252	80	39	2.1	843	8.1
July 11-20	169	22		70	24		74	232	74	112		12		543	.74	248	273	83	37	1.9	878	8.2
July 21-31	411	16		82	24		100	228	100	157		10		630	.86	689	303	116	42	2.5	1,060	8.0
Aug. 1-12	207	15		88	31		120	191	169	190		9.7		774	1.05	433	347	190	43	2.8	1,230	8.1
Aug. 13-27	114	17		81	33		129	195	170	186		2.5		785	1.08	245	338	178	45	3.0	1,220	7.9
Aug. 28-31,																						
Sept. 1-5	92.1	16		102	44		226	191	261	332		3.5		al,100	1.50	274	436	279	53	4.7	1,840	7.9
Sept. 6-12	103	16		74	32		144	208	142	218		2.5		a,730	.99	203	316	146	50	3.5	1,270	8.0
Sept. 13-24	1,265	11		48	9.1		98	138	48	98		3.2		541	.41	1,020	157	44	36	1.4	501	8.0
Sept. 25-30	1,194	10		64	18		98	158	90	156		3.8		541	.74	1,740	234	104	48	2.8	918	8.0
Weighted average	3,354	10		38	5.3		23	125	19	29		3.4		204	0.28	1,850	117	14	30	0.9	333	--

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally between 7 and 11 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	62	47	47	51	55	58	66	73	81	84	86
2	72	63	58	49	55	65	59	67	72	83	84	82
3	73	59	50	49	57	58	62	66	70	82	84	80
4	75	58	55	54	59	57	65	67	70	88	88	80
5	72	61	55	51	57	57	62	65	70	83	84	80
6	73	59	60	57	58	55	61	63	70	83	82	78
7	76	59	62	57	60	56	66	65	73	89	78	--
8	69	57	58	57	69	52	60	65	75	81	84	--
9	71	52	49	58	65	53	60	66	--	83	--	80
10	70	--	45	52	69	66	62	69	78	82	--	82
11	67	--	48	48	62	61	65	--	80	83	--	82
12	74	58	50	49	61	61	61	--	78	84	--	--
13	72	62	47	51	55	61	55	--	78	83	81	--
14	78	62	46	51	55	65	56	--	78	86	84	78
15	70	62	48	47	54	58	56	--	79	87	83	76
16	70	53	54	42	60	60	61	--	78	84	82	78
17	70	52	51	39	60	65	65	--	80	83	83	79
18	70	59	49	40	57	62	69	--	80	83	88	78
19	69	59	45	40	56	60	68	--	78	84	83	81
20	67	60	48	58	55	61	65	--	78	83	80	81
21	--	52	--	57	53	59	68	73	79	85	80	81
22	60	50	--	57	55	58	66	73	79	83	80	74
23	70	53	--	48	53	60	65	72	80	82	81	--
24	--	52	47	46	55	56	68	74	76	81	81	71
25	66	55	47	48	55	52	69	73	82	82	83	70
26	60	50	45	42	56	54	69	73	82	83	81	71
27	60	49	45	43	54	56	64	72	80	89	82	71
28	--	50	46	43	54	54	69	72	83	90	81	73
29	--	46	46	51	--	55	65	71	80	84	81	70
30	65	47	55	46	--	59	65	73	85	84	80	67
31	65	--	48	48	--	59	--	72	--	85	80	--
Average	70	56	50	49	58	58	63	--	77	84	82	77

WESTERN GULF OF MEXICO BASINS
 COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	8.4			118	145	46	26		
2.....	7.7			192	182	94	26		
3.....	8.1			213	162	93	25		
4.....	13			950	818	sa2,430	23		
5.....	14	34	1.0	1,380	1,230	4,580	20		
6.....	13			1,380	1,500	5,590	18	28	1.6
7.....	12			924	1,120	2,790	18		
8.....	11			562	890	1,350	18		
9.....	12			344	720	669	16		
10.....	13			221	--	e 340	16		
11.....	14	39	1.3	152	438	180	20		
12.....	12			117	320	101	20		
13.....	11			94	255	65	16		
14.....	11			84	214	49	15		
15.....	20	44	2.4	69	151	28	14	32	1.6
16.....	178	--	e 70	62	140	23	16		
17.....	3,170	5,410	sa63,900	56	100	15	18		
18.....	2,150	5,200	30,200	51	50	6.9	30		
19.....	1,200	4,300	13,900	48	24	3.1	923	1,670	sa5,580
20.....	8,440	10,500	sa251,000	44	54	6.4	964	2,400	6,250
21.....	1,500	5,000	155,000	40	56	6.0	520	2,050	2,880
22.....	2,660	5,400	38,800	37	50	5.0	188	650	330
23.....	1,120	4,550	13,800	36			512	625	sa1,190
24.....	692	1,850	3,460	35			597	500	806
25.....	450	689	837	31			356	600	577
26.....	270	383	279	30	40	3.2	234	402	254
27.....	177	265	127	28			170	250	115
28.....	132	215	77	27			136	140	51
29.....	112	160	48	26			126	120	41
30.....	91	185	45	26			112	110	33
31.....	67	140	25	--	--	--	99	84	22
Total.	32,589.2	--	571,586.5	7,377	--	18,496	5,297	--	18,137.8
January			February			March			
1.....	89		58			82			
2.....	80	77	51			76			
3.....	76		60			69			
4.....	76		56			65			
5.....	71		48			58			
6.....	69			76	10		98	16	
7.....	65	50	45			55			
8.....	60		43			50			
9.....	58		43			48			
10.....	55		43			47			
11.....	53		41			51			
12.....	50		38						
13.....	50		38	63	6.5	385	--	b 370	
14.....	50		607	--	b 800	173			
15.....	50		450	--	b 300	188			
16.....	50		305	--	b 150	152			
17.....	47					109	--	30	
18.....	44	57	213	61	35	80			
19.....	44		170	54	25	67			
20.....	44		148	48	19	58			
21.....	44		136	56	21	420	--	b 450	
22.....	44		159	50	21	583	300	472	
23.....	43								
24.....	44		145			5,540	5,550	s 86,800	
25.....	47		123			6,170	5,760	96,000	
26.....	44		142			1,650	3,920	17,500	
27.....	43		145			1,300	2,990	10,500	
28.....	47		126	106	35	948	2,380	6,090	
29.....	44	44	112			611	850	1,400	
30.....	45		101			429	595	689	
31.....	44		91			315	444	378	
32.....	44		--	--	--	248	345	231	
33.....	44		--	--	--	177	310	148	
34.....	44		--	--	--	561	1,230	s 2,950	
Total.	1,664	--	234	3,737	--	1,764	20,765	--	224,348

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated graph.

b Computed from water-sediment discharge curve.

COLORADO RIVER BASIN--Continued

COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	1,190	1,220	3,920	28,000	2,500	189,000	5,000	5,180	s 72,900
2.....	562	850	1,290	15,800	2,800	119,000	10,900	6,300	185,000
3.....	282	300	228	8,780	3,020	71,600	17,900	3,400	164,000
4.....	184	250	124	4,560	4,060	50,000	25,000	2,600	176,000
5.....	442	496	sa 954	5,900	4,000	63,700	30,000	1,800	146,000
6.....	640	600	1,040	3,680	2,400	23,800	25,400	1,450	99,400
7.....	358	116	54	2,160	1,800	10,500	8,820	3,800	s 80,000
8.....	261			1,310	1,200	4,240	4,690	2,400	30,400
9.....	210			2,150	3,520	sa 22,700	3,620	1,750	17,100
10.....	154			8,180	3,100	68,500	2,820	1,320	10,100
11.....	124	323	sa 393	18,300	3,690	s 181,000	2,290	1,050	6,490
12.....	104			31,300	2,600	220,000	2,010	750	4,070
13.....	88			54,600	1,920	283,000	3,020	2,080	sa 24,200
14.....	77			64,600	1,670	291,000	7,810	3,050	64,300
15.....	383			58,900	1,420	226,000	4,760	1,620	20,800
16.....	328	200	177	59,500	1,230	198,000	2,670	1,450	10,500
17.....	218	200	103	55,600	863	130,000	2,200	850	5,050
18.....	164			24,900	5,000	s 266,000	1,850	600	3,000
19.....	2,470	4,290	sa 37,700	23,300	3,700	233,000	1,680	800	3,630
20.....	5,630	5,120	sa 84,500	32,100	2,000	173,000	1,470	450	1,790
21.....	11,100	3,800	114,000	34,300	1,550	144,000	1,700	400	1,840
22.....	4,080	2,770	sa 59,500	31,100	1,500	126,000	1,420	400	a 1,530
23.....	10,800	4,090	s 107,000	9,230	5,680	s 122,000	1,530	450	a 1,860
24.....	19,500	5,260	s 275,000	12,400	5,450	s 184,000	1,250	200	a 675
25.....	14,100	4,300	164,000	20,900	3,500	198,000	1,120	170	514
26.....	4,770	2,500	32,200	22,500	1,800	109,000	989	162	433
27.....	22,700	3,470	s 213,000	17,100	2,200	102,000	916	170	420
28.....	36,600	2,850	282,000	24,200	2,200	144,000	868	170	398
29.....	34,400	2,300	214,000	30,600	2,100	174,000	828	186	416
30.....	35,300	2,500	238,000	19,900	1,710	s 77,000	716	140	271
31.....	--	--	--	6,270	4,640	s 81,500	--	--	--
Total.	207,219	--	1,829,664	732,120	--	4,285,540	175,247	--	1,133,087
Day	July			August			September		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	534	150	216	338	46	28	84	73	15
2.....	513			290			73		
3.....	450			252			76		
4.....	415			221			71		
5.....	368			209			71		
6.....	350	96	90	243	114	35	80	58	12
7.....	315			217			84		
8.....	295			170			94		
9.....	275			148			78		
10.....	252			145			64		
11.....	238	82	35	132	107	22	62	73	15
12.....	204			123			257		
13.....	188			114			5,470	3,740	s 585
14.....	200			107			3,600	1,950	s 55,100
15.....	170			96			1,300	950	19,000
16.....	160	77	92	89	84	33	748	400	808
17.....	148			82			464	196	246
18.....	146			73			300	156	126
19.....	129			69			234	189	119
20.....	112			69			200	126	68
21.....	107	77	92	62	94	31	170	112	51
22.....	312			55			892	400	963
23.....	452			53			544	334	491
24.....	261			96			1,260	1,150	s 10,800
25.....	704			338			3,660	4,950	48,900
26.....	338	77	92	234	84	33	1,340	2,600	9,410
27.....	285			180			876	800	1,890
28.....	660			142			597	300	484
29.....	527			129			401	155	168
30.....	485			96			290	156	122
31.....	394			87			--	--	--
Total.	9,983	--	2,386	4,659	--	918	23,440	--	152,811

Total discharge for year (cfs-days) 1,224,097.2

Total load for year (tons) 8,238,972.3

s Computed by subdividing day.

a Computed from partly estimated graph.

COLORADO RIVER BASIN--Continued
COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Oct. 18, 1956 ...	8:00 a. m.	2,420	70	5,200	2,970	--	57	86	95	97	100	--	--	--	--	SPWCM
Oct. 20 ...	8:00 a. m.	6,920	67	11,600	4,120	--	71	88	93	98	100	--	--	--	--	SPWCM
Oct. 24 ...	8:00 a. m.	804	65	1,980	1,240	--	87	94	98	99	99	100	--	--	--	SPWCM
Oct. 25 ...	8:00 a. m.	485	66	732	360	82	87	88	95	96	99	100	--	--	--	SPWCM
Nov. 5 ...	6:00 p. m.	1,340	61	1,170	808	70	81	87	96	98	99	99	100	--	--	SPWCM
Nov. 9 ...	8:00 a. m.	1,373	52	752	448	83	89	92	94	94	97	100	--	--	--	SPWCM
Dec. 20 ...	8:00 a. m.	1,010	48	1,320	810	74	81	84	89	96	99	100	--	--	--	SPWCM
Dec. 22 ...	9:00 a. m.	200	50	628	395	91	94	95	97	99	100	--	--	--	--	SPWCM
Mar. 22, 1957 ...	8:00 a. m.	8,300	58	6,340	4,120	--	67	81	92	98	99	100	--	--	--	SPWCM
Apr. 23 ...	8:00 a. m.	12,100	65	4,300	3,190	--	62	76	87	94	98	99	100	--	--	SPWCM
Apr. 24 ...	8:00 a. m.	15,800	68	6,050	2,470	--	71	76	94	98	99	100	--	--	--	SPWCM
Apr. 24 ...	8:00 a. m.	13,800	68	6,050	2,360	--	46	77	84	98	99	100	--	--	--	SPNM
Apr. 25 ...	6:20 a. m.	17,600	67	4,890	3,620	--	75	86	95	97	99	100	--	--	--	SPWCM
Apr. 27 ...	9:30 p. m.	32,200	65	2,670	2,140	--	64	85	93	98	99	100	--	--	--	SPWCM
Apr. 28 ...	8:30 a. m.	38,200	69	2,800	2,150	--	77	88	93	98	99	100	--	--	--	SPWCM
May 2 ...	6:00 p. m.	14,100	69	3,100	2,920	--	79	87	96	99	100	--	--	--	--	SPWCM
May 9 ...	7:30 a. m.	1,660	66	2,420	1,350	57	72	81	93	98	100	--	--	--	--	SPWCM
May 11 ...	10:25 a. m.	16,800	68	5,250	2,590	43	56	64	76	82	99	100	--	--	--	SPWCM
May 13 ...	4:10 a. m.	48,900	67	1,760	1,090	69	78	86	94	95	98	99	100	--	--	SPWCM
May 14 ...	12:00 m.	66,100	71	1,600	1,300	72	84	94	98	99	99	100	--	--	--	SPWCM
May 15 ...	11:45 p. m.	57,500	70	1,400	942	71	83	92	94	96	98	99	100	--	--	SPWCM
May 16 ...	11:55 p. m.	61,000	71	990	563	81	87	91	95	96	98	99	100	--	--	SPWCM
May 17 ...	10:30 p. m.	46,200	73	922	731	75	88	92	96	98	99	100	--	--	--	SPWCM
May 18 ...	8:00 a. m.	26,800	70	1,770	1,380	65	78	85	91	92	98	99	100	--	--	SPWCM

May 23, 1957	7:30 a. m.	8,460	72	7,020	4,760	--	57	69	82	96	99	100	--	SPWCM
June 1	6:00 p. m.	6,500	73	7,060	4,930	--	58	63	81	94	98	100	--	SPWCM
June 4	6:30 p. m.	25,800	72	2,250	1,810	60	68	78	84	92	97	99	100	SPWCM
June 7	7:30 a. m.	9,260	73	3,470	2,750	--	62	71	78	92	98	99	--	SPWCM
June 15	8:00 a. m.	5,130	79	1,660	1,190	51	62	71	88	95	98	99	--	SPWCM
Sept. 13	6:00 p. m.	6,920	82	3,810	3,340	43	55	63	81	94	98	99	100	SPWCM
Sept. 13	6:00 p. m.	6,920	82	3,810	2,720	5	9	11	49	96	98	99	100	SPWCM
Sept. 23	6:00 p. m.	2,420	70	4,240	2,710	56	74	86	97	99	100	--	--	SPWCM

COLORADO RIVER BASIN--Continued
WALLER CREEK AT 23rd STREET, AT AUSTIN, TEX.

LOCATION.--Temperature recorder at gaging station, on San Jacinto Boulevard, 50 feet upstream from bridge on East 23rd Street at Austin, Travis County, and 2.1 miles upstream from Colorado River.

DRAINAGE AREA.--4.13 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1955 to September 1957.

EXTREMES, 1956-57.--Water temperatures: Maximum, 92°F July 30, Aug. 1; minimum, 47°F Jan. 17.

EXTREMES, 1955-57.--Water temperatures: Maximum, 93°F June 28, 1955; minimum, 43°F Jan. 18, 1956.

REMARKS.--No temperature record Jan. 24 to Feb. 3, June 21 to July 10, recorder not functioning. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Temperature (°F) of water, water year October 1956 to September 1957

Day	October		November		December		January		February		March		April		May		June		July		August		September	
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	
1.....	80	78	76	70	64	58	64	58	--	--	69	64	72	64	75	74	81	78	--	--	92	82	87	80
2.....	82	79	76	58	63	58	60	57	--	--	68	66	75	72	75	74	75	73	--	--	90	82	86	80
3.....	82	79	62	58	60	64	59	57	--	--	68	65	76	74	77	75	77	76	--	--	90	82	85	79
4.....	81	79	60	56	67	64	70	64	72	65	71	64	75	71	77	75	79	75	--	--	89	81	85	79
5.....	81	79	65	60	71	68	67	62	72	69	71	67	73	68	75	72	78	76	--	--	86	81	85	78
6.....	81	78	72	65	72	71	67	63	71	68	70	66	72	69	74	72	80	75	--	--	87	82	85	78
7.....	80	76	71	73	72	67	62	63	68	67	62	74	71	74	73	81	77	--	--	--	87	79	82	75
8.....	80	76	72	67	75	67	70	66	76	71	65	60	74	71	76	73	83	79	--	--	88	81	77	73
9.....	80	78	67	62	67	58	71	68	76	71	67	62	74	68	76	75	85	80	--	--	88	80	80	71
10.....	80	78	66	61	62	57	71	59	77	72	70	67	76	71	79	76	85	81	--	--	86	81	81	73
11.....	79	76	67	62	69	61	59	56	78	72	78	51	76	74	79	78	89	82	87	79	89	81	82	75
12.....	80	78	69	64	73	63	67	63	78	73	70	60	76	72	80	79	84	74	88	80	90	82	81	73
13.....	80	78	70	65	73	63	67	61	76	64	72	66	72	64	80	77	82	76	87	80	90	82	84	76
14.....	79	78	72	69	65	61	66	61	72	67	72	68	64	82	82	76	83	78	87	80	89	81	84	78
15.....	79	78	72	65	66	62	60	56	76	70	70	62	68	64	83	80	86	79	85	79	88	81	84	79
16.....	79	78	65	62	64	61	56	50	75	64	68	65	71	68	83	81	86	79	87	79	88	81	81	76
17.....	79	78	64	60	69	63	55	47	64	60	70	67	75	71	83	81	86	80	87	80	89	82	81	75
18.....	79	78	64	59	67	49	57	49	62	57	73	67	77	75	83	75	86	79	88	80	88	82	83	78
19.....	79	77	69	62	54	49	55	52	62	58	73	67	77	75	79	75	86	79	88	80	86	82	83	77
20.....	79	75	73	68	61	54	61	55	62	59	70	65	80	75	80	78	86	79	89	82	87	80	84	80
21.....	76	74	68	62	61	58	66	61	64	58	70	65	80	77	83	80	--	--	89	81	85	78	85	81
22.....	75	72	66	61	66	61	70	62	64	61	71	65	79	75	83	82	--	--	86	82	85	78	82	72
23.....	76	73	64	60	64	58	62	55	62	59	71	67	77	75	83	82	--	--	88	81	86	78	72	67
24.....	76	74	65	60	61	55	--	--	62	60	67	61	75	74	85	83	--	--	89	81	86	79	75	69
25.....	77	75	65	60	61	55	--	--	68	61	63	59	75	74	85	83	--	--	89	80	85	79	72	68
26.....	77	74	65	59	61	55	--	--	68	64	66	61	77	72	85	78	--	--	89	80	88	80	74	69
27.....	74	72	63	59	62	55	--	--	66	62	70	65	72	70	79	76	--	--	88	81	88	82	76	70
28.....	74	72	63	58	62	55	--	--	66	61	70	62	73	72	78	76	--	--	89	80	87	82	74	70
29.....	76	74	62	58	63	56	--	--	68	62	74	63	73	72	82	77	--	--	91	80	85	80	74	69
30.....	76	75	61	56	64	57	--	--	68	67	75	73	73	73	83	78	--	--	92	81	86	79	74	68
31.....	75	72	--	--	85	57	--	--	--	--	67	66	--	--	82	76	--	--	88	81	85	78	--	--
Average.....	78	76	67	62	65	60	--	--	--	--	70	64	74	71	80	77	--	--	--	--	88	81	81	75

COLORADO RIVER BASIN--Continued
COLORADO RIVER AT AUSTIN, TEX.

LOCATION (revised).--At raw-water intake at Austin City Water Plant, just downstream from bridge on U. S. Highway 290 in Austin, Travis County, half a mile downstream from Barton Creek and 4.5 miles upstream from gaging station at Montopolis Bridge on U. S. Highway 183.
DRAINAGE AREA. 38,400 square miles, approximately, above gaging station, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1957.
Water temperatures: October 1947 to September 1957.

EXHES. 1956-57.--Dissolved solids: Maximum, 259 ppm June 2-3, minimum, 184 ppm July 1-31.

Hardness: Maximum, 171 ppm Jan. 1-31; minimum, 122 ppm June 1, 4-30.

Specific conductance: Maximum daily, 552 micromhos Dec. 1; minimum daily, 288 micromhos Sept. 23.

Water temperatures: Maximum, 82°F Aug. 19, 20; minimum, 49°F Jan. 13, 19, Feb. 19.

EXHES. 1947-57.--Dissolved solids: Maximum, 340 ppm Nov. 1-30, 1951; minimum, 184 ppm July 1-31, 1957.

Hardness: Maximum, 214 ppm Jan. 1-31, 1954; minimum, 122 ppm June 1, 4-30, 1957.

Specific conductance: Maximum daily, 591 micromhos July 1, 1948; minimum daily, 243 micromhos Dec. 2, 1953.

Water temperatures: Maximum, 87°F on several days during summer months; minimum, 43°F Jan. 28, 1948, Feb. 4, 1949.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956 ..	310	8.0		41	11		29	162	22	39	0.2	0.8		237	0.32	188	148	15	30	1.0	412	7.7
Nov. 1-30	182	9.2		45	11	31	31	167	25	42	.4	.8		a 246	.33	121	137	20	30	1.0	440	8.0
Dec. 1-31	175	9.2		42	12	31	31	168	20	44	.3	.5		a 242	.33	114	154	16	31	1.1	432	8.0
Jan. 1-31, 1957 ..	172	6.4		49	12	23	23	167	23	41	.3	.5		245	.33	114	171	34	22	.8	437	8.1
Feb. 1-28	189	7.8		42	11	31	31	164	22	42	.3	.8		242	.33	123	150	16	31	1.1	428	8.0
Mar. 1-31	229	8.2		40	11	32	32	158	23	41	.5	1.2		237	.32	147	145	16	32	1.1	423	8.2
Apr. 1-30	2,166	8.0		37	11	28	28	149	21	37	.3	2.2		226	.31	1,320	138	16	31	1.0	397	7.5
May 1-31	27,270	8.4		38	7.8	26	26	137	18	34	.3	1.8		207	.26	15,240	126	14	31	1.0	363	7.4
June 1-30	16,180	9.6		38	6.7	21	21	132	16	27	.6	4.0		188	.26	9,230	122	14	27	.8	329	7.5
June 2-3	12,360	14		49	9.2	31	31	168	29	39	.6	4.5		a 259	.35	8,640	161	24	29	1.0	433	8.1
July 1-31	4,899	11		39	6.4	13	13	131	13	19	.5	3.2		184	.25	2,430	124	16	18	.5	304	7.7
Aug. 1-31	2,665	9.6		40	6.6	17	17	143	14	20	.3	3.0		197	.27	1,420	127	10	22	.6	337	8.0
Sept. 1-30	2,388	9.6		40	6.6	18	18	145	12	23	.3	1.5		190	.26	1,230	127	8	23	.7	321	7.8
Weighted average	4,900	9.1		38	7.1	23	23	137	17	30	0.4	2.6		201	0.27	2,660	124	12	28	0.9	349	--

a. Calculated from determined constituents.

WESTERN GULF OF MEXICO BASINS
COLORADO RIVER BASIN--Continued

COLORADO RIVER AT AUSTIN, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily temperature measurement, generally at 8 a.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	68	59	57	54	61	63	65	76	78	79	80
2	76	70	58	57	55	61	66	64	72	--	79	79
3	76	68	59	58	57	62	67	70	72	--	79	78
4	76	66	59	56	57	62	66	64	72	--	79	79
5	75	64	60	59	59	66	--	68	72	--	80	79
6	74	--	62	--	59	62	72	62	72	--	80	78
7	--	66	58	60	59	62	66	65	72	77	79	79
8	--	66	--	60	60	58	67	64	74	78	79	78
9	75	66	62	--	60	--	52	66	74	--	80	77
10	75	66	61	--	62	60	65	66	74	--	80	76
11	75	64	58	60	62	63	67	--	76	--	80	78
12	74	66	58	59	63	63	66	69	76	--	79	76
13	74	65	59	49	63	--	65	67	76	--	80	78
14	74	67	57	59	63	65	--	67	76	--	80	78
15	74	65	57	59	63	64	--	68	76	77	81	78
16	75	65	57	54	64	62	63	69	76	--	80	78
17	76	--	56	54	63	64	65	69	75	--	81	78
18	76	65	58	52	63	64	66	69	76	--	80	78
19	75	64	58	49	49	64	66	69	76	--	82	78
20	74	71	57	54	--	65	68	70	76	--	82	78
21	73	64	57	56	61	64	68	70	76	78	80	79
22	73	64	58	58	60	66	69	71	77	78	81	80
23	71	64	58	58	60	66	70	72	78	80	--	78
24	71	62	59	57	60	63	70	72	77	79	80	76
25	71	63	58	54	--	64	70	72	76	79	79	76
26	71	61	58	54	61	60	70	73	76	79	78	75
27	68	61	57	54	60	61	70	73	77	80	81	75
28	67	--	57	53	60	--	70	71	--	80	80	75
29	70	61	56	53	--	61	71	71	--	80	78	75
30	71	60	56	53	--	62	66	73	78	80	79	74
31	70	--	57	53	--	63	--	74	--	80	79	--
Average	73	65	58	56	60	63	67	69	75	--	80	77

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT COLUMBUS, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 90, at eastern edge of Columbus, Colorado County, 340 feet downstream from Texas and New Orleans Railroad bridge, 2.6 miles downstream from Cummins Creek, and at mile 135.

DRAINAGE AREA.--41,070 square miles, approximately, of which 11,900 square miles are noncontributing.

RECORDS AVAILABLE.--Water temperatures: March to September 1957.

Sediment records: March to September 1957.

EXTREMES, March to September 1957.--Water temperatures: Maximum, 89°F July 27, 28, Aug. 11.

Sediment concentrations: Maximum daily, 5,650 ppm Mar. 25; minimum, 33 ppm composite period Aug. 13-17.

Sediment loads: Maximum daily, 410,000 tons Apr. 29; minimum, 44 tons, composite period Aug. 16-19.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Temperature (°F) of water, March to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	60	67	73	85	88	82
2						--	66	69	72	87	88	83
3						--	69	67	73	88	86	--
4						--	68	64	73	88	85	--
5						--	65	65	73	87	88	--
6						--	63	60	72	86	83	--
7						--	68	65	75	85	85	82
8						--	62	64	75	87	86	77
9						--	69	67	78	86	85	76
10						--	63	68	79	87	87	77
11						--	64	70	77	86	89	78
12						--	65	73	77	85	88	72
13						--	57	73	78	87	87	80
14						--	55	70	78	86	85	82
15						--	59	71	78	87	88	82
16						--	68	72	80	86	--	81
17						--	66	72	78	87	88	79
18						--	72	72	77	87	87	81
19						--	73	70	77	87	--	81
20						--	75	70	78	86	--	81
21						66	73	72	79	88	--	82
22						64	73	72	82	87	88	80
23						66	73	74	82	85	84	75
24						60	73	75	80	86	86	72
25						65	75	78	84	87	85	70
26						67	73	76	81	85	84	66
27						72	69	73	81	89	84	67
28						77	67	71	85	89	88	67
29						73	64	72	83	87	86	70
30						62	67	74	83	87	83	69
31						63	--	75	--	86	82	--
Average						--	67	70	78	87	86	77

Suspended sediment, March to September 1957

Date	Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
Mar. 21, 1957	5,330	3,170	52,000
Mar. 22	5,700	2,700	41,600
Mar. 23	6,260	4,550	76,300
Mar. 24	3,020	5,010	40,900
Mar. 25	1,360	5,650	20,300
Mar. 26	952	2,300	5,910
Mar. 27	752	882	1,790
Mar. 28	1,330	998	3,580
Mar. 29	1,440	846	3,290
Mar. 30	1,780	966	4,640
Mar. 31	1,860	1,240	6,230
Total	29,784	--	256,540

s Computed by subdividing day.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT COLUMBUS, TEX.--Continued

Suspended sediment, March to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	4,390	2,930	s35,000	22,800	2,400	148,000	37,500	682	69,100
2.....	2,440	1,560	10,300	12,100	1,030	33,700	42,000	682	77,300
3.....	1,100	808	2,400	23,400	1,210	76,400	44,100	1,070	127,000
4.....	832	490	1,100	30,100	978	79,500	25,400	1,670	115,000
5.....	645	294	512	30,500	876	72,100	29,900	2,210	178,000
6.....	548	196	290	30,800	670	55,700	42,200	1,390	158,000
7.....	495	174	233	30,900	618	51,600	31,400	824	69,900
8.....	446	160	193	27,000	505	36,800	35,900	682	66,100
9.....	441	118	131	16,200	432	18,900	39,000	735	77,400
10.....	383	100	103	9,340	752	19,000	38,900	788	82,800
11.....	362	84	82	8,560	720	16,600	39,700	502	53,800
12.....	348	82	77	8,140	612	13,500	40,100	517	56,000
13.....	329	90	80	15,100	912	37,200	39,800	543	58,400
14.....	316	77	66	23,900	909	58,700	44,400	1,600	192,000
15.....	316	58	49	23,500	606	38,500	23,500	2,020	128,000
16.....	342	40	44	23,800	596	38,300	18,100	1,780	87,000
17.....	390			30,400	721	59,200	30,300	1,240	101,000
18.....	446			31,800	670	57,500	28,800	721	56,100
19.....	470			32,500	650	57,000	13,300	582	20,900
20.....	1,000	285	770	35,900	630	61,100	10,800	846	24,700
21.....	1,480	1,870	s10,200	37,200	578	58,100	10,200	658	18,100
22.....	2,660	1,380	9,910	36,900	504	50,200	8,110	450	9,850
23.....	2,340	1,070	6,760	37,000	472	47,200	7,620	450	9,260
24.....	4,370	1,590	18,800	37,000	525	52,400	7,480	396	8,000
25.....	4,990	2,370	31,900	37,200	514	51,600	7,180	376	7,290
26.....	6,950	2,850	s64,600	37,600	483	49,000	6,850	254	4,700
27.....	24,700	4,440	296,000	41,300	578	64,500	6,810	225	4,140
28.....	39,800	2,990	321,000	46,100	1,340	167,000	6,710	261	4,730
29.....	59,800	2,540	410,000	32,400	1,180	102,000	6,620	246	4,400
30.....	44,100	1,710	204,000	18,900	1,880	95,900	6,540	241	4,260
31.....	--	--	--	29,600	1,030	82,300	--	--	--
Total.	207,199	--	1,424,732	857,940	--	1,849,500	729,220	--	1,873,230
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	6,400	160	2,760	3,850	104	1,030	2,200	127	780
2.....	6,400	212	3,660	3,740			2,350		
3.....	6,260	252	4,260	3,630			2,450		
4.....	6,120	163	2,690	3,630			2,450	--	e 650
5.....	6,120	185	3,060	3,520			2,450		
6.....	5,840	153	2,410	3,740	70	470	2,250	81	508
7.....	5,700	118	1,820	3,630			2,600		
8.....	5,980	212	3,420	2,970			2,550		
9.....	5,840	110	1,730	2,750			2,300		
10.....	5,840	191	3,010	2,650			2,150		
11.....	5,840	238	3,750	2,100	54	323	2,150	103	688
12.....	5,700	111	1,710	1,960			2,200		
13.....	5,570	177	2,660	1,920			2,600		
14.....	5,570	178	2,680	2,300			2,550		
15.....	5,570	174	2,620	2,300			2,650		
16.....	5,570	156	2,350	2,150	33	179	2,600	80	473
17.....	5,440	173	2,540	2,400			2,200		
18.....	5,180	192	2,690	2,250			2,250		
19.....	5,440	126	1,850	2,150			2,150		
20.....	5,310	225	3,230	1,820			2,150		
21.....	5,310	208	2,980	1,690	79	552	2,000	690	9,450
22.....	4,690	118	1,490	2,150			2,100		
23.....	4,210	191	2,170	2,450			2,550		
24.....	4,210	158	1,800	2,550			5,070		
25.....	4,090	157	1,730	2,450			13,000	2,770	s113,000
26.....	3,970	157	1,680	2,750	127	958	49,800	2,890	389,000
27.....	3,850	123	1,280	2,750			32,700	1,180	104,000
28.....	3,970	117	1,250	2,750			9,090	810	19,900
29.....	4,090	60	663	2,860			4,690	519	6,570
30.....	3,970	142	1,520	2,970			3,630	280	2,740
31.....	4,090	131	1,450	2,600			--	--	--
Total.	162,140	--	72,913	83,430	--	18,662	171,880	--	658,361

Total discharge for March to September (cfs-days) 2,241,593

Total load for March to September (tons) 6,153,938

e Estimated.

s Computed by subdividing day.

COLORADO RIVER BASIN--Continued
COLORADO RIVER NEAR COLUMBUS, TEX.--Continued

Particle-size analyses of suspended sediment, March to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Mar. 21, 1957 ..	7:15 p. m.	7,520	66	3,610	4,840	--	70	80	88	93	95	96	99	100	SPWCM
Mar. 21	2:30 p. m.	7,520	66	2,980	1,320	68	73	80	87	90	92	94	99	100	SPWCM
Mar. 22	9:20 a. m.	5,840	65	2,600	2,660	--	75	82	89	90	93	93	99	100	SPWCM
Mar. 23	6:680 a. m.	6,680	67	4,000	2,020	--	65	66	71	74	76	76	95	--	SPWCM
Mar. 24	8:27 a. m.	3,410	60	5,600	3,140	--	88	94	95	96	100	--	--	--	SPWCM
Mar. 30	8:27 a. m.	1,520	62	746	473	77	81	85	90	92	94	95	100	--	SPWCM
Apr. 1	11:28 a. m.	4,330	63	5,760	1,650	40	48	52	56	57	61	61	76	99	SPWCM
Apr. 2	11:10 a. m.	2,250	68	1,570	--	--	88	93	96	97	99	99	100	--	SPWCM
Apr. 4	8:16 a. m.	864	68	581	451	94	95	95	97	97	100	--	--	--	SPWCM
Apr. 24	7:30 a. m.	3,630	73	1,390	1,040	76	78	83	87	88	90	97	100	--	SPWCM
Apr. 25	7:40 a. m.	5,570	73	2,580	1,980	--	82	85	90	93	94	95	98	100	SPWCM
Apr. 25	1:55 p. m.	4,600	76	1,970	--	--	87	91	94	96	97	97	99	100	SPWCM
Apr. 26	4:24 p. m.	8,100	75	3,520	2,290	--	85	89	90	92	94	95	99	100	SPWCM
Apr. 27	1:40 p. m.	31,600	73	4,380	--	--	56	67	71	74	76	77	88	98	SPWCM
Apr. 27	5:30 p. m.	29,500	70	4,200	2,450	63	79	84	90	95	97	98	100	100	SPWCM
Apr. 28	10:00 p. m.	54,000	67	2,820	2,070	60	67	75	81	84	88	90	98	--	SPWCM
Apr. 29	5:30 p. m.	60,200	68	1,820	1,380	67	73	78	84	86	87	89	98	100	SPWCM
May 1	7:50 a. m.	26,100	67	2,740	1,830	74	82	87	93	95	97	98	99	100	SPWCM
May 5	4:00 p. m.	30,400	68	780	442	45	49	54	61	65	71	78	97	100	SPWCM
May 6	6:30 p. m.	31,800	64	687	--	--	--	--	--	--	74	80	95	100	S
May 9	4:45 p. m.	13,000	69	448	3,020	--	53	63	75	86	91	96	100	--	SPWCM
May 14	6:30 p. m.	23,800	73	826	491	52	60	65	73	80	86	92	100	--	SPWCM
May 21	12:30 p. m.	36,800	74	562	241	45	49	55	65	72	78	84	100	--	SPWCM
May 30	11:00 a. m.	16,400	76	2,140	1,180	52	62	64	78	85	95	98	100	--	SPWCM
June 1	8:00 a. m.	36,000	73	647	3,400	31	37	42	52	57	75	84	100	--	SPWCM
June 5	2:45 p. m.	32,100	73	2,080	3,140	51	51	58	68	77	82	87	95	100	SPWCM
June 14	5:30 p. m.	46,100	81	2,090	1,560	65	74	78	83	87	93	95	99	100	SPWCM
June 20	5:30 p. m.	11,200	80	1,100	641	39	44	47	59	76	88	96	100	--	SPWCM
June 30	5:30 p. m.	11,200	80	1,100	716	62	65	68	72	81	90	97	100	--	SPWCM
Sept. 25	7:30 a. m.	9,460	70	2,000	1,270	59	67	70	77	82	86	91	99	100	SPWCM
Sept. 26	10:30 a. m.	52,500	66	2,780	1,520	45	49	55	59	64	68	73	95	100	SPWCM
Sept. 26	4:30 p. m.	61,000	69	1,940	4,380	--	46	51	57	62	69	73	91	99	SPWCM

COLORADO RIVER BASIN--Continued
COLORADO RIVER AT WHARTON, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59, in Wharton, Wharton County, 1,000 feet downstream from Texas and New Orleans Railroad bridge, 12 miles upstream from Jones Creek and at mile 67.
DRAINAGE AREA.--41,380 square miles, approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: April 1944 to September 1957.
Water temperatures: October 1945 to September 1948, March 1950 to September 1957.
EXTREMES, 1944-57.--Dissolved solids: Maximum, 312 ppm Dec. 1-25; minimum, 108 ppm Sept. 27-29.
Hardness: Maximum, 199 ppm Dec. 1-25; minimum, 66 ppm Sept. 27-29.
Specific conductance: Maximum daily, 765 micromhos Feb. 5; minimum daily, 146 micromhos Sept. 27.
Water temperatures: Maximum, 88°F July 29; minimum, 38°F Jan. 17.
EXTREMES, 1944-57.--Dissolved solids: Maximum, 386 ppm Apr. 1-10, 1948; minimum, 108 ppm Sept. 27-29, 1957.
Hardness: Maximum, 231 ppm Feb. 1-10, 1947; minimum, 66 ppm Sept. 27-29, 1957.
Specific conductance: Maximum daily, 765 micromhos Feb. 5, 1957; minimum daily, 146 micromhos Sept. 27, 1957.
Water temperatures (1945-48, 1950-57): Maximum, 95°F July 26, 1954; minimum, 38°F Jan. 17, 1957.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956 ..	286	14		50	12	32	5.2	200	24	43	0.3	0.5		a279	0.38	223	174	10	28	1.1	478	7.9
Nov. 1-30	220	10		56	13	34	5.0	224	26	47	--	.5		304	.41	181	192	8	27	1.1	529	8.2
Dec. 1-25	279	8.8		57	14	34	4.9	229	26	47	--	.4		312	.42	235	199	12	26	1.0	544	8.2
Dec. 26-31	469	8.6		39	5.4	18	4.2	129	22	24	.5	1.8	2.2	194	.26	246	119	14	24	.7	331	7.9
Jan. 1-31, 1957 ..	251	6.2		57	12	31	4.7	216	29	43	--	.5		292	.40	198	191	14	26	1.0	519	8.2
Feb. 1-28	361	5.8		43	13	39	4.8	199	27	55	.3	1.2	2.5	296	.40	289	176	13	32	1.3	534	7.9
Mar. 1-10	423	11		43	8.0	25	4.4	154	25	34	--	2.5		246	.33	281	140	14	27	.9	406	8.2
Mar. 11-17	497	8.2		48	10	30	4.6	183	26	41	--	1.0		272	.37	365	162	10	28	1.0	466	8.2
Mar. 18-31	3,246	9.2		34	3.8	11	4.1	115	14	14	--	3.8		168	.23	1,470	100	6	19	.5	260	8.0
Apr. 1-23	1,245	11		43	6.3	18	4.5	147	20	26	.5	2.2		222	.30	746	134	13	22	.7	359	7.8
Apr. 24-28	9,528	9.0		36	4.5	11	4.3	120	17	14	.5	3.2		a158	.21	4,060	108	10	17	.5	279	7.7
Apr. 29-30, May 1-3	35,240	12		34	3.4	7.5	4.0	105	17	9.5	--	4.2		153	.21	14,560	98	12	14	.3	237	7.7
May 4-31	27,230	9.6		40	7.4	23	4.9	140	20	34	--	2.5		219	.30	16,100	131	16	27	.9	374	7.6
June 1-10	34,730	11		38	5.9	16	4.3	123	18	25	--	3.5		195	.27	18,290	120	18	22	.6	325	7.6
June 11-20	28,600	12		38	5.6	13	4.3	125	16	21	--	4.2		186	.25	14,360	118	16	19	.5	307	7.5
June 21-30	7,050	13		43	7.2	15	4.3	146	17	23	--	4.7		214	.29	4,070	137	18	19	.6	349	7.6
July 1-31	4,277	13		43	6.9	13	4.0	144	15	23	--	3.2		a192	.26	2,220	136	18	17	.5	342	7.8
Aug. 1-31	2,151	12		38	7.8	15	4.2	140	17	20	.3	2.0		200	.27	1,160	127	12	20	.6	331	7.8
Sept. 1-26, 30	2,836	11		38	7.5	17	4.5	142	15	24	.2	1.0		194	.26	1,540	126	10	22	.7	323	7.9
Sept. 27-29	24,360	10		24	1.2	7.0	5.2	77	11	9.5	1.4	1.0		a108	.15	7,100	66	3	17	.4	169	7.7
Weighted average	5,937	11		39	6.3	17	4.5	131	18	25	--	3.0		198	0.27	3,170	124	16	22	0.7	331	--

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued

COLORADO RIVER AT WHARTON, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	64	48	60	65	59	64	70	75	85	85	84
2	76	65	52	55	61	62	69	70	74	85	85	85
3	78	61	50	60	64	66	70	72	74	86	85	85
4	77	59	60	62	68	60	69	71	75	85	84	84
5	75	59	62	62	70	63	68	70	75	85	85	84
6	75	60	68	65	68	60	65	66	74	86	86	84
7	76	67	70	66	70	54	68	66	76	85	83	84
8	75	62	67	66	70	51	67	68	76	87	84	79
9	74	53	50	66	69	55	62	69	77	86	84	78
10	71	51	46	59	69	62	65	71	78	--	85	79
11	70	55	52	51	71	67	70	71	--	86	85	80
12	74	59	62	54	69	66	67	74	79	86	85	80
13	73	64	59	60	67	65	61	75	79	87	85	80
14	73	66	52	62	63	66	60	76	80	85	85	82
15	73	70	54	57	68	61	63	73	79	85	85	81
16	74	55	52	46	70	62	65	75	80	86	85	82
17	70	53	60	38	57	67	68	74	80	86	85	82
18	70	53	64	39	53	67	74	73	79	86	87	82
19	72	64	60	45	55	66	75	71	79	86	87	83
20	74	68	59	54	54	68	75	73	80	86	85	83
21	70	58	58	63	51	66	73	73	80	87	83	83
22	66	52	58	68	56	67	75	75	81	86	83	83
23	67	53	58	51	61	67	75	74	82	85	83	79
24	69	54	52	48	58	62	75	76	83	85	84	76
25	71	50	52	50	60	59	75	76	83	85	84	75
26	68	50	51	52	61	57	75	75	84	87	84	73
27	64	46	50	50	58	60	75	75	83	86	84	69
28	67	47	50	49	58	62	75	73	83	87	85	69
29	70	48	51	63	--	59	69	74	84	88	84	70
30	72	45	51	59	--	63	70	75	85	87	84	70
31	64	--	55	59	--	63	--	77	--	87	82	--
Average	72	57	56	56	63	62	69	73	79	86	85	80

GUADALUPE RIVER BASIN
GUADALUPE RIVER AT VICTORIA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59, in Victoria, Victoria County, 1,300 feet upstream from Texas and New Orleans Railroad bridge, 10 miles upstream from Coleta Creek, and at mile 51.
DRAINAGE AREA.--5,161 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1948 to September 1957.

Water temperatures: November 1950 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 404 ppm July 1-10; minimum, 142 ppm Oct. 23-31.

Hardness: Maximum, 267 ppm June 16-30; minimum, 86 ppm Oct. 23-31.

Specific conductance: Maximum daily, 770 micromhos Feb. 20; minimum daily, 184 micromhos Oct. 24.

Water temperatures: Maximum, 87°F June 1; minimum, 44°F Jan. 17.

EXTREMES, 1945-46, 1948-57.--Dissolved solids: Maximum, 1,040 ppm Jan. 11-17, 1946; minimum, 142 ppm Oct. 23-31, 1956.

Hardness: Maximum, 428 ppm Jan. 11-17, 1946; minimum, 86 ppm Oct. 23-31, 1956.

Specific conductance: Maximum daily, 1,950 micromhos Jan. 11-17, 1946; minimum daily, 184 micromhos Oct. 24, 1956.

Water temperatures (1950-57): Maximum, 90°F Aug. 4, 27, 1952; minimum, 40°F Feb. 1-2, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Specific conductance (micro-mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Oct. 1-18, 1956	32.2	21		43	13	74		214	26	84	--	0.5		366	0.50	31.8	161	0	50	2.5	631	8.3
Oct. 19-22	879	12		30	6.0	28	4.3	130	13	32	--	2.2		192	.26	456	99	0	37	1.2	336	7.8
Oct. 23-31	109	12		29	3.0	13	4.9	110	9.2	14	--	2.2		142	.19	41.8	86	0	24	.6	233	8.0
Nov. 1-10	84.8	17		41	5.1	22	5.2	152	16	26	--	2.7		219	.30	50.1	123	0	27	.9	351	8.1
Nov. 11-20	51.3	15		41	5.6	26	4.5	154	16	33	--	2.0		229	.31	31.7	125	0	30	1.0	375	7.9
Nov. 21-30	42.7	15		50	7.7	40	4.4	193	22	51	--	.9		289	.39	33.3	157	0	35	1.4	484	7.7
Dec. 1-10	50.3	17		57	11	55	4.8	236	27	66	0.5	.5		368	.50	50.0	187	0	38	1.7	622	7.8
Dec. 11-21	571	16		58	13	64	5.0	252	29	79	.5	.2		400	.54	617	199	0	40	2.0	684	8.2
Dec. 22-31	828	9.0		35	4.5	22	4.5	124	19	28	.5	1.8		199	.27	44.5	106	4	30	.9	326	7.8
Jan. 1-10, 1957	121	11		40	5.6	26	4.7	142	21	29	--	4.2		223	.30	72.9	124	8	30	1.0	373	7.4
Jan. 11-20	112	14		48	7.8	29	4.5	179	24	35	--	2.8		262	.36	79.2	153	6	28	1.0	442	7.6
Jan. 21-31	121	13		55	10	35	4.5	208	28	44	--	2.5		304	.41	99.3	179	8	29	1.1	515	8.1
Feb. 1-12	139	14		60	15	62		249	38	72	.4	2.0		395	.54	148	212	8	39	1.9	670	8.0
Feb. 13-24	254	14		63	16	63		260	34	77	--	1.0		402	.55	276	222	9	38	1.8	697	8.1
Feb. 25-28	1,691	11		46	10	41	4.3	177	29	54	--	2.5		301	.41	1,370	156	11	36	1.4	499	7.9
Mar. 1-10	438	13		44	8.4	32	4.3	150	29	44	--	3.8		276	.38	326	144	22	32	1.2	444	8.1
Mar. 11-20	859	12		44	7.5	29	4.0	160	27	34	--	2.5		257	.35	596	141	10	30	1.1	413	8.2
Mar. 21-31	2,106	10		39	6.4	21	4.0	140	20	27	--	2.8		218	.30	1,240	124	10	26	.8	351	8.1

^a Calculated from determined constituents.

GUADALUPE RIVER BASIN--Continued

GUADALUPE RIVER AT VICTORIA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Apr. 1-10, 1957.	1,659	11		39	6.0	22	4.2	133	21	30	0.5	3.2		217	0.30	972	132	13	27	0.9	350	7.9
Apr. 11-20	974	14		52	8.7	30	4.2	178	27	44	.5	3.0		288	.39	757	166	20	28	1.0	467	7.9
Apr. 21-30	9,809	10		34	4.6	12	4.6	118	15	16	.4	2.8		a157	.21	4,160	104	8	19	.5	272	7.9
May 1-6	20,130	15		42	4.8	10	5.0	140	16	14	--	4.2		194	.26	10,540	124	10	14	.4	305	7.6
May 7-18	3,418	17		60	9.8	23	4.1	197	28	34	--	8.2		313	.43	2,890	190	28	20	.7	478	7.8
May 19-20, 30-31	7,538	13		36	6.1	15	4.6	122	17	22	--	4.2		195	.27	3,970	114	14	21	.6	305	7.6
May 21-29	2,627	17		67	14	25	3.6	230	32	38	--	8.6		351	.48	2,490	225	36	19	.7	542	8.1
June 1-9	13,020	12		47	5.6	13	4.6	150	18	21	--	4.0		210	.29	7,380	140	18	16	.5	345	7.4
June 10-15	3,025	14		62	11	21	4.0	202	26	35	--	6.5		304	.41	2,480	200	34	18	.6	491	7.6
June 16-30	1,603	16		79	17	30	3.1	266	37	51	--	7.3		393	.53	1,700	267	49	19	.8	852	7.8
July 1-10	887	21		65	18	40	3.0	229	41	63	--	8.1		404	.55	968	236	43	27	1.1	636	8.0
July 11-20	660	23		82	19	42	3.1	221	42	66	--	6.6		396	.54	706	232	52	28	1.2	638	8.0
July 21-31	499	19		56	18	43	3.0	219	41	67	--	2.5		382	.52	515	218	39	30	1.3	631	8.0
Aug. 1-10	392	20		46	19	44	3.1	191	41	69	--	2.0		370	.50	392	193	36	33	1.4	596	7.9
Aug. 11-20	357	20		54	19	45	3.0	217	40	69	--	2.0		366	.52	372	212	34	31	1.4	625	7.9
Aug. 21-31	321	20		54	15	41	3.9	212	35	59	--	1.5		346	.47	300	196	22	31	1.3	570	7.9
Sept. 1-10	246	21		53	18	53		211	40	75	--	1.0		a365	.50	242	206	33	36	1.6	637	8.2
Sept. 11-23	360	18		51	18	52		216	37	69	--	.5		386	.52	375	201	24	36	1.6	621	8.2
Sept. 24-30	15,520	11		32	4.9	13	5.1	114	16	18	--	2.5		a158	.21	6,620	100	6	21	.6	274	8.0
Weighted average	1,873	13		45	7.3	18	4.5	153	21	26	--	4.0		227	0.31	1,210	142	17	21	0.7	370	--

a Calculated from determined constituents.

GUADALUPE RIVER BASIN--Continued

GUADALUPE RIVER AT VICTORIA, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement between 6 and 9 a.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	75	68	--	62	57	60	65	71	87	84	85	83
2	--	70	54	60	61	64	69	70	74	85	85	84
3	78	--	--	60	63	65	70	72	74	84	84	84
4	78	68	64	63	66	62	67	71	75	84	84	82
5	75	--	65	65	68	63	66	70	76	86	85	82
6	76	66	67	66	67	60	66	68	75	86	85	82
7	77	68	70	64	70	58	70	69	74	86	84	82
8	77	65	70	66	70	56	68	70	77	86	83	80
9	76	60	56	67	69	60	64	72	82	85	84	70
10	75	58	56	60	70	65	64	71	80	84	84	78
11	75	60	56	58	73	68	67	73	82	85	86	78
12	76	64	64	58	73	67	67	75	80	85	85	78
13	77	64	61	62	--	65	61	76	82	85	85	79
14	74	69	58	64	68	65	60	76	82	86	85	79
15	76	70	59	60	69	62	63	76	80	84	84	82
16	74	60	58	50	70	63	66	77	84	83	84	83
17	75	60	61	44	64	67	67	77	80	85	85	79
18	74	58	63	47	58	68	70	77	80	85	86	80
19	73	63	59	49	60	66	72	76	82	86	84	81
20	72	69	58	58	58	67	71	76	80	85	85	80
21	70	64	--	62	56	66	72	--	80	84	84	82
22	68	57	59	67	60	67	73	80	81	86	82	81
23	68	58	56	56	62	70	73	80	80	84	83	76
24	70	59	54	53	60	62	73	81	82	85	83	73
25	70	58	53	57	62	60	74	81	83	84	83	70
26	72	57	54	55	60	59	74	80	83	85	84	70
27	70	53	54	53	59	62	72	80	82	84	84	79
28	72	53	56	52	--	62	70	76	82	85	86	68
29	71	54	--	62	--	61	70	82	84	85	83	68
30	73	52	55	59	--	62	70	75	84	85	82	67
31	68	--	57	59	--	64	--	--	--	84	82	--
Average	74	62	59	59	64	63	68	75	80	85	84	78

GUADALUPE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN GUADALUPE RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
ESCONDIDO RESERVOIR NO. 1 NEAR KENEDY																				
Dec. 17, 1956	--		--	--	--	--	156	--	4.0	--	--	--	a160	0.22	117	0	--	279	7.5	
Feb. 25, 1957	5.0		21	21	1.7	12	83	7.2	4.5	0.5	3.5	59	96	.13	59	0	31	143	7.5	
Mar. 12	11		22	22	1.3	10	87	3.4	3.2	.5	3.0	61	97	.13	61	0	27	164	7.8	
Apr. 17	12		30	30	1.6	4.9	111	2.8	2.5	.5	3.2	81	119	.18	81	0	11	2	166	6.9
Apr. 22	18		42	42	2.3	14	143	5.4	10	.8	5.0	113	a183	.25	113	0	21	285	7.5	
Apr. 27	7.8		19	19	.8	4.9	71	.6	.0	.5	2.0	71	71	.10	51	0	17	127	7.9	
Sept. 30	6.0		23	23	1.6	6.8	8.0	96	3.8	4.5	.2	1.0	102	.14	64	0	17	174	7.4	
Residue on evaporation at 180°C.																				

ESCONDIDO RESERVOIR NO. 1 NEAR KENEDY

NUECES RIVER BASIN
NUECES RIVER NEAR MATHIS, TEX.

LOCATION.--At intake tower at Lake Corpus Christi, 0.8 mile upstream from gaging station at bridge on State Highway 359, 200 feet downstream from Texas and New Orleans Railroad bridge and 4 miles southwest of Mathis, San Patricio County.

DRAINAGE AREA.--16,660 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1957.

EXTREMES, 1936-57.--Dissolved solids: Maximum, 322 ppm Sept. 1-30; minimum, 177 ppm May 1-31.

Hardness: Maximum, 174 ppm July 1-31; minimum, 90 ppm Apr. 24-30.

Specific conductance: Maximum daily, 677 micromhos Apr. 9; minimum daily, 246 micromhos May 31.

Water temperatures: Maximum daily, 67° F July 31; minimum, 50° F Jan. 18, 19.

EXTREMES, 1947-57.--Dissolved solids: Maximum, 348 ppm June 1-30, 1948; minimum, 175 ppm Apr. 27-30, 1949.

Hardness: Maximum, 201 ppm May 1-24, 1951; minimum, 85 ppm Apr. 27-30, 1949.

Specific conductance: Maximum daily, 1,040 micromhos July 1, 1948; minimum daily, 233 micromhos July 30, 1949.

Water temperatures: Maximum, 94° F July 27, 1948; minimum, 38° F Jan. 31, 1948.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956	635	18	37	3.2	3.2	38	6.5	141	33	31	--	3.8		240	0.33	411	105	0	42	1.6	385	7.8
Nov. 1-30	108	17	36	2.6	2.6	39	6.2	137	39	29	--	3.2		246	.33	71.7	101	0	44	1.7	391	7.6
Dec. 1-31	93.3	17	40	3.2	4.5	45	5.6	156	39	30	0.7	2.2		269	.37	67.8	113	0	45	1.8	417	7.5
Jan. 1-31, 1957	60.4	15	40	3.4	3.9	49	6.8	159	30	31	--	2.0		257	.35	41.9	114	0	41	1.6	415	7.7
Feb. 1-28	63.6	17	42	3.4	4.4	44	6.6	169	30	36	--	2.5		282	.38	48.4	118	0	43	1.8	431	7.9
Mar. 1-31	321	19	41	3.1	5.4	54	6.2	178	32	42	--	2.5		309	.42	268	115	0	49	2.2	480	8.2
Apr. 1-23	648	14	36	2.8	2.8	67		159	37	53	.5	2.8		316	.43	553	102	0	59	2.9	491	8.0
Apr. 24-30	9,284	12	32	2.6	2.6	24	7.3	119	20	22	.5	4.8		al84	.25	4,610	90	0	34	1.1	309	7.5
May 1-31	9,482	14	20	10	16	18	6.6	117	20	15	--	3.0		177	.24	4,530	92	0	28	.8	283	7.2
June 1-30	8,142	14	43	3.6	17	7.4	134	15	15	16	--	3.6		208	.28	4,570	122	0	22	.7	334	7.4
July 1-31	109	17	61	5.4	27	8.3	216	23	25	35	.4	3.5		290	.39	85.3	174	0	24	.9	458	8.0
Aug. 1-31	106	17	57	6.7	36	17	9.0	218	28	35	.4	3.0		312	.42	89.3	170	0	30	1.2	499	8.0
Sept. 1-30	1,735	17	53	6.1	6.1	48		200	31	44	.4	2.5		322	.44	1,510	157	0	40	1.7	509	8.0
Weighted average	1,962	14	33	6.3	6.3	22	7.2	140	20	20	--	3.4		208	0.28	1,100	108	0	29	0.9	333	--

a Calculated from determined constituents.

WESTERN GULF OF MEXICO BASINS

NUECES RIVER BASIN--Continued

NUECES RIVER NEAR MATHIS, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, usually at 9 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	78	74	56	60	58	64	67	73	79	86	86	83
2	78	74	57	58	60	63	69	74	79	87	85	84
3	79	69	57	59	62	63	71	74	78	86	85	88
4	79	68	58	60	63	64	71	74	78	85	86	87
5	78	66	61	61	65	64	71	73	78	85	85	--
6	78	65	63	62	65	64	72	73	80	85	86	85
7	78	65	63	64	66	62	72	73	82	85	85	--
8	78	64	63	63	67	63	67	72	82	87	85	--
9	78	64	61	64	67	63	65	73	82	86	85	83
10	78	63	58	62	68	63	66	74	82	85	85	83
11	78	63	58	59	68	65	66	74	84	84		84
12	78	64	60	58	68	66	68	74	84	85	85	83
13	78	63	61	58	68	68	67	74	85	85	85	81
14	78	66	61	60	69	67	66	75	85	84	85	81
15	78	70	59	61	68	68	64	77	85	84	84	--
16	78	67	59	60	68	68	64	77	--	86	86	--
17	79	64	59	56	67	68	66	77	84	84	86	83
18	80	63	58	50	63	69	68	77	84	84	86	83
19	82	64	60	50	61	69	70	77	84	85	86	84
20	80	66	59	53	61	68	70	79	84	86	85	83
21	80	64	59	54	61	68	72	78	83	87	85	83
22	78	63	59	53	62	68	73	80	83	88	85	83
23	77	61	60	53	62	68	75	81	83	86	88	79
24	77	63	60	54	63	66	75	81	84	87	--	--
25	74	63	60	55	66	63	75	81	84	86	86	75
26	72	60	59	55	65	62	75	81	85	85	85	70
27	70	60	60	53	66	64	75	80	85	85	85	70
28	70	60	59	54	65	64	75	79	86	86	85	70
29	72	58	60	55	--	62	73	79	86	85	84	69
30	72	56	60	57	--	63	72	79	86	88	--	71
31	74	--	61	56	--	63	--	79	--	90	84	--
Average	77	64	60	57	65	65	70	77	83	86	85	80

RIO GRANDE BASIN
RIO GRANDE ABOVE CULEBRA CREEK, NEAR LOBATOS, COLO.

LOCATION. --Half a mile southeast of Lasauces, 7 miles upstream from Culebra Creek, and 15 miles upstream from gaging station near Lobatos, Conejos County. DRAINAGE AREA. --7,700 square miles, approximately, above gaging station (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

RECORDS AVAILABLE. --Chemical analyses: October 1946 to September 1957.

EXTREMES, 1956-57. --Dissolved solids: Maximum, 518 ppm Oct. 11-19; minimum, 136 ppm Sept. 3.

Hardness: Maximum, 206 ppm Oct. 11-19; minimum, 68 ppm Sept. 3.

Specific conductance: Maximum daily, 873 micromhos Oct. 15; minimum daily, 196 micromhos June 23.

EXTREMES, 1946-57. --Dissolved solids: Maximum, 691 ppm July 21-31, 1948; minimum, 104 ppm May 2-10, 1947.

Hardness: Maximum, 346 ppm June 9-14, 1953; minimum, 52 ppm May 1-10, 1952.

Specific conductance: Maximum daily, 1,070 micromhos July 26, 1948; minimum daily, 122 micromhos June 1, 1949.

REMARKS. --Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Lobatos for water year October 1956 to September 1957 given in WSP 1512. Culebra Creek which enters the Rio Grande between the sampling point and the gaging station is usually dry at its mouth. Inflow from this and other sources between sampling point and gaging station occurs only after heavy local rainfall.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per-cent so-ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH		
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium, mag-nesium				Non-carbon-ate	
Oct. 1-10, 1956	7.60	41	0.02	39	10	67	8.2	197	0	98	22	1.2	0.4	0.32	387	0.53	138	0	49	2.5	568	7.8	
Oct. 11-19	12.3	--	--	58	15	81	--	213	0	--	--	--	--	--	518	70	206	32	46	2.5	749	7.9	
Oct. 20-31	17.7	--	--	46	11	50	--	232	0	--	--	--	--	--	361	49	17.3	160	0	41	1.7	524	7.6
Nov. 1-19	54.9	--	--	46	9.7	44	--	187	0	--	--	--	--	--	338	46	50.1	135	2	38	1.5	490	7.5
Nov. 20-30	76.3	--	--	42	9.0	34	--	169	0	--	--	--	--	--	299	41	61.6	142	4	34	1.2	426	7.4
Dec. 1-31	63.0	--	--	40	7.8	31	--	168	0	--	--	--	--	--	276	38	46.9	132	0	34	1.2	392	7.7
Jan. 1-18, 1957	78.9	33	.11	35	5.2	26	5.5	138	0	40	8.2	.5	.2	.08	235	32	50.1	109	0	33	1.1	327	7.0
Jan. 19-31	71.4	--	--	35	7.6	30	--	168	0	--	--	--	--	--	250	34	48.2	119	0	35	1.2	362	7.6
Feb. 1-28	102	--	--	34	7.4	28	--	143	0	--	--	--	--	--	242	33	66.6	116	0	35	1.1	354	7.7
Mar. 1-31	66.0	--	--	41	9.3	36	--	167	0	--	--	--	--	--	296	40	52.7	140	4	36	1.3	436	7.9
Apr. 1-13	60.8	--	--	48	11	57	--	172	0	--	--	--	--	--	396	54	65.0	165	24	43	1.9	573	7.7
Apr. 14-18	37.4	--	--	44	10	48	--	178	0	--	--	--	--	--	342	47	34.5	131	5	41	1.7	504	7.7
Apr. 19-29	85.2	33	.08	30	7.6	30	6.2	157	0	36	6.2	.7	.9	.19	237	32	54.5	106	0	36	1.3	338	7.5
Apr. 30	60	--	--	41	8.8	45	--	143	0	--	--	--	--	--	318	43	51.5	138	22	41	1.7	465	7.3
May 1-2	46.5	--	--	47	12	58	--	162	0	--	--	--	--	--	402	55	50.5	167	34	43	1.9	568	8.0
May 3	39	--	--	35	7.8	36	--	147	0	--	--	--	--	--	298	41	31.4	120	0	40	1.4	390	7.4
May 4-10	516	--	--	21	5.0	20	--	108	0	--	--	--	--	--	182	25	254	73	0	37	1.0	230	7.6
May 11-14	896	--	--	23	5.7	97	--	204	0	--	--	--	--	--	404	55	977	81	0	72	4.7	570	7.9
May 15-20	744	--	--	25	6.9	68	--	162	0	--	--	--	--	--	336	46	675	91	0	62	3.1	471	7.8
May 21-28	750	--	--	35	8.6	33	--	108	0	--	--	--	--	--	272	37	551	123	34	37	1.3	386	7.5

RIO GRANDE BASIN--Continued
RIO GRANDE ABOVE CULEBRA CREEK, NEAR LOBATOS, COLO.--Continued
Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per-cent so-ad-sorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH	
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium	Non-carbon-ate				
May 29-31, 1957...	1,025	--	--	25	7.1	18	--	78	0	--	--	--	--	--	198	0.27	548	92	28	30	0.8	270	7.7
June 1-30	2,000	--	--	20	5.9	19	--	80	0	--	--	--	--	--	172	.23	929	74	9	36	1.0	234	7.7
July 1-16	2,066	--	--	22	5.2	19	--	88	0	--	--	--	--	--	178	.24	993	76	4	35	.9	241	7.5
July 17-27	1,520	--	--	30	10	27	--	99	0	--	--	--	--	--	236	.32	969	116	35	34	1.1	335	7.4
July 28-31	3,032	--	--	22	6.2	21	--	73	0	--	--	--	--	--	192	.26	1,570	80	20	36	1.0	265	7.2
Aug. 1-3	2,737	--	--	29	4.9	30	--	92	0	--	--	--	--	--	210	.29	1,550	92	16	41	1.4	312	8.1
Aug. 4-8	1,370	--	--	37	6.6	33	--	98	16	--	--	--	--	--	232	.32	858	120	12	38	1.3	379	9.0
Aug. 9-13	791	--	--	45	8.5	36	--	140	0	--	--	--	--	--	315	.43	673	148	33	35	1.3	462	7.8
Aug. 14	625	--	--	52	10	47	--	149	6	--	--	--	--	--	342	.47	577	170	38	37	1.6	520	8.5
Aug. 15-22	417	--	--	56	9.5	57	--	184	0	--	--	--	--	--	395	.54	445	178	25	41	1.9	599	8.1
Aug. 23	322	--	--	58	10	67	--	160	9	--	--	--	--	--	430	.58	374	186	40	44	2.1	657	8.6
Aug. 24-25	287	--	--	56	11	57	--	192	0	--	--	--	--	--	407	.55	315	184	27	40	1.8	602	8.0
Aug. 26-30	366	--	--	43	10	42	--	154	6	--	--	--	--	--	302	.41	288	148	12	38	1.5	456	8.5
Aug. 31	406	--	--	35	7.6	35	--	111	11	--	--	--	--	--	256	.32	259	119	10	39	1.4	360	8.8
Sept. 1	586	--	--	32	1.9	20	--	85	0	--	--	--	--	--	164	.22	259	88	18	33	.9	245	8.2
Sept. 2	1,020	--	--	21	10	26	--	101	3	--	--	--	--	--	198	.27	545	94	6	38	1.2	295	8.4
Sept. 3	1,270	--	--	23	2.4	20	--	78	0	--	--	--	--	--	136	.18	466	68	4	39	1.1	218	7.9
Sept. 4-6	883	--	--	28	4.3	26	--	76	12	--	--	--	--	--	189	.26	451	88	5	39	1.2	287	9.1
Sept. 7-11	472	--	--	40	7.6	38	--	142	0	--	--	--	--	--	268	.36	342	131	15	39	1.4	413	6.7
Sept. 12-14	250	--	--	51	10	46	--	160	0	--	--	--	--	--	367	.50	248	168	37	37	1.5	536	7.5
Sept. 15-20	163	--	--	63	11	53	--	176	0	--	--	--	--	--	426	.58	176	202	58	36	1.6	622	7.9
Sept. 21	117	--	--	59	10	47	--	142	13	--	--	--	--	--	392	.53	124	188	50	35	1.5	567	8.8
Sept. 22	111	--	--	46	8.6	36	--	148	0	--	--	--	--	--	290	.39	86.9	150	29	34	1.3	452	7.2
Sept. 23-25	114	--	--	39	8.1	32	--	134	6	--	--	--	--	--	289	.39	88.0	131	11	35	1.2	596	8.5
Sept. 26-28	113	--	--	40	10	38	--	142	0	--	--	--	--	--	290	.38	85.4	141	24	37	1.4	447	8.0
Sept. 29-30	105	--	--	52	11	45	--	126	14	--	--	--	--	--	369	.50	105	174	48	36	1.5	544	8.8
Weighted average	529	--	--	27	6.6	27	--	a 103	0	--	--	--	--	--	217	0.30	310	94	10	38	1.2	507	--

a Includes carbonate as bicarbonate.

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.

LOCATION.--At gaging station on left bank, 200 feet downstream from bridge on U. S. Highway 285, half a mile west of Chamita, Rio Arriba County, 2½ miles northwest of San Juan Pueblo, and 3 miles upstream from mouth.

DRAINAGE AREA.--3,200 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1957.

Sediment records: October 1947 to September 1957.

EXTREMES, 1956-57.--Water temperatures: Maximum, 78°F Aug. 23; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 38,800 ppm Aug. 7; minimum daily, 10 ppm Oct. 10.

Sediment loads: Maximum daily, 209,000 tons Aug. 7; minimum daily, less than 0.50 ton on many days in October.

EXTREMES, 1947-57.--Water temperatures (1950-57) Maximum, 89°F July 19, 1951, Aug. 8, 1956; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 55,500 ppm Aug. 21, 1955; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 209,000 tons Aug. 7, 1957; minimum daily, 0 ton on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512. Flow affected by ice Nov. 16, 17, 20-23, Nov. 29 to Dec. 5, Dec. 9 to Jan. 4, Jan. 17-24, Jan. 30 to Feb. 2.

Chemical analyses, in parts per million, August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Sodium (Na)	Bicarbonate (HCO ₃)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
						Calcium, magnesium	Non-carbonate				
Aug. 17, 1957 ...	1,640	16	25	224	3.0	184	1	23	0.8	456	7.6
Aug. 18	1,610	16	35	190	6.0	740	584	9	.6	1,330	7.3
Aug. 19	1,440	17	8.8	106	2.0	111	24	15	.4	260	7.6
Aug. 20	1,440	18	7.7	129	1.0	111	6	13	.3	249	8.0
Aug. 22	1,490	18	12	134	1.0	154	44	14	.4	344	7.7
Aug. 24	1,540	18	19	170	1.0	170	30	20	.6	395	7.6
Aug. 26	1,780	17	14	144	2.0	154	36	17	.5	351	7.9

Temperature (°F) of water, water year October 1956 to September 1957

Once-daily measurement, generally between 8 a. m. and 5 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	40	37	32	32	46	55	59	a 57	62	72	b 68
2	64	41	32	32	32	47	48	55	53	63	67	70
3	54	35	33	32	42	42	45	52	67	72	72	70
4	53	38	36	38	35	34	48	53	66	63	74	70
5	55	32	35	40	45	36	53	59	68	62	69	71
6	60	37	34	36	41	36	51	58	65	62	69	71
7	65	51	37	32	45	52	53	58	70	62	74	62
8	55	50	36	41	47	55	a 52	52	b 58	61	68	--
9	55	36	33	38	44	48	51	58	62	68	76	71
10	57	52	32	34	44	49	60	48	b 59	b 67	67	62
11	55	50	32	41	44	54	54	55	b 57	62	61	71
12	53	38	32	41	52	45	58	53	69	b 62	66	67
13	--	43	33	38	49	44	60	58	71	b 61	70	70
14	67	45	32	44	47	45	52	59	b 61	61	68	71
15	46	35	32	46	46	34	59	55	62	61	61	66
16	61	35	32	44	44	43	58	59	56	59	b 61	60
17	50	46	34	32	45	45	60	58	b 54	64	71	60
18	53	41	34	36	43	53	56	54	66	65	--	60
19	57	44	33	33	39	54	57	53	64	58	72	58
20	55	32	33	34	39	46	49	52	65	b 59	72	65
21	50	32	32	32	45	44	57	48	62	59	62	56
22	53	32	32	35	45	46	49	56	--	61	70	61
23	44	32	32	34	48	44	49	57	b 56	60	78	69
24	55	36	32	32	46	48	54	58	60	67	67	66
25	40	38	32	32	46	55	57	52	60	58	65	71
26	46	44	32	40	52	54	52	55	61	67	70	65
27	43	44	32	43	42	60	52	51	60	60	--	71
28	55	41	32	35	53	59	50	62	61	61	63	76
29	45	32	32	39	--	53	56	62	63	66	65	54
30	49	32	32	36	--	56	61	a 59	62	67	66	70
31	39	--	32	32	--	50	--	54	--	73	63	--
Average	53	39	34	37	44	48	54	55	62	63	66	67

a Measurement obtained after 5 p. m.

b Measurement obtained before 8 a. m.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0.7	13	(t)	14	35	1	30	60	5
2.....	.8	18	(t)	20	49	3	30	85	7
3.....	.7	28	(t)	23	36	2	30	165	13
4.....	.6	26	(t)	23	48	3	45	780	95
5.....	.7	14	(t)	24	41	3	65	450	79
6.....	.8	28	(t)	26	59	4	72	130	25
7.....	.8	17	(t)	25	44	3	74	90	18
8.....	.8	13	(t)	24	32	2	68	75	14
9.....	.8	14	(t)	26	44	3	50	78	11
10.....	.5	10	(t)	28	110	8	35	105	10
11.....	.6	20	(t)	33	51	5	35	112	11
12.....	.4	22	(t)	31	38	3	40	90	10
13.....	.4	32	(t)	30	37	3	45	82	11
14.....	.5	19	(t)	40	60	6	45	43	5
15.....	1.5	26	(t)	37	88	9	40	52	6
16.....	1.0	22	(t)	25	90	6	35	110	10
17.....	.8	25	(t)	30	72	6	30	103	8
18.....	.8	27	(t)	37	65	6	30	108	9
19.....	.8	20	(t)	34	40	4	30	108	9
20.....	.8	21	(t)	20	43	2	30	70	6
21.....	.8	16	(t)	25	60	4	30	41	3
22.....	.8	18	(t)	30	55	4	30	60	5
23.....	1.0	28	(t)	30	53	4	30	130	11
24.....	1.7	24	(t)	41	75	8	30	100	8
25.....	3.2	32	(t)	37	68	7	30	90	7
26.....	2.4	27	(t)	35	62	6	35	65	6
27.....	2.9	40	(t)	37	50	5	35	67	6
28.....	2.2	34	(t)	37	38	4	35	95	9
29.....	3.4	35	(t)	25	46	3	35	109	10
30.....	7.5	31	1	30	38	3	40	122	13
31.....	10	30	1	--	--	--	40	144	16
Total.	50.7	--	4	877	--	130	1,229	--	456
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	45	92	11	74	200	40	174	600	282
2.....	50	107	14	80	230	50	170	720	330
3.....	50	102	14	100	280	76	191	1,600	825
4.....	60	160	26	90	310	75	212	2,250	1,290
5.....	54	100	15	80	280	60	221	3,180	1,900
6.....	54	80	12	80	450	97	216	1,920	1,120
7.....	59	52	8	69	320	60	187	1,500	757
8.....	73	78	15	83	250	56	159	840	361
9.....	104	240	67	80	270	58	155	740	310
10.....	125	570	192	97	300	79	159	1,000	429
11.....	83	610	137	129	880	307	174	1,590	747
12.....	100	2,400	648	195	7,280	84,700	208	2,050	1,150
13.....	118	1,250	398	212	11,500	6,580	226	1,060	647
14.....	107	500	144	231	6,700	4,180	221	920	549
15.....	136	830	305	246	5,100	3,390	216	740	432
16.....	136	2,700	991	272	4,200	3,080	191	400	206
17.....	100	3,800	1,030	266	3,400	2,440	159	500	215
18.....	90	1,100	267	266	3,100	2,230	151	390	159
19.....	80	980	212	261	1,900	1,340	155	440	184
20.....	70	820	155	251	1,000	678	166	370	166
21.....	70	400	76	256	1,000	691	174	550	258
22.....	90	420	102	261	1,500	1,060	182	390	192
23.....	80	300	65	251	1,500	1,020	199	660	355
24.....	80	230	50	246	2,500	1,660	221	1,050	627
25.....	104	250	70	241	3,000	1,950	208	780	438
26.....	104	270	76	236	5,700	3,630	159	350	150
27.....	90	230	56	212	2,250	1,290	147	300	119
28.....	90	370	90	203	1,000	548	129	260	91
29.....	64	200	35	--	--	--	122	220	72
30.....	70	180	34	--	--	--	144	480	187
31.....	70	200	38	--	--	--	178	560	269
Total.	2,606	--	5,353	5,068	--	41,425	5,574	--	14,817

s Computed by subdividing day.

t Less than 0.50 ton.

RIO GRANDE BASIN --Continued

RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	226	1,000	610	914	2,250	5,550	2,490	2,550	17,100
2.....	256	1,280	885	1,030	2,100	5,840	1,730	2,100	9,810
3.....	277	1,200	897	1,340	2,920	10,600	1,950	2,700	14,200
4.....	277	1,260	942	1,690	3,710	16,900	2,580	3,250	22,600
5.....	272	1,400	1,030	1,950	3,850	20,300	2,210	3,000	17,900
6.....	256	1,120	774	2,100	4,400	24,900	1,310	2,430	8,590
7.....	236	800	510	2,220	4,560	27,300	1,160	2,210	6,920
8.....	236	640	408	2,440	4,700	31,000	1,040	2,060	5,780
9.....	241	710	462	2,190	4,400	26,000	925	2,120	5,290
10.....	208	830	466	2,490	4,330	29,100	2,080	2,200	12,400
11.....	231	880	549	3,020	5,780	47,100	860	3,900	9,060
12.....	359	2,150	2,080	2,670	5,870	42,300	992	6,100	16,300
13.....	513	3,450	4,780	2,150	4,030	23,400	725	3,160	6,190
14.....	664	3,900	6,990	2,050	3,750	20,800	770	2,550	5,300
15.....	780	4,150	8,740	1,780	3,260	15,700	1,000	3,700	9,990
16.....	958	5,100	13,200	1,690	3,620	16,500	1,180	4,040	12,900
17.....	1,100	4,550	13,500	1,660	3,030	13,600	1,240	3,950	13,200
18.....	1,240	4,500	15,100	1,640	2,200	9,740	1,370	2,350	8,690
19.....	1,290	3,600	12,500	1,800	2,600	12,600	1,810	3,100	15,100
20.....	1,260	2,500	8,510	2,030	2,620	14,400	2,170	4,500	26,400
21.....	1,230	3,100	10,300	1,950	3,230	17,000	2,460	3,500	23,200
22.....	1,340	3,250	11,800	1,860	3,200	16,100	2,030	4,280	23,500
23.....	1,180	3,050	9,720	1,810	2,920	14,300	1,500	2,160	8,750
24.....	1,040	2,100	5,900	1,700	3,000	13,800	1,330	1,530	5,490
25.....	1,040	2,150	6,040	1,520	2,810	11,500	1,430	1,850	7,140
26.....	980	2,200	5,820	1,660	2,690	12,100	1,930	2,350	12,200
27.....	947	2,080	5,320	1,730	2,330	10,900	1,970	2,570	13,700
28.....	892	2,670	6,430	1,770	2,120	10,100	2,080	2,380	13,400
29.....	881	2,260	5,380	2,070	2,580	14,400	1,640	2,080	9,210
30.....	892	2,450	5,900	2,280	2,690	16,600	1,600	2,520	10,900
31.....	---	---	---	2,460	3,030	20,100	---	---	---
Total.	21,302	--	165,543	59,864	--	570,530	47,562	--	371,210
	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	1,420	1,830	7,020	1,160	8,820	s35,300	1,620	21,300	93,200
2.....	1,360	1,880	6,900	1,600	10,800	46,700	1,360	5,900	21,700
3.....	1,500	1,900	7,700	780	4,100	8,630	1,300	3,800	13,300
4.....	1,700	1,790	8,220	716	12,300	s28,300	1,260	2,800	9,530
5.....	1,730	2,000	9,340	790	35,200	s85,100	1,220	3,000	9,880
6.....	1,970	2,200	11,700	1,120	26,800	s99,200	1,200	2,750	8,910
7.....	1,920	1,860	9,640	1,640	38,800	s209,000	1,180	2,800	8,920
8.....	1,920	1,600	8,290	608	9,750	16,000	1,150	3,300	a 10,000
9.....	2,370	3,500	22,400	652	8,380	s31,800	1,130	3,400	10,400
10.....	2,940	3,120	24,800	962	18,200	s48,400	1,130	2,500	7,630
11.....	2,750	2,380	17,700	1,460	9,650	38,000	1,110	2,360	7,070
12.....	2,310	2,000	12,500	1,550	9,500	39,800	1,100	2,320	6,890
13.....	1,930	1,790	9,330	1,620	11,700	51,200	1,080	2,040	5,950
14.....	1,640	2,220	9,830	1,690	13,500	61,600	1,060	2,200	6,300
15.....	1,490	1,600	6,440	1,460	5,700	22,500	1,080	2,210	6,440
16.....	1,490	2,500	10,100	1,670	6,500	29,300	1,080	2,120	6,180
17.....	1,550	4,100	17,200	1,640	14,200	62,900	1,080	2,100	6,120
18.....	1,610	16,800	s79,500	1,610	28,300	123,000	1,060	2,140	6,120
19.....	1,520	3,900	16,000	1,440	8,600	33,400	1,060	2,230	6,380
20.....	1,520	2,550	10,500	1,440	4,800	18,700	793	1,690	3,620
21.....	1,460	2,320	9,150	1,400	4,500	17,000	191	500	258
22.....	1,460	1,860	7,330	1,490	9,500	38,200	129	230	80
23.....	1,480	1,600	6,390	1,440	5,600	21,800	114	198	61
24.....	1,520	3,030	12,400	1,540	7,800	32,400	93	113	28
25.....	1,440	2,470	9,600	1,640	5,300	a 23,000	93	100	25
26.....	1,640	6,500	28,800	1,780	10,400	50,000	93	112	28
27.....	1,720	5,610	26,100	1,480	4,500	a 18,000	97	91	24
28.....	1,560	4,820	20,300	1,500	5,300	21,500	80	131	28
29.....	1,580	3,740	16,000	1,630	8,560	s45,700	69	71	13
30.....	1,550	7,200	30,100	1,360	6,900	25,300	61	44	7
31.....	1,020	3,150	8,680	1,690	12,700	58,000	---	---	---
Total.	53,070	--	479,960	42,558	--	1,439,730	24,073	--	255,092

Total discharge for year (cfs-days) 263,633.7

Total load for year (tons) 3,344,250

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued
RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Jan. 11, 1967	3:45 p. m.	60	41	522	4,350	--	90	--	93	--	96	98	100	--	SPWCM	
Feb. 12	3:30 p. m.	158	52	2,030	4,060	--	72	--	80	--	83	90	99	100	--	VPWCM
Feb. 26	3:15 p. m.	210	52	13,000	3,660	67	83	92	97	98	98	98	100	--	--	VPWCM
Feb. 26	3:13 p. m.	210	52	13,000	3,800	2	3	16	97	98	98	98	100	--	--	VPN
Apr. 13	2:35 p. m.	540	60	5,120	3,830	--	32	--	68	--	80	89	97	100	--	VPWCM
May 4	9:55 a. m.	1,800	53	4,430	3,580	--	16	--	23	--	39	61	86	99	100	VPWCM
May 11	3:30 p. m.	3,050	55	5,310	3,820	--	23	--	34	--	48	68	90	98	100	VPWCM
June 2	7:50 a. m.	2,070	53	2,590	4,460	--	16	--	25	--	41	53	88	99	100	VPWCM
June 12	7:40 a. m.	1,220	56	7,640	3,920	--	25	--	41	--	56	63	73	90	100	VPWCM
June 20	8:30 a. m.	1,360	59	3,120	3,460	--	16	--	26	--	54	71	90	97	99	VPWCM
June 21	8:35 a. m.	2,600	59	3,590	3,660	--	14	--	20	--	39	58	80	91	96	VPWCM
July 24	8:15 a. m.	1,430	59	11,700	4,730	--	48	--	72	--	85	87	95	99	100	VPWCM
Aug. 7	4:10 p. m.	1,050	74	25,300	3,960	--	58	--	80	--	94	98	100	--	--	VPWCM
Aug. 10	10:20 a. m.	716	67	13,300	3,490	--	48	--	70	--	90	97	100	--	--	VPWCM
Aug. 30	8:20 a. m.	1,370	62	6,350	3,130	--	24	--	28	--	38	70	93	99	100	VPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.

LOCATION.--At gaging station on downstream side of pier of former railway bridge, 400 feet downstream from bridge on State Highway 4, 1½ miles southwest of San Ildefonso Pueblo, 2½ miles downstream from Pojoaque River, and 7 miles west of Pojoaque, Santa Fe County.

DRAINAGE AREA.--14,300 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1957.

Water temperatures: October 1948 to September 1957.

Sediment records: October 1947 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 397 ppm June 13-16; minimum, 147 ppm June 10-12.

Hardness: Maximum, 233 ppm Feb. 13-16; minimum, 92 ppm June 10-12, July 3-8.

Specific conductance: Maximum daily, 636 micromhos Feb. 14-15; minimum daily, 205 micromhos June 12.

Water temperatures: Maximum, 77°F July 31, Aug. 1; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 17,100 ppm Aug. 10; minimum daily, 40 ppm Oct. 2.

Sediment loads: Maximum daily, 158,000 tons Aug. 10; minimum daily, 16 tons Oct. 2.

EXTREMES, 1946-57.--Dissolved solids: Maximum, 884 ppm Aug. 26, 1951; minimum, 137 ppm June 11-20, 1952.

Hardness: Maximum, 572 ppm Aug. 26, 1951; minimum, 85 ppm June 21-30, 1949.

Specific conductance: Maximum daily, 1,230 micromhos Aug. 26, 1951; minimum daily, 165 micromhos June 13, 1952.

Water temperatures: Maximum daily, 1,230 micromhos Aug. 26, 1951; minimum, freezing point on many days during winter months.

Sediment concentrations (1946-57): Maximum, 88 F Aug. 4, 5, 1954; minimum, 18 ppm Sept. 24, 26, 1953.

Sediment loads (1947-57): Maximum daily, 239,000 tons Aug. 21, 1955; minimum daily, 9 tons Sept. 22, 24, 26, 1953.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
															Parts per million	Tons per acre-foot	Calcium	Non-carbonate					
Oct. 1-31, 1956	168	36		37	9.0	28		171	0	39	8.5		0.5		242	0.33	110	130	0	32	1.1	369	7.8
Nov. 1-30	281	33		45	11	36		174	0	77	12		.5		300	.41	228	156	15	33	1.3	463	7.8
Dec. 1-31	361	32		44	10	33		173	0	68	12		.7		285	.39	278	151	9	32	1.2	440	7.7
Jan. 1-31, 1957	402	31		45	11	31		166	0	68	12		.9		281	.38	305	158	22	30	1.1	433	7.9
Feb. 1-12	416	28		44	11	30		163	0	68	11		.8		273	.37	307	155	22	30	1.0	425	7.7
Feb. 13-16	664	23		67	16	38		159	0	164	9.0		1.7		397	.54	712	233	102	26	1.1	599	7.9
Feb. 17-28	648	23		52	12	31		153	0	103	9.2		1.3		306	.42	535	179	54	27	1.0	476	7.8
Mar. 1-31	490	29		52	11	34		163	0	93	8.8		.7		310	.42	410	174	41	30	1.1	483	7.7
Apr. 1-15	653	26		53	11	29		159	0	90	8.8		1.9		298	.41	525	177	46	26	.9	454	7.9
Apr. 16-May 3	1,675	20		46	6.9	14		146	0	40	5.2		3.0		207	.28	936	144	24	18	.5	332	7.9
May 4-31	3,740	23		42	5.0	12		128	0	35	4.2		1.7		186	.25	1,860	126	20	17	.5	292	7.9
June 1-3	4,633	20		37	4.5	10		114	0	31	4.2		1.4		164	.22	2,050	111	18	17	.4	261	7.9
June 4-9	5,663	18		38	4.3	11		117	0	31	4.2		1.7		166	.23	2,490	112	16	18	.5	270	7.7
June 10-12	5,687	20		30	4.0	11		97	0	29	3.8		1.2		147	.20	2,260	92	12	21	.5	228	7.9
June 13-24	4,842	17		36	3.8	12		107	0	33	4.0		.9		160	.22	2,090	106	18	20	.5	257	7.7
June 25-30	4,860	18		32	3.8	11		97	0	33	3.8		.9		150	.20	1,970	96	16	20	.5	238	7.7

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonyl (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium carbonate	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
July 1-2, 1957.....	5,160	12		31	6.6	20		114	0	43	5.0		1.1		175	0.24	2,440	104	11	29	0.8	8.2
July 3-8.....	4,910	9.7		30	4.3	20		102	0	42	4.0		1.1		161	.22	2,130	92	9	32	.9	8.2
July 9-16.....	4,578	12		31	5.7	18		82	6	47	6.5		1.1		166	.23	2,050	101	24	28	.8	8.2
July 17-23.....	3,626	12		33	5.7	20		94	10	43	5.5		1.1		176	.24	1,720	106	12	29	.8	8.2
July 24-26.....	3,833	12		34	6.4	24		114	8	49	6.0		2.6		196	.27	1,900	112	4	32	.9	8.7
July 27-29.....	3,893	17		36	6.2	25		122	0	54	8.0		1.1		207	.28	2,180	116	16	32	1.0	8.7
July 30-Aug. 3.....	5,240	12		31	4.7	20		90	8	41	6.0		1.1		168	.23	2,380	97	10	31	.9	8.8
Aug. 4-14.....	3,268	15		44	10	24		156	0	67	6.5		1.1		245	.33	2,160	151	22	26	.8	8.0
Aug. 15-18.....	2,990	11		38	6.6	23		124	0	50	9.0		1.0		200	.27	1,610	122	20	29	.9	7.9
Aug. 19.....	2,660	--		--	--	22		--	--	72	6.5		--		--	--	--	--	--	--	--	--
Aug. 20-23.....	2,558	12		36	6.2	22		128	0	51	9.0		1.0		200	.27	1,380	116	10	29	1.0	7.9
Aug. 24.....	3,120	--		--	--	28		--	--	123	8.0		--		--	--	--	--	--	--	--	--
Aug. 25.....	3,050	--		--	--	18		--	--	79	5.0		--		--	--	--	--	--	--	--	--
Aug. 26.....	3,070	--		--	--	20		--	--	79	5.5		--		--	--	--	--	--	--	--	--
Aug. 27-31.....	3,292	12		34	5.7	20		92	8	52	9.0		1.0		187	.25	1,660	108	20	29	.8	8.8
Sept. 1.....	3,500	10		--	--	30		82	15	98	6.0		.1		--	--	--	--	--	--	--	9.2
Sept. 2-6.....	3,248	17		46	5.0	15		145	2	42	6.0		.1		204	.28	1,790	136	14	19	.6	8.3
Sept. 7-11.....	2,386	17		44	4.5	13		135	0	42	6.0		.1		193	.26	1,240	128	18	18	.5	7.6
Sept. 12-20.....	1,702	20		42	4.7	14		129	0	46	5.5		.1		195	.27	896	124	19	20	.5	307
Sept. 21-30.....	615	21		48	6.6	25		153	0	67	10		.1		253	.34	420	147	22	27	.9	396
Weighted average	1,792	18		39	6.0	18		a125	0	47	5.9		1.2		196	0.27	948	122	20	24	0.7	--

a Includes carbonate as bicarbonate.

RIO GRANDE BASIN--Continued
 RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.--Continued
 Temperature (°F) of water, water year October 1956 to September 1957
 Seven-day mercury actuated thermograph

Day	October		November		December		January		February		March		April		May		June		July		August		September		
	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max		
1.....	71	56	48	42	41	31	40	32	40	32	46	44	56	50	65	53	61	53	74	64	77	70	68	60	
2.....	68	54	50	39	40	31	42	36	40	32	50	44	51	46	65	57	64	54	75	65	76	69	70	60	
3.....	68	56	a48	38	40	31	39	34	42	36	48	44	51	46	62	56	67	56	75	67	74	69	70	60	
4.....	68	54	47	37	42	37	42	37	41	36	47	40	49	45	61	53	68	57	72	66	76	70	70	61	
5.....	68	55	47	35	44	36	44	37	44	33	45	40	51	40	58	50	70	60	70	65	74	68	69	61	
6.....	71	56	48	38	45	38	43	34	44	34	48	40	53	44	60	52	68	62	72	63	73	68	71	61	
7.....	67	55	52	40	41	40	38	34	44	34	51	40	54	46	58	52	68	61	72	63	74	67	70	62	
8.....	65	55	51	42	43	39	43	39	42	36	53	43	51	41	55	50	66	60	72	63	76	68	72	62	
9.....	66	54	50	40	36	31	46	41	49	40	54	44	56	44	58	48	68	60	70	62	76	68	69	62	
10.....	65	53	52	40	38	31	38	36	48	39	56	47	58	47	57	51	66	60	71	64	75	66	67	61	
11.....	65	53	52	41	a38	32	40	33	49	42	54	44	59	48	56	51	64	59	71	63	72	65	69	62	
12.....	63	53	51	40	a43	a33	42	34	50	41	52	43	56	47	55	48	66	57	72	63	70	64	68	58	
13.....	66	52	50	39	42	a36	a40	38	48	41	53	46	60	48	58	48	66	58	72	64	72	64	67	60	
14.....	65	50	48	41	38	33	46	39	48	40	50	40	58	52	60	50	66	60	73	64	73	64	68	60	
15.....	66	49	44	35	38	31	47	40	47	42	50	40	59	50	57	51	66	60	71	65	72	65	66	58	
16.....	63	48	42	32	38	31	44	37	48	42	52	43	60	50	59	48	66	58	73	63	73	65	66	58	
17.....	62	53	44	33	38	32	41	34	47	43	54	44	61	51	58	51	65	56	71	64	73	66	67	58	
18.....	a53	44	34	38	32	38	32	38	a32	46	44	50	43	58	50	61	51	66	56	73	62	71	65	67	60
19.....	64	50	44	35	38	32	39	31	44	41	52	44	58	50	61	53	65	59	72	64	73	64	64	57	
20.....	61	46	40	34	41	34	37	31	48	41	50	47	58	49	59	52	69	59	71	66	74	64	67	56	
21.....	60	44	38	32	38	32	35	32	48	42	54	45	57	48	56	50	67	60	75	65	72	66	66	56	
22.....	59	45	41	32	33	32	38	31	50	45	50	46	54	51	58	49	66	58	76	66	70	64	a54	54	
23.....	59	46	43	a32	38	33	35	31	48	42	45	39	49	44	58	50	67	58	74	67	70	65	66	56	
24.....	56	50	44	34	36	32	38	31	51	44	48	36	56	45	59	52	70	60	73	66	68	63	67	56	
25.....	54	41	44	34	36	32	40	33	50	43	50	38	56	48	61	50	72	61	69	65	68	63	67	56	
26.....	54	41	44	33	38	32	43	36	50	42	55	44	56	47	62	54	70	62	70	64	70	62	65	58	
27.....	55	42	42	32	39	33	40	35	48	44	56	45	57	48	58	52	71	60	73	63	70	62	67	56	
28.....	55	42	42	33	38	32	39	37	51	42	56	45	55	49	60	50	72	63	76	66	70	63	69	56	
29.....	50	a45	42	32	38	32	38	31	--	--	53	47	58	47	63	55	74	65	74	67	68	61	70	59	
30.....	53	40	42	32	39	32	40	32	--	--	57	50	61	50	64	56	72	64	75	67	67	61	70	60	
31.....	53	40	--	--	38	32	40	32	--	--	59	48	--	--	58	54	--	--	68	68	67	62	--	--	
Average.....	62	49	46	36	39	33	40	35	47	40	52	43	56	47	59	52	68	59	73	65	72	65	68	59	

a Thermograph record doubtful.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	152	43	18	213	72	41	344	210	195
2.....	152	40	16	229	80	49	361	220	214
3.....	152	44	18	235	85	54	332	210	188
4.....	150	45	18	245	83	55	332	250	224
5.....	145	44	17	254	140	96	357	260	251
6.....	150	42	17	265	170	122	365	240	237
7.....	150	48	19	254	100	69	369	260	259
8.....	150	48	19	258	100	70	378	220	225
9.....	150	50	20	279	190	143	369	230	229
10.....	159	53	23	276	140	104	328	250	221
11.....	169	61	28	279	160	121	349	290	273
12.....	172	83	39	290	200	157	378	260	
13.....	164	42	19	272	140	103	405	270	295
14.....	164	48	21	290	200	157	378	200	204
15.....	177	48	23	279	175	132	365	150	148
16.....	167	50	23	272	160	118	344	205	190
17.....	164	81	36	254	130	89	332	260	233
18.....	164	56	25	262	130	92	357	270	260
19.....	162	47	21	268	150	109	357	230	214
20.....	162	44	19	272	150	110	378	210	214
21.....	172	43	20	268	220	159	387	240	251
22.....	169	44	20	279	225	169	361	140	136
23.....	164	57	25	290	220	172	369	170	169
24.....	174	95	45	324	230	201	378	160	163
25.....	182	86	43	324	240	210	344	240	223
26.....	185	63	31	332	280	251	336	280	254
27.....	182	51	25	340	250	230	353	230	219
28.....	187	48	24	340	230	211	374	230	232
29.....	193	64	33	344	220	204	369	180	179
30.....	202	69	36	344	210	195	365	210	207
31.....	210	66	37	--	--	--	365	230	227
Total.	5,195	--	779	8,431	--	3,993	11,179	--	6,807
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	369	270	269	353	210	200	538	550	799
2.....	383	280	290	374	250	252	540	500	729
3.....	349	320	302	437	275	324	580	750	1,170
4.....	369	320	319	437	330	389	615	1,300	2,160
5.....	365	250	246	383	230	238	598	2,600	4,200
6.....	353	190	181	396	275	294	517	1,720	2,400
7.....	344	200	186	383	240	248	486	790	1,040
8.....	361	220	214	391	240	253	447	500	603
9.....	491	690	915	400	220	238	471	400	509
10.....	447	500	603	447	290	350	466	400	503
11.....	400	530	572	481	320	416	486	650	853
12.....	387	520	543	511	850	1,170	559	750	1,130
13.....	418	830	937	633	2,500	4,270	543	700	1,030
14.....	442	520	621	645	4,000	6,970	491	400	530
15.....	461	510	635	669	4,250	7,680	486	430	564
16.....	491	560	742	708	3,700	7,070	442	275	328
17.....	491	1,020	1,350	688	3,000	5,570	418	270	305
18.....	432	730	851	714	1,900	3,660	423	300	343
19.....	405	460	503	701	1,400	2,650	447	290	350
20.....	374	430	434	663	1,100	1,970	476	300	386
21.....	378	330	337	639	650	1,120	491	310	411
22.....	396	350	374	627	550	931	491	320	424
23.....	387	270	282	645	700	1,220	511	380	524
24.....	344	200	186	639	1,080	1,860	517	410	572
25.....	418	290	327	662	2,100	3,870	476	370	476
26.....	414	230	257	627	3,950	6,690	414	330	369
27.....	418	300	339	587	2,100	3,330	423	300	343
28.....	442	280	334	565	850	1,300	423	260	297
29.....	405	230	252	--	--	--	437	320	378
30.....	365	170	168	--	--	--	481	270	351
31.....	361	240	234	--	--	--	511	330	455
Total.	12,460	---	13,803	15,425	--	64,533	15,204	--	24,532

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	548	400	592	1,410	1,220	4,640	5,020	3,140	42,600
2.....	598	480	775	1,580	1,700	7,250	4,460	2,650	31,900
3.....	651	570	1,000	1,960	2,180	11,500	4,420	2,500	29,800
4.....	639	790	1,360	2,310	3,240	20,200	5,140	2,890	40,100
5.....	609	940	1,550	2,630	3,550	25,200	5,500	2,480	36,800
6.....	543	800	1,170	2,970	4,000	32,100	5,480	2,310	34,200
7.....	501	530	717	3,390	4,550	41,600	5,660	2,520	38,500
8.....	517	420	586	4,000	3,800	41,000	5,760	1,900	29,500
9.....	532	400	575	4,200	3,560	40,400	5,840	1,900	30,000
10.....	466	320	403	4,450	3,800	45,700	5,800	2,040	31,900
11.....	442	410	489	5,160	4,400	61,300	5,520	1,900	28,300
12.....	576	700	1,090	4,750	4,070	52,200	5,740	1,720	26,700
13.....	852	2,150	4,950	4,500	4,080	49,600	5,290	1,500	21,400
14.....	1,070	3,100	8,960	4,100	3,200	35,400	4,670	2,040	25,700
15.....	1,250	3,180	10,700	3,680	2,300	22,900	4,660	1,530	19,300
16.....	1,420	3,400	13,000	3,370	2,100	19,100	5,040	1,700	23,100
17.....	1,540	3,420	14,200	3,320	2,260	20,300	5,040	2,000	27,200
18.....	1,680	3,280	14,900	3,370	2,130	19,400	4,640	1,320	16,500
19.....	1,770	3,100	14,800	3,510	2,210	20,900	4,510	1,520	18,500
20.....	1,760	3,050	14,500	3,770	2,800	28,500	4,530	1,840	22,500
21.....	1,830	2,340	11,600	3,900	2,620	27,600	4,930	1,870	24,900
22.....	2,060	2,590	14,400	3,940	2,600	27,700	5,020	1,680	22,800
23.....	2,060	2,200	12,200	3,810	2,420	24,900	4,930	2,000	26,600
24.....	1,880	1,900	9,640	3,550	2,360	22,600	4,840	1,550	20,300
25.....	1,720	1,750	8,130	3,260	2,230	19,600	4,510	1,380	16,800
26.....	1,700	1,650	7,570	3,380	2,220	20,300	4,600	1,150	14,300
27.....	1,560	1,800	7,580	3,420	2,080	19,000	4,690	1,400	17,700
28.....	1,460	1,200	4,730	3,440	1,860	17,300	5,060	1,590	21,700
29.....	1,390	1,150	4,320	3,760	1,930	19,600	5,120	1,250	17,300
30.....	1,370	1,210	4,480	4,150	2,630	29,500	5,180	1,140	15,900
31.....	--	--	--	4,640	2,790	35,000	--	--	--
Total.	34,994	--	190,967	109,680	--	862,290	151,600	--	772,800
	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	5,140	1,200	16,700	5,360	2,100	30,400	3,500	9,200	86,900
2.....	5,180	1,140	15,900	6,640	5,200	84,800	3,180	4,000	34,300
3.....	5,140	1,300	18,000	4,640	2,550	31,900	3,320	2,750	24,700
4.....	5,190	1,150	16,100	3,550	3,150	30,200	3,520	2,800	26,600
5.....	5,040	1,150	15,600	3,520	5,200	49,400	3,280	2,100	18,600
6.....	4,980	1,000	13,400	3,420	6,200	57,300	2,940	2,000	15,900
7.....	4,710	1,000	12,700	4,100	14,200	157,000	2,700	2,300	16,800
8.....	4,400	820	9,740	2,760	3,400	25,300	2,590	2,000	14,000
9.....	4,640	1,550	19,400	2,700	6,650	61,700	2,390	1,500	9,680
10.....	5,160	1,800	25,100	3,110	17,100	158,000	2,180	1,270	7,480
11.....	5,210	1,540	21,700	3,180	5,800	49,800	2,070	1,240	6,930
12.....	5,000	1,200	16,200	3,110	4,200	35,300	1,960	1,220	6,460
13.....	4,670	1,470	18,500	3,220	5,200	45,200	1,900	1,140	5,850
14.....	4,250	1,480	17,000	3,280	5,600	49,600	1,830	900	4,450
15.....	3,870	1,010	10,600	2,860	2,800	21,600	1,740	1,180	5,540
16.....	3,820	1,100	11,300	2,970	3,000	24,100	1,740	1,070	5,030
17.....	3,790	3,100	31,700	2,980	4,900	39,400	1,700	1,180	5,420
18.....	3,780	5,800	59,200	3,150	5,600	47,600	1,160	1,160	5,010
19.....	3,710	1,990	19,900	2,660	3,000	21,500	1,550	1,030	4,310
20.....	3,810	1,370	14,100	2,510	2,750	18,600	1,300	1,140	4,000
21.....	3,600	1,220	11,900	2,490	2,600	17,500	770	880	1,830
22.....	3,430	1,100	10,200	2,720	5,700	41,900	695	510	957
23.....	3,260	830	7,310	2,510	3,150	21,300	653	250	441
24.....	3,490	2,680	25,300	3,120	8,800	74,100	613	150	248
25.....	3,570	1,910	18,400	3,050	6,300	51,900	613	230	381
26.....	3,630	2,270	22,200	3,070	7,200	59,700	608	200	328
27.....	3,780	3,100	31,600	2,630	2,450	17,400	613	250	414
28.....	3,650	2,950	29,100	2,630	4,750	33,700	586	150	237
29.....	4,250	4,100	a 47,000	3,460	8,920	s111,000	520	120	168
30.....	5,040	3,900	53,100	4,030	10,300	s131,000	482	100	130
31.....	5,120	1,700	23,500	3,710	4,300	43,100	--	--	--
Total.	134,310	--	662,450	102,540	--	1,641,300	53,143	--	313,094

Total discharge for year (cfs-days) 654,161

Total load for year (tons) 4,557,348

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO GRANDE AT OTOWI BRIDGE, NEAR SAN ILDEFONSO, N. MEX.--Continued

Particle-size analyses, of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube).

Date of collection	Time	Discharge (cfs)	Water temperature per-centage (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Jan. 17, 1957.....	11:10 a. m.	496	35	1,110	2,880	64	64			68	75	97		100	--	V P W C M
Feb. 13	9:45 a. m.	645	42	2,500	7,600	57	74			82	88	98		100	--	V P W C M
Apr. 13	9:30 a. m.	873	55	2,310	3,840	32	55			68	77	86		92	96	V P W C M
May 6	10:10 a. m.	3,520	54	3,330	3,440	18	27			49	74	93		99	100	V P W C M
May 12	9:15 a. m.	5,140	50	3,930	5,320	25	35			49	64	88		98	100	V P W C M
June 4	9:30 a. m.	5,420	58	2,680	2,900	18	24			42	58	86		98	99	V P W C M
June 21	10:00 a. m.	5,000	61	2,190	4,780	15	22			42	57	80		97	100	V P W C M
Aug. 10	9:15 a. m.	2,840	67	23,200	3,140	56	78			95	97	99		100	--	V P W C M
Aug. 29	9:30 p. m.	5,230	68	18,600	4,630	27	45			78	93	98		99	100	V P W C M

RIO GRANDE BASIN--Continued
GALISTEO CREEK AT DOMINGO, N. MEX.

LOCATION --At gaging station in Santo Domingo Pueblo Grant, 160 feet downstream from highway bridge, 0.3 mile northeast of Domingo, Sandoval County, 21 miles east of Santo Domingo Pueblo, and 4 miles upstream from mouth.

DRAINAGE AREA 640 square miles, approximately.

RECORDS AVAILABLE --Sediment records: January 1948 to September 1957.

EXTREMES, 1956-57. --Sediment concentrations: Maximum daily, 74,000 ppm Aug. 5; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 690,000 tons Aug. 5; minimum daily, 0 tons on many days.

EXTREMES, 1948-57. --Sediment concentrations: Maximum daily, 88,800 ppm July 4, 1952; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 1,600,000 tons Sept. 25, 1955; minimum daily, 0 tons on many days.

REMARKS --No flow October to February, April to June; tabulation omitted for these periods. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, July to August 1957

Date of collection	Discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Per- cent so- dium adsorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	
														Parts per mil- lion	Tons per acre- foot	Tons per day	Calcium, magnesium	Non- carbon- ate				
July 25, 1957, 2:10 p. m.	32.0			64	13	28		133		7.5				350	0.48	30.2	213	104	22	0.8	511	7.4
July 25, 3:25 p. m.	5,780			210	46	75		162		14				1,170	1.59	18,260	713	580	19	1.2	1,400	7.1
Aug. 5, 2:15 a. m.	3,000			80	16	58		74		10				550	.75	4,460	266	205	32	1.5	744	7.7
Aug. 5, 9:50 a. m.	2,500			111	21	65		69		11				714	.97	4,820	364	307	28	1.5	926	7.8
Aug. 29 a 212				141	18	28		127		6.0				--	--	--	426	322	13	.6	881	7.7
Aug. 30, 2:00 a. m.	652			100	15	33		121		6.5				--	--	--	311	212	19	.8	699	7.8
Aug. 30, 6:30 a. m.	272			91	16	56		122		7.5				--	--	--	293	193	29	1.4	759	7.8
Aug. 31 a 596		15		--	--	55		140		6.5				--	--	--	346	232	26	1.3	859	7.6

a Daily mean discharge.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	March			July			August		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1	700	sa 2	0	--	0	78	32,000	sa 12,000
2.....	1	338	s 1	0	--	0	1	5,000	a 14
3.....	0	--	0	0	--	0	49	17,000	sa 4,600
4.....	0	--	0	12	--	b 2,000	815	42,000	sa 370,000
5.....	0	--	0	0	--	0	2,570	74,000	sc 690,000
6.....	0	--	0	4	--	b 800	440	--	b 80,000
7.....	0	--	0	0	--	0	624	--	b 200,000
8.....	0	--	0	0	--	0	10	--	b 1,500
9.....	0	--	0	0	--	0	37	--	b 8,000
10.....	0	--	0	0	--	0	41	--	b 8,500
11.....	0	--	0	0	--	0	24	--	b 5,000
12.....	0	--	0	0	--	0	7	--	b 1,000
13.....	0	--	0	0	--	0	4	--	b 600
14.....	0	--	0	0	--	0	24	--	b 6,000
15.....	0	--	0	160	18,300	s 42,100	384	--	b 150,000
16.....	0	--	0	46	37,100	s 5,830	7	--	b 800
17.....	0	--	0	4	4,790	s 631	35	--	b 7,500
18.....	0	--	0	10	30,000	sa 970	137	--	b 40,000
19.....	0	--	0	1	8,000	a 22	8	--	b 1,000
20.....	0	--	0	0	--	0	0	--	0
21.....	0	--	0	0	--	0	42	--	b 8,000
22.....	0	--	0	0	--	0	14	--	b 2,500
23.....	0	--	0	44	52,000	sc 8,600	0	--	0
24.....	0	--	0	10	54,000	sa 2,200	544	--	b 170,000
25.....	0	--	0	693	38,300	s 199,000	100	--	b 20,000
26.....	0	--	0	182	48,700	s 31,100	6	--	b 800
27.....	0	--	0	11	29,000	a 860	0	--	0
28.....	0	--	0	0	--	0	0	--	0
29.....	0	--	0	27	12,000	sa 7,600	212	21,000	sc 44,000
30.....	0	--	0	6	28,000	sa 1,200	381	52,000	sc 75,000
31.....	0	--	0	0	--	0	596	53,000	sc 150,000
Total.	2	--	3	1,210	--	302,913	7,190	--	2,056,814
September									
1.....				122	37,000	a 13,000			
2.....				6	7,000	a 110			
3.....				0	--	0			
4.....				0	--	0			
5.....				0	--	0			
6.....				0	--	0			
7.....				0	--	0			
8.....				0	--	0			
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.....				0	--	0			
24.....				0	--	0			
25.....				0	--	0			
26.....				0	--	0			
27.....				0	--	0			
28.....				0	--	0			
29.....				0	--	0			
30.....				0	--	0			
31.....				--	--	--			
Total.				128	--	13,110			

Total discharge for year (cfs-days) 8,530
 Total load for year (tons) 2,372,840

s Computed by subdividing day.

a Computed from estimated concentration graph.

b Computed from water-sediment discharge relationship.

c Computed from partly-estimated concentration graph.

RIO GRANDE BASIN--Continued
GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
July 25, 1957 ...	3:25 p. m.	5,780	73	104,000	3,990		32		46		71	85	96		100	SPWCM
July 25.....	6:45 p. m.	1,610	69	87,800	4,400		36		53		79	91	98		100	SPWCM
July 26.....	4:55 a. m.	333	64	50,400	4,360		50		71		91	97	100		--	VPWCM
Aug. 5.....	5:10 a. m.	6,180	64	98,000	3,450		28		41		66	81	93		98	SPWCM
Aug. 6.....	11:20 a. m.	74	75	22,700	3,430		68		86		94	98	100		--	VPWCM
Aug. 29.....	10:30 p. m.	1,190	62	71,300	4,080		32		47		83	94	99		100	SPWCM

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

JAMEZ RIVER BELOW JAMEZ CANYON DAM, N. MEX.

LOCATION.--At gaging station, three-quarters of a mile downstream from Jamez Canyon Dam, 1½ miles upstream from mouth, and 6 miles north of Bernalillo, Sandoval County.

DRAINAGE AREA.--1,040 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1950 to September 1957.

Sediment records: April 1948 to September 1957.

EXTREMES, 1956-57. Water temperatures: Maximum, 94°F Aug. 16; minimum, freezing point Dec. 6, 22, 28-29, Jan. 10.

Sediment concentrations: Maximum daily, 65,500 ppm Aug. 30; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 46,600 tons Aug. 30; minimum daily, 0 tons on many days.

EXTREMES, (1948-57).--Water temperatures (1950-57): Maximum 94°F Aug. 16, 1957; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 118,000 ppm Aug. 1, 1955; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 167,000 tons July 25, 1951; minimum daily, 0 tons on many days each year.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512. Flow affected by ice Dec. 8-10, 19, 23-24, Jan. 18-20, 29 to Feb. 2.

REVISIONS.--Revised figures of mean discharge, mean concentration, and tons per day for water year 1950, superseding figures published in WSP 1188 are given herewith.

WSP 1188 - 1950 water year			
Date	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
Sept. 19, 1950	197	65,300	s58,300
Sept. 20	289	66,700	s91,700
Total for September	694	--	162,000
Total discharge for year (cfs-days).....			5,144
Total load for year (tons).....			214,400
s Computed by subdividing day.			

EXTREMES, 1948-50.--Sediment loads: Maximum daily, 91,700 tons Sept. 20, 1950.

Chemical analyses, in parts per million, July and August 1957

Constituent	July 26, 1957	Aug. 8, 1957	Constituent	July 26, 1957	Aug. 8, 1957
Discharge (cfs).....	15	262	Dissolved solids--cont.		
Silica (SiO ₂).....	--	23	Tons per day.....	77.0	--
Calcium (Ca).....	256	--	Hardness as CaCO ₃).....		
Magnesium (Mg).....	28	--	Calcium, magnesium....	754	614
Sodium (Na).....	281	216	Noncarbonate	639	491
Bicarbonate (HCO ₃).....	140	150	Percent sodium.....	45	43
Chloride (Cl).....	194	135	Sodium adsorption ratio ...	4.4	3.8
Dissolved solids			Specific conductance		
Parts per million.....	1,900	--	(micromhos at 25°C).....	2,440	1,910
Tons per acre foot.....	2.58	--	pH	7.9	--

RIO GRANDE BASIN--Continued

JAMEZ RIVER BELOW JAMEZ CANYON DAM, N. MEX.--Continued

Temperature (* F) of water, water year October 1956 to September 1957

Once daily measurement, generally between 11 a. m. and 4 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		--	a38	--	42	56	62	62	--	--	86	--
2		--	--	44	--	54	53	69	--	--	91	--
3		--	b34	34	--	--	58	63	63	--	--	83
4		--	40	40	--	53	54	--	b68	--	--	84
5		--	34	50	58	57	62	--	--	--	70	89
6		--	b32	--	54	56	63	62	--	--	82	87
7		--	44	44	55	59	--	65	--	--	82	--
8		--	37	--	58	63	63	58	--	--	75	--
9		--	--	48	--	--	67	62	--	--	76	79
10		a46	--	32	--	--	70	60	--	--	--	73
11		--	--	47	67	61	71	58	69	--	--	72
12		--	47	49	66	64	75	--	--	--	79	75
13		48	41	--	64	57	--	58	--	--	93	75
14		43	34	56	61	62	--	65	--	--	84	--
15		b36	33	52	63	64	71	64	--	--	83	--
16		--	--	46	--	--	76	58	--	--	94	--
17		--	45	--	57	--	66	62	70	--	--	--
18		--	41	--	46	62	65	--	--	--	--	--
19		43	36	--	52	60	69	--	--	--	74	79
20		--	37	--	62	61	59	61	73	--	90	--
21		--	35	34	59	65	--	61	70	--	83	--
22		--	a32	41	62	52	55	69	b64	--	86	--
23		--	--	--	51	--	49	70	--	--	75	--
24		a38	--	--	51	--	52	67	70	--	--	--
25		--	--	--	52	62	59	--	b71	--	--	--
26		43	--	a49	60	60	56	--	b69	b81	73	--
27		42	--	--	64	67	--	64	--	--	72	--
28		39	32	39	63	65	--	72	--	--	81	--
29		42	a32	37	--	68	53	78	--	--	91	85
30		43	--	42	--	63	60	--	--	--	86	64
31		--	35	42	--	--	--	57	--	--	87	--
Average		--	--	--	--	--	--	--	--	--	--	--

a Measurement obtained after 4 p. m.

b Measurement obtained before 11 a. m.

RIO GRANDE BASIN--Continued

JAMEZ RIVER BELOW JAMEZ CANYON DAM, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....				0	--	0	6	3,200	52
2.....				0	--	0	3	3,800	a31
3.....				0	--	0	2	2,100	11
4.....				0	--	0	15	6,380	s2,300
5.....				0	--	0	9	3,750	91
6.....				0	--	0	11	6,700	199
7.....				0	--	0	13	5,800	204
8.....				0	--	0	16	5,700	246
9.....				0	--	0	5	3,200	a43
10.....				.1	2,000	1	0	--	0
11.....				.6	2,500	a4	0	--	0
12.....				2	2,100	a11	37	8,850	s972
13.....				4	950	10	14	7,150	270
14.....				4	3,250	35	12	6,100	198
15.....				.3	2,100	2	9	5,100	124
16.....				0	--	0	4	4,900	a53
17.....				2	1,900	sa37	10	5,000	135
18.....				9	3,300	a80	15	7,200	292
19.....				6	3,400	55	5	4,100	55
20.....				7	3,600	a68	15	3,300	134
21.....				0	--	0	6	3,000	49
22.....				0	--	0	12	4,750	s296
23.....				5	1,800	sa140	15	12,000	a490
24.....				34	6,800	624	1	2,800	a8
25.....				14	5,200	a200	0	--	0
26.....				9	5,000	122	0	--	0
27.....				4	2,600	28	0	--	0
28.....				9	7,420	s1,480	5	2,250	s116
29.....				5	3,400	46	11	3,900	116
30.....				6	3,000	49	15	5,600	a230
31.....				--	--	--	17	5,750	264
Total.	0		0	121.0	--	2,992	283	--	6,979
	January			February			March		
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	18	5,700	a280	6	5,400	87	34	2,500	230
2.....	19	7,500	385	16	5,800	a250	57	4,800	739
3.....	18	7,000	340	24	5,700	a370	36	2,800	a270
4.....	30	11,200	907	21	3,400	a190	31	3,400	285
5.....	16	6,800	294	22	4,200	249	30	1,900	154
6.....	13	7,200	a250	17	3,500	161	20	1,600	86
7.....	15	5,700	231	14	3,200	121	11	2,200	65
8.....	19	2,900	a150	16	3,500	151	16	3,800	164
9.....	30	7,100	575	21	3,400	a190	30	3,900	a320
10.....	43	10,600	1,230	20	3,700	a200	47	1,900	a240
11.....	26	7,900	555	19	6,100	313	57	7,000	1,080
12.....	26	4,900	344	22	6,250	371	49	6,600	873
13.....	22	4,700	a280	32	8,100	700	53	5,500	787
14.....	21	4,750	269	51	8,000	1,100	47	4,200	533
15.....	22	5,500	327	62	8,300	1,390	32	4,100	354
16.....	28	4,500	340	65	6,600	al,200	30	4,000	a320
17.....	13	4,700	a160	57	9,700	1,490	31	5,600	a470
18.....	10	6,600	a180	68	6,100	1,120	41	5,500	609
19.....	12	6,500	a210	88	1,750	416	36	2,100	204
20.....	15	6,800	a280	70	4,100	775	45	3,000	364
21.....	21	5,500	312	41	3,700	410	47	7,250	920
22.....	13	5,600	197	31	3,600	301	43	6,100	708
23.....	8	6,400	a140	30	3,300	267	39	6,900	a730
24.....	8	5,600	a120	30	2,750	223	30	3,500	a280
25.....	18	7,200	a350	24	2,300	149	21	1,800	102
26.....	14	5,000	189	20	1,800	97	11	1,700	50
27.....	13	4,600	a160	18	1,900	92	13	1,700	60
28.....	18	5,000	243	21	1,700	96	19	2,500	128
29.....	10	5,100	138	--	--	--	25	4,500	304
30.....	15	5,400	219	--	--	--	32	4,500	389
31.....	13	4,750	167	--	--	--	41	4,100	a450
Total.	567	--	9,822	926.0	--	12,479	1,054	--	12,268

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

JAMEZ RIVER BELOW JAMEZ CANYON DAM, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	57	3,300	508	73	100	20	82	100	a22
2.....	60	3,000	486	70	150	28	88	100	a24
3.....	55	4,200	624	62	210	35	267	220	159
4.....	45	3,850	468	62	210	a35	152	1,120	460
5.....	41	3,000	332	57	210	a32	36	1,100	a110
6.....	37	2,800	280	202	1,000	s995	23	830	a52
7.....	37	2,500	a250	261	670	472	15	600	a24
8.....	47	4,000	508	270	470	343	15	400	a16
9.....	41	3,700	410	288	650	a410	15	230	a9
10.....	47	4,400	558	288	1,360	1,060	36	120	a12
11.....	53	5,300	758	258	2,970	2,070	50	50	7
12.....	65	5,900	1,040	252	2,600	a1,800	50	40	a5
13.....	91	6,200	a1,500	232	480	301	50	40	a5
14.....	102	6,300	a1,700	193	370	193	50	40	a5
15.....	84	4,900	1,110	153	550	227	50	40	a5
16.....	84	3,500	794	129	300	104	49	35	a5
17.....	76	3,200	657	123	280	93	46	30	4
18.....	70	3,500	662	125	210	a71	44	30	a4
19.....	41	2,900	321	123	450	a150	44	30	a4
20.....	45	3,000	364	123	2,070	687	175	238	s196
21.....	53	3,800	a540	155	830	347	285	150	115
22.....	62	2,500	418	109	1,320	388	152	150	62
23.....	148	4,750	1,900	91	630	155	32	150	a13
24.....	108	2,750	802	85	650	149	29	90	7
25.....	98	500	132	77	840	a170	125	103	s60
26.....	116	280	88	79	510	a110	143	100	39
27.....	109	810	a240	103	280	78	.7	--	(et)
28.....	165	1,000	a450	163	350	154	.3	--	(et)
29.....	98	460	122	121	340	111	.3	--	(et)
30.....	84	180	41	125	560	a190	.3	--	(et)
31.....	--	--	--	129	390	136	--	--	--
Total.	2,219	--	18,063	4,561	--	11,114	2,104.6	--	1,424
	July			August			September		
1.....	0.2	--	(et)	20	9,000	486	312	1,300	a1,100
2.....	.1	--	(et)	52	18,400	s2,780	235	13,000	sa2,600
3.....	.1	--	(et)	66	20,000	a3,600	53	23,500	3,360
4.....	.1	--	(et)	137	20,000	a7,400	43	13,500	1,530
5.....	.3	--	(et)	138	35,500	s14,400	35	12,000	1,130
6.....	0	--	0	2	3,000	16	28	18,000	1,360
7.....	0	--	0	2	210	1	13	21,000	a740
8.....	0	--	0	262	5,600	s8,460	7	13,000	a250
9.....	0	--	0	404	600	654	3	2,500	20
10.....	0	--	0	202	400	a220	5	5,500	74
11.....	0	--	0	190	1,700	a870	8	5,000	108
12.....	0	--	0	157	6,500	2,760	2	400	2
13.....	0	--	0	64	12,100	s893	.7	210	(t)
14.....	0	--	0	52	13,500	s1,710	.2	200	(at)
15.....	0	--	0	107	7,500	s2,490	.2	200	(at)
16.....	0	--	0	123	9,070	s3,240	.4	200	(at)
17.....	.3	130	sa1	135	16,000	a5,800	.3	150	(at)
18.....	.5	130	(at)	141	8,000	a3,000	.2	100	(at)
19.....	0	--	0	337	4,000	3,640	.1	58	(t)
20.....	0	--	0	92	23,400	s4,560	.1	50	(at)
21.....	0	--	0	34	14,000	1,290	0	--	0
22.....	0	--	0	72	17,000	3,300	0	--	0
23.....	0	--	0	105	9,000	2,550	0	--	0
24.....	0	--	0	139	18,000	a6,800	0	--	0
25.....	.5	6,500	sa26	141	31,000	a12,000	0	--	0
26.....	15	35,100	s1,560	359	9,500	9,210	0	--	0
27.....	57	27,000	sa4,300	510	540	744	0	--	0
28.....	30	23,000	a1,900	167	27,000	s30,600	0	--	0
29.....	7	6,400	121	95	24,500	6,280	0	--	0
30.....	47	26,900	s3,730	254	65,500	46,600	0	--	0
31.....	32	12,500	1,080	340	26,000	a24,000	--	--	--
Total.	190.1	--	12,718	4,899	--	219,354	745.2	--	12,275

Total discharge for year (cfs-days) 17,669.9

Total load for year (tons) 319,489

e Estimated.

t Less than 0.50 ton.

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued
JAMEZ RIVER BELOW JAMEZ CANYON DAM, N. MEX.--Continued

Particle-size analysis of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of Collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis			
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Nov. 13, 1956 ...	4:25 p.m.	3.6	67	1,170	1,990	--	97	--	99	--	99	100	--	--	--	--	SPWCM
Dec. 28 ...	2:00 p.m.	71	32	11,000	4,780	--	39	--	59	--	93	100	--	--	--	--	VPWCM
Jan. 22, 1957 ...	2:45 p.m.	19	32	6,830	3,540	--	36	--	49	--	75	98	100	--	--	--	VPWCM
Feb. 11 ...	12:00 m.	16	57	3,740	4,100	36	40	44	51	62	79	98	100	--	--	--	VPWCM
Feb. 11 ...	12:00 m.	16	57	3,740	4,170	2	7	35	--	60	79	98	100	--	--	--	VPN
Feb. 17 ...	2:45 p.m.	65	57	5,820	4,160	--	37	--	50	--	74	96	100	--	--	--	VPWCM
Feb. 17 ...	5:00 p.m.	113	55	9,700	4,230	--	30	--	44	--	73	96	100	--	--	--	VPWCM
Mar. 11 ...	12:00 m.	53	56	6,480	4,530	--	26	--	38	--	66	96	100	--	--	--	VPWCM
Mar. 21 ...	1:15 p.m.	62	61	5,670	2,970	--	30	--	39	--	64	95	100	--	--	--	VPWCM
Apr. 8 ...	11:30 a.m.	57	55	3,750	3,580	--	36	--	51	--	68	84	98	100	--	--	VPWCM
May 6 ...	2:55 p.m.	432	62	2,320	2,420	--	18	--	23	--	40	78	98	100	--	100	VPWCM
May 13 ...	12:00 m.	235	53	438	1,950	--	73	--	78	--	80	82	89	99	--	--	VPWCM
May 28 ...	3:15 p.m.	220	72	387	--	--	--	--	--	--	83	86	93	100	--	--	V
June 11 ...	11:15 a.m.	52	69	43	--	--	--	--	--	--	87	92	100	--	--	--	S
June 24 ...	10:35 a.m.	28	77	131	--	--	--	--	--	--	100	--	--	--	--	--	S
Aug. 2 ...	10:50 a.m.	31	77	9,480	3,940	--	84	--	94	--	100	--	--	--	--	--	PWCM
Aug. 8 ...	1:50 p.m.	542	73	47,600	3,840	--	73	--	93	--	97	98	100	--	--	--	VPWCM
Sept. 3 ...	3:20 p.m.	52	83	21,500	3,360	--	53	--	68	--	97	100	--	--	--	--	VPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.

LOCATION.--At gaging station, 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 River.

DRAINAGE AREA.--17,300 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).

RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1957.

Sediment records: November 1947 to September 1957.

EXTREMES, 1956-57.--Water temperatures: Maximum, 80°F June 28; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 34,500 ppm Aug. 5; minimum daily, 64 ppm Oct. 14.

Sediment loads: Maximum daily, 861,000 tons Aug. 5; minimum daily, 1 ton Oct. 1, 2, 4, 13, 14.

EXTREMES, 1947-57.--Water temperatures (1948-57) Maximum, 93°F Aug. 18, 1951; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 75,000 ppm Sept. 25, 1955; minimum daily, no flow on several days during July 1956.

Sediment loads: Maximum daily, 1,680,000 tons Sept. 25, 1955; minimum daily, 0 tons on several days during July 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512. Flow affected by ice Dec. 25 to Jan. 2.

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally before 12 m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	40	a 43	33	33	47	49	51	b 60	66	68	62
2	49	33	37	36	b 54	b 50	44	59	51	65	68	63
3	a 75	a 45	34	a 37	37	42	42	55	62	73	69	68
4	53	34	34	35	36	48	42	b 70	59	64	68	58
5	53	a 48	35	b 45	35	39	39	56	64	70	65	60
6	b 70	34	35	35	34	40	b 58	52	65	b 74	68	60
7	53	35	36	40	35	39	48	56	60	68	67	b 69
8	51	38	38	44	36	42	34	55	b 66	65	67	58
9	b 65	38	33	47	a 52	b 55	42	50	60	62	67	60
10	49	--	38	36	42	48	45	51	65	b 70	b 73	62
11	50	40	36	34	44	49	47	b 60	57	65	67	60
12	40	37	39	a 46	44	41	48	58	58	62	66	55
13	b 50	37	39	45	42	43	--	47	59	b 70	68	59
14	47	34	41	48	45	36	53	49	60	67	65	b 65
15	43	39	34	40	42	38	48	52	b 65	66	65	58
16	50	a 42	33	42	44	b 55	53	48	58	66	65	58
17	56	a 45	36	36	a 52	44	50	50	55	66	b 70	58
18	a 68	33	35	33	45	42	50	b 60	72	65	68	58
19	49	a 51	35	33	42	42	48	52	74	66	66	56
20	b 55	a 32	37	a 41	44	45	b 65	52	68	b 67	65	54
21	45	35	33	35	43	48	54	50	70	64	68	b 65
22	a 64	34	a 38	37	47	40	47	60	63	65	75	50
23	43	34	32	35	b 48	b 48	58	52	--	63	67	55
24	50	a 44	34	36	45	35	45	62	62	67	b 68	55
25	34	38	31	35	44	34	47	b 60	61	65	65	54
26	34	34	32	b 45	42	40	46	51	60	66	65	54
27	b 57	35	32	35	45	62	b 61	52	70	65	66	55
28	48	34	32	38	43	43	51	53	80	67	67	b 70
29	47	34	a 34	35	--	45	47	56	b 72	68	64	59
30	35	34	33	34	--	b 55	46	63	70	67	64	53
31	34	--	32	33	--	47	--	52	--	67	b 66	--
Average	51	38	35	38	43	45	49	55	64	66	67	59

a Measurement between 12 m. and 6 p. m.

b Measurement after 6 p. m.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	5	68	1	15	141	6	267	1,330	959
2.....	5	87	1	17	163	7	275	1,470	1,090
3.....	9	84	2	20	180	10	285	1,430	1,100
4.....	4	76	1	25	205	14	263	1,270	902
5.....	9	97	2	28	145	11	275	1,580	1,170
6.....	9	88	2	26	380	27	285	1,730	1,330
7.....	6	96	2	47	537	s125	300	1,680	1,360
8.....	8	95	2	77	791	s208	310	1,120	937
9.....	10	95	3	194	1,930	1,010	270	1,720	1,250
10.....	11	72	2	207	1,550	866	265	2,010	1,440
11.....	11	89	3	210	1,270	720	270	1,830	1,330
12.....	11	91	3	224	1,200	726	300	2,300	1,860
13.....	6	66	1	228	1,110	683	304	1,940	1,590
14.....	4	64	1	210	1,130	641	338	2,130	1,940
15.....	12	101	3	207	1,090	609	320	1,850	1,600
16.....	12	100	3	200	1,140	616	309	1,500	1,250
17.....	15	102	4	197	950	505	282	2,420	1,840
18.....	15	110	a4	194	1,060	555	282	2,430	1,850
19.....	12	105	3	200	960	518	298	2,670	2,150
20.....	12	111	4	218	1,160	683	304	1,820	1,490
21.....	18	164	8	228	1,100	677	304	1,710	1,400
22.....	12	113	4	224	850	514	298	1,640	1,320
23.....	15	159	6	235	720	457	287	1,270	984
24.....	19	230	12	224	860	520	298	1,340	1,080
25.....	16	135	6	267	1,260	908	270	1,640	1,200
26.....	18	320	16	285	1,280	985	240	1,030	667
27.....	19	250	13	280	1,130	854	210	500	284
28.....	19	170	9	290	1,120	877	250	570	385
29.....	18	293	14	271	1,130	827	270	490	357
30.....	17	194	9	251	1,210	820	290	660	517
31.....	19	157	8	--	--	--	300	710	575
Total.	376	--	152	5,299	--	15,977	8,819	--	37,207
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	310	1,730	1,450	342	1,840	1,700	510	3,200	4,410
2.....	330	3,780	3,370	347	1,700	1,590	510	2,420	3,330
3.....	315	2,350	2,000	369	1,910	1,900	503	2,310	3,140
4.....	325	2,500	2,190	428	2,490	2,680	447	1,610	2,180
5.....	330	2,210	1,970	416	2,080	2,340	489	1,690	2,230
6.....	325	2,350	2,060	386	1,800	1,880	440	3,500	4,160
7.....	320	2,420	2,090	398	1,720	1,850	374	3,200	3,230
8.....	295	1,690	1,510	374	1,480	1,490	358	1,800	1,740
9.....	347	2,140	2,000	364	1,920	1,890	267	1,700	1,230
10.....	468	3,900	4,930	330	2,840	2,910	392	2,500	2,650
11.....	374	3,250	3,280	404	2,200	2,400	275	1,380	1,020
12.....	392	3,290	3,480	440	2,140	2,540	300	1,310	1,060
13.....	422	2,910	3,320	503	3,100	4,210	305	1,670	1,380
14.....	404	3,550	3,870	536	4,750	7,260	280	1,650	1,250
15.....	416	2,930	3,290	635	6,370	10,900	263	1,400	994
16.....	447	3,290	3,970	671	6,780	12,300	251	1,070	725
17.....	461	3,160	3,930	671	5,570	10,100	347	1,750	1,640
18.....	416	3,760	4,220	690	5,280	9,840	224	920	556
19.....	347	3,450	3,230	690	4,750	8,850	204	770	424
20.....	347	2,750	2,580	653	4,500	7,930	243	800	525
21.....	342	2,190	2,020	700	3,490	6,600	275	1,380	1,020
22.....	369	2,250	2,240	690	3,210	5,980	255	1,350	929
23.....	374	2,280	2,300	626	2,940	4,970	255	1,100	757
24.....	374	2,360	2,380	617	2,930	4,880	404	2,000	2,180
25.....	342	2,140	2,140	617	3,000	5,000	243	1,380	905
26.....	352	2,550	2,420	644	3,500	6,090	232	950	595
27.....	269	2,000	1,990	566	5,310	8,110	197	820	436
28.....	398	2,310	2,480	526	5,210	7,400	185	760	380
29.....	380	2,310	2,370	--	--	--	176	2,080	s1,120
30.....	352	1,970	1,870	--	--	--	185	510	255
31.....	336	1,740	1,580	--	--	--	358	1,370	1,320
Total.	11,379	--	82,530	14,713	--	145,790	9,747	--	47,771

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	224	690	417	1,240	3,250	10,900	4,940	3,730	49,800
2.....	386	1,460	1,520	1,290	2,900	10,100	4,580	4,180	51,700
3.....	342	1,200	1,110	1,540	4,550	18,900	3,080	3,040	25,300
4.....	352	1,120	1,060	2,010	4,950	26,900	4,640	3,280	41,100
5.....	347	1,250	1,170	2,390	6,200	40,000	5,000	3,950	53,300
6.....	347	1,250	1,170	2,270	5,470	33,500	5,240	5,220	73,900
7.....	440	1,660	1,970	2,550	5,200	35,800	5,000	4,330	58,500
8.....	369	1,850	1,840	3,180	6,950	59,700	5,600	4,670	70,600
9.....	263	1,000	710	3,850	7,320	76,100	5,600	2,750	41,600
10.....	263	1,140	810	3,400	6,570	60,300	5,600	3,050	46,100
11.....	247	950	634	4,300	6,320	73,400	5,300	3,750	53,700
12.....	214	1,200	693	4,700	5,430	68,900	5,360	3,750	54,700
13.....	305	1,690	51,500	4,100	6,500	72,000	4,580	3,700	45,800
14.....	680	5,500	10,100	4,300	6,700	77,800	3,850	2,300	23,900
15.....	792	5,100	10,900	3,750	5,340	54,100	3,900	2,750	29,000
16.....	852	5,600	12,900	3,220	4,370	38,000	4,400	2,500	29,700
17.....	1,040	6,150	17,300	2,910	4,480	35,200	4,760	3,100	39,800
18.....	1,300	7,500	26,300	2,910	4,490	35,300	4,400	4,200	49,900
19.....	1,370	5,450	20,200	3,180	4,210	36,100	4,250	3,800	43,600
20.....	1,200	5,800	18,800	2,980	4,170	33,600	4,080	2,900	31,900
21.....	1,480	5,650	22,600	3,360	4,290	38,900	4,200	5,650	64,100
22.....	1,390	5,400	26,300	3,310	4,310	38,500	4,950	3,700	49,500
23.....	1,610	6,000	26,100	3,260	4,110	36,200	4,600	2,200	a 27,000
24.....	1,390	5,200	19,500	3,400	3,820	35,100	4,320	2,400	28,000
25.....	1,280	2,380	8,230	3,130	4,100	34,600	4,000	2,450	26,500
26.....	1,330	2,970	10,700	2,950	3,380	26,900	4,320	5,400	63,000
27.....	1,310	3,150	11,100	3,130	3,480	29,400	4,650	5,800	72,800
28.....	1,500	4,150	16,800	3,080	3,230	26,900	4,900	3,750	49,600
29.....	1,480	3,270	13,100	3,220	2,520	21,900	4,820	3,250	42,300
30.....	1,330	3,050	11,000	3,220	3,030	26,300	4,880	2,600	34,300
31.....	--	--	--	3,750	3,120	31,600	--	--	--
Total.	25,433	--	290,534	95,880	--	1,242,900	139,800	--	1,370,600
	July			August			September		
1.....	4,820	2,350	30,600	5,120	4,500	62,200	4,350	13,700	s183,000
2.....	5,000	2,200	29,700	6,230	7,000	118,000	3,180	9,000	77,300
3.....	4,700	2,250	28,600	4,460	5,400	65,000	2,590	5,600	39,200
4.....	6,020	4,260	s 80,700	3,400	5,800	53,200	3,360	6,200	56,200
5.....	5,880	3,950	62,700	8,160	34,500	s861,000	3,180	4,900	42,100
6.....	5,180	3,050	42,700	3,530	17,200	s176,000	2,830	5,300	40,500
7.....	5,000	2,150	29,000	6,170	26,700	s481,000	2,630	3,800	27,000
8.....	4,520	2,700	33,000	2,430	14,400	94,500	2,830	3,100	23,700
9.....	4,460	2,400	28,900	2,590	5,500	38,500	2,350	2,920	18,500
10.....	4,640	2,700	33,800	4,150	18,000	b200,000	1,840	3,220	16,000
11.....	4,760	2,750	35,300	3,400	12,500	115,000	1,680	2,530	11,500
12.....	5,120	2,600	35,900	2,590	6,200	43,400	1,630	2,670	11,800
13.....	5,120	2,150	29,700	2,830	5,200	39,700	1,600	2,150	9,290
14.....	4,640	2,100	26,300	2,950	6,600	52,600	1,510	2,000	8,150
15.....	3,850	2,000	20,800	3,180	9,390	s 84,200	1,800	2,350	11,400
16.....	3,700	5,700	56,900	2,910	9,700	76,200	1,740	2,270	10,700
17.....	4,000	3,200	34,600	2,950	9,400	74,900	1,340	1,770	6,400
18.....	3,900	3,700	39,000	3,310	10,500	93,800	1,270	2,150	7,370
19.....	3,600	3,650	35,500	2,950	10,400	82,800	1,070	1,920	5,550
20.....	3,800	3,800	39,000	2,350	8,700	55,200	1,170	1,860	5,880
21.....	4,100	2,050	22,700	2,040	4,000	22,000	920	1,330	3,200
22.....	3,850	2,100	21,800	2,950	5,700	45,400	630	1,150	1,960
23.....	3,850	2,450	25,500	2,350	6,900	43,800	387	760	794
24.....	3,400	2,500	23,000	3,470	10,900	s135,000	374	510	515
25.....	4,130	6,220	s 88,700	3,700	20,800	208,000	344	410	381
26.....	5,050	16,300	s246,000	2,950	10,600	84,400	326	400	352
27.....	3,800	10,800	111,000	2,870	12,600	97,600	309	300	250
28.....	4,400	5,200	61,800	2,500	10,800	75,500	287	180	139
29.....	3,900	4,700	49,500	4,010	10,500	s193,000	436	500	589
30.....	5,000	7,300	98,600	4,350	20,400	240,000	235	130	82
31.....	5,240	5,200	73,600	4,630	9,800	s154,000	--	--	--
Total.	139,450	--	1,574,900	111,570	--	4,165,900	48,198	--	619,902
Total discharge for year (cfs-days)									610,664
Total load for year (tons)									9,594,163

a Computed from estimated concentration graph.

s Computed by subdividing day.

b Computed from partly estimated concentration graph.

RIO GRANDE BASIN--Continued
RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection.	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment											Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Oct. 2, 1956	12:55 p. m.	6	75	109	400		61		65		73	80	94		100		SPWCM
Oct. 15	1:35 p. m.	7	69	69	--		--		--		95	98	100		--		S
Oct. 29	2:00 p. m.	12	51	121	580		71		91		98	99	100		--		SPWCM
Nov. 26	12:30 p. m.	295	38	1,360	4,650		23		40		77	92	98		100		VPWCM
Dec. 11	3:45 p. m.	250	34	2,900	6,110		8		19		55	81	97		100		VPWCM
Jan. 8, 1957	4:30 p. m.	275	45	1,890	4,050		15		24		56	87	100		--		VPWCM
Jan. 21	11:30 a. m.	342	34	2,280	3,030		15		23		49	85	97		100		VPWCM
Feb. 5	2:45 p. m.	404	48	1,960	5,360		12		18		59	84	95		99	100	VPWCM
Feb. 19	4:20 p. m.	662	50	1,720	3,940		36		53		63	83	97		100		VPWCM
Mar. 4	3:10 p. m.	434	52	1,830	3,590		20		27		53	85	97		100		VPWCM
Mar. 18	1:20 p. m.	207	53	1,140	3,540		17		24		43	72	98		100		VPWCM
Apr. 2	1:50 p. m.	434	54	1,250	3,790		24		34		65	94	100		--		VPWCM
Apr. 15	2:45 p. m.	780	65	4,940	4,640		35		50		74	95	98		100		VPWCM
Apr. 29	3:00 p. m.	1,320	59	3,680	3,460		12		16		39	79	93		100		VPWCM
May 13	6:00 p. m.	4,460	58	6,320	3,830		16		21		36	79	97		100		VPWCM
May 16	6:00 p. m.	3,080	60	4,460	3,840		9		13		30	73	97		100		VPWCM
May 27	3:55 p. m.	3,040	64	2,540	3,330		9		13		32	80	98		100		VPWCM
June 11	4:00 p. m.	4,880	65	3,570	4,020		10		15		27	64	94		100		VPWCM
June 24	4:30 p. m.	4,450	73	1,900	4,140		12		15		32	63	95		100		VPWCM
July 5	1:05 p. m.	4,940	74	3,560	3,580		12		19		44	64	95		100		VPWCM
Aug. 9	2:50	2,530	81	4,520	3,8		38		50		74	90	100		--		VPWCM
Aug. 30	4:15 p. m.	5,000	69	20,400	3,540		42		59		86	94	99		100		VPWCM

RIO GRANDE BASIN--Continued
RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Particle-size analyses of bed material, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; M, mechanically dispersed;
N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material										Methods of analysis	
				Percent finer than indicated size, in millimeters											
				0.0625	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000	32.000		
Apr. 25, 1952	...	2,820	--	2	11	56	93	98	99	99	99	99	100		S
May 12	...	6,490	--	0	2	15	71	94	98	99	99	99	100		S
June 17	...	6,120	--	0	3	37	93	99	99	100	--	--	--		S
June 20	...	4,780	--	0	3	27	86	95	97	98	99	99	100		S
June 26	...	2,800	--	0	3	33	87	98	99	100	--	--	--		S
July 24	...	2,080	--	1	6	46	87	98	100	--	--	--	--		S
Apr. 29, 1953	...	1,540	15	0	3	29	87	98	99	99	99	100	--		S
May 5	...	550	15	1	5	41	82	96	98	99	99	100	--		S
June 1	...	2,570	3	1	4	26	87	98	99	100	--	--	--		S
June 2	...	2,150	15	1	4	28	87	98	99	99	100	--	--		S
June 4	...	2,090	3	0	4	34	74	91	94	96	97	98	100		S
June 17	...	1,340	3	0	3	31	88	96	97	98	99	100	--		S

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.

LOCATION.--At gaging station at bridge on U. S. Highway 60, 2 miles east of Bernardo, Socorro County, and 3½ miles upstream from Rio Puerco.
DRAINAGE AREA.--19,230 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).
RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1957.

Sediment records: October 1947 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 787 ppm Nov. 1-27; minimum, 221 ppm July 1-4.

Hardness: Maximum, 348 ppm Nov. 1-27; minimum, 120 ppm July 1-4.

Specific conductance: Maximum daily, 325 micromhos Nov. 16; minimum daily, 92 micromhos July 3.

Sediment loads: Maximum daily, 232,000 tons Aug. 31; minimum daily, 92 tons on many days in October.

EXTREMES, 1947-57.--Sediment loads: Maximum daily, 348,000 tons Sept. 26, 1953; minimum daily, 0 tons on many days.

REMARKS.--Chemical records computed from summation of water discharges from all channels. Records are summation of water and sediment discharges in main channel, sediment concentrations available in district office at Albuquerque, N. Mex. Records are particle-size analyses for conveyance channel is published separately and shows water discharge and concentrations in that channel at the time of sampling. Daily sediment concentrations not listed because a composite concentration of more than one channel is meaningless. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./nesium	Non-carbonate			
Oct. 25-31, 1956..	a 1.9	37	--	102	19	120	--	263	279	66	--	1.0	--	753	1.02	3.86	332	117	44	2.9	1,110
Nov. 1-27.....	10.1	50	--	106	20	123	--	284	281	65	--	2.2	--	787	1.07	21.5	346	114	44	2.9	1,140
Nov. 28-30.....	21.7	51	--	94	17	105	--	263	233	53	--	5.1	--	687	.93	40.3	304	89	43	2.6	1,000
Dec. 1-3.....	23.0	42	--	103	18	110	--	277	256	57	--	3.1	--	725	.99	45.0	331	104	42	2.6	1,070
Dec. 4-10.....	61.4	39	--	98	17	91	--	269	223	46	--	3.2	--	649	.88	108	314	94	39	2.2	963
Dec. 11-18.....	165	35	--	89	15	72	--	257	175	35	--	4.6	--	552	.75	246	284	73	36	1.9	832
Dec. 19-31.....	218	34	--	84	13	66	--	244	160	32	--	3.4	--	512	.70	301	263	63	35	1.8	771
Jan. 1-11, 1957..	312	33	--	81	13	60	--	236	143	30	--	3.4	--	479	.65	404	256	62	34	1.6	727
Jan. 12-31.....	397	32	--	74	12	56	--	221	133	28	--	3.0	--	447	.61	479	234	53	34	1.6	680
Feb. 1-28.....	504	36	0.01	71	13	55	4.1	217	129	28	0.6	1.9	0.16	446	.61	607	230	52	34	1.6	664
Mar. 1-31.....	231	34	.01	73	15	63	4.1	223	150	32	.2	2.4	.18	484	.66	302	244	61	36	1.8	728
Apr. 1-17.....	97.5	37	.00	83	18	82	6.7	249	194	43	.6	2.4	.25	589	.80	155	281	77	38	2.1	881
Apr. 18.....	187	37	.00	83	19	78	5.9	240	--	--	--	--	--	b 562	.76	284	285	88	37	2.0	854
Apr. 19-20.....	432	29	.04	69	15	49	5.4	217	125	25	.8	2.4	.09	429	.58	732	234	56	31	1.4	652
Apr. 21-30.....	1,057	27	.04	61	11	37	4.7	188	92	19	.6	1.9	.12	346	.47	987	197	43	26	1.1	533
May 1-4.....	503	29	.01	62	11	49	5.1	191	114	26	.4	2.3	.12	393	.53	534	200	43	34	1.5	600
May 5-10.....	2,023	24	.04	55	10	33	4.2	174	80	18	.8	1.1	.10	312	.42	1,710	176	36	28	1.1	483
May 11-16.....	3,965	23	.03	54	9.0	25	4.5	167	68	15	.6	2.2	.13	287	.39	3,070	172	34	26	.9	443
May 17-23.....	2,900	22	.04	47	8.5	25	3.9	148	65	11	.6	1.2	.09	237	.35	2,010	152	31	26	.9	402
May 24-26.....	2,940	20	.06	49	8.8	24	3.2	148	67	15	.4	1.2	.07	252	.36	2,060	156	37	24	.8	412

May 27-31, 1957 ..	2,478	.02	46	8.8	26	4.2	145	66	16	.6	1.2	.07	261	.35	1,750	151	32	27	.9	403	8.0
June 1-30	3,829	--	48	5.4	23	--	149	55	9.0	--	.6	--	241	.33	2,490	142	20	26	.8	376	8.0
July 1-4	3,902	--	40	5.0	22	--	120	57	8.0	--	1.1	--	221	.30	2,330	120	22	28	.9	330	8.2
July 5	4,980	--	72	9.7	25	--	129	156	9	--	.7	--	357	.49	4,800	220	114	20	.7	526	7.6
July 6-19	4,274	--	46	4.7	23	--	139	60	10	--	.3	--	239	.33	2,760	134	20	27	.9	366	7.9
July 20	3,300	--	68	8.1	25	--	172	100	9	--	.6	--	320	.44	2,850	203	62	21	.8	483	7.8
July 21-Aug. 5	3,942	--	54	6.4	28	--	150	82	12	--	.5	--	284	.39	3,020	161	38	27	1.0	433	7.8
Aug. 6	6,020	--	91	12	57	--	177	219	19	--	1.1	--	509	.69	8,270	276	132	31	1.5	739	8.0
Aug. 7-10	3,538	--	75	11	39	--	161	164	16	--	.2	--	410	.56	3,920	232	100	27	1.1	610	7.6
Aug. 11-19	2,934	--	60	7.4	34	--	160	102	15	--	.8	--	326	.44	2,560	180	49	29	1.1	500	7.7
Aug. 20	2,140	--	91	12	40	--	163	203	18	--	.6	--	468	.64	2,700	276	143	24	1.0	680	7.4
Aug. 21-26	2,133	--	84	7.8	33	--	170	100	15	--	1.0	--	331	.45	1,910	192	52	27	1.0	507	7.8
Aug. 27-30	2,620	--	85	11	42	--	160	166	22	--	.8	--	450	.61	3,180	257	126	26	1.1	667	7.6
Aug. 31	6,220	--	77	7.8	32	--	175	107	15	--	.7	--	340	.46	5,710	199	56	26	1.0	510	7.4
Sept. 1-6	3,682	--	71	9.0	35	--	196	102	18	1.0	1.2	--	360	.50	3,580	214	54	26	1.0	540	7.8
Sept. 7-22	1,282	--	62	6.1	34	--	191	64	15	--	1.1	--	329	.45	1,140	166	32	28	1.1	499	7.7
Sept. 23-30	1,359	--	75	11	60	--	223	139	27	--	1.6	--	462	.64	448	232	50	36	1.7	698	7.7
Weighted average	c 1,514	--	57	7.7	31	--	162	86	14	--	1.0	--	304	0.41	1,240	174	40	28	1.0	464	--

a No flow Oct. 1-24.

b Residue on evaporation at 180° C.

c Average for 341 days of flow.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	0		0	3		(t)	18		4
2.....	0		0	5		1	20		6
3.....	0		0	5		1	31		14
4.....	0		0	7		1	47		48
5.....	0		0	8		1	49		51
6.....	0		0	6		1	54		42
7.....	0		0	7		(t)	57		45
8.....	0		0	8		1	67		79
9.....	0		0	8		1	65		67
10.....	0		0	7		(t)	91		290
11.....	0		0	8		(t)	120		641
12.....	0		0	8		1	142		756
13.....	0		0	9		1	140		566
14.....	0		0	9		2	156		740
15.....	0		0	10		1	174		924
16.....	0		0	12		s 3	192		1,110
17.....	0		0	13		3	198		1,020
18.....	0		0	13		2	198		916
19.....	0		0	12		1	203		939
20.....	0		0	10		1	207		913
21.....	0		0	12		s 4	216		1,020
22.....	0		0	15		s 5	221		1,020
23.....	0		0	15		2	227		984
24.....	0		0	15		2	232		1,190
25.....	1		(t)	18		3	228		1,200
26.....	1		(t)	16		4	234		1,060
27.....	1		(t)	15		2	220		978
28.....	2		(t)	24		s 18	197		660
29.....	2		(t)	22		22	197		602
30.....	3		(t)	19		8	220		867
31.....	3		(t)	--		--	232		971
Total.	13		1	339		94	4,653		19,723
	January			February			March		
1.....	240		979	366		1,540	524		3,730
2.....	261		1,300	344		1,370	479		4,360
3.....	305		1,960	342		1,260	539		3,600
4.....	353		2,480	339		1,270	373		1,800
5.....	348		2,190	334		1,190	317		1,380
6.....	321		1,800	359		1,130	305		1,330
7.....	315		1,560	404		1,520	308		1,340
8.....	321		1,610	389		1,460	283		1,190
9.....	321		1,530	374		1,310	253		1,210
10.....	313		1,410	366		1,300	232		824
11.....	335		1,630	356		1,280	191		586
12.....	478		4,390	349		1,270	187		554
13.....	448		3,400	359		1,360	202		534
14.....	403		2,340	389		1,510	198		432
15.....	388		2,000	494		2,580	182		328
16.....	403		2,160	614		4,550	187		416
17.....	403		2,240	679		7,760	149		262
18.....	419		2,420	732		8,710	181		365
19.....	463		3,100	836		10,300	179	s 522	
20.....	464		3,060	732		8,280	169		253
21.....	419		2,380	662		6,320	212		393
22.....	389		2,080	629		5,300	190		251
23.....	374		1,870	614		4,660	190		269
24.....	363		1,820	614		4,610	176		218
25.....	373		1,800	599		3,980	134		146
26.....	359		1,530	599		3,780	189		416
27.....	329		1,300	614		3,990	152		215
28.....	352		1,620	629		4,780	157		278
29.....	363		1,560	--		--	136		188
30.....	365		1,610	--		--	108		100
31.....	388		1,910	--		--	79		53
Total.	11,376		63,039	14,117		98,370	7,161		27,743

s Computed by subdividing day.

t Less than 0.50 ton.

RIO GRANDE BASIN--Continued

RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	91		73	572		2,750	3,220		29,200
2.....	97		s 83	502		2,120	3,960		32,500
3.....	112		113	410		2,160	3,910		30,100
4.....	141		176	527		3,780	3,570		28,600
5.....	146		206	1,000		10,700	4,310		36,300
6.....	151		198	1,610	s 23,800		4,010		28,000
7.....	131		167	1,390	16,700		4,470		30,700
8.....	130		156	2,050	23,200		4,230		26,400
9.....	111		132	2,810	42,200		4,460		30,400
10.....	116		135	3,290	40,800		4,780		31,900
11.....	85		76	3,450	39,900		4,760		32,000
12.....	70		37	3,750	44,400		4,480		30,600
13.....	58		18	5,080	62,100		4,510		29,200
14.....	45		9	4,280	47,300		4,190		26,200
15.....	46		9	3,880	36,800		3,740		20,600
16.....	56		45	3,350	a 31,000		3,740		21,400
17.....	72		130	2,950	28,700		4,340		26,900
18.....	187	s 1,700	2,450	2,450	17,300		3,860		24,100
19.....	459	s 6,950	2,690	2,690	21,900		3,280		18,800
20.....	806	12,500	3,000	3,000	22,600		2,960		15,600
21.....	912	13,000	3,060	3,060	22,400		3,130		18,000
22.....	1,040	14,900	3,180	3,180	24,200		3,490		23,400
23.....	953	s 11,800	2,970	2,970	23,700		3,650		23,300
24.....	1,110	s 15,800	3,070	3,070	29,000		3,790		21,300
25.....	1,130	s 13,400	2,810	2,810	27,300		3,150		15,800
26.....	1,040	11,200	2,940	2,940	27,700		2,970		15,200
27.....	1,110	10,100	2,760	2,760	23,700		3,170		14,400
28.....	1,090	10,800	2,420	2,420	19,000		3,440		20,400
29.....	1,750	s 13,200	2,350	2,350	18,000		3,500		20,900
30.....	932	6,580	2,230	2,230	18,600		3,800		19,100
31.....	--	--	2,630	2,630	24,800		--		--
Total.	13,677		143,693	79,461		778,610	114,870		741,300
	July			August			September		
1.....	4,140		19,700	4,290		39,100	5,870		164,000
2.....	3,780		20,200	4,480		41,400	4,660		108,000
3.....	3,830		19,900	4,900		56,800	2,850		58,300
4.....	3,860		20,200	5,080		56,200	2,660		39,800
5.....	4,980		60,300	3,320		37,400	3,170		35,200
6.....	5,470		50,800	6,020		174,000	2,880	a 26,000	
7.....	4,550		32,100	3,760		89,400	2,480		22,400
8.....	4,850		31,900	4,930		162,000	2,150		20,800
9.....	3,870		21,100	2,540		65,700	2,120		17,800
10.....	3,430		16,700	2,920		56,400	1,580		12,500
11.....	4,620		26,400	4,040		83,100	1,520		13,300
12.....	5,050		23,300	2,920		60,700	1,330		8,790
13.....	4,920		21,600	2,630		39,000	1,160		7,040
14.....	4,950		27,000	2,770		45,300	1,090		7,380
15.....	4,380		18,300	3,060		s 49,200	1,040		6,000
16.....	3,700		15,300	3,090	s 101,000		1,140	sb 6,600	
17.....	3,300		13,900	2,470	53,400		1,010	b 5,800	
18.....	3,340		14,400	2,750	59,100		824	4,310	
19.....	3,410		18,200	2,680	74,500		789	3,800	
20.....	3,300		58,100	2,140	54,500		827	4,090	
21.....	3,900		34,800	1,640	s 32,600		756	3,230	
22.....	3,070		20,500	1,530	b 19,000		701	2,910	
23.....	2,660		20,200	1,730	sb 27,000		616	1,810	
24.....	2,730		20,500	1,800	b 32,000		510	1,020	
25.....	3,420		26,400	3,430	s 95,500		398	439	
26.....	4,900		55,200	2,670	90,600		327	242	
27.....	4,760		108,000	2,510	67,900		274	278	
28.....	3,560		54,400	2,210	41,700		269	464	
29.....	3,600		31,500	1,890	38,600		260	302	
30.....	3,670		32,400	3,870	s 160,000		219	256	
31.....	4,730		43,000	6,220	232,000		--	--	
Total.	124,730		976,300	100,290		2,235,100	45,480		582,861
Total discharge for year (cfs-days).....									516,167
Total load for year (tons).....									5,666,834

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

b Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued
RIO GRANDE NEAR BERNARDO, N. MEX.--Continued
CONVEYANCE CHANNEL

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Dec. 13, 1956.....	1:30 p.m.	130	44	1,380	3,650	64	82	95	97	100	--	--	SPWCM		
Jan. 14, 1957.....	10:30 a.m.	412	45	1,990	3,915	40	51	77	93	100	--	--	VPWCM		
Feb. 1.....	12:30 p.m.	360	40	1,560	2,420	34	45	76	98	100	--	--	VPWCM		
Feb. 16.....	6:00 p.m.	628	57	2,780	3,340	45	58	81	92	100	--	--	VPWCM		
Feb. 19.....	6:00 p.m.	818	51	4,430	4,525	54	65	82	92	99	--	--	VPWCM		
Mar. 9.....	2:00 p.m.	272	57	2,000	3,810	52	62	67	71	77	99	100	VPWCM		
Mar. 20.....	1:30 p.m.	154	50	580	--	--	--	75	83	99	100	--	V		
Apr. 6.....	2:00 p.m.	154	60	562	--	--	--	91	95	100	--	--	V		
Apr. 16.....	7:00 a.m.	44	52	86	--	--	--	81	96	100	--	--	S		
Apr. 24.....	12:05 p.m.	1,000	53	5,400	4,920	40	63	78	87	98	100	--	VPWCM		
May 1.....	2:45 p.m.	550	68	1,850	4,270	41	59	79	88	97	100	--	VPWCM		
May 8.....	7:00 a.m.	1,900	59	4,370	4,340	38	55	81	91	99	100	--	VPWCM		
May 10.....	3:00 p.m.	1,680	63	4,830	4,380	40	58	85	90	98	100	--	VPWCM		
June 5.....	6:00 p.m.	1,490	80	3,470	3,730	26	34	73	92	98	100	--	VPWCM		
June 11.....	5:00 p.m.	1,690	67	3,100	4,980	19	28	57	83	96	99	100	VPWCM		
June 14.....	11:50 a.m.	1,630	67	4,290	3,790	16	22	44	62	72	88	100	VPWCM		
June 26.....	5:00 p.m.	1,140	82	2,540	4,500	15	27	58	87	97	100	--	VPWCM		
Sept. 5.....	5:30 p.m.	1,570	75	4,520	3,800	26	41	72	91	98	100	--	VPWCM		
Sept. 20.....	5:00 p.m.	856	69	1,950	2,850	16	24	48	87	100	--	--	VPWCM		

Particle-size analyses of bed material, water year October 1956 to September 1957

Date of collection	Time	Discharge (cfs)	Number of sampling points	Bed material										Methods of analysis	
				Percent finer than indicated size, in millimeters											
				0.0625	0.125	0.25	0.5	1	2	4	8	16	32		
Apr. 24, 1957	12:05 p.m.	1,000	3	2	13	74	100	--	--	--	--	--	--	--	S
May 1.....	2:45 p.m.	550	3	1	4	45	97	99	99	99	99	99	100		S
May 10	3:00 p.m.	1,680	3	1	3	44	94	100	--	--	--	--			S
June 14	11:50 a.m.	1,630	3	0	2	20	82	99	100	100	100				S

RIO GRANDE BASIN--Continued
RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

FLOODWAY

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Apr. 24, 1957....	1:30 p.m.	178	58	3,890	3,910	61			87		97	99	100		VFWCM
May 13.....	6:00 p.m.	3,320	72	3,440	3,850	48			65		89	96	100		VFWCM
May 26.....	10:00 a.m.	1,400	65	2,680	3,300	29			41		89	99	100		VFWCM
May 27.....	6:00 p.m.	1,480	68	2,320	3,050	30			44		92	100	--		VFWCM
June 3.....	6:30 p.m.	2,700	72	2,530	3,320	38			49		90	99	100		VFWCM
June 17.....	6:00 p.m.	2,670	71	1,940	4,640	26			39		86	99	100		VFWCM
July 5.....	7:00 p.m.	3,830	80	6,000	3,830	55			74		93	98	100		VFWCM
July 12.....	7:30 a.m.	3,280	72	1,330	2,350	37			49		79	96	100		VFWCM

RIO GRANDE BASIN--Continued

RIO PUERCO NEAR BERNARDO, N. MEX.

LOCATION.--At gaging station at bridge on U. S. Highway 85, 1.2 miles southwest of Bernardo, Socorro County, 3 miles upstream from mouth, and 18 (revised) miles south of Belen.

DRAINAGE AREA.--5,860 square miles, approximately.

RECORDS AVAILABLE.--Sediment records: October 1947 to September 1957.

EXTREMES, 1956-57.--Sediment concentrations: Maximum daily, 230,000 ppm July 26; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 2,240,000 tons Aug. 7; minimum daily, 0 tons on many days.

EXTREMES, 1947-57.--Sediment concentrations: Maximum daily, 230,000 ppm July 26, 1957; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 2,240,000 tons Aug. 7, 1957; minimum daily, 0 tons on many days each year.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. No flow October to April; tabulation omitted for this period. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

REVISIONS.--Revised figures of mean discharge, mean concentration, and tons per day for water year 1948, 1949, superseding figures published in WSP 1133 and WSP 1163 are given herewith:

WSP 1133 - 1948 water year

Date	Mean discharge (cfs)	Mean concentration (percent)	Tons per day
Apr. 23, 1948	12	9.35	3,250
Total for April..	321	--	85,960
Total discharge for year (cfs-days)			5,293
Total load for year (tons)			1,634,000

WSP 1163 - 1949 water year

Date	Mean discharge (cfs)	Mean concentration (percent)	Tons per day
June 12, 1949	15	8.08	55,470
June 19	7	5.86	22,110
June 24	23	8.55	87,150
Total for June..	53	--	16,850
Total discharge for year (cfs-days)			14,246
Total load for year (tons)			5,760,000

s Computed by subdividing day.

RIO GRANDE BASIN--Continued
RIO PIERCO NEAR BERNARDO, N. MEX.--Continued
Chemical analyses, in parts per million, June to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH		
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate					
June 4, 1957.....	146	--		232	46	301		219			52				1,970	2.68	777	768	588	46	4.7	2,420	7.3
July 27.....	3,450	--		138	28	188		119			71				1,190	1.62	11,080	460	362	47	3.8	1,600	7.7
Aug. 7.....	5,010	23		--	--	39		165			12				--	--	--	222	87	28	1.1	584	8.0
Aug. 22.....	30	11		--	--	246		139			56				--	--	--	558	444	49	4.5	1,900	7.6
Aug. 30.....	1,400	11		--	--	220		172			82				--	--	--	710	569	40	3.6	2,120	8.0

RIO GRANDE BASIN--Continued

RIO PUERCO NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....				0	--	0	2	8,400	sa 410
2.....				0	--	0	32	78,000	a 7,000
3.....				0	--	0	34	74,500	7,080
4.....				0	--	0	146	100,000	sa 72,000
5.....				0	--	0	95	120,000	a 33,000
6.....				0	--	0	39	110,000	a 12,000
7.....				0	--	0	31	95,000	8,540
8.....				0	--	0	21	77,600	4,560
9.....				0	--	0	15	52,000	2,180
10.....				0	--	0	14	73,000	2,860
11.....				0	--	0	15	74,000	3,110
12.....				0	--	0	24	75,000	5,040
13.....				13	87,000	sa 3,200	151	124,000	s 44,600
14.....				9	85,000	a 2,100	72	90,000	18,800
15.....				11	70,000	a 2,200	25	75,000	5,250
16.....				3	23,000	a 190	10	72,600	2,030
17.....				1	7,000	a 20	7	73,000	1,430
18.....				0	--	0	5	56,000	784
19.....				0	--	0	2	43,000	241
20.....				0	--	0	133	74,000	s 52,500
21.....				0	--	0	50	78,800	s 13,800
22.....				0	--	0	17	57,500	2,740
23.....				0	--	0	3	28,500	231
24.....				0	--	0	1	4,200	11
25.....				0	--	0	0	--	0
26.....				1	--	e 20	0	--	0
27.....				0	--	0	0	--	0
28.....				0	--	0	0	--	0
29.....				0	--	0	0	--	0
30.....				0	--	0	0	--	0
31.....				0	--	0	0	--	0
Total.	0	0	0	38	--	7,730	944	--	306,207
Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	138	87,400	33,800	2,000	114,000	746,000
2.....	0	--	0	450	108,000	s 213,000	1,520	135,000	s 623,000
3.....	0	--	0	623	94,200	s 180,000	302	76,000	64,300
4.....	245	35,000	sa 220,000	253	104,000	s 88,200	107	56,000	16,800
5.....	913	160,000	sa 490,000	921	174,000	s 499,000	51	51,000	7,280
6.....	53	56,800	s 8,420	1,550	140,000	s 651,000	23	47,400	3,050
7.....	6	19,800	s 510	5,010	149,000	2,240,000	6	41,500	697
8.....	0	--	0	3,130	164,000	s 1,590,000	1	12,500	34
9.....	0	--	0	1,110	120,000	386,000	0	--	0
10.....	0	--	0	460	91,000	121,000	0	--	0
11.....	0	--	0	539	107,000	s 186,000	0	--	0
12.....	0	--	0	145	73,500	29,800	0	--	0
13.....	0	--	0	38	52,000	5,530	0	--	0
14.....	3	--	e 80	10	45,000	1,260	0	--	0
15.....	0	--	0	163	99,200	a 53,800	0	--	0
16.....	442	68,600	s 149,000	278	128,000	103,000	0	--	0
17.....	170	72,000	s 42,800	633	144,000	s 286,000	0	--	0
18.....	65	60,600	s 13,800	1,710	208,000	s 861,000	0	--	0
19.....	110	83,300	s 27,900	2,190	138,000	s 942,000	0	--	0
20.....	37	73,900	7,660	376	89,000	s 100,000	0	--	0
21.....	20	79,000	4,420	97	63,000	17,100	0	--	0
22.....	19	81,000	4,310	30	58,000	4,870	0	--	0
23.....	4	90,000	1,040	15	56,500	2,370	0	--	0
24.....	87	45,900	s 26,000	177	78,100	s 70,200	0	--	0
25.....	36	31,700	s 10,600	1,070	148,000	s 549,000	0	--	0
26.....	1,100	230,000	s 806,000	1,950	141,000	s 926,000	0	--	0
27.....	3,450	127,000	sl 260,000	308	92,400	82,500	0	--	0
28.....	2,770	142,000	sl 290,000	100	70,500	19,700	0	--	0
29.....	793	92,100	s 228,000	87	62,000	15,100	0	--	0
30.....	210	51,000	30,000	1,400	94,500	s 570,000	0	--	0
31.....	109	52,500	18,000	b 2,750	102,000	s 844,900	--	--	0
Total.	10,642	--	4,634,540	27,711	--	11,651,230	4,010	--	1,461,161

Total discharge for year (cfs-days).....

43,345

Total load for year (tons).....

18,094,888

e Estimated.

a Computed from estimated concentration graph.

s Computed by subdividing day.

b Revised in WSP 1632

RIO GRANDE BASIN--Continued
RIO PUERTO NEAR BERNARDO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000		2.000
June 3, 1957.....	10:00 a. m.	39	68	78,100	4,880		85		98		100	--	--	--			PWCM
June 20.....	12:00 m.	11	82	86,600	4,030		95		98		100	--	--	--			PWCM
July 16.....	1:30 p. m.	680	77	95,500	3,840		62		83		99	100	--	--			VPWCM
July 18.....	6:00 p. m.	283	81	89,700	3,760		64		80		95	100	--	--			VPWCM
July 27.....	4:10 a. m.	3,830	70	77,200	4,380		45		64		81	87	97	100			SPWCM
July 27.....	6:25 a. m.	3,450	71	90,300	4,040		46		56		76	90	99	100			SPWCM
Aug. 5.....	9:15 a. m.	870	--	162,000	3,570		42		55		77	93	100	--			SPWCM
Aug. 7.....	10:00 a. m.	4,300	--	127,000	4,180		45		61		79	90	98	100			SPWCM
Aug. 24.....	3:00 p. m.	134	70	73,300	3,490		85		95		98	99	100	--			SPWCM
Aug. 26.....	2:00 a. m.	5,170	70	178,000	4,750		34		47		67	83	99	100			SPWCM
Sept. 7.....	8:00 a. m.	9	--	44,100	2,810		98		99		100	--	--	--			PWCM

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

RIO SALADO NEAR SAN ACACIA, N. MEX.

LOCATION.--At gaging station, 1 mile upstream from mouth, 2 miles northeast of San Acacia, Socorro County, 1.7 miles downstream from bridge on U. S. Highway 85, and 15 miles north of Socorro.

DRAINAGE AREA.--1,380 square miles, approximately.

RECORDS AVAILABLE.--Chemical analyses: July 1956 to September 1957 (intermittent).

Sediment records: July 1948 to June 1956 (daily). July 1956 to September 1957 (intermittent).

EXTREMES, 1948-56.--Sediment concentrations: Maximum daily, 182,000 ppm Aug. 13, 1953; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 793,000 tons Aug. 13, 1953; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

REVISIONS.--Revised figures of mean discharge, mean concentration, and tons per day for water years 1948, 1949, superseding figures published in WSP 1133 and WSP 1163 are given herewith.

WSP 1133 - 1948 water year

Date	Mean discharge (cfs)	Mean concentration (percent)	Tons per day
Aug. 1, 1948.....	15	9.22	4,010
Total for August.....	61.7	--	19,390
Total discharge for year (cfs-days)			832.4
Total load for year (tons).....			279,600

WSP 1163 - 1949 water year

Date	Mean discharge (cfs)	Mean concentration (percent)	Tons per day
Oct. 14, 1948	143	2.41	s 53,300
Oct. 15	98	9.28	s 28,000
Oct. 20	14	4.35	s 4,780
Total for October	278	--	88,980
May 12, 1949	127	8.40	s 33,300
Total for May	158	--	41,940
July 13, 1949	451	13.6	s 258,000
July 14	94	7.67	s 27,900
July 23	492	11.2	s 247,000
July 24	30	7.2	s 6,050
Total for July	1,486	--	664,700
Aug. 3, 1949	181	8.58	s 71,900
Aug. 4	2	4.40	246
Aug. 6	0	--	0
Aug. 7	0	--	0
Aug. 8	160	10.7	s 111,000
Aug. 9	32	7.00	6,270
Aug. 18	36	8.46	s 14,000
Aug. 24	1	4.25	s 468
Aug. 25	4	10.2	1,180
Aug. 26	0	--	0
Aug. 27	0	--	0
Aug. 28	0	--	0
Total for August	437	--	208,600
Sept. 1, 1949	267	8.88	s 136,000
Sept. 6	21	2.19	s 7,770
Sept. 9	109	8.11	s 57,500
Sept. 10	72	8.62	s 17,600
Sept. 15	186	7.87	s 59,900
Sept. 30	223	7.14	s 55,900
Total for September	1,188	--	464,800
Total discharge for year (cfs-days).....			3,561
Total suspended sediment load for year (tons)			1,469,000

s Computed by subdividing day.

RIO GRANDE BASIN--Continued
RIO SALADO NEAR SAN ACACIA, N. MEX.--Continued
Chemical analyses, in parts per million, March to August 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Mar. 20, 1957	3	--	--	--	--	--	--	--	--	--	--	--	--	586	0.80	240	107	--	1,470	--
July 26	1,100	--	75	108	13	91	--	163	--	35	--	--	--	--	--	372	28	45	2.6	7.5
Aug. 5 (11:00 a.m.)	a 417	--	108	108	25	72	--	420	--	36	--	--	--	--	--	420	119	30	1.6	844
Aug. 5 (5:00 p.m.)	a 168	18	--	--	--	73	--	367	--	30	--	--	--	--	--	480	385	27	1.6	7.2
Aug. 22	160	21	--	--	--	67	--	288	--	32	--	--	--	--	--	480	306	27	1.5	7.4
Aug. 30	175	20	--	--	--	97	--	188	--	46	--	--	--	--	--	480	306	31	2.0	7.2
Aug. 30	175	20	--	--	--	97	--	188	--	46	--	--	--	--	--	480	306	31	2.0	7.8

a Discharge at time of sampling.

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957

Date of collection	Time	Discharge (cfs)	Mean concentration (ppm)	Discharge (tons per day)
Mar. 20, 1957	10:00 a.m.	8	67,700	1,520
Mar. 20	2:30 p.m.	6	35,700	600
July 11	--	71	58,300	11,600
July 16	--	232	158,000	110,000
July 18	--	39	103,000	11,600
July 24	8:30 a.m.	982	123,000	340,000
July 24	9:30 a.m.	790	124,000	284,000
July 26	--	--	--	--
July 26	7:30 a.m.	1,900	119,000	658,000
July 26	8:30 a.m.	1,800	120,000	628,000
Aug. 5	--	156	105,000	47,500
Aug. 8	--	335	103,000	100,000
Aug. 22	--	746	131,000	283,000
Aug. 30	11:30 a.m.	952	89,400	247,000
Aug. 30	12:30 p.m.	468	102,000	138,000

RIO GRANDE BASIN--Continued
RIO SALADO NEAR SAN ACACIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500	1.000
Mar. 20, 1957....	10:00 a.m.	8	50	67,700	5,200		70		96		99	100	--	--		VPWCM
July 11.....	5:00 p.m.	71	66	58,300	4,500		95		100		--	--	--	--		PWCM
July 24.....	8:30 a.m.	817	68	123,000	3,900		42		60		79	85	97	100		SPWCM
July 26.....	7:30 a.m.	1,640	69	119,000	3,980		39		55		76	91	99	100		SPWCM
Aug. 22.....	2:30 p.m.	898	74	131,000	3,580		32		50		77	89	98	100		SPWCM

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING, NEAR SAN MARCIAL, N. MEX.

LOCATION.--At heading structure, 1,250 feet upstream from gaging station, 6 miles upstream from former site of San Marcial, Socorro County, and 13.4 miles southwest of San Antonio.

RECORDS AVAILABLE.--Water temperatures: March 1954 to June 1957 (discontinued).

Sediment records: March 1954 to June 1957 (discontinued).

EXTREMES, 1956-57.--Water temperatures: Maximum, 83°F June 25, 26, 28, 30; minimum, not determined.

Sediment concentrations: Maximum daily, 12,800 ppm Apr. 22; minimum daily, not determined.

Sediment loads: Maximum daily, 20,800 tons Apr. 26; minimum daily, not determined.

EXTREMES, 1954-57.--Water temperatures: Maximum, 90°F June 12, 1955; minimum, freezing point on several days.

Sediment concentrations: Maximum daily, 138,000 ppm Aug. 4, 1956; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 294,000 tons July 28, 1955; minimum daily, 0 tons on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for period October 1956 to June 1957 given in WSP 1512.

Temperature (°F) of water, December 1956 to June 1957
Once-daily measurement, generally between 11 a. m. and 6 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	38	52	58	66	68	70			
2			--	46	48	58	--	74	74			
3			--	38	58	54	50	78	73			
4			--	44	46	54	54	74	74			
5			--	45	54	55	a 61	68	78			
6			--	48	50	58	63	72	75			
7			--	47	46	61	85	70	75			
8			--	49	58	66	62	66	74			
9			--	51	55	56	--	73	75			
10			--	41	55	58	65	69	71			
11			--	55	65	a 61	--	62	68			
12			--	a 48	56	63	--	60	72			
13			--	50	62	64	--	65	75			
14			--	60	60	59	--	69	73			
15			38	58	59	58	--	64	73			
16			35	58	48	60	--	66	75			
17			43	52	52	60	--	68	69			
18			47	45	48	62	--	68	74			
19			41	48	54	54	--	68	74			
20			45	48	56	48	--	65	78			
21			45	a 50	--	62	65	67	74			
22			35	48	60	53	a 53	64	78			
23			48	48	--	48	56	68	78			
24			36	55	53	--	64	68	79			
25			38	52	54	56	64	68	83			
26			40	49	58	60	63	72	83			
27			45	50	60	58	64	70	80			
28			48	48	60	58	56	75	83			
29			39	a 42	--	58	54	75	b 75			
30			48	51	--	58	68	78	83			
31			41	44	--	71	--	69	--			
Average			--	49	55	58	--	69	76			

a Measurement before 11 a. m.

b Measurement after 6 p. m.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING, NEAR SAN MARCIAL, N. MEX.--Continued

Suspended sediment, October 1956 to June 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	2.9			4.8			9.5		
2.....	3.4			5.4			9.8		
3.....	3.2			8.9			9.8		
4.....	3.2			8.8			9.7		
5.....	3.8			7.1			9.9		
6.....	3.3			6.5			9.8		
7.....	3.4			6.2			9.8		
8.....	3.2			6.6			11		
9.....	3.7			6.8			9.6		
10.....	4.4			6.8			9.6		
11.....	4.3			6.7			9.7		
12.....	4.1			6.8			11		
13.....	4.8			7.4			14		
14.....	4.8			9.3			33	--	a 40
15.....	5.1			7.8			43	2,320	b 200
16.....	5.2			7.9			44	2,680	318
17.....	5.2			7.6			56	2,880	435
18.....	5.5			7.6			77	4,850	1,010
19.....	3.7			7.3			78	3,400	716
20.....	3.8			8.1			78	3,140	661
21.....	3.8			7.5			80	3,920	847
22.....	3.7			8.2			84	3,620	821
23.....	3.3			7.6			94	5,180	1,310
24.....	3.9			7.7			58	4,300	673
25.....	4.7			7.8			40	1,510	163
26.....	4.8			7.8			40	1,740	188
27.....	4.6			8.1			39	1,160	122
28.....	4.7			9.9			47	2,820	358
29.....	4.5			9.3			65	2,700	474
30.....	5.1			9.6			66	4,620	823
31.....	4.9			--			82	5,680	1,260
Total.	129.0		e 120	227.9		e 180	1,237.2	--	10,784
Day	January			February			March		
	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day	Mean dis-charge (cfs)	Mean concen-tration (ppm)	Tons per day
1.....	121	6,460	2,110	234	5,880	3,710	440	8,980	10,700
2.....	186	7,130	3,580	234	6,170	3,900	388	8,180	8,570
3.....	159	7,650	3,280	231	5,660	3,530	366	10,500	10,400
4.....	177	7,210	3,450	215	5,340	3,100	431	12,000	14,000
5.....	192	7,880	4,080	208	5,550	3,120	312	8,010	6,750
6.....	191	7,820	4,030	204	5,670	3,120	270	7,720	5,630
7.....	171	8,090	3,740	217	6,700	3,930	259	7,350	5,140
8.....	161	7,930	3,450	230	5,990	3,720	231	6,330	3,950
9.....	155	6,730	2,820	234	6,080	3,840	233	6,540	3,940
10.....	164	6,240	2,760	223	6,170	3,710	227	7,440	4,560
11.....	173	6,630	3,100	218	6,130	3,610	194	6,140	3,220
12.....	170	7,320	3,360	204	6,270	3,450	140	8,230	3,110
13.....	214	9,870	5,700	210	5,580	3,160	128	5,440	1,880
14.....	245	8,770	5,800	224	6,120	3,700	133	6,170	2,220
15.....	221	6,950	4,150	239	6,800	4,390	137	5,800	2,150
16.....	171	8,540	3,940	272	8,490	6,240	123	4,730	1,570
17.....	186	7,200	3,620	343	9,400	8,710	120	4,330	1,400
18.....	191	8,300	4,280	433	11,900	13,900	99	5,110	1,370
19.....	225	9,040	5,490	482	9,840	12,800	105	5,130	1,450
20.....	253	8,790	6,000	568	11,100	17,000	123	5,600	1,860
21.....	264	9,230	6,580	558	9,640	14,500	131	6,320	2,240
22.....	266	10,200	7,330	494	9,790	13,100	124	6,190	2,070
23.....	247	7,800	5,200	454	9,740	11,900	121	6,490	2,120
24.....	226	7,310	4,460	452	9,940	12,100	151	5,450	2,220
25.....	228	7,200	4,430	436	9,680	11,400	146	5,250	2,070
26.....	214	7,590	4,390	424	11,000	12,600	91	2,780	683
27.....	201	5,910	3,210	441	9,250	11,000	90	4,760	1,160
28.....	202	5,520	3,010	439	9,100	10,800	98	4,300	1,140
29.....	199	5,720	3,070	--	--	--	79	2,330	497
30.....	222	5,940	3,560	--	--	--	69	2,480	462
31.....	220	4,230	2,510	--	--	--	44	1,840	219
Total.	6,215	--	126,490	9,121	--	210,040	5,593	--	108,751

e Estimated.

a Computed from water-sediment discharge curve.

b Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING, NEAR SAN MARCIAL, N. MEX.--Continued

Suspended sediment, October 1956 to June 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	35	1,200	113	751	8,500	17,200	1,050	2,420	6,860
2.....	23	960	b60	391	6,910	7,290	1,130	2,030	6,190
3.....	25	728	49	298	4,880	3,930	1,240	1,780	5,960
4.....	33	1,560	139	231	5,080	3,070	1,110	1,970	5,900
5.....	68	4,430	813	289	6,700	5,230	990	3,080	8,250
6.....	48	1,870	242	660	9,800	17,500	991	3,550	9,500
7.....	35	1,210	114	929	6,820	17,100	1,100	2,810	8,350
8.....	29	1,500	117	1,110	4,610	13,800	1,140	1,960	6,030
9.....	27	1,100	b80	1,270	4,280	14,700	1,150	1,730	5,370
10.....	24	650	42	1,270	4,400	15,100	1,150	1,740	5,400
11.....	22	600	b38	1,090	2,730	8,030	1,280	1,760	6,080
12.....	23			913	3,140	7,740	1,440	1,680	6,530
13.....	26			1,060	4,180	12,000	1,430	1,660	6,410
14.....	20			1,320	2,460	8,770	1,430	3,400	13,100
15.....	23			1,420	2,920	11,200	1,400	2,430	9,190
16.....	26	600	b38	1,220	2,720	8,960	1,380	1,880	7,000
17.....	24			1,220	2,380	7,840	1,310	1,660	5,870
18.....	24			1,140	2,060	6,340	1,320	1,460	5,200
19.....	24			1,090	1,840	5,420	1,340	1,330	4,810
20.....	21			1,020	1,800	4,960	1,320	1,360	4,850
21.....	177	8,450	s6,030	1,060	1,910	5,470	1,270	4,100	14,100
22.....	414	12,800	14,300	1,040	2,060	5,780	1,240	2,600	8,700
23.....	606	11,400	18,700	1,110	1,980	5,930	1,270	1,800	6,170
24.....	743	9,640	19,300	1,120	2,140	6,470	1,310	2,000	7,070
25.....	931	8,200	20,600	1,130	2,020	6,160	1,350	1,400	5,100
26.....	1,000	7,710	20,800	1,110	1,730	5,180	1,360	1,320	4,850
27.....	766	8,800	18,200	1,110	1,780	5,330	1,410	1,330	5,060
28.....	663	8,400	15,000	1,090	1,540	4,530	1,450	1,280	5,010
29.....	724	8,700	17,000	1,050	2,050	5,810	1,430	1,240	4,790
30.....	861	7,260	16,900	952	2,280	5,860	1,400	1,120	4,230
31.....	--	--	--	948	2,480	6,350	--	--	--
Total ..	7,465	--	168,979	30,412	--	259,150	38,191	--	201,910

Total discharge for period (cfs-days) 98,591.1

Total load for period (tons) 1,086,404

s Computed by subdividing day.

b Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued
RIO GRANDE CONVEYANCE CHANNEL BELOW HEADING, NEAR SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, October 1956 to June 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment												Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000
Dec. 15, 1956...	10:25 a. m.	42	38	2,320	3,990	--	81	--	95	--	99	100	--	--	--	SPWCM	
Dec. 19.....	4:00 p. m.	58	41	3,430	3,770	--	80	--	92	--	94	98	100	--	--	VPWCM	
Dec. 30.....	4:45 p. m.	66	48	5,320	3,760	--	43	--	52	--	67	80	98	--	100	VPWCM	
Jan. 10, 1957...	4:15 p. m.	180	41	6,240	4,240	--	55	--	69	--	77	90	99	--	100	VPWCM	
Jan. 20.....	2:10 p. m.	253	48	8,790	3,130	--	45	--	55	--	68	88	99	--	100	VPWCM	
Jan. 27.....	11:45 a. m.	164	50	5,910	3,880	--	47	--	60	--	69	87	99	--	100	VPWCM	
Feb. 4.....	10:00 a. m.	218	46	5,340	3,630	--	44	--	56	--	72	88	99	--	100	VPWCM	
Feb. 9.....	11:30 a. m.	242	55	6,080	3,620	--	44	--	59	--	76	91	100	--	--	VPWCM	
Feb. 17.....	3:00 p. m.	371	52	8,870	3,710	--	41	--	58	--	76	92	99	--	100	VPWCM	
Feb. 23.....	1:55 p. m.	429	55	9,740	3,810	37	44	49	58	69	79	95	100	--	--	VPWCM	
Feb. 23.....	1:55 p. m.	429	55	9,740	4,140	2	5	28	58	68	79	95	100	--	--	VPWCM	
Mar. 2.....	2:40 p. m.	344	58	8,180	3,340	--	45	--	60	--	81	96	100	--	--	VPWCM	
Mar. 11.....	6:05 p. m.	176	61	6,140	4,070	--	38	--	49	--	73	91	99	--	100	VPWCM	
Mar. 22.....	3:00 p. m.	137	53	6,120	3,960	--	33	--	45	--	68	90	99	--	100	VPWCM	
Apr. 4.....	12:25 p. m.	39	54	1,860	4,040	--	89	--	93	--	96	97	100	--	--	VPWCM	
Apr. 10.....	3:10 p. m.	22	65	872	4,160	--	94	--	98	--	100	--	--	--	--	PWCM	
May 3.....	3:00 p. m.	310	78	4,770	4,120	--	44	--	58	--	79	97	100	--	--	VPWCM	
May 11.....	6:50 a. m.	1,260	63	3,250	3,360	--	82	--	92	--	99	100	--	--	--	SPWCM	
May 22.....	11:20 a. m.	1,040	64	2,070	3,740	--	62	--	72	--	90	100	--	--	--	VPWCM	
May 29.....	6:50 a. m.	1,060	65	2,060	3,660	--	60	--	71	--	90	98	100	--	--	VPWCM	
June 2.....	3:25 p. m.	1,150	72	2,210	4,010	--	62	--	75	--	93	98	100	--	--	VPWCM	
July 1.....	3:50 p. m.	1,440	83	948	3,740	--	79	--	96	--	98	99	100	--	--	SPWCM	

RIO GRANDE BASIN--Continued
RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.

LOCATION.--At gaging station 440 feet downstream from grade control at outlet of San Marcial Lake, 150 feet downstream from mouth of drain entering from left side, 1,800 feet west of San Marcial gage on railway bridge, about 18½ miles southwest of San Antonio, and about 1 mile south of the site of former village of San Marcial, Socorro County.

RECORDS AVAILABLE.--Chemical analyses: March 1954 to September 1957.

Water temperatures: March 1954 to September 1957.

Sediment records: March 1954 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 1,810 ppm Oct. 21-31; minimum, 390 ppm July 1-5.

Hardness: Maximum, 489 ppm Oct. 21-31; minimum, 189 ppm July 1-5.

Specific conductance: Maximum daily, 2,860 micromhos Oct. 25; minimum daily, 527 micromhos June 24, July 2.

Water temperatures: Maximum, 91°F July 3; minimum 35°F Nov. 15, Dec. 9, 24, 25.

Sediment concentrations: Maximum daily, 18,600 ppm July 29; minimum daily, 53 ppm Nov. 11.

Sediment loads: Maximum daily, 52,700 tons July 29; minimum daily, 1 ton on several days.

EXTREMES, 1954-57.--Dissolved solids: Maximum, 2,010 ppm Aug. 2-8, 1956; minimum, 189 ppm July 1-5, 1957.

Hardness: Maximum, 948 ppm Aug. 2-8, 1956; minimum, 189 ppm July 1-5, 1957.

Specific conductance: Maximum daily, 2,860 micromhos Oct. 25, 1956; minimum daily, 527 micromhos June 24, July 2, 1957.

Water temperatures: Maximum, 95°F June 21, 22, July 8, 15, 1955; minimum, 33°F Dec. 28, 30, 31, 1954, Dec. 10, 1955, Feb. 2, 1956.

Sediment concentrations: Maximum daily, 76,600 ppm Aug. 12, 1956; minimum daily, 0 tons on several days in 1956.

Sediment loads: Maximum daily, 234,000 tons July 29, 1955; minimum daily, 0 tons on several days in 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Marcial, and Rio Grande floodway at San Marcial given under Rio Grande at San Marcial in WSP 1512. Quality of water records for Rio Grande floodway given on page 455.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate		
Oct. 1-20, 1956...	5.13	44	0.01	102	28	336	12	317	412	298	0.7	2.4	0.45	1,380	1.88	370	110	66	2,140
Oct. 21-31.....	3.52	--	--	130	40	410	--	372	--	--	--	--	--	1,810	2.46	489	184	65	2,680
Nov. 1-21.....	6.36	--	--	124	32	392	--	337	--	--	--	--	--	1,680	2.26	441	165	66	2,520
Nov. 22-30.....	6.77	--	--	116	29	342	--	308	--	--	--	--	--	1,460	1.99	408	156	65	2,250
Dec. 1-13.....	8.78	--	--	124	28	332	--	358	--	--	--	--	--	1,430	1.94	424	149	63	2,220
Dec. 14-31.....	60.3	--	--	98	18	128	--	252	--	--	--	--	--	769	1.05	318	112	47	1,150
Jan. 1-31, 1957..	224	30	.03	87	14	100	6.5	231	204	73	.7	2.3	.19	641	.87	274	85	43	965
Feb. 1-28.....	375	--	--	87	15	90	--	232	--	--	--	--	--	610	.83	278	86	41	919
Mar. 1-31.....	254	--	--	91	18	122	--	232	--	--	--	--	--	722	.98	301	111	47	1,100
Apr. 1-21.....	102	--	--	103	23	167	--	247	--	--	--	--	--	922	1.25	352	149	51	1,400
Apr. 22-26.....	748	--	--	68	15	66	--	195	--	--	--	--	--	480	.65	231	71	38	728
Apr. 27-30.....	817	26	--	67	14	64	5.8	196	135	44	--	4.2	.25	462	.63	224	64	37	704

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Percent sodium chloride	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
May 1-7, 1957	573	--	--	74	15	82	--	201	--	--	--	--	--	550	0.75	851	246	82	42	2.3	831	7.9
May 8-14	1,247	--	--	62	11	55	--	181	--	--	--	--	--	408	.55	1,370	200	51	37	1.7	624	7.7
May 15-31	1,294	--	--	58	11	58	--	161	--	--	--	--	--	409	.56	1,430	190	58	40	1.8	628	7.7
June 1-30	1,409	--	--	62	9.5	54	--	186	--	--	--	--	--	408	.55	1,550	194	41	38	1.7	618	8.0
July 1-5	1,290	24	0.01	56	12	47	4.8	164	107	38	0.6	1.9	0.10	390	.53	1,360	189	54	34	1.5	567	7.9
July 6-8	1,213	--	--	77	12	62	--	178	--	--	--	--	--	500	.68	1,640	242	96	36	1.7	740	8.0
July 9-17	1,162	--	--	65	9.5	51	--	189	--	--	--	--	--	406	.55	1,270	201	46	36	1.6	802	7.8
July 18-27	879	--	--	77	12	65	--	208	--	--	--	--	--	500	.68	1,190	242	71	37	1.8	749	7.8
July 28-Aug. 1	959	--	--	109	15	98	--	236	--	--	--	--	--	720	.98	1,860	334	140	39	2.3	1,030	7.9
Aug. 2-29	263	--	--	80	14	116	--	a196	--	--	--	--	--	690	.94	490	257	96	50	3.2	1,060	8.5
Aug. 30-Sept. 4	547	--	--	75	16	100	--	b129	--	--	--	--	--	431	.86	933	253	147	46	2.7	1,050	8.4
Sept. 5-13	718	--	--	71	11	66	--	c198	--	--	--	--	--	681	.65	932	222	64	39	1.9	737	8.6
Sept. 14-30	254	--	--	90	14	110	--	221	--	--	--	--	--	696	.95	477	282	101	46	2.9	1,030	7.9
Weighted average	482	--	--	71	12	73	--	194	--	--	--	--	--	505	0.69	630	226	68	41	2.1	763	--

a Includes 10 parts per million of carbonate (CO₃).b Includes 5 parts per million of carbonate (CO₃).c Includes 12 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally between 9 a. m. and 6 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	48	50	a 43	65	63	66	75	74	88	83	79
2	75	45	38	50	45	60	52	86	78	89	85	77
3	78	47	48	36	53	58	b 53	82	74	91	81	a 66
4	76	45	40	--	49	58	61	77	82	86	76	78
5	76	55	43	44	64	60	b 60	73	85	87	82	74
6	65	56	44	48	51	57	67	76	80	89	80	80
7	62	56	49	a 47	48	67	64	73	84	87	80	a 64
8	74	55	40	48	56	73	66	74	81	80	79	79
9	75	56	35	50	60	54	66	75	80	85	79	75
10	72	59	38	40	58	55	72	72	78	85	b 75	68
11	74	44	50	55	68	60	b 65	64	75	75	80	75
12	65	57	53	52	58	66	b 64	61	80	83	82	76
13	60	52	45	56	65	63	76	72	80	80	79	75
14	63	55	50	59	65	63	67	74	79	86	82	73
15	74	35	36	52	55	63	b 67	68	78	86	82	76
16	72	47	36	58	52	59	b 69	74	82	87	81	75
17	55	48	45	54	55	67	b 66	77	75	87	79	75
18	67	48	48	43	48	67	b 63	71	82	80	73	a 61
19	68	54	43	56	55	56	79	69	78	85	79	74
20	67	38	46	55	62	51	70	71	82	78	80	74
21	60	40	45	b 43	60	67	68	72	83	84	80	72
22	55	44	37	54	66	56	b 55	74	82	86	79	70
23	65	45	46	56	62	48	60	74	86	84	82	74
24	62	39	35	62	55	58	54	74	86	83	73	72
25	47	47	35	63	61	57	74	b 71	89	87	77	75
26	62	47	38	51	65	63	70	83	90	83	80	75
27	50	44	37	52	67	62	72	72	88	84	73	75
28	58	45	40	52	68	61	61	b 80	89	86	77	73
29	55	45	38	51	--	58	57	78	a 75	87	75	75
30	56	46	46	58	--	64	74	84	88	86	78	76
31	55	--	42	48	--	73	--	72	--	78	72	--
Average	65	48	42	51	58	61	65	74	81	85	79	74

a Measurement before 9 a. m.

b Measurement after 6 p. m.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	4	350	4	4	700	8	8	171	4
2.....	5	293	4	5	300	4	8	156	3
3.....	6	216	3	6	1,470	24	8	136	3
4.....	5	225	3	10	670	18	7	111	2
5.....	6	259	4	8	160	3	8	126	3
6.....	5	337	5	6	125	2	8	84	2
7.....	5	258	3	6	85	1	7	78	1
8.....	6	250	4	6	95	2	9	152	4
9.....	6	227	4	6	77	1	8	120	3
10.....	4	250	3	6	54	1	9	90	2
11.....	5	262	4	6	53	1	14	251	s 37
12.....	5	320	4	6	115	2	10	120	3
13.....	6	180	3	6	145	2	11	450	13
14.....	6	176	3	9	144	3	28	870	66
15.....	6	141	2	8	202	4	36	870	85
16.....	6	137	2	7	135	3	40	1,320	143
17.....	6	228	4	6	107	2	46	2,150	267
18.....	6	156	3	6	178	3	69	2,800	522
19.....	3	143	1	5	160	2	76	2,220	456
20.....	3	144	1	7	126	2	75	2,240	454
21.....	3	134	1	6	144	2	82	2,250	498
22.....	3	189	2	6	132	2	86	2,050	476
23.....	3	245	2	7	137	3	99	1,850	495
24.....	3	230	2	6	82	1	57	1,250	192
25.....	4	161	2	6	80	1	38	1,000	103
26.....	4	162	2	6	106	2	43	1,100	128
27.....	4	282	3	6	100	2	40	730	79
28.....	4	151	2	9	162	4	49	630	83
29.....	3	153	1	7	123	2	68	660	121
30.....	4	228	2	8	137	3	69	780	145
31.....	4	120	1	--	--	--	85	810	186
Total..	143	--	84	196	--	110	1,201	--	4,579
	January			February			March		
1.....	129	1,600	s 626	290	1,750	1,370	473	3,140	4,010
2.....	178	2,570	1,240	289	1,700	1,290	454	2,910	3,570
3.....	176	4,080	1,940	280	1,600	1,210	434	2,880	3,370
4.....	181	2,760	1,350	268	1,610	1,160	517	3,690	5,150
5.....	197	2,890	1,540	266	1,550	1,110	473	2,400	3,040
6.....	197	2,810	1,490	256	1,570	1,090	386	2,010	2,090
7.....	182	2,820	1,390	265	1,570	1,120	327	1,640	1,450
8.....	172	2,790	1,300	280	1,650	1,250	296	1,890	1,510
9.....	176	3,560	1,690	294	2,400	1,910	276	1,930	1,440
10.....	190	2,750	1,410	276	1,850	1,380	280	2,400	1,810
11.....	176	2,550	1,210	274	1,560	1,150	247	2,030	1,350
12.....	174	2,380	1,120	266	1,780	1,280	202	1,540	840
13.....	200	2,470	1,330	256	1,750	1,210	176	1,960	831
14.....	252	3,020	2,050	268	1,690	1,220	184	1,990	989
15.....	224	2,730	1,650	286	1,800	1,390	202	2,160	1,180
16.....	184	2,150	1,070	292	2,110	1,660	200	1,750	945
17.....	195	2,450	1,290	367	2,320	2,300	220	2,200	1,310
18.....	221	2,220	1,320	462	3,130	4,070	198	1,730	925
19.....	261	2,120	1,490	551	3,000	4,460	176	1,200	570
20.....	290	2,060	1,610	604	3,720	6,070	181	900	440
21.....	294	2,810	2,230	615	3,450	5,730	184	1,040	517
22.....	302	3,000	2,450	558	3,070	4,630	172	1,340	622
23.....	272	2,200	1,620	511	2,990	4,130	175	1,370	647
24.....	256	2,480	1,710	502	3,400	4,610	210	1,280	726
25.....	263	2,220	1,580	493	3,000	3,990	217	1,350	791
26.....	265	2,060	1,470	489	2,860	3,780	166	750	336
27.....	252	2,550	1,740	487	2,460	3,230	181	930	454
28.....	241	2,550	1,660	454	2,380	2,920	189	1,220	623
29.....	252	1,960	1,330	--	--	--	170	550	252
30.....	290	1,800	1,410	--	--	--	168	510	231
31.....	302	1,870	1,520	--	--	--	153	300	124
Total..	6,944	--	46,836	10,510	--	70,720	7,887	--	42,273

s Computed by subdividing day.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	134	680	246	912	3,160	7,780	1,150	1,020	3,170
2.....	134	730	264	534	2,010	2,900	1,250	872	3,280
3.....	134	310	112	331	1,550	1,390	1,350	1,010	3,680
4.....	133	380	136	286	1,460	1,130	1,380	1,400	5,220
5.....	146	610	240	335	1,270	1,150	1,150	1,500	4,660
6.....	127	570	195	650	2,260	3,970	1,130	2,980	9,090
7.....	103	880	245	965	2,710	7,060	1,240	1,960	6,560
8.....	109	800	235	1,190	2,920	9,380	1,260	1,490	5,070
9.....	116	400	125	1,310	3,060	10,800	1,280	1,400	4,840
10.....	108	510	149	1,380	2,000	7,450	1,290	1,590	5,540
11.....	105	320	91	1,300	1,480	5,190	1,370	1,740	6,440
12.....	102	460	127	1,030	2,290	6,370	1,540	1,400	5,820
13.....	86	270	63	1,140	2,690	8,280	1,560	1,270	5,350
14.....	70	250	47	1,380	2,370	8,830	1,560	2,240	9,430
15.....	78	320	67	1,500	2,830	11,500	1,540	2,470	10,300
16.....	69	200	37	1,400	2,600	9,830	1,530	1,400	5,780
17.....	65	280	49	1,430	1,870	7,220	1,490	1,180	4,750
18.....	59	300	48	1,400	1,410	5,330	1,490	1,030	4,140
19.....	61	250	41	1,320	1,280	4,560	1,500	940	3,810
20.....	60	240	39	1,220	1,300	4,280	1,480	1,030	4,120
21.....	138	1,910	s 977	1,220	1,390	4,580	1,420	1,630	6,250
22.....	405	4,420	4,830	1,280	1,100	3,800	1,390	1,870	7,020
23.....	629	4,400	7,470	1,310	1,200	4,240	1,410	1,490	5,670
24.....	756	3,450	7,040	1,310	1,300	4,600	1,460	1,100	4,340
25.....	900	3,190	7,750	1,310	1,100	3,890	1,490	950	3,820
26.....	1,050	3,410	9,670	1,310	1,070	3,780	1,490	870	3,500
27.....	871	3,090	7,270	1,310	1,130	4,000	1,510	900	3,400
28.....	751	3,040	6,160	1,250	876	2,960	1,550	810	3,390
29.....	746	2,930	5,900	1,200	1,280	4,150	1,520	750	3,080
30.....	900	2,910	7,070	1,120	1,040	3,140	1,480	810	3,240
31.....	--	--	--	1,100	1,020	3,030	--	--	--
Total.	9,156	--	66,693	34,733	--	166,570	42,260	--	155,030
	July			August			September		
1.....	1,500	820	3,320	841	4,000	9,080	615	11,200	s 19,000
2.....	1,500	760	3,080	286	1,400	1,080	526	8,600	12,200
3.....	1,150	810	2,520	294	1,100	873	468	8,800	11,100
4.....	1,120	940	2,840	300	1,500	1,220	520	6,000	8,420
5.....	1,180	1,670	5,320	300	1,300	1,050	713	5,000	9,630
6.....	1,240	4,980	16,700	286	1,200	927	896	3,250	7,860
7.....	1,230	2,300	7,640	313	2,750	2,320	898	2,600	6,300
8.....	1,170	1,500	4,740	338	2,900	2,650	858	2,100	4,860
9.....	1,140	1,330	4,090	342	3,880	s 4,760	823	2,000	4,440
10.....	1,120	1,280	3,870	260	2,300	1,610	707	1,800	3,440
11.....	1,100	1,350	4,010	238	1,050	675	614	1,600	2,650
12.....	1,120	1,350	4,080	242	980	640	524	1,280	1,810
13.....	1,170	1,120	3,540	228	840	517	432	1,130	1,320
14.....	1,170	1,040	3,290	223	580	349	331	830	742
15.....	1,240	1,250	4,180	231	500	312	313	680	575
16.....	1,240	1,770	5,930	262	760	538	298	530	426
17.....	1,160	4,160	13,000	300	1,300	1,050	302	600	489
18.....	1,110	5,680	s 17,300	258	1,620	1,130	276	500	373
19.....	810	2,820	6,170	270	2,550	1,860	236	350	223
20.....	834	5,120	11,500	252	2,530	1,720	226	260	159
21.....	830	2,730	6,120	231	860	536	230	250	155
22.....	845	2,870	6,550	230	720	447	222	230	138
23.....	845	1,800	4,110	230	770	478	225	240	146
24.....	825	2,700	6,010	226	710	433	225	240	146
25.....	830	8,300	18,600	239	950	613	225	210	128
26.....	858	4,000	9,270	254	780	535	284	250	192
27.....	1,000	12,500	33,800	234	350	221	239	240	155
28.....	1,040	14,700	41,300	236	1,310	835	226	200	122
29.....	1,050	18,600	52,700	260	1,900	1,330	236	170	108
30.....	960	9,900	25,700	607	6,160	s 14,000	230	230	143
31.....	905	6,800	16,600	544	8,460	s 12,600	--	--	--
Total.	33,292	--	347,880	9,355	--	66,389	12,918	--	97,450

Total discharge for year (cfs-days) 168,584
 Total load for year (tons) 1,064,614

s Computed by subdividing day.

RIO GRANDE BASIN--Continued

RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of Collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.062	0.125	0.250	0.500		1.000	2.000
Oct. 17, 1956	10:20 a.m.	6	55	228	--	--	--	--	--	95	97	100	--	--	--	S
Dec. 17	2:40 p.m.	56	44	2,560	4,760	85	85	99	99	100	--	--	--	--	--	PWCM
Dec. 30	3:15 p.m.	103	44	806	--	--	--	--	--	100	--	--	--	--	--	S
Jan. 7, 1957	8:10 p.m.	181	47	2,700	4,170	89	89	100	100	--	--	--	--	--	--	PWCM
Jan. 20	1:45 p.m.	298	55	2,150	3,600	90	90	99	99	100	--	--	--	--	--	PWCM
Jan. 29	6:05 p.m.	284	51	1,650	2,410	90	90	99	99	100	--	--	--	--	--	PWCM
Feb. 9	11:45 a.m.	294	60	2,560	2,640	51	51	66	66	68	70	81	93	100	--	VPWCM
Feb. 20	4:30 p.m.	624	62	3,700	3,210	86	86	97	97	100	--	--	100	--	--	PWCM
Mar. 3	12:55 p.m.	423	58	2,890	4,430	83	83	96	96	98	98	96	98	100	--	SPWCM
Apr. 7	2:45 p.m.	89	64	867	--	--	--	--	--	94	95	98	98	100	--	S
Apr. 19	2:00 p.m.	62	79	197	--	--	--	--	--	99	100	--	--	--	--	S
May 1	2:10 p.m.	866	75	3,030	4,760	84	84	97	97	100	--	--	--	--	--	PWCM
May 15	7:30 a.m.	1,490	60	2,110	3,630	88	88	97	97	99	100	--	--	--	--	SPWCM
June 2	4:30 p.m.	1,300	78	866	--	--	--	--	--	100	--	--	--	--	--	S
June 28	6:50 a.m.	1,550	72	823	--	--	--	--	--	99	100	--	--	--	--	S
July 6	6:40 a.m.	1,210	72	4,180	3,460	89	89	98	98	100	--	--	--	--	--	PWCM
July 11	7:10 a.m.	1,090	71	948	--	--	--	--	--	99	100	--	--	--	--	S
July 30	6:40 a.m.	982	74	11,300	4,210	84	84	95	95	97	98	98	99	99	100	SPWCM
Aug. 14	7:10 a.m.	217	68	543	--	--	--	--	--	99	100	--	--	--	--	S
Aug. 26	3:30 p.m.	258	80	448	--	--	--	--	--	97	98	99	100	--	--	S
Sept. 1	11:30 a.m.	560	73	7,360	3,330	82	82	96	96	99	100	--	--	--	--	SPWCM
Sept. 6	2:30 p.m.	922	80	2,970	2,360	78	78	94	94	99	100	--	--	--	--	SPWCM
Sept. 10	3:25 p.m.	678	68	1,750	3,060	68	68	88	88	98	99	100	--	--	--	SPWCM

RIO GRANDE BASIN--Continued
RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.

LOCATION.--At gaging station at Atchison, Topeka, and Santa Fe Railway bridge, 1.1 miles downstream from former site of San Marcial, Socorro County, and 18 1/2 miles southwest of San Antonio.

DRAINAGE AREA.--27,700 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).

RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1957.

Water temperatures: January 1949 to September 1957.

Sediment records: July 1946 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 990 ppm Aug. 18; minimum, 263 ppm July 14.

Hardness: Maximum, 494 ppm Aug. 18; minimum, 132 ppm June 20.

Specific conductance: Maximum daily, 1,350 micromhos Aug. 18; minimum daily, 378 micromhos June 20.

Water temperatures: Maximum daily, 1,350 micromhos Aug. 18; minimum, not determined.

Sediment concentrations: Maximum daily, 41,400 ppm Aug. 19; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 754,000 tons Aug. 8; minimum daily, 0 tons on many days.

Hardness, 1946-57.--Dissolved solids: Maximum, 1,950 ppm Aug. 3-10, 1954; minimum, 233 ppm June 11-20, 1952.

Specific conductance: Maximum daily, 2,730 micromhos Apr. 8, 1953; minimum daily, 311 micromhos June 14, 1952.

Water temperatures (1949-57): Maximum, 97°F Aug. 11, 1951; minimum, freezing point on many days.

Sediment concentrations: Maximum daily, 98,300 ppm Aug. 8, 1957; minimum daily, 0 tons on many days each year.

Sediment loads: Maximum daily, 754,000 tons Aug. 8, 1957; tabulation omitted for this period. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of chemical analyses and sediment loads for years prior to 1946 have been published in Water Bulletins of International Boundary and Water Commission. Records of discharge for water year October 1956 to September 1957 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Marcial and Rio Grande floodway at San Marcial given under Rio Grande at San Marcial in WSP 1512. Quality of Water records for Rio Grande conveyance channel at San Marcial on page 429.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Per- cent dium sorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)			
														Parts per mil- lion	Tons per acre- foot	Calcium, magnesium	Non- carbon- ate					
May 11-31, 1957 ...	1,376			63	8.1	37		196						350	0.48	1,300	190	30	30	1.2	527	8.0
June 1-5 ..	1,820			48	12	34		171						321	.44	1,400	170	30	30	1.1	477	7.9
June 6 ..	2,330			64	8.1	50		173						402	.55	2,530	193	50	36	1.6	580	8.9
June 7-19 ..	2,482			58	6.2	33		180						318	.43	2,110	170	22	30	1.1	471	7.7
June 20 ..	1,940			42	6.6	31		129						279	.38	1,460	132	26	34	1.2	378	7.4
June 21-30 ..	1,767			48	6.2	33		149						292	.40	1,390	146	24	33	1.2	434	7.9
July 1-5 ..	2,112	37	0.00	48	9.5	31	4.1	152	80	12	0.5	1.8	0.02	330	.45	1,880	159	34	29	1.1	408	8.0
July 6-7 ..	3,070			70	11	51		163						462	.63	3,830	220	86	34	1.5	686	7.6
July 8-13 ..	2,728			59	6.4	30		177						313	.43	2,310	174	28	27	1.0	465	7.7
July 14 ..	2,720			47	4.7	27		140						263	.36	1,930	137	22	30	1.0	380	8.2
July 15-17 ..	2,687			58	6.2	29		181						300	.41	2,180	170	22	27	1.0	464	7.7

a includes 17 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued
RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued
Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180° C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
July 18, 1957	2,180			75	11	58		b166						499	0.68	2,940	232	98	35	1.7	692	8.5
July 19	2,040			58	8.1	37		c172						459	.45	1,820	178	37	31	1.2	486	8.5
July 20-26	2,236			69	8.8	39		199						384	.52	2,320	208	45	29	1.2	571	7.7
July 27	3,410			94	19	63		247						557	.76	5,130	312	110	30	1.6	822	7.5
July 28-29	5,715			121	15	108		231						835	1.14	12,880	364	174	39	2.5	1,160	8.1
July 30-31	3,000			84	13	69		202						554	.75	4,490	263	98	36	1.8	795	7.8
Aug. 1-5	4,150			73	10	48		193						432	.59	4,840	223	65	32	1.4	635	7.6
Aug. 6-7	5,155			102	16	65		218						618	.84	8,570	320	142	31	1.6	865	7.3
Aug. 8-11	5,290			134	20	101		235						855	1.16	12,210	416	224	35	2.2	1,170	8.1
Aug. 12-13	2,850			89	14	68		222						567	.77	4,360	280	98	35	1.8	821	7.2
Aug. 14-16	2,430			49	6.2	48		d141						347	.47	2,280	148	32	41	1.7	605	8.9
Aug. 17	2,990			108	14	56		270						563	.77	4,550	322	100	27	1.4	799	7.3
Aug. 18	3,050			160	23	104		179						980	1.35	8,150	494	347	31	2.0	1,350	8.2
Aug. 19	4,210			107	14	66		e215						632	.86	7,180	324	148	31	1.6	904	8.3
Aug. 20	4,080			139	22	110		f160						949	1.29	10,450	438	306	35	2.3	1,260	8.3
Aug. 21-23	1,707			87	13	68		186						567	.77	2,610	270	118	35	1.8	814	8.0
Aug. 24	1,680			106	16	75		148						685	.93	3,110	330	209	33	1.8	948	8.2
Aug. 25	3,140			92	12	48		240						473	.84	4,010	279	82	27	1.2	704	8.1
Aug. 26-27	4,255			137	19	89		237						812	1.10	9,330	420	210	32	1.9	1,120	7.4
Aug. 28-31	2,580			96	14	67		214						591	.80	4,120	297	122	33	1.7	856	7.9
Sept. 1-3	5,740			117	17	77		214						713	.97	11,050	362	186	32	1.8	997	7.7
Sept. 4	2,200			77	10	63		g186						498	.68	2,960	233	80	37	1.8	790	8.7
Sept. 5-7	1,763			70	8.5	44		205						391	.53	1,860	210	42	31	1.3	587	8.1
Sept. 8-17	682			60	7.6	41		180						356	.48	944	181	34	33	1.3	530	8.1
Sept. 18-25	376			87	9.0	49		195						406	.55	412	204	44	34	1.5	612	8.2
Sept. 26-30	44.4			77	12	69		215						530	.72	63.5	242	66	38	1.9	765	--
Weighted average	h 2,249			80	11	54		194						485	0.68	2,950	244	86	32	1.5	696	--

b Includes 8 parts per million of carbonate (CO₃).
c Includes 6 parts per million of carbonate (CO₃).
d Includes 19 parts per million of carbonate (CO₃).
e Includes 3 parts per million of carbonate (CO₃).
f Includes 4 parts per million of carbonate (CO₃).
g Includes 15 parts per million of carbonate (CO₃).
h Average for 143 days of flow.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
(Once-daily measurement, generally between 8 a.m. and 6 p.m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								--	72	85	81	74
2								--	75	87	83	75
3								--	76	88	83	76
4								--	78	81	78	76
5								--	80	83	80	73
6								--	76	85	78	76
7								--	78	82	81	75
8								--	78	80	80	74
9								--	77	82	80	74
10								--	73	82	a 78	69
11								a 61	72	77	79	73
12								58	75	82	80	72
13								65	78	83	80	72
14								66	74	84	82	74
15								64	75	83	80	72
16								66	78	83	80	73
17								70	73	84	80	71
18								72	78	81	74	75
19								69	76	81	77	71
20								68	77	a 79	78	70
21								68	78	83	80	71
22								65	81	84	79	65
23								68	82	82	83	70
24								68	84	80	72	69
25								a 71	86	84	75	69
26								73	86	82	78	72
27								72	88	82	75	72
28								78	89	84	79	74
29								75	b 75	86	76	79
30								84	87	85	74	79
31								69	--	80	73	--
Average								69	78	83	79	73

a Measurement after 6 p.m.

b Measurement before 8 a.m.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	April			May			June		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....				0	--	0	1,100	1,910	5,670
2.....				0	--	0	1,270	1,820	6,240
3.....				0	--	0	1,440	1,850	7,190
4.....				0	--	0	1,870	2,080	10,500
5.....				0	--	0	2,420	3,050	19,900
6.....				0	--	0	2,330	3,760	23,700
7.....				0	--	0	2,270	2,570	15,800
8.....				0	--	0	2,300	2,120	13,200
9.....				0	--	0	2,500	2,000	13,500
10.....				0	--	0	2,640	1,970	14,000
11.....				145	4,800	s 3,090	2,800	1,900	14,400
12.....				1,180	4,250	s 12,900	2,850	1,820	14,000
13.....				1,480	3,250	13,000	2,790	1,850	13,900
14.....				1,260	2,700	9,190	2,740	3,550	26,300
15.....				1,900	2,900	14,900	2,560	2,990	20,700
16.....				2,240	2,780	16,800	2,300	2,030	12,600
17.....				1,960	2,390	12,600	2,080	1,900	10,700
18.....				1,680	2,090	9,480	2,070	1,790	10,000
19.....				1,420	1,980	7,590	2,110	1,930	11,000
20.....				1,260	2,100	7,140	1,940	1,700	8,900
21.....				1,370	1,910	7,070	1,720	2,920	13,600
22.....				1,420	1,890	7,250	1,680	2,950	13,400
23.....				1,380	1,850	6,890	1,750	2,110	9,970
24.....				1,380	1,920	7,150	1,900	2,010	10,300
25.....				1,450	1,690	6,620	1,980	1,980	10,600
26.....				1,400	1,500	5,670	1,880	1,720	8,730
27.....				1,350	1,520	5,540	1,730	1,750	8,170
28.....				1,320	1,450	5,170	1,590	1,310	5,620
29.....				1,220	1,860	6,130	1,580	1,750	7,470
30.....				1,060	1,640	4,690	1,660	1,700	8,540
31.....				1,020	2,070	5,700			
Total.				28,895	--	174,570	62,050	--	368,600
Day	July			August			September		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	1,660	1,630	7,310	3,200	7,750	67,000	6,640	33,800	628,000
2.....	1,820	1,500	7,370	3,970	6,750	72,400	6,540	31,600	s 566,000
3.....	2,320	1,700	10,600	4,190	13,300	150,000	4,040	26,300	s 302,000
4.....	2,350	1,350	8,570	4,660	12,700	160,000	2,200	18,300	109,000
5.....	2,410	2,900	18,900	4,730	10,200	130,000	1,660	12,500	62,800
6.....	3,000	9,200	74,500	4,500	20,500	249,000	1,800	8,100	39,400
7.....	3,140	3,800	32,200	5,810	24,500	384,000	1,630	7,700	33,900
8.....	3,000	2,600	21,100	7,240	37,200	754,000	1,410	6,600	25,100
9.....	2,920	2,300	18,100	7,100	33,600	668,000	1,300	7,000	24,600
10.....	2,720	2,100	15,400	3,720	27,800	279,000	1,150	6,000	18,600
11.....	2,560	1,800	12,400	3,100	20,600	172,000	1,030	6,000	16,700
12.....	2,580	2,500	17,400	3,240	18,800	164,000	990	5,500	14,700
13.....	2,590	2,100	14,700	2,460	14,300	95,000	930	5,250	13,200
14.....	2,720	2,150	15,800	2,150	7,800	45,300	810	4,800	10,500
15.....	2,820	2,650	20,200	2,270	7,400	45,400	750	4,800	9,720
16.....	2,720	3,150	23,100	2,870	15,200	118,000	735	4,300	8,530
17.....	2,520	7,000	47,600	2,990	23,100	186,000	710	4,400	8,430
18.....	2,180	7,850	46,200	3,050	31,000	255,000	615	3,900	6,480
19.....	2,040	4,300	23,700	4,210	41,400	s 530,000	442	3,000	3,580
20.....	2,220	6,750	40,500	4,080	35,200	s 419,000	383	2,500	2,590
21.....	2,140	6,000	34,700	2,140	21,400	124,000	431	3,250	3,780
22.....	2,510	5,200	35,200	1,470	11,700	46,400	368	2,400	2,360
23.....	2,260	2,900	17,700	1,510	15,000	61,200	338	2,900	2,650
24.....	2,000	3,250	17,600	1,680	17,900	81,200	262	2,300	1,630
25.....	2,210	10,500	62,700	3,140	34,300	s 325,000	171	2,030	937
26.....	2,310	7,400	46,200	4,880	40,800	557,000	105	1,380	391
27.....	3,410	23,000	212,000	3,630	37,600	s 395,000	64	1,270	219
28.....	5,010	27,700	375,000	2,410	24,000	156,000	40	580	63
29.....	6,420	25,800	s 455,000	1,890	12,500	63,800	10	580	16
30.....	3,450	12,800	s 123,000	1,730	13,900	64,900	3	210	2
31.....	2,550	9,400	64,700	4,290	36,600	s 440,000			
Total.	84,560	--	1,919,450	108,310	--	7,257,600	37,757	--	1,915,898

Total discharge for year (cfs-days)..... 321,572
 Total load for year (tons)..... 11,636,118

s Computed by subdividing day.

RIO GRANDE BASIN--Continued

RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (° F)	Suspended sediment												Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters												
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000	
May 16, 1957.....	10:25 a. m.	2,260	60															VPWCM
May 20.....	4:40 p. m.	1,240	68	2,940	3,000		74		83		89	93	97		99		100	VPWCM
May 31.....	2:50 p. m.	996	69	2,040	4,420		71		86		91	95	100					VPWCM
June 12.....	2:55 p. m.	2,900	75	2,050	3,450		52		64		75	80	100					VPWCM
June 24.....	6:30 a. m.	1,840	71	1,800	4,220		76		91		93	96	100					VPWCM
June 28.....	6:40 a. m.	1,590	72	2,050	4,250		65		79		81	84	100					VPWCM
July 7.....	2:10 p. m.	3,020	82	2,960	2,680		63		78		80	86	100					VPWCM
July 8.....	3:10 p. m.	2,930	80	2,720	3,370		67		80		87	94	100					VPWCM
July 20.....	6:15 p. m.	2,240	79	3,960	3,060		79		72		87	94	100					VPWCM
July 29.....	6:45 a. m.	6,990	72	30,600	3,770		75		94		95	97	100					VPWCM
Aug. 8.....	8:00 a. m.	7,340	76	37,300	4,260		76		87		91	93	100					VPWCM
Aug. 14.....	2:45 p. m.	2,110	82	7,450	4,680		66		93		98	99	100					VPWCM
Aug. 22.....	3:15 p. m.	1,440	79	10,600	3,510		70		85		94	97	100					VPWCM
Aug. 31.....	6:55 a. m.	3,200	67	40,000	3,340		47		85		98	99	100					VPWCM
Sept. 10.....	3:15 p. m.	1,060	69	5,650	4,910		38		63		94	100	--					VPWCM
Sept. 23.....	6:40 a. m.	298	60	2,550	3,400		47		53		87	99	100					VPWCM
Sept. 26.....	3:10 p. m.	103	72	1,350	2,310		70		60		82	99	100					VPWCM
Sept. 29.....	3:00 p. m.	9	79	421	3,050		--		82		90	99	100					VPWCM
					--		--		--		87	97	100					S

RIO GRANDE BASIN --Continued
PECOS RIVER AT PUERTO DE LUNA, N. MEX.

LOCATION.--At bridge at Puerto de Luna, Guadalupe County, 9 miles northwest of gaging station near Puerto de Luna which is 17½ miles upstream from Alamogordo Dam.

DRAINAGE AREA.--3,970 square miles, approximately (contributing area above gaging station).

RECORDS AVAILABLE.--Chemical analyses: July 1939 to September 1941, November 1946 to September 1957.

Water temperatures: June 1949 to September 1954.

Sediment records: January 1949 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 2,680 ppm Mar. 1-31, July 1-14; minimum, 220 ppm Aug. 7.

Hardness: Maximum, 1,850 ppm Feb. 1-28; minimum, 161 ppm Aug. 7.

Specific conductance: Maximum daily, 3,880 micromhos June 27, 30; minimum daily, 352 micromhos Aug. 7.

Sediment concentrations: Maximum daily, 48,000 ppm Aug. 31; minimum daily, 51 ppm Sept. 24.

Sediment loads: Maximum daily, 1,400,000 tons Aug. 31; minimum daily, 11 tons Sept. 24.

EXTREMES, 1939-41, 1946-57.--Dissolved solids: Maximum, 2,740 ppm May 1-10, 1955, July 1-9, 1956; minimum, 220 ppm Aug. 7, 1957.

Hardness: Maximum, 1,910 ppm Apr. 21-30, 1954; minimum, 161 ppm Aug. 7, 1957.

Specific conductance: Maximum daily, 3,880 micromhos June 27, 30, 1957; minimum daily, 344 micromhos Sept. 21, 1941.

Sediment concentrations (1949-57): Maximum daily, 59,200 ppm July 28, 1955; minimum daily, 20 ppm Apr. 21-30, 1955.

Sediment loads (1949-57): Maximum daily, 1,510,000 tons Oct. 7, 1954; minimum daily, 4 tons Apr. 21-30, 1955.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Puerto de Luna for water year October 1956 to September 1957 given in WSP 1512. No appreciable inflow between sampling point and gaging station except during periods of heavy local runoff. Flow affected by ice Nov. 21-22, 28, Dec. 9-11, 23-27, Jan. 16-19, 24, 26-27.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Per- cent so- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1956 ..	62.3	29		603	71	106		135	1,840	152		0.3	2,670	3.63	449	1,800	1,690	11	2,950	7.8
Nov. 1-30	73.0	27		592	78	107		151	1,640	153		.5	2,670	3.63	526	1,800	1,670	11	2,950	7.6
Dec. 1-31	75.2	19		596	78	109		174	1,610	155		.5	2,650	3.60	538	1,810	1,660	12	2,960	7.8
Jan. 1-31, 1957 ..	76.6	20		580	85	104		139	1,620	150		.3	2,630	3.58	544	1,800	1,680	11	2,900	7.9
Feb. 1-28	79.6	20		596	88	104		169	1,630	151		.5	2,670	3.63	574	1,850	1,710	11	2,950	7.8
Mar. 1-31	79.6	25		592	85	113		133	1,640	159		.4	2,680	3.64	576	1,830	1,720	12	2,950	7.9
Apr. 1-30	83.3	20		560	57	96		126	1,520	137		.6	2,450	3.33	551	1,630	1,530	11	2,760	7.9
May 1-9	80.3	20		564	64	96		170	1,510	136		.5	2,470	3.36	536	1,670	1,530	11	2,790	7.7
May 10	232	17		361	47	59		169	938	80		3.1	1,580	2.16	996	1,090	956	11	1,950	7.3
May 11	458	17		246	39	48		174	629	85		1.0	1,130	1.54	1,400	774	632	12	1,480	7.5
May 12	267	16		258	30	40		172	622	52		1.8	1,100	1.50	793	767	626	10	1,430	7.6
May 13-15	185	15		298	32	49		154	746	87		1.9	1,280	1.74	639	875	749	11	1,620	7.6
May 16-19	122	16		421	52	69		156	1,110	96		.9	1,840	2.50	606	1,260	1,140	11	2,180	7.7
May 20-27	88.0	17		524	59	86		166	1,390	122		.6	2,280	3.10	542	1,550	1,410	11	2,610	7.7
May 28	197	18		230	31	48		184	555	51		1.8	1,020	1.39	543	702	550	13	1,360	7.5
May 29-31	348	17		409	52	59		176	1,070	77		1.9	1,770	2.41	1,660	1,230	1,090	9	2,090	7.5

June 1-18, 1957.....																	
258	20	238	20	35	158	536	45	2.2	974	1.32	678	676	546	10	.6	1,270	7.6
182	24	324	32	59	153	807	73	2.5	1,400	1.90	688	940	814	12	.8	1,700	8.1
587	27	264	25	23	252	545	75	5.6	1,040	1.41	1,650	762	555	6	.4	1,320	7.5
83.6	25	528	50	96	149	1,400	117	.9	2,290	3.11	517	1,520	1,400	12	1.1	2,540	8.0
50.2	26	615	59	114	134	1,650	145	.4	2,660	3.64	363	1,780	1,670	12	1.2	2,910	7.8
224	19	220	18	32	169	478	40	2.5	892	1.21	539	623	484	10	.6	1,180	8.0
July 15-16.....																	
80.0	25	580	47	102	173	1,490	126	1.0	2,460	3.35	531	1,640	1,500	12	1.1	2,700	7.7
83.5	26	399	39	67	176	1,020	84	2.7	1,720	2.34	388	1,160	1,010	11	.9	2,020	7.5
70	25	552	52	104	163	1,460	123	1.3	2,400	3.26	454	1,580	1,460	12	1.1	2,610	8.2
283	22	226	22	37	203	494	41	1.3	943	1.28	721	554	488	11	.6	1,240	7.5
4,830	25	74	6	6	228	40	10	4.2	287	.39	3,740	212	24	13	.4	456	7.5
1,012	17	150	12	21	182	274	27	1.6	592	.81	1,620	424	274	10	.4	849	7.7
268	18	268	22	50	168	629	55	1.4	1,130	1.54	818	759	622	13	.8	1,430	7.4
July 20-31.....																	
1,750	18	93	7.6	11	177	124	12	1.7	354	.48	1,670	264	118	8	.3	544	7.8
512	20	164	17	24	154	353	30	4.5	688	.94	951	479	353	10	.5	948	7.9
213	16	88	6.1	9.0	191	94	9	2.3	318	.43	183	244	88	7	.2	505	7.7
4,200	21	56	5.2	8.8	171	32	7	2.3	220	.30	2,490	161	21	11	.3	352	7.5
908	16	121	7.6	16	149	211	18	2.9	466	.63	1,140	334	212	9	.4	881	7.7
326	17	210	14	29	146	454	38	1.9	836	1.14	736	582	462	10	.5	1,120	7.8
1,010	17	170	9.9	15	165	328	17	1.8	640	.87	1,750	464	330	7	.3	877	7.7
Aug. 1.....																	
710	14	284	19	45	213	653	43	.5	1,170	1.59	2,240	812	637	11	.7	1,450	7.2
1,960	14	76	3.8	12	a 144	96	6	5.5	284	.39	1,500	205	87	11	.4	444	8.5
2,170	14	326	21	10	178	727	12	.6	1,200	1.63	7,030	900	754	2	.1	1,420	7.2
815	13	117	6.6	19	133	216	18	6.5	461	.63	1,010	319	210	12	.5	671	8.2
347	14	174	16	26	154	367	32	2.2	707	.96	862	500	374	10	.5	977	7.7
525	16	157	18	16	174	300	26	1.8	621	.84	880	466	323	7	.3	879	7.4
1,950	11	97	4.7	7.8	196	101	6	5.5	329	.45	1,730	262	101	6	.2	524	7.3
Aug. 25.....																	
746	14	157	15	23	151	329	28	.9	641	.87	1,290	453	330	10	.5	900	7.4
2,610	15	76	5.2	5.5	174	76	6	1.6	273	.37	1,920	216	74	5	.2	439	8.0
8,790	15	180	9.7	13	146	378	6	1.3	675	.92	16,020	489	370	6	.3	903	7.7
959	14	148	11	19	148	295	19	1.8	581	.79	1,500	414	293	9	.4	814	7.7
322	13	248	17	42	144	570	48	.9	1,010	1.37	878	689	571	12	.7	1,310	7.4
169	17	393	43	69	160	1,010	87	.9	1,700	2.31	776	1,160	1,030	11	.9	2,000	7.9
87.3	20	576	57	105	162	1,520	134	.5	2,490	3.39	587	1,670	1,540	12	1.1	2,740	7.6
Sept. 14-30.....																	
240	18	281	27	40	165	618	51	1.9	1,100	1.50	713	762	627	10	0.6	1,340	--
Weighted average																	

a Includes 6 parts per million of carbonate (CO₂).

a Includes 6 parts per million of carbonate (CO₃).

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN --Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	54	273	40	61	133	22	81	160	35
2.....	65	559	98	65	207	36	76	192	39
3.....	61	804	132	72	161	31	83	187	42
4.....	61	175	29	72	70	14	85	333	76
5.....	59	115	18	72	136	26	83	269	60
6.....	56	249	38	72	76	15	83	252	56
7.....	61	273	45	70	234	44	76	179	37
8.....	61	250	41	70	238	45	79	142	30
9.....	63	296	50	72	180	35	74	158	32
10.....	61	124	20	76	551	113	76	174	36
11.....	57	174	27	76	584	120	72	210	41
12.....	61	130	21	72	244	47	79	192	41
13.....	57	177	27	74	605	121	72	144	28
14.....	59	199	32	74	553	110	79	151	32
15.....	63	124	21	72	213	41	79	121	26
16.....	63	131	22	72	284	55	76	100	21
17.....	63	117	20	68	427	78	72	278	54
18.....	77	346	72	81	281	61	76	348	71
19.....	70	234	44	74	250	50	74	291	58
20.....	61	89	15	74	395	79	76	302	62
21.....	63	184	31	74	359	72	70	265	50
22.....	65	155	27	76	247	51	68	252	46
23.....	61	126	21	74	241	48	70	179	34
24.....	63	182	31	72	143	28	74	207	41
25.....	62	138	23	72	124	24	72	182	35
26.....	65	225	39	76	121	25	70	127	24
27.....	63	368	63	74	244	49	68	124	23
28.....	63	580	99	70	216	41	72	400	78
29.....	65	224	39	83	202	45	72	442	86
30.....	63	315	54	81	207	45	74	674	135
31.....	65	311	55	--	--	--	70	569	108
Total..	1,931	--	1,294	2,191	--	1,571	2,331	--	1,537
Day	January			February			March		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	72	451	88	79	217	46	83	129	29
2.....	76	589	121	76	118	24	97	213	56
3.....	68	420	77	76	161	33	95	112	29
4.....	79	650	139	76	136	28	88	128	30
5.....	76	221	45	76	161	33	81	122	27
6.....	70	290	55	76	153	31	83	166	37
7.....	79	255	54	74	173	35	83	241	54
8.....	83	282	63	76	118	24	81	251	55
9.....	81	288	63	79	149	32	76	134	27
10.....	74	245	49	81	198	43	76	117	24
11.....	79	330	70	81	120	26	79	226	48
12.....	74	200	40	79	119	25	76	92	19
13.....	74	210	42	79	186	40	70	102	19
14.....	76	189	39	81	198	43	72	223	43
15.....	79	392	84	79	113	24	79	204	44
16.....	76	243	50	81	118	26	83	169	38
17.....	79	301	64	81	80	17	76	109	22
18.....	76	293	60	93	106	27	70	124	23
19.....	79	291	62	90	82	20	72	142	28
20.....	79	340	73	79	147	31	90	223	54
21.....	76	117	24	79	153	33	102	437	120
22.....	81	134	29	81	147	32	81	290	63
23.....	79	136	29	83	143	32	76	328	87
24.....	81	160	35	81	156	34	76	205	42
25.....	76	143	29	76	181	37	79	225	48
26.....	74	121	24	79	406	87	74	413	83
27.....	76	237	49	79	102	22	74	92	18
28.....	74	114	23	79	110	23	74	92	18
29.....	76	430	88	--	--	--	74	84	17
30.....	76	117	24	--	--	--	74	103	21
31.....	76	145	30	--	--	--	74	118	24
Total..	2,374	--	1,722	2,229	--	908	2,468	--	1,227

RIO GRANDE BASIN--Continued

PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	April			May			June		
	Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment		Mean dis-charge (cfs)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1.....	74	115	23	100	234	63	361	13,800	s 14,100
2.....	76	92	19	95	166	43	305	9,500	7,820
3.....	81	72	16	79	109	23	245	6,000	3,970
4.....	83	106	24	70	100	19	232	2,430	1,520
5.....	85	119	27	70	99	19	202	1,880	1,030
6.....	81	65	14	74	114	23	206	3,290	1,830
7.....	81	96	21	70	71	13	244	3,290	2,170
8.....	81	101	22	72	149	29	280	2,860	2,160
9.....	81	115	25	93	145	36	336	3,170	2,880
10.....	81	140	31	232	3,100	sa 2,200	330	4,740	4,220
11.....	81	135	30	458	7,000	sa 10,000	300	2,070	1,680
12.....	76	82	17	267	6,800	a 4,800	280	2,040	1,540
13.....	76	82	17	206	3,950	2,200	267	2,230	1,610
14.....	76	93	19	184	1,700	845	245	1,050	695
15.....	81	170	37	164	1,550	686	209	908	512
16.....	79	166	35	143	1,060	409	209	899	507
17.....	74	75	15	126	894	304	202	852	465
18.....	74	100	20	115	470	146	188	929	472
19.....	74	92	18	102	440	121	182	1,420	s 1,670
20.....	76	268	55	88	324	77	587	20,400	s 37,100
21.....	95	219	56	79	279	60	171	3,800	1,750
22.....	92	541	139	76	288	59	126	750	255
23.....	90	389	90	93	574	144	102	422	116
24.....	88	660	157	105	591	168	90	411	100
25.....	105	980	278	88	270	64	76	172	35
26.....	98	407	108	81	310	68	63	146	25
27.....	88	203	48	94	1,600	sa 740	56	134	20
28.....	83	172	39	197	8,600	sa 5,300	52	161	23
29.....	90	209	51	123	1,500	498	48	167	22
30.....	97	242	63	676	17,000	sa 43,000	52	154	22
31.....	--	--	--	246	14,800	s 9,310	--	--	--
Total.	2,500	--	1,514	4,666	--	81,467	6,246	--	90,319
	July			August			September		
1.....	54	128	19	1,750	17,000	sa 150,000	1,950	15,500	s 96,900
2.....	54	133	19	653	10,400	s 20,300	806	5,600	12,200
3.....	52	136	19	370	8,020	s 8,430	617	2,380	3,960
4.....	47	141	18	967	19,000	sa 62,000	464	2,270	2,840
5.....	50	179	24	2,360	27,000	sa 210,000	403	2,020	2,200
6.....	52	182	26	3,050	31,200	s 290,000	336	2,820	2,560
7.....	52	171	24	4,200	36,000	sa 490,000	290	2,150	1,680
8.....	47	170	22	1,180	20,100	s 70,000	258	1,770	1,230
9.....	47	178	23	1,190	8,800	sa 29,000	213	820	472
10.....	52	190	27	696	8,710	s 16,500	184	820	407
11.....	47	187	24	567	4,690	7,180	171	406	187
12.....	47	148	19	374	3,440	3,470	146	319	126
13.....	48	144	19	330	2,250	2,000	131	333	118
14.....	54	118	17	275	2,640	1,960	123	486	161
15.....	264	4,700	s 6,040	1,010	20,100	s 67,600	112	282	85
16.....	183	4,400	s 2,110	710	13,000	sa 45,000	97	343	90
17.....	95	1,150	295	1,960	19,000	sa 110,000	93	211	53
18.....	65	--	e 50	2,170	19,000	sa 140,000	85	297	68
19.....	58	--	e 60	815	7,920	s 19,900	81	255	56
20.....	109	2,190	645	445	2,740	3,290	81	168	37
21.....	70	676	128	341	2,230	2,050	83	308	69
22.....	95	14,000	sa 3,700	254	1,820	1,250	79	169	36
23.....	464	19,000	sa 38,000	400	5,000	sa 6,200	79	126	27
24.....	269	17,000	sa 13,000	650	8,300	sa 19,000	83	51	11
25.....	304	8,670	s 13,000	1,950	12,000	sa 83,000	83	353	79
26.....	4,830	33,000	sa 580,000	1,690	7,100	sa 27,000	81	345	75
27.....	1,470	12,300	s 64,300	548	6,400	9,470	81	192	42
28.....	554	7,010	10,500	415	3,230	3,620	81	79	17
29.....	280	5,540	4,190	330	2,870	2,560	83	152	34
30.....	209	4,420	2,490	2,610	26,000	sa 290,000	79	73	16
31.....	314	5,530	4,690	8,790	48,000	sa 140,000	--	--	--
Total.	10,336	--	743,498	43,050	--	3,590,780	7,453	--	125,836

Total discharge for year (cfs-days) 87,775

Total load for year (tons) 4,641,673

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated concentration graph.

RIO GRANDE BASIN--Continued
PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge ^a (cfs)	Water temperature (° F)	Suspended sediment											Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Dec. 1, 1956	9:35 a. m.		48	160	--	--	--	--	--	--	67	91	100		--	--	S
Jan. 20, 1957	2:10 p. m.		52	340	--	--	--	--	--	--	44	94	100		--	--	V
Feb. 1	10:05 a. m.		45	217	--	--	--	--	--	--	84	98	100		--	--	S
Apr. 24	11:00 a. m.		62	876	2,200	36	36	42	42	61	84	99	100		100		VPWCM
May 11	5:30 a. m.		55	7,100	4,720	38	38	53	53	77	95	100	100		--	--	VPWCM
May 27	10:45 a. m.		70	193	--	--	--	--	--	--	86	99	100		--	--	S
June 1	7:00 a. m.		60	17,600	4,270	48	48	78	78	98	100	--	--		--	--	VPWCM
June 19	7:45 p. m.		61	18,900	3,580	6	6	28	28	85	98	100	--		--	--	VPWCM
July 9	5:55 a. m.		65	178	--	--	--	--	--	97	100	--	--		--	--	S
July 17	11:45 a. m.		79	672	--	--	--	--	--	85	91	100	--		--	--	S
July 25	7:05 p. m.		72	21,400	4,450	37	37	61	61	88	96	99	100		100		VPWCM
Aug. 4	8:30 a. m.		74	13,900	3,420	35	35	51	51	81	97	100	--		--	--	VPWCM
Aug. 5	5:05 p. m.		73	28,000	3,580	29	29	46	46	71	80	92	100		198		SPWCM
Aug. 17	7:15 a. m.		68	24,400	4,470	31	31	39	39	81	97	99	100		100		VPWCM
Aug. 20	6:10 p. m.		76	2,740	3,240	56	56	77	77	97	100	--	--		--	--	VPWCM
Aug. 30	4:30 a. m.		65	24,700	2,920	32	32	46	46	85	97	99	100		100		VPWCM
Aug. 31	8:00 a. m.		65	28,100	4,660	28	28	44	44	74	90	98	100		100		VPWCM
Aug. 31	2:45 p. m.		70	49,500	3,630	19	19	27	27	62	81	97	100		100		SPWCM
Sept. 20	5:15 p. m.		70	168	--	--	--	--	--	18	77	100	--		--	--	V

^a Discharges omitted because of lack of correlation of discharges at sampling point and at gaging station.

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.

LOCATION.--At gaging station, 1,200 feet downstream from Alamogordo Dam, 1½ miles downstream from Alamogordo Creek, and 4½ miles northeast of Guadalupe, De Baca County.

DRAINAGE AREA.--4,390 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: June 1937 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 2,720 ppm Oct. 1-31, Nov. 5-7; minimum, 545 ppm Aug. 9-31.

Hardness: Maximum, 1,820 ppm Nov. 5-7; minimum, 373 ppm Aug. 9-31.

Specific conductance: Maximum daily, 3,070 microhms Nov. 5; minimum daily, 549 microhms Aug. 10.

EXTREMES, 1937-57.--Dissolved solids: Maximum, 2,730 ppm May 11-20, 1954; minimum, 435 ppm Oct. 1-8, 1941.

Hardness: Maximum, 1,910 ppm May 1-10, 1954; minimum, 294 ppm Oct. 1-8, 12-20, 1941.

Specific conductance: Maximum, 3,200 microhms Jan. 14, 1948; minimum, 513 microhms July 22, 1937.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent dissolved	Sodium adsorption ratio	Specific conductance (microhms at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Oct. 1-31, 1956..	56.1	19		607	73	110		129	1,700	151		0.7		2,720	3.70	412	1,810	1,710	12	1.1	2,990	7.6
Nov. 1-4	6.10	19		572	76	107		152	1,590	144		.6		2,580	3.51	42.5	1,740	1,620	12	1.1	2,880	7.6
Nov. 5-7	578	21		599	78	115		160	1,670	157		2.0		2,720	3.70	4,240	1,820	1,680	12	1.2	3,010	7.9
Nov. 8-12	75.4	18		580	76	106		158	1,610	145		1.5		2,610	3.55	531	1,760	1,630	12	1.1	2,910	7.7
Nov. 13-14	a 19.0	17		580	85	110		155	1,620	150		.9		2,650	3.60	136	1,800	1,670	12	1.1	2,940	7.4
Nov. 16, 21-30...	a 34	17		520	83	105		154	1,490	137		2.9		2,430	3.30	2.23	1,640	1,510	12	1.1	2,760	7.6
Dec. 1-31	1.44	12		500	78	104		158	1,430	135		4.0		2,340	3.18	9.10	1,570	1,440	13	1.1	2,690	7.2
Jan. 1-16, 18-31, 1957	a 37.4	18		560	88	102		132	1,570	147		2.1		2,550	3.47	287	1,760	1,650	11	1.1	2,860	7.7
Feb. 1-28	253	21		498	88	100		149	1,420	135		3.4		2,330	3.17	3.21	1,600	1,480	12	1.1	2,690	7.6
Mar. 1-31	45.6	20		596	73	109		154	1,650	152		.7		2,660	3.62	1,820	1,790	1,660	12	1.1	2,940	7.7
Apr. 1-30				368	83	111		137	1,650	137		.5		2,660	3.62	327	1,610	1,700	12	1.1	2,970	7.7
May 1-31	67.0	20		556	59	102		122	1,500	134		.5		2,430	3.30	440	1,630	1,530	12	1.1	2,710	7.7
June 1-30	84.1	17		393	43	71		127	1,040	90		1.4		1,720	2.34	391	1,160	1,050	12	.9	2,040	7.7
July 1-26	364	19		381	43	70		119	1,020	90		2.1		1,680	2.28	1,650	1,130	1,030	12	.9	2,000	7.7
July 27-Aug. 8	896	14		153	20	27		126	361	28		2.4		667	.91	1,610	464	360	11	.5	932	7.3
Aug. 9-31	374	14		133	10	20		109	296	16		1.8		545	.74	550	373	284	10	.4	801	7.5
Sept. 1-24	409	8.7		160	11	18		107	360	15		1.4		627	.85	692	444	366	8	.4	857	7.3
Sept. 25-30	54.8	9.7		268	19	42		137	643	48		1.1		1,100	1.50	163	746	634	11	.7	1,390	7.4
Weighted average	b 164	16		320	37	96		125	839	71		1.5		1,400	1.90	608	950	848	11	0.8	1,680	--

a No flow Nov. 15, 17-20, Jan. 17.

b Average for 399 days of flow.

RIO GRANDE BASIN--Continued
PECOS RIVER NEAR ACME, N. MEX.

LOCATION--At gaging station, 1 mile southeast of Melena railroad station, 3½ miles downstream from Salt Creek, 5 miles southwest of Acme, Chaves County and 13 miles northeast of Roswell.
DRAINAGE AREA--41,380 square miles, approximately (contributing area).
RECORDS AVAILABLE--Chemical analyses: July 1937 to September 1957.
Water temperatures: May 1952 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 6,670 ppm May 1-3; minimum, 594 ppm Aug. 11-16.
Hardness: Maximum, 3,060 ppm May 1-3; minimum, 366 ppm July 26-27.

Specific conductance: Maximum daily, 10,300 micromhos May 1; minimum daily, 859 micromhos Aug. 12.

Water temperatures: Maximum, 90°F July 29; minimum, 38°F Dec. 9, Jan. 18, 26.

EXTREMES, 1937-57.--Dissolved solids: Maximum, 19,870 ppm May 23 to June 2, 1938; minimum, 594 ppm Aug. 11-16, 1957.

Hardness: Maximum, 5,320 ppm May 23 to June 2, 1938; minimum, 366 ppm July 26-27, 1957.

Specific conductance: Maximum daily, 39,300 micromhos Aug. 9, 1945; minimum daily, 859 micromhos Aug. 12, 1957.

Water temperatures, 1952-57: Maximum, 95°F July 15, 1955; minimum, 33°F Jan. 4, 1953; Feb. 5-7, 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate			
Nov. 7-20, 1956	a 81.3	14		588	107	130	132	132	1,710	212		2.2	2,830	3.85	621	1,910	1,800	13	3,270	7.7	
Nov. 21-30	10.8	17	580	121	121	252	143	143	1,770	376		2.4	3,190	4.34	93.0	1,940	1,830	22	3,830	7.7	
Dec. 1-31	3.6	17	576	133	133	454	152	152	1,880	630		.8	3,760	5.11	36.5	1,960	1,860	33	4,460	7.5	
Jan. 1-31, 1957	5.5	19	572	143	143	464	125	125	1,890	675		1.4	3,830	5.21	56.9	2,020	1,910	33	4,770	7.7	
Feb. 1-14	4.3	16	580	154	154	527	112	112	1,960	775		1.0	4,070	5.54	47.3	2,080	1,990	36	5,180	7.3	
Feb. 15-18	2.0	15	631	171	171	713	116	116	2,120	1,080		1.9	4,790	6.51	25.9	2,280	2,180	40	6,220	7.5	
Feb. 19-28	5.8	16	584	159	159	553	121	121	1,970	825		1.1	4,170	5.67	65.3	2,110	2,010	36	5,320	7.5	
Mar. 1-2, 7-8	a 4.5	24	667	190	190	799	131	131	2,300	1,190		3.1	5,240	7.13	63.7	2,450	2,340	42	6,700	7.9	
Mar. 9-12	6.5	21	647	169	169	391	116	116	2,150	585		1.3	4,020	5.47	70.6	2,310	2,210	27	3.5	4,820	7.9
Mar. 13-14	3.0	20	679	190	190	522	124	124	2,300	790		.8	4,560	6.20	36.9	2,480	2,370	31	4.6	5,590	7.5
Mar. 15-31	332	23	603	119	130	160	132	132	1,800	255		1.5	3,030	4.12	2,720	1,990	1,890	15	1.6	3,450	7.6
Apr. 1-16	13.1	21	651	157	157	386	123	123	2,110	575		.8	3,960	5.39	140	2,270	2,170	27	3.5	4,750	7.6
Apr. 17-21	a 2.0	21	766	204	204	627	131	131	2,520	980		1.1	5,180	7.04	28.0	2,750	2,640	33	5.2	6,310	7.4
May 1-3	1.7	16	778	271	271	1,090	135	135	2,610	1,840		2.8	6,670	9.07	30.6	3,060	2,940	44	8.6	8,770	7.9
May 4-10	4.1	22	683	204	204	549	98	98	2,360	850		1.1	4,720	6.42	52.3	2,540	2,460	32	4.7	5,810	7.2
May 11-12	130	10	262	55	55	276	122	122	1,875	478		4.4	1,820	2.48	639	1,880	780	41	4.0	2,780	7.3
May 13-15	43.0	17	500	128	128	440	123	123	1,500	745		23	3,410	4.64	398	1,770	1,670	35	4.5	4,550	7.6
May 16-17	a 1.5	9.0	651	176	176	610	79	79	2,080	1,020		6.9	4,590	6.24	18.6	2,350	2,280	36	5.5	5,970	7.3
May 26	23	16	619	142	142	398	97	97	1,930	640		2.2	3,800	5.17	236	2,130	2,050	29	3.7	4,710	7.1
May 27-31	366	14	234	50	50	96	107	107	697	134		.6	1,280	1.74	1,280	1,790	702	21	1.5	1,760	7.5

June 1-5, 1957...	387	20	212	27	89	135	575	87	1.6	1,080	1.47	1,130	640	530	23	1.5	1,450	7.7
June 6-8.....	37.3	18	303	66	197	102	1,900	252	2.1	2,170	2.95	219	1,250	1,170	25	2.4	2,730	7.8
June 9-12.....	43.0	22	515	107	477	117	1,820	680	1.7	3,950	5.24	41.6	1,970	1,980	34	4.7	4,730	8.0
July 8-19.....	402	19	453	57	118	131	1,280	128	1.7	2,120	2.68	2,300	1,960	1,280	16	1.4	2,460	7.7
July 20.....	15	15	163	17	63	111	407	68	1.9	1,781	1.68	32.0	476	386	22	1.3	1,100	7.5
July 21-25.....	5.2	17	391	41	87	96	1,080	82	1.7	1,760	2.39	24.7	1,140	1,070	14	1.1	2,060	7.6
July 26-27.....	27.0	16	125	13	116	160	389	57	1.3	796	1.08	58.0	366	234	41	2.6	1,150	7.5
July 28-29.....	23.0	16	411	68	200	97	1,310	210	1.5	2,260	3.07	140	1,300	1,230	25	2.4	2,720	7.6
July 30-31.....	1,156	17	270	26	70	172	664	70	2.9	1,200	1.63	3,750	780	640	16	1.1	1,540	7.8
Aug. 1-9.....	820	13	145	36	58	150	428	48	1.1	802	1.09	1,780	510	387	20	1.1	1,120	7.2
Aug. 10.....	150	19	250	37	75	128	698	74	3.2	1,220	1.66	494	776	671	17	1.2	1,450	7.6
Aug. 11-16.....	966	7.3	125	28	24	136	311	31	1.1	594	.81	1,550	427	316	11	.5	874	7.8
Aug. 17-19.....	291	6.4	163	24	48	104	415	64	2.2	774	1.05	608	505	420	17	.9	967	8.2
Aug. 20-23.....	114	13	247	76	109	136	835	130	1.4	1,480	2.01	456	929	818	20	1.5	1,750	7.6
Aug. 24-27.....	30.2	16	397	71	104	86	1,150	170	1.0	1,950	2.65	159	1,280	1,210	15	1.3	2,360	7.7
Aug. 28.....	12	16	274	52	122	132	765	182	2.1	1,480	2.01	48.0	898	790	23	1.8	2,040	8.0
Aug. 29-31.....	8.3	15	349	81	180	132	1,050	280	.2	2,020	2.75	45.3	1,200	1,100	25	2.3	2,610	8.0
Sept. 1-5, 9-11...	86.0	21	445	85	102	104	1,330	150	1.1	2,180	2.96	35.3	1,460	1,380	13	1.2	3,350	8.2
Sept. 19-25.....	773	7.5	206	36	35	131	533	54	.8	956	1.27	1,950	662	554	10	.6	1,130	8.2
Sept. 27-28.....	78.0	11	256	15	32	135	550	62	.2	992	1.35	204	700	590	9	.5	1,430	8.2
Sept. 29-30.....	49.0	11	318	38	96	118	840	132	1.5	1,490	2.03	197	950	854	16	1.3	1,896	7.7
Weighted average	b 149	14	296	54	89	136	641	117	1.3	1,480	2.01	595	960	849	17	1.2	1,950	--

a No flow Oct. 1 to Nov. 6, Mar. 3-6, Apr. 22-30, May 18-25, June 13 to July 7, Sept. 6-8, 12-18.

b Average for 272 days of flow.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ACME, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally between 4 and 5 p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		--	52	43	55	67	62	81	85	--	86	a 83
2		--	53	50	57	64	59	79	a 72	--	85	82
3		--	51	43	58	--	65	--	72	--	82	87
4		--	53	46	55	--	58	--	73	--	86	89
5		--	46	52	56	--	67	66	80	--	83	83
6		--	54	51	54	--	67	73	--	--	86	--
7		--	53	48	60	66	66	76	86	--	86	--
8		50	45	54	67	67	63	74	87	80	87	--
9		54	38	58	64	63	67	81	85	81	82	--
10		56	46	48	63	60	73	68	86	83	86	--
11		57	50	50	65	66	72	--	85	82	--	--
12		58	51	54	66	67	60	62	77	a 83	70	--
13		60	49	55	68	65	63	72	--	80	74	--
14		58	50	56	67	67	64	74	--	79	70	--
15		50	51	51	63	56	75	69	--	83	79	--
16		52	50	45	53	58	77	81	--	85	b 72	--
17		50	a 47	40	50	61	73	78	--	86	74	--
18		54	48	38	43	57	71	--	--	87	80	--
19		53	46	42	47	57	78	--	--	88	74	76
20		43	48	53	63	52	73	--	--	81	80	75
21		49	50	50	64	50	a 69	--	--	80	66	76
22		53	45	52	51	58	--	--	--	87	76	71
23		57	--	50	50	47	--	--	--	82	55	72
24		50	43	55	52	45	--	--	--	80	--	71
25		52	39	46	61	47	--	--	--	81	--	71
26		49	41	38	62	62	--	79	--	82	--	75
27		50	43	40	64	63	--	b 75	--	82	--	77
28		45	45	53	67	63	--	76	--	83	77	74
29		53	41	--	--	63	--	78	--	90	a 80	73
30		51	47	43	--	62	--	73	--	86	83	76
31		--	48	45	--	a 67	--	75	--	85	--	--
Average		--	47	48	59	60	--	--	--	--	--	--

a Measurement after 5 p. m.

b Measurement before 4 p. m.

RIO GRANDE BASIN--Continued

RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.

LOCATION --At gaging station on downstream side of road bridge, at Diamond A. Ranch, 8 miles upstream from Rocky Arroyo, and 18 miles west of Roswell, Chaves County, 947 square miles (contributing area).

DRAINAGE AREA --Chemical analyses: August 1956 to September 1957 (intermittent).

RECORDS AVAILABLE --September 1951 to September 1955, May to September 1957.

Water temperatures: September 1951 to September 1957.

Sediment records: September 1951 to September 1957.

EXTREMES, 1956-57 --Water temperatures: Maximum, 88°F Aug. 1; minimum, 51°F June 1.

Sediment concentrations: Maximum daily, 44,700 ppm July 27; minimum daily, no flow on many days.

EXTREMES, 1951-57 --Water temperatures: (1951-55, 1956-57) --Maximum, 88°F Aug. 1, 1957; minimum, 51°F June 1, 1957.

Sediment loads: Maximum daily, 127,000 tons Aug. 18; minimum daily, 0 tons on many days.

Sediment concentrations: Maximum daily, 64,900 ppm July 19, 1956; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 630,000 tons Oct. 6, 1954; minimum daily, 0 tons on many days.

REMARKS --No flow during October, December, February and March; tabulation omitted for these months. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, August 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25 °C)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Aug. 21, 1956	191	17	0.01	108	20	--	11	171		200	18	0.6	1.2	0.08	460	0.63	237	352	212	7	0.3	692	7.3
June 3, 1957	8	--	--	220	56	34		104			45				1,190	1.62	25.7	780	694	9	.5	1,400	7.9
July 20	a 172	--	--	243	61	35		350			45				1,260	1.71	885	858	570	8	.5	1,500	7.4
July 20	a 87.5	--	--	81	12	8.0		149			11				382	.52	69.6	252	130	7	.2	514	7.6
July 21	51	--	--	86	15	12		95			14				442	.60	60.9	276	198	9	.3	571	7.7
July 23	245	--	--	191	43	26		378			32				900	1.22	595	654	344	8	.4	1,170	7.2
July 27	506	--	--	292	46	23		213			19				1,330	1.81	1,820	918	743	5	.3	1,500	7.2
Aug. 5, 1:40 p.m.	a 314	--	--	266	58	35		189			49				--	--	--	902	747	8	.5	1,530	7.3
Aug. 5, 9:00 p.m.	a 22	12	--	--	--	6.8		106			7.5				--	--	--	199	112	7	.2	414	7.7
Aug. 6, 9:40 a.m.	a 1,550	--	--	230	68	31		240			42				--	--	--	854	657	7	.5	1,420	7.3
Aug. 6, 8:00 p.m.	a 146	--	--	101	17	9		189			10				--	--	--	322	167	6	.2	638	7.3
Aug. 18	919	18	--	--	--	6.6		209			6.0				--	--	--	230	58	6	.2	457	7.6
Aug. 20	42	12	--	--	--	23		142			18				--	--	--	530	414	9	.4	1,080	7.7
Sept. 9	4	19	--	--	--	38		115			47				--	--	--	690	596	11	.6	1,310	8.0

a Discharge at time of sampling.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

RIO MONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.--Continued

Temperature (°F) of water, May to September 1957
Once daily measurement, generally between 11:00 a.m. and 6:00 p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1									51	--	88	75
2									a 58	--	84	a 68
3									74	--	86	a 68
4									--	--	79	a 70
5									--	--	77	a 70
6									--	--	75	a 70
7									--	--	78	75
8									--	--	78	a 64
9									--	--	80	a 68
10									--	--	83	a 68
11									--	--	--	75
12									--	--	--	75
13									--	--	--	75
14									--	--	--	a 66
15									--	--	78	--
16									--	--	75	--
17									--	--	74	--
18									--	--	86	--
19									--	--	75	--
20									--	80	77	--
21									--	76	80	--
22									--	--	a 72	--
23									--	75	80	--
24									--	75	78	--
25									--	80	a 75	--
26									--	82	82	--
27									--	77	a 71	--
28									--	81	a 70	--
29									--	85	a 67	--
30									--	82	b 65	--
31								57	--	81	a 65	--
Average								--	--	79	76	--

a Measurement before 11:00 a.m.

b Measurement after 6:00 p.m.

Suspended sediment, water year October 1956 to September 1957

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Nov. 1-30, 1956.....	1	--	e 5
Jan. 1-31, 1957.....	12	--	e 24
Apr. 1-30	2	--	e 5
May 10	27	--	e 3,000
May 11	39	--	e 3,000
May 30	35	787	4,530
May 31	340	38,300	s 80,000
May 1-31	441	--	70,530
June 1	19	7,900	405
June 2	12	1,900	62
June 3	8	484	10
June 4	1	--	e 5
June 5	1	--	e 4
June 1-30	41	--	486

e Estimated.

s Computed by subdividing day.

RIO GRANDE BASIN--Continued

RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	0	--	0	6	355	s 12	80	13,500	2,920
2.....	0	--	0	10	600	16	67	2,600	470
3.....	0	--	0	4	400	4	50	1,200	162
4.....	0	--	0	2	141	1	31	485	41
5.....	0	--	0	43	3,980	s 2,270	18	315	15
6.....	0	--	0	255	26,900	s 46,900	14	262	10
7.....	0	--	0	88	11,000	2,610	14	195	7
8.....	0	--	0	194	31,400	s 24,600	11	80	2
9.....	0	--	0	50	6,340	s 1,050	4	55	1
10.....	0	--	0	5	1,250	17	11	62	2
11.....	0	--	0	0	--	0	9	48	1
12.....	0	--	0	0	--	0	1	6	(t)
13.....	0	--	0	0	--	0	3	10	(t)
14.....	0	--	0	0	--	0	5	8	(t)
15.....	0	--	0	102	15,900	s 9,170	4	--	(et)
16.....	0	--	0	117	32,400	s 8,720	3	--	(et)
17.....	0	--	0	130	21,800	s 12,300	3	--	(et)
18.....	0	--	0	919	40,200	s 127,000	2	--	(et)
19.....	0	--	0	179	17,500	s 9,400	1	--	(et)
20.....	53	13,400	s 3,100	42	4,300	488	0	--	0
21.....	51	11,200	s 2,610	25	960	65	0	--	0
22.....	1	--	e 3	27	625	s 53	2	--	e 1
23.....	245	28,600	s 38,300	28	540	41	2	--	(et)
24.....	39	16,700	s 1,850	36	1,390	s 160	1	--	(et)
25.....	104	17,800	s 7,640	26	2,980	209	0	--	0
26.....	277	7,380	s 50,500	21	1,300	74	0	--	0
27.....	506	44,700	s 84,400	10	400	11	0	--	0
28.....	142	34,900	s 14,100	2	420	2	0	--	0
29.....	13	13,200	463	2	100	1	0	--	0
30.....	2	760	4	2	667	s 106	0	--	0
31.....	1	136	s 1	23	4,170	s 705	--	--	--
Total.	1,434	--	202,971	2,348	--	245,985	336	--	3,633
Total discharge for year (cfs-days).....									4,615
Total load for year (tons).....									523,639

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

RIO GRANDE BASIN--Continued
RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet, 8, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
May 31, 1957	12:05 a. m.	3,000	52	90,500	4,520	--	41	--	66	--	94	98	100	SPWCM
June 2	7:30 p. m.	9	68	844	1,700	--	95	--	99	--	99	100	--	SPWCM
July 20	8:10 a. m.	152	75	24,600	3,830	--	58	--	88	--	98	99	100	VPWCM
July 21	10:50 p. m.	7	77	2,440	5,050	--	92	--	100	--	--	--	--	VPWCM
July 23	8:50 a. m.	1,030	73	78,100	4,780	--	27	--	55	--	94	99	100	VPWCM
July 26	11:00 p. m.	3,680	73	92,700	3,940	--	32	--	50	--	93	98	100	VPWCM
July 26	11:30 p. m.	4,920	68	73,300	4,130	--	44	--	64	--	95	99	100	VPWCM
July 27	1:40 a. m.	2,110	66	62,500	4,350	--	43	--	62	--	90	97	100	SPWCM
July 27	2:50 a. m.	1,300	66	65,400	3,780	--	44	--	61	--	90	96	99	VPWCM
Aug. 5	1:30 p. m.	402	81	33,800	3,840	--	47	--	68	--	93	97	99	VPWCM
Aug. 6	9:15 a. m.	724	74	38,900	3,840	14	17	19	27	44	81	92	99	VPWCM
Aug. 6	9:15 a. m.	724	74	38,900	4,680	2	4	11	24	36	81	92	99	VPN
Aug. 6	9:55 a. m.	1,620	74	85,700	5,030	--	32	--	52	--	91	98	100	VPWCM
Aug. 8	2:35 a. m.	571	71	48,000	3,670	--	40	--	61	--	87	97	100	VPWCM
Aug. 8	10:45 a. m.	151	73	28,600	4,520	46	58	71	83	92	97	99	100	VPWCM
Aug. 8	10:45 a. m.	151	73	28,600	4,740	2	5	12	82	92	97	99	100	VPN
Aug. 18	4:35 p. m.	3,400	66	43,900	4,140	--	26	--	46	--	81	96	100	VPWCM
Aug. 18	5:25 p. m.	2,400	66	41,500	3,760	19	29	36	46	57	81	96	99	VPWCM
Aug. 18	5:25 p. m.	2,400	66	41,500	4,740	3	6	18	37	56	81	96	99	VPN

RIO GRANDE BASIN--Continued
PECOS RIVER NEAR ARTESIA, N. MEX.

LOCATION.--At gaging station at bridge on State Highway 83, 4.3 miles east of Artesia, Eddy County, 7.0 miles north of mouth of Rio Penasco, and 17 miles north of McKittrick Dam.

DRAINAGE AREA.--15,500 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1957.

Water temperatures: January 1949 to September 1957.

Sediment records: January 1949 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 14,800 ppm July 11; minimum, 572 ppm July 26-27.

Hardness: Maximum, 3,950 ppm July 11; minimum, 332 ppm July 26-27.

Specific conductance: Maximum daily, 19,700 micromhos July 11; minimum daily, 792 micromhos July 26.

Water temperatures: Maximum, 90°F June 28; minimum, 38°F Jan. 18.

Sediment concentrations: Maximum daily, 12,700 ppm June 3; minimum daily, no flow on several days in July.

Sediment loads: Maximum daily, 81,300 tons May 31; minimum daily, 0 tons on several days in July.

EXTREMES, 1937-57.--Dissolved solids: Maximum, 14,800 ppm July 11, 1957; minimum, 479 ppm Oct. 7-8, 1954.

Hardness: Maximum, 3,950 ppm July 11, 1957; minimum, 270 ppm Oct. 7-8, 1954.

Specific conductance: Maximum daily, 20,700 micromhos Sept. 10, 1955; minimum daily, 745 micromhos Oct. 8, 1954.

Water temperatures (1949-57): Maximum, 92°F June 30, 1953; minimum, freezing point, Feb. 2, 1956.

Sediment concentrations (1949-57): Maximum daily, 20,800 ppm July 22, 1955; minimum daily, no flow on many days.

Sediment loads (1949-57): Maximum daily, 183,000 tons Sept. 26, 1955; minimum daily, 0 tons on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- rides (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per- cent so- dium ad- sorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg./l.	Non-carbonate				
Oct. 1-4, 1956....	13.8	23		724	320	2,130		145	2,680	3,330		--		9,270	12.6	345	3,120	3,000	60	17	12,700	7.5
Oct. 5-18.....	12.8	20		653	296	1,630		143	2,480	2,550		--		7,700	10.5	266	2,950	2,730	55	13	10,600	7.4
Oct. 19-21.....	24.0			594	280	1,850		148	2,220	2,830		--		7,970	10.8	516	2,630	2,510	60	16	11,300	7.6
Oct. 22-31.....	26.1	19		588	257	1,350		150	2,150	2,130		--		6,370	8.94	463	2,520	2,400	54	12	9,150	7.5
Nov. 1-8.....	30.8	17		576	259	1,250		168	2,110	2,080		3.7		6,320	8.60	526	2,500	2,360	52	11	8,820	7.7
Nov. 9-15.....	134	21		560	145	375		151	1,800	535		2.6		3,510	4.77	1,270	1,990	1,870	29	3.7	4,290	8.0
Nov. 16-24.....	69.8	20		584	171	632		171	1,680	975		2.5		4,360	5.93	622	2,180	2,020	39	5.9	5,700	7.6
Nov. 25-30.....	53.3	20		580	214	912		175	1,980	1,440		3.9		5,240	7.13	754	2,330	2,180	46	8.2	7,080	7.8
Dec. 1-31.....	58.8	17		564	228	1,070		152	1,930	1,780		3.8		5,670	7.71	900	2,340	2,220	50	9.6	7,920	7.9
Jan. 1-31, 1957....	62.6	17		556	233	1,140		185	1,940	1,890		3.3		5,860	7.97	990	2,340	2,210	51	10	8,280	7.9
Feb. 1-28.....	53.0	18		584	245	1,250		156	2,070	2,040		--		6,260	8.94	899	2,460	2,340	53	11	8,620	7.6
Mar. 1-16.....	41.5	23		615	250	1,360		154	2,230	2,200		--		6,760	9.18	758	2,560	2,440	54	12	9,410	7.8
Mar. 17.....	441	26		599	166	587		205	2,060	815		1.3		4,360	5.93	5,190	2,180	2,010	37	5.5	5,900	7.4
Mar. 18-23.....	623	20		592	95	225		149	1,750	310		3.2		3,070	4.18	5,160	1,870	1,750	21	2.3	3,590	7.7
Mar. 24-25.....	163	19		568	109	356		137	1,770	530		3.0		3,440	4.68	1,510	1,920	1,800	29	3.5	4,500	8.3
Mar. 26-31.....	62.0	17		611	152	462		148	1,960	920		2.6		4,340	5.90	727	2,150	2,030	38	5.6	5,600	7.6

RIO GRANDE BASIN--Continued
PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957.--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent dissolved	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Apr. 1-5, 1957 ..	39.6	18		643	207	924		138	2,220	1,470		3.6		5,550	7.55	593	2,460	2,340	45	8.1	7,360	7.5
Apr. 6-30	31.2	18		667	264	1,400		156	2,410	2,260		--		7,100	9.66	598	2,750	2,620	53	12	9,790	7.5
May 1-15	39.1	13		637	273	1,500		159	2,380	2,440		--		7,320	9.96	773	2,710	2,560	55	13	10,200	7.4
May 16-19	36.2	12		588	178	994		119	1,980	1,580		3.4		5,390	7.33	527	2,200	2,100	50	9.2	7,470	7.1
May 20-27	12.4	14		651	273	1,420		114	2,370	2,340		--		7,120	9.68	238	2,200	2,650	53	12	9,880	7.2
May 28	424	26		592	128	590		204	1,850	860		9		4,150	5.64	4,750	2,000	1,840	39	5.7	5,400	7.4
May 29-30	240	14		498	81	274		139	1,470	378		3.1		2,780	3.78	1,800	1,570	1,460	28	3.0	3,480	7.6
May 31	1,630	20		153	21	137		a241	281	204		1.3		936	1.27	4,120	468	270	39	2.7	1,480	8.3
June 1-2	686	--		222	40	141		213	--	190		--		b1,340	1.82	2,480	718	544	30	2.3	1,830	7.8
June 3-7	211	21		310	50	174		135	885	232		4.1		1,740	2.37	991	979	868	28	2.4	2,320	7.8
June 8-10	51.3	25		222	157	351		134	1,030	525		6.7		2,380	3.24	330	1,200	1,080	39	4.4	3,440	7.9
June 11-15	19.3	28		449	114	590		126	1,340	975		3.9		3,560	4.84	188	2,700	1,490	45	6.4	5,180	7.6
June 16-22	5.73	26		580	164	980		147	1,830	1,510		3.1		5,150	7.00	79.7	2,070	1,950	51	9.4	7,120	7.5
June 23-July 3	2.07	26		715	223	1,430		130	2,420	2,240		--		7,120	9.68	33.8	2,700	2,590	54	12	9,720	7.5
July 11	227	--		965	362	3,540		178	5,900	5,900		--		b14,800	20.1	9,070	3,950	3,800	66	24	19,700	7.5
July 12-22	302	24		482	71	180		128	1,400	238		3.3		2,480	3.39	2,030	1,520	1,410	20	2.0	3,000	7.5
July 23-25	305	21		373	52	166		128	1,030	230		4.0		1,940	2.64	1,600	1,120	1,040	24	2.1	2,480	7.4
July 26-27	283	--		113	12	50		107	77	77		4.9		b572	.78	437	382	194	25	1.2	860	8.2
July 28-30	37.7	15		153	28	133		101	402	206		--		b955	1.35	101	496	409	37	2.6	1,520	7.7
July 31	217	--		516	140	664		133	--	1,080		--		b4,470	6.08	2,620	1,860	1,750	44	6.7	5,540	7.7
Aug. 1-2	1,315	--		365	45	122		171	--	150		--		b1,870	2.54	6,640	1,100	956	20	1.6	2,200	7.5
Aug. 3-11	580	23		274	30	77		145	682	98		3.0		1,260	1.71	1,970	807	688	17	1.2	1,660	7.4
Aug. 12	498	--		266	36	129		129	589	182		--		b1,460	1.99	1,960	812	688	26	2.0	1,900	7.5
Aug. 13-17	838	20		212	20	49		142	509	152		2.0		1,27	2,110	611	611	494	15	1.9	1,250	7.6
Aug. 18-23	187	15		263	32	126		135	663	188		4.0		1,360	1.85	687	790	680	26	1.9	1,880	7.5
Aug. 24-31	27.8	21		453	100	590		112	1,380	905		1.8		3,510	4.77	263	1,540	1,450	45	6.5	4,880	7.4
Sept. 1-15	6.09	19		576	169	945		116	1,860	1,510		2.1		5,140	6.99	84.5	2,130	2,040	49	8.9	7,090	7.4
Sept. 16-20	9.36	21		790	246	2,100		109	2,550	3,480		--		b1,840	12.6	234	2,980	2,890	60	17	13,100	7.4
Sept. 21	626	--		318	50	170		142	--	222		--		1,270	1.73	1,550	999	881	27	2.3	2,340	7.5
Sept. 22-30	451	17		266	28	93		125	677	130		1.8		1,270	1.73	1,550	778	676	21	1.5	1,700	7.5
Weighted average	d 125	20		405	94	401		152	1,220	624		--		2,840	3.86	958	1,400	1,270	38	4.7	3,790	--

a Includes 4 parts per million of carbonate (CO₃).

b Residue on evaporation at 180°C.

c No flow July 4-10.

d Average for 358 days of flow.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
 Once-daily measurement, generally between 11 p.m. and 6 p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	57	50	44	49	a 54	64	b 72	62	87	87	76
2	74	51	50	50	47	a 55	a 56	75	65	88	85	a 74
3	72	50	52	48	51	49	58	75	63	a 75	86	a 70
4	76	50	52	52	50	a 53	a 58	65	b 70	84	b 80	76
5	74	48	49	47	52	a 49	59	58	a 70	80	80	80
6	74	50	50	49	52	a 52	65	65	a 75	a 77	a 75	78
7	a 67	55	55	55	61	49	a 61	55	a 75	82	80	78
8	a 67	a 54	50	55	61	52	57	a 70	a 79	a 77	80	74
9	a 64	a 51	43	--	a 55	a 53	a 55	70	80	80	80	79
10	a 65	53	43	49	62	65	63	68	77	a 76	78	a 70
11	67	--	56	50	57	58	62	70	80	82	80	80
12	67	a 51	58	55	a 55	58	a 52	a 68	77	82	78	78
13	73	--	50	53	a 57	a 57	45	75	80	85	79	a 70
14	70	--	a 45	50	59	54	a 54	a 67	85	81	78	79
15	71	--	51	45	62	53	67	75	84	83	79	a 68
16	73	49	50	--	53	55	67	72	a 82	83	79	70
17	65	48	47	45	50	58	71	73	a 70	81	80	a 70
18	67	46	47	a 38	50	57	70	a 68	a 72	85	78	75
19	69	--	48	46	47	58	70	74	80	85	78	78
20	65	a 45	47	47	52	50	73	70	82	a 80	a 74	78
21	a 58	45	49	51	55	61	70	a 67	83	a 82	80	70
22	68	44	50	47	50	58	65	a 65	80	85	a 75	70
23	64	47	43	43	52	48	b 62	--	84	78	a 74	68
24	65	a 42	42	47	54	45	63	75	82	a 78	78	61
25	a 55	--	39	48	a 49	48	65	75	87	a 76	80	68
26	58	49	42	40	49	56	63	75	88	a 75	a 78	69
27	58	--	40	40	55	a 55	72	a 74	a 85	a 81	a 76	70
28	67	48	47	--	a 54	55	60	76	90	85	a 80	a 66
29	59	48	a 40	45	--	57	57	b 67	a 88	88	81	a 64
30	56	46	43	46	--	64	70	72	88	86	78	70
31	57	--	47	46	--	64	--	60	--	85	a 74	--
Average	66	--	48	48	54	55	62	70	79	82	79	73

a Measurement before 11 a.m.

b Measurement after 6 p.m.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1.....	8.4	31	1	28	28	2	46	19	2
2.....	15	63	3	26	102	7	42	134	15
3.....	16	57	2	29	76	6	42	29	3
4.....	16	160	7	29	85	7	41	29	3
5.....	17	22	1	31	69	6	42	47	5
6.....	14	5	(at)	34	141	13	42	31	4
7.....	14	6	(t)	35	137	13	50	46	6
8.....	14	46	2	34	84	8	46	31	4
9.....	16	79	3	125	612	s 385	46	55	7
10.....	16	60	3	256	2,350	1,620	49	26	3
11.....	16	55	2	171	1,220	563	52	12	2
12.....	16	55	2	126	455	155	57	11	2
13.....	12	42	1	95	143	37	55	50	7
14.....	8.8	26	1	87	70	16	56	27	4
15.....	6.4	30	a 1	75	51	10	65	18	3
16.....	6.7	40	1	69	24	4	71	44	8
17.....	8.4	57	1	67	16	3	71	13	2
18.....	14	39	1	72	25	5	70	50	9
19.....	29	99	8	75	41	7	71	19	4
20.....	21	20	1	70	36	7	71	91	17
21.....	22	120	7	77	24	5	68	44	8
22.....	21	20	1	72	40	8	67	72	13
23.....	24	38	2	67	27	5	65	69	12
24.....	24	50	a 3	59	30	5	62	70	12
25.....	25	78	5	56	27	4	67	80	14
26.....	28	16	1	57	26	4	67	57	10
27.....	25	51	3	56	6	1	70	26	5
28.....	26	56	4	55	5	a 1	68	75	14
29.....	28	41	3	52	12	2	68	46	8
30.....	31	30	3	44	33	4	69	50	9
31.....	29	77	6	--	--	--	66	44	8
Total.	567.7	--	79	2,129	--	2,914	1,822	--	223
Day	January			February			March		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1.....	67	71	13	56	63	10	52	73	10
2.....	69	36	7	55	84	12	43	117	13
3.....	72	22	4	51	89	12	44	57	7
4.....	77	31	6	49	74	10	42	80	9
5.....	76	74	15	52	87	12	42	62	7
6.....	75	51	10	49	85	11	42	32	4
7.....	73	10	2	47	80	a 10	46	58	8
8.....	73	39	8	46	82	10	40	80	9
9.....	72	43	8	45	121	15	42	57	6
10.....	72	38	7	45	84	10	36	51	5
11.....	70	53	10	42	197	22	39	51	5
12.....	68	20	a 4	45	100	12	41	42	5
13.....	67	20	a 4	47	57	7	38	40	4
14.....	68	25	5	40	88	10	33	42	4
15.....	68	44	8	43	196	25	33	66	6
16.....	61	30	a 5	51	210	29	46	50	a 6
17.....	56	26	4	55	99	15	441	798	s 1,070
18.....	51	29	4	56	217	33	595	1,400	2,250
19.....	53	13	2	60	109	18	642	1,400	2,430
20.....	54	19	3	62	229	38	744	1,520	3,050
21.....	54	46	7	64	97	17	796	1,420	3,050
22.....	55	30	a 4	67	146	26	644	1,280	2,230
23.....	54	30	a 4	65	120	21	315	1,500	1,280
24.....	54	20	a 3	65	126	22	177	1,380	660
25.....	52	20	a 3	65	60	11	149	482	194
26.....	51	15	2	58	112	18	107	247	71
27.....	50	14	2	52	56	8	83	174	39
28.....	50	4	1	52	122	17	64	111	19
29.....	57	17	3	--	--	--	48	89	12
30.....	60	9	1	--	--	--	38	79	8
31.....	60	42	7	--	--	--	32	76	7
Total.	1,941	--	166	1,484	--	459	5,539	--	16,478

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Suspended sediment, water year October 1956 to September 1957--Continued

Suspended sediment, water year October 1956 to September 1957--Continued									
Day	Mean dis- charge (cfs)	April		Mean dis- charge (cfs)	May		Mean dis- charge (cfs)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1.....	56	97	15	35	109	10	674	8,780	s 19,600
2.....	47	112	14	32	83	7	698	9,460	s 19,800
3.....	34	120	a 11	23	84	5	490	12,700	16,800
4.....	28	130	10	19	76	4	213	9,000	5,610
5.....	33	21	2	30	94	8	148	3,600	1,440
6.....	37	130	12	32	181	16	106	700	200
7.....	34	72	7	37	242	24	81	275	60
8.....	32	78	7	40	231	25	58	105	16
9.....	40	68	7	39	116	12	54	58	8
10.....	35	65	6	38	97	10	42	105	12
11.....	30	50	a 4	36	144	14	30	62	5
12.....	29	45	4	37	108	11	28	68	5
13.....	28	24	2	40	107	12	17	51	2
14.....	30	29	2	79	151	32	13	50	a 2
15.....	41	52	6	70	176	33	8.7	50	a 1
16.....	40	39	4	46	74	9	5.1	40	a 1
17.....	27	143	10	41	50	6	6.1	67	1
18.....	25	59	4	32	63	5	6.1	33	1
19.....	32	213	18	26	60	4	7.5	96	2
20.....	31	76	6	21	36	2	4.4	50	a 1
21.....	29	50	a 4	23	94	6	3.3	50	(at)
22.....	29	35	3	14	90	a 3	7.6	71	1
23.....	29	50	a 4	11	77	2	9.2	106	3
24.....	25	70	5	9.2	94	2	5.1	85	1
25.....	26	65	a 5	7.7	81	2	2.6	74	1
26.....	23	60	a 4	7.0	83	2	1.8	126	1
27.....	20	61	3	6.1	80	a 1	1.4	102	(t)
28.....	26	86	6	424	8,450	s 14,300	1.1	65	(t)
29.....	42	109	12	322	9,500	8,260	.7	33	(t)
30.....	40	102	11	159	3,200	1,370	.5	90	(t)
31.....	--	--	--	1,630	11,500	s 81,300	--	--	--
Total.	978	--	208	3,366.0	--	105,497	2,741.2	--	63,575

Total discharge for year (cfs-days)..... 44,621.4
 Total load for year (tons)..... 499,947

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Jan. 14, 1957	12:00 p.	55	55	25	--	--	--	--	--	62	70	98	100	S	
Mar. 20	6:15 p.m.	759	52	2,170	2,940	60	--	84	--	96	99	100	100	SPWCM	
Apr. 26	9:30 a.m.	21	60	31	--	--	--	--	--	68	76	98	100	S	
Aug. 16	9:45 a.m.	1,020	79	3,600	3,380	53	--	71	--	94	98	100	--	VPWCM	
Aug. 25	12:15 p.m.	30	80	160	--	--	--	--	--	86	94	99	100	S	
Aug. 29	11:15 a.m.	16	81	312	--	--	--	--	--	20	34	99	100	V	
Sept. 7	11:00 a.m.	1.6	78	80	--	--	--	--	--	88	93	99	100	S	
Sept. 21	9:45 a.m.	631	64	7,330	3,090	65	--	90	--	97	99	100	--	VPWCM	
Sept. 26	5:00 p.m.	216	69	1,680	4,410	68	--	88	--	92	95	100	--	VPWCM	

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION

Several series of water samples were collected during the months of October 1956, January, March, and June 1957 on the Pecos River and its tributaries beginning at the gaging station near Acme, N. Mex., and ending at the gaging station near Artesia, N. Mex. Samples were collected for chemical analysis at the time of discharge measurement. Discharge data are given in WSP 1512.

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957

Date	Streams or diversion	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ calcium, magne-sium	Specific conductance (micro-mhos at 25°C)	pH
Oct. 17, 1956	Bitter Creek	Near mouth, 6½ miles east of Roswell.	2.07	58	7,660	6,090	--	21,400	--
17	Pecos River.	Just upstream from Rio Hondo, 7 miles east of Roswell.	5.84	238	--	2,230	--	8,810	6.8
17	Hagerman, Inc. well "a".	NE¼NE¼NE¼ sec. 35, T. 10 S., R. 24 E. (empties into Rio Hondo above Hagerman Canal), 3 miles east of Roswell.	5.47	145	--	3,490	--	11,900	8.0
17	Hagerman, Inc. well "b".	NE¼NE¼NE¼ sec. 35, T. 10 S., R. 24 E. (empties into Rio Hondo above Hagerman Canal), 3 miles east of Roswell.	6.34	57	--	3,570	--	11,800	8.0
17	Hagerman Canal.	At head, 5 miles east of Roswell (diverts from Rio Hondo).	24.4	237	1,180	2,610	--	9,440	7.5
17	South Spring Creek.	At entrance to Hagerman Canal, SE¼SE¼SE¼ sec. 8, T. 11 S., R. 25 E., 2½ miles northeast of East Grand Plains.	2.81	218	--	526	--	3,590	7.8
17	Pamona main drain	At entrance to Hagerman Canal, NW¼NW¼SE¼ sec. 22, T. 11 S., R. 25 E., 2½ miles east of East Grand Plains.	4.28	227	1,500	94	--	2,770	7.7
17	Rio Hondo.	At mouth, 7 miles east of Roswell.	5.00	239	1,080	1,350	--	5,750	7.2
17	East Grand Plains Drainage District "D" line.	At mouth, 3.1 miles northeast of East Grand Plains.	.90	324	--	226	--	2,430	7.1
17	East Grand Plains Drainage District "A-B-C" lines.	At mouth, 3.4 miles northeast of East Grand Plains.	.40	273	1,080	238	--	2,710	7.4
17	Gravel Pit drain.	At mouth, 3½ miles east of East Grand Plains.	.49	312	--	186	--	2,410	8.0
17	Pecos River	Below Bottomless Lakes, 4½ miles east of East Grand Plains.	15.2	204	1,240	1,240	--	5,680	8.2
17	Oasis-Miller drain.	At mouth, 4½ miles east of East Grand Plains.	.54	307	--	155	--	3,360	7.4
17	Nine Mile Draw.	At mouth, 3 miles north of Dexter.	.09	185	--	545	--	4,010	7.8
17	Pecos River	At Dexter Bridge, 2¼ miles northeast of Dexter.	12.6	169	--	1,310	--	6,230	7.8
17	Berry ditch	At mouth, 3 miles east of Dexter.	.39	291	--	150	--	3,860	7.7
17	Dexter-Greenfield drain, "E" line.	At mouth, 4 miles northeast of Dexter.	.12	215	--	1,470	--	8,430	8.0
17	Dexter-Greenfield drain, "D" line.	At mouth, 4 miles southeast of Dexter.	.38	237	--	915	--	5,580	7.2
17	Pecos River	0.8 mile upstream from Rio Felix and 2½ miles north of Hagerman.	16.6	164	--	1,110	--	5,790	7.4
17	Rio Felix	0.7 mile upstream from mouth and 2 miles north of Hagerman.	.08	142	2,190	1,860	--	8,150	8.0

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION--Continued

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957--Continued

Date	Streams or diversions	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ calcium, magne-sium	Specific conductance (micro-mhos at 25°C)	pH
Oct. 17, 1956	Hagerman Drainage District, "D" line.	At mouth, 1½ miles northeast of Hagerman.	0.10	361	--	76	--	1,650	7.2
17	Pecos River	Near Lake Arthur (gaging station).	6.99	169	--	4,520	--	15,700	7.9
17	Walnut Creek	Near mouth, ½ mile south of Lake Arthur.	.10	166	--	255	--	3,360	8.2
17	Lake Arthur Drainage District, "B" line.	At mouth, 3½ miles southeast of Lake Arthur.	.03	343	--	590	--	7,270	7.6
17	Lawrence Ranch drain	At mouth, 6¼ miles south of Lake Arthur.	.39	239	--	58	--	2,380	7.6
17	Cottonwood Creek.	Near Lake Arthur (gaging station).	.28	228	--	250	--	3,870	8.2
17	Pecos River	Near Artesia (gaging station).	8.86	137	--	2,310	--	9,830	8.3
Jan. 2, 1957	....do.....	Near Acme (gaging station).	4.98	144	1,830	635	--	4,700	7.5
2	Bitter Creek	Near mouth, 6½ miles east of Roswell.	5.99	102	2,630	4,180	--	15,300	7.4
2	Pecos River	Just upstream from Rio Hondo, 7 miles east of Roswell.	17.1	175	1,870	2,030	--	9,160	6.8
2	Hagerman Canal.	At head, 5 miles east of Roswell (diverts from Rio Hondo).	1.56	241	1,560	1,810	--	7,770	7.1
2	South Spring Creek.	At entrance to Hagerman Canal, SE¼SE¼ sec. 8, T. 11 S., R. 25 E., 2½ miles northeast of East Grand Plains.	3.94	257	1,230	510	--	3,820	7.1
2	Pamona drain.	At entrance to Hagerman Canal, NW¼NW¼ sec. 22, T. 11 S., R. 25 E., 2½ miles east of East Grand Plains.	2.73	255	1,340	88	--	2,590	7.5
2	Rio Hondo...	At mouth, 7 miles east of Roswell.	24.9	256	1,260	1,260	--	5,910	7.3
2	East Grand Plains Drainage District "D" line.	At mouth, 3.1 miles northeast of East Grand Plains.	.70	266	994	265	--	2,690	6.9
2	East Grand Plains Drainage District "A-B-C" lines.	At mouth, 3.4 miles northeast of East Grand Plains.	1.05	292	1,600	318	--	3,620	7.6
2	Gravel Pit drain.	At mouth, 3½ miles east of East Grand Plains.	.84	287	1,080	218	--	2,710	7.7
2	Pecos River.	Below Bottomless Lakes, 4¼ miles east of East Grand Plains.	51.7	226	1,520	1,450	--	6,720	7.1
2	Oasis-Miller drain.	At mouth, 4¼ miles east of East Grand Plains.	.15	169	2,170	350	--	4,360	7.8
2	Nine Mile draw.	At mouth, 3 miles north of Dexter.	.86	193	1,560	410	--	3,740	7.4
2	Pecos River.	At Dexter Bridge, 2¼ miles northeast of Dexter.	54.4	221	1,580	1,470	--	6,860	7.1
2	Berry ditch.	At mouth, 3 miles east of Dexter.	.63	--	2,160	320	--	4,040	8.1
2	Zuber Hollow ditch.	1 mile upstream from mouth and 3 miles east of Dexter.	.45	209	1,920	505	--	4,400	7.6
2	Dexter-Greenfield drain, "A" line.	At mouth, 4 miles southeast of Dexter.	.22	178	1,660	1,000	--	5,420	7.7
2	Dexter-Greenfield drain, "E" line.	At mouth, 4 miles northeast of Dexter.	.09	169	1,870	326	--	3,840	8.1
2	Dexter-Greenfield drain, "D" line.	At mouth, 4 miles southeast of Dexter.	.28	253	2,380	1,520	--	7,790	7.4

a Includes equivalent of 5 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION--Continued

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957--Continued

Date	Streams or diversion	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ , calcium, magne-sium	Specific conductance (micro-mhos at 25°C)	pH
Jan. 2, 1957	Pecos River	0.8 mile upstream from Rio Felix and 2½ miles north of Hagerman.	61.3	222	1,660	1,510	--	6,810	8.1
2	Rio Felix...	0.7 mile upstream from mouth and 2 miles north of Hagerman.	2.63	265	1,830	1,350	--	6,720	7.3
2	Hagerman Drainage District, "D" line.	At mouth, 1½ miles northeast of Hagerman.	.09	392	556	64	--	1,600	7.3
2	Pecos River	Near Lake Arthur (gaging station).	63.2	206	1,780	1,750	--	7,750	7.2
2	Lake Arthur Drainage District, "B" line.	At mouth, 3½ miles southeast of Lake Arthur.	.01	253	2,480	270	--	4,500	8.0
2	Lawrence Ranch drain.	At mouth, 6½ miles south of Lake Arthur.	.05	233	1,360	142	--	2,780	7.6
2	Cottonwood Creek.	Near Lake Arthur (gaging station).	.84	261	2,120	240	--	3,990	7.4
2	Artesia sewage line.	At mouth, 2½ miles east of Artesia.	.11	297	2,020	440	--	4,570	7.6
2	Pecos River	Near Artesia (gaging station).	68.9	181	1,820	1,710	--	7,730	7.9
Mar. 4	.... do	Near Acme (gaging station).	.47	147	--	1,440	--	7,520	7.4
4	Bitter Creek	Near mouth, 6½ miles east of Roswell.	4.88	132	2,540	3,490	2,870	13,300	8.8
4	Pecos River	Just upstream from Rio Hondo, 7 miles east of Roswell.	9.94	182	--	3,360	--	12,800	7.5
4	Hagerman, Inc. well "a".	NE¼NE¼ sec. 35, T. 10S., R. 24 E. (empties into Rio Hondo above Hagerman Canal), 3 miles east of Roswell.	4.86	200	940	3,020	1,320	10,800	7.3
4	Hagerman, Inc. well "b".	.... do	5.24	202	836	2,520	1,240	8,990	7.2
4	Hagerman Canal.	At head, 5 miles east of Roswell (diverts from Rio Hondo).	26.5	230	--	1,930	--	7,990	7.1
4	South Spring Creek.	At entrance to Hagerman Canal. SE¼SE¼ sec. 8, T. 11 S., R. 25 E., 2½ miles northeast of East Grand Plains.	4.07	255	1,230	515	1,760	3,690	7.5
4	Pamona drain.	At entrance to Hagerman Canal. NW¼NW¼SE¼ sec. 22, T. 11 S., R. 25 E., 2½ miles east of East Grand Plains.	3.45	261	1,470	96	1,820	2,770	7.4
4	Rio Hondo ..	At mouth, 7 miles east of Roswell.	6.47	238	--	1,410	--	6,070	7.4
4	East Grand Plains Drainage District "D" line.	At mouth, 3.1 miles northeast of East Grand Plains.	.67	272	965	266	1,430	2,640	7.2
4	East Grand Plains Drainage District "A-B-C" lines.	At mouth, 3.4 miles northeast of East Grand Plains.	1.57	308	1,660	350	2,060	3,780	7.4
4	Gravel Pit drain.	At mouth, 3½ miles east of East Grand Plains.	.88	258	1,160	218	1,560	2,730	7.6
4	Pecos River	Below Bottomless Lake, 4½ miles east of East Grand Plains.	24.5	202	--	1,820	--	7,840	7.7
4	Oasis-Miller drain.	At mouth, 4½ miles east of East Grand Plains.	.41	249	2,170	255	2,530	4,010	7.6
4	Nine Mile draw.	At mouth, 3 miles north of Dexter.	.52	243	1,580	670	2,160	4,490	7.5
4	Zuber Hollow wasteway.	At mouth, 2 miles northeast of Dexter.	.04	166	2,140	605	2,610	4,830	6.9

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION--Continued

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957--Continued

Date	Streams or diversion	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ calcium, magne-sium	Specific conductance (micro-mhos at 25°C)	pH
Mar. 4, 1957	Pecos River.	At Dexter Bridge, 2½ miles northeast of Dexter.	30.0	201	2,370	1,670	--	7,570	7.8
4	Berry ditch.	At mouth, 3 miles east of Dexter.	.42	219	2,330	160	2,740	3,890	8.0
4	Dexter-Greenfield drain, "A" line.	At mouth, 4 miles southeast of Dexter.	.21	245	1,690	910	2,650	5,190	8.1
4	Dexter-Greenfield drain, "E" line.	At mouth, 4 miles northeast of Dexter.	.32	272	2,850	1,150	3,320	7,340	7.6
4	Dexter-Greenfield drain, "D" line.	At mouth, 4 miles southeast of Dexter.	.49	263	2,350	1,430	3,280	7,480	7.7
4	Pecos River.	0.8 mile upstream from Rio Felix and 2½ miles north of Hagerman.	37.4	198	--	1,550	--	7,320	7.6
4	Rio Felix...	0.7 mile upstream from mouth and 2 miles north of Hagerman.	.49	260	1,910	1,480	--	7,060	7.5
4	Hagerman Drainage District, "D" line.	At mouth, 1½ miles northeast of Hagerman.	.02	270	673	124	1,080	1,850	7.0
4	Hagerman Drainage District, "A" line.	At mouth, 2½ miles southeast of Hagerman.	.40	193	2,080	1,310	3,320	6,670	7.3
4	Pecos River.	Near Lake Arthur (gaging station).	48.6	162	--	2,180	--	9,320	7.0
4	Lake Arthur Drainage District, "B" line.	At mouth, 3½ miles southeast of Lake Arthur.	.01	351	4,450	795	5,960	10,500	7.4
4	Lawrence Ranch drain.	At mouth, 6½ miles south of Lake Arthur.	.10	190	4,140	1,490	3,200	10,000	7.8
4	Cottonwood Creek.	Near Lake Arthur (gaging station).	1.01	259	1,930	295	--	4,440	7.3
4	Artesia sewage line.	At mouth, 2½ miles east of Artesia.	.57	317	1,940	330	2,260	4,210	7.4
4	Pecos River.	Near Artesia (gaging station)...	42.7	160	--	2,090	--	9,100	7.2
June 19	Bitter Creek	Near mouth, 6½ miles east of Roswell.	.59	54	--	5,480	--	19,800	7.0
19	Pecos River.	Just upstream from Rio Hondo, 7 miles east of Roswell.	2.74	147	2,040	2,850	--	10,800	8.0
19	Hagerman, Inc. well "a".	NE¼NE¼ sec. 35, T. 10 S., R. 24 E. (empties into Rio Hondo above Hagerman Canal), 3 miles east of Roswell.	3.42	203	--	3,190	--	10,900	7.6
19	Hagerman, Inc. well "b".	....do.....	3.70	202	--	3,120	--	10,700	7.1
19	Hagerman Canal.	At head, 5 miles east of Roswell (diverts from Rio Hondo).	20.0	b122	--	2,080	--	7,840	8.5
19	South Spring Creek.	At entrance to Hagerman Canal, SE¼SE¼ sec. 8, T. 11 S., R. 25 E., 2½ miles northeast of East Grand Plains.	2.16	243	--	475	--	3,430	8.0
19	Pamona drain.	At entrance to Hagerman Canal, NW¼NW¼ sec. 22, T. 11 S., R. 25 E., 2½ miles east of East Grand Plains.	4.84	255	--	100	--	2,920	7.2
19	Flowing well (tributary to Rio Hondo).	¼ mile upstream from mouth and 6½ miles east of Roswell.	1.24	206	1,130	2,200	--	8,370	7.1

b Includes equivalent of 8 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION--Continued

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957--Continued

Date	Streams or diversion	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ calcium, magne-sium	Specific conduct-ance (micro-mhos at 25°C)	pH
June 19, 1957	Rio Hondo	At mouth, 7 miles east of Roswell.	5.03	211	1,090	1,530	--	6,250	7.8
19	East Grand Plains Drainage District "D" line.	At mouth, 3.1 miles northeast of East Grand Plains.	.39	96	820	280	--	2,280	6.3
19	East Grand Plains Drainage District "A-B-C" lines.	At mouth, 3.4 miles northeast of East Grand Plains.	.37	280	1,210	260	--	2,970	7.3
19	Gravel Pit drain.	At mouth, 3½ miles east of East Grand Plains.	.23	236	--	184	--	2,310	8.1
19	Pecos River.	Below Bottomless Lake, 4½ miles east of East Grand Plains.	12.3	132	1,450	1,550	--	6,640	8.0
19	Oasis-Miller drain.	At mouth, 4½ miles east of East Grand Plains.	.26	245	--	160	--	3,210	8.0
19	Nine Mile draw.	At mouth, 3 miles north of Dexter.	.10	170	--	725	--	4,490	7.4
19	Pecos River.	At Dexter Bridge, 2¼ miles northeast of Dexter.	14.1	147	1,570	1,220	--	5,870	8.0
19	Berry ditch.	At mouth, 3 miles east of Dexter.	.84	275	--	155	--	3,950	7.9
19	Dexter-Greenfield drain, "E" line.	At mouth, 4 miles northeast of Dexter.	.12	282	2,910	1,320	--	7,870	7.8
19	Dexter-Greenfield drain, "D" line.	At mouth, 4 miles southeast of Dexter.	.35	279	2,720	1,540	--	8,180	8.1
19	Pecos River.	0.8 mile upstream from Rio Felix and 2½ miles north of Hagerman.	17.3	175	1,830	1,240	--	6,250	8.1
19	Templeton pump diversion.	On left bank of Rio Felix, 1 mile upstream from mouth.	5.07	285	1,800	1,430	--	6,660	7.8
19	Bogle pump diversion from Rio Felix.	On right bank ½ mile upstream from mouth.	-4.35	c 58	1,930	1,510	--	6,860	8.6
19	Rio Felix...	0.7 mile upstream from mouth and 2 miles north of Hagerman.	.17	265	--	1,780	--	7,980	7.0
19	Lankford pump diversion.	1¼ miles northeast of Hagerman.	-5.28	175	--	1,210	--	6,320	7.6
19	Ball pump diversion.	1½ miles northeast of Hagerman.	-2.48	176	1,890	1,200	--	6,360	8.1
19	Michelet pump diversion.	2 miles northeast of Hagerman.	d-8.12 to -6.68	177	--	1,230	--	6,440	7.2
19	Charles Green pump diversion.	2 miles east of Hagerman.	d-3.17 to -3.31	176	--	1,310	--	6,850	7.5
19	Buffalo Valley pump diversion.	6.3 miles northeast of Lake Arthur.	d-6.26 to -7.97	189	2,270	1,680	--	8,130	8.0
19	Parker upper pump diversion.	6.1 miles northeast of Lake Arthur.	d6.92 to 9.80 to 10.1	200	2,540	2,340	--	10,200	7.6
19	Pecos River.	Near Lake Arthur (gaging station)	4.31	128	2,430	3,420	--	12,800	8.0

c Includes equivalent of 7 parts per million of carbonate (CO₃).

d Pump ran at varying rate.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER SEEPAGE INVESTIGATION--Continued

Chemical analyses, in parts per million, of Pecos River and tributaries,
N. Mex., water year October 1956 to September 1957--Continued

Date	Streams or diversion	Location	Dis-charge (cfs)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Hardness as CaCO ₃ calcium, magne-sium	Specific conduct-ance (micro-mhos at 25°C)	pH
June 19, 1957	Lawrence Ranch drain.	At mouth, 6½ miles south of Lake Arthur.	0.60	238	1,630	150	--	3,140	8.0
19	Cottonwood Creek.	Near Lake Arthur (gaging station).	.25	72	1,860	260	--	3,580	8.2
19	Artesia sewage line	At mouth, 2½ miles east of Artesia.	.16	415	--	335	--	3,940	7.6
19	Pecos River.	Near Artesia (gaging station)...	8.15	161	--	1,580	--	7,270	7.9

RIO GRANDE BASIN--Continued

RIO PENASCO AT DAYTON, N. MEX.

LOCATION.--At gaging station 3 feet upstream from crest of abandoned diversion dam, 1 mile northeast of old Dayton railway station, 3½ miles upstream from mouth, and 7 miles south-east of Artesia, Eddy County.

DRAINAGE AREA.--1,070 square miles, approximately.

RECORDS AVAILABLE.--Sediment records: September 1951 to September 1957.

EXTREMES, 1956-57.--Sediment concentrations: Maximum daily, 17,700 ppm Aug. 31; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 48,600 tons Aug. 18; minimum daily, 0 tons on many days.

EXTREMES, 1951-57.--Sediment concentrations: Maximum daily, 30,000 ppm Oct. 7, 1954; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 600,000 tons Oct. 7, 1954; minimum daily, 0 tons on many days each year.

REMARKS.--Records of discharge for water year October 1956 to September 1957 given in VSP 1512.

Suspended sediment, water year October 1956 to September 1957

Flow occurred only on days indicated

Date	Water discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
Apr. 28, 1957.....	21	--	a 250
April Total.....	21	--	250
Aug. 18.....	669	5,120	s 48,600
Aug. 19.....	253	5,980	s 4,980
Aug. 20.....	5	3,000	40
Aug. 31.....	177	17,700	s 14,200
August Total.....	1,104	--	67,820
Sept. 1.....	31	12,000	sb 1,500
September Total.....	31	--	1,500
Total discharge for year (cfs-days).....			1,156
Total annual load (tons).....			69,570

a Computed by subdividing day.

s Computed from water-sediment discharge curve.

b Computed from estimated concentration graph.

Particle-size analyses of suspended sediment, water year October 1956 to September 1957
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of Collection	Time	Dis-charge (cfs)	Water temperature (°F)	Suspended sediment								Methods of analysis
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters						
						0.002	0.004	0.008	0.016	0.031	0.062	
Aug. 19, 1957....	10:00 a.m.	184	70	5,360	4,240	66	84	97	99	99	100	PWCM
Aug. 19....	10:00 a.m.	184	70	5,360	4,580	5	18	73	98	99	100	PN
Aug. 19....	12:00 m.	169	70	5,350	3,900	--	88	--	98	--	100	PWCM
Aug. 19....	2:00 p.m.	158	70	5,250	3,720	--	88	--	99	--	100	PWCM
Aug. 19....	7:00 p.m.	81	70	4,720	3,600	--	93	--	99	--	100	PWCM
Aug. 19....	8:00 p.m.	68	70	4,590	3,380	--	89	--	98	--	100	PWCM
Aug. 31....	9:00 a.m.	627	68	31,900	3,430	--	55	--	93	--	100	PWCM

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER AT DAM SITE 3, NEAR CARLSBAD, N. MEX.

LOCATION.--At gaging station 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, Eddy County.

DRAINAGE AREA.--17,620 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1951 to September 1957.

REMARKS.--Samples collected at approximately weekly intervals. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Bicarbonate (HCO ₃)	Chloride (Cl)	Specific conductance (micromhos at 25° C)	pH
Oct 1, 1956	48	109	380	3,620	--
Oct. 8	37	153	810	5,090	7.2
Oct. 15	32	153	830	5,070	7.3
Oct. 23	37	156	810	5,080	7.4
Nov. 1	32	159	810	5,120	7.4
Nov. 15	30	129	830	5,090	7.9
Nov. 26	28	54	820	5,050	8.1
Dec. 2	30	152	820	5,110	7.8
Dec. 10	30	48	830	5,120	8.1
Dec. 18	31	113	820	5,080	7.8
Dec. 27	32	156	820	5,120	7.7
Jan. 2, 1957	30	140	820	5,110	7.9
Jan. 12	31	155	820	5,150	7.7
Jan. 17	30	153	830	5,140	7.4
Jan. 25	30	153	820	5,140	7.5
Feb. 1	29	154	810	5,130	7.2
Feb. 8	29	150	820	5,110	7.1
Feb. 15	31	147	820	5,110	7.2
Feb. 21	31	150	810	5,110	7.1
Mar. 1	34	113	820	5,110	7.9
Mar. 7	34	150	820	5,160	7.6
Mar. 19	32	154	840	5,160	7.4
Mar. 26	34	146	830	5,180	7.5
Apr. 1	35	158	830	5,150	7.5
Apr. 11	474	114	1,260	6,870	7.1
Apr. 16	295	129	1,310	6,980	7.6
May 1	120	133	1,420	7,420	7.9
May 9	175	113	1,740	8,580	8.0
May 20	29	163	835	5,210	8.1
June 4	24	130	213	1,830	7.2
June 12	22	172	830	5,240	7.4
June 17	21	167	845	5,300	7.7
July 1	258	114	965	5,510	7.0
July 10	18	147	875	5,360	7.1
July 17	314	89	288	3,280	7.1
Aug. 1	48	88	790	4,990	8.0
Aug. 8	329	111	195	2,230	6.5
Aug. 14	234	a127	225	2,390	8.5
Aug. 20	40	b151	230	1,940	8.5
Aug. 27	244	121	215	2,200	7.2
Sept. 3	284	c80	215	2,180	8.3
Sept. 13	192	80	255	2,440	8.2
Sept. 23	181	d71	335	2,820	8.6

a Includes 11 parts per million of carbonate (CO₃).

b Includes 13 parts per million of carbonate (CO₃).

c Includes 2 parts per million of carbonate (CO₃).

d Includes 6 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

CARLSBAD MAIN CANAL AT HEAD, NEAR CARLSBAD, N. MEX.

LOCATION --At gaging station, 220 feet downstream from headgates in Avalon Dam and 5.0 miles north of Carlsbad, Eddy County.

RECORDS AVAILABLE --Chemical analyses: February 1939 to September 1957.

EXTREMES: 1956-57 --Dissolved solids: Maximum, 6 030 ppm May 1-10, 29; minimum, 800 ppm Aug. 19-24.

Hardness: Maximum, 2,730 ppm May 1-10, 29; minimum, 474 ppm Aug. 19-24.

Specific conductance: Maximum daily, 6,360 micromhos May 10, 29; minimum daily, 1,060 micromhos Aug. 20.

EXTREMES: 1939-57 --Dissolved solids: Maximum, 7,430 ppm June 21-28, 1955; minimum, 552 ppm Aug. 24-31, 1954.

Hardness: Maximum, 3,100 ppm June 11-20, 1955; minimum, 336 ppm Aug. 24-31, 1954.

Specific conductance: Maximum daily, 11,100 micromhos June 24, 1955; minimum daily, 401 micromhos June 3, 1948.

REMARKS --Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge furnished by

Surface Water Branch, Santa Fe district for water year October 1956 to September 1957. Monthly diversions to canal below Lake Avalon for water year

October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Per-cent so-dium	So-dium adsorp-tion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium, mag-nesium	Non-carbon-ate				
Oct. 1-4, 1956.....	a2.0	17		488	95	226		108		1,450	355		2.0		2,690	3.66	14.5	1,610	1,520	23	2.5	3,340	7.6
Mar. 31-Apr. 30, 1957	216	14		715	164	792		129		2,260	1,220		2.1		5,230	7.11	3,050	2,460	2,350	41	6.9	6,460	7.8
May 1-10, 29	a101	13		766	200	970		137		2,510	1,500		2.3		6,030	8.20	1,640	2,730	2,620	44	8.1	7,740	7.6
June 16-24	166	10		335	70	339		136		983	514		2.0		2,320	3.16	1,040	1,120	1,010	40	4.4	3,230	7.6
June 25-27	294	14		464	97	483		140		1,410	725		1.8		3,260	4.43	2,590	1,560	1,440	40	5.3	4,260	7.4
June 28-July 7	a215	11		576	131	703		111		1,840	1,060		3.3		4,380	5.96	2,540	1,980	1,880	44	6.9	5,790	7.5
July 14-16	207	14		655	138	666		131		2,050	995		5.1		4,590	6.24	2,570	2,200	2,090	40	6.2	5,840	7.8
July 17-23	195	13		526	79	266		87		1,610	330		2.6		2,870	3.90	1,510	1,640	1,570	26	2.9	3,430	7.4
July 24-27	a70.8	11		298	39	141		87		858	172		3.7		1,570	2.14	300	904	832	25	2.0	2,050	7.7
July 31-Aug. 18	241	15		325	53	192		98		1,010	240		1.1		1,990	2.57	1,230	1,050	974	28	2.6	2,430	7.8
Aug. 19-24	215	5.9		80	71	192		84		421	80		4		1,900	1.09	464	474	398	25	1.4	1,130	7.8
Aug. 25-Sept. 8	299	18		286	45	164		108		853	200		1.3		1,920	2.20	1,310	904	815	28	2.4	2,130	7.5
Sept. 9-30	157	17		351	62	244		103		1,080	320		1.6		2,130	2.90	903	1,130	1,050	32	3.2	2,160	7.3
Weighted average...	b197	14		466	95	430		113		1,440	629		1.9		3,130	4.26	1,660	1,550	1,460	38	4.7	4,000	--

a No flow Oct. 5 to Mar. 30, May 11-28, May 30 to June 15, July 8-13, 28-30.

b Average for 144 days of flow.

RIO GRANDE BASIN--Continued

PECOS RIVER AT CARLSBAD, N. MEX.

LOCATION. --At gaging station at Greene Street bridge in Carlsbad, Eddy County, half a mile upstream from Dark Canyon. DRAINAGE AREA. --18,100 square miles, approximately, (contributing area).

RECORDS AVAILABLE. --Chemical analyses: May 1937 to September 1946, July 1951 to September 1957.

Water temperatures: July 1951 to September 1957.

EXTREMES, 1937-46, 51-57. --Dissolved solids: Maximum, 2,770 ppm July 1-31; minimum, 2,340 ppm Mar. 1-31.

Hardness: Maximum, 1,440 ppm Oct. 1-31, May 1-31; minimum, 1,270 ppm Mar. 1-31.

Specific conductance: Maximum daily, 3,980 micromhos July 14; minimum daily, 3,130 micromhos Nov. 30.

Water temperatures: Maximum, 98°F July 3; minimum, 40°F Jan. 25.

EXTREMES, 1937-46, 51-57. --Dissolved solids: Maximum, 3,590 ppm May 1, 1941; minimum, 360 ppm May 25, 1941.

Hardness: Maximum, 1,970 ppm May 1, 1941; minimum, 280 ppm May 22, 1951.

Specific conductance: Maximum daily, 5,870 micromhos Apr. 25, 1942; minimum daily, 649 micromhos May 22, 1941.

Water temperatures (1951-57): Maximum, 98°F July 3, 1957; minimum, 40°F Jan. 25, 1957.

REMARKS. --Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Oct. 1-31, 1956	27.8	20		371	125	320		183		1,180	580		3.5	2,640	3.59	1,440	1,290	33	3.7	3,630	7.7
Nov. 1-30	27.9	21		345	121	286		192		1,100	485		3.0	2,480	3.37	1,360	1,200	32	3.5	3,440	7.6
Dec. 1-31	27.1	19		330	116	282		186		1,060	480		2.8	2,390	3.25	1,300	1,150	33	3.5	3,320	7.7
Jan. 1-31, 1957	30.0	19		351	110	281		200		1,050	482		3.7	2,390	3.25	1,330	1,160	32	3.4	3,290	7.7
Feb. 1-28	26.6	23		351	110	284		196		1,060	482		3.4	2,410	3.28	1,330	1,170	32	3.4	3,310	7.7
Mar. 1-31	29.9	12		318	116	284		a 118		1,070	480		1.0	2,340	3.18	1,270	1,170	33	3.5	3,330	8.3
Apr. 1-30	26.0	15		341	126	303		b 139		1,140	515		1.1	2,510	3.41	1,370	1,260	32	3.6	3,520	8.3
May 1-31	25.0	18		361	131	319		c 161		1,190	540		.8	2,640	3.59	1,440	1,310	33	3.7	3,640	8.4
June 1-30	23.2	25		337	109	322		152		1,100	510		1.4	2,480	3.37	1,290	1,160	35	3.9	3,410	7.6
July 1-31	16.7	18		373	112	379		d 138		1,240	575		.2	2,770	3.77	1,390	1,280	37	4.4	3,730	8.3
Aug. 1-31	20.1	26		363	106	358		173		1,180	530		2.4	2,650	3.60	1,340	1,200	37	4.2	3,560	7.7
Sept. 1-30	27.4	23		359	108	343		191		1,160	510		2.4	2,600	3.54	1,340	1,180	36	4.1	3,490	7.6
Weighted average	25.6	20		349	116	312		169		1,120	510		2.2	2,510	3.41	1,350	1,210	33	3.7	3,460	--

a Includes 2 parts per million of carbonate (CO₃).

b Includes 1 part per million of carbonate (CO₃).

c Includes 5 parts per million of carbonate (CO₃).

d Includes 4 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

PECOS RIVER AT CARLSBAD, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement, generally in the p. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	85	67	66	46	52	63	75	72	77	93	86	84
2	78	65	65	48	54	64	68	80	76	91	87	84
3	83	63	56	47	45	65	70	70	75	98	87	84
4	80	62	64	58	55	65	70	72	a 75	a 90	84	85
5	83	65	68	60	68	63	72	a 70	80	81	85	84
6	83	67	64	55	55	65	75	75	a 80	82	a 85	85
7	75	65	64	56	66	63	74	78	81	a 88	86	82
8	80	63	58	58	72	73	70	76	80	82	87	77
9	80	--	52	56	70	65	70	78	82	84	a 85	80
10	78	65	56	54	72	67	80	76	82	82	a 85	80
11	78	70	56	50	70	73	75	78	80	84	a 83	80
12	78	68	52	68	70	72	58	72	85	87	81	83
13	76	65	54	65	72	70	52	a 77	84	82	85	83
14	78	65	59	56	70	71	54	95	85	87	86	84
15	78	63	60	58	70	65	70	82	82	87	88	82
16	--	63	58	50	67	70	70	75	80	87	85	79
17	74	62	45	50	50	73	76	80	85	84	87	78
18	73	65	48	50	57	70	75	78	81	85	82	84
19	74	63	48	50	65	70	76	78	83	a 83	85	80
20	73	65	50	52	61	68	78	80	83	82	84	84
21	73	--	57	50	61	69	78	79	84	a 85	84	83
22	73	65	56	48	65	68	75	80	87	85	84	83
23	75	63	55	45	58	63	a 69	80	80	82	84	75
24	73	60	55	42	66	62	--	82	82	85	82	74
25	70	64	57	40	65	65	71	80	88	84	84	78
26	68	65	58	42	68	62	70	76	87	83	86	80
27	73	63	54	45	65	63	76	80	92	85	85	80
28	73	62	56	--	68	66	70	80	91	84	85	76
29	68	62	64	--	--	66	73	75	90	85	85	82
30	72	65	64	53	--	70	71	75	90	85	84	80
31	70	--	60	60	--	75	--	78	--	84	80	--
Average	76	64	57	52	63	67	71	78	83	85	85	81

a Measurement obtained after 6 p. m.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

REFINERY INTAKE CANAL NEAR LOVING, N. MEX.

(Weekly samples taken from canal in sec. 13, T. 23 S., R. 28 E., representing water in Harroun Canal diverted from Pecos River at dam in sec. 11, T. 23 S., R. 28 E.)

Date of collection	Chloride (Cl)	Specific conductance (micromhos at 25°C)
Oct. 4, 1956.....	855	5,030
Oct. 11.....	885	5,160
Oct. 18.....	890	5,170
Oct. 25.....	940	5,340
Nov. 1.....	855	5,010
Nov. 8.....	865	5,070
Nov. 15.....	885	5,190
Nov. 22.....	860	5,060
Nov. 29.....	830	4,960
Dec. 6.....	887	5,050
Dec. 13.....	833	4,970
Dec. 20.....	767	4,680
Dec. 27.....	773	4,760
Jan. 3, 1957.....	780	4,570
Jan. 10.....	753	4,600
Jan. 17.....	760	4,580
Jan. 24.....	747	4,540
Jan. 31.....	747	4,570
Feb. 7.....	740	4,370
Feb. 14.....	733	4,450
Feb. 21.....	737	4,480
Feb. 28.....	713	4,400
Mar. 7.....	683	4,100
Mar. 15.....	707	4,300
Mar. 21.....	720	4,370
Mar. 28.....	863	5,030
Apr. 4.....	757	4,590
Apr. 11.....	717	4,340
Apr. 18.....	720	4,420
Apr. 25.....	733	4,400
May 2.....	740	4,450
May 9.....	823	4,840
May 16.....	837	4,910
May 23.....	810	4,750
May 29.....	727	4,240
June 6.....	610	3,810
June 14.....	647	3,980
June 20.....	737	4,350
June 27.....	750	4,480
July 4.....	753	4,520
July 11.....	723	4,440
July 18.....	757	4,550
July 25.....	820	4,680
Aug. 1.....	635	3,830
Aug. 8.....	610	3,610
Aug. 18.....	22	410
Aug. 22.....	86	680
Aug. 29.....	222	1,360
Sept. 5.....	615	3,570
Sept. 12.....	680	4,020
Sept. 19.....	740	4,360
Sept. 26.....	815	4,700

RIO GRANDE BASIN--Continued
 PECOS RIVER EAST OF MALAGA, N. MEX.
 LOCATION.--One and one-half miles upstream from gaging station near Malaga, Eddy County, and 3 miles downstream from Black River.

DRAINAGE AREA.--19,190 square miles, approximately, above gaging station (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 9,100 ppm June 22 to July 21; minimum, 530 ppm Aug. 18-19.

Hardness: Maximum, 2,700 ppm May 1-8; minimum, 278 ppm Aug. 18-19.

Specific conductance: Maximum daily, 14,600 micromhos July 21; minimum daily, 864 micromhos Aug. 19.

EXTREMES 1937-57.--Dissolved solids: Maximum, 9,100 ppm June 22 to July 21, 1957; minimum, 384 ppm Sept. 21-22, 1941.

Hardness: Maximum, 2,750 ppm June 1-10, 1955; minimum, 254 ppm Sept. 21-22, 1941.

Specific conductance: Maximum daily, 14,600 micromhos July 21, 1957; minimum daily, 450 micromhos Sept. 21, 1941.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Malaga for water year October 1956 to September 1957 given in WSP 1532. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Per-cent so-lu-sion ratio	Specific conduct-ance (micro-mhos at 25°C)	pH		
															Parts per mil-lion	Tons per acre-foot	Tons per day	Calcium, nesium				Non-carbon-ate	
Oct. 1-31, 1956	42.0	23		596	242	1,370		181	0	2,000	2,290		--		6,610	8.99	750	2,480	2,330	55	9,340	7.6	
Nov. 1-30	31.7	28		584	238	1,450		180	0	2,050	2,340		--		6,780	9.22	580	2,440	2,290	56	9,850	7.7	
Dec. 1-31	57.7	21		528	209	902		194	0	1,770	1,510		8.4		5,040	6.85	785	2,180	2,020	47	7,130	7.7	
Jan. 1-31, 1957	62.6	18		528	181	806		202	0	1,670	1,350		8.9		4,660	6.34	788	2,060	1,900	46	7,7	6,500	7.7
Feb. 1-16	45.4	18		508	173	814		179	0	1,640	1,340		7.7		4,590	6.24	563	1,980	1,830	47	8,060	7.6	
Feb. 17-28	23.9	21		548	188	1,150		181	0	1,790	1,860		8.9		5,650	7.68	365	2,140	1,990	54	11	8,060	7.7
Mar. 1-31	20.4	27		598	254	1,540		175	0	2,080	2,540		--		7,120	9.68	392	2,540	2,380	57	13	10,300	7.7
Apr. 1-7	13.9	18		610	244	1,610		179	0	2,090	2,620		--		7,280	9.90	313	2,530	2,380	58	14	10,500	7.9
Apr. 8-30	16.5	21		617	265	1,930		183	0	2,190	3,110		--		8,220	11.2	366	2,630	2,480	61	16	12,000	8.1
May 1-8	22.0	23		609	287	2,000		175	2	2,220	3,260		--		8,490	11.5	304	2,700	2,550	62	17	12,400	8.3
May 9-20	23.2	22		590	273	1,510		103	5	2,180	2,490		--		7,120	9.68	446	2,580	2,500	56	13	10,300	8.4
May 21-29	15.4	18		601	284	2,030		133	6	2,230	3,290		--		8,520	11.6	354	2,670	2,550	62	17	12,600	8.4
May 30-June 3	242	16		389	119	646		135	0	1,260	1,020		4.1		3,520	4.79	2,300	1,460	1,350	49	7.3	5,070	8.2
June 4-9	20.0	20		449	143	1,190		165	0	1,480	1,850		3.4		5,220	7.10	282	1,710	1,570	60	12	7,700	7.5
June 10-20	15.3	31		546	192	1,950		199	0	1,860	3,040		--		7,720	10.5	319	2,150	1,990	66	18	11,300	7.9
June 21	15	32		601	194	2,170		220	0	2,010	3,660		--		8,480	11.5	343	2,300	2,120	67	20	12,300	7.8
June 22-July 21	16.5	32		617	218	2,350		206	0	2,120	3,660		--		9,100	12.4	405	2,440	2,270	68	21	13,300	7.9
July 22-31	30.4	4		560	185	1,420		157	0	1,880	2,240		--		6,390	8.68	524	2,160	2,030	59	13	9,170	7.4
Aug. 1-17	17.9	26		608	215	2,180		188	0	2,070	3,430		--		8,620	11.7	417	2,400	2,250	66	19	12,400	8.2
Aug. 18-19	1.460	7.0		87	15	77		114	17	159	111		1.4		580	.72	2,080	278	136	37	2.0	864	9.0
Aug. 20	180	16		127	30	268		103	7	334	498		5.0		1,250	1.70	540	440	344	57	3.8	2,040	8.5
Aug. 21	27.0	19		195	57	684		144	0	558	760		4.7		2,150	2.92	302	721	603	59	7.8	3,440	8.1
Aug. 22-23	52.0	20		248	76	664		157	0	774	1,020		4.4		2,860	3.92	210	932	803	61	9.5	4,480	8.6
Aug. 24	22	16		318	97	886		129	14	1,000	1,390		5.6		3,780	5.14	225	1,190	1,060	62	11	5,780	8.6
Aug. 25	36.1	116		361	116	1,060		143	7	1,190	1,640		--		4,480	6.09	242	1,990	1,850	63	12	6,750	8.3
Aug. 26-28	18.0	24		409	145	1,480		161	0	1,380	2,320		--		5,860	7.97	285	1,630	1,480	67	16	8,810	7.9
Aug. 29-Sept. 30	23.0	24		514	206	2,050		181	0	1,830	3,210		--		7,920	10.8	492	2,130	1,980	68	19	11,500	8.1
Weighted average	42.1	19		447	166	1,020		173	--	1,480	1,660		--		4,880	6.64	555	1,800	1,660	55	10	7,020	--

a Includes carbonate as bicarbonate.

RIO GRANDE BASIN--Continued

PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.

LOCATION --At Pierce Canyon Crossing, a quarter of a mile downstream from gaging station which is 6 miles southeast of Malaga, Eddy County. DRAINAGE AREA --19,260 square miles, approximately (contributing area). RECORDS AVAILABLE --Chemical analyses: March 1938 to September 1941, October 1951 to September 1957.

Water temperatures: October 1932 to September 1957.

EXTREMES, 1956-57 --Dissolved solids: Maximum, 16,800 ppm July 1-21; minimum, 410 ppm Aug. 18-19.

Hardness: Maximum, 2,860 ppm July 1-21; minimum, 204 ppm Aug. 18-19.

Specific conductance: Maximum daily, 26,500 micromhos July 21; minimum daily, 686 micromhos Aug. 19.

Water temperatures: Maximum, 90° F July 1; minimum, 42° F Dec. 28-29, Jan. 18.

EXTREMES, 1938-41, 1951-57 --Dissolved solids: Maximum, 23,700 ppm Aug. 11-21, 1954; minimum, 280 ppm Sept. 21, 1941.

Hardness: Maximum, 3,420 ppm Aug. 11-21, 1954; minimum, 202 ppm Sept. 21, 1941.

Specific conductance: Maximum daily, 34,400 micromhos Aug. 2, 1954; minimum daily, 433 micromhos Sept. 21, 1941.

Water temperatures: Maximum, 90° F Aug. 2, 1954; minimum, 37° F Dec. 24, 1953, Feb. 5, 1956.

REMARKS --Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Oct. 1-31, 1956 ..	47.7	25		612	289	2,850		182	2,230	4,570		--		10,700	14.6	1,380	2,720	2,570	70	24	15,600	7.5
Nov. 1-30	37.5	27		616	270	2,920		181	2,230	4,630		--		10,800	14.7	1,080	2,650	2,500	71	25	15,600	7.9
Dec. 1-31	66.2	18		554	225	1,840		179	1,930	2,940		--		7,590	10.3	1,360	2,310	2,160	63	17	11,000	7.8
Jan. 1-31, 1957 ..	70.3	17		528	207	1,640		192	1,810	2,620		--		6,920	9.41	1,310	2,170	2,010	62	15	9,970	7.6
Feb. 1-14	54.4	15		507	206	1,640		168	1,770	2,620		--		6,840	9.30	1,000	2,110	1,970	63	16	10,000	7.4
Feb. 15-28	28.9	18		534	230	2,600		169	1,950	4,080		--		9,500	12.9	742	2,280	2,140	71	24	14,000	7.5
Mar. 1-31	23.3	24		615	269	3,600		147	2,350	5,610		--		12,500	17.0	868	2,640	2,520	75	30	18,500	7.8
Apr. 1-30	18.2	19		646	278	3,970		150	2,480	6,150		--		13,600	18.5	868	2,760	2,630	76	33	20,000	7.8
May 1-30	25.7	19		677	278	3,800		170	2,540	5,900		--		13,300	18.1	923	2,630	2,690	74	31	19,500	7.6
May 31	1,600	5.0		212	28	166		84	438	340		0.6		1,230	1.67	1,980	644	575	36	2.8	2,150	7.4
June 1-3	102	14		425	135	897		138	1,390	1,420		4.8		4,350	5.92	1,200	1,620	1,500	55	9.7	6,400	7.4
June 4-6	30.7	13		429	190	1,580		142	1,420	6,010		--		6,320	8.60	1,524	1,250	1,740	65	16	9,780	7.3
June 7-30	18.9	23		536	280	3,880		190	2,120	6,010		--		12,900	17.5	658	2,410	2,250	73	34	19,400	7.4
July 1-21	18.0	21		652	306	3,140		164	2,580	7,970		--		16,800	22.8	816	2,680	2,750	79	42	24,600	7.4
July 22-31	37.3	19		576	241	2,910		134	2,100	4,570		--		10,500	14.3	1,080	2,430	2,300	72	26	15,700	7.4
Aug. 1-17	23.0	16		591	282	4,310		157	2,380	6,700		--		14,400	19.6	1,884	2,680	2,550	76	38	21,000	7.6
Aug. 18-19	1,300	13		64	11	65		145	91	83		1.6		110	.56	1,440	204	88	41	2.0	2,100	8.1
Aug. 20	251	10		90	22	211		115	217	318		5.4		950	1.26	630	315	221	59	5.2	1,570	7.3
Aug. 21	119	8.7		42	526	211		a 125	339	820		1.5		1,920	2.61	363	470	367	71	11	3,520	8.2
Aug. 22-25	32.5	13		191	86	1,370		136	645	2,150		--		4,520	6.15	397	830	718	78	21	7,530	7.8
Aug. 26-31	23.7	13		317	166	2,800		133	1,800	4,370		--		8,960	12.2	975	1,470	1,360	81	32	13,900	7.6
Sept. 1-30	26.7	16		536	250	4,170		158	2,100	6,500		--		13,700	18.6	968	2,410	2,280	79	37	20,000	7.4
Weighted average	45.5	18		465	195	2,170		164	1,660	3,410		--		8,000	10.9	983	1,960	1,830	71	21	11,700	--

a Includes 4 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued

PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957
Once-daily measurement during daylight hours

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	71	60	46	46	45	56	--	66	67	90	80	80
2	71	55	47	--	47	59	67	69	67	87	87	81
3	70	53	48	47	50	59	59	71	70	82	--	84
4	70	54	48	46	52	55	57	69	72	82	82	82
5	74	52	49	45	52	53	57	65	75	86	80	82
6	75	51	50	44	54	53	58	69	79	85	82	83
7	73	52	53	46	55	52	63	63	--	80	82	75
8	74	53	54	58	55	52	58	65	80	84	83	75
9	73	55	50	56	64	58	58	68	79	79	84	75
10	71	58	48	56	59	60	61	68	79	79	84	77
11	68	54	53	--	60	57	62	68	83	80	78	76
12	68	54	52	54	62	59	59	69	81	83	82	80
13	71	53	51	--	59	59	--	66	83	81	82	78
14	66	58	54	--	60	59	--	67	79	--	82	82
15	73	53	51	54	60	60	56	68	81	80	86	76
16	69	51	48	44	58	61	60	67	79	83	84	77
17	72	48	47	44	58	59	62	74	81	82	82	76
18	68	51	49	42	54	58	63	70	75	78	80	77
19	65	54	49	43	52	59	67	70	80	84	73	80
20	65	--	47	44	52	62	68	72	79	80	74	80
21	63	46	50	50	53	57	69	72	80	84	80	73
22	61	--	51	49	55	57	72	72	77	85	80	70
23	62	46	51	46	55	56	63	75	80	82	82	72
24	62	48	46	45	56	51	63	77	80	85	80	71
25	61	47	--	45	54	49	65	75	82	85	80	70
26	62	47	43	46	54	50	65	73	80	84	80	74
27	59	46	--	43	55	55	66	72	83	82	83	74
28	63	47	42	45	62	55	66	77	80	80	82	73
29	63	46	42	47	--	56	63	76	80	84	83	74
30	58	46	--	--	--	69	70	75	89	83	81	76
31	55	--	44	46	--	63	--	64	--	83	82	--
Average	67	51	49	47	55	57	63	70	79	83	81	77

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR RED BLUFF, N. MEX.

LOCATION.--At pipeline bridge, 2½ miles downstream from gaging station at Red Bluff, Eddy County, which is 0.2 mile downstream from Red Bluff Creek, and 5.5 miles upstream from Delaware River.

DRAINAGE AREA.--19,540 square miles, approximately, above gaging station (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1957.

Water temperatures: October 1952 to September 1957.

EXTREMES, 1956-57.--Dissolved solids: Maximum, 17,400 ppm June 26 to July 25; minimum, 588 ppm Aug. 18-19.

Hardness: Maximum, 3,100 ppm May 1-16; minimum, 282 ppm Aug. 18-19.

Specific conductance: Maximum daily, 28,300 micromhos July 21; minimum daily, 978 micromhos Aug. 19.

Water temperatures: Maximum, 89°F July 21; minimum, 43°F Jan. 27.

EXTREMES, 1937-57.--Dissolved solids: Maximum, 22,800 ppm Sept. 1-20, 1953; minimum, 456 ppm June 3, 1948.

Hardness: Maximum, 3,860 ppm Sept. 1-10, 1953; minimum, 256 ppm June 3, 1948.

Specific conductance: Maximum daily, 33,200 micromhos Sept. 18, 1953; minimum daily, 268 micromhos Sept. 19, 1946.

Water temperatures (1952-57): Maximum, 91°F Aug. 7, 1955; minimum, 35°F Dec. 28, 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station at Red Bluff for water year 1956 to September 1957 given in WSP 1512. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)			
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
Oct. 1-31, 1956	52.7			600	293	3,090		74		4,670				11,800	16.0	2,700	2,640	71	25	16,500	6.8	
Nov. 1-30	44.1			577	284	2,890		129		4,430				11,100	15.1	2,610	2,500	71	25	15,600	7.3	
Dec. 1-31, 1957	66.9			542	249	2,000		168		3,090				8,450	11.5	1,480	2,380	65	18	11,600	7.5	
Jan. 1-31, 1957	64.7			523	216	1,660		166		2,720				7,260	9.90	1,310	2,190	62	15	10,300	7.8	
Feb. 1-16	50.6			503	209	1,580		155		2,620				7,030	9.56	960	2,110	1,990	62	15	10,000	7.5
Feb. 17-28	26.8			522	225	2,230		150		3,690				8,890	12.1	643	2,230	2,100	69	21	12,800	7.3
Mar. 1-31	22.8			556	303	3,380		160		5,340				12,500	17.0	770	2,630	2,500	74	29	17,900	7.7
Apr. 1-30	19.1			658	349	3,750		123		5,900				14,100	19.2	727	3,080	2,980	73	29	19,700	7.3
May 1-16	27.0			630	372	4,560		94		7,090				16,100	21.9	1,170	3,100	3,020	76	36	22,800	7.0
May 17-20	25.5			447	294	2,690		95		3,860				9,280	12.6	640	2,080	2,000	69	20	13,600	7.2
May 21-30	21.3			631	340	3,380		74		5,310				12,900	19.5	742	2,970	2,910	71	27	18,000	7.1
May 31-June 1	575			244	59	505		123		830				2,490	3.39	3,870	852	750	56	7.5	3,790	8.0
June 2-14	21.2			421	176	1,200		102		1,980				5,570	7.58	319	1,770	1,690	60	12	8,000	7.7

Month	459	208	2,700	79	4,320	9,720	426	2,000	1,940	75	26	14,400	7.3
June 15-25.....	645	306	5,070	53	8,020	17,400	23.7	841	2,870	79	41	24,600	7.1
June 26-July 25...	552	250	3,200	46	5,170	12,000	16.3	638	2,450	74	28	17,000	7.0
July 26-Aug. 17...	90	14	90	167	143	588	.80	282	145	41	2.3	970	7.5
Aug. 18-19.....	1,263	90	187	302	302	598	2.01	332	225	55	4.5	1,550	7.5
Aug. 20.....	480	23	187	123	572	1,251	1.90	547	412	312	65	2,490	7.4
Aug. 21.....	111	33	349	123	349	1,500	2.04	547	748	628	68	2,490	7.6
Aug. 22-25.....	163	83	715	146	1,220	2,840	3.86	295	345	808	79	7,850	7.5
Aug. 26-29.....	210	69	1,370	152	2,190	4,920	6.69	345	1,310	820	80	12,400	7.3
Aug. 30-Sept. 5...	273	154	2,390	109	3,810	8,030	10.9	594	1,310	820	80	12,400	7.3
Sept. 6-30.....	489	260	4,210	71	6,550	13,900	18.9	1,070	2,290	2,230	38	20,300	7.2
Weighted average	440	201	2,070	131	3,260	8,050	10.9	1,020	1,920	1,800	70	11,400	--

RIO GRANDE BASIN

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR RED BLUFF, N. MEX.--Continued

Temperature (°F of water, water year October 1956 to September 1957
Once-daily measurement, generally in the p.m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	77	62	50	46	51	63	a65	--	a66	88	86	84
2	77	59	50	48	52	63	66	78	72	b87	b86	85
3	77	54	48	47	54	61	64	79	71	b88	b84	84
4	78	58	50	52	57	60	60	70	75	b85	83	84
5	--	55	51	52	57	58	64	--	--	87	83	83
6	--	--	54	31	56	51	65	--	--	87	85	83
7	b75	58	a54	53	59	56	66	b70	84	b85	83	76
8	75	a54	53	54	63	59	63	74	--	82	84	80
9	74	55	48	55	--	--	64	75	82	84	83	79
10	73	60	48	51	a63	--	70	74	81	84	b83	78
11	72	59	50	53	a63	--	69	75	82	84	85	82
12	72	58	52	a48	65	65	60	75	80	--	81	80
13	73	--	51	--	65	--	62	b73	81	85	85	81
14	73	--	a49	--	66	--	60	75	b83	b85	84	81
15	73	54	50	49	64	61	69	b77	84	b83	85	79
16	73	51	--	47	58	62	70	75	85	83	87	78
17	72	52	--	45	--	65	70	70	85	82	84	78
18	70	51	48	44	56	64	71	79	80	84	b76	78
19	70	55	49	46	54	63	71	76	83	84	75	78
20	68	50	47	48	56	61	75	73	83	85	80	78
21	70	49	a49	51	58	65	77	75	87	89	82	78
22	72	--	50	--	55	61	71	75	85	85	82	73
23	66	a45	48	46	54	a56	a68	--	80	83	85	72
24	67	a48	47	48	62	55	--	b80	--	84	85	70
25	65	50	46	49	60	57	a62	80	88	84	86	73
26	--	50	45	46	60	--	--	75	83	--	86	75
27	67	49	45	43	61	61	72	79	86	b84	88	75
28	a64	48	47	47	62	62	65	80	--	--	85	76
29	63	50	48	--	--	62	64	75	b87	b84	84	76
30	63	a50	46	a47	--	64	72	--	87	84	82	76
31	62	--	--	47	--	68	--	69	--	82	82	--
Average	71	53	49	48	59	61	67	75	82	85	84	78

a Measurement obtained in a.m.

b Measurement obtained after 6 p.m.

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW RED BLUFF DAM NEAR ORLA, TEX.

LOCATION.--Just below dam, 3 miles upstream from Salt (Screwbean) Draw, 5 miles northwest of Orla, Reeves County, and 14 miles upstream from gaging station near Orla.

DRAINAGE AREA.--20,720 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1957.

Water temperatures: March 1953 to September 1957.

EXTREMES 1956-57.--Dissolved solids: Maximum, 4,010 ppm Sept. 12-23.

Hardness: Maximum, 3,010 ppm May 1-31; minimum, 1,440 ppm Sept. 12-23.

Specific conductance: Maximum daily, 22,600 micromhos July 26; minimum daily, 4,870 micromhos Aug. 19.

Water temperatures: Maximum, 80°F on several days during July and August; minimum, 43°F, Dec. 28, 29.

EXTREMES 1947-57.--Dissolved solids: Maximum, 13,600 ppm Sept. 17-30, 1953; minimum, 1,090 ppm June 1-2, 1948.

Hardness: Maximum, 3,430 ppm July 1-31; Oct. 1-16, 1953; minimum, 602 ppm June 1-2, 1948.

Specific conductance: Maximum daily, 24,200 micromhos Sept. 28, 30, 1953; minimum daily, 1,610 micromhos June 2, 1948.

Water temperatures (1953-57): Maximum, 80°F on many days during July and August; minimum, 40°F on several days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Orla for water year October 1956 to September 1957 given in WSP 1512. Mean discharge values reported below have been adjusted to reflect inflow from Salt (Screwbean) Draw which enters Pecos River between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Per- cent so- lution adsorp- tion ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate
Oct. 1-31, 1956 ..	25.0	14		681	227	2,460	2,460	103	2,360	3,860		--		9,850	13.1	651	2,630	2,550	67	13,700	7.7
Nov. 1-30	21.2	--	--	--	--	2,010	--	108	2,360	3,240		--		--	--	--	2,630	2,540	62	12,200	7.2
Dec. 1-31	22.4	14		673	245	2,480	2,480	129	2,340	3,930		--		9,740	13.2	589	2,690	2,560	67	14,100	7.6
Jan. 1-31, 1957 ..	47.7	6.2		887	234	2,180	2,180	125	2,340	3,460		--		8,970	12.2	1,160	2,680	2,570	64	12,900	7.8
Feb. 1-28	265	5.0		649	219	2,090	2,090	127	2,220	3,290		--		8,540	11.6	6,110	2,520	2,420	64	12,200	7.6
Mar. 1-31	8.30	5.4		637	231	1,950	1,950	145	2,140	3,140		--		8,170	11.1	183	2,540	2,420	63	11,900	7.7
Apr. 1-30	7.96	8.2		689	249	2,330	2,330	132	2,270	3,780		--		9,390	12.8	202	2,740	2,640	65	13,900	7.5
May 1-31	39.1	3.8		704	305	2,990	2,990	120	2,530	4,800		--		11,400	15.5	1,200	3,010	2,910	68	16,300	7.8
June 1-30	20.3	9.6		617	234	2,460	2,460	99	2,160	3,910		--		9,440	12.8	517	2,500	2,420	68	13,800	7.8
July 1-31	16.9	8.8		617	249	2,880	2,880	80	2,250	4,550		--		10,600	14.4	484	2,560	2,500	71	15,500	7.2
Aug. 1-13	11.8	15		651	283	3,650	3,650	87	2,420	5,760		--		12,800	17.4	408	2,790	2,720	74	18,200	7.6
Aug. 14-16, 20-22 ..	108	12		669	211	2,510	2,510	80	2,290	3,930		--		9,660	13.1	2,820	2,640	2,470	68	13,900	7.5
Aug. 19	13.0	--		--	--	--	--	410	--	650		--		--	--	--	1,450	1,110	--	4,870	7.5
Aug. 23-31	284	14		598	161	1,880	1,880	83	1,990	2,910		--		7,590	10.3	5,820	2,150	2,060	65	11,100	7.5
Sept. 1-11, 24-30 ..	175	11		480	110	1,210	1,210	86	1,470	1,900		3.4		5,230	7.11	2,470	1,650	1,580	61	7,790	7.7
Sept. 12-23	131	6.4		442	81	836	836	68	1,310	1,300		1.6		4,010	5.45	1,420	1,440	1,380	56	5,980	7.6
Weighted average	60.6	8.5		610	196	1,990	1,990	107	2,060	3,130		--		8,050	10.9	1,320	2,330	2,240	65	11,600	--

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER BELOW RED BLUFF DAM NEAR ORLA, TEX.--Continued

Temperature (F°) of water, water year October 1956 to September 1957
Once-daily measurement, generally at 8 a. m.

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	59	48	44	45	56	55	65	71	77	80	79
2	72	58	48	44	--	55	57	63	68	77	80	78
3	72	56	48	44	45	56	56	--	69	77	80	78
4	72	55	49	44	48	56	57	62	70	77	79	78
5	72	55	49	45	49	55	58	61	70	78	79	78
6	73	55	49	45	51	55	56	61	70	78	79	77
7	73	55	49	46	52	54	58	62	70	77	78	76
8	73	56	49	46	51	52	57	62	71	77	78	76
9	73	55	49	48	52	53	55	63	70	76	78	75
10	72	54	49	48	54	53	57	66	70	76	78	75
11	72	54	48	48	54	55	58	67	70	77	78	75
12	72	53	49	48	54	55	58	67	70	76	78	76
13	73	54	48	49	55	55	57	67	71	76	77	76
14	72	55	49	49	55	56	57	67	71	77	78	75
15	72	53	49	50	55	55	57	66	71	76	77	74
16	72	53	48	--	56	55	58	66	71	76	78	74
17	71	51	48	47	55	56	58	67	72	76	80	73
18	70	51	47	46	55	55	59	67	73	76	79	73
19	70	51	48	45	54	56	59	68	73	76	74	73
20	65	49	47	45	54	57	60	69	74	76	77	74
21	67	48	47	46	54	58	60	69	74	77	78	73
22	67	48	47	46	54	59	59	69	74	77	78	72
23	67	48	46	46	54	55	59	69	76	77	77	72
24	68	48	45	45	55	51	66	69	76	77	77	72
25	64	47	45	47	55	51	60	68	76	78	78	71
26	62	48	44	46	--	51	61	70	76	80	78	71
27	62	47	44	45	--	52	62	70	76	80	79	70
28	62	46	43	44	55	52	62	69	76	80	79	70
29	63	46	43	45	--	54	61	70	76	80	78	70
30	60	--	44	46	--	55	62	71	77	80	78	70
31	59	--	44	45	--	55	--	71	--	80	78	--
Average	69	52	47	46	53	55	58	67	72	77	78	74

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR GIRVIN, TEX.

LOCATION.--At supplementary gage at bridge on U. S. Highway 67, about half a mile downstream from Panhandle and Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, 6½ miles downstream from Comanche Creek and 7.8 miles downstream from regular gaging station.

DRAINAGE AREA.--29,560 square miles, approximately (contributing area at supplementary gage).

RECORDS AVAILABLE.--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947, October 1953 to September 1957.

Water temperatures: October 1953 to September 1957.

EXTREMES, 1956-57.--Hardness: Maximum, 4,820 ppm Sept. 1-20; minimum, 330 ppm May 18. Specific conductance: Maximum daily, 24,300 micromhos July 13-15; minimum daily, 790 micromhos Apr. 26.

Water temperatures: Maximum, 92°F June 24; minimum, 40°F Nov. 29, Dec. 29-31.

EXTREMES, 1939-41, 1946-47, 1953-57.--Hardness: Maximum, 5,040 ppm June 1-30, 1956; minimum, 330 ppm May 18, 1957.

Specific conductance: Maximum daily, 25,600 micromhos July 1, 1956; minimum daily, 790 micromhos Apr. 26, 1957.

Water temperatures (1953-57): Maximum, 93°F June 1, 1954; minimum, 38°F Feb. 3, 4, 1956. REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1956 to September 1957 given in WSP 1512.

Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Sodium (Na)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH
						Calcium, magnesium	Non-carbonate				
Oct. 1-15, 20-31, 1956.....	17.8	3,920	61	3,930	6,140	4,280	4,230	67	26	19,800	7.4
Oct. 16-19.....	47.5	2,210	61	2,350	3,560	2,630	2,580	65	19	12,500	7.5
Nov. 1-30.....	23.6	3,860	104	3,880	6,050	4,160	4,080	67	26	20,700	7.6
Dec. 1-31.....	24.1	3,690	159	3,670	5,900	4,020	3,890	67	25	19,900	7.6
Jan. 1-31, 1957..	22.2	3,670	187	3,610	5,800	3,920	3,770	67	25	19,800	8.0
Feb. 1-28.....	54.7	3,240	169	3,150	5,090	3,540	3,400	67	24	17,500	7.8
Mar. 1-31.....	43.2	2,970	112	3,150	4,720	3,380	3,290	66	22	16,800	7.6
Apr. 1-18.....	50.4	3,740	88	3,630	5,800	4,120	4,050	66	25	19,300	7.4
Apr. 19-22.....	163	734	96	960	1,160	1,120	1,040	59	9.5	5,130	7.5
Apr. 23-24, 27, 29-30.....	36.4	1,980	139	2,220	3,060	2,480	2,370	63	17	11,500	7.5
Apr. 25-26, 28...	964	36	82	332	51	411	344	16	.8	924	7.5
May 1-17, 25-27..	24.9	3,570	139	3,530	5,570	3,830	3,720	67	25	19,000	7.5
May 18.....	390	192	107	240	300	330	242	56	4.6	1,570	7.9
May 19, 28.....	71.5	925	101	1,380	1,350	1,480	1,400	58	10	6,340	7.9
May 20-24, 29-31	52.9	1,930	75	2,170	3,040	2,370	2,310	64	17	11,400	7.2
June 1-9.....	45.3	2,260	96	2,370	3,610	2,690	2,610	65	19	13,200	7.5
June 10-30.....	19.1	3,080	72	3,140	4,720	3,340	3,280	67	23	16,700	7.4
July 1-22.....	15.8	4,530	63	4,260	6,970	4,680	4,630	68	29	23,100	7.5
July 23-31.....	23.2	3,040	75	3,290	4,570	3,440	3,380	66	23	16,500	7.1
Aug. 1-31.....	14.8	4,380	68	4,440	6,920	4,750	4,690	67	28	22,900	7.5
Sept. 1-20.....	13.9	4,570	69	4,610	7,070	4,820	4,760	67	29	23,400	7.5
Sept. 21-30.....	31.4	2,280	39	2,440	3,540	2,610	2,540	66	19	13,100	7.6
Weighted average	37.9	2,420	107	2,510	3,790	2,760	2,670	66	20	13,270	--

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

PECOS RIVER NEAR GIRVIN, TEX.--Continued

Temperature (°F) of water, water year October 1956 to September 1957

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	55	52	42	58	62	66	78	75	90	--	72
2	78	54	46	52	58	64	57	78	70	90	--	76
3	80	54	45	54	63	67	58	78	76	88	--	76
4	78	52	49	60	63	62	68	74	73	86	--	73
5	70	50	48	58	64	60	66	--	78	88	--	75
6	68	53	59	60	64	62	65	67	--	88	--	69
7	69	52	57	61	62	62	66	--	78	86	--	72
8	68	56	60	--	62	--	67	--	--	85	--	75
9	68	58	54	62	64	--	--	--	--	85	--	79
10	68	65	56	56	69	62	72	--	73	88	--	72
11	67	63	58	58	69	64	73	--	75	88	--	82
12	70	62	54	58	69	68	60	--	78	82	--	79
13	73	61	58	59	68	70	63	--	88	88	--	80
14	70	61	56	56	68	64	57	--	88	87	--	80
15	76	--	56	50	68	64	65	--	87	86	--	75
16	75	--	53	56	61	--	--	--	88	--	--	76
17	72	57	52	48	51	64	65	--	81	--	87	76
18	68	55	49	44	55	64	65	--	81	--	87	78
19	80	52	--	46	55	65	69	--	89	--	86	79
20	69	53	54	52	60	66	72	--	85	--	89	78
21	68	55	56	51	61	69	72	--	90	--	86	71
22	64	49	54	52	61	69	77	--	80	--	72	71
23	70	51	54	45	58	68	77	--	84	--	73	74
24	68	52	56	52	58	--	77	--	92	--	73	68
25	67	51	46	46	64	51	65	--	81	--	70	75
26	69	56	46	46	64	61	65	--	81	--	81	78
27	72	48	46	48	62	64	68	--	87	--	81	80
28	70	46	51	48	62	66	61	--	85	--	86	--
29	71	40	40	54	--	67	65	--	83	--	82	80
30	64	43	40	50	--	70	69	81	87	--	83	65
31	60	--	40	50	--	67	--	79	--	--	84	--
Average	71	54	52	53	62	64	67	--	82	--	--	75

RIO GRANDE BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO
Chemical analyses, in parts per million, water year October 1956 to September 1957

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Percent non-carbonate	Soil adsorption ratio	Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Tons per day	Calcium-magnesium	Non-carbonate			

RIO HONDO AT ARROYO HONDO

Aug. 13, 1957.....		8.9				3.0		70									63	6	9	0.2	138	7.3
Aug. 25.....		7.6				2.9		69			0.5	1.5					65	8	9	.2	145	7.1

EMBUDO CREEK AT DIXON

Aug. 24, 1957.....		14				5.6		145			0.5						129	10	9	0.2	269	7.7
Aug. 26.....		8.0				3.5		122			1.0						118	18	6	.1	232	7.5

RIO GRANDE AT ALBUQUERQUE

Feb. 18, 1957.....	732	21	0.08	55	8.8	37	4.3	158		101	18	0.6	0.8	0.10	325	0.44	642	173	44	31	1.2	498	7.8
Mar. 19.....	165	--	--	55	10	38		172			17				330	.45	165	178	37	32	1.2	506	7.9
Apr. 16.....	732	--	--	42	8.8	31		128		13	13				270	.37	534	141	36	32	1.1	411	8.2
June 3.....	3,920	--	--	19	2.6	16		a 45			7.5				140	.19	1,480	58	16	38	.9	195	9.0
June 24.....	4,690	--	--	32	3.6	14		96			5.0				168	.23	2,130	95	16	24	.6	248	8.0
July 22.....	3,220	--	--	31	4.7	17		102			6.2				187	.25	1,630	97	14	28	.8	265	7.9
Aug. 12.....	2,940	--	--	54	8.3	30		138		14					--	--	--	168	56	28	1.0	444	7.6
Sept. 16.....	1,310	19		--	--	18		120			8.0				--	--	--	126	28	24	.7	328	7.7

TIJERAS CREEK AT TIJERAS

July 26, 1957.....				36	2.8	2.2		122							175	0.24		102	2	5	0.1	202	7.5
Aug. 10.....				44	4.0	4.2		123			1.5							126	26	7	.2	254	7.6

SAN JOSE RIVER AT U.S. HIGHWAY 66, NEAR LAGUNA PUEBLO

July 26, 1957.....				33	8.1	80		109			17				400	0.54		118	26	60	3.2	557	7.8
Aug. 19.....				67	15	75		142			40							228	112	42	2.1	769	7.5

RIO PUERCO AT U.S. HIGHWAY 66, NEAR CORRO

July 16, 1957.....				187	31	166		201			22				1,290	1.75	2,010	594	430	38	3.0	1,920	7.3
July 26.....				306	74	170		156			15				1,980	2.67		1,070	940	26	2.3	2,180	7.2
Aug. 7.....				143	24	192		192			19				--	--		456	298	48	3.9	1,550	7.5

a Includes 6 parts per million of carbonate (CO₂)

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Bicarbonate (HCO ₃)	Chloride (Cl)	Specific conductance (micromhos at 25° C)	pH
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PECOS RIVER BELOW LAKE McMILLAN DAM, NEAR LAKEWOOD

Oct. 11, 1956	0.2	82	278	3,270	6.9
Sept. 27, 1957	132	86	148	1,770	7.2

PECOS RIVER AT FORD CROSSING IN MAJOR JOHNSON SPRING AREA, NEAR LAKEWOOD

Oct. 1, 1956		129	623	4,430	8.0
Oct. 25		172	787	5,020	6.8
Nov. 8		175	793	5,020	7.9
Dec. 17		171	785	5,050	7.3
Jan. 2, 1957		170	795	5,030	7.2
Jan. 15		191	780	4,920	7.2
Jan. 22		169	780	5,040	7.4
Feb. 5		166	785	5,040	7.8
Feb. 19		168	770	5,070	7.3
Mar. 4		167	785	5,080	7.3
Mar. 18		172	780	5,070	7.3
Apr. 2		173	770	5,080	7.2
May 3		131	1,650	8,420	7.5
May 17		177	785	5,160	7.7
May 27		181	780	5,110	7.6
June 15		138	760	4,970	8.0
July 12		184	805	5,170	6.8
Aug. 9		100	147	1,980	7.2
Aug. 23		172	735	4,370	7.1
Sept. 13		98	172	2,020	7.1
Sept. 27		82	206	2,090	7.2

PECOS RIVER BELOW MAJOR JOHNSON SPRING, NEAR CARLSBAD

Oct. 1, 1956		156	747	4,840	7.6
Dec. 17		160	815	5,090	7.7
Jan. 2, 1957		161	820	5,110	7.6
Jan. 15		161	815	5,100	7.7
Jan. 22		157	815	5,100	7.4
Feb. 5		157	805	5,090	7.5
Feb. 19		151	820	5,090	7.9
Mar. 4		161	825	5,120	7.4
Mar. 18		161	820	5,120	7.2
Apr. 2		163	820	5,140	7.2
Apr. 19		135	1,150	6,410	7.1
May 3		136	1,440	7,530	7.1
May 17		170	810	5,120	7.1
May 27		154	785	5,030	7.4
June 15		164	785	5,020	7.1
June 28		120	945	5,390	6.8
July 12		170	770	4,970	7.0
July 26		104	590	4,170	7.2
Aug. 9		102	172	2,100	7.0
Aug. 23		165	770	4,790	7.4
Sept. 13		101	282	2,530	7.2
Sept. 27		95	374	2,880	7.4

BLACK RIVER BELOW MAYES RANCH, NEAR WHITE CITY

Oct. 31, 1956	b 0.84	170	11	2,180	7.7
Nov. 21	b 1.11	225	9.0	2,240	7.5
Dec. 20	b .93	225	12	2,230	7.3
Jan. 21, 1957	b 1.29	224	--	2,250	7.4
Feb. 27	b 1.39	227	12	2,370	7.3
Mar. 26	b 1.25	208	10	2,220	7.3
Apr. 18	b .99	224	12	2,230	7.2
May 27	d 1.20	209	9.5	2,200	7.9
June 17	b .70	219	9.5	2,200	7.9
July 29	b .77	--	9.0	2,080	7.9
Aug. 27	b .96	228	11	2,210	7.4
Sept. 26	b 1.01	127	9.0	2,130	7.8

b Discharge at time of sampling.

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Chemical analyses, in parts per million, water year October 1956 to September 1957--Continued

Date of collection	Mean discharge (cfs)	Bicarbonate (HCO ₃)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH
BLACK RIVER AT HARKEY CROSSING SEC. 9, T. 24 S., R. 27 E., NEAR MALAGA					
Nov. 9, 1956.....		198	30	1,940	7.8
Dec. 18		205	26	1,930	7.4
Jan. 30, 1957		178	28	1,920	7.8
Mar. 12		186	23	1,880	7.7
Apr. 25		197	22	1,760	7.5
June 7		214	18	1,650	7.8
July 18		169	20	1,650	7.5
Aug. 28		c 138	14	1,270	8.4

c Includes 4 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis	
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
RIO GRANDE AT COCHITI															
Oct. 3, 1956 Oct. 16 Oct. 30 Oct. 30 Nov. 14 Nov. 27 Dec. 11 Dec. 26 Jan. 8, 1957 Jan. 21 Feb. 5 Feb. 19 Mar. 18 Apr. 1 Apr. 15 May 2 May 16 May 29 June 12 June 26	1:45 p. m.	24	71	20	--	--	--	--	--	--	77	89	100	--	S
	1:00 p. m.	53	62	26	--	--	--	--	--	--	94	96	100	--	S
	1:20 p. m.	95	52	49	--	--	--	--	--	--	87	90	98	100	S
	12:40 p. m.	280	46	847	1,400	10	15	15	15	15	36	64	83	99	VPWCM
	12:30 p. m.	331	39	710	--	--	--	--	--	--	27	76	100	--	V
	1:00 p. m.	435	33	953	1,410	5	5	9	9	28	63	98	100	--	VPWCM
	2:15 p. m.	345	32	724	--	--	--	--	--	8	19	55	94	100	V
	11:50 a. m.	352	39	384	--	--	--	--	--	16	45	87	100	--	V
	11:40 a. m.	366	35	684	--	--	--	--	--	22	37	80	100	--	V
	2:15 p. m.	396	44	426	--	--	--	--	--	13	35	84	100	--	V
	11:00 a. m.	676	44	2,870	4,140	22	23	23	23	32	40	49	62	96	VPWCM
	2:30 p. m.	304	52	195	--	--	--	--	--	51	54	91	100	--	V
	2:20 p. m.	380	54	1,330	1,010	9	9	11	11	13	13	40	90	100	VPWCM
	4:00 p. m.	985	58	4,710	3,870	37	37	52	52	62	68	73	81	98	VPWCM
	1:30 p. m.	1,220	62	1,760	4,490	16	16	22	22	43	65	86	89	98	VPWCM
	4:00 p. m.	3,370	54	2,550	3,880	12	12	16	16	26	49	85	96	100	VPWCM
3:00 p. m.	3,470	62	2,770	3,410	7	7	9	9	19	32	63	87	100	VPWCM	
5:00 p. m.	5,580	62	5,410	4,360	8	8	13	13	20	25	36	58	90	VPWCM	
5:40 p. m.	4,500	67	3,940	1,680	5	5	6	6	14	22	51	80	96	VPWCM	

RIO GRANDE AT SAN FELIPE

Oct. 4, 1955	3:45 p. m.	82	73	108	--	--	--	66	91	99	100	--	S
Oct. 17	2:15 p. m.	119	56	196	--	--	--	37	76	98	100	--	S
Oct. 31	3:15 p. m.	160	54	693	1,160	12	17	34	78	99	100	--	VPWCM
Nov. 14	3:20 p. m.	255	47	995	2,180	9	15	47	92	100	--	--	VPWCM
Nov. 27	3:30 p. m.	325	43	1,210	1,440	4	8	28	85	100	--	--	VPWCM
Dec. 13	3:15 p. m.	376	39	1,300	1,440	4	6	22	77	100	--	--	VPWCM
Dec. 26	1:05 p. m.	320	35	1,190	--	--	--	9	60	99	100	--	V
Jan. 8, 1957	2:40 p. m.	358	43	1,140	--	--	--	24	72	97	100	--	V
Jan. 21	2:30 p. m.	358	37	1,794	--	--	--	46	82	99	100	--	V
Feb. 5	10:45 a. m.	394	41	756	--	--	--	21	60	99	100	--	V
Feb. 19	2:00 p. m.	680	45	6,060	3,340	24	28	69	96	100	--	--	VPWCM
Mar. 4	3:30 p. m.	428	49	1,060	3,280	28	36	50	77	98	99	100	VPWCM
Mar. 19	10:45 a. m.	407	48	1,450	--	--	--	13	26	59	78	98	V
Apr. 2	10:50 a. m.	52	52	1,080	1,720	13	15	23	33	50	72	100	VPWCM
Apr. 16	1:40 p. m.	1,080	59	3,920	3,980	31	50	69	90	98	100	--	VPWCM
May 1	11:15 a. m.	1,160	61	1,710	3,370	13	19	40	74	95	100	--	VPWCM
May 15	2:30 p. m.	3,520	57	3,360	3,910	14	19	35	54	76	83	100	VPWCM
May 28	1:20 p. m.	3,170	61	2,250	3,690	10	11	21	40	83	97	100	VPWCM
June 13	11:00 a. m.	5,200	64	2,670	3,920	11	17	28	47	77	94	100	VPWCM
June 28	2:00 p. m.	4,400	73	2,160	3,440	7	11	25	43	78	98	100	VPWCM

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Particle-size analyses of suspended sediment, water year October 1956 to September 1957--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipet; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed; V, visual accumulation tube)

Date of collection	Time	Discharge (cfs)	Water temperature (°F)	Suspended sediment										Methods of analysis		
				Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500	1.000
RIO GRANDE AT ALBUQUERQUE																
Nov. 15, 1956	4:30 p. m.	64	42	1,170	3,050		66		89		90	92	95	100	--	SPWCM
Nov. 26	3:30 p. m.	138	41	1,440	2,960		55		83		89	94	99	100	--	SPWCM
Dec. 1	12:05 p. m.	290	38	1,020	1,690		17		26		44	72	99	100	--	VPWCM
Dec. 24	12:15 p. m.	346	44	756	--		--		--		48	61	92	100	--	V
Jan. 7, 1957	3:30 p. m.	376	43	936	2,450		27		40		51	59	82	99	100	VPWCM
Jan. 21	2:30 p. m.	428	44	1,880	3,170		35		55		66	78	98	100	--	VPWCM
Feb. 4	3:10 p. m.	346	46	827	2,540		35		49		68	80	96	100	--	VPWCM
Feb. 18	3:40 p. m.	794	48	4,450	4,440		43		56		86	95	98	100	--	VPWCM
Mar. 8	12:20 p. m.	364	50	2,640	3,770		56		67		86	94	98	100	--	VPWCM
Mar. 19	2:30 p. m.	188	51	585	2,170		38		49		79	87	99	100	--	VPWCM
Apr. 1	3:50 p. m.	102	53	618	3,750		52		69		91	99	100	--	--	SPWCM
Apr. 16	3:45 p. m.	920	66	8,170	4,270		31		45		76	96	99	100	--	VPWCM
Apr. 30	4:00 p. m.	4,470	68	4,470	3,980		13		19		45	76	89	98	100	VPWCM
May 14	3:15 p. m.	4,020	82	9,490	5,100		10		14		34	54	69	90	98	100
May 27	12:10 p. m.	3,040	65	3,910	3,870		9		14		30	73	94	99	100	VPWCM
June 10	12:45 p. m.	5,500	67	5,540	2,860		10		15		29	65	86	97	100	VPWCM
June 24	3:45 p. m.	4,860	75	8,490	3,630		3		5		12	26	51	94	100	VPWCM
RIO GRANDE NEAR BELEN																
Dec. 27, 1956	2:20 p. m.	215	44	882	--		--		--		87	90	98	100	--	S
Jan. 7, 1957	3:00 p. m.	290	48	3,520	--		--		--		29	29	37	70	99	V
Jan. 21	2:00 p. m.	378	45	1,890	3,300		59		78		86	89	99	100	--	VPWCM
Feb. 4	1:30 p. m.	315	45	991	4,300		43		65		77	84	95	100	--	VPWCM
Feb. 18	2:00 p. m.	790	51	3,470	4,970		64		86		86	90	99	100	--	VPWCM
Mar. 4	3:10 p. m.	262	53	1,220	3,960		56		78		94	97	100	--	--	SPWCM
Mar. 19	12:00 m.	192	52	494	2,150		58		78		90	95	100	--	--	SPWCM

RIO GRANDE NEAR BELEN--Continued

Apr. 1, 1957	4:00 p. m.	128	56	354	1,430		46		62		89	94	99		100	--	SPWCM
Apr. 15	12:15 p. m.	116	64	799	5,480		66		89		96	97	99		100	--	SPWCM
Apr. 29	2:45 p. m.	986	60	3,440	4,170		33		52		84	95	100		--	--	VPWCM
May 15	3:00 p. m.	3,640	61	7,960	3,960		18		27		55	73	90		98	100	VPWCM
May 27	12:30 p. m.	2,930	64	5,210	3,960		14		25		57	84	97		100	--	VPWCM
June 24	2:10 p. m.	4,100	85	3,200	3,590		14		22		46	81	98		100	--	VPWCM

RIO GRANDE AT SAN ACACIA

Jan. 14, 1957 ...	10:00 a. m.	425	48	9,050	3,410		23		30		56	84	100		--		VPWCM
June 4,	1:05 p. m.	3,260	70	5,400	3,400		30		37		60	84	98		100		VPWCM
July 8,	9:00 a. m.	4,650	75	4,950	4,040		22		27		55	80	98		100		VPWCM

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957			
Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)
RIO GRANDE AT EMBUDO			
Oct. 26, 1956	183	32	16
Nov. 23	239	252	163
Dec. 27	246	24	16
Feb. 14, 1957	343	64	59
Mar. 25	282	29	22
Apr. 17	565	469	715
May 5	802	410	888
May 11	2,300	1,010	1,840
June 13 (3:15 p. m.)	4,380	516	6,100
June 13 (3:30 p. m.)	4,380	524	6,200
June 19	2,680	203	1,470
June 24	3,280	236	2,090
July 3	3,700	259	2,590
July 10	2,600	160	1,120
July 18	1,960	381	2,020
July 26	2,100	387	2,190
July 29	3,280	674	5,970
Aug. 1	4,530	745	9,110
Aug. 13	1,390	1,010	3,870
Aug. 30 (1:45 p. m.)	1,730	2,880	13,500
Aug. 30 (2:00 p. m.)	1,730	3,720	17,400
Sept. 12	766	78	161

COCHITI EAST SIDE MAIN CANAL NEAR COCHITI

Oct. 3, 1956	91	36	9
Oct. 16	91	42	10
Oct. 30	68	73	13
Mar. 12, 1957	61	609	100
Mar. 18	53	114	16
Mar. 25	67	362	65
Apr. 1	64	143	25
Apr. 8	64	182	31
Apr. 15	68	2,750	505
Apr. 23	68	1,580	290
May 2	74	1,090	218
May 7	82	2,470	547
May 16	78	956	201
May 21	73	841	166
May 29	104	803	225
June 4	91	1,130	278
June 12	84	1,190	270
June 20	80	711	154
June 26	98	611	162

RIO PUERCO BELOW CABEZON

Mar. 6, 1957	1.9	59,200	315
May 3	9.0	53,800	1,360
May 9	60	58,100	9,930
May 16	29	32,300	2,620
May 24	12	29,300	949
May 29	94	77,800	20,500
June 4	71	49,900	9,920
June 13	44	27,400	3,260
July 30	4.6	34,300	442
July 31	17	76,800	3,680
Aug. 8	27	42,400	3,210
Aug. 21	11	18,800	558

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957--Continued

Date		Discharge (cfs)	Suspended sediment	
			Mean concentration (ppm)	Discharge (tons per day)
CHICO ARROYO NEAR GUADALUPE				
Mar. 6, 1957	0.5	26,300	36	
May 9	8.4	44,200	1,040	
June 4	8.2	20,200	447	
June 13	6.1	34,600	591	
July 30	152	68,700	29,200	
July 31	16	28,700	1,240	
Aug. 8	428	76,900	92,200	
Aug. 21	146	42,100	17,200	
Sept. 5	2.8	1,640	12	

RIO PUERCO AT RIO PUERCO

Aug. 25, 1957 (2:50 p. m.) .	6,960	216,000	4,660,000
Aug. 25 (3:40 p. m.)	7,440	173,000	3,860,000

SILI MAIN CANAL NEAR COCHITI

Oct. 3, 1956	35	19	2
Oct. 16	38	24	2
Oct. 30	34	64	6
Mar. 12, 1957	31	637	53
Mar. 18	29	113	9
Mar. 25	36	191	19
Apr. 1	43	147	17
Apr. 8	35	231	22
Apr. 15	44	2,650	315
Apr. 23	31	1,610	135
May 2	42	709	80
May 7	53	1,450	207
May 16	47	559	71
May 21	49	650	86
May 29	47	334	42
June 4	46	1,140	142
June 12	44	989	117
June 20	43	686	80
June 26	44	470	56

RIO GRANDE AT COCHITI

Oct. 3, 1956	24	20	1
Oct. 8	30	27	2
Oct. 16	53	26	4
Oct. 22	73	33	7
Oct. 30	95	49	13
Nov. 5	250	856	578
Nov. 14	280	847	640
Nov. 19	268	487	352
Nov. 27	331	710	635
Dec. 3	345	504	469
Dec. 11	435	953	1,120
Dec. 17	370	576	575
Dec. 26	345	724	674
Dec. 31	353	667	636
Jan. 8, 1957	352	384	365
Jan. 14	428	764	883
Jan. 21	386	684	676
Jan. 30	352	508	483
Feb. 5	396	426	455
Feb. 11	428	528	610
Feb. 19	676	2,870	5,240
Feb. 28	649	2,200	3,860

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)

RIO GRANDE AT COCHITI--Continued

Mar. 12, 1957.....	412	851	947
Mar. 18	304	195	160
Mar. 25	373	346	348
Apr. 1	380	1,330	1,360
Apr. 8	380	290	298
Apr. 15	985	4,710	12,500
Apr. 23	1,910	2,530	13,000
May 2	1,220	1,760	5,800
May 7	3,090	6,010	50,100
May 16	3,370	2,550	23,200
May 21	3,840	907	9,400
May 29	3,470	2,770	26,000
June 4	4,850	1,150	15,100
June 12	5,580	5,410	81,500
June 20	3,910	5,020	53,000
June 26	4,500	3,940	47,900

RIO GRANDE AT SAN FELIPE

Oct. 4, 1956	82	108	24
Oct. 9	88	115	27
Oct. 17	119	196	63
Oct. 22	129	337	117
Oct. 31	160	693	299
Nov. 7	290	1,780	1,390
Nov. 14	255	995	685
Nov. 20	259	1,490	1,040
Nov. 27	325	1,210	1,060
Dec. 3	352	1,380	1,310
Dec. 13	376	1,300	1,320
Dec. 17	364	1,460	1,430
Dec. 26	320	1,190	1,030
Dec. 31	320	1,100	950
Jan. 8, 1957	358	1,140	1,100
Jan. 14	449	1,570	1,900
Jan. 21	358	794	767
Jan. 30	358	712	688
Feb. 5	394	736	783
Feb. 11	435	736	864
Feb. 19	680	6,060	11,100
Feb. 25	613	1,370	2,270
Mar. 4	428	1,060	1,220
Mar. 12	449	2,240	2,720
Mar. 19	407	1,450	1,590
Mar. 26	394	423	450
Apr. 2	470	1,090	1,380
Apr. 9	478	747	964
Apr. 16	1,080	3,920	11,400
Apr. 24	1,760	1,010	4,800
May 1	1,160	1,710	5,360
May 7	2,590	3,890	27,200
May 15	3,520	3,360	31,900
May 23	3,980	2,400	25,800
May 28	3,170	2,250	19,300
June 3	4,150	2,310	25,900
June 13	5,200	2,670	37,500
June 20	4,540	1,270	15,600
June 28	4,400	2,160	25,700

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957--Continued

Periodic determinations of suspended-sediment discharge		Suspended sediment	
Date	Discharge (cfs)	Mean	Discharge
		concentration (ppm)	(tons per day)
RIO GRANDE AT ALBUQUERQUE			
Nov. 5, 1956	16	261	11
Nov. 15	64	1,170	202
Nov. 20	33	974	87
Nov. 26	138	1,440	537
Dec. 3	160	1,390	600
Dec. 11	290	1,020	799
Dec. 17	329	839	745
Dec. 24	346	756	706
Jan. 2, 1957	400	1,320	1,430
Jan. 7	376	936	950
Jan. 14	428	1,530	1,770
Jan. 21	428	1,880	2,170
Jan. 28	421	1,190	1,350
Feb. 4	346	827	773
Feb. 11	358	815	788
Feb. 18	794	4,450	9,540
Feb. 26	684	4,180	7,720
Mar. 8	364	2,640	2,590
Mar. 12	290	1,400	1,100
Mar. 19	188	585	297
Mar. 25	250	1,070	722
Apr. 1	102	618	170
Apr. 9	159	828	355
Apr. 16	920	8,170	20,300
Apr. 22	1,690	9,920	45,300
Apr. 30	971	4,470	11,700
May 3	1,640	6,950	30,800
May 6	2,010	11,900	64,600
May 14	4,020	9,490	103,000
May 21	3,430	4,690	43,400
May 27	3,040	3,910	32,100
June 3	3,880	7,010	73,400
June 10	5,500	5,540	82,300
June 17	4,940	12,000	160,000
June 24	4,860	8,490	111,000

RIO GRANDE NEAR BELEN

Oct. 18, 1956	18	58	3
Oct. 24	16	59	3
Nov. 6	18	105	5
Nov. 12	25	164	11
Nov. 26	34	223	20
Dec. 4	54	189	28
Dec. 18	203	2,120	1,160
Dec. 27	215	882	512
Dec. 31	218	875	515
Jan. 7, 1957	290	3,520	2,760
Jan. 14	325	1,640	1,440
Jan. 21	378	1,890	1,930
Jan. 28	315	1,310	1,110
Feb. 4	315	991	843
Feb. 11	320	878	759
Feb. 18	790	3,470	7,400
Feb. 25	676	3,280	5,990
Mar. 4	262	1,220	863
Mar. 11	254	1,110	761
Mar. 19	192	494	256
Mar. 25	246	845	561

WESTERN GULF OF MEXICO BASINS

RIO GRANDE BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RIO GRANDE BASIN IN NEW MEXICO--Continued

Periodic determinations of suspended-sediment discharge, water year October 1956 to September 1957--Continued

Date	Discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Discharge (tons per day)

RIO GRANDE NEAR BELEN--Continued

Apr. 1, 1957	128	354	122
Apr. 9	172	793	368
Apr. 15	116	799	250
Apr. 23	1,250	4,010	13,500
Apr. 29	986	3,440	9,160
May 6	2,240	4,940	29,900
May 15	3,640	7,960	78,200
May 20	3,350	7,000	63,300
May 27	2,930	5,210	41,200
June 3	4,140	7,890	88,200
June 17	4,860	4,360	57,200
June 24	4,100	3,200	35,400

RIO GRANDE AT SAN ACACIA

Jan. 14, 1957	425	9,050	10,400
Feb. 1	414	5,320	5,950
Feb. 8	438	2,840	3,360
Apr. 11	15	475	19
May 6	1,260	7,850	26,700
June 4	3,260	5,400	47,500
June 13	4,440	10,900	131,000
July 8	4,650	4,950	62,100
Aug. 7	6,410	82,100	1,470,000
Sept. 11	1,560	2,450	10,300

INDEX

A

	Page
Abbeville, La., Vermilion River near	277-280
Acidity	15
Acme, N. Mex., Pecos River near	446-448
Alamogordo Dam, N. Mex., Pecos River below	445
Alexandria, La., Red River at	240-242
Altus Lugert Reservoir at Lugert, Kiowa County, Okla	264
Aluminum	9
Amarillo, Tex., Canadian River near	114-117
Anahuac, Tex., Trinity Bay near	327-330
Trinity River at	325-326
Angelina River near Lufkin, Tex.	294-296
Arkadelphia, Ark., Ouachita River at	243-245
Arkansas River, at Arkansas City, Kans.	62-65
at Dardanelle, Ark.	164-167
at Little Rock, Ark.	168-171
at Salston, Okla	68-71
at Sand Springs Bridge, near Tulsa, Okla.	86-89
at Van Buren, Ark.	156-160
at Webbers Falls, Okla	104-109
below John Martin Reservoir, Colo	60-61
near Muskogee, Muskogee County, Okla.	175
Arkansas River basin.	60-180
Artesia, N. Mex., Pecos River near	453-458
Aspermont, Tex., Double Mountain Fork Brazos River near	332-335
Haystack (Hayrick) Creek near	339
Salt Croton (Dove) Creek near	337, 338, 340-341
Salt Fork Brazos River near	342-345
Salt Fork Creek near	336
Austin, Tex., Colorado River at	373-374
Waller Creek at	372

B

Bancker's Ferry, La., Vermilion River at	277-280
Bayou Bartholomew near Beekman, La.	270
Bayou Bodcau at State Highway 157, near Bellevue, La.	270
near Sarepta, La.	270
Bayou De View near Brasfield, Ark.	59
Bayou Dorcheat near Minden, La.	235
on State Highway 160, near Cotton Valley, La.	270
on State Highway 2, near Sarepta, La.	270
Bayou L'outre at De Loutre, La.	271
just south of Arkansas border, La.	271
near Laran, La.	271
Bayou Macon on State Highway 2, near Oak Grove, La.	273
Bayou San Miguel near Zolle, La.	293
Bayou San Patricio near Noble, La.	293
Beals Creek at Big Spring, Tex.	380
Beaver Creek near Waurika, Okla.	184-189
on State Highway 167, south of Junction City, La.	272
Beggs, Okla., Deep Fork near	144-147
Belton, Tex., Leon River near	352
Benton, La., Cypress Bayou near	236
Bernalillo, N. Mex., Rio Grande near	407-411
Bernardo, N. Mex., Rio Grande near	412-417
Rio Puerco near	418-421
Berryville, Ark., Kings River near	30
Big Cabin Creek near Big Cabin, Craig County, Okla.	174
Big Corney Bayou near Lillie, La.	272
Black Bayou Lake at dam, near Hosston, La.	269
Black Bayou near Gilliam, La.	231
on State Highway 1, south of Rodessa, La.	269
Black Bear Creek at Pawnee, Okla.	72
Black Lake Bayou near Castor, La.	239
Black River at Harkey Crossing, near Malaga, N. Mex.	484

Page

Black River below Mayes Ranch near White City, N. Mex.	483
near Corning, Ark.	39-41
Blackwell, Okla., Chikaskia River near	67
Blue Creek at Milburn, Johnston County, Okla.	266
Blue River near Blue, Bryan County, Okla.	266
Boeuf River near Girard, La.	262
on State Highway 2, near Girard, La.	273
Boron	12
Brazos River, at Possum Kingdom Dam, near Graford, Tex.	349
at Richmond, Tex.	353-356
at Whitney Dam, near Whitney, Tex.	350-351
Brazos River basin	332-357
Breckenridge, Tex., Hubbard Creek near	346-348
Bridgeport, Okla., Canadian River at	118-122
Buck Creek near Moyers, Pushmataha County, Okla.	267
Buffalo River near St. Joe, Ark.	35-37
Bull Shoals Dam, Ark., White River at	31-32
Bundick Creek near Dry Creek, La.	285

C

Caddo Lake at bridge, on State Highway 1, near Moorsinsport, La.	270
in Caddo Parish, La.	269
Calcasieu River basin	284-285
Calcium	10
Canadian River, at Bridgeport, Okla.	118-122
at Logan, N. Mex.	112-113
near Amarillo, Tex.	114-117
near Whitefield, Okla.	148-152
Caney, Okla., Clear Boggy Creek near	217-220
Caney River near Ramona, Washington County, Okla.	174
Canton, Okla., North Canadian River near	135
Captain Creek near Wellston, Lincoln County, Okla.	178
Carbonate and bicarbonate	11
Carlsbad main canal at head, near Carlsbad, N. Mex.	467
Carlsbad, N. Mex., Pecos River at	468-469
Pecos River near	466
Carnegie, Okla., Washita River at	202-205
Castor, La., Black Lake Bayou near	239
Cauthron, Ark., Poteau River at	154
Cedar Creek near Mabank, Tex.	307-309
Chamita, N. Mex., Rio Chama near	389-392
Chemical quality	3
Chickasaw Creek near Stringtown, Atoka County, Okla.	267
Chico Arroyo near Guadalupe, N. Mex.	491
Chikaskia River near Blackwell, Okla.	67
Chloride	11
Chouteau, Okla., Neosho (Grand) River near	101
Cimarron River, at Perkins, Okla.	80-85
near Guthrie, Logan County, Okla.	79
near Kenton, Okla.	73
near Mocane, Okla.	74-75
near Waynoka, Okla.	76
Clarendon, Ark., White River at	56-58
Clear Boggy Creek near Caney, Okla.	217-220
Clear Creek near May, Harper County, Okla.	177
Clear Fork Trinity River at Fort Worth, Tex.	300
Cochiti east side main canal near Cochiti, N. Mex.	485, 490

	Page		Page
Coldwater Creek near Hardesty, Texas		Fort Worth, Tex., Clear Fork Trinity	
County, Okla.	176	River at	300
Collection and examination of samples	3-6	Foss, Okla., Washita River near	195-201
Color	13-14	Fourche Maline near Red Oak, Okla.	179
Colorado River, at Austin, Tex.	373-374	Fulton, Ark., Red River at	224-227
at Colorado City, Tex.	358-360		
at Columbus, Tex.	375-377	G	
at Wharton, Tex.	378-379	Gainesville, Tex., Red River near	190-194
near San Saba, Tex.	365-371	Galisteo Creek at Domingo, N. Mex.	399-401
near Silver, Tex.	361-364	Gilliam, La., Black Bayou near	231
Colorado River basin	358-380	Girard, La., Boeuf River near	262
Columbus, Tex., Colorado River at	375-377	Girvin, Tex., Pecos River near	479-480
Composition of surface waters	8-13	Gore, Okla., Illinois River near	110-111
Cooperation	19-22	Graford, Tex., Brazos River near	349
Corney Bayou near Lillie, La.	258	Guadalupe River at Victoria, Tex.	381-383
Corney Lake at Spillway, near Lillie, La.	272	Guadalupe River basin	381-384
on State Highway 9, near Summerfield,		Guthrie, Okla., Cimarron River near	79
La.	272	Cottonwood Creek near	78
Cornie Bayou near Three Creeks, Ark.	250-253	Gypsum Creek near Olustee, Jackson	
Corning, Ark., Black River near	39-41	County, Okla.	264
Corrosiveness	15		
Cotter, Ark., White River at	33-34	H	
Cottonwood Creek near Guthrie, Okla.	78	Hardness	14-15
Cove, Tex., Old River near	323-324	Haystack (Hayrick) Creek at Weir E, near	
Current River near Pochontas, Ark.	42	Aspermont, Tex.	339
Cypress Bayou near Benton, La.	236	Heber Springs, Ark., Little Red River	
		near	55
D		Hedley, Tex., Salt Fork Red River near ..	181-183
Dardanelle, Ark., Arkansas River at	164-167	Hindsville, Ark., War Eagle Creek near ..	29
Dayton, N. Mex., Rio Penasco at	465	Holden, La., Tickfaw River at	281
Deep Fork near Beggs, Okla.	144-147	Horatio, Ark., Little River near	221-223
Deep Fork River near Welty, Creek		Hosston, La., Red River near	228-230
County, Okla.	178	Hubbard Creek near Breckenridge, Tex. ...	346-348
Deer Creek near Hydro, Okla.	175	Hubbard, Tex., Pin Oak Creek near	310-313
Denison, Tex., Red River near	215-216	Hydrogen-ion concentration	14
Dissolved solids	13		
Division of work	22	I	
Domingo, N. Mex., Galisteo Creek at	399-401	Idefonso, N. Mex., Rio Grande near	393-398
Double Creek near Ramona, Washington		Illinois Bayou near Scottsville, Ark.	163
County, Okla.	173-174	Illinois River at Tenkiller Reservoir, near	
Double Mountain Fork Brazos River near		Gore, Okla.	110-111
Aspermont, Tex.	332-335	near Watts, Okla.	175
Dougherty, Okla., Rock Creek near	207-210	Imboden, Ark., Spring River at	43-45
Dove Creek at Weir A, northwest of		Inola, Okla., Verdigris River near	94-97
Aspermont, Tex.	357	Introduction	1-3
Dover, Ark., Piney Creek near	162	Iron	10
Drummond, Okla., Turkey Creek near	77		
Dry Creek, La., Bundick Creek near	285	J	
Durwood, Okla., Washita River near	211-214	Jemez Canyon Dam, N. Mex., Jemez	
		River below	402-406
E		Jemez River below Jemez Canyon Dam,	
East Amarillo Creek near Amarillo, Tex. .	180	N. Mex.	402-406
El Reno, Okla., North Canadian River		Jet, Okla., Salt Fork Arkansas River near	66
near	136-138	John Martin Reservoir, Colo., Arkansas	
Eleven Point River near Ravenden Springs,		River below	60-61
Ark.	46-48		
Elk Creek near Hobart, Kiowa County,		K	
Okla.	264	Kenton, Okla., Cimarron River near	73
Elk River near Tiff City, Mo.	174	Kings River near Berryville, Ark.	30
Elm Fork Trinity River near Muenster,		Kiowa Creek near Slapout, Beaver County,	
Tex.	301-303	Okla.	176
Embudo Creek at Dixon, N. Mex.	481		
Escondido Reservoir No. 1 near Kenedy,		L	
Tex.	384	Lake Arthur, La., Mermentau River at ...	282-283
Evadale, Tex., Neches River at	297-299	Lake J. B. Thomas near Vincent, Tex. ...	380
Expression of results	6-8	Lake McMillan at McMillan Dam, near	
F		Lakewood, N. Mex.	482
Fairfield, Tex., Richland Creek near	314-317	Langley, Okla., Neosho (Grand) River	
Felsenthal, Ark., Ouachita River near ...	246-249	near	98-100
Finn Creek near Story, McClain County,		Lee Creek near Van Buren, Ark.	155
Okla.	265	Lenapah, Okla., Verdigris River near	90-93
Flint Creek near Kansas, Delaware County		Leon River near Belton, Tex.	352
Okla.	175	Lillie, La., Corney Bayou near	258
Fluoride	11-12		
Fort Gibson, Okla., Neosho River near	102-103		

W

	Page		Page
Waller Creek at 23rd Street, at Austin, Tex.	372	Wharton, Tex., Colorado River at.	378-379
War Eagle Creek near Hindsville, Ark. ...	29	Whiskey Chitto Creek near Oberlin, La.	284
Washita River at Carnegie, Okla.	202-205	White River at Bull Shoals Dam, Ark.	31-32
near Durwood, Okla.	211-214	White River at Clarendon, Ark.	56-58
near Foss, Okla.	195-201	at Cotter, Ark.	33-34
near Pauls Valley, Okla.	206	at Newport, Ark.	52-54
Waurika, Okla., Beaver Creek near	184-189	White River basin.	29-59
Waynoka, Okla., Cimarron River near ..	76	Whitefield, Okla., Canadian River near.	148-152
Webbers Falls, Okla., Arkansas River at	104-109	Whitney, Tex., Brazos River near	350-351
Western Gulf of Mexico basins	282-494	Wildhorse Creek near Hoover, Garvin County, Okla.	266
Wetumka, Okla., North Canadian River near	139-143	Wister, Okla., Poteau River at	153
Wewoka Creek near Wetumka, Hughes County, Okla.	178	Wolf Creek near Fort Supply, Woodward County, Okla.	177

