Texas Board of Water Engineers
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BULLETIN 5905

CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1956

Prepared in cooperation with the
United States Department of the Interior, Geological Survey,
and other agencies,
under the direction of
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Geological Survey

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CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1956

INTRODUCTION

This report makes available to the public data on the chemical quality of the surface waters of Texas in the water year 1956. Results are presented for chemical analyses of water samples obtained daily from selected points throughout the State and also the results for a number of miscellaneous samples obtained at various points during the period October 1, 1955, to September 30, 1956.

All natural waters contain dissolved mineral matter. Water in contact with rocks and soils, even for only short periods of time, will dissolve some of the mineral and organic substances. The chemical character of stream waters is dependent on several factors, such as type of soil and rock with which the water is in contact, length of time of the contact, and climatic conditions. In Texas, the chemical composition of waters varies widely from stream to stream and, often, from point to point on a particular stream.

The records of chemical analysis of surface waters given in this volume serve as a basis for determining the suitability of the waters for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved mineral matter in the waters.

COOPERATION

This is the twelfth in a series of reports covering surface waters of Texas prepared by the U. S. Geological Survey in cooperation with the Texas Board of Water Engineers. These reports may be obtained by writing the Board of Water Engineers, Austin, Texas.

Cooperating in the collection of these data were the cities of Fort Worth and Wichita Falls, the Colorado River Municipal Water District, the Canadian River Municipal Water Authority, the Hubbard Creek Water Committee, the Lower Colorado River Authority, the Lower Neches River Authority, the Brazos River Authority, the Sabine River Authority, the Red Bluff Water Power Control District, the Chambers-Liberty Counties Navigation District, the Greenbelt Municipal and Industrial Water Association, and the U. S. Corps of Engineers.

Records for 8 stations in the Rio Grande Basin have been furnished by the U. S. Department of Agriculture, in cooperation with the International Boundary and Water Commission.

COLLECTION AND ANALYSIS OF SAMPLES

The samples for which data are given were collected from October 1, 1955, to September 30, 1956. Descriptive statements are given for each sampling station for which a regular series of chemical analyses have been made. These statements give the location of the stream sampling station, drainage area of the stream above the station, length of time for which records are available, extremes of dissolved solids, hardness and water temperature, and other pertinent data. Records of discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses.

Texas Board of Water Engineers-U. S. Geological Survey Sampling Program

During the period October 1, 1955, to September 30, 1956, samples were collected daily at 30 points on Texas streams and twice weekly at 4 sampling points in Trinity Bay near the mouth of the Trinity River. In addition to the data on chemical quality included in this report, temperature data for streams at 24 of the 30 sampling stations and sediment data for 1 of the sampling stations are available in the files of the U. S. Geological Survey, Austin, Texas. Records of chemical quality of streams at 52 additional sampling points for varying lengths of time have been published in previous reports of this series. The locations of the active and inactive stations are shown on the accompanying map, and the periods of operation of all the stations are shown on the bar graph.

Water samples were usually obtained daily at or near a Geological Survey gaging station. Specific conductance was determined on all samples. Composite samples were usually made for 10-day periods using equal volumes of successive samples having similar conductances. For some streams that are subject to sudden and large changes in chemical composition or concentration, samples were composited for shorter periods on the basis of the concentration of dissolved solids indicated by the measurements of specific conductance of the daily samples. At several sampling stations where changes in chemical composition occur gradually, daily samples for an entire month were composited.

International Boundary & Water Commission-U. S. Department of Agriculture Sampling Program

This report includes chemical quality records for 8 stations in the Rio Grande Basin where samples were collected by the International Boundary and Water Commission and analyses made by the U. S. Department of Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, California. At 2 of the stations, samples were collected daily; at the others, from 2 to 14 samples were collected each month. A single monthly composite sample was made up for analysis by taking from each individual sample an amount of water proportional to the volume of river flow represented by the sample. Results of these analyses in equivalents per million are also published in Water Bulletin Number 26 of the International Boundary and Water Commission, together with streamflow and related data.

EXPRESSION OF RESULTS

All data in the tables of analyses are reported in parts per million except those for mean discharge, tons per acre foot, tons per day, percent sodium, specific conductance, sodium-adsorption-ratio, and pH.

A part per million is a unit weight of a constituent in a million unit weights of water.

Mean discharge is reported in cubic feet per second, which is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Dissolved solids are reported in tons per day, tons per acre-foot, and parts per million. Values reported for dissolved solids less than 1,000 parts per million are residues on evaporation and for more than 1,000 parts per million are sums of determined constituents unless noted otherwise. In obtaining the sum, the bicarbonate is calculated to carbonate by dividing by 2.03.

For those analyses in which a calculated value as sodium is shown for sodium and potassium, this value, in equivalents per million, was used in computing the percent sodium. For those analyses in which a determined value for sodium is reported separately, this value is used in computing the percent sodium.

Sodium-adsorption-ratio (SAR) is the relative proportion of sodium to other cations in water and is defined by the equation:

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

where the concentrations of the constituents are expressed in equivalents per million. Waters are divided into four classes with respect to sodium hazard, the dividing points being at SAR values of 10, 18, and 26. They range from low-sodium water that can be used for irrigation on almost all soils to very high-sodium water which is generally unsatisfactory for irrigation.

Specific conductance, a measure of a water's ability to conduct an electric current, is reported in micromhos per centimeter at 25°C.

A water having a pH of 7.0 is considered to be neutral; less than 7.0, increasingly acidic; and greater than 7.0, increasingly alkaline.

Sodium and potassium are reported as sodium unless listed separately in the tables.

Hardness due to calcium and magnesium and noncarbonate hardness are reported as calcium carbonate ($CaCO_3$).

The weighted averages of analyses are reported for those sampling stations for which discharge records are available. The weighted average of analyses represents the approximate composition of water that would be found in a reservoir containing all the water passing a given station during the year, after thorough mixing in the reservoir.

The methods of analysis were the same as or modifications of those in standard publications for water analysis. 1/

1/ Collins, W. D., 1928, Notes on practical water analysis: U. S. Geol. Survey Water-Supply Paper 596-H, p. 235-261; American Public Health Association Standard methods for the examination of water, sewage, and industrial wastes, 10th ed., 1955; Scott, W. W., 1939, Standard methods of chemical analysis, v. II, p. 2049-2055, 5th ed.; Theroux, Eldridge, and Mallmann, 1943, Laboratory manual for chemical and bacteriological analyses of water and sewage, 3rd ed.

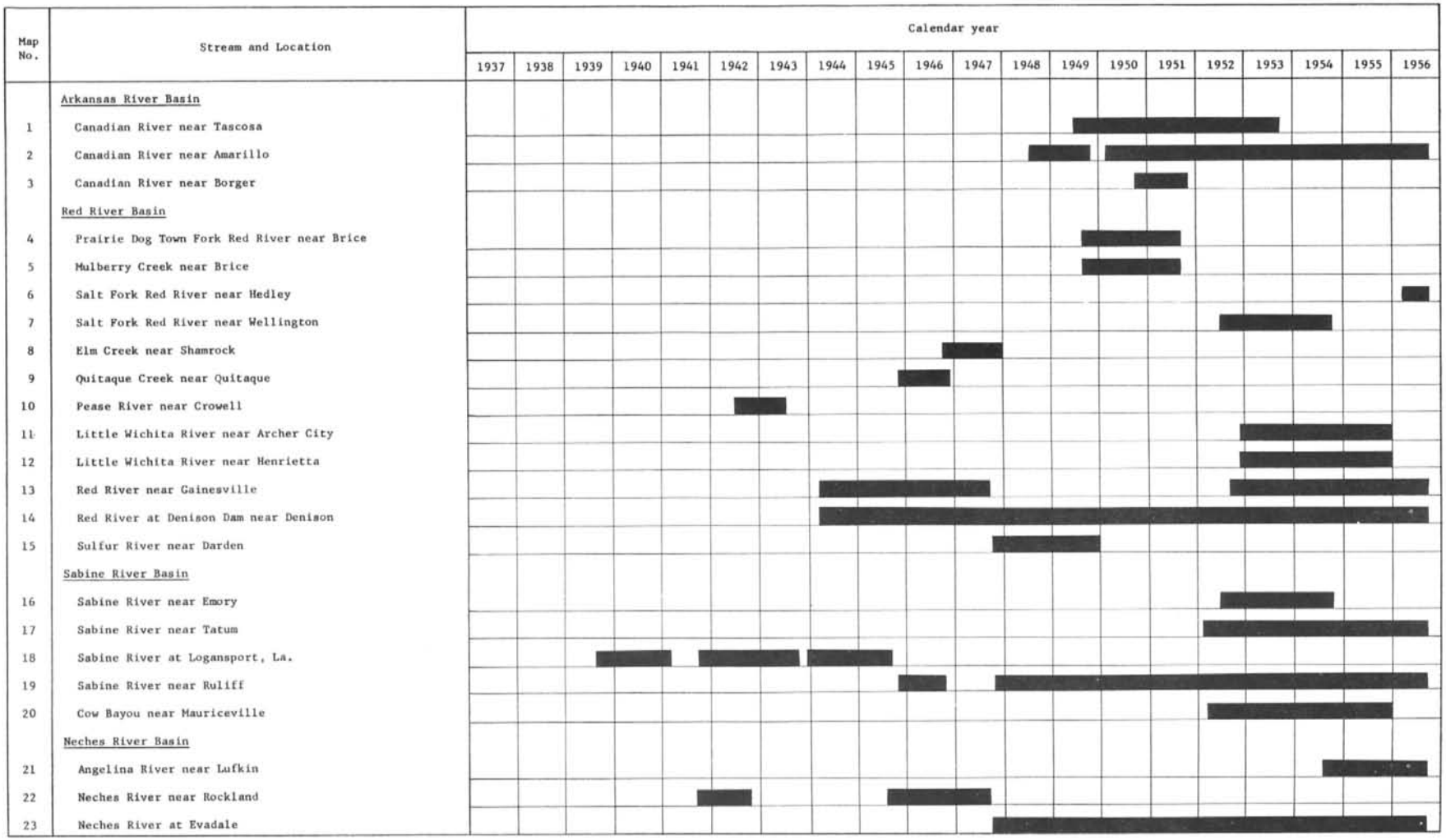
LOCATION OF QUALITY OF WATER SAMPLING STATIONS

Map Ref.	
	Arkansas River Basin
1	Canadian River near Tascosa
2	Canadian River near Amarillo
3	Canadian River near Borger
	Red River Basin
4	Prairie Dog Town Fork Red River near Brice
5	Mulberry Creek near Brice
6	Salt Fork Red River near Hedley
7	Salt Fork Red River near Wellington
8	Elm Creek near Shamrock
9	Quitaque Creek near Quitaque
10	Pease River near Crowell
11	Little Wichita River near Archer City
12	Little Wichita River near Henrietta
13	Red River near Gainesville
14	Red River at Denison Dam near Denison
15	Sulphur River near Darden
	Sabine River Basin
16	Sabine River near Emory
17	Sabine River near Tatum
18	Sabine River at Logansport, La.
19	Sabine River near Ruliff
20	Cow Bayou near Mauriceville
	Neches River Basin
21	Neches River near Rockland
22	Angelina River near Lufkin
23	Neches River at Evadale
	Trinity River Basin
24	Clear Fork Trinity River at Fort Worth
25	Trinity River near Rosser
26	Cedar Creek near Mabank
27	Richland Creek near Fairfield
28	Trinity River near Oakwood
29	Trinity River at Romayor
30	Trinity River near Moss Bluff
31	Old River near Cove
32	Trinity River at Anahuac
33	Trinity Bay near Anahuac
	San Jacinto River Basin
34	San Jacinto River (West Fork) near Humble
35	San Jacinto River near Huffman
	Brazos River Basin
36	Double Mountain Fork Brazos River near Rotan
37	Double Mountain Fork Brazos River near Aspermont
38	Salt Fork Brazos River near Peacock
39	Salt Fork Brazos River near Aspermont
40	Clear Fork Brazos River at Nugent
41	Paint Creek near Haskell
42	Clear Fork Brazos River at Fort Griffin
43	Hubbard Creek near Breckenridge
44	Brazos River near South Bend
45	Brazos River at Possum Kingdom Dam near Graford
46	Brazos River near Whitney
47	Leon River near Eastland
48	Lampasas River near Belton
49	Navasota River near Easterly
50	Brazos River at Richmond

LOCATION OF QUALITY OF WATER SAMPLING STATIONS--Continued

Map Ref.	
	Colorado River Basin
51	Colorado River above Bull Creek near Knapp
52	Bull Creek near Ira
53	Bluff Creek near Ira
54	Deep Creek near Dunn
55	Colorado River at Colorado City
56	Morgan Creek near Colorado City
57	Colorado River at Robert Lee
58	Oak Creek near Blackwell
59	Colorado River near San Saba
60	Colorado River at Austin
61	Colorado River at Wharton
	Guadalupe River Basin
62	Guadalupe River near Spring Branch
63	Guadalupe River at Victoria
64	San Antonio River at Goliad
	Nueces River Basin
65	Nueces River at Cotulla
66	Nueces River at Tilden
67	Nueces River near Three Rivers
68	Nueces River near Mathis

Map Ref.	
	Rio Grande Basin
69	Rio Grande near El Paso
70	Rio Grande below Old Fort Quitman
71	Rio Grande at Upper Presidio
72	Rio Grande near Johnson Ranch
73	Rio Grande at Langtry
74	Salt (Screwbean) Draw near Orla
75	Pecos River near Orla
76	Pecos River at Pecos
77	Toyah Creek near Pecos
78	Salt Draw near Pecos
79	Toyah Creek below Toyah Lake near Pecos
80	Pecos River below Barstow
81	Pecos River below Grandfalls
82	Pecos River near Girvin
83	Pecos River near Sheffield
84	Pecos River near Shumla
85	Rio Grande at Laredo
86	Rio Grande below Falcon Dam
87	Rio Grande at Roma
88	Rio Grande at Mission Pumping Plant near Mission
89	Rio Grande near San Benito
90	Rio Grande at Los Fresnos Pumping Plant near Brownsville
91	Rio Grande near Brownsville



PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS

Map No.	Stream and Location	Calendar year																			
		1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
	Trinity River Basin																				
24	Clear Fork Trinity River at Fort Worth																				
25	Trinity River near Rosser																				
26	Cedar Creek near Mabank																				
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PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS — Continued

Map No.	Stream and Location	Calendar year																			
		1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
	Brazos River Basin--Continued																				
47	Leon River near Eastland																				
48	Lampasas River near Belton																				
49	Navasota River near Easterly																				
50	Brazos River at Richmond																				
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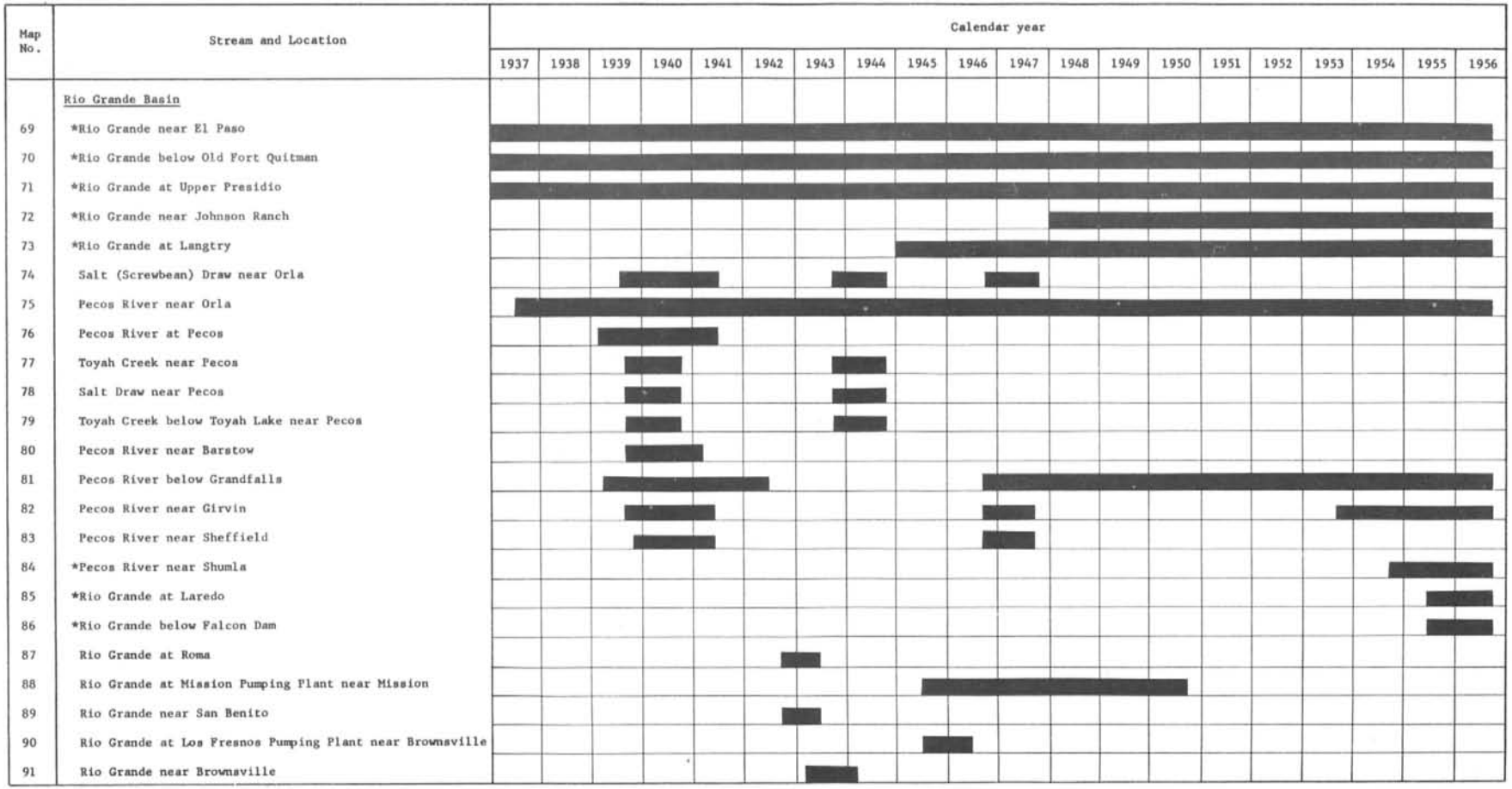
68	Nueces River near Mathis																				

PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS—Continued



*Analyses by the U. S. Department of Agriculture, published in Water Bulletins of the International Boundary and Water Commission. See page 1.

PERIODS OF OPERATION OF QUALITY OF WATER SAMPLING STATIONS IN TEXAS—Continued

ARKANSAS RIVER BASIN

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 & Santa Fe Railway bridge, and 19 miles north of Amarillo, Potter County.
DRAINAGE AREA.--19,445 square miles.
RECORDS AVAILABLE.--Chemical analyses: July 1948 to October 1949, February 1950 to September 1956.
Water temperatures: August 1949 to September 1956.
Sediment record: August 1949 to September 1952.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,970 ppm July 9, 13; minimum, 372 ppm Aug. 19-20, 22.
Hardness: Maximum, 631 ppm July 9, 13; minimum, 121 ppm Aug. 19-20, 22.
Specific conductance: Maximum observed, 3,440 micromhos Feb. 13; minimum observed, 562 micromhos July 30.
Water temperatures: Maximum observed, 72°F July 29, 31; minimum observed, freezing point on many days during winter months.
EXTREMES, 1948-56.--Dissolved solids: Maximum, 2,320 ppm Dec. 25-29, 1952; minimum, 285 ppm Sept. 3, 1952.
Hardness: Maximum, 860 ppm Dec. 25-29, 1952; minimum, 90 ppm Aug. 10-12, 1951.
Specific conductance: Maximum observed, 3,980 micromhos Dec. 26, 1952; minimum observed, 406 micromhos May 18, 1954.
Water temperatures (1949-56): Maximum observed 95°F June 29, 1951; minimum observed, 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 sums of 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 1955 to September 1956 given in Water-Supply Paper 1441.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-7, 1955	188	24		47	18	150		201	144	140	--	6.2		638	0.87	324	192	28	63	4.7	1,070	7.7
Oct. 8-19	20.3	53		107	43	264		290	296	315	2.8	25		1,250	1.70	68.5	444	206	56	5.4	1,990	8.0
Oct. 20-31	10.7	74		82	41	171		350	158	168	4.8	53		928	1.26	26.8	372	85	50	3.9	1,450	7.6
Nov. 1-9	15.7	79		69	39	147		323	133	128	4.8	68		876	1.19	37.1	332	68	49	3.5	1,330	6.9
Nov. 10-20	9.91	73		78	40	143		330	144	132	4.0	65		876	1.19	23.4	359	88	46	3.3	1,330	7.7
Nov. 21-30	9.31	74		68	38	134		320	125	110	4.0	75		832	1.13	20.9	326	64	47	3.2	1,270	7.7
Dec. 1-16	11.2	73		66	38	141		312	132	120	3.6	68		828	1.13	25.0	321	66	49	3.4	1,240	7.3
Dec. 17-31	13.8	74		86	41	177		291	199	180	3.2	74		a977	1.33	36.4	383	144	50	3.9	1,560	7.0
Jan. 1-10, 1956	15.8	73		86	45	188		276	205	198	3.6	99		1,030	1.40	43.9	400	174	51	4.1	1,670	7.4
Jan. 11-19	14.1	76		87	39	224		396	184	198	4.0	72		1,080	1.47	41.1	378	53	56	5.0	1,600	7.6
Jan. 20-27	14.8	66		132	50	329		299	370	390	3.6	75		1,560	2.12	62.3	535	290	57	6.2	2,360	7.5
Jan. 28-31, Feb. 1-8	12.8	71		77	38	189		374	153	152	3.6	85		a953	1.30	32.9	348	42	54	4.4	1,410	7.6
Feb. 9-24	18.5	52		143	53	356		251	426	458	3.2	57		1,670	2.27	83.4	575	370	57	6.5	2,620	7.3
Feb. 25-29	14.0	66		76	38	151		363	151	145	4.0	6.8		852	1.16	32.2	346	48	49	3.5	1,390	7.2
Mar. 1-10	14.9	79		70	43	149		345	137	128	4.0	73		a853	1.16	34.3	352	69	48	3.5	1,340	7.0
Mar. 11-20	14.8	77		72	43	158		377	138	128	4.4	69		a874	1.19	34.9	356	48	49	3.6	1,340	7.1
Mar. 21-31	14.8	78		70	39	138		320	132	118	4.0	74		820	1.12	32.8	335	73	47	3.3	1,270	7.1
Apr. 1-10	15.1	77		69	43	134		320	140	118	4.4	67		a809	1.10	33.0	349	87	45	3.1	1,290	7.2
Apr. 11-20	9.17	76		72	42	136		325	136	128	4.4	60		a814	1.11	20.2	352	86	46	3.2	1,330	8.1
Apr. 21-30	8.10	80		70	43	144		334	132	132	4.4	70		a839	1.14	18.3	352	78	47	3.4	1,320	8.0
May 1-10	8.17	76		70	42	154		342	121	145	3.6	75		869	1.18	19.2	347	66	49	3.6	1,370	7.3
May 11-20	10.6	57		72	42	151		351	114	145	3.6	75		866	1.18	24.8	352	64	48	3.5	1,400	7.1
May 21-24, 27-29	1,188	52		63	28	188		301	135	192	2.4	21		841	1.14	2,700	272	26	60	5.0	1,340	7.4
May 25	5,080	22		138	45	405		264	466	500	1.2	.5		1,710	2.33	23,450	530	314	62	7.6	2,550	8.2
May 26, 30-31, June 1-2	721	22		43	13	121		193	99	112	1.2	1.8		a508	.69	989	161	3	62	4.1	847	7.8
June 3-20	176	24		62	19	209		219	197	210	1.6	2.5		a833	1.13	396	232	52	66	6.0	1,370	7.9
June 21-25	5.26	32		97	38	275		275	314	308	1.6	6.0		1,210	1.65	17.2	399	173	60	6.0	1,950	8.1
June 26-30	13.2	28		54	22	185		231	169	180	1.6	5.0		a759	1.03	27.0	225	36	64	5.4	1,270	7.8
July 1-2, 5-8, 10-12	3.40	46		83	38	229		287	261	242	2.0	11		1,050	1.43	9.64	364	128	58	5.2	1,690	8.2
July 3-4, 14-19	516	22		37	12	152		207	115	128	1.2	1.5		588	.80	819	142	0	70	5.6	968	7.9
July 9, 13	42.6	39		149	63	453		b271	551	572	1.6	11		1,970	2.68	227	631	420	61	7.8	3,070	8.4
July 20-31	705	20		37	13	127		212	89	108	1.2	1.8		a501	.68	954	147	0	65	4.6	842	8.1
Aug. 1-10	50.8	30		60	24	218		223	179	245	1.2	6.7		a874	1.19	120	248	66	66	6.0	1,440	8.0
Aug. 11-18	2.46	66		69	37	170		c310	157	172	3.6	28		876	1.19	5.82	324	70	53	4.1	1,350	8.4
Aug. 19-20, 22	249	18		32	10	89		197	62	59	1.2	2.5		372	.51	250	121	0	61	3.5	619	8.0
Aug. 21, 23-31	63.8	21		54	18	195		232	180	177	1.2	1.4		772	1.05	133	208	18	67	5.8	1,280	7.9
Sept. 1-10	7.20	52		71	34	201		291	195	195	2.8	48		954	1.30	18.5	326	88	57	4.8	1,470	8.0
Sept. 11-20	9.50	59		61	34	134		320	104	112	3.6	56		747	1.02	19.2	291	29	50	3.4	1,170	8.0
Sept. 21-30	5.00	65		68	33	131		318	106	113	2.8	65		749	1.02	10.1	306	46	48	3.3	1,140	7.6
Weighted average	108	32		63	24	193		245	174	198	1.8	11		823	1.12	240	256	54	62	5.3	1,310	--

a Sum of determined constituents.
b Includes equivalent of 7 ppm carbonate (CO_3).
c Includes equivalent of 8 ppm carbonate (CO_3).

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (residue at 180°C)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
EAST AMARILLO CREEK NEAR AMARILLO																						
Oct. 14, 1955	11.4	83		55	34	132		a317	86	115	--	64		732	1.00		277	17	51	3.4	1,160	8.5
Nov. 17	6.08	68		67	39	131		372	104	120	--	37		765	1.04		327	22	47	3.2	1,240	8.1
Dec. 14	7.24	82		55	39	143		413	98	115	--	5.4		757	1.03		297	0	51	3.6	1,210	7.5
Jan. 11, 1956	10.6	79		60	38	131		305	109	122	--	70		808	1.10		307	57	48	3.3	1,340	7.4
Mar. 14	6.44	83		53	36	129		291	85	110	3.6	87		764	1.04		280	42	50	3.4	1,240	8.2
Apr. 18	19.6	87		51	40	138		300	110	108	4.8	82		802	1.09		292	46	51	3.5	1,210	8.2
May 16	11.9	99		50	36	137		b276	102	110	3.6	90		c764	1.04		272	46	52	3.6	1,160	8.6
June 28	7.24	102		41	26	167		d293	84	138	2.8	53		764	1.04		210	0	63	5.0	1,050	8.5
July 25	--	89		42	30	134		278	77	105	4.0	66		707	.96		228	0	56	3.8	1,180	8.2
Sept. 12	3.14	89		40	34	248		a252	71	298	4.4	82		1,020	1.39		240	33	69	7.0	1,490	8.4
BONITA CREEK NEAR AMARILLO																						
Jan. 11, 1956	2.64	22		52	13	19		245	12	7.8		0.7		c246	0.33		184	0	18	0.6	417	8.2
CHICKEN CREEK NEAR AMARILLO																						
Jan. 11, 1956	4.97	22		48	9.0	11		200	8.0	4.8		1.9		208	0.28		157	0	13	0.4	336	8.2
COETAS CREEK NEAR AMARILLO																						
Jan. 11, 1956	1.03	24		51	9.4	14		201	14	10		3.4		230	0.31		165	0	16	0.5	379	8.2

a Includes equivalent of 8 parts per million of carbonate (CO_3).
b Includes equivalent of 12 parts per million of carbonate (CO_3).
c Sum of determined constituents.
d Includes equivalent of 16 parts per million of carbonate (CO_3).

SALT FORK RED RIVER NEAR HEDLEY, TEX.

LOCATION.--Half a mile downstream from Whitefish Creek, 2½ 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 to September, 1956.
Water temperatures: March to September,1956.
EXTREMES, 1956.--Dissolved solids: Maximum, 2,600 ppm Apr. 30; minimum, 443 ppm July 8-9.
Hardness: Maximum, 1,640 ppm Apr. 30; minimum, 198 ppm July 8-9.
Specific conductance: Maximum daily, 3,000 micromhos Apr. 3; minimum daily, 440 micromhos May 27.
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 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 during much of the period.

Chemical analyses, in parts per million, March to September, 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Mar. 28-31, Apr. 1-10, 1956		32		172	65	143		172	624	150	0.9	3.8		1,280	1.74		696	556	31	2.4	1,770	8.1
Apr. 11-14, 17-20		22		126	55	135		113	526	135	.9	1.0		1,060	1.44		540	448	35	2.5	1,530	7.9
Apr. 21-26		16		114	51	128		101	487	128	.9	.2		a975	1.33		494	411	36	2.5	1,440	7.9
Apr. 30		27		450	126	163		84	1,630	160	.8	1.4		2,600	3.54		1,640	1,570	18	1.7	2,940	7.9
May 1-9, 26		32		104	39	132		144	379	135	.9	2.4		917	1.25		420	302	41	2.8	1,320	8.0
May 27-30		20		64	14	67		150	123	77	.7	2.2		450	.61		217	94	40	2.0	722	8.1
May 31, June 1-10		29		110	32	122		177	307	143	1.0	2.2		869	1.18		406	261	39	2.6	1,280	7.8
June 11, 13, 18-19, July 3-4		36		96	34	134		116	347	150	.8	1.8		889	1.20		380	284	43	3.0	1,310	7.9
June 12, 14-15		39		216	88	216		70	907	260	.8	.5		1,760	2.39		901	844	34	3.1	2,400	7.7
July 8-9		26		58	13	72		138	124	76	1.0	4.2		443	.60		198	85	44	2.2	711	7.9
July 10, 19		34		60	14	71		139	130	77	.6	3.2		476	.65		207	93	43	2.2	728	8.2
July 20, 21-23		34		88	24	112		160	237	127	.7	2.2		736	1.00		318	187	43	2.7	1,090	8.2
July 24-27	(b)	40		274	98	215		84	1,060	268	.7	.5		2,000	2.72		1,090	1,020	30	2.8	2,610	7.9

a Sum of determined constituents.
b No flow July 28 to September 30, 1956.

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.

LOCATION.--At gaging station at bridge on State Highway 79, 1.5 miles downstream from confluence of North and Middle Forks, and 4.8 miles north of Archer City, Archer County.
DRAINAGE AREA.--481 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to January 1956 (discontinued).
Water temperatures: December 1952 to January 1956 (discontinued).
EXTREMES, 1952-56.--Dissolved solids: Maximum, 2,340 ppm Sept. 19, 1954; minimum, 95 ppm Sept. 25-26, 1955.
Hardness: Maximum, 590 ppm Sept. 19, 1954; minimum, 40 ppm Sept. 25-26, 1955.
Specific conductance: Maximum daily, 3,730 micromhos Sept. 19, 1954; minimum daily, 103 micromhos Oct. 26, 1953.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for period October 1955 to January 1956 given in Water-Supply Paper 1441.

Chemical analyses, in parts per million, October 1955 to January 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-7, 1955	1,273	9.4		23	6.3	27		119	6.7	25	0.5	2.8		168	0.23	577	84	0	41	1.3	291	7.5
Oct. 8-18	86.5	9.6		26	6.8	25		130	7.0	21	.5	2.5		170	.23	39.7	92	0	37	1.1	296	7.7
Oct. 19-21, 28-31	a4.66	11		25	7.2	28		139	7.0	19	.7	1.8		b168	.23	2.11	91	0	40	1.3	300	8.0
Nov. 20, 27	--	--		--	--	--		196	--	24	--	--		--	--	--	128	0	--	--	396	8.0
Dec. 5	--	--		--	--	--		194	--	25	--	--		--	--	--	126	0	--	--	386	8.1
Dec. 11, 18	--	--		--	--	--		242	--	75	--	--		--	--	--	170	0	--	--	609	8.0
Dec. 25	--	--		--	--	--		238	--	150	--	--		--	--	--	226	31	--	--	847	8.1
Jan. 1, 1956	0	--		--	--	--		294	--	278	--	--		--	--	--	322	81	--	--	1,370	8.2
Jan. 6	48	9.2		52	20	104		265	32	130	.6	3.2		489	.67	63.4	212	0	52	3.1	870	8.2

a Less than 0.05 second foot flow, Oct. 22-27, Nov. 1 - Jan. 5.
b Sum of determined constituents.

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.

LOCATION.--At gaging station at bridge on State Highway 148, 1.5 miles northwest of Henrietta, Clay County, 4 miles upstream from Turkey Creek, and 5 miles upstream from Dry Fork Little Wichita River.
DRAINAGE AREA.--1,037 square miles.
RECORDS AVAILABLE.--Chemical analyses: December 1952 to January 1956 (discontinued.)
Water temperatures: December 1952 to January 1956 (discontinued.)
EXTREMES, 1952-56.--Dissolved solids: Maximum, 1,700 ppm Mar. 15 (12 m.-12p.m.), 16, 1953; minimum, 57 ppm May 19, 1955.
Hardness: Maximum, 700 ppm May 1, 1953; minimum, 25 ppm Feb. 20, 1955.
Specific conductance: Maximum daily, 5,910 micromhos May 1, 1953; minimum daily, 81.1 micromhos Oct. 24, 1953.
REMARKS.--Values reported for dissolved solids concentrations are residues on evaporation. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1441.

Chemical analyses, in parts per million, October 1955 to January 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-3, 5-7, 1955---		9.0		22	5.6	24		108	5.8	24	0.5	1.8		166	0.23		79	0	40	1.2	266	7.3
Oct. 4---		9.8		29	7.4	55		110	6.4	87	.5	2.8		264	.36		104	14	53	2.3	484	7.9
Oct. 8-14---		14		26	7.0	29		132	6.5	29	.5	1.2		185	.25		94	0	41	1.3	316	7.8
Oct. 17-22, 24-25, 27, 29---		12		29	8.0	33		149	7.2	32	.5	1.2		205	.28		106	0	40	1.4	352	7.8
Nov. 1-4, 8---		12		35	9.7	44		180	8.2	47	.5	.8		252	.34		128	0	43	1.7	442	8.1
Nov. 22, 25-30---		--		--	--	--		192	--	54	--	--		--	--		136	0	--	--	477	8.2
Dec. 9, 15, 22, 29---		9.6		39	11	49		198	8.0	53	.6	.6		272	.37		142	0	43	1.8	480	8.0
Jan. 4, 11, 13, 1956---		4.6		33	7.7	38		168	8.1	34	.3	.8		224	.30		113	0	42	1.6	379	7.9

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, & Santa Fe Railway bridge, 5 miles downstream from Fish Creek, and 7 miles north of Gainesville, Cooke County, and at mile 791.5.
DRAINAGE AREA.--30,782 square miles, of which 5,936 square miles are probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1956.
Water temperatures: October 1952 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 5,490 ppm June 21-23; minimum, 446 ppm July 11.
Hardness: Maximum, 1,480 ppm June 21-23; minimum, 160 ppm July 11.
Specific conductance: Maximum observed, 9,320 micromhos June 21; minimum observed, 776 micromhos July 11.
Water temperatures: Maximum observed, 89°F Aug. 13; minimum observed, 33°F Jan. 18, Feb. 3.
EXTREMES, 1944-46, 1952-56.--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 observed, 9,890 micromhos Apr. 11, 1953; minimum observed, 325 micromhos Oct. 1, 1945.
Water temperatures, 1952-56: Maximum observed, 95°F July 13, 1954; minimum observed, freezing point Dec. 23, 1953, Jan. 21, 1954.
REMARKS.--Records of specific conductance of daily samples for period May 1944 to April 1946 available in district office at Austin, Tex. Record of specific conductance of daily samples for period October 1952 to September 1956 available in district office at Oklahoma City, Okla. Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1441.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955	38,870	--	--	72	17	116	--	118	142	172	--	1.8	--	605	0.82	63,490	250	154	50	3.2	1,060	7.7
Oct. 11-13	10,760	--	--	70	11	115		132	128	162	--	.4	--	590	.80	17,140	220	112	53	3.4	1,020	7.8
Oct. 14-15	5,720	--	--	115	27	210	--	148	228	340	--	--	--	1,040	1.41	16,060	398	276	53	4.6	1,800	8.0
Oct. 16-20	4,304	--	--	160	44	350	--	160	354	590	--	1.6	--	1,670	2.27	19,410	580	449	57	6.3	2,810	7.8
Oct. 21-31	3,251	14	0.02	194	57	405	7.8	152	472	800	0.0	1.7	0.32	2,170	2.95	19,050	720	596	55	6.6	3,550	7.8
Nov. 1-10	2,373	--	--	208	49	493		152	509	805	--	2.3	--	2,230	3.03	14,290	720	596	60	8.0	3,490	8.0
Nov. 11-20	1,020	--	--	232	66	594		204	567	980	--	2.5	--	2,660	3.62	7,330	850	683	60	8.9	4,300	7.8
Nov. 21-22	848	--	--	228	61	582		180	560	960	--	2.2	--	2,620	3.56	6,000	820	672	61	8.8	4,240	8.0
Nov. 23-30	824	--	--	284	81	727		232	642	1,250	--	--	--	3,280	4.46	7,300	1,040	850	60	9.8	5,270	8.0
Dec. 1-10	793	--	--	248	102	743		204	630	1,300	--	--	--	3,240	4.41	6,940	1,040	873	61	10	5,170	7.4
Dec. 11-20	576	--	--	264	103	776		208	665	1,350	--	--	--	3,420	4.65	5,320	1,080	910	61	10	5,440	7.5
Dec. 21-31	504	--	--	268	105	794		208	681	1,380	--	--	--	3,530	4.80	4,800	1,100	930	61	10	5,630	7.8
Jan. 1-10, 1956	467	9.0	.03	288	107	841	6.3	220	703	1,500	.3	--	.54	3,690	5.02	4,650	1,160	980	61	11	5,720	7.9
Jan. 11-20	453	--	--	288	93	820		220	699	1,400	--	--	--	3,650	4.96	4,460	1,100	920	62	11	5,810	8.0
Jan. 21-31	495	--	--	268	103	783		192	662	1,380	--	--	--	3,510	4.77	4,690	1,090	932	61	10	5,670	7.8
Feb. 1-10	472	--	--	288	112	849		188	726	1,500	--	--	--	3,690	5.02	4,700	1,180	1,030	61	11	6,050	8.0
Feb. 11-20	680	--	--	288	103	853		172	710	1,500	--	--	--	3,780	5.14	6,940	1,140	999	62	11	5,970	8.1
Feb. 21-22	542	--	--	240	83	688		140	577	1,220	--	--	--	3,110	4.23	4,550	940	826	61	9.8	4,970	7.9
Feb. 23-29	452	--	--	320	112	1,040		192	798	1,800	--	--	--	4,430	6.02	5,410	1,260	1,100	64	13	6,920	8.2
Mar. 1-10	344	--	--	304	127	1,040		208	835	1,780	--	--	--	4,370	5.94	4,060	1,280	1,110	64	13	6,700	8.0
Mar. 11-20	288	--	--	296	137	985		222	802	1,720	--	--	--	4,280	5.82	3,330	1,300	1,120	62	12	6,610	8.0
Mar. 21-31	263	--	--	288	127	906		216	747	1,600	--	--	--	3,990	5.43	2,830	1,240	1,060	61	11	6,150	7.8
Apr. 1-10	248	5.5	.01	320	134	803	6.7	224	712	1,600	.3	--	.04	4,030	5.48	2,700	1,350	1,170	56	9.5	6,290	7.8
Apr. 11-20	246	--	--	288	117	856		212	714	1,520	--	--	--	4,000	5.44	2,660	1,200	1,030	61	11	6,060	7.5
Apr. 21-30	269	--	--	272	107	785		216	676	1,380	--	--	--	3,490	4.75	2,530	1,120	943	60	10	5,580	7.9
May 1	1,030	--	--	240	78	651		a192	575	1,120	--	--	--	2,910	3.96	8,090	920	762	61	9.3	4,630	8.4
May 2-4, 6	3,242	--	--	92	22	217		126	170	360	--	3.6	--	975	1.33	8,530	320	216	60	5.3	1,680	7.9
May 5, 7-10	4,490	--	--	220	42	482		122	541	780	--	5.5	--	2,230	3.03	27,030	720	620	59	7.8	3,550	8.0
May 11-16	1,000	--	--	264	49	505		128	694	800	--	3.5	--	2,550	3.47	6,880	860	755	56	7.5	3,910	7.5
May 17-20	513	--	--	300	66	635		132	780	1,050	--	--	--	3,050	4.15	4,220	1,020	912	58	8.6	4,670	7.7
May 21-28	409	--	--	312	78	759		176	743	1,300	--	--	--	3,390	4.61	3,740	1,100	956	60	10	5,330	7.9
May 29-31	18,140	--	--	190	45	408		140	426	700	--	3.7	--	1,970	2.68	96,490	660	546	57	6.9	3,200	7.9

a Includes equivalent of 8 parts per million carbonate (CO_3).

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1955 to September 1956--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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
June 1-5, 1956	7,518	--	--	320	49	675		128	874	1,030	--	--	--	3,140	4.27	63,740	1,000	895	59	9.3	4,660	8.0
June 6-7	3,550	--	--	228	39	478		126	595	740	--	4.4	--	2,270	3.09	21,760	730	626	59	7.7	3,570	8.1
June 8-10	1,917	--	--	180	29	406		196	479	560	--	4.8	--	1,760	2.39	9,110	570	410	61	7.4	2,830	8.0
June 11	1,340	--	--	200	44	413		126	522	660	--	1.3	--	1,960	2.67	7,090	680	576	57	6.9	3,140	8.1
June 12-18	996	--	--	320	68	775		166	832	1,250	--	--	--	3,440	4.68	9,250	1,080	944	61	10	5,370	7.9
June 19-20	716	--	--	424	100	1,230		166	1,120	2,020	--	--	--	5,180	7.04	10,010	1,470	1,330	65	14	7,980	8.1
June 21-23	530	--	--	424	103	1,370		134	1,120	2,250	--	--	--	5,490	7.47	7,860	1,480	1,370	67	15	8,670	8.1
June 24-30	376	--	--	354	82	887		144	946	1,450	--	--	--	4,010	5.45	4,070	1,220	1,100	61	11	6,180	7.8
July 1-5	300	--	--	368	95	957		128	989	1,600	--	--	--	4,340	5.90	3,520	1,310	1,200	61	11	6,710	7.9
July 6	1,290	--	--	102	33	275		112	250	450	--	2.2	--	1,220	1.66	4,250	390	298	61	6.1	2,080	8.0
July 7	2,880	--	--	164	61	480		116	457	800	--	5.5	--	2,120	2.88	16,490	660	565	61	8.1	3,490	8.2
July 8-10	1,940	--	--	70	20	161		108	143	260	--	1.8	--	765	1.04	4,010	255	166	58	4.4	1,310	8.0
July 11	1,220	--	--	45	12	89		90	57	155	--	3.3	--	446	.61	1,470	160	86	55	3.1	776	8.0
July 12-13	810	--	--	88	41	247		120	211	430	--	1.9	--	1,140	1.55	2,490	390	292	58	5.4	1,950	8.0
July 14	572	--	--	172	61	497		140	428	850	--	1.1	--	2,220	3.02	3,430	680	566	61	8.3	3,640	8.1
July 15-16	417	--	--	276	100	861		130	789	1,450	--	--	--	3,670	4.99	4,130	1,100	994	63	11	5,820	8.0
July 17-20	343	--	--	328	117	1,150		102	1,030	1,880	--	--	--	4,720	6.42	4,370	1,300	1,220	66	14	7,340	7.9
July 21-23	257	--	--	392	93	1,160		128	1,050	1,900	--	--	--	4,860	6.61	3,370	1,360	1,260	65	14	7,450	7.8
July 24-25	876	--	--	320	78	920		140	856	1,500	--	--	--	3,870	5.26	9,150	1,120	1,010	64	12	6,120	7.9
July 26-31	520	--	--	198	46	496		122	498	810	--	4.2	--	2,220	3.02	3,120	685	585	61	8.2	3,600	7.8
Aug. 1-10	246	16	0.06	280	90	861	10	120	770	1,450	0.4	--	0.52	3,580	4.87	2,380	1,070	972	63	11	5,700	7.9
Aug. 11-20	158	--	--	292	100	796		118	769	1,400	--	--	--	3,620	4.92	1,540	1,140	1,040	60	10	5,560	7.9
Aug. 21-31	153	--	--	276	105	755		118	745	1,340	--	--	--	3,470	4.72	1,430	1,120	1,020	59	9.8	5,360	7.8
Sept. 1-4	153	--	--	248	102	648		120	659	1,180	--	--	--	3,080	4.19	1,270	1,040	942	58	8.7	4,770	8.0
Sept. 5-10	126	--	--	272	105	728		126	727	1,300	--	--	--	3,420	4.65	1,160	1,110	1,010	59	9.5	5,260	7.7
Sept. 11-20	98.7	--	--	284	105	760		124	742	1,360	--	--	--	3,560	4.84	949	1,140	1,040	59	9.8	5,430	7.8
Sept. 21-30	88.7	--	--	272	117	788		124	740	1,420	--	--	--	3,640	4.95	872	1,160	1,060	60	10	5,560	7.4
Weighted average	2,177	--	--	146	37	323		136	341	533	--	--	--	1,530	2.08	8,990	516	405	58	6.2	2,470	--

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 non-contributing.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1956.
Water temperatures: October 1945 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,280 ppm Sept. 1-30; minimum, 954 ppm Jan. 1-31.
Hardness: Maximum, 450 ppm Sept. 1-30; minimum, 331 ppm Dec. 1-31.
Specific conductance: Maximum daily, 2,210 micromhos Aug. 29, Sept. 11, 26-27; minimum daily, 1,560 micromhos Dec. 29.
EXTREMES, 1944-56.--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 on evaporation and for concentrations more than 1,000 ppm are sums of determined constituents unless otherwise noted. 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 1955 to September 1956 given in Water-Supply Paper 1441. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955--------	14,759	11		106	24	230	6.5	117	252	358	0.5	1.0	0.19	1,050	1.43	41,840	364	268	57	5.2	1,750	7.8
Nov. 1-30----------	4,773	10		103	22	210	6.2	117	236	328	.4	1.8	.15	a976	1.33	12,580	348	252	56	4.9	1,640	7.6
Dec. 1-31----------	4,052	9.8		98	21	198	6.0	118	228	302	.3	1.2	.08	970	1.32	10,610	331	234	56	4.7	1,590	7.9
Jan. 1-31, 1956--------	3,627	11		102	21	194	5.9	121	228	305	.3	.9	.17	954	1.30	9,340	341	242	55	4.6	1,600	7.9
Feb. 1-29----------	4,016	10		102	20	194	5.7	123	224	305	.3	.8	.16	984	1.34	10,670	336	236	55	4.6	1,590	7.9
Mar. 1-31----------	2,250	11		103	23	196	5.7	126	235	318	.4	.8	.11	977	1.33	5,940	352	248	54	4.6	1,620	7.6
Apr. 1-30----------	1,089	11		104	24	200	5.8	130	235	318	.4	1.0	.13	a963	1.36	2,830	358	252	54	4.6	1,650	7.7
May 1-31----------	2,057	12		107	24	209	5.8	134	244	322	.4	.8	.19	a991	1.35	5,500	366	256	55	4.8	1,690	7.8
June 1-30----------	1,449	12		112	27	228	6.1	130	263	365	.5	1.2	.17	1,080	1.47	4,230	390	284	55	5.0	1,850	8.0
July 1-31----------	1,580	12		124	28	262	6.3	135	299	422	.4	1.2	.12	1,220	1.66	5,200	424	314	57	5.5	2,070	7.8
Aug. 1-31----------	1,381	12		117	29	285	6.6	132	305	435	.4	1.2	.29	1,260	1.71	4,700	411	303	60	6.1	2,120	7.9
Sept. 1-30----------	1,423	12		128	32	276	6.8	126	315	448	.5	.5	.20	1,280	1.74	4,920	450	346	57	5.7	2,190	7.8
Weighted average-----	3,550	11		106	23	219	6.2	122	248	346	0.4	1.1	0.17	1,030	1.40	9,870	359	259	56	5.0	1,720	--

a Sum of determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
BUCK CREEK NEAR WELLINGTON																						
Jan. 12, 1956---------	3.57	19		574	117	196		157	1,790	242		6.6		3,020	4.11		1,910	1,780	18	1.9	3,380	7.8
SALT FORK RED RIVER NEAR CLARENDON																						
Apr. 26, 1956---------	2.36	34		47	21	69		151	121	74		0.5		440	0.60		204	80	42	2.1	716	8.2
LONG BRANCH BALLARD CREEK NEAR MATADOR																						
Mar. 16, 1956---------	0.25	26		18	11	109		184	51	86		0.4		391	0.53		90	0	72	5.0	654	8.2
ROARING SPRINGS NEAR ROARING SPRINGS																						
Jan. 19, 1956---------	1.54	38		78	29	75		303	76	92		25		a580	0.79		314	66	34	1.8	956	8.2
LAKE KEMP NEAR MAYBELLE																						
Nov. 23, 1955---------	--	6.5	0.06	146	25	298	6.1	86	387	470	0.3	0.8		1,380	1.88		468	397	58	6.0	2,290	7.6
LAKE TEXOMA NEAR DENISON																						
Nov. 4, 1955----------	--	7.8	0.02	94	19	186		106	222	282	0.3	1.5		a901	1.23		312	226	56	4.6	1,520	7.5

a Residue on evaporation at 180°C.

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 1956.
Water temperatures: February 1952 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 936 ppm Aug. 21-31; minimum, 126 ppm May 1-7, 10-16.
Hardness: Maximum, 105 ppm Aug. 21-31; minimum, 39 ppm May 1-7, 10-16.
Specific conductance: Maximum observed, 1,850 micromhos Aug. 31; minimum observed, 148 micromhos May 3.
Water temperatures: Maximum observed, 98°F Aug. 13; minimum observed, 42°F Feb. 10.
EXTREMES, 1952-56.--Dissolved solids: Maximum, 936 ppm Aug. 21-31, 1956; minimum, 82 ppm May 10-20, 1953.
Hardness: Maximum, 106 ppm Sept. 1-10, 1954; minimum, 29 ppm Sept. 9-10, 12-18, 1953.
Specific conductance: Maximum observed, 1,850 micromhos Oct. 25, 1954, Aug. 31, 1956; minimum observed, 123 micromhos May 10-11, 1953.
Water temperatures: Maximum observed, 98°F Aug. 13, 1956; minimum observed, 42°F Feb. 10, 1956.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-7, 1955	256	17		13	4.6	93		31	15	150		1.0		a309	0.42	214	51	26	80	5.7	584	7.3
Oct. 8-20	113	17		16	5.4	130		40	15	210		.4		a414	.56	126	62	29	82	7.2	789	7.1
Oct. 21-31	70.0	16		15	5.7	127		52	15	198		.2		a403	.55	76.2	61	18	82	7.1	749	7.1
Nov. 1-14	67.3	16		17	6.0	137		62	15	211		1.1		446	.61	81.0	68	17	81	7.2	821	7.1
Nov. 15-18	81.0	14		25	8.2	273		65	15	440		.7		859	1.17	188	97	44	86	12	1,550	7.1
Nov. 19-30	101	15		16	5.6	141		58	15	217		.8		454	.62	124	62	14	83	7.8	828	7.0
Dec. 1-8	259	15		19	6.0	141		39	18	232		1.8		459	.62	321	72	40	81	7.2	885	7.2
Dec. 9-18	185	17		16	4.7	94		30	17	156		1.0		328	.45	164	59	34	78	5.3	612	6.8
Dec. 19-31	187	16		15	5.5	115		31	20	187		1.2		a375	.51	189	61	36	80	6.4	719	7.0
Jan. 1-10, 1956	179	15		13	5.0	107		31	18	171		.5		374	.51	181	53	28	81	6.4	659	6.9
Jan. 11-23	362	14		13	4.8	103		31	19	163		.6		365	.50	357	52	26	81	6.2	634	6.9
Jan. 24-31	621	16		10	4.4	58		16	23	93		1.4		248	.34	416	44	31	74	3.8	396	6.7
Feb. 1-10	2,194	14		10	4.4	59		13	25	96		1.2		a216	.29	1,280	44	33	75	3.9	411	6.4
Feb. 11-20	2,337	14		13	4.8	51		16	31	83		1.0		a206	.28	1,300	53	40	68	3.0	377	6.9
Feb. 21-29	1,248	16		18	5.8	58		28	37	94		.8		a244	.33	822	68	45	65	3.1	441	6.5
Mar. 1-10	575	18		18	6.4	69		33	34	111		1.8		a274	.37	425	71	44	68	3.5	502	7.4
Mar. 11-20	462	18		16	6.7	80		24	31	134		1.0		a299	.41	373	67	48	72	4.2	563	6.8
Mar. 21-31	485	17		15	6.3	79		25	29	131		.8		a290	.39	380	63	43	73	4.3	546	7.1
Apr. 1-10	385	12		20	7.9	106		42	37	170		1.2		393	.53	409	83	48	74	5.1	693	7.7
Apr. 11-20	277	15		18	7.0	117		29	32	192		.9		412	.56	308	75	51	77	5.9	748	6.9
Apr. 21-30	204	7.8		18	7.0	143		36	28	230		1.2		472	.64	260	74	44	81	7.2	863	7.3
May 1-7, 10-16	4,697	11		11	2.7	28		33	15	40		1.8		a126	.17	1,600	39	12	61	2.0	230	7.2
May 8-9, 17-20	1,875	15		17	4.5	50		49	21	75		1.7		a208	.28	1,050	60	20	65	2.8	380	7.3
May 21-31	196	18		20	6.3	98		58	20	155		1.0		a347	.47	184	76	28	74	4.9	651	7.3
June 1-10	110	20		20	7.5	130		60	24	205		1.5		a438	.60	130	81	32	78	6.3	825	7.5
June 11-20	89.2	15		22	7.7	160		60	23	255		.5		a513	.70	124	86	37	80	7.5	1,010	7.6
June 21-30	57.2	13		21	8.1	178		72	24	275		.5		a555	.75	85.7	86	27	82	8.3	1,060	7.4
July 1-10	40.9	12		24	9.0	213		85	24	330		1.2		667	.91	73.7	98	28	83	9.4	1,260	7.6
July 11-20	28.7	6.8		24	8.8	196		123	24	280		1.0		a601	.82	46.6	96	0	82	8.7	1,130	7.5
July 21-31	22.6	6.4		21	8.4	186		105	23	270		1.2		568	.77	34.7	87	1	82	8.7	1,090	7.3
Aug. 1-10	21.0	13		21	7.6	174		132	14	240		1.3		a536	.73	30.4	83	0	82	8.3	1,030	7.9
Aug. 11-20	15.7	12		24	9.0	248		123	15	368		1.9		763	1.04	32.3	98	0	85	11	1,420	7.9
Aug. 21-31	14.2	8.8		26	10	315		120	19	475		1.1		936	1.27	35.9	105	6	87	13	1,750	7.8
Sept. 1-10	17.2	7.8		25	8.7	314		138	21	458		.8		919	1.25	42.7	99	0	87	14	1,730	8.2
Sept. 11-20	14.4	6.6		21	7.8	275		155	21	378		1.0		811	1.10	31.5	85	0	88	13	1,520	8.0
Sept. 21-30	11.6	5.8		20	7.8	250		157	24	335		.8		746	1.01	23.4	83	0	87	12	1,390	8.0
Weighted average	516	14		13	4.4	60		30	23	95		1.4		229	0.31	319	50	26	72	3.7	420	--

a Sum of determined constituents.

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.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1947 to September 1956.
Water temperatures: October 1947 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 193 ppm July 11-20; minimum, 63 ppm Feb. 6-16.
Hardness: Maximum, 44 ppm June 1-10; minimum, 16 ppm Jan. 23-31, Feb. 6-16.
Specific conductance: Maximum observed, 393 micromhos July 1; minimum observed, 61.1 micromhos Apr. 8.
Water temperatures: Maximum observed, 88°F on many days during July and August; minimum observed, 48°F Feb. 6-7.
EXTREMES, 1945-46, 1947-56.--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 observed, 774 micromhos Dec. 26, 1948; minimum observed, 32.9 micromhos May 22, 1953.
Water temperatures (1947-56): Maximum observed, 95°F Aug. 12, 1953; minimum observed, 34°F Jan. 28, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-9, 1955	1,838	17		6.5	2.1	30		28	6.7	41		3.2		134	0.18	665	25	2	72	2.6	201	7.0
Oct. 10-20	1,275	18		8.7	3.0	38		35	8.8	54		2.2		157	.21	540	34	5	71	2.8	258	7.0
Oct. 21-31	908	21		7.7	2.8	33		36	7.1	45		1.5		140	.19	343	31	1	70	2.6	226	7.2
Nov. 1-10	900	23		7.0	2.6	29		36	6.0	39		1.0		132	.18	321	28	0	69	2.4	204	7.0
Nov. 11-20	958	22		6.4	2.4	27		33	5.7	37		.8		126	.17	326	26	0	70	2.3	191	7.0
Nov. 21-30	1,016	23		6.6	2.3	28		32	5.4	39		.7		129	.18	354	26	0	70	2.4	196	6.7
Dec. 1-10	2,592	14		5.4	1.6	26		20	5.3	38		.5		111	.15	777	20	4	74	2.5	172	6.6
Dec. 11-20	1,801	15		6.4	2.4	35		27	7.7	51		.8		144	.20	700	26	4	75	3.0	235	6.8
Dec. 21-31	1,546	16		8.2	2.6	38		27	8.5	59		.5		155	.21	647	31	9	73	3.0	261	7.0
Jan. 1-13, 1956	1,157	19		8.6	3.0	43		31	8.8	66		1.0		176	.24	550	34	8	74	3.2	291	7.1
Jan. 14-22	1,308	18		7.4	2.6	39		31	8.1	57		.3		158	.21	558	29	4	75	3.2	260	6.9
Jan. 23-31	7,490	8.8		4.2	1.3	17		12	7.1	24		.5		a69	.09	1,400	16	6	69	1.8	122	6.3
Feb. 1-5	5,284	12		5.6	2.0	27		15	10	41		.5		a105	.14	1,500	22	10	73	2.5	185	6.8
Feb. 6-16	19,400	8.8		4.0	1.4	14		8	9.9	20		.5		a63	.09	3,300	16	10	65	1.5	110	6.3
Feb. 17-29	9,726	12		7.0	2.6	24		14	16	36		.8		a105	.14	2,760	28	16	65	1.9	184	6.6
Mar. 1-12	5,620	15		8.4	3.4	25		18	19	38		.5		a118	.16	1,790	35	20	61	1.8	210	6.5
Mar. 13-20	5,968	13		7.6	2.8	20		19	15	30		1.2		a99	.13	1,590	30	15	59	1.6	174	6.4
Mar. 21-31	5,457	14		7.3	3.4	22		20	17	33		.5		a107	.15	1,580	32	16	60	1.7	185	6.4
Apr. 1-5	3,170	17		9.8	3.8	38		26	32	47		1.0		164	.22	1,400	40	18	67	2.6	252	6.6
Apr. 6-14, 16-17	9,020	9.2		4.6	1.6	14		13	9.7	19		1.5		a66	.09	1,610	18	8	63	1.4	112	6.1
Apr. 15, 18-30	4,093	16		8.0	3.4	28		27	16	39		1.0		a124	.17	1,370	34	12	64	2.1	213	6.5
May 1-7	3,489	17		8.6	3.5	34		31	16	48		.8		a143	.19	1,350	36	10	67	2.5	248	7.2
May 8-14	11,600	7.6		4.6	1.6	16		15	9.5	21		1.2		a69	.09	2,160	18	6	66	1.6	119	6.8
May 15-31	7,096	14		11	3.2	27		38	15	36		1.6		a127	.17	2,430	41	10	59	1.8	219	6.9
June 1-10	1,659	19		11	3.9	30		48	12	40		1.0		152	.21	681	44	8	60	2.0	240	7.7
June 11-20	1,598	17		8.6	3.0	26		39	8.2	35		1.0		127	.17	548	34	2	63	2.0	193	7.3
June 21-30	1,270	17		12	3.1	32		51	7.9	43		1.0		153	.21	525	42	0	62	2.1	232	7.7
July 1-10	950	20		11	3.5	43		50	9.7	60		.5		177	.24	454	42	1	69	2.9	298	7.0
July 11-20	607	22		11	3.6	50		51	8.3	70		1.0		193	.26	316	42	0	72	3.3	332	7.3
July 21-31	521	21		9.0	3.0	34		49	6.8	43		1.2		151	.21	212	35	0	68	2.5	236	7.1
Aug. 1-10	411	22		9.4	3.1	31		48	5.8	40		1.5		146	.20	162	36	0	65	2.2	228	7.6
Aug. 11-20	358	22		8.4	3.2	34		48	5.9	44		1.5		150	.20	145	34	0	69	2.6	238	7.5
Aug. 21-31	325	22		9.0	3.3	40		50	6.1	52		1.2		163	.22	143	36	0	70	2.9	265	7.4
Sept. 1-10	387	21		9.0	3.3	38		43	10	52		.5		170	.23	178	36	1	70	2.8	273	7.4
Sept. 11-20	313	21		7.0	2.8	36		44	5.6	46		.8		152	.21	128	29	0	73	2.9	246	7.4
Sept. 21-30	278	21		7.6	2.9	37		47	5.3	48		.8		157	.21	118	31	0	72	2.9	254	7.6
Weighted average	3,421	13		6.8	2.4	23		21	12	33		0.9		103	0.14	951	27	10	65	1.9	176	--

a Sum of determined constituents.

COW BAYOU NEAR MAURICEVILLE, TEX.

LOCATION.--At gaging station at bridge on State Highway 235, half a mile upstream from Kansas City Southern Railway Bridge, and 3 miles southwest of Mauriceville, Orange County.
DRAINAGE AREA.--127 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1952 to December 1955.
Water temperatures: March 1952 to September 1954.
EXTREMES, 1952-55.--Dissolved solids: Maximum, 1,030 ppm July 29-31, 1953; minimum, 23 ppm Apr. 23-30, 1952.
Hardness: Maximum, 186 ppm Nov. 1-9, 1953; minimum, 8 ppm Nov. 15-17, 1954, Jan. 14-24, 1955.
Specific conductance: Maximum observed, 2,190 micromhos Aug. 24, 1953; minimum observed, 22.0 micromhos Apr. 24, 1952.
REMARKS.--Values reported for dissolved solids concentrations are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955--------	0.27	8.0		4.5	1.9	30		18	3.6	46		0.8		104	0.14	0.08	19	4	77	3.0	199	6.7
Oct. 11-14----------	.10	14		14	5.5	63		41	8.5	107		.8		233	.32	.06	57	23	71	3.6	441	7.0
Oct. 17-31----------	0	22		26	12	122		74	15	215		1.2		a461	.63	--	115	54	70	4.9	809	7.3
Nov. 1-10----------	0	25		29	14	136		83	18	240		.5		a520	.71	--	130	62	69	5.2	932	7.2
Nov. 11-12, 22-26------	0	16		18	8.7	91		56	12	157		.8		332	.45	--	82	36	71	4.4	620	7.4
Nov. 27-30----------	0	5.6		5.0	2.3	30		18	5.8	47		.5		105	.14	--	22	7	75	2.8	201	6.8
Dec. 1-2, 11-17--------	10.7	6.8		3.2	1.7	9.6	2.7	4	8.3	17		.5		52	.07	1.50	15	12	53	1.1	84.9	5.9
Dec. 3-10, 20-21-------	42.7	4.6		5.2	1.7	34		6	5.4	58		.8		113	.15	13.0	20	15	78	3.3	220	6.0
Dec. 18-19----------	209	2.7		1.8	1.1	5.3	2.5	6	4.7	8.5		.5		30	.04	16.9	9	4	49	.8	56.8	6.2
Dec. 22-31----------	26.3	5.9		3.6	1.7	12		8	4.5	21		.8		54	.07	3.83	16	9	61	1.3	96.1	6.0

a Residue on evaporation at 180°C.

NECHES RIVER BASIN

ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 59, 400 feet upstream from Procella Creek, half a mile downstream from Little Loco Bayou, 1.5 miles upstream from Texas & New Orleans Railroad bridge, and 8 miles north of Lufkin, Angelina County.
DRAINAGE AREA.--1,630 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1956.
Water temperatures: October 1954 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 333 ppm Oct. 11-20; minimum, 80 ppm May 4-8, 11-14.
Hardness: Maximum, 62 ppm Aug. 11-20; minimum, 22 ppm May 4-8, 11-14.
Specific conductance: Maximum observed, 735 micromhos Oct. 2; minimum observed, 102 micromhos May 5.
Water temperatures: Maximum observed, 86°F July 9; minimum observed, 40°F Jan. 19-20, 24.
EXTREMES, 1954-56.--Dissolved solids: Maximum, 412 ppm Nov. 4-18, 26-30, 1954; minimum, 53 ppm May 24-29, 1955.
Hardness: Maximum, 76 ppm Nov. 4-18, 26-30, 1954; minimum, 18 ppm May 24-29, 1955.
Specific conductance: Maximum observed, 895 micromhos Nov. 10, 1954; minimum observed, 51.4 micromhos May 25, 1955.
Water temperatures: Maximum observed, 86°F Oct. 11, 1954, July 9, 1956; minimum observed, 40°F Jan. 24, 1955, Jan. 19-20, 24, 1956.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955-------	90.5	15	0.27	12	4.4	81		30	10	135		1.0		287	0.39	70.1	49	24	78	5.1	524	6.8
Oct. 11-20----------	54.1	16	.28	12	5.0	92		24	12	154		.5		333	.45	48.6	50	30	80	5.6	581	7.0
Oct. 21-31----------	25.8	14	.49	9.6	4.4	72		33	9.3	115		.6		268	.36	18.7	42	15	79	4.9	455	7.0
Nov. 1-10----------	22.7	16	--	9.6	4.4	62		34	9.4	99		.6		236	.32	14.5	42	14	76	4.2	405	6.9
Nov. 11-20----------	32.5	15	--	9.1	4.7	64		33	9.0	103		.6		238	.32	20.9	42	15	77	4.3	425	7.0
Nov. 21-30----------	42.6	15	--	9.3	4.3	64		32	9.1	102		.4		232	.32	26.7	41	15	77	4.3	408	7.2
Dec. 1-10----------	118	14	--	8.5	4.6	66		27	10	107		1.3		249	.34	79.3	40	18	78	4.6	436	6.9
Dec. 11-20----------	121	16	--	10	4.9	74		16	17	124		1.4		295	.40	96.4	46	33	78	4.7	508	6.6
Dec. 21-31----------	94.7	16	--	10	4.9	86		16	16	143		1.2		306	.42	78.2	46	33	80	5.5	543	6.4
Jan. 1-10, 1956-------	93.5	13	.14	11	3.4	82		38	15	123		.2		272	.37	68.7	42	11	81	5.5	476	6.6
Jan. 11-17----------	86.6	14	.76	11	4.1	77		20	14	128		.4		279	.38	65.2	44	28	79	5.1	499	7.0
Jan. 18-28----------	289	14	.26	9.0	3.3	58		14	17	94		.5		223	.30	174	36	25	78	4.2	379	6.8
Jan. 29-31, Feb. 1-3--	334	15	.07	12	5.0	80		9	25	136		.2		307	.42	277	51	44	77	4.9	530	6.5
Feb. 4-10----------	724	14	.31	8.8	3.9	55		10	23	88		.6		228	.31	446	38	30	76	3.9	367	6.5
Feb. 11-20----------	1,229	13	.31	8.1	4.1	39		8	22	65		.2		187	.25	621	37	30	69	2.8	284	6.4
Feb. 21-29----------	744	14	.28	9.3	4.8	46		12	28	74		.2		210	.29	422	43	33	70	3.1	333	6.5
Mar. 1-10----------	364	16	.14	10	5.8	54		15	28	88		.5		239	.33	235	49	36	71	3.3	388	6.5
Mar. 11-20----------	422	15	.21	9.6	5.6	49		18	25	80		.2		220	.30	251	47	32	69	3.1	363	7.0
Mar. 21-31----------	461	14	.18	11	6.1	49		16	30	82		.2		229	.31	285	53	39	67	3.0	378	6.8
Apr. 1-6, 16-20-------	419	15	.31	11	5.4	51		21	25	83		.8		223	.30	252	50	33	69	3.1	367	6.5
Apr. 7-15----------	1,272	13	.40	6.3	3.0	25		14	19	36		1.1		a111	.15	381	28	17	66	2.1	185	6.1
Apr. 21-30, May 1-3---	296	16	.42	10	5.2	50		28	19	80		1.2		218	.30	174	47	24	70	3.2	363	6.8
May 4-8, 11-14--------	4,572	13	.73	3.7	3.1	16		19	17	16		1.5		a80	.11	988	22	6	61	1.5	123	6.5
May 9-10, 15-20-------	4,162	14	.97	7.1	4.2	24		28	15	33		1.7		a114	.16	1,280	35	12	60	1.7	192	6.4
May 21-31----------	264	20	.85	9.9	5.4	47		31	16	75		2.9		220	.30	157	47	22	69	3.0	344	7.0
June 1-10----------	130	20	.78	9.7	5.3	52		30	14	83		2.4		227	.31	79.7	46	21	71	3.3	362	7.0
June 11-20----------	88.6	18	.66	10	5.6	54		34	15	85		1.6		236	.32	56.5	48	20	71	3.4	378	7.0
June 21-30----------	89.1	19	.38	11	4.4	51		34	12	82		1.0		221	.30	53.2	46	18	71	3.3	358	7.2
July 1-10----------	34.1	17	.17	11	5.7	60		40	11	98		.8		240	.33	22.1	52	19	72	3.6	413	6.9
July 11-20----------	22.4	15	.06	11	5.9	61		44	12	96		.5		232	.32	14.0	52	16	72	3.7	413	6.8
July 21-31----------	13.1	14	.06	12	6.4	66		46	12	105		.5		252	.34	8.91	56	18	72	3.8	452	7.3
Aug. 1-10----------	8.05	13	.10	12	6.6	69		50	11	110		.8		264	.36	5.74	58	17	72	3.9	475	7.4
Aug. 11-20----------	4.98	11	.13	13	7.1	73		51	11	119		.5		286	.39	3.85	62	20	72	4.1	510	7.4
Aug. 21-31----------	5.79	12	.04	12	7.1	75		54	13	117		.8		284	.39	4.44	60	16	73	4.2	510	7.3
Sept. 1-10----------	6.64	12	.19	11	6.1	60		50	16	88		.5		a219	.30	3.93	52	11	71	3.6	417	7.6
Sept. 11-20----------	3.70	11	.12	9.2	5.6	54		50	14	77		.2		a196	.27	1.96	46	5	72	3.5	376	7.8
Sept. 21-30----------	1.82	7.4	.10	11	6.0	62		53	12	93		.8		223	.30	1.10	53	10	72	3.7	392	7.6
Weighted average----	413	14	--	7.2	4.1	34		20	19	51		1.1		153	0.21	171	35	18	68	2.5	249	--

a Sum of determined constituents.

NECHES RIVER AT EVADALE, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 96, 200 feet upstream from Gulf, Colorado & 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 1956.
Water temperatures: October 1947 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 199 ppm Nov. 21-30; minimum, 82 ppm Feb. 11-21.
Hardness: Maximum, 54 ppm Sept. 1-10; minimum, 23 ppm Jan. 24-31, Feb. 11-21.
Specific conductance: Maximum observed, 350 micromhos Nov. 18; minimum observed, 114 micromhos Jan. 26.
Water temperatures: Maximum observed, 92°F Aug. 8-11; minimum observed, 43°F Jan. 20.
EXTREMES, 1947-56.--Dissolved solids: Maximum, 218 ppm Dec. 11-20, 1948; minimum, 36 ppm May 5-12, 26-27, 1953.
Hardness: Maximum, 70 ppm Nov. 1-10, 1947; minimum, 16 ppm Sept. 22-25, 27, 1950.
Specific conductance: Maximum observed, 415 micromhos Nov. 29, 1952; minimum observed, 49.3 micromhos May 9, 1953.
Water temperatures: Maximum observed 94°F June 29, 1953; minimum observed, 37°F Jan. 30-31, 1948, Jan. 31, 1949.
REMARKS.--Values reported for dissolved solids are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955------	627	17		9.2	3.6	33		38	13	44	0.4	2.8		142	0.19	240	38	7	65	2.3	243	6.8
Oct. 11-20----------	506	19		10	3.2	31		42	11	41	.4	.8		137	.19	187	39	4	63	2.1	233	7.1
Oct. 21-31----------	516	17		10	3.3	34		41	12	47	.4	.5		144	.20	201	39	6	66	2.4	257	7.0
Nov. 1-10----------	607	20		11	3.2	42		44	14	55	.5	2.5		170	.26	310	40	4	70	2.9	283	7.1
Nov. 11-20----------	541	19		11	3.2	45		47	15	57	.5	1.0		a196	.27	286	40	2	71	3.1	293	7.1
Nov. 21-30----------	498	19		11	3.1	46		48	14	60	.5	1.0		a199	.27	268	40	0	72	3.2	299	7.0
Dec. 1-10----------	623	15		8.6	2.8	35		35	12	47	.7	.8		139	.19	234	33	4	70	2.7	242	7.2
Dec. 11-20----------	408	17		9.8	3.3	37		47	12	46	.7	.8		150	.20	165	38	0	68	2.6	253	7.0
Dec. 21-31----------	498	17		9.4	3.0	43		48	13	52	.7	.8		163	.22	219	36	0	72	3.1	278	7.0
Jan. 1-10, 1956------	477	17		10	3.0	43		48	16	52	.5	1.2		167	.23	215	38	0	71	3.0	280	7.3
Jan. 11-23----------	577	16		9.6	3.2	39		43	16	48	.6	.9		154	.21	240	37	2	69	2.8	270	7.1
Jan. 24-31----------	930	12		6.4	1.7	20		21	9.1	26	.5	1.0		87	.12	218	23	6	65	1.8	148	6.7
Feb. 1-10----------	2,847	14		7.8	2.3	28		24	14	38	.6	1.2		118	.16	907	29	10	68	2.3	204	6.6
Feb. 11-21----------	7,018	12		6.4	1.7	17		14	14	22	.7	.8		82	.11	1,550	23	12	61	1.5	138	6.2
Feb. 22-29----------	3,086	13		7.0	2.6	22		16	19	28	.7	.5		101	.14	842	28	15	63	1.8	170	6.4
Mar. 1-10----------	3,055	14		8.8	2.9	28		18	23	38	.5	1.2		125	.17	1,030	34	19	64	2.1	206	6.5
Mar. 11-20----------	1,649	15		9.8	3.0	26		22	20	38	.5	.8		124	.17	552	37	19	61	1.9	212	6.4
Mar. 21-31----------	2,225	14		10	3.2	29		23	23	40	.4	.9		132	.18	793	38	19	62	2.0	223	7.1
Apr. 1-14----------	3,739	15		11	3.5	30		27	25	41	.4	.9		140	.19	1,410	42	20	61	2.0	246	6.9
Apr. 15-22----------	4,781	12		8.2	2.8	21		22	20	26	.6	2.1		104	.14	1,340	32	14	59	1.6	176	6.8
Apr. 23-30----------	1,318	14		8.4	2.7	21		25	19	24	.5	1.3		103	.14	367	32	12	58	1.6	169	7.1
May 1-10----------	1,780	13		8.4	3.2	22		26	20	26	.3	1.5		107	.15	514	34	12	58	1.6	176	6.8
May 11-20----------	5,617	13		8.6	3.0	26		28	20	32	.4	1.2		118	.16	1,790	34	11	63	2.0	195	6.7
May 21-31----------	5,348	11		6.2	2.6	20		22	12	26	.4	1.0		90	.12	1,300	26	8	62	1.7	153	6.9
June 1-10----------	1,352	15		8.2	3.5	19		34	12	25	.4	.8		101	.14	369	35	7	55	1.4	174	7.1
June 11-20----------	1,358	13		9.2	3.6	21		36	12	28	.4	.8		106	.14	389	38	8	54	1.5	179	7.0
June 21-30----------	650	15		11	3.8	21		41	11	29	.4	1.0		112	.15	197	42	8	52	1.4	195	7.6
July 1-10----------	992	17		11	4.0	29		45	14	37	.5	1.0		136	.18	364	44	7	58	1.9	233	6.8
July 11-20----------	810	16		11	4.0	30		48	13	38	.5	.8		137	.19	300	44	4	59	1.9	241	7.0
July 21-31----------	857	15		11	3.8	30		47	12	38	.5	1.0		134	.18	310	42	4	61	2.0	235	7.0
Aug. 1-10----------	534	18		11	4.6	34		54	14	42	.5	1.2		152	.21	219	46	2	62	2.2	260	7.6
Aug. 11-20----------	636	17		11	4.5	38		59	13	46	.5	1.0		160	.22	275	46	0	64	2.5	279	7.4
Aug. 21-31----------	490	18		12	4.9	43		66	14	52	.5	.8		177	.24	234	51	0	65	2.6	313	7.6
Sept. 1-10----------	212	24		13	5.0	41		76	10	49	.5	.8		a188	.26	108	54	0	62	2.4	296	7.4
Sept. 11-20----------	204	23		13	4.5	31		71	9.6	34	.5	.8		a160	.22	88.1	50	0	58	1.9	247	7.4
Sept. 21-30----------	166	22		13	4.4	39		74	10	44	.5	.8		170	.23	76.2	50	0	63	2.4	286	7.4
Weighted average---	1,608	14		8.6	2.9	26		28	17	33	0.5	1.1		117	0.16	508	34	10	63	2.0	198	--

a Residue on evaporation at 180°C.

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 1956.
Water temperatures: October 1954 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,800 ppm Aug. 21-31; minimum, 279 ppm May 1-10.
Hardness: Maximum, 296 ppm Sept. 11-20; minimum, 132 ppm Apr. 15-16, 18.
Specific conductance: Maximum observed, 2,890 micromhos Sept. 26; minimum observed, 344 micromhos May 4.
Water temperatures: Maximum observed, 87°F July 9, Aug. 15-16, 19; minimum observed, 34°F Jan. 20.
EXTREMES, 1954-56.--Dissolved solids: Maximum, 1,800 ppm Aug. 21-31, 1956; minimum, 279 ppm May 1-10, 1956.
Hardness: Maximum, 296 ppm Sept. 11-20, 1956; minimum, 120 ppm Sept. 20-21, 26-27, 29, 1955.
Specific conductance: Maximum observed, 2,890 micromhos Sept. 26, 1956; minimum observed, 344 micromhos May 4, 1956.
Water temperatures: Maximum observed, 97°F July 1, 1955; minimum observed, 34°F Jan. 20, 1956.
REMARKS.--Values reported for dissolved solids are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955-------	250	20		50	5.0	170		128	152	143		64		667	0.91	450	146	41	72	6.1	1,100	7.8
Oct. 11-17----------	145	23		56	5.9	206		96	211	172		88		809	1.10	317	164	86	73	7.0	1,290	7.4
Oct. 18-31----------	124	23		52	6.9	258		164	202	220		78		921	1.25	308	158	24	78	8.9	1,520	7.6
Nov. 1-10----------	124	22		55	7.8	272		121	263	220		95		995	1.35	333	169	70	78	9.1	1,640	7.2
Nov. 11-20----------	129	23		52	7.7	272		169	207	232		90		967	1.32	337	162	24	79	9.3	1,640	7.5
Nov. 21-30----------	142	22		56	8.2	282		177	249	215		96		1,020	1.39	391	172	27	78	9.3	1,730	7.1
Dec. 1-10----------	226	18		52	7.4	261		164	229	200		89		937	1.27	572	160	26	78	9.0	1,600	6.6
Dec. 11-20----------	150	20		53	8.0	276		148	267	205		94		996	1.35	403	165	44	78	9.3	1,740	6.4
Dec. 21-31----------	150	21		51	8.1	265		173	205	215		98		948	1.29	384	161	19	78	9.1	1,690	7.0
Jan. 1-10, 1956-------	150	21		52	8.1	297		233	214	222		102		1,030	1.40	417	163	0	80	10	1,630	7.2
Jan. 11-20----------	161	19		52	8.1	304		273	196	228		92		1,030	1.40	448	163	0	80	10	1,640	7.1
Jan. 21-31----------	230	16		56	6.7	268		260	258	180		17		930	1.26	578	167	0	78	9.0	1,550	7.2
Feb. 1-8----------	252	16		56	5.8	223		156	186	180		91		a844	1.15	574	164	36	75	7.6	1,380	6.7
Feb. 9-17----------	407	13		60	4.8	156		132	171	120		65		a686	.93	754	169	61	67	5.2	1,110	6.6
Feb. 18-20----------	571	12		56	3.3	90		164	90	77		14		a454	.62	700	153	18	56	3.2	732	8.1
Feb. 21-29----------	226	17		64	5.7	196		161	199	152		69		a823	1.12	502	182	50	70	6.3	1,320	6.8
Mar. 1-10----------	166	20		62	9.2	217		159	209	175		85		a894	1.22	401	192	62	71	6.8	1,410	7.3
Mar. 11-20----------	156	22		61	9.8	256		174	229	212		85		a1,000	1.36	421	192	50	74	8.0	1,600	6.9
Mar. 21-31----------	160	23		58	9.6	285		263	208	218		79		1,010	1.37	436	184	0	77	9.1	1,650	7.1
Apr. 1-14----------	148	24		58	7.7	270		190	220	222		83		978	1.33	391	177	22	77	8.8	1,600	7.4
Apr. 15-16, 18--------	693	15		47	3.7	93		146	86	76		22		415	.56	777	132	12	60	3.5	715	8.1
Apr. 17, 19-30--------	172	20		60	6.5	226		180	213	172		71		858	1.17	398	177	30	74	7.4	1,440	7.1
May 1-10----------	3,637	13		57	3.3	36		161	57	26		7.7		279	.38	2,740	156	24	33	1.3	470	8.0
May 11-20----------	491	15		65	4.3	88		204	94	67		13		446	.61	591	179	12	52	2.9	755	8.1
May 21-31----------	163	23		63	5.8	202		230	156	175		30		768	1.04	338	182	0	71	6.5	1,320	7.4
June 1-4----------	403	23		58	5.2	224		198	196	175		50		a842	1.15	916	166	4	75	7.6	1,350	7.9
June 5-16----------	324	17		55	4.7	133		171	118	108		36		a568	.77	497	156	16	65	4.6	922	7.7
June 17-30----------	128	21		60	6.5	259		214	190	230		52		a947	1.29	327	176	0	76	8.5	1,530	7.3
July 1-10----------	125	35		54	7.3	281		221	183	258		49		976	1.33	329	164	0	79	9.5	1,610	8.1
July 11-20----------	126	23		66	12	309		228	177	335		53		1,090	1.48	371	214	27	76	9.2	1,840	8.0
July 21-31----------	125	23		77	12	371		220	316	352		51		1,310	1.84	442	242	61	77	10	2,180	7.8
Aug. 1-10----------	114	29		71	12	370		224	241	395		48		1,280	1.74	394	226	43	78	11	2,110	8.0
Aug. 11-20----------	117	27		80	13	412		232	308	422		53		1,430	1.94	452	253	63	78	11	2,270	7.9
Aug. 21-31----------	119	29		88	15	522		229	512	455		67		1,800	2.45	578	281	94	80	14	2,470	7.5
Sep. 1-10----------	125	26		88	14	413		200	291	465		63		1,460	1.99	493	276	112	76	11	2,410	7.9
Sep. 11-20----------	116	26		92	16	460		228	323	515		57		1,600	2.18	501	296	109	77	12	2,650	7.5
Sep. 21-30----------	115	24		90	17	494		276	343	530		47		1,680	2.28	522	294	68	79	13	2,780	7.2
Weighted average----	280	18		59	6.0	168		179	151	142		42		678	0.92	513	172	25	68	5.6	1,120	--

a Residue on evaporation at 180°C.

CEDAR CREEK NEAR MABANK, TEX.

LOCATION.--At gaging station at bridge on State Farm Highway 85, 2 miles downstream from Lacy's Fork and 5.5 miles southwest of Mabank, Kaufman County.
DRAINAGE AREA.--734 square miles.
RECORDS AVAILABLE.--Chemical analyses: April to September 1956.
Water temperatures: April to September 1956.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, April to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr.24-30, May 1, 1956	15.9	8.2		26	6.9	36		90	27	47	0.5	1.8		197	0.27	8.46	93	19	45	1.6	363	7.4
May 2-6	2,442	13		13	4.4	12		54	16	10	.4	2.2		98	.13	646	53	8	32	.7	163	6.8
May 7-14	a12.9	15		24	5.6	21		81	29	20	.4	2.5		158	.21	5.50	83	17	35	1.0	267	7.5
May 15-23	0	18		30	6.1	30		98	39	28	.6	2.1		202	.27	0	99	19	40	1.3	342	7.6
June 1-10	a10.2	10		24	2.8	25		78	34	16	.7	2.5		153	.21	4.21	71	7	44	1.3	259	7.2
June 11-15	b0	13		28	4.6	27		101	39	15	.7	2.1		179	.24	0	90	7	39	1.2	292	7.8

a Includes day of less than 0.05 cubic feet per second discharge.
b No flow June 8 to September 30.

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 to September 1956.
Water temperatures: April to September, 1956.
EXTREMES, 1956.--Dissolved solids: Maximum, 13,500 ppm Aug. 11-31; minimum, 189 ppm May 2 (6 p.m.), 3-6.
Hardness: Maximum, 343 ppm June 1-4; minimum, 108 ppm May 2 (7 a.m.).
Specific conductance: Maximum daily, 22,000 micromhos Aug. 22; minimum daily, 274 micromhos May 4.
Water temperatures: Maximum observed, 95°F July 5.
REMARKS.--Values reported for dissolved solids are 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.

Chemical analyses, in parts per million, April to September, 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Apr. 24-30, May 1, 1956		5.8		78	26	2,580		513	33	3,870	0.6	--		6,850	9.32		302	0	95	65	11,600	8.2
May 2 (7 a.m.)---------		13		37	4.0	308		142	10	460	.4	2.5		905	1.23		108	0	86	13	1,720	7.9
May 2 (6 p.m.), 3-6----		13		39	2.9	24		123	27	20	.4	3.0		189	.26		109	8	32	1.0	322	7.4
May 7-9----------------		16		52	3.9	58		161	33	72	.4	2.2		316	.43		146	14	46	2.1	552	7.5
May 10-11--------------		18		66	6.8	150		197	21	235	.4	3.2		597	.81		192	31	63	4.7	1,160	7.9
May 12-16--------------		16		89	11	514		251	74	778	.6	3.8		1,610	2.19		267	62	81	14	2,920	7.9
May 17-31--------------		4.4		87	20	1,400		286	70	2,150	.6	--		3,870	5.26		299	64	91	35	6,920	8.0
June 1-4---------------		7.7		96	25	2,480		395	61	3,790	.7	--		6,650	9.04		343	20	94	58	11,300	8.0
June 5-----------------		13		59	4.9	82		191	74	76	.8	1.4		a408	.55		166	10	52	2.8	671	7.8
June 6-7---------------		14		47	3.0	56		128	55	60	.8	2.5		a304	.41		130	25	48	2.1	516	8.2
June 8-10--------------		13		55	3.7	167		147	63	230	.8	2.0		a615	.84		151	30	71	5.9	1,070	7.7
June 11-20-------------		12		67	7.5	603		205	67	900	.7	1.2		1,760	2.39		198	30	87	19	3,190	7.8
June 21-25-------------		9.8		75	17	1,980		337	55	3,000	.7	--		5,300	7.21		256	0	94	54	9,040	8.2
June 26-30, July 1-17--		7.9		67	26	3,040		368	40	4,640	.9	--		8,000	10.9		275	0	96	80	13,200	8.2
July 18-31-------------		6.6		41	31	3,880		b455	27	5,860	1.1	--		10,100	13.7		231	0	97	111	16,600	8.4
Aug. 1-10--------------		4.3		40	42	4,870		b513	24	7,380	1.1	--		12,600	17.1		272	0	97	129	20,200	8.3
Aug. 11-31-------------		3.6		39	42	5,220		c597	30	7,870	1.2	--		13,500	18.4		270	0	98	138	21,700	8.6
Sept. 1-3--------------		--		--	--	--		d612	--	7,550	--	--		--	--		322	0	--	--	20,700	--
Sept. 4-8--------------		15		51	4.7	380		166	70	540	1.0	1.2		1,140	1.55		147	11	85	14	2,070	8.0
Sept. 9-30-------------	e																					

a Residue on evaporation at 180°C.
b Includes equivalent of 13 parts per million carbonate (CO_3).
c Includes equivalent of 39 parts per million carbonate (CO_3).
d Includes equivalent of 52 parts per million carbonate (CO_3).
e No flow.

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 1956.
Water temperatures: February 1950 to September 1951, April 1953 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,180 ppm Sept. 11-21; minimum, 155 ppm Apr. 13-16.
Hardness: Maximum, 215 ppm Aug. 16-31; minimum, 58 ppm Apr. 13-16.
Specific conductance: Maximum observed, 2,360 micromhos May 2; minimum observed, 213 micromhos Apr. 13.
Water temperatures: Maximum observed, 95°F July 19-20; minimum observed, 38°F Jan. 18.
EXTREMES, 1945-50, 1953-56.--Dissolved solids: Maximum, 1,900 ppm Nov. 7, 1953; minimum, 82 ppm July 31, 1954.
Hardness: Maximum, 254 ppm Oct. 17-19, 1954; minimum, 32 ppm Nov. 1-3, 1953.
Specific conductance: Maximum observed, 3,170 micromhos Nov. 7, 1953; minimum observed, 103 micromhos Nov. 9, 1946.
Water temperatures (1953-56): Maximum observed 98°F July 18, 27, 1953; minimum observed, 38°F Jan. 18, 1956.
REMARKS.--Values reported for dissolved solids are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-7, 1955	1,119	20		60	7.8	293		174	102	398		10		977	1.33	2,950	181	38	78	9.5	1,720	7.9
Oct. 8-10	742	18		34	4.2	145		127	44	186	6.6	6.6		500	0.68	1,000	103	0	75	6.2	900	7.9
Oct. 11-15	695	17		36	3.6	83		124	36	103		3.4		343	0.47	644	106	4	63	3.5	608	7.9
Oct. 16-20	488	22		49	3.8	159		141	70	205		9.7		588	0.80	775	139	24	71	5.9	1,040	7.8
Oct. 21-31	296	13		52	6.1	172		145	90	218		11		633	0.86	506	154	35	71	6.0	1,110	7.7
Nov. 1-11	262	13		52	6.4	141		151	63	192		5.2		a583	0.79	412	156	32	66	4.9	1,010	6.7
Nov. 12-20	274	4.4		57	6.6	195		160	82	265		4.5		a728	0.99	539	170	39	71	6.5	1,270	7.4
Nov. 21-30	287	3.8		58	6.8	180		171	73	245		3.0		a689	0.94	534	172	32	70	6.0	1,210	7.6
Dec. 1-10	447	4.2		62	7.1	250		157	89	355		6.5		851	1.16	1,030	184	56	75	8.0	1,550	8.0
Dec. 11-20	422	12		63	8.0	309		177	104	425		11		1,020	1.39	1,160	190	45	78	9.7	1,830	7.7
Dec. 21-31	358	15		63	7.9	332		167	110	458		16		1,080	1.47	1,040	189	52	79	10	1,910	7.4
Jan. 1-10, 1956	344	11		57	7.0	308		179	100	415		7.0		993	1.35	922	171	24	80	10	1,810	7.9
Jan. 11-21	464	12		54	6.0	250		160	100	325		11		837	1.14	1,050	158	27	77	8.7	1,500	7.7
Jan. 22-31	1,248	10		44	5.1	204		114	78	278		8.5		684	0.93	2,300	131	38	77	7.7	1,280	7.4
Feb. 1-6	1,462	16		44	6.7	264		110	78	372		18		a902	1.23	3,560	137	47	81	9.8	1,530	7.8
Feb. 7-10	6,320	11		33	3.4	86		109	42	106		0.2		336	0.46	5,730	96	6	66	3.8	597	6.5
Feb. 11-20	4,514	11		33	3.1	52		90	40	62		6.0		251	0.34	3,060	96	22	54	2.3	443	7.5
Feb. 21-29	1,607	14		40	4.7	79		99	60	100		9.3		356	0.48	1,540	120	39	59	3.1	624	7.5
Mar. 1-3	1,138	17		50	6.3	170		104	80	238		19		a646	0.88	1,980	150	65	71	6.0	1,140	7.8
Mar. 4-9	1,322	15		37	3.3	57		102	33	75		6.0		a306	0.42	1,090	105	22	54	2.4	493	7.8
Mar. 10-20	736	17		48	6.3	87		130	49	123		4.5		a420	0.57	835	146	40	56	3.1	717	8.1
Mar. 21-31	922	13		43	6.2	106		104	54	156		4.2		a464	0.63	1,160	133	48	64	4.0	802	7.9
Apr. 1-5, 25-30	678	15		46	8.4	163		120	72	232		3.8		599	0.81	1,100	150	51	70	5.8	1,100	7.5
Apr. 6-12, 17-24	2,833	15		29	5.5	66		76	39	93		4.1		289	0.39	2,210	95	32	60	2.9	532	7.3
Apr. 13-16	2,750	11		18	2.9	31		48	23	41		3.8		155	0.21	1,150	58	18	53	1.7	280	7.2
May 1-3	645	17		57	9.0	297		177	84	420		0.1		971	1.32	1,690	178	33	78	9.7	1,780	7.9
May 4, 6-7	8,077	17		38	5.2	104		102	54	139		6.8		414	0.56	9,030	116	32	66	4.2	761	7.9
May 5, 8-18	9,909	21		39	3.7	37		122	31	42		3.4		237	0.32	6,340	113	13	42	1.5	410	7.8
May 19-31	1,105	16		52	5.4	70		151	47	91		2.6		358	0.49	1,070	151	28	50	2.5	641	7.8
June 1-12	769	14		60	6.0	87		182	52	113		1.2		422	0.57	876	174	25	52	2.9	762	8.0
June 13-16	1,191	10		68	8.7	300		217	106	400		6.7		1,010	1.37	3,250	206	28	76	9.1	1,810	8.3
June 17-30	660	17		37	3.3	59		117	40	68		3.2		286	0.39	510	107	11	55	2.5	505	8.1
July 1-10	234	17		54	5.0	94		178	56	109		1.2		a425	0.58	269	155	9	57	3.3	757	8.0
July 11-20	207	18		62	5.5	124		204	52	160		1.2		a527	0.72	295	177	10	60	4.1	933	8.2
July 21-31	165	18		58	6.2	155		184	60	208		1.5		597	0.81	266	170	19	67	5.2	1,060	7.9
Aug. 1-15	136	21		66	8.4	172		217	57	238		1.8		671	0.91	246	200	22	65	5.3	1,200	8.2
Aug. 16-31	120	22		73	8.2	211		238	66	290		1.2		788	1.07	255	215	20	68	6.3	1,470	8.2
Sept. 1-10	207	19		66	10	327		228	105	438		2.2		1,080	1.47	604	206	18	78	9.9	1,940	8.2
Sept. 11-21	157	16		54	9.7	378		207	119	498		1.5		1,180	1.60	500	175	6	82	12	2,120	8.2
Sept. 22-30	128	16		57	7.8	231		184	82	310		1.0		795	1.08	275	173	22	74	7.6	1,430	8.2
Weighted average	1,211	16		41	4.8	98		119	49	129		5.0		405	0.55	1,320	122	24	64	3.9	720	--

a Residue on evaporation at 180°C.

TRINITY RIVER NEAR MOSS BLUFF, TEX.

LOCATION.--At Devers Pumping Plant Number One, one 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 1955.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 3,930 ppm Aug. 26-31; minimum, 129 ppm Apr. 14-16.
Hardness: Maximum, 790 ppm Aug. 26-31; minimum, 48 ppm Apr. 14-16.
Specific conductance: Maximum daily, 6,980 micromhos Aug. 26, 31; minimum daily, 238 micromhos Apr. 15.
EXTREMES, 1949-56.--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 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 for this station.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-15, 1955--------		16		41	4.3	127		150	44	161		2.6		499	0.68		121	0	70	5.0	867	7.6
Oct. 16-31-------------		18		46	4.4	123		152	40	165		3.2		499	.68		133	8	67	4.6	877	8.0
Nov. 1-15--------------		12		52	5.6	121		179	41	160		2.2		489	.67		152	6	63	4.3	877	7.6
Nov. 16-30-------------		7.0		60	6.2	172		180	70	232		3.2		647	.88		175	28	68	5.7	1,160	7.7
Dec. 1-15--------------		4.2		61	6.4	219		152	66	325		4.0		a761	1.03		178	54	73	7.1	1,410	7.7
Dec. 16-31-------------		8.8		64	7.6	269		183	95	370		6.8		911	1.24		192	42	75	8.4	1,670	7.6
Jan. 1-17, 1956--------		14		63	8.9	319		189	99	440		9.5		1,050	1.43		194	38	78	10	1,890	7.6
Jan. 18-31-------------		11		41	5.3	177		130	72	228		8.9		629	.86		124	18	76	6.9	1,100	7.5
Feb. 1-5, 9-14---------		12		28	3.3	93		72	41	127		6.5		a346	.47		84	25	71	4.4	632	7.2
Feb. 6-8---------------		14		39	5.7	240		104	52	352		9.2		823	1.12		121	36	81	9.5	1,380	7.3
Feb. 15-29-------------		13		40	4.1	73		102	48	97		6.6		a332	.45		118	34	57	2.9	589	7.4
Mar. 1-15--------------		16		38	4.5	76		108	43	99		8.2		370	.50		114	25	59	3.1	600	7.5
Mar. 16-31-------------		10		44	5.9	84		119	48	119		2.5		390	.53		134	37	58	3.2	677	7.5
Apr. 1-13--------------		9.0		38	4.3	85		100	41	121		2.4		422	.57		112	30	62	3.5	659	7.4
Apr. 14-16-------------		9.0		16	1.8	26		48	20	30		2.1		a129	.18		48	9	54	1.6	243	7.0
Apr. 17-30-------------		14		34	4.7	77		95	41	105		2.4		330	.45		104	26	62	3.3	551	6.9
May 1-6----------------		17		54	6.6	183		152	71	255		2.1		676	.92		161	36	71	6.3	1,200	7.7
May 7-19---------------		16		43	3.7	44		136	31	51		1.7		274	.37		122	11	44	1.7	455	7.7
May 20-31--------------		17		50	4.4	65		148	43	82		1.5		348	.47		142	20	50	2.4	591	8.0
June 1-21--------------		16		61	5.4	106		184	52	139		1.8		487	.66		173	22	57	3.5	877	7.8
June 22-30-------------		20		44	3.7	87		142	51	101		3.5		394	.54		125	8	60	3.4	665	7.9
July 1-4, 7-8----------		19		54	4.8	219		145	72	308		2.0		a750	1.02		154	35	76	7.7	1,340	8.0
July 6-----------------		17		99	86	867		194	227	1,480		3.5		2,870	3.90		600	441	76	15	5,020	8.2
July 11, 14, 17-18-----		17		79	41	457		198	131	750		1.8		1,570	2.14		366	203	73	10	2,830	7.9
July 21, 25-26---------		19		72	27	337		196	96	540		1.2		1,190	1.62		290	130	72	8.6	2,160	8.1
Aug. 1-10--------------		21		88	58	610		213	164	1,020		1.5		2,070	2.82		458	284	74	12	3,730	7.9
Aug. 11-25-------------		20		92	67	707		214	182	1,190		1.5		2,360	3.21		506	330	75	14	4,270	7.8
Aug. 26-31-------------		16		124	117	1,200		192	303	2,080		--		3,930	5.34		790	632	77	19	6,900	7.7
Sept. 1-6, 8-16--------		18		92	56	658		238	165	1,080		2.0		2,190	2.98		460	265	76	13	3,940	8.0
Sept. 7, 21, 24--------		9.8		77	22	282		241	72	440		2.0		1,020	1.39		282	85	68	7.3	1,890	8.1
Sept. 17-20, 22-23, 25-30----------		17		99	63	784		239	201	1,280		1.5		2,560	3.48		506	310	77	15	4,580	7.9

a Sum of determined constituents.

OLD RIVER NEAR COVE, TEX.

LOCATION.--At Barber Hill Pumping Plant, 5 miles northeast of Cove, Chamber's County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 7,850 ppm Sept. 21-30; minimum, 271 ppm Feb. 1-14.
Hardness: Maximum, 1,610 ppm Sept. 21-30; minimum, 91 ppm Feb. 1-14.
Specific conductance: Maximum daily, 15,100 micromhos Sept. 17; minimum daily, 400 micromhos Feb. 20.
EXTREMES, 1949-55.--Dissolved solids: Maximum, 9,140 ppm Aug. 31, 1954; minimum, 156 ppm Jan. 26-31, Apr. 21-30, 1952.
Hardness: Maximum, 1,780 ppm Aug. 31, 1954; minimum, 55 ppm Jan. 25-26, 1955.
Specific conductance: Maximum daily, 15,100 micromhos Sept. 17, 1956; minimum daily, 223 micromhos Dec. 21, 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 sums of determined constituents. 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 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-12, 1955--------		15		36	4.4	72		111	19	107		1.1		340	0.46		107	16	59	3.0	564	7.6
Oct. 13-31-------------		16		46	6.3	95		137	30	144		1.3		447	.61		142	30	59	3.4	746	7.8
Nov. 1-9, 28-30--------		14		58	17	227		157	65	362		1.2		848	1.15		214	86	70	6.7	1,500	7.6
Nov. 10-27-------------		14		76	30	365		173	100	610		.5		1,280	1.74		313	171	72	8.9	2,290	7.8
Dec. 1-6, 12-15, 19-31-		13		49	13	150		123	57	240		1.2		618	.84		175	74	65	4.9	1,080	7.8
Dec. 7-9, 11, 16-18----		10		79	25	311		151	94	535		1.1		1,130	1.54		300	176	69	7.8	2,090	7.9
Jan. 1-23, 1956--------		11		52	12	148		142	56	232		.7		617	.84		180	64	64	4.8	1,090	8.0
Jan. 24-31-------------		11		39	6.5	93		107	43	136		.6		412	.56		123	36	62	3.6	702	7.8
Feb. 1-14--------------		15		28	5.1	52		83	33	72		1.0		271	.37		91	23	56	2.4	446	7.6
Feb. 15-29-------------		17		32	4.9	50		103	26	68		1.0		275	.37		100	16	52	2.2	446	7.6
Mar. 1-15--------------		18		37	5.7	55		124	24	76		1.2		301	.41		116	14	51	2.2	497	7.7
Mar. 16-31-------------		15		45	6.2	68		144	29	96		2.0		352	.48		138	20	52	2.5	606	7.8
Apr. 1-7---------------		12		46	7.6	67		153	23	100		1.2		353	.48		146	21	50	2.4	624	7.8
Apr. 8-17--------------		18		51	11	142		149	43	222		1.5		589	.80		172	50	64	4.7	1,030	8.1
Apr. 18-30-------------		21		32	4.6	69		104	30	92		2.8		332	.45		99	14	60	3.0	542	7.7
May 1-10, 15-26--------		19		37	4.6	57		121	30	73		2.5		302	.41		111	12	53	2.4	506	7.9
May 11-14, 27-31-------		18		44	7.6	113		135	45	162		2.5		485	.66		142	31	64	4.1	843	8.1
June 1, 6-22, 28-29----		16		52	6.0	92		162	44	123		1.2		427	.58		154	21	56	3.2	749	8.2
June 2-4---------------		16		67	36	423		162	108	700		2.2		1,430	1.94		315	182	74	10	2,660	8.0
June 5, 23-27----------		13		57	11	175		162	62	260		2.8		675	.92		187	54	67	5.6	1,220	7.9
June 30, July 1-5------		16		80	6.8	511		137	133	770		2.8		1,590	2.16		228	115	83	15	2,880	7.9
July 6-14--------------		14		122	116	1,310		151	327	2,250		--		4,210	5.73		782	658	79	20	7,230	7.7
July 15-20, 22-31------		18		138	165	1,690		163	420	2,920		--		5,430	7.38		1,020	890	78	23	9,160	7.9
July 21----------------		--		--	--	--		a189	--	680		--		--	--		324	168	--	--	2,570	8.5
Aug. 1-14--------------		16		139	177	1,710		175	370	3,020		--		5,520	7.51		1,080	932	78	23	9,530	7.9
Aug. 15----------------		--		--	--	--		b247	--	600		--		--	--		312	109	--	--	2,360	8.6
Aug. 16-31-------------		16		126	160	1,520		192	376	2,650		1.5		4,940	6.72		972	815	77	21	8,480	8.0
Sept. 1-17-------------		15		175	241	2,090		180	427	3,820		--		6,860	9.33		1,430	1,280	76	24	11,700	8.0
Sept. 21-30------------		18		214	261	2,390		185	588	4,290		--		7,850	10.7		1,610	1,460	76	26	12,900	8.0

a Includes equivalent of 8 parts per million carbonate (CO_3).
b Includes equivalent of 15 parts per million carbonate (CO_3).

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, daily records December 1949 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 18,400 ppm Aug. 1-31; minimum, 375 ppm May 7-23.
Hardness: Maximum, 3,420 ppm Aug. 1-31; minimum, 92 ppm Apr. 9-16, 17, 19.
Specific conductance: Maximum daily, 33,700 micromhos Sept. 26; minimum daily, 454 micromhos Feb. 15.
EXTREMES, 1949-56.--Dissolved solids: Maximum, 18,400 ppm Aug. 1-31, 1956; minimum, 140 ppm Apr. 12-19, 1955.
Hardness: Maximum, 3,550 ppm Oct. 21-31, 1952; minimum, 45 ppm Apr. 12-19, 1955.
Specific conductance: Maximum daily, 33,700 micromhos Sept. 26, 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 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 for this station.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1, 5-7, 12-19, 1955		18		67	35	511		155	129	820		3.0		1,660	2.26		310	183	78	13	2,980	7.9
Oct. 2-4		17		56	16	291		161	73	445		3.3		984	1.34		206	74	75	8.8	1,800	7.8
Oct. 8-11		--		--	--	--		143	--	2,780		--		--	--		975	857	--	--	8,800	7.7
Oct. 20-27		--		--	--	--		147	--	1,950		--		--	--		680	560	--	--	6,410	7.8
Oct. 28-31		--		--	--	--		148	--	3,840		--		--	--		1,350	1,230	--	--	11,700	7.8
Nov. 1, 3-6, 9, 12-13, 15-16, 18-20, 22-23, 27-29		10		180	336	3,140		166	766	5,480		--		9,990	13.59		1,830	1,690	79	32	16,100	7.4
Nov. 2, 7-8, 10-11, 14, 17, 21, 24-26, 30		13		132	169	1,830		165	459	3,120		--		5,800	7.89		1,020	890	80	25	9,970	7.2
Dec. 1, 21		--		--	--	--		132	--	5,400		--		--	--		1,830	1,720	--	--	15,700	7.8
Dec. 2-3, 10-18, 31		6.4		84	63	760		159	175	1,280		3.5		2,450	3.33		468	338	78	15	4,410	7.8
Dec. 4-9		11		44	20	238		118	62	388		1.5		866	1.18		192	96	73	7.5	1,520	7.7
Dec. 19-20, 22-31		5.2		104	112	1,390		148	330	2,320		--		4,330	5.89		720	598	81	22	7,420	7.7
Jan. 1-3, 6-12, 1956		12		117	75	975		186	254	1,630		4.0		3,160	4.30		600	448	78	17	5,650	7.9
Jan. 4-5, 13-16, 18-21		13		138	134	1,600		178	405	2,700		--		5,080	6.91		895	749	80	23	8,790	7.6
Jan. 17		--		--	--	--		164	--	5,950		--		--	--		1,970	1,840	--	--	17,300	7.5
Jan. 22-31		8.4		43	12	190		112	52	300		2.7		688	.94		157	65	73	6.6	1,240	7.5
Feb. 1-2		--		--	--	--		100	--	800		--		--	--		340	308	--	--	2,890	8.0
Feb. 3-14, 27-29		10		38	9.5	131		93	43	210		2.2		540	.73		135	59	68	4.9	931	7.6
Feb. 15-26		9.6		35	6.2	83		96	37	124		3.4		376	.51		113	34	61	3.4	644	7.6
Mar. 1-14, 24-29		12		44	9.7	160		105	58	245		6.2		607	.83		150	64	70	5.7	1,120	7.6
Mar. 15-20, 22-23, 30-31		13		57	24	337		124	91	548		5.0		1,140	1.55		240	139	75	9.5	2,080	7.6
Mar. 21		--		--	--	--		129	--	1,280		--		--	--		480	374	--	--	4,360	8.0
Apr. 1-6, 23-27, 29-30		14		66	83	814		93	214	1,400		2.5		2,640	3.59		506	430	78	16	4,770	7.9
Apr. 7-8, 18, 20-22		9.2		36	12	196		77	98	282		2.2		683	.93		140	76	75	7.2	1,180	7.2
Apr. 9-17, 19		12		28	5.4	83		68	23	135		3.2		403	.55		92	36	66	3.8	657	7.3
Apr. 28		--		--	--	--		99	--	5,680		--		--	--		2,290	1,480	--	--	16,200	7.8
May 1-3, 27-31		17		66	57	592		127	163	1,000		2.0		1,960	2.66		399	295	76	13	3,670	7.8
May 4-6, 24-26		16		51	11	210		125	68	322		1.7		785	1.07		172	70	73	7.0	1,380	7.8
May 7-23		17		41	4.2	79		122	42	103		3.8		375	.51		120	20	59	3.1	625	7.7
June 1		--		--	--	--		160	--	520		--		--	--		228	97	--	--	2,140	8.2
June 2-10, 13		15		88	85	901		148	237	1,530		3.5		2,930	3.98		569	448	77	16	5,170	7.9
June 11-12		--		--	--	--		140	--	3,650		--		--	--		1,250	1,140	--	--	10,900	8.0
June 14-19, 22-30		13		82	58	719		174	189	1,180		3.0		2,330	3.17		443	300	78	15	4,080	8.2
June 20-21		12		72	23	356		174	110	560		2.5		1,220	1.66		274	131	74	9.3	2,240	8.2
July 10		--		--	--	--		138	--	7,010		--		--	--		2,390	2,280	--	--	19,800	8.0
July 21-31		8.9		256	612	5,190		134	1,310	9,190		--		16,600	22.58		3,160	3,040	78	40	25,000	7.2
Aug. 1-31		11		275	665	5,780		136	1,430	10,200		--		18,400	25.02		3,420	3,310	79	43	27,800	7.4
Sept. 1-10		--		--	--	--		--	--	11,500		--		--	--		--	--	--	--	29,700	--
Sept. 11-20		--		--	--	--		--	--	12,500		--		--	--		--	--	--	--	32,400	--
Sept. 21-30		--		--	--	--		--	--	12,700		--		--	--		--	--	--	--	33,000	--

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: Bi-weekly October 1950 to September 1956.

Specific conductance, micromhos at 25°C, and chloride, in parts per million, water year October 1955 to September 1956

Date of Collection	Station 2		Station 3		Station 6		Station 7	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
Oct. 5, 1955	8,770	2,800	9,540	3,100	21,500	7,750	22,000	7,700
Oct. 12	12,300	4,090	17,700	6,220	25,800	9,550	25,600	9,550
Oct. 19	15,600	5,330	17,300	6,040	26,000	9,650	25,800	9,550
Oct. 26	18,800	6,710	20,700	7,500	24,300	8,970	24,600	9,070
Nov. 2	15,300	5,150	--	--	18,600	6,510	--	--
Nov. 9	19,700	6,960	19,200	6,660	18,100	6,270	17,600	6,070
Nov. 16	14,600	4,810	15,300	5,150	16,000	5,430	16,000	5,480
Nov. 23	25,900	9,600	27,300	10,200	30,000	11,200	30,100	11,300
Nov. 30	14,200	4,740	15,000	5,130	16,100	5,580	16,200	5,580
Dec. 7	14,100	4,740	18,500	6,460	27,700	10,300	27,500	10,200
Dec. 14	7,740	2,450	8,270	2,650	14,800	5,100	15,000	5,100
Dec. 21	18,700	6,610	20,500	7,300	26,000	9,550	26,100	9,550
Jan. 4, 1956	10,000	3,250	11,200	3,670	18,100	6,410	18,300	6,460
Jan. 11	8,750	2,750	8,980	2,850	20,700	7,650	20,600	7,450
Jan. 18	24,800	9,220	23,700	8,680	26,500	9,990	26,400	9,990
Jan. 25	1,550	370	1,420	345	4,800	1,400	4,650	1,340
Feb. 1	15,700	5,450	23,000	8,480	28,300	10,900	28,500	10,800
Feb. 8	1,090	255	1,050	240	1,070	250	1,080	255
Feb. 15	549	113	558	117	498	97	561	114
Feb. 22	558	90	848	185	13,800	4,710	15,200	5,180
Feb. 29	994	218	--	--	962	210	973	215
Mar. 7	2,050	520	6,680	2,050	18,800	6,660	19,000	6,710
Mar. 14	11,600	3,870	10,900	3,590	13,400	4,510	13,400	4,540
Mar. 21	9,970	3,250	11,500	3,790	14,100	4,810	14,100	4,810
Mar. 28	13,300	4,510	15,500	5,350	22,300	8,040	22,300	8,040
Apr. 2	23,100	8,430	24,300	8,920	24,800	9,120	24,800	9,120
Apr. 4	4,710	1,380	17,300	6,090	21,000	7,650	20,900	7,500
Apr. 6	4,530	1,320	4,920	1,440	22,400	8,180	22,800	8,180
Apr. 9	581	112	813	188	666	138	670	139
Apr. 11	637	124	639	126	637	126	639	126
Apr. 13	613	116	658	139	13,900	4,690	13,800	4,610
Apr. 16	646	138	643	138	657	145	678	148
Apr. 20	1,430	378	6,540	2,060	10,400	3,370	10,400	3,370
Apr. 23	14,600	4,910	15,200	5,130	15,200	5,130	15,200	5,130
Apr. 25	17,500	5,970	19,800	6,810	21,200	7,450	21,500	7,650
Apr. 27	17,000	5,820	18,800	6,460	19,600	6,780	19,600	6,860
Apr. 30	20,300	7,060	21,800	7,650	24,800	8,820	24,500	8,820
May 2	4,670	1,370	5,190	1,530	14,600	4,880	15,000	5,000
May 4	2,520	680	15,500	5,180	17,100	5,820	16,700	5,670
May 7	933	173	922	160	16,700	5,670	16,800	5,750
May 9	810	160	748	143	4,660	1,350	2,680	732
May 11	634	110	595	82	1,100	200	1,040	168
May 14	480	58	480	58	2,540	652	2,480	645
May 16	477	57	477	59	477	58	480	60
May 18	619	101	630	103	630	104	637	105
May 21	700	125	738	131	720	130	722	130
May 23	757	140	800	151	3,760	1,060	4,050	1,140
May 25	1,920	480	3,200	860	6,530	1,970	6,610	2,000
May 28	7,660	2,350	7,730	2,400	11,900	3,870	11,900	3,870
May 30	7,240	2,220	6,730	2,060	12,800	4,160	12,800	4,140
June 1	2,330	602	5,850	1,720	13,500	4,540	13,700	4,590
June 4	12,500	4,140	15,000	5,080	16,500	5,670	16,600	5,770
June 6	12,300	4,090	13,000	4,360	16,100	5,580	15,900	5,450
June 8	13,400	4,490	14,600	4,980	17,600	6,070	17,400	6,000
June 11	14,800	4,980	15,000	5,100	15,600	5,330	15,500	5,300
June 13	14,000	4,710	14,600	4,960	16,500	5,720	16,700	5,770
June 15	3,510	980	3,570	980	14,000	4,760	14,000	4,710
June 18	13,900	4,660	16,900	5,850	19,600	6,980	19,500	6,960
June 20	14,100	4,740	16,500	5,670	19,300	6,760	19,400	6,810
June 22	17,700	6,220	19,000	6,810	20,200	7,370	20,400	7,420
June 25	12,200	4,090	16,300	5,800	20,000	7,270	20,000	7,250
June 27	6,740	2,050	12,700	4,360	18,300	6,510	18,300	6,540
June 29	7,690	2,400	15,700	5,600	19,000	6,880	19,000	6,780

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 1955 to September 1956--Continued

Date of Collection	Station 2		Station 3		Station 6		Station 7	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
July 2, 1956	18,800	6,780	19,600	7,030	20,600	7,470	20,700	7,520
July 4	18,500	6,590	19,800	7,170	19,500	7,010	19,500	7,030
July 6	19,900	7,200	20,200	7,370	20,400	7,450	20,400	7,370
July 9	21,800	8,090	24,300	9,070	25,800	9,800	25,900	9,800
July 11	22,800	8,430	23,500	8,820	25,600	9,700	25,500	9,550
July 13	23,300	8,480	24,600	9,120	26,600	10,100	26,600	10,000
July 16	24,100	8,870	24,800	9,120	24,900	9,320	24,700	9,200
July 18	24,300	8,870	24,400	8,920	24,700	9,070	24,800	9,120
July 20	24,800	9,120	24,400	8,970	24,100	8,820	24,000	8,820
July 23	26,700	9,990	26,900	10,100	26,600	9,900	26,600	9,990
July 25	26,200	9,850	26,300	9,800	26,600	9,940	26,600	9,990
July 27	26,500	9,600	26,900	9,850	27,300	9,940	27,300	9,990
July 30	27,300	9,940	27,700	10,100	27,900	10,300	27,900	10,200
Aug. 1	27,700	10,200	27,500	10,100	27,500	10,100	27,700	10,100
Aug. 3	27,700	10,200	27,700	10,200	27,700	10,300	27,700	10,200
Aug. 6	27,500	10,000	27,500	10,100	27,500	10,100	27,300	9,940
Aug. 8	26,900	9,800	27,600	10,200	27,600	10,100	27,600	10,100
Aug. 10	26,200	9,510	26,900	9,850	27,700	10,100	27,800	10,100
Aug. 13	28,300	10,400	28,700	10,600	28,900	10,700	29,000	10,700
Aug. 15	28,800	10,600	28,500	10,500	28,800	10,600	29,200	10,800
Aug. 17	28,900	10,800	29,200	10,800	28,900	10,600	28,700	10,600
Aug. 20	27,900	10,300	29,200	10,800	31,100	11,600	31,100	11,700
Aug. 22	30,800	11,500	31,000	11,500	30,300	11,300	30,400	11,300
Aug. 24	30,500	11,400	30,500	11,400	30,500	11,400	30,400	11,400
Aug. 27	30,100	11,200	30,400	11,300	30,700	11,500	30,700	11,500
Aug. 29	30,100	11,200	30,400	11,400	31,000	11,500	31,000	11,600
Aug. 31	30,400	11,300	29,700	11,100	30,900	11,500	30,800	11,500
Sep. 3	30,800	11,500	30,300	11,400	30,400	11,500	30,500	11,500
Sep. 5	26,500	9,800	27,000	9,990	29,100	10,900	28,600	10,800
Sep. 7	31,000	11,800	31,000	11,800	31,000	11,800	31,600	12,000
Sep. 10	30,700	11,700	30,500	11,500	31,000	11,700	30,400	11,500
Sep. 12	31,800	12,200	32,000	12,300	32,700	12,500	31,800	12,200
Sep. 14	32,000	12,300	31,700	12,100	31,900	12,300	32,000	12,300
Sep. 17	31,400	12,000	31,700	12,200	32,700	12,600	31,700	12,200
Sep. 19	31,100	11,900	31,100	11,900	33,500	13,000	30,600	11,600
Sep. 21	29,200	11,100	29,600	11,100	32,400	12,500	30,500	11,600
Sep. 24	33,700	13,100	33,700	13,100	33,900	13,200	33,500	13,000
Sep. 26	33,800	13,100	33,600	12,900	33,900	13,200	33,800	13,100
Sep. 28	31,600	12,200	31,600	12,100	32,300	12,500	32,600	12,500

MISCELLANEOUS ANALYSES OF STREAMS IN TRINITY RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
SOUTH CHANNEL OF TEHUACANA CREEK AT FARM-TO-MARKET ROAD 488 NEAR FAIRFIELD																						
May 12, 1956	--	13		35	12	171	58	33	301	--	1.1			595	0.81		136	88	73	6.4	1,130	6.9
June 6	--	11		53	19	232	86	49	420	0.7	.4			827	1.12		211	190	71	7.0	1,590	7.4
NORTH CHANNEL OF TEHUACANA CREEK AT FARM-TO-MARKET ROAD 488 NEAR FAIRFIELD																						
May 12, 1956	--	9.8		21	7.6	156	67	23	243	--	1.2			495	0.67		84	29	80	7.4	956	6.7
June 6	--	9.6		26	8.4	209	92	30	315	0.8	.9			645	.88		99	24	82	9.1	1,250	7.3

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 northeast 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 1956.
Water temperatures: April 1955 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 2,200 ppm Apr. 17-28; minimum, 152 ppm Oct. 3-10.
Hardness: Maximum, 866 ppm Apr. 17-28; minimum, 95 ppm Oct. 3-10.
Specific Conductance: Maximum daily, 5,530 micromhos Apr. 18; minimum daily, 238 micromhos June 9.
EXTREMES, April 1955 to September 1956.--Dissolved solids: Maximum, 2,200 ppm Apr. 17-28, 1956; minimum, 152 ppm Oct. 3-10, 1955.
Hardness: Maximum, 866 ppm Apr. 17-28, 1956; minimum, 92 ppm Sept. 25-30, 1955.
Specific conductance: Maximum daily, 5,530 micromhos Apr. 18, 1956; minimum daily, 174 micromhos Sept. 25, 1955.
REMARKS.--Values reported for dissolved solids are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-2, 1955---------	242	14		53	6.8	72		100	14	154	--	5.0		368	0.50	240	161	79	49	2.5	691	7.9
Oct. 3-10---------	88.7	10		32	3.6	13		101	8.7	20	0.5	3.5		a152	.21	36.4	95	12	23	.6	256	7.9
Oct. 11-28---------	.44	11		46	4.9	22		134	16	37	.5	1.2		a223	.30	.28	134	24	26	.8	374	7.7
Oct. 29-31, Nov. 1-12--	b.05	10		53	7.1	28		163	24	46	--	.5		a262	.36	.04	162	28	28	1.0	452	8.1
Nov. 13-30---------	0	8.8		63	8.0	33		183	31	55	.4	.5		a296	.40	--	189	39	28	1.1	518	7.6
Dec. 1-11---------	0	5.8		68	9.7	41		198	39	67	.4	.2		a331	.45	--	210	47	30	1.2	580	7.5
Dec. 12-30---------	0	4.8		79	8.8	44		210	48	75	.2	.2		363	.49	--	232	60	29	1.3	644	7.8
Jan. 1-18, 1956--------	0	4.6		81	9.4	49		212	55	81	.2	.2		384	.52	--	240	66	31	1.4	673	7.9
Jan. 19-31---------	1.17	3.0		82	11	52		203	66	90	.1	.2		404	.55	1.28	250	84	31	1.4	708	7.8
Feb. 1-8---------	3.19	5.2		84	15	52		185	101	90	.4	.8		444	.60	3.82	271	120	30	1.4	750	8.1
Feb. 9-29---------	b1.50	7.2		46	7.2	24		147	21	37	.4	.8		a234	.32	.95	144	24	26	.9	387	7.9
Mar. 1-19---------	0	4.8		51	9.6	26		167	24	43	.4	.5		a262	.36	--	167	30	26	.9	439	7.8
Mar. 20-31---------	0	4.8		48	9.0	33		158	26	51	.3	.7		a255	.35	--	157	28	32	1.2	460	7.7
Apr. 1-14---------	0	2.9		44	10	39		148	30	58	.3	.6		a261	.35	--	151	30	36	1.4	475	7.8
Apr. 15-16---------	16.0	--		--	--	--		116	--	432	--	--		--	--	--	252	157	--	--	1,560	8.0
Apr. 17-28---------	1.28	5.6		268	48	498		132	32	1,280	.2	1.2		2,200	2.99	7.60	866	758	56	7.4	4,120	7.9
Apr. 29-30---------	.08	9.0		88	12	102		84	63	250	.2	3.8		569	.77	.12	268	199	45	2.7	1,080	7.5
May 1-10---------	551	11		36	4.2	29		102	11	51	.3	2.5		195	.27	290	107	23	37	1.2	361	7.7
May 11-22---------	b1.52	10		47	6.4	42		129	18	76	.3	1.5		264	.36	1.08	143	37	39	1.5	495	7.7
May 23-30, June 1-7----	0	6.6		51	7.8	50		148	21	88	.3	.8		298	.41	--	160	38	41	1.7	564	7.7
June 9, 11-12, 19-30---	b50.8	11		36	3.7	30		107	10	48	.6	2.9		a207	.28	28.4	105	17	38	1.3	352	7.7
June 10, 13-18---------	22.9	12		44	5.2	58		116	13	103	.5	2.9		a316	.43	19.5	131	36	49	2.2	552	7.8
July 1-25---------	0	9.8		42	5.8	37		132	11	61	.6	1.2		233	.32	--	128	20	38	1.4	438	7.7
July 26-31---------	0	--		--	--	--		143	--	70	--	--		--	--	--	138	28	--	--	480	7.7
Aug. 1-19---------	0	7.0		45	7.6	49		150	11	80	.6	2.0		276	.38	--	144	21	43	1.8	534	8.2
Aug. 20-31, Sept. 1-7--	b28.2	13		41	3.9	22		137	7.8	30	.6	2.0		187	.25	14.2	118	6	29	.9	328	8.2
Sept. 8-16---------	0	8.2		76	11	172		100	16	360	.7	1.5		694	.94	--	234	152	61	4.9	1,360	7.6
Sept. 17-30---------	0	9.6		71	12	188		86	15	388	.4	2.0		728	.99	--	226	156	64	5.5	1,390	7.7
Weighted average-----	22.7	11		38	4.4	32		106	11	58	0.4	2.7		212	0.29	13.0	113	26	38	1.3	386	--

a Residue on evaporation at 180°C.
b Includes days of less than 0.05 cubic foot per second discharge.

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 Graford, 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 non-contributing.
RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1956.
Water temperatures: October 1949 to September 1955.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 2,640 ppm Jan. 1-31; minimum, 806 ppm Oct. 1-16.
Hardness: Maximum, 828 ppm Jan. 1-31; minimum, 304 ppm Oct. 1-16.
Specific conductance: Maximum daily, 5,720 micromhos Jan. 7; minimum daily, 1,080 micromhos Oct. 8.
EXTREMES, 1942-56.--Dissolved solids: Maximum, 2,640 ppm Jan. 1-31, 1956; minimum, 806 ppm Oct. 1-16, 1955.
Hardness: Maximum, 828 ppm Jan. 1-31, 1956; minimum, 304 ppm Oct. 1-16, 1955.
Specific conductance: Maximum daily, 5,720 micromhos Jan. 7, 1956; minimum daily, 1,080 micromhos Oct. 8, 1955.
Water temperatures (1949-55): Maximum observed, 76°F Sept. 27-30, 1950; minimum observed, 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 sums of 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 1955 to September 1956 given in Water-Supply Paper 1442. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-16, 1955--------	10,920	11		102	12	152		97	235	220		1.1		806	1.10	23,760	304	224	52	3.8	1,310	7.3
Oct. 17-31----------	298	15		190	19	200		97	499	275		.8		1,250	1.70	1,010	552	472	44	3.7	1,930	7.5
Nov. 1-8, 10-11, 13, 20, 24----------	500	14		197	24	292		109	494	440		1.5		1,520	2.07	2,050	590	500	52	5.2	2,400	7.4
Nov. 9, 12, 14-19, 21-23, 25-30----------	294	14		231	32	476		121	575	740		1.2		2,130	2.90	1,690	708	609	59	7.8	3,410	7.6
Dec. 1-31----------	186	12		238	36	525		122	601	820		1.5		2,290	3.11	1,150	742	642	61	8.4	3,650	7.7
Jan. 1-31, 1956--------	584	13		266	40	620		128	660	980		1.3		2,640	3.59	4,160	828	723	62	9.4	4,230	7.8
Feb. 1-29----------	620	9.6		234	30	511		120	581	790		.8		2,220	3.02	3,720	708	609	61	8.3	3,570	7.8
Mar. 1-31----------	745	12		212	32	458		117	550	700		.9		2,020	2.75	4,060	660	564	60	7.7	3,220	7.6
Apr. 1-30----------	465	10		189	28	374		109	484	572		.8		1,710	2.33	2,150	586	497	58	6.7	2,770	7.8
May 1-31----------	836	10		184	26	340		112	452	525		3.2		1,600	2.18	3,610	566	474	57	6.2	2,640	7.5
June 1-30----------	340	11		183	23	359		116	449	545		1.2		1,630	2.22	1,500	551	456	59	6.7	2,650	7.6
July 1-31----------	1,118	9.6		185	27	379		118	465	578		.8		1,700	2.31	5,130	572	476	59	6.9	2,780	7.7
Aug. 1-31----------	574	10		203	30	434		122	466	700		.7		1,900	2.58	2,940	630	530	60	7.5	3,110	7.5
Sept. 1-30----------	52.9	11		214	32	515		129	530	800		1.2		2,170	2.95	310	666	560	63	8.7	3,440	7.5
Weighted average-----	983	11		156	21	292		107	379	445		1.2		1,370	1.86	3,640	476	388	57	5.8	2,220	--

BRAZOS RIVER NEAR WHITNEY, TEX.

LOCATION.--At Whitney Dam on State Highway 22, 3.4 miles upstream from gaging station which is 1.0 mile downstream from Coon Creek, 7.5 miles south of Whitney, Hill County, and at mile 439.
DRAINAGE AREA.--26,190 square miles, approximately, above gaging station, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to May 1948, October 1948 to September 1956.
Water temperatures: October 1947 to May 1948, October 1948 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,290 ppm Sept. 1-30; minimum, 766 ppm Nov. 1-30.
Hardness: Maximum, 432 ppm May 1-31, Sept. 1-30; minimum, 287 ppm Nov. 1-30.
Specific conductance: Maximum daily, 2,290 micromhos Sept. 21; minimum daily, 1,280 micromhos Nov. 16, 17.
Water temperatures: Maximum observed, 80°F Aug. 16-18; minimum observed, 44°F on several days during February.
EXTREMES, 1947-56.--Dissolved solids: Maximum, 1,560 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 observed 98°F July 8, 1954; minimum observed, 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 sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955--------	9,553	11		105	13	203		113	221	308		1.2		a918	1.25	23,680	316	224	58	5.0	1,570	7.7
Nov. 1-30--------------	411	8.8		92	14	159		107	196	242		1.0		a766	1.04	850	287	200	55	4.1	1,340	7.4
Dec. 1-31--------------	385	9.6		94	13	163		112	196	245		1.0		808	1.10	840	288	196	55	4.2	1,320	7.6
Jan. 1-31, 1956--------	576	12		106	14	173		117	225	260		1.2		903	1.23	1,400	322	226	54	4.2	1,430	7.9
Feb. 1-29--------------	637	9.6		114	15	184		122	237	282		1.0		967	1.32	1,660	346	246	54	4.3	1,530	7.9
Mar. 1-31--------------	548	7.8		124	21	218		125	275	340		1.6		1,050	1.43	1,550	396	294	54	4.8	1,740	7.7
Apr. 1-30--------------	605	8.4		135	20	253		126	309	385		1.0		1,170	1.59	1,910	419	316	57	5.4	1,950	7.8
May 1-31---------------	2,331	8.4		140	20	269		117	326	410		2.4		1,230	1.67	7,740	432	336	58	5.6	2,050	7.5
June 1-30--------------	618	11		132	23	248		112	317	382		4.0		1,170	1.59	1,950	424	332	56	5.2	1,960	7.8
July 1-31--------------	1,636	11		130	19	240		121	293	368		1.4		1,120	1.52	4,950	402	304	56	5.2	1,880	7.9
Aug. 1-31--------------	751	12		125	21	256		125	310	375		1.2		1,160	1.58	2,350	398	296	58	5.6	1,950	7.8
Sept. 1-30-------------	609	10		137	22	289		115	345	430		1.2		1,290	1.75	2,120	432	338	59	6.1	2,160	7.8
Weighted average-----	1,571	10		116	16	220		116	255	333		1.4		1,010	1.37	4,280	356	260	57	5.1	1,710	--

a Sum of determined constituents.

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 & New Orleans Railroad Bridge and at mile 93.
DRAINAGE AREA.--44,050 square miles, approximately, of which 9,240 square miles is probably non-contributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1956.
Water temperatures: November 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,190 ppm Sept. 21-30; minimum, 318 ppm Feb. 14-19.
Hardness: Maximum, 404 ppm Sept. 21-30; minimum, 122 ppm Feb. 14-19.
Specific conductance: Maximum daily, 2,090 micromhos Sept. 30; minimum daily, 433 micromhos Feb. 16.
Water temperatures: Maximum observed, 85°F on several days during July and August; minimum observed, 43°F Jan. 30.
EXTREMES, 1945-56.--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 (1950-56): Maximum observed, 91°F Aug. 5, 1951; minimum observed, 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 sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955--------	14,860	13		107	14	214	6.3	126	211	335	0.6	2.2	0.22	982	1.34	39,400	324	221	58	5.2	1,650	7.6
Oct. 11-20----------	15,000	13		106	15	209	6.2	114	238	325	.5	1.8	.24	a1,000	1.36	40,500	326	232	58	5.0	1,660	7.7
Oct. 21-31----------	3,569	13		109	13	197	6.1	134	224	302	.5	1.2	.26	952	1.29	9,170	326	216	56	4.8	1,590	7.7
Nov. 1-30----------	1,120	13		112	15	174	5.8	174	191	272	.5	1.0	.27	886	1.20	2,680	341	198	52	4.1	1,460	7.8
Dec. 1-10----------	869	14		104	17	152	5.2	209	157	225	.3	.6	.13	811	1.10	1,900	330	158	50	3.6	1,320	8.2
Dec. 11-20----------	745	9.8		102	16	141	4.9	216	154	205	.3	.3	.15	770	1.05	1,550	320	144	48	3.4	1,260	8.0
Dec. 21-31----------	741	8.4		100	17	141	5.1	214	152	205	.3	.5	.13	757	1.03	1,510	320	144	48	3.4	1,250	7.8
Jan. 1-10, 1956--------	719	7.8		101	16	141	5.2	210	158	215	.4	.6	.19	764	1.04	1,480	318	146	49	3.4	1,260	7.9
Jan. 11-20----------	764	9.2		102	16	143	5.2	217	157	215	.4	.6	.22	772	1.05	1,590	320	142	49	3.5	1,270	7.9
Jan. 21-31----------	1,363	6.0		86	13	130	5.0	152	154	198	.4	.8	.14	680	.92	2,500	268	144	51	3.4	1,140	7.7
Feb. 1-8, 12----------	1,412	7.8		81	14	127	4.8	156	133	192	.4	.9	.20	642	.87	2,450	260	132	51	3.4	1,110	7.7
Feb. 9-11, 13----------	3,232	7.6		57	8.0	75	4.2	135	78	110	.4	1.0	.16	421	.57	3,670	176	66	47	2.5	732	7.6
Feb. 14-19----------	3,212	9.6		41	4.8	53	4.3	104	45	77	.5	2.2	.14	318	.43	2,760	122	37	48	2.1	519	7.6
Feb. 20-29----------	1,536	9.4		58	10	120	5.4	123	78	192	.5	1.0	.22	552	.75	2,290	186	84	58	3.8	970	7.6
Mar. 1-6, 14-16--------	1,396	9.6		103	15	178	6.0	159	193	280	.4	.6	.14	884	1.20	3,330	318	188	54	4.3	1,460	7.6
Mar. 7-13----------	1,477	11		68	9.4	100	5.0	129	104	157	.4	2.3	.12	530	.72	2,110	208	102	50	3.0	903	7.6
Mar. 17-31----------	651	10		110	18	164	5.4	189	193	262	.4	.8	.12	879	1.20	1,550	348	194	50	3.8	1,430	7.7
Apr. 1-10----------	597	14		99	18	142	5.2	215	148	208	.4	.7	.14	766	1.04	1,230	320	144	49	3.5	1,280	7.5
Apr. 11-23----------	1,255	15		61	9.5	85	5.0	129	95	126	.5	1.4	.12	478	.65	1,620	192	86	48	2.7	807	7.4
Apr. 24-30----------	646	10		111	20	186	6.1	180	220	275	.5	1.0	.14	958	1.30	1,670	358	210	52	4.3	1,560	8.2
May 1-3, 13-22----------	3,668	13		68	10	99	5.5	128	104	157	.5	1.2	.18	554	.75	5,490	210	106	50	3.0	921	8.1
May 4-5, 10-12----------	9,174	12		114	17	186	6.5	147	229	288	.5	1.2	.11	a1,000	1.36	24,770	354	234	53	4.3	1,580	7.8
May 6-9----------	14,700	13		52	6.9	49	4.8	123	70	67	.7	2.0	--	343	.47	13,610	157	56	40	1.7	562	7.8
May 23-31----------	945	10		80	14	129	5.9	138	140	202	.5	.8	.12	700	.95	1,790	257	144	51	3.5	1,140	8.0
June 1-10----------	916	15		108	19	174	5.8	165	209	265	.5	.8	.17	943	1.28	2,330	348	212	52	4.0	1,490	8.0
June 11-20----------	868	12		96	17	154	5.5	150	185	240	.5	.5	.14	846	1.15	1,980	310	186	51	3.8	1,330	8.1
June 21-30----------	575	13		102	18	174	5.7	163	195	265	.6	.8	.18	922	1.25	1,430	328	195	53	4.2	1,460	8.1
July 1-10----------	135	17		100	19	182	6.1	186	205	260	.5	.8	.11	926	1.26	338	328	175	54	4.4	1,530	7.9
July 11-20----------	992	13		115	20	225	6.6	133	265	338	.5	.8	.03	1,050	1.43	2,810	369	260	56	5.1	1,750	7.7
July 21-31----------	996	11		119	19	239	6.3	117	286	360	.5	.8	.06	1,100	1.50	2,960	375	279	58	5.4	1,870	7.8
Aug. 1-10----------	862	12		114	19	226	6.1	119	269	342	.4	1.2	.16	1,050	1.43	2,440	362	265	57	5.2	1,790	7.9
Aug. 11-20----------	352	13		108	20	214	5.9	141	248	325	.4	1.2	.16	b1,000	1.36	950	352	236	56	5.0	1,720	7.8
Aug. 21-31----------	690	11		115	22	246	6.3	120	289	368	.4	1.0	.19	1,120	1.52	2,090	378	279	58	5.5	1,890	7.8
Sept. 1-10----------	595	13		119	19	229	6.5	126	276	352	.5	1.2	.22	1,080	1.47	1,740	376	272	56	5.1	1,790	7.6
Sept. 11-20----------	471	14		121	18	219	6.3	155	257	340	.4	1.2	.21	1,050	1.43	1,340	376	249	55	4.9	1,740	8.1
Sept. 21-30----------	741	12		127	21	254	7.0	127	300	400	.4	1.5	.23	1,190	1.62	2,380	404	300	57	5.5	1,960	7.6
Weighted average-----	2,158	12		95	14	166	5.8	136	185	260	0.5	1.5	0.18	834	1.13	4,860	294	183	54	4.2	1,380	--

a Residue on evaporation at 180°C.
b Sum of determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
WHITE RIVER AT U. S. HIGHWAY 82, 4½ MILES EAST OF CROSBYTON																						
Jan. 19, 1956----------	3.36	38		54	46	74		452	70	28		0.5		532	0.72		323	0	33	1.8	875	8.2
WHITE RIVER AT COUNTY ROAD CROSSING 4½ MILES EAST OF CROSBYTON																						
Jan. 19, 1956----------	2.44	41		49	47	78		447	77	27		0.2		539	0.73		315	0	35	1.9	914	8.2
LAKE BELTON NEAR BELTON																						
Aug. 22, 1956----------	--	2.9	0.02	44	5.0	15		163	7.9	14	0.3	0.5		170	0.23		131	0	20	0.6	317	7.4

COLORADO RIVER BASIN

COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION.--At gaging station at bridge on U. S. Highway 190, 5.2 miles downstream from San Saba River, 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 1956.
Water temperatures: September 1947 to September 1956.
Sediment records: December 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 1,520 ppm Aug. 21, 24-28; minimum, 171 ppm Oct. 1-5.
Hardness: Maximum, 380 ppm Aug. 21, 24-28; minimum, 114 ppm Oct. 1-5.
Specific conductance: Maximum observed, 3,140 micromhos Aug. 26; minimum observed, 223 micromhos Apr. 30.
Water temperatures: Maximum observed, 98°F Aug. 3,
EXTREMES, 1947-56.--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 observed, 3,420 micromhos Sept. 20, 1947; minimum observed, 161 micromhos Sept. 11, 1952.
Water temperatures: Maximum observed, 98°F Aug. 3, 1956; minimum observed, freezing point Jan. 29, 1948, Jan. 30, 1951.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-5, 1955	2,046	11		38	4.8	13		127	11	18		2.5		171	0.23	945	114	10	20	0.5	289	7.8
Oct. 6-10	1,752	9.2		43	6.0	50		136	25	71		3.2		285	.39	1,350	132	21	45	1.9	503	7.6
Oct. 11-20	406	9.6		46	7.4	50		147	26	74		2.5		298	.41	327	145	24	43	1.8	527	7.7
Oct. 21-31	162	12		55	10	42		187	22	64		2.2		310	.42	136	177	24	34	1.4	542	7.9
Nov. 1-10	59.5	13		57	16	39		228	21	59		2.0		327	.44	52.5	208	21	29	1.2	567	7.7
Nov. 11-20	60.2	13		63	19	43		261	24	62		2.4		361	.49	58.7	235	21	28	1.2	622	8.1
Nov. 21-30	49.7	12		64	24	49		278	28	75		3.2		400	.54	53.7	258	30	29	1.3	699	8.0
Dec. 1-10	56.0	12		70	23	53		291	31	78		2.8		a413	.56	62.4	269	30	30	1.4	734	8.1
Dec. 11-20	53.1	12		57	26	52		266	29	78		3.5		398	.54	57.1	249	31	31	1.4	702	8.0
Dec. 21-31	53.4	10		64	26	60		282	33	92		3.4		438	.60	63.2	266	36	33	1.6	766	8.0
Jan. 1-10, 1956	43.3	8.2		63	26	73		270	37	114		2.4		468	.64	54.7	264	42	38	1.9	840	8.1
Jan. 11-20	50.8	8.4		53	28	69		258	35	105		2.5		438	.60	60.1	248	36	38	1.9	784	8.1
Jan. 21-31	82.0	7.8		73	25	69		295	39	106		2.8		479	.65	106	284	42	35	1.8	841	8.1
Feb. 1-10	238	6.2		68	22	78		273	38	116		3.2		485	.66	312	260	36	39	2.1	858	7.9
Feb. 11-20	118	8.6		63	21	69		259	40	96		6.8		449	.61	143	244	32	38	1.9	776	8.1
Feb. 21-29	73.2	11		61	21	54		244	33	84		3.8		408	.55	80.6	238	38	33	1.5	699	8.3
Mar. 1-10	55.4	9.6		55	22	49		239	30	76		1.0		362	.49	54.1	228	32	32	1.4	655	8.0
Mar. 11-20	33.1	11		57	26	47		264	29	74		.8		404	.55	36.1	249	32	29	1.3	679	8.1
Mar. 21-31	24.3	9.4		56	29	50		276	28	80		.2		404	.55	26.5	258	32	30	1.4	714	8.1
Apr. 1-7	19.3	10		54	29	60		269	33	91		1.0		420	.57	21.9	254	33	34	1.6	747	8.0
Apr. 8-20	163	7.6		108	26	107		172	225	165		2.0		a726	.99	320	376	236	38	2.4	1,200	8.0
Apr. 21-29	20.7	7.6		97	26	86		158	204	138		.8		a637	.87	35.6	349	220	35	2.0	1,050	7.8
Apr. 30, May 1-6	28,130	10		40	4.7	18		137	14	20		2.4		186	.25	14,130	118	6	25	.7	320	7.7
May 7-15	1,122	14		52	8.6	56		163	31	83		3.7		338	.46	1,020	164	30	43	1.9	592	8.0
May 16-18, 25	3,049	13		68	11	137		168	62	218		4.1		624	.85	5,140	214	77	58	4.1	1,090	7.8
May 19-24, 26-31	1,098	12		44	7.1	31		146	21	44		3.4		241	.33	714	138	18	33	1.2	420	7.6
June 1-10	207	13		47	9.4	21		175	16	29		3.2		a225	.31	126	157	22	23	.7	412	7.9
June 11-20	78.1	16		52	14	32		b203	24	43		3.1		286	.39	60.3	186	20	27	1.0	489	8.4
June 21-30	28.7	16		48	17	40		201	30	56		2.4		310	.42	24.0	190	26	31	1.3	538	8.2
July 1-10	44.8	15		49	19	50		205	34	74		1.6		348	.47	42.1	200	32	35	1.5	611	8.2
July 11-20	78.1	14		60	21	73		218	51	114		2.3		452	.61	95.3	235	56	40	2.1	794	8.2
July 21-31	28.6	11		58	23	97		179	61	170		.8		558	.76	43.1	239	92	47	2.7	934	7.8
Aug. 1-10	18.8	14		56	27	112		196	62	190		1.0		a558	.76	28.3	250	9(	49	3.1	1,020	8.2
Aug. 11-20	31.2	13		62	27	147		172	80	255		1.0		a670	.91	56.4	266	124	55	3.9	1,240	8.1
Aug. 21, 24-28	161	13		88	39	425		180	188	680		2.0		a1,520	2.07	661	380	32	71	9.5	2,710	8.1
Aug. 22-23, 29	889	11		50	10	89		148	46	133		2.0		441	.60	1,060	166	44	54	3.0	762	7.9
Aug. 30-31, Sept. 1-10	252	12		38	8.8	31		159	17	34		3.5		233	.32	159	131	1	34	1.2	398	8.1
Sept. 11-20	18.2	13		42	12	32		184	17	38		2.2		258	.35	12.7	154	3	31	1.1	446	8.1
Sept. 21-30	9.72	12		40	18	42		212	17	52		1.0		294	.40	7.7	174	0	34	1.4	514	8.1
Weighted average	772	10		44	6.6	32		145	21	43		2.6		242	0.34	504	137	18	34	1.2	419	--

a Sum of determined constituents.
b Includes equivalent of 4 parts per million carbonate (CO_3).

COLORADO RIVER AT AUSTIN, TEX.

LOCATION.--At raw-water intake at Austin City Water Plant, 4.5 miles upstream from gaging station which is at Montopolis bridge on U. S. Highway 183 at southeast edge of Austin, Travis County, 2.8 miles upstream from Walnut Creek, 3.8 miles downstream from Waller Creek, 5 miles downstream from Barton Creek and at mile 290.
DRAINAGE AREA.--38,400 square miles, approximately, of which 11,900 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1956.
Water temperatures: October 1947 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 249 ppm Oct. 1-31; minimum, 225 ppm Apr. 1-30.
Hardness: Maximum, 157 ppm Dec. 1-31; minimum, 139 ppm May 1-31.
Specific conductance: Maximum observed, 459 micromhos June 22; minimum observed, 368 micromhos May 2.
Water temperatures: Maximum observed, 79°F Oct. 1-4, 6, Sept. 8; minimum observed, 49°F Feb. 4.
EXTREMES, 1947-56.--Dissolved solids: Maximum, 340 ppm Nov. 1-30, 1951; minimum, 214 ppm July 1-31, 1953.
Hardness: Maximum, 214 ppm Jan. 1-31, 1954; minimum, 139 ppm May 1-31, 1956.
Specific conductance: Maximum observed, 591 micromhos July 1, 1948; minimum observed, 243 micromhos Dec. 2, 1953.
Water temperatures: Maximum observed 87°F on several days during summer months; minimum observed, 43°F Jan. 28, 1948, Feb. 4, 1949.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442. 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 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955	2,243	7.4		42	10	33		157	23	46	0.2	0.7		249	0.34	1,510	146	18	33	1.2	425	7.8
Nov. 1-30	1,733	8.8		41	10	31		151	23	44	.4	.8		233	.32	1,090	143	20	32	1.1	410	8.1
Dec. 1-31	506	7.8		45	11	26		160	23	41	.4	.5		234	.32	320	157	26	27	.9	421	8.0
Jan. 1-31, 1956	328	6.4		44	9.3	31		161	24	42	.1	.8		237	.32	210	149	17	31	1.1	424	7.9
Feb. 1-29	547	6.8		43	10	27		160	21	38	.1	.7		226	.31	334	148	17	29	1.0	405	7.9
Mar. 1-31	485	7.2		44	11	28		166	23	38	.4	.8		247	.34	323	155	19	28	1.0	430	8.1
Apr. 1-30	966	8.0		42	11	26		159	22	36	.4	1.2		225	.31	587	150	20	27	.9	423	8.1
May 1-31	2,300	11		40	9.3	30		151	23	38	.3	2.4		228	.31	1,420	139	16	32	1.1	405	7.9
June 1-30	2,273	7.8		42	9.2	31		158	21	40	.3	1.2		230	.31	1,410	143	14	32	1.1	414	8.1
July 1-31	2,382	7.8		43	10	29		161	22	39	.4	1.0		232	.32	1,490	149	17	30	1.0	416	7.7
Aug. 1-31	1,583	8.0		43	10	29		163	22	38	.4	.8		235	.32	1,000	148	14	30	1.0	419	8.0
Sept. 1-30	581	7.0		41	10	30		161	21	38	.3	.6		236	.32	370	143	11	32	1.1	411	8.2
Weighted Average	1,331	8.2		42	9.9	30		158	22	40	0.3	1.1		146	0.32	841	146	16	31	1.1	416	--

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 & New Orleans Railroad bridge, 12 miles downstream 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 1956.
Water temperatures: October 1945 to September 1948, March 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 288 ppm Jan. 1-31; minimum, 178 ppm Feb. 10-17.
Hardness: Maximum, 185 ppm Jan. 1-31; minimum, 114 ppm Feb. 10-17.
Specific conductance: Maximum daily, 559 micromhos Sept. 23; minimum daily, 266 micromhos Feb. 12.
Water temperatures: Maximum observed, 86°F Aug. 29-31; minimum observed, 42°F Feb. 4.
EXTREMES, 1944-56.--Dissolved solids: Maximum, 386 ppm Apr. 1-10, 1948; minimum, 144 ppm Feb. 24-28, 1949.
Hardness: Maximum, 231 ppm Feb. 1-10, 1947; minimum, 87 ppm Feb. 24-28, 1949.
Specific conductance: Maximum daily, 721 micromhos Oct. 3, 1952; minimum daily, 179 micromhos Oct. 30, 1953.
Water temperatures (1945-48, 1950-56): Maximum observed, 95°F July 26, 1954; minimum observed, 42°F Dec. 26, 1953, Jan. 24, 1955, Feb. 4, 1956.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955-------	2,609	10		45	9.6	31	5.2	163	23	46	0.5	1.5	0.14	a252	0.34	1,780	151	18	30	1.1	454	7.8
Nov. 1-30----------	1,781	6.4		44	10	30	5.3	160	23	46	.5	1.2	.13	a246	.33	1,180	150	19	29	1.1	435	7.9
Dec. 1-31----------	780	7.8		49	12	30	4.9	188	24	44	.2	.7	.07	274	.37	577	172	18	27	1.0	477	8.2
Jan. 1-31, 1956-------	461	5.2		56	11	32	4.8	212	26	44	.1	.5	--	288	.39	358	185	12	27	1.0	507	8.1
Feb. 1-9, 18-29-------	800	7.6		48	9.7	26	4.8	173	25	38	.2	1.8	.10	a246	.33	531	159	17	26	.9	441	8.0
Feb. 10-17----------	1,575	8		36	6	17	4	118	21	24	.2	2.4	.18	178	.24	757	114	18	24	.7	313	7.7
Mar. 1-31----------	509	8		49	13	31	5.2	192	27	45	.3	.6	.12	a273	.37	375	176	18	27	1.0	487	7.8
Apr. 1-30----------	749	7.4		42	10	28	5.3	155	24	42	.4	1.2	.11	243	.33	491	146	19	29	1.0	429	7.6
May 1-31----------	1,424	--		40	9.6	26	5.6	148	24	37	--	--	--	238	.32	915	140	18	28	1.0	401	7.9
June 1-30----------	1,235	8.8		39	9.4	27	5.3	149	22	40	.5	1.2	.14	229	.31	764	137	15	29	1.0	403	7.8
July 1-31----------	797	8.4		39	10	27	5.3	152	22	40	.4	.8	.00	a228	.31	491	138	14	29	1.0	413	7.8
Aug. 1-31----------	654	12		42	10	28	5.1	166	21	40	.4	.8	.06	a241	.33	426	147	11	28	1.0	427	8.1
Sept. 1-30----------	475	11		45	12	31	5.5	b186	22	44	.3	.8	.15	265	.36	340	161	8	29	1.1	470	8.3
Weighted average-----	1,041	8.6		44	10	29	5.2	163	23	42	0.4	1.2	0.11	246	0.33	691	151	18	29	1.0	435	--

a Sum of determined constituents.
b Includes equivalent of 2 parts per million carbonate (CO_3).

MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
LAKE J. B. THOMAS NEAR VINCENT																						
Jan. 3, 1956----------	--	0.6	0.00	31	4.5	48		140	52	22	0.7	0.2		225	0.31		97	0	52	2.1	388	8.0
LAKE BROWNWOOD NEAR BROWNWOOD																						
Apr. 20, 1956---------	--	4.2		43	4.5	19		145	9.3	26		1.5		181	0.25		125	6	25	0.7	318	7.8

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 & New Orleans Railroad bridge, 10 miles upstream from Coleto Creek, and at mile 51.
DRAINAGE AREA.--5,161 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1948 to September 1956.
Water temperatures: November 1950 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 427 ppm June 11-20; minimum, 304 ppm May 11-20.
Hardness: Maximum, 230 ppm Jan. 11-20; minimum, 155 ppm Aug. 11-20.
Specific conductance: Maximum daily, 905 micromhos Jan. 1; minimum daily, 478 micromhos May 14.
Water temperatures: Maximum observed, 86°F on several days during summer months; minimum observed, 47°F Nov. 9, Feb. 3.
EXTREMES, 1945-46, 1948-56.--Dissolved solids: Maximum, 1,040 ppm Jan. 11-17, 1946; minimum, 168 ppm Oct. 26-31, Nov. 1-2, 1953.
Hardness: Maximum, 428 ppm Jan. 11-17, 1946; minimum, 104 ppm Oct. 26-31, Nov. 1-2, 1953.
Specific conductance: Maximum daily, 1,950 micromhos Jan. 11-17, 1946; minimum daily, 201 micromhos Sept. 1, 1953.
Water temperatures (1950-56): Maximum observed, 90°F Aug. 4, 27, 1952; minimum observed, 40°F Feb. 1-2, 1951.
REMARKS.--Values reported for dissolved solids are sums of 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-10, 1955--------	108	22		48	13	47	4.2	214	24	59	0.6	0.8	0.25	324	0.44	94.5	174	0	36	1.5	570	8.1
Oct. 11-20----------	98.3	20		52	15	49	3.9	230	26	60	.6	.5	.15	340	.46	90.2	191	2	35	1.5	592	8.1
Oct. 21-31----------	94.7	17		52	14	51	3.9	232	26	64	.5	.5	.24	343	.47	87.7	187	0	37	1.6	604	8.0
Nov. 1-10----------	101	16		57	16	54	3.8	246	29	71	.6	.8	.26	369	.50	101	208	6	36	1.6	639	8.0
Nov. 11-20----------	106	16		58	15	55	3.8	a251	29	70	.6	1.0	.25	372	.51	106	206	0	36	1.7	642	8.5
Nov. 21-30----------	114	15		60	16	66	3.9	256	31	85	.6	.8	.27	405	.55	125	216	6	39	2.0	699	8.0
Dec. 1-10----------	200	16		60	17	57	3.8	263	30	71	.3	2.6	.18	b396	.54	214	220	4	36	1.7	680	8.1
Dec. 11-20----------	167	16		60	18	54	3.6	262	32	70	.3	1.0	.18	b390	.53	176	224	9	34	1.6	675	7.9
Dec. 21-31----------	182	13		62	18	56	3.6	254	31	77	.3	.9	.15	b389	.53	191	228	20	34	1.6	684	8.0
Jan. 1-10, 1956--------	190	13		70	13	66	4.1	245	36	94	.2	.8	.22	b422	.57	216	227	26	38	1.9	737	8.1
Jan. 11-20----------	174	12		71	13	48	3.5	266	32	60	.2	.5	.22	371	.50	175	230	12	31	1.4	637	8.1
Jan. 21-31----------	218	11		70	11	50	3.4	260	30	62	.2	.5	.20	366	.50	215	220	7	33	1.5	636	8.1
Feb. 1-10----------	218	13		59	17	50	3.2	252	32	63	.2	1.0	.09	362	.49	213	217	10	33	1.5	612	8.2
Feb. 11-20----------	335	13		61	18	50	3.3	259	30	64	.2	1.3	.17	368	.50	333	226	14	32	1.5	628	8.2
Feb. 21-29----------	208	14		54	14	41	3.6	228	27	50	.2	1.6	.06	317	.43	178	192	5	31	1.3	538	8.2
Mar. 1-10----------	176	20		60	17	53	3.9	237	34	74	.3	1.4	.21	381	.52	181	220	26	34	1.6	656	8.0
Mar. 11-20----------	151	15		59	18	52	3.9	250	33	72	.3	1.0	.18	377	.51	154	221	16	33	1.5	659	8.0
Mar. 21-31----------	148	13		56	19	50	3.5	244	33	67	.4	.5	.20	363	.49	145	218	18	33	1.5	630	7.8
Apr. 1-10----------	118	14		55	17	54	3.4	238	31	68	.4	.6	.18	b362	.49	115	206	11	36	1.6	640	7.8
Apr. 11-20----------	118	15		54	18	57	3.5	240	33	72	.4	.7	.22	b378	.51	120	208	12	37	1.7	660	8.1
Apr. 21-30----------	236	15		54	18	56	3.6	240	32	72	.4	.7	.22	b374	.51	238	208	12	36	1.7	650	8.1
May 1-10----------	258	15		47	20	64	3.9	215	33	90	.5	1.8	.19	b388	.53	270	200	24	40	2.0	682	8.0
May 11-20----------	329	22		47	11	43	4.3	174	23	64	.4	2.0	.14	b304	.41	270	162	20	36	1.5	524	8.0
May 21-31----------	98.7	17		47	12	56	4.8	180	30	81	.5	1.7	.18	b348	.47	92.7	168	20	41	1.9	606	7.9
June 1-10----------	64.2	21		48	14	61	4.8	205	30	82	.6	1.0	.22	364	.50	63.1	178	10	42	2.0	633	8.2
June 11-20----------	57.4	19		57	16	76	4.8	c203	31	122	.6	1.0	.16	427	.58	66.2	208	42	44	2.3	758	8.4
June 21-30----------	57.4	18		54	13	67	4.6	c190	27	109	.6	.8	.19	388	.53	60.1	188	32	43	2.1	690	8.4
July 1-10----------	44.5	23		52	12	54	4.8	204	23	78	.6	.5	.12	348	.47	41.8	178	11	39	1.8	600	7.7
July 11-20----------	72.8	23		48	12	52	4.8	208	22	68	.6	.5	.13	333	.45	65.5	169	0	39	1.7	577	7.9
July 21-31----------	45.2	19		52	12	72	5.2	208	31	98	.6	.5	.19	392	.53	47.8	180	10	46	2.3	698	7.9
Aug. 1-10----------	38.5	22		47	14	80	4.9	216	31	101	.5	.7	.16	407	.55	42.3	174	0	49	2.6	718	8.2
Aug. 11-20----------	27.9	24		44	11	61	5.0	207	20	70	.6	.9	.13	339	.46	25.5	155	0	45	2.1	591	8.1
Aug. 21-31----------	45.5	20		47	12	71	5.1	219	26	85	.6	.8	.13	376	.51	46.2	168	0	47	2.4	661	8.1
Sept. 1-10----------	69.8	23		45	15	70	5.0	228	27	86	.5	1.2	.30	385	.52	72.6	175	0	46	2.3	679	8.1
Sept. 11-20----------	53.2	21		45	15	77	4.8	234	29	91	.5	1.0	.33	400	.54	57.5	174	0	48	2.5	709	8.0
Sept. 21-30----------	31.8	19		44	15	73	4.6	228	28	88	.5	.8	.31	b388	.53	33.3	171	0	47	2.4	685	8.2
Weighted average-----	132	16		56	16	55	3.9	235	30	72	0.4	1.1	0.19	368	0.50	131	206	13	36	1.7	639	--

a Includes equivalent of 6 parts per million carbonate (CO_3).
b Residue on evaporation at 180°C.
c Includes equivalent of 5 parts per million carbonate (CO_3).

MISCELLANEOUS ANALYSES OF STREAMS IN GUADALUPE RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
ESCONDIDO RESERVOIR NO. 1 NEAR KENEDY																						
Jan. 4, 1956	--	3.0		24	2.7	12		108	1.5	3.8	0.5	1.4		115	0.16		72	0	26	0.6	184	7.3
July 10	--	--		--	--	--		190	--	3.5	--	--		--	--		138	0	--	--	295	7.2
ESCONDIDO RESERVOIR NO. 2 NEAR KENEDY																						
Jan. 4, 1956	--	0.7		26	3.5	30		127	19	12	0.6	1.5		171	0.23		79	0	45	1.5	251	7.6

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 & 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 1956.
Water temperatures: October 1947 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 410 ppm Apr. 1-30, Aug. 1-31; minimum, 254 ppm Sept. 1-30.
Hardness: Maximum, 175 ppm Apr. 1-30; minimum, 100 ppm Sept. 1-30.
Specific conductance: Maximum daily, 788 micromhos Apr. 29; minimum daily, 355 micromhos Sept. 14-15.
Water temperatures: Maximum observed, 87°F Sept. 19-20; minimum observed, 46°F Feb. 5.
EXTREMES, 1947-56.--Dissolved solids: Maximum, 548 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 observed, 94°F July 27, 1948; minimum observed, 38°F Jan. 31, 1948.
REMARKS.--Values reported for dissolved solids are residues on evaporation unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex.
Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955--------	672	22		46	3.9	35	7.7	177	26	30	0.7	3.5	0.28	267	0.36	484	131	0	35	1.3	430	7.9
Nov. 1-30----------	61.5	22		52	3.8	33	8.0	194	23	29	.6	3.0	.22	284	.39	47.2	145	0	32	1.2	435	7.8
Dec. 1-31----------	45.4	21		52	4.6	35	7.8	201	24	30	.4	2.1	.10	294	.40	36.0	148	0	32	1.2	444	7.7
Jan. 1-31, 1956--------	52.0	18		55	3.7	40	7.9	208	27	32	.3	1.2	.18	300	.41	42.1	153	0	35	1.4	472	8.1
Feb. 1-29----------	52.9	19		56	4.8	42	7.9	217	28	37	.2	.8	.23	a303	.41	43.3	160	0	35	1.4	497	8.2
Mar. 1-31----------	59.0	21		59	5.1	46	8.8	227	31	42	.4	2.0	.18	332	.45	52.9	168	0	36	1.5	542	7.9
Apr. 1-30----------	49.0	21		60	6.2	73	9.1	259	36	62	.5	1.8	.22	410	.56	54.2	175	0	46	2.4	666	7.9
May 1-31----------	70.1	20		48	4.8	87	9.0	229	38	76	.5	3.7	.26	409	.56	77.4	139	0	56	3.2	679	7.8
June 1-30----------	106	21		45	4.1	81	8.3	212	38	66	.5	3.5	.34	382	.52	109	129	0	56	3.1	624	8.0
July 1-31----------	110	22		47	4.2	80	8.3	211	41	68	.7	2.8	.14	378	.51	112	134	0	55	3.0	638	7.7
Aug. 1-31----------	183	22		48	4.6	84	8.5	228	43	66	.7	2.3	.12	410	.56	203	138	0	55	3.1	652	8.2
Sept. 1-30----------	740	17		35	3.2	40	7.5	137	32	34	.5	4.5	.14	254	.35	507	100	0	44	7.9	406	7.8
Weighted average-----	184	20		44	3.9	48	7.9	179	31	41	0.6	3.5	0.20	296	0.40	147	126	0	43	1.9	480	--

a Sum of determined constituents.

RIO GRANDE NEAR EL PASO, TEX.

LOCATION.--At gaging station 5 miles northwest of El Paso, El Paso County, 6 miles northwest of Juarez, Chihuahua, and 1.9 river miles above the American Dam.
DRAINAGE AREA.--29,267 square miles.
RECORDS AVAILABLE.--Chemical analyses: 1933 to 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	31	24.0			59	17	306		183	346	273		(a)	0.34	1,140	1.55		216		76		1,800	8.1
November-----	30	6.56			108	29	552		238	664	509		(a)	.54	2,040	2.78		390		76		3,120	8.5
December-----	21	4.23			139	38	786		328	939	702		(a)	.76	2,840	3.86		504		77		4,190	8.3
January 1956-	29	38.0			154	38	788		330	959	706		(a)	.78	2,890	3.93		540		75		4,250	8.1
February-----	29	36.8			166	47	877		323	1,070	805		0.6	.71	3,180	4.32		608		76		4,700	8.2
March--------	31	179			130	27	191		195	446	168		1.2	.18	1,130	1.54		438		49		1,630	8.0
April--------	30	298			114	26	168		200	403	126		(a)	.21	993	1.35		390		48		1,430	8.1
May----------	31	19.8			124	28	307		214	529	262		.6	.50	1,400	1.91		426		61		2,090	8.0
June---------	30	123			106	24	173		192	376	143		.6	.17	964	1.31		364		51		1,430	8.0
July---------	31	161			92	23	168		187	339	137		.6	.21	927	1.26		326		52		1,350	8.1
August-------	26	79.2			99	21	204		201	357	172		.6	.25	1,010	1.37		334		57		1,530	7.9
September----	30	72.3			95	23	205		195	368	176		(a)	.35	1,010	1.38		331		57		1,530	7.8

a Less than 0.4 parts per million.

RIO GRANDE BELOW OLD FORT QUITMAN, TEX.

LOCATION.--At gaging station at the rectified channel of the Rio Grande, 1.5 miles below Old Fort Quitman, and 81.1 river miles below the American Dam at El Paso, Tex.
DRAINAGE AREA.--32,035 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses, 1933 to 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	4	47.2			26	7.1	100		139	121	51		1.2	0.30	405	0.55		94		70		643	8.2
November-----	5	.39			775	256	1,930		247	1,490	3,880		(a)	.55	9,340	12.7		2,980		58		12,800	7.8
December-----	4	.39			726	229	1,770		247	1,380	3,530		(a)	.66	8,460	11.5		2,750		58		11,800	7.7
January 1956-	4	.40			700	222	1,720		189	1,300	3,510		(a)	.65	8,240	11.2		2,660		58		11,600	7.8
February-----	6	.40			706	242	1,780		110	1,320	3,620		.6	.62	8,460	11.5		2,760		58		11,800	7.8
March--------	--	.07			--	--	--		--	--	--		--	--	--	--		--		--		--	--
April--------	--	0			--	--	--		--	--	--		--	--	--	--		--		--		--	--
May----------	--	1.83			--	--	--		--	--	--		--	--	--	--		--		--		--	--
June---------	--	0			--	--	--		--	--	--		--	--	--	--		--		--		--	--
July---------	--	3.82			--	--	--		--	--	--		--	--	--	--		--		--		--	--
August-------	2	91.0			58	9.5	33		232	51	11		.6	.17	294	.40		184		28		472	8.1
September----	--	0			--	--	--		--	--	--		--	--	--	--		--		--		--	--

a Less than 0.4 part per million

RIO GRANDE AT UPPER PRESIDIO, TEX.

LOCATION.--At gaging station 7.8 river miles above the junction of the Rio Conchos, and about 10 miles northwest of the towns of Presidio, Tex., and Ojinaga, Chihuahua, and 285.7 river miles below the American Dam at El Paso, Tex.
DRAINAGE AREA.--34,988 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses, 1935 to 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	9	177					56		145		30				405	0.55		184		40		611	
November-----	6	.08					801		168		1,420				4,550	6.19		1,650		51		6,220	
December-----	--	0					--		--		--				--	--		--		--		--	
January 1956-	--	0					--		--		--				--	--		--		--		--	
February-----	--	0					--		--		--				--	--		--		--		--	
March--------	--	0					--		--		--				--	--		--		--		--	
April--------	--	0					--		--		--				--	--		--		--		--	
May----------	--	0					--		--		--				--	--		--		--		--	
June---------	--	0					--		--		--				--	--		--		--		--	
July---------	--	.80					--		--		--				--	--		--		--		--	
August-------	6	38.2					38		140		20				279	.38		--		36		455	
September----	--	0					--		--		--				--	--		--		--		--	

RIO GRANDE NEAR JOHNSON RANCH, TEX.

LOCATION.--At gaging station about 2 miles upstream from Johnson Ranch, Brewster County, 14 miles downstream from Castolon, and 392.9 river miles below the American Dam at El Paso.
DRAINAGE AREA.--70,715 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses: 1948 to 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	4	2,470			--	--	58		163	--	34		--	--	456	0.62		204		38		665	--
November-----	5	539			--	--	146		192	--	98		--	--	927	1.26		372		46		1,320	--
December-----	4	379			--	--	167		195	--	115		--	--	1,010	1.38		388		48		1,430	--
January 1956-	4	302			119	22	178		131	464	131		1.2	0.38	1,070	1.46		389		49		1,540	8.3
February-----	5	336			--	--	181		183	--	113		--	--	1,040	1.42		--		50		1,480	--
March--------	4	198			--	--	191		156	--	126		--	--	1,120	1.52		--		51		1,560	--
April--------	5	42.7			--	--	206		159	--	140		--	--	1,170	1.59		--		52		1,650	--
May----------	6	125			--	--	204		169	--	144		--	--	1,180	1.60		--		51		1,660	--
June---------	4	165			--	--	144		135	--	78		--	--	905	1.23		--		49		1,250	--
July---------	5	96.5			140	20	152		171	516	69		.6	.25	1,000	1.36		433		43		1,420	7.8
August-------	6	486			--	--	101		169	--	55		--	--	684	.93		--		44		979	--
September----	5	569			--	--	112		162	--	53		--	--	802	1.09		--		42		1,110	--

RIO GRANDE AT LANGTRY, TEX.

LOCATION.--At gaging station at Langtry, Tex., 24.1 river miles above the confluence with the Pecos River, and 614.1 river miles below the American Dam at El Paso, Tex.
DRAINAGE AREA.--84,795 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses, 1944 to 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	13	2,840			80	9.8	51		168	163	32		1.9	0.13	456	0.62		240		32		668	8.0
November-----	8	907			91	20	103		191	270	69		1.9	.21	699	.95		312		42		1,020	8.4
December-----	9	694			90	23	109		192	284	76		1.9	.18	728	.99		320		42		1,050	7.8
January 1956-	9	621			91	22	106		183	276	80		1.9	.22	721	.98		318		41		1,050	8.0
February-----	8	648			94	23	120		183	303	85		1.2	.21	758	1.03		328		44		1,110	8.0
March--------	5	498			79	22	107		165	274	76		.6	.21	677	.92		290		45		999	8.0
April--------	8	356			67	23	92		156	228	71		.6	.17	596	.81		264		43		893	8.0
May----------	9	456			63	14	44		184	110	35		1.2	.16	382	.52		216		31		605	8.1
June---------	4	545			75	12	75		183	175	50		1.9	.17	522	.71		236		41		783	8.0
July---------	4	329			72	19	98		162	244	64		.6	.18	618	.84		260		44		914	8.0
August-------	7	684			86	15	78		177	225	50		2.5	.15	574	.78		276		38		867	7.8
September----	4	737			95	16	103		180	283	64		1.9	.24	699	.95		304		42		1,010	8.2

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 1956.
Water temperatures: March 1953 to September 1956.
EXTREMES, 1955-56.--Dissolved solids: Maximum, 7,340 ppm Sept. 1-30; minimum, 3,620 ppm Feb. 1-8.
Hardness: Maximum, 2,320 ppm Sept. 1-30; minimum, 1,510 ppm Feb. 1-8.
Specific conductance: Maximum daily, 12,800 micromhos Oct. 1-2; minimum daily, 4,950 micromhos Feb. 4.
Water temperatures: Maximum observed, 80°F July 17-18; minimum observed, 40°F Feb. 4.
EXTREMES, 1937-56.--Dissolved solids: Maximum, 15,600 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 (1953-56): Maximum observed, 80°F on many days during July and August; minimum observed, 40°F on several days during winter months.
REMARKS.--Values reported for dissolved solids are sums of determined constituents. 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 1955 to September 1956 given in Water-Supply Paper 1442. 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 1955 to September 1956

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 (Sum)			Hardness as $CaCO_3$		Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955--------	35.1	18		511	162	1,790		132	1,660	2,840		--		7,050	9.59	668	1,940	1,830	67	18	10,500	7.6
Nov. 1-30----------	29.8	13		472	118	1,080		138	1,470	1,680		3.5		4,900	6.66	394	1,660	1,550	59	12	7,120	7.8
Dec. 1-31----------	32.0	13		466	130	999		145	1,500	1,550		3.5		4,730	6.43	409	1,700	1,580	56	11	6,760	7.8
Jan. 1-31, 1956--------	31.5	13		492	128	1,020		157	1,540	1,580		2.9		4,850	6.60	412	1,750	1,630	56	11	6,810	7.8
Feb. 1-8----------	32.5	14		450	93	650		125	1,350	1,000		1.5		3,620	4.92	318	1,510	1,400	48	7.3	5,090	8.0
Feb. 9-29----------	30.9	14		492	150	1,060		152	1,620	1,650		3.0		5,060	6.88	422	1,840	1,720	55	11	7,390	8.0
Mar. 1-17, 26-31--------	83.7	9.6		490	138	1,190		129	1,550	1,880		3.0		5,320	7.24	1,200	1,790	1,680	59	12	7,070	8.0
Mar. 18-25----------	28.5	8.8		532	163	1,360		132	1,750	2,150		--		6,030	8.20	464	2,000	1,890	60	13	9,310	8.0
Apr. 1-30----------	284	11		480	112	855		114	1,500	1,320		.8		4,330	5.89	3,320	1,660	1,560	53	9.1	6,170	7.9
May 1-31----------	130	12		512	121	1,070		110	1,610	1,650		2.0		5,030	6.84	1,770	1,780	1,680	57	11	7,280	7.5
June 1-30----------	225	12		514	120	964		98	1,610	1,500		1.5		4,770	6.49	2,900	1,780	1,700	54	10	6,710	7.7
July 1-31----------	307	14		554	133	1,060		102	1,740	1,660		1.0		5,210	7.09	4,320	1,930	1,850	54	11	7,440	7.7
Aug. 1-31----------	236	14		594	146	1,230		108	1,900	1,910		1.3		5,850	7.96	3,730	2,080	1,990	56	12	8,090	7.7
Sept. 1-30----------	79.0	17		642	175	1,700		119	2,130	2,620		--		7,340	9.98	1,570	2,320	2,220	61	15	10,200	7.9
Weighted average-----	125	13		531	131	1,090		112	1,680	1,690		--		5,190	7.06	1,750	1,860	1,770	56	11	7,340	--

PECOS RIVER BELOW GRANDFALLS, TEX.

LOCATION.--At gaging station at bridge on State Farm-to-Market Road 11 between Grandfalls and Imperial, 7.1 miles southeast of Grandfalls, Ward County, and 10 miles downstream from Chacatori Draw.
DRAINAGE AREA.--27,820 square miles, approximately (contributing area).
RECORDS AVAILABLE.--Chemical analyses: April 1939 to June 1942, October 1946 to September 1956 (discontinued).
EXTREMES, 1955-56.--Hardness: Maximum, 3,830 ppm June 1-30; minimum, 2,000 ppm Oct. 6-13.
Specific conductance: Maximum daily, 19,000 micromhos July 3-6; minimum daily, 5,190 micromhos Oct. 9.
EXTREMES, 1939-42, 1946-56.--Hardness: Maximum, 4,460 ppm Mar. 1-31, 1953; minimum, 246 ppm June 14, 1954.
Specific conductance: Maximum daily, 35,700 micromhos Feb. 9-10, 15, 19-20, 1953; minimum daily, 904 micromhos June 14, 1954.
REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956.

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: Parts per million	Dissolved solids: Tons per acre-foot	Dissolved solids: Tons per day	Hardness as $CaCO_3$: Calcium, magnesium	Hardness as $CaCO_3$: Noncarbonate	Percent sodium	Sodium adsorption ratio	Specific conductance (micromhos at 25° C)	pH
Oct. 1-5, 14-31, 1955--	20.7					1,510		122	2,150	2,450							2,560	2,460	56	13	9,840	7.5
Oct. 6-13----------	70.6					928		111	1,780	1,520							2,000	1,910	50	9.0	7,070	7.6
Nov. 1-30----------	15.9					2,400		148	2,720	3,930							3,220	3,100	62	18	14,100	7.5
Dec. 1-31----------	19.1					2,820		181	2,820	4,600							3,380	3,230	64	21	16,200	7.6
Jan. 1-31, 1956----	34.8					2,710		180	2,750	4,350							3,180	3,030	65	21	15,100	7.8
Feb. 1-29----------	34.2					2,690		172	2,710	4,250							3,140	3,000	85	21	15,000	7.8
Mar. 1-31----------	30.3					2,770		152	2,840	4,470							3,240	3,120	65	21	15,800	7.8
Apr. 1-30----------	16.5					2,850		132	2,960	4,640							3,540	3,430	64	21	16,300	7.6
May 1-31----------	11.3					2,920		96	3,070	4,720							3,560	3,480	64	21	16,300	7.2
June 1-30----------	7.81					3,220		101	3,210	5,230							3,830	3,750	65	23	17,600	7.7
July 1-31----------	7.95					3,220		92	3,280	5,230							3,810	3,730	65	23	17,700	7.5
Aug. 1-31----------	10.5					3,130		103	3,200	5,070							3,660	3,580	65	23	17,500	7.5
Sept. 1-30---------	12.9					3,110		110	3,140	5,080							3,710	3,620	65	22	17,400	7.7
Weighted average---	19.6					2,580		144	2,750	4,160							3,200	3,080	64	20	14,800	--

PECOS RIVER NEAR GIRVIN, TEX.

LOCATION.--At supplementary gage at bridge on U. S. Highway 67, about half a mile downstream from Panhandle & 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 1956.
Water temperatures: October 1953 to September 1956.
EXTREMES, 1955-56.--Hardness: Maximum, 5,040 ppm June 1-30; minimum, 2,530 ppm Oct. 1-31.
Specific conductance: Maximum daily, 25,600 micromhos July 1; minimum daily, 8,610 micromhos Oct. 14.
Water temperatures: Maximum observed, 89°F July 10, Aug. 19, 29; minimum observed, 38°F Feb. 3-4.
EXTREMES, 1939-41, 1946-47, 1953-56.--Hardness: Maximum, 5,040 ppm June 1-30, 1956; minimum, 640 ppm June 16-18, 1954.
Specific conductance: Maximum daily, 25,600 micromhos July 1, 1956; minimum daily, 1,480 micromhos May 29, 1941.
Water temperatures (1953-56): Maximum observed, 93°F June 1, 1954; minimum observed, 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 1955 to September 1956 given in Water-Supply Paper 1442.

Chemical analyses, in parts per million, water year October 1955 to September 1956

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 (micromhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
Oct. 1-31, 1955--------	40.6					1,850		49	2,330	2,890							2,530	2,490	61	16	11,200	7.1
Nov. 1-30----------	24.7					2,640		60	3,120	4,200							3,340	3,290	63	20	14,100	7.0
Dec. 1-31----------	27.7					3,170		137	3,330	5,060							3,710	3,600	65	23	17,700	7.5
Jan. 1-31, 1956--------	43.7					3,230		158	3,200	5,090							3,590	3,460	66	23	17,400	7.7
Feb. 1-29----------	44.3					3,000		161	3,080	4,690							3,560	3,430	65	22	16,300	7.5
Mar. 1-31----------	38.8					3,180		121	3,270	5,040							3,570	3,470	66	23	17,500	7.5
Apr. 1-8, 19-30--------	26.0					3,420		79	3,460	5,410							3,770	3,710	66	24	18,600	7.3
Apr. 9-18----------	24.9					2,420		59	2,840	3,830							3,040	2,990	63	19	14,100	7.3
May 1-31----------	12.6					3,880		50	4,020	6,010							4,200	4,160	67	26	20,200	7.2
June 1-30----------	10.6					4,640		59	4,670	7,260							5,040	4,990	67	28	23,700	7.4
July 1-9----------	30.6					4,210		58	4,340	6,680							4,730	4,680	66	27	22,200	7.2
July 10-22----------	15.0					3,110		73	3,380	4,970							3,650	3,590	65	22	17,300	7.4
July 23-31----------	13.0					4,600		63	4,630	7,290							5,020	4,970	67	28	23,800	7.2
Aug. 1-31----------	13.6					4,540		63	4,570	7,160							4,820	4,770	67	28	23,500	7.2
Sept. 1-30----------	15.5					3,950		55	4,060	6,230							4,310	4,260	67	26	21,000	7.5
Weighted average-----	26.4					3,160		101	3,330	4,980							3,640	3,560	65	23	17,200	--

PECOS RIVER NEAR SHUMLA, TEX.

LOCATION.--At gaging station about 6 miles north of Shumla, Val Verde County, 13.0 river miles upstream from the Pecos High Bridge and 18.5 river miles upstream from the confluence with the Rio Grande.
DRAINAGE AREA.--35,162 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	4	299			116	49	253		174	282	429		5.6	0.20	1,280	1.74		489		53		2,100	8.0
November-----	4	204			126	58	297		174	336	507		5.6	.09	1,530	2.08		554		54		2,410	7.9
December-----	5	200			133	64	308		180	355	535		3.7	.18	1,580	2.15		595		53		2,500	8.0
January 1956-	4	201			152	70	374		181	419	638		3.1	.13	1,880	2.55		666		55		2,920	8.1
February-----	3	201			197	80	521		174	558	874		2.5	.22	2,480	3.37		821		58		3,800	8.1
March--------	5	163			186	89	531		156	569	901		1.2	.26	2,490	3.39		828		58		3,890	8.1
April--------	6	135			171	83	499		128	529	844		.6	.24	2,330	3.17		768		59		3,650	7.9
May----------	10	161			151	78	442		113	475	764		1.2	.26	2,080	2.83		696		58		3,320	7.8
June---------	4	97.8			116	61	351		98	364	599		.6	.26	1,650	2.25		540		59		2,630	7.8
July---------	4	89.7			113	53	320		104	328	553		.6	.24	1,530	2.08		500		58		2,460	7.9
August-------	5	85.0			111	61	302		116	313	534		.6	.11	1,430	1.94		526		56		2,390	8.0
September----	4	108			115	54	297		137	323	505		.6	.22	1,400	1.91		509		56		2,320	7.9

RIO GRANDE AT LAREDO, TEX.

LOCATION.--At gaging station at railroad bridge between Laredo, Webb County, and Nuevo Laredo, Tamaulipas, 884.3 miles below the American Dam at El Paso.
DRAINAGE AREA.--135,976 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses: July 1955 to September 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	20	4,150			--	--	57		165	--	46		--	--	500	0.68		249		33		736	--
November-----	19	2,020			--	--	98		146	--	106		--	--	618	.84		260		45		950	--
December-----	31	1,650			--	--	99		165	--	117		--	--	625	.85		270		44		978	--
January 1956-	31	1,490			74	24	105		159	188	131		2.5	.12	647	.88		284		44		1,020	7.9
February-----	29	1,260			--	--	124		174	--	152		--	--	758	1.03		--		46		1,180	--
March--------	31	803			--	--	146		156	--	183		--	--	816	1.11		--		49		1,300	--
April--------	30	609			--	--	133		145	--	176		--	--	750	1.02		--		49		1,200	--
May----------	31	641			--	--	120		142	--	165		--	--	684	.93		--		47		1,120	--
June---------	30	303			--	--	127		137	--	174		--	--	736	1.00		--		49		1,160	--
July---------	31	752			61	17	81		145	142	94		(a)	.27	500	.68		220		44		805	7.8
August-------	31	601			--	--	85		134	--	96		--	--	552	.75		--		43		864	--
September----	30	1,700			--	--	59		143	--	103		--	--	427	.58		--		37		695	--

a Less than 0.4 part per million.

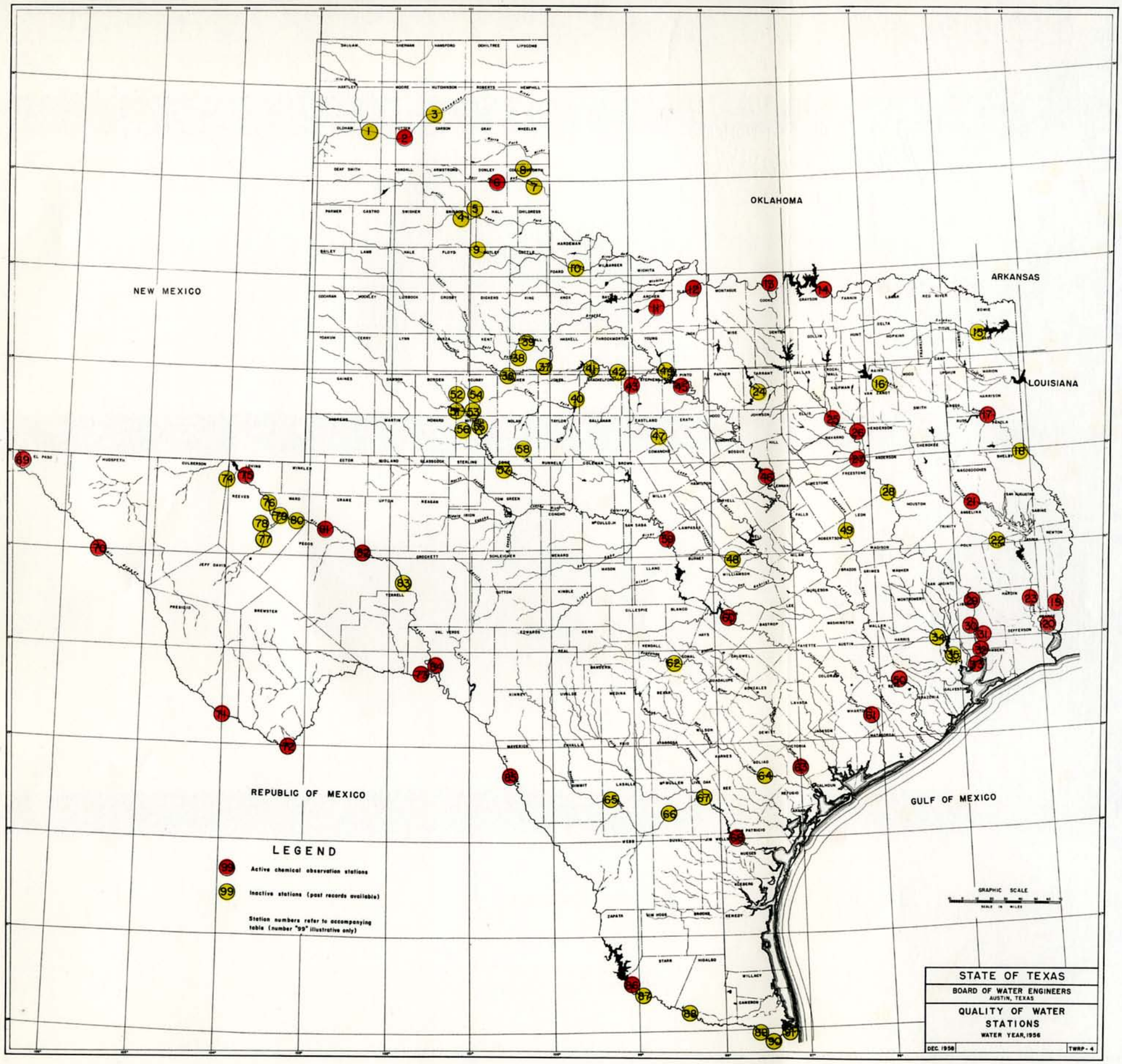
RIO GRANDE BELOW FALCON DAM, TEX.

LOCATION.--Immediately below Falcon Dam, Starr County, 2.5 miles upstream from gaging station near Chapeno, 970.9 river miles below the American Dam at El Paso, Tex.
DRAINAGE AREA.--87,760 square miles (United States and Mexico; from International Boundary and Water Commission Water Bulletin Number 24).
RECORDS AVAILABLE.--Chemical analyses: July 1955 to September 1956.
REMARKS.--Chemical analyses by the U. S. Dept. Agriculture, Agricultural Research Service, U. S. Salinity Laboratory, Riverside, Calif. Records of discharge for water year October 1955 to September 1956 given in International Boundary and Water Commission Water Bulletin Numbers 25 and 26.

Chemical analyses, in parts per million, water year October 1955 to September 1956

Month	Number of Samples	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 (micromhos at 25° C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Noncarbonate				
October 1955-	9	1,410			64	14	61		137	132	72		1.9	0.21	449	0.61		215		38		700	8.2
November-----	10	1,850			64	12	66		140	139	67		1.9	.10	441	.60		210		41		703	8.0
December-----	10	3,020			66	15	63		146	141	71		1.9	.14	449	.61		228		38		710	8.0
January 1956-	13	5,610			65	16	64		156	143	69		1.2	.10	456	.62		226		37		723	7.9
February-----	10	6,070			73	14	69		162	150	74		1.2	.09	485	.66		240		38		755	8.1
March--------	8	2,720			77	16	74		165	159	87		1.2	.11	522	.71		258		38		824	8.0
April--------	8	2,560			77	17	78		163	168	89		.6	.19	544	.74		260		40		859	8.1
May----------	10	3,850			76	19	90		149	186	108		1.2	.17	581	.79		270		42		928	8.0
June---------	9	4,630			76	20	96		146	189	113		.6	.13	610	.83		270		44		948	8.1
July---------	5	298			80	19	113		156	205	135		(a)	.26	684	.93		280		46		1,060	8.0
August-------	7	421			84	24	128		147	228	160		(a)	.26	735	1.00		308		47		1,170	8.0
September----	7	1,360			78	26	122		143	223	156		(a)	.24	706	.96		300		47		1,120	8.0

a Less than 0.4 part per million.


OKLAHOMA
ARKANSAS
LOUISIANA
NEW MEXICO
REPUBLIC OF MEXICO
GULF OF MEXICO
LEGEND
Active chemical observation stations
Inactive stations (past records available)
Station numbers refer to accompanying table (number "99" illustrative only)
GRAPHIC SCALE
STATE OF TEXAS
BOARD OF WATER ENGINEERS
AUSTIN, TEXAS
QUALITY OF WATER STATIONS
WATER YEAR, 1956
DEC. 1956
TWRP-4