

Texas Board of Water Engineers
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CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1955

Prepared in cooperation with the
United States Department of the Interior, Geological Survey
and other agencies, under the direction of
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CHEMICAL COMPOSITION OF TEXAS SURFACE WATERS, 1955

Introduction

This report makes available to the public data on the chemical quality of the surface waters of Texas in the water year 1955. The results of chemical analyses of water 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, 1954 to September 30, 1955, are presented.

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 variation in chemical composition of different stream waters and, often, at different points on a particular stream is very wide.

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 eleventh 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 city of 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 Pecos River Commission, and the U. S. Corps of Engineers.

Collection and Analysis of Samples

The samples for which data are given were collected from October 1, 1954, to September 30, 1955. 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.

During the period October 1, 1954 to September 30, 1955, samples were collected daily at 27 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 21 of the 27 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 location 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.

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 is 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. Specific conductance, a measure of a water's ability to conduct an electric current, is reported in micromhos at 25°C. The values for pH are reported on a numerical scale. 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 (CaCO₃).

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/

Additional Available Data

Chemical analyses of samples collected at several additional stations in the Rio Grande Basin are published in the Water Bulletins of the International Boundary and Water Commission, El Paso, Texas.

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

LOCATION OF QUALITY OF WATER SAMPLING STATIONS

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 Wellington
7. Elm Creek near Shamrock
8. Quitaque Creek near Quitaque
9. Pease River near Crowell
10. Little Wichita River near Archer City
11. Little Wichita River near Henrietta
12. Red River near Gainesville
13. Red River at Denison Dam near Denison
14. Sulphur River near Darden

Sabine River Basin

15. Sabine River near Emory
16. Sabine River near Tatum
17. Sabine River at Logansport, La.
18. Sabine River near Ruliff
19. Cow Bayou near Mauriceville

Neches River Basin

20. Neches River near Rockland
21. Angelina River near Lufkin
22. Neches River at Evadale

Trinity River Basin

23. Clear Fork Trinity River at Fort Worth
24. Trinity River near Rosser
25. Trinity River near Oakwood
26. Trinity River at Romayor
27. Trinity River near Moss Bluff
28. Old River near Cove
29. Trinity River at Anahuac
30. Trinity Bay near Anahuac

San Jacinto River Basin

31. San Jacinto River (West Fork) near Humble
32. San Jacinto River near Huffman

Brazos River Basin

33. Double Mountain Fork Brazos River near Rotan
34. Double Mountain Fork Brazos River near Aspermont
35. Salt Fork Brazos River near Peacock
36. Salt Fork Brazos River near Aspermont
37. Clear Fork Brazos River at Nugent
38. Paint Creek near Haskell
39. Clear Fork Brazos River at Fort Griffin
40. Hubbard Creek near Breckenridge
41. Brazos River near South Bend
42. Brazos River at Possum Kingdom Dam near Graford
43. Brazos River near Whitney
44. Leon River near Eastland
45. Lampasas River near Belton
46. Navasota River near Easterly
47. Brazos River at Richmond

LOCATION OF QUALITY OF WATER SAMPLING STATIONS--Continued

Colorado River Basin

- | | |
|--|-------------------------------------|
| 48. Colorado River above Bull Creek near Knapp | 53. Morgan Creek near Colorado City |
| 49. Bull Creek near Ira | 54. Colorado River at Robert Lee |
| 50. Bluff Creek near Ira | 55. Oak Creek near Blackwell |
| 51. Deep Creek near Dunn | 56. Colorado River near San Saba |
| 52. Colorado River at Colorado City | 57. Colorado River at Austin |
| | 58. Colorado River at Wharton |

Guadalupe River Basin

- | | |
|--|---------------------------------|
| 59. Guadalupe River near Spring Branch | 61. San Antonio River at Goliad |
| 60. Guadalupe River at Victoria | |

Nueces River Basin

- | | |
|-----------------------------|------------------------------------|
| 62. Nueces River at Cotulla | 64. Nueces River near Three Rivers |
| 63. Nueces River at Tilden | 65. Nueces River near Mathis |

Rio Grande Basin

- | | |
|---|--|
| 66. Salt (Screwbean) Draw near Orla | 74. Pecos River near Girvin |
| 67. Pecos River near Orla | 75. Pecos River near Sheffield |
| 68. Pecos River at Pecos | 76. Rio Grande at Roma |
| 69. Toyah Creek near Pecos | 77. Rio Grande at Mission Pumping Plant near Mission |
| 70. Salt Draw near Pecos | 78. Rio Grande near San Benito |
| 71. Toyah Creek below Toyah Lake near Pecos | 79. Rio Grande at Los Fresnos Pumping Plant near Brownsville |
| 72. Pecos River below Barstow | 80. Rio Grande near Brownsville |
| 73. Pecos River below Grandfalls | |

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	
	<u>Arkansas River Basin</u>																				
1	Canadian River near Tacosa																				
2	Canadian River near Amarillo																				
3	Canadian River near Borger																				
	<u>Red River Basin</u>																				
4	Prairie Dog Town Fork Red River near Brice																				
5	Halberry Creek near Brice																				
6	Salt Fork Red River near Wellington																				
7	Elm Creek near Shamrock																				
8	Quitcaque Creek near Quitoque																				
9	Pease River near Crowell																				
10	Little Wichita River near Archer City																				
11	Little Wichita River near Henrietta																				
12	Red River near Gainesville																				
13	Red River at Denison Dam near Denison																				
14	Sulfur River near Darden																				
	<u>Sabine River Basin</u>																				
15	Sabine River near Emory																				
16	Sabine River near Tatum																				
17	Sabine River at Logansport, La.																				
18	Sabine River near Ruliff																				
19	Cow Bayou near Mauriceville																				
	<u>Neches River Basin</u>																				
20	Angelina River near Lufkin																				
21	Neches River near Rockland																				
22	Neches River at Evadale																				
	<u>Trinity River Basin</u>																				
23	Clear Fork Trinity River at Port Worth																				
24	Trinity River near Rosser																				
25	Trinity River near Oakwood																				
26	Trinity River at Romayor																				

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	
	<u>Trinity River Basin--Continued</u>																				
27	Trinity River near Moss Bluff																				
28	Old River near Cove																				
29	Trinity River at Anahuac																				
30	Trinity Bay at Mouth of Trinity River near Anahuac																				
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31	San Jacinto River (West Fork) near Humble																				
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33	Double Mountain Fork Brazos River near Rotan																				
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38	Paint Creek near Haskell																				
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40	Hubbard Creek near Breckenridge																				
41	Brazos River near South Bend																				
42	Brazos River at Possum Kingdom Dam near Graford																				
43	Brazos River near Whitney																				
44	Leon River near Eastland																				
45	Lampasas River near Belton																				
46	Navasota River near Easterly																				
47	Brazos River at Richmond																				
	<u>Colorado River Basin</u>																				
48	Colorado River above Bull Creek near Knapp																				
49	Bull Creek near Ira																				
50	Bluff Creek near Ira																				
51	Deep Creek near Dunn																				
52	Colorado River at Colorado City																				
53	Morgan Creek near Colorado City																				

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
	<u>Colorado River Basin--Continued</u>																			
54	Colorado River at Robert Lee																			
55	Oak Creek near Blackwell																			
56	Colorado River near San Saba																			
57	Colorado River at Austin																			
58	Colorado River at Wharton																			
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66	Salt (Screbean) Draw near Orla																			
67	Pecos River near Orla																			
68	Pecos River at Pecos																			
69	Toyah Creek near Pecos																			
70	Salt Draw near Pecos																			
71	Toyah Creek below Toyah Lake near Pecos																			
72	Pecos River near Barstow																			
73	Pecos River below Grandfalls																			
74	Pecos River near Girvin																			
75	Pecos River near Sheffield																			
76	Rio Grande at Roma																			
77	Rio Grande at Mission Pumping Plant near Mission																			
78	Rio Grande near San Benito																			
79	Rio Grande at Los Fresnos Pumping Plant near Brownsville																			
80	Rio Grande near Brownsville																			

ARKANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ARKANSAS RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Water discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Residue at 180°C)		Hardness as CaCO ₃		Percent sodium	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate			
E. AMARILLO CREEK NEAR AMARILLO																				
Jan. 11, 1955	13.3	76		53	45	94	257	93	75	--	134	720	0.98	317	106	39	2.3	1,110	8.2	
Feb. 16	9.18	53		48	39	133	266	97	105	3.0	118	a727	.99	280	76	51	3.5	1,170	--	
Mar. 24	13.6	44		52	36	165	302	80	122	3.6	154	a806	1.10	278	30	56	4.3	1,370	7.0	
Apr. 18	12.0	109		59	40	145	311	133	111	3.6	85	a756	1.03	312	57	50	3.6	1,230	--	
May 17	12.6	94		57	36	129	291	119	94	3.2	81	764	1.04	290	51	49	3.3	1,100	--	
June 24	14.5	64		57	28	122	288	103	89	2.8	28	635	.86	256	20	49	3.0	974	--	
July 14	7.36	77		59	36	137	304	135	107	3.6	51	767	1.04	284	44	50	3.5	1,130	--	
Aug. 10	17.7	92		63	32	114	312	107	96	2.8	32	704	.96	289	33	46	2.9	1,020	--	
Sept. 8	10.4	60		55	36	133	324	114	101	3.6	46	722	.98	285	19	50	3.4	1,090	--	
BONITA CREEK NEAR AMARILLO																				
Jan. 11, 1955	2.52	28		--	13	--	--	10	8.2	--	1.5	--	--	--	--	--	--	416	--	--
CHECEN CREEK NEAR AMARILLO																				
Jan. 11, 1955	4.08	24		32	7.9	13	152	6.8	4.8	--	2.5	a166	.23	112	0	20	.5	315	8.2	--
COETAS CREEK NEAR AMARILLO																				
Jan. 11, 1955	1.29	32		24	9.6	18	130	15	10	--	3.8	a176	.24	100	0	28	.8	353	8.1	--

a Sum of determined constituents.

RED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR ARCHER CITY, TEX.--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
June 1, 4-10, 1955-----	83.7	12		29	6.5	59		97	5.3	98	0.5	4.2		286	0.39	64.6	99	20	57	2.6	503	7.9
June 11-14-----	1.63	10		32	7.0	62		65	6.6	147	.5	3.0		364	.50	1.80	110	40	62	3.4	649	7.5
June 18-20-----	388	9.6		21	4.8	39		78	5.1	62	.5	4.0		4182	.25	289	73	12	54	2.0	350	7.3
June 21-23-----	289	20		22	4.4	28		86	4.9	37	.4	3.5		195	.27	152	97	0	46	1.4	284	7.7
June 24-27-----	.85	22		28	6.7	37		120	5.0	49	.4	4.0		230	.31	.53	224	84	61	1.6	366	8.0
July 2-3-----	1.30	21		62	1.7	164		171	7.2	305	.5	2.2		4663	.90	2.33	172	0	--	4.8	1,260	8.2
July 10, 17-----	0	--		--	--	--		216	--	143	--	--		--	--	--	237	145	72	7.9	805	8.2
July 19-20-----	35.0	16		72	14	279		112	12	518	.7	8.0		992	1.35	93.7	105	16	64	3.7	1,870	7.8
July 21-23-----	2.03	18		31	6.6	87		109	5.8	138	.5	3.5		3344	.47	1.89	148	36	--	--	643	8.0
July 24, 31-----	0	--		--	--	--		137	--	186	--	--		--	--	--	189	37	--	--	828	8.1
Aug. 10-----	0	--		--	--	--		186	--	216	--	--		--	--	--	112	0	47	1.9	985	--
Aug. 20-21-----	4.05	16		31	8.5	45		179	9.7	33	1.0	5.0		237	.32	2.59	138	0	--	--	410	8.1
Sept. 6, 12, 19-----	0	--		--	--	--		220	--	48	--	--		--	--	--	116	14	--	--	513	8.2
Sept. 21, 24-----	24.5	10		34	7.3	83		125	6.7	129	.8	4.5		4336	.46	22.2	40	1	50	3.4	643	7.6
Sept. 25-26-----	1,890	6.4		12	2.4	18		48	7.8	20	.5	4.0		495	.13	998	100	0	35	1.3	156	7.3
Sept. 27-30-----	1,880	11		28	7.3	24		144	2.6	20	.5	3.5		188	.26	954	80	3	49	1.8	310	8.1
Weighted average-----	1,643	9.7		23	5.5	36		94	5.6	51	0.5	4.0		197	0.27	34.2	80	3	49	1.8	337	--

a Sum of determined constituents.

b Represents 100 percent of runoff for water year October 1954 to September 1955.

MED RIVER BASIN--Continued

LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.

LOCATION:--At seign 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 September 1955.

Water temperatures: December 1952 to September 1955.

EXTREMES, 1954-55:--Dissolved solids: Maximum, 1,670 ppm Sept. 24; minimum, 57 ppm May 19. Hardness: Maximum, 418 ppm Sept. 24; minimum, 25 ppm Feb. 20.

Specific conductance: Maximum daily, 3,360 microhos July 22; minimum daily, 96.9 microhos May 19.

EXTREMES, 1952-55:--Dissolved solids: Maximum, 1,700 ppm Mar. 15 (12m-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 microhos May 1, 1953; minimum daily, 81.1 microhos Oct. 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 1954 to September 1955 given in Water-Supply Paper 1391.

Chemical analyses, in parts per million, water year October 1954 to September 1955

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		Sodium adsorption ratio	Specific conductance (microhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium				Non-carbonate
Oct. 7, 1954	0	--	--	--	--	--	--	174	--	33	--	--	--	252	0.34	114	0	--	386	8.2	
Oct. 9-10	11.6	--	--	--	--	--	--	185	--	108	--	--	--	380	.52	130	0	--	661	8.2	
Oct. 21	0	--	--	--	--	--	--	195	--	109	--	--	--	--	--	137	0	--	665	8.2	
Oct. 27	0	--	--	--	--	--	--	194	--	110	--	--	--	--	--	140	0	--	672	8.2	
Nov. 5	0	--	--	--	--	--	--	197	--	113	--	--	--	404	.55	141	0	--	683	8.2	
Nov. 11	0	--	--	--	--	--	--	200	--	115	--	--	--	--	--	145	0	--	699	8.2	
Nov. 18	0	--	--	--	--	--	--	212	--	82	--	--	--	--	--	140	0	--	608	8.2	
Nov. 25	0	--	--	--	--	--	--	216	--	85	--	--	--	--	--	145	0	--	617	8.2	
Dec. 2	0	--	--	--	--	--	--	219	--	87	--	--	--	382	.52	149	0	--	631	8.2	
Dec. 8	0	--	--	--	--	--	--	222	--	90	--	--	--	4750	1.02	153	0	--	653	8.2	
Dec. 13-15	43.9	7.4	--	219	14	--	--	85	12	402	0.4	4.5	--	--	--	176	102	72	1,430	7.9	
Dec. 16-17, 19-26, 28-31	1.27	8.0	--	239	11	--	--	110	12	420	.3	2.2	--	870	1.18	179	89	74	1,540	7.8	
Jan. 1, 1955	0	--	--	--	--	--	--	124	--	400	--	--	--	--	--	172	161	--	1,440	8.1	
Jan. 3	0	--	--	--	--	--	--	125	--	330	--	--	--	--	--	155	43	--	1,230	8.1	
Jan. 8-20	7.55	7.8	--	148	9.7	--	--	114	9.3	250	.5	2.0	--	549	.75	137	44	70	1,000	7.5	
Jan. 21	55	7.0	--	358	24	--	--	113	16	682	--	3.5	--	1,230	1.67	296	204	72	2,280	7.9	
Jan. 22-31	4.93	8.2	--	189	13	--	--	93	11	345	.4	3.0	--	730	.99	167	91	71	1,290	7.7	
Feb. 4, 7-18	14.7	8.2	--	82	5.8	--	--	85	7.6	128	.5	3.0	--	308	.42	83	14	68	567	7.8	
Feb. 5-6, 19	89.0	6.4	--	43	3.8	--	--	55	5.6	58	--	3.0	--	176	.24	42	7.4	69	293	7.4	
Feb. 20	32	8.8	--	--	--	10	--	42	--	5.0	--	5.0	--	--	--	25	0	47	1.8	97.9	7.9
Feb. 21	170	12	--	276	7.0	--	--	103	17	480	.8	7.3	--	976	1.33	187	102	76	8.8	1,670	7.3
Feb. 22-28	20.2	7.6	--	86	4.1	--	--	67	7.1	145	.6	2.8	--	338	.46	85	30	69	4.0	597	7.3
Mar. 1-5, 23-25	16.8	8.6	--	74	5.8	--	--	79	6.8	125	.2	2.5	--	316	.43	90	26	64	3.4	561	7.4
Mar. 21	93	11	--	17	3.6	--	--	55	1	18	1.0	4.5	--	494	.13	41	10	47	1.1	168	7.7
Mar. 22	243	9.2	--	38	5.1	--	--	87	4	59	.4	4.5	--	220	.30	61	10	50	1.8	389	7.4
Mar. 26-31	.88	9.6	--	122	8.8	--	--	84	8	224	.5	3.5	--	539	.73	133	64	67	4.6	896	7.4
Apr. 2, 5	0	--	--	--	--	--	--	98	--	216	--	--	--	--	--	130	50	--	883	7.8	
Apr. 7-8	128	12	--	15	4.6	--	--	61	5	14	.5	4.5	--	497	.13	47	0	41	1.0	160	7.7
Apr. 9-17	22.4	12	--	51	5.5	--	--	76	6.3	78	.4	4.0	--	232	.32	73	11	60	2.6	404	7.5
Apr. 19	0	--	--	--	--	--	--	96	--	63	--	--	--	--	--	78	0	--	371	7.9	7.9
Apr. 27	0	--	--	--	--	--	--	116	--	65	--	--	--	--	--	92	0	--	411	8.1	8.1
Apr. 29	623	13	--	107	109	--	--	109	7	192	.2	4.5	--	4426	.58	139	50	63	4.0	830	7.5
Apr. 30, May 1-6, 15-17	49.6	13	--	71	8.0	--	--	108	7.4	120	.5	3.5	--	330	.45	114	26	58	2.9	590	7.5
May 18	821	14	--	236	15	--	--	64	12	448	.6	5.2	--	818	1.11	190	138	73	7.4	1,550	7.9
May 19	1,430	7.2	--	8.4	2.3	--	--	34	2	10	.6	2.0	--	457	.08	220	29	1	7	96.9	7.9
May 20-26	799	11	--	33	7.8	--	--	46	4.6	51	.5	2.0	--	4160	.22	345	65	8	32	309	7.2
May 27, 29-31	53.2	11	--	100	8.7	--	--	109	7.7	177	.5	2.8	--	643	.60	127	45	63	1.8	461	7.4
May 28	160	15	--	48	6.5	--	--	103	7	70	.6	2.8	--	4226	.31	89	5	54	2.2	716	8.0

RED RIVER BASIN--Continued
LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
June 1-3, 6, 1955	105	13		33	8.1	90		103	9	132	0.5	3.0		390	0.33	111	117	32	63	3.6	683	7.7
June 4-5, 7-9, 11	151	12		23	5.7	44		91	5.9	64	.5	3.5		222	.30	90.5	80	5	54	2.1	389	7.8
June 10, 12-17	85.3	12		39	9.4	103		91	7.3	195	.5	3.0		414	.56	95.3	137	62	62	3.8	804	7.7
June 18-20	967	8.6		18	4.4	30		63	4.0	48	.5	2.5		147	.20	384	62	10	51	1.6	276	7.6
June 21-26	873	14		19	4.6	26		76	4.0	39	.4	1.8		146	.20	344	67	5	46	1.4	274	7.6
June 27-30, July 1	2.46							119		38							92	0			332	8.0
July 2, 7, 14	0							138		42							104	0			355	8.2
July 19-21	113	12		15	4.0	19		77	3.7	16	.4	3.5		136	.18	41.5	53	0	43	1.1	185	8.0
July 22-31	8.89	17		101	28	429		81	17	860	.4	4.0		1,500	2.04	36.0	368	302	72	9.7	2,840	7.8
Aug. 1, 3, 5, 10	0							115		332							185	91			1,350	7.9
Aug. 16, 26	0							128		412							224	119			1,550	8.0
Aug. 31, Sept. 1	1.50	14		34	1.0	112		100	6.7	185	.6	3.5		432	.59	1.75	126	64	66	4.3	815	7.9
Sept. 14, 21	0							115		252							158	64			1,010	7.9
Sept. 22-23	43.5	11		28	8.0	100		72	6.9	176		2.5		359	.50	63.3	102	63	68	4.3	720	7.8
Sept. 26	92	11		113	33	481		74	18	960	.4	2.2		1,670	2.27	413	418	358	71	10	3,250	7.8
Sept. 25-27	1,878	6.0		16	2.1	13		47	2.8	12	.2	3.0		472	.10	365	33	0	46	1.0	123	7.4
Sept. 28-30	4,620	8.4		16	2.2	18		70	3.3	18	.2	2.0		402	.14	1,272	50	0	43	1.1	176	7.5
Weighted average	bl16	9.7		19	4.1	36		69	4.3	56	0.3	2.4		168	0.23	51.7	64	8	55	1.9	306	--

^a Sum of determined constituents.

^b Represents 100 percent of runoff for water year October 1954 to September 1955. No flow on many days.

RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--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)	Nonion (B)	Dissolved solids (Residue at 180°C)			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
May 1-3, 1955	147	--	--	238	95	742	--	149	565	1,350	--	--	--	3,300	4.49	1,310	985	863	62	5,310	7.6	
May 4-5	205	--	--	92	34	293	--	126	166	1,520	--	3.0	--	1,290	1.75	714	370	267	63	2,220	7.7	
May 6-10	175	--	--	192	76	586	--	142	466	1,010	--	--	--	2,590	3.52	1,220	790	674	62	4,240	7.7	
May 11-12	286	--	--	146	59	431	--	136	325	795	--	2.6	--	2,010	2.73	1,450	605	494	61	3,270	7.9	
May 13-18	4,329	--	--	220	56	553	--	119	601	850	--	4.6	--	2,510	3.41	30,690	780	682	61	4,020	7.9	
May 19-20	32,100	--	--	84	2.6	116	--	136	128	170	--	4.2	--	622	1.85	53,910	220	108	53	1,050	7.8	
May 21-26	51,800	--	--	104	18	185	--	124	235	280	--	1.9	--	891	1.21	328,600	335	234	55	1,560	7.9	
May 27-31	9,536	--	--	144	22	310	--	157	296	500	--	2.8	--	1,370	1.86	31,370	450	322	60	2,390	7.7	
June 1	4,050	--	--	141	21	312	--	148	300	490	--	3.0	--	1,460	1.99	15,970	440	318	61	2,300	7.9	
June 2-8	6,486	--	--	272	54	578	--	128	733	925	--	3.0	--	2,820	3.84	49,380	900	795	58	4,260	7.5	
June 9-10	8,380	--	--	232	51	432	--	122	605	785	--	3.6	--	2,280	3.10	51,590	790	690	54	3,520	7.6	
June 11-13	12,750	--	--	142	35	245	--	132	313	425	--	6.0	--	1,280	1.74	44,060	500	392	52	2,130	7.6	
June 14-20	6,064	--	--	108	29	185	--	124	210	330	--	5.2	--	1,020	1.39	16,700	390	288	51	1,760	7.5	
June 21-27	20,750	--	--	148	37	244	--	124	355	430	--	5.2	--	1,340	1.82	75,070	520	418	50	2,230	7.5	
June 28-30	2,690	--	--	186	53	371	--	134	438	625	--	3.5	--	1,850	2.52	13,440	680	570	54	3,040	7.6	
July 1-11	3,018	--	--	304	78	659	--	150	790	1,100	--	--	--	3,100	4.22	25,260	1,080	957	57	4,900	7.8	
July 12-20	1,663	19	0.00	280	103	777	8.0	154	756	1,110	0.4	-2	0.41	3,470	4.72	6,210	1,120	994	60	5,590	7.4	
July 21-14	1,060	--	--	232	78	643	--	164	561	1,100	--	--	--	2,830	3.85	8,100	900	766	61	4,650	7.7	
July 22-25	1,955	--	--	140	46	366	--	140	302	630	--	2.6	--	1,610	2.19	8,500	540	426	60	2,750	7.8	
July 26	1,290	--	--	184	61	487	--	150	412	850	--	2.3	--	2,140	2.91	7,450	710	587	60	2,580	8.0	
July 27-31	1,078	--	--	328	81	735	--	142	814	1,300	--	--	--	3,580	4.84	10,360	1,150	1,030	58	3,580	7.8	
Aug. 1-6	1,303	--	--	356	73	867	--	126	900	1,400	--	--	--	3,830	5.21	13,470	1,190	1,090	61	6,000	7.4	
Aug. 7-10	1,052	--	--	220	63	543	--	126	565	900	--	.8	--	2,450	3.33	6,960	810	707	59	4,020	8.1	
Aug. 11-12	1,145	--	--	256	71	667	--	140	641	1,120	--	--	--	2,990	4.07	9,240	930	816	61	9.5	4,880	8.3
Aug. 13-14	713	--	--	176	56	477	--	124	437	825	--	1.1	--	2,120	2.88	4,080	670	568	61	3,540	8.2	
Aug. 15	564	--	--	156	56	454	--	126	363	790	--	2.5	--	1,960	2.67	2,980	620	517	61	7.9	3,210	8.2
Aug. 16-20	487	--	--	232	78	702	--	134	596	1,150	--	--	--	2,970	4.04	3,910	900	790	63	10	4,850	8.1
Aug. 21-31	360	--	--	276	88	804	--	158	714	1,320	--	--	--	3,430	4.66	3,330	1,050	920	62	11	5,550	8.1
Sept. 1-10	388	--	--	244	71	689	--	146	589	1,180	--	--	--	2,960	4.03	3,100	900	780	62	10	4,820	7.9
Sept. 11-14	276	--	--	192	54	539	--	144	435	900	--	3.1	--	2,300	3.13	2,010	700	582	63	8.9	3,740	7.8
Sept. 15-20	292	--	--	222	67	608	--	146	514	1,050	--	--	--	2,680	3.66	2,110	830	694	61	9.2	4,380	7.4
Sept. 21	286	--	--	150	48	388	--	122	356	680	--	1.6	--	1,730	2.35	1,440	570	470	60	7.1	2,870	8.0
Sept. 22-23	397	--	--	234	85	722	--	164	396	1,200	--	--	--	3,000	4.08	3,220	935	800	63	10	4,510	8.1
Sept. 24-25	2,195	--	--	118	40	512	--	126	282	510	--	1.8	--	1,390	1.89	8,240	460	357	60	6.3	2,370	8.0
Sept. 26-30	16,660	--	--	48	12	83	--	150	70	118	--	1.7	--	400	1.54	15,830	170	72	51	2.8	7.7	--
Weighted average	2,630	--	--	141	32	282	--	130	326	462	--	--	--	1,370	1.86	9,730	484	377	56	5.6	2,270	--

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

b Sum of determined constituents.

c Includes equivalent of 11 parts per million carbonate (CO₃).

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

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

f Includes equivalent of 5 parts per million carbonate (CO₃).

g Includes equivalent of 1 part per million carbonate (CO₃).

RED RIVER BASIN--Continued

RED RIVER AT DEWISON DAM NEAR DEWISON, TEX.

LOCATION:--Immediately below dam on Red River, 1.7 miles upstream from Sand Creek, 4 miles northwest of Denison, Grayson County, and three 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 1955.

Water temperatures: October 1945 to September 1955.

EXTREMES, 1954-55.--Dissolved solids: Maximum, 1,000 ppm Sept. 1-30; minimum, 880 ppm Oct. 1-31.

Barsness: Maximum, 351 ppm Sept. 1-30; minimum, 305 ppm Oct. 1-31.

Specific conductance: Maximum daily, 1,730 microhos Aug. 16-19, Sept. 7-9; minimum daily, 1,430 microhos Oct. 1, 4-7.

EXTREMES, 1944-55.--Dissolved solids: Maximum, 1,430 ppm Aug. 11-20, Sept. 1-10, 1944; minimum, 464 ppm Oct. 21-31, 1945.

Barsness: 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, 3,320 microhos Aug. 16, 1944; minimum daily, 656 microhos Oct. 16, 1945.

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 gaging station near Colbert, Okla. for water year October 1954 to September 1955 given in Water-Supply Paper 1391. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1954 to September 1955

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		Sodium adsorption ratio	Percent sodium	Specific conductance (microhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, mg/l	Non-carbonate				
Oct. 1-31, 1954	1,109	12		86	22	177	--	122	190	278	0.4	1.5	0.08	880	1.20	2,630	305	205	56	4.4	1,480	7.7
Nov. 1-30	1,970	14		89	24	166	5.6	126	200	300	.1	1.2	.08	904	1.23	4,810	320	218	55	4.5	1,500	7.9
Dec. 1-31	2,078	12		93	24	190	5.4	129	202	310	.4	1.0	.16	934	1.27	5,240	330	225	55	4.5	1,560	8.1
Jan. 1-31, 1955	325	11		94	24	188	5.6	128	208	308	.4	.8	.16	936	1.27	821	333	228	55	4.5	1,560	8.0
Feb. 1-28	1,016	9.4		93	20	188	5.6	127	200	295	.4	.8	.16	942	1.28	2,580	314	210	56	4.6	1,520	7.4
Mar. 1-31	821	8.4		93	21	187	5.5	128	201	295	.4	1.2	.17	938	1.28	2,080	318	214	56	4.5	1,560	7.5
Apr. 1-30	1,174	6.2		94	22	182	5.3	130	198	288	.5	.8	.15	921	1.25	2,920	325	218	54	4.4	1,530	8.0
May 1-31	3,203	8.0		98	22	181	--	124	205	300	.3	1.0	.13	932	1.27	8,060	335	234	54	4.3	1,520	7.7
June 1-30	11,640	8.4		94	22	184	5.4	127	201	295	.2	1.5	.16	907	1.23	28,510	325	221	55	4.4	1,510	8.0
July 1-31	3,568	11		100	21	196	5.6	125	215	315	.5	2.2	.14	990	1.35	9,940	337	234	55	4.7	1,630	7.8
Aug. 1-31	3,600	12		103	21	206	5.7	126	233	328	.2	2.0	.13	998	1.36	9,700	344	240	56	4.8	1,700	7.5
Sept. 1-30	2,688	11		106	21	212	6.0	122	240	342	.4	1.2	.14	91,000	1.36	7,260	351	251	56	4.9	1,720	7.8
Weighted average	2,762	9.9		96	22	190	5.5	126	209	306	0.3	1.5	0.14	937	1.27	6,990	330	227	55	4.5	1,570	--

a Sum of determined constituents.

RED RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Water dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium	So-dium ad-sorp-tion ratio	Specific con-ductance (micro-mhos at 25° C)	pH
														Parts per mil-lion	Tons per acre-foot	Tons per day	Cal-cium, mag-ne-sium	Non-carbon-ate				
BUCK CREEK NEAR WELLINGTON																						
Jan. 12, 1955-----	2.68	29	--	568	125	137	77	1,770	225	--	7.0	2,900	3.94	1,930	1,870	13	1.4	3,320	7.8			
DOZIER CREEK NEAR WELLINGTON																						
Jan. 12, 1955-----	.24	30	--	560	84	71	69	1,660	75	--	8.0	2,520	3.43	1,740	1,690	8	.7	2,720	7.8			
SWEETWATER CREEK NEAR WHEELER																						
Jan. 12, 1955-----	2.98	36	--	--	13	--	--	18	16	--	1.0	--	--	--	0	--	--	506	--			
ELM CREEK NEAR SHARROCK																						
Jan. 12, 1955-----	1.67	39	--	131	28	78	76	393	98	--	2.5	6863	1.17	442	380	28	1.6	1,280	7.9			
ROARING SPRINGS NEAR ROARING SPRINGS																						
Jan. 18, 1955-----	1.51	49	--	--	31	--	--	77	96	--	26	--	--	--	--	--	--	966	--			
LAKE TEXOMA AT PERRIN AIR FORCE BASE																						
Nov. 1, 1954-----	--	6.6	0.01	105	25	247	112	251	388	0.4	1.0	1,080	1.47	365	273	60	5.6	1,850	7.6			
RANDZELL LAKE NEAR DENISON																						
February 1955-----	--	3.8	.00	73	18	129	122	141	205	.3	.2	6682	.93	256	156	52	3.5	1,130	7.7			
CANEY LAKE AT RED RIVER ARSENAL NEAR TEXARKANA																						
Aug. 22, 1955-----	--	4.5	.00	3.6	2.2	8.6	27	5.0	5.8	.2	.8	64	.06	18	0	51	.9	69.0	6.9			
BIG CYPRESS BAYOU NEAR KARRACK																						
Nov. 2, 1954-----	--	15	.10	7.4	3.7	24	39	13	28	.3	.2	6120	.16	34	2	61	1.8	185	7.1			

a Residue on evaporation at 180°C.

SABINE RIVER BASIN--Continued
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 September 1955 (discontinued). Water temperature: March 1952 to September 1954. EXTREMES, 1954-55.--Dissolved solids: Maximum, 917 ppm Nov. 18-22; minimum, 30 ppm Feb. 8-19. Hardness: Maximum, 158 ppm Dec. 17-31; minimum, 8 ppm Nov. 15-17, Jan. 14-24. Specific conductance: Maximum daily, 1,800 microhos Nov. 23; minimum daily, 34.5 microhos Sept. 15. 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 daily, 2,190 microhos Aug. 24, 1953; minimum daily, 22.0 microhos Apr. 24, 1952. 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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955.

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (microhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 1-4, 1954	40.05	32		31	16	144		96	17	255		1.2		543	0.73	144	65	69	1,040	7.4
Oct. 5-11	.29	11		5.9	3.2	31		10	6.2	57		1.5		121	.16	.09	28	20	226	6.6
Oct. 12-22, 27-31	0.14	19		12	6.4	59		35	10	103		1.5		228	.31	.09	56	71	430	7.1
Oct. 23-26	1.03	10		2.7	1.0	14		10	4.4	19		1.2		57	.08	.16	11	3	83.8	6.4
Nov. 1-10	.18	8.8		8.7	4.2	54		14	6.0	98		1.0		188	.26	.09	39	28	367	6.7
Nov. 11-14	10.3	9.4		1.9	4.6	62	1.4	14	8.4	113		3.8		220	.30	.06	48	37	423	7.0
Nov. 15-17	1.06	2.6		3.3	.8	9.6		6	3.0	16		1.0		39	.05	1.08	8	3	72.0	6.2
Nov. 18-22	.11	6.4		35	12	304		9	4.7	552		1.0		917	1.25	2.62	132	124	1,780	6.3
Nov. 23-30	.11	20		36	16	240		26	8.1	528		1.2		900	1.22	.27	149	128	1,730	7.2
Dec. 1-8	.11	20		36	16	240		60	15	635		.8		793	1.08	.24	156	107	1,510	7.7
Dec. 9-16	.11	19		33	15	204		58	15	372		.2		859	.93	.20	144	96	1,320	7.3
Dec. 17-31	.17	13		37	16	286		28	9.0	502		.2		859	1.17	.39	158	78	1,660	7.2
Jan. 1-6, 1955	.28	5.2		37	15	286		8	4.9	542		.8		895	1.22	.66	154	148	1,770	6.1
Jan. 7-13	36.4	4.8		3.7	1.9	36		7	4.4	60		1.2		115	.16	.11	17	11	235	6.0
Jan. 14-24	164	5.3		1.1	1.3	6.5	1.4	8	5.6	8.2		.5		34	.05	15.1	8	1	63.1	6.5
Jan. 25-31	46	8.3		2.2	1.6	8.9	1.4	9	8.5	12		.8		48	.07	5.96	12	5	82.8	6.6
Feb. 1-7	284	6.1		2.4	1.7	6.4	.9	10	15	12		.5		999	.13	.13	13	13	65.9	4.1
Feb. 8-19	385	5.6		2.2	1.2	4.7	.7	7	3.6	8.0		.8		30	.04	31.2	10	5	49.1	6.3
Feb. 20-28	176	6.6		2.4	1.3	5.4	.7	8	3.1	9.5		.8		34	.05	16.2	11	5	54.3	6.1
Mar. 1-15	24.5	9.5		2.7	1.3	6.1	1.2	8	2.3	12		1.2		40	.05	2.65	12	6	63.1	6.5
Mar. 16-31, Apr. 1-8	.52	15		12	4.5	42		32	6.9	75		1.8		173	.24	.24	49	23	319	7.3
Apr. 9-25	447	8.6		3.2	1.7	10		10	1.9	18		2.2		51	.07	61.5	15	7	88.4	6.5
Apr. 26-30	3.52	16.6		16	6.8	56		41	7.6	100		2.0		222	.30	2.11	62	28	419	7.3
June 10-23	6.14	7.2		8.4	3.9	58		20	4.4	100		1.2		193	.26	3.20	37	21	383	6.4
June 26-30, July 1-6	.39	7.2		9.0	3.8	58		20	4.2	101		1.2		186	.26	.26	38	22	393	6.5
July 7-17	.25	17		19	8.9	92		55	9.9	160		1.2		335	.46	.23	83	38	645	7.2
July 18-31, Aug. 1-2	.83	8.8		59	2.0	37		16	7.2	58		1.0		128	.17	.28	23	10	236	7.2
Aug. 3-9	71.4	5.6		2.7	1.5	15		10	2.6	24		1.2		58	.08	11.2	13	5	103	6.6
Aug. 10-15	19.5	7.8		2.9	1.4	5.9	1.5	10	2.8	10		1.5		39	.05	2.05	13	5	59.9	6.6
Aug. 16-27	.98	9.6		7.7	3.1	39		17	4.2	70		1.0		143	.38	.38	32	18	273	6.6
Aug. 28-31	.52	5.0		3.8	1.6	31		8	2.2	52		1.0		101	.14	.14	16	9	188	6.3
Sept. 1-15	116	7.3		3.0	1.1	5.5	1.6	11	1.9	9.2		1.5		36	.05	11.3	12	3	46	7.7
Sept. 16-28	1.99	5.6		11	3.2	91		11	2.4	161		1.0		280	.38	1.50	41	32	53.8	6.1
Sept. 29-30	.45	6.1		4.4	1.2	25		15	2.8	38		1.5		86	.12	.10	16	4	567	6.3
Weighted average	.466	7.0		2.7	1.5	9.2		8	4.1	15		1.3		50	0.07	8.91	13	6	76.3	6.1

a Includes days of less than 0.05 second-foot flow.
b Free acid as H₂SO₄, 4 parts per million.
c Residue on evaporation at 180°C.
d Represents 96 percent of flow for water year October 1954 to September 1955.

MECHES RIVER BASIN--Continued
MECHES 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 Hill 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 1955.
Water temperatures: Maximum daily, 49.3 microombs May 9, 1953.
EXTREMES, 1954-55.--Dissolved solids: Maximum, 203 ppm Oct. 1-10; minimum, 62 ppm Apr. 13-19, 21-26.
Hardness: Maximum, 56 ppm Oct. 1-10; minimum, 21 ppm Feb. 6-18, 21-22, 24, Apr. 13-19, 21-26.
Specific conductance: Maximum daily, 408 microombs Oct. 26; minimum daily, 83.3 microombs Apr. 19.
Water temperatures: Maximum observed, 86° F. July 7; minimum observed, 42° F. Feb. 11.
EXTREMES, 1947-55.--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 daily, 415 microombs Nov. 29, 1952; minimum observed, 37° F. June 29, 1953; minimum observed, 37° F. Jan. 30-31, 1948, Jan. 31, 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 1954 to September 1955 given in Water-Supply Paper 1992.

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Residue at 180°C)		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				
Oct. 1-10, 1954	191	26		14	5.2	46		86	9.7	52	0.4	2.8		203	105	56	0	64	2.7	330	7.6
Oct. 11-20	157	26		13	4.5	40		81	7.2	43	.3	2.8		196	.27	51	0	63	2.4	300	7.5
Oct. 21-31	161	24		13	4.5	39		75	7.6	45	.3	2.0		196	.27	51	0	62	2.4	290	7.6
Nov. 1-10	101	25		12	3.6	32		71	7.1	32	.3	2.2		152	.21	45	0	60	2.0	236	7.6
Nov. 11-20	196	22		11	2.8	26		54	9.4	28	.3	2.5		138	.19	39	0	59	1.8	205	7.5
Nov. 21-30	542	16		11	2.8	42		47	19	49	.3	2.2		194	.26	39	0	70	2.9	287	7.5
Dec. 1-10	445	17		12	2.2	35		32	25	43	.6	1.5		4152	.21	39	13	66	2.4	264	7.2
Dec. 11-20	610	16		12	2.2	29		26	25	37	.6	1.0		4136	.18	39	18	62	2.0	229	7.2
Dec. 21-31	1,604	18		10	2.2	31		21	28	38	.7	.8		4139	.19	35	18	66	2.3	229	7.0
Jan. 1-10, 1955	1,768	16		7.0	4.0	37		20	29	46	.5	.8		185	.22	34	18	70	2.7	258	6.8
Jan. 11-20	2,142	17		6.4	3.9	35		16	24	48	.5	.8		160	.22	32	19	70	2.7	247	6.9
Jan. 21-31	3,406	16		7.0	3.5	32		17	23	44	.5	1.0		134	.21	32	18	69	2.5	236	6.8
Feb. 1-5	3,520	16		11	2.8	27		18	24	40	.5	1.0		162	.22	40	26	59	1.8	230	6.7
Feb. 6-18, 21-22, 24	1,460	11		3.8	1.6	14		10	14	19	.4	.8		472	.10	21	13	39	1.3	116	6.3
Feb. 19-20, 23, 25-28	7,134	13		6.8	2.7	18		13	20	24	.5	.8		492	.13	28	18	59	1.5	135	6.6
Mar. 1-10	5,029	15		7.8	3.3	25		14	26	33	.4	1.0		123	.17	33	22	62	1.9	202	7.0
Mar. 11-20	3,528	15		9.0	3.7	26		16	28	36	.4	1.2		131	.18	38	24	61	1.9	220	7.0
Mar. 21-31	3,873	13		11	4.0	28		21	29	40	.2	1.0		161	.22	44	27	58	1.8	235	7.3
Apr. 1-12	5,424	11		9.8	3.7	24		26	24	31	.4	.8		4118	.16	40	18	57	1.7	208	7.1
Apr. 13-19, 21-26	1,903	8.6		5.0	2.0	12		16	11	14	.5	.5		462	.08	21	8	55	1.1	101	6.8
Apr. 20, 27-30	10,500	12		10	2.8	19		16	16	18	1.0	1.0		100	.14	36	4	54	1.4	158	6.9
May 1-10	4,656	15		9.6	3.6	23		32	17	30	.2	1.8		144	.20	39	13	56	1.6	194	6.8
May 11-20	1,751	14		12	3.7	22		38	15	30	.2	2.0		681	.20	44	13	52	1.4	203	7.5
May 21-31	3,475	10		11	4.0	24		41	16	32	.2	1.5		140	.19	45	12	53	1.5	210	7.0
June 1-10	5,746	15		8.4	3.4	19		27	17	24	.4	1.2		4101	.14	35	13	54	1.4	171	7.0
June 11-20	2,324	16		8.2	3.3	18		26	15	24	.4	1.0		499	.13	34	12	53	1.3	169	7.0
June 21-30	997	16		11	3.8	20		36	15	28	.4	.8		4113	.15	34	12	51	1.4	193	7.2
July 1-10	1,374	17		10	4.0	26		38	15	35	.3	1.5		136	.18	48	11	56	1.7	207	7.0
July 11-20	865	18		12	4.1	26		44	14	36	.3	1.5		140	.19	46	10	56	1.7	219	7.0
July 21-31	441	19		12	4.3	27		50	12	37	.3	1.2		139	.19	48	7	55	1.7	227	7.1
Aug. 1-10	757	17		11	3.3	26		41	13	34	.3	1.8		143	.19	40	6	59	1.8	203	7.7
Aug. 11-20	1,699	16		11	3.6	30		45	11	41	.3	1.0		139	.22	43	6	60	2.0	238	7.6
Aug. 21-31	1,832	14		10	3.3	31		39	13	41	.3	1.8		139	.22	39	7	63	2.1	239	7.6
Sept. 1-9	982	14		9.6	2.4	24		36	10	32	.4	1.2		131	.18	34	4	61	1.8	194	7.0
Sept. 10-20	655	15		11	3.4	32		44	13	42	.4	1.0		132	.21	41	5	63	2.2	242	7.6
Sept. 21-30	614	16		10	3.0	32		43	11	42	.3	.8		151	.21	38	3	64	2.2	235	7.1
Weighted average	3,149	13		7.8	2.8	21		22	17	27	0.4	1.0		107	0.15	31	13	59	1.6	169	--

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT ROMAYOR, TEX.--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Aug. 1-10, 1955-----	395	16		57	5.8	145		172	53	200		4.3		576	0.78	614	156	25	66	4.9	1,020	8.0
Aug. 11-20-----	443	17		60	6.6	246		186	87	332		1.0		4841	1.14	1,010	176	24	75	8.1	1,500	8.0
Aug. 21-31-----	541	15		56	6.5	224		176	82	300		1.2		4772	1.04	1,130	166	22	75	7.6	1,380	7.9
Sept. 1-10-----	601	18		63	7.2	316		194	88	440		1.8		1,030	1.40	1,670	186	27	79	10.1	1,840	7.9
Sept. 11-18-----	488	18		53	6.3	219		164	72	300		2.2		4752	1.02	991	158	24	75	7.6	1,360	8.1
Sept. 19-21, 23-30-----	425	16		43	5.0	130		152	64	157		2.0		504	1.69	578	132	8	68	4.9	880	7.9
Sept. 22-24-----	406	16		66	7.3	294		191	99	405		3.8		4985	1.34	1,080	194	38	77	9.2	1,750	7.6
Weighted average-----	2,935	14		29	34	64		81	36	83		4.9		296	0.40	2,350	86	20	62	3.0	487	--

* Sum of determined constituents.

TRINITY RIVER BASIN--Continued
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, 1954-55.--Dissolved solids: Maximum, 883 ppm Dec. 23-27; minimum, 144 ppm Apr. 9-13.
Hardness: Maximum, 173 ppm Aug. 1-17; minimum, 40 ppm Apr. 9-13.
Specific conductance: Maximum daily, 2,030 microhos Aug. 26-27, 1952; minimum, 110 ppm Oct. 4-10, 1949.
EXTREMES, 1949-55.--Dissolved solids: Maximum, 3,640 ppm Aug. 26-27, 1952; minimum, 110 ppm Oct. 4-10, 1949.
Hardness: Maximum, 782 ppm Aug. 26-27, 1952; minimum, 40 ppm Apr. 9-13, 1955.
Specific conductance: Maximum daily, 7,630 microhos Aug. 27, 1952; minimum Oct. 7, 1949.
REMARKS.--Values reported for dissolved solids concentrations are residues on evaporation 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, November 1954 to September 1955

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 (microhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Nov. 1-6, 15-21, 1954--		10		21	1.8	33		63	22	40		2.5		196	0.27	61	9	54	1.8	291	7.3	
Nov. 7-11-----		13		29	3.3	76		82	45	92		4.2		316	.43	87	20	65	3.4	543	7.5	
Nov. 12-14-----		12		49	5.6	151		90	69	225		13		587	.80	145	72	69	5.5	1,040	7.6	
Nov. 22-30-----		13		37	4.5	112		93	40	165		5.8		445	.61	112	36	68	4.6	789	7.6	
Dec. 1-19-----		18		33	6.4	71		114	36	84		5.0		312	.42	100	6	61	3.1	543	7.6	
Dec. 20-22-----		16		43	5.4	126		96	62	182		7.0		495	.67	130	52	68	4.8	888	7.9	
Dec. 23-27-----		17		50	8.3	234		96	61	398		9.3		883	1.2	159	80	78	8.7	1,590	7.6	
Dec. 28-31-----		17		38	5.1	85		110	44	113		6.5		372	.51	116	26	61	3.4	647	7.7	
Jan. 1-10, 1955-----		20		40	5.4	107		104	54	127		6.0		458	.62	121	36	66	4.2	769	7.7	
Jan. 11-19-----		19		35	4.8	92		96	42	147		4.8		386	.52	106	28	65	3.9	655	7.7	
Jan. 20-28-----		14		23	2.9	70		52	44	89		9.9		330	.45	99	26	69	3.7	496	7.3	
Jan. 29-31-----		26		47	6.7	171		142	52	241		7.5		633	.86	144	28	72	6.2	1,100	7.8	
Feb. 1-4-----		14		28	4.0	86		80	31	120		6.1		354	.48	86	20	68	4.0	612	7.4	
Feb. 5-8, 15-16-----		8.8		19	2.0	27		56	19	33		2.2		189	.26	55	9	52	1.6	246	7.3	
Feb. 9-14, 17-19-----		11		21	2.9	46		63	26	58		5.5		238	.32	65	13	61	2.5	374	7.2	
Feb. 20-28-----		13		26	3.8	46		62	37	60		6.5		257	.35	80	29	55	2.2	395	7.7	
Mar. 1-10-----		18		37	4.7	58		101	40	77		6.6		311	.42	112	29	53	2.4	517	7.7	
Mar. 11-20-----		18		45	5.9	77		123	55	100		5.8		381	.52	136	35	55	2.9	648	7.8	
Mar. 21-28-----		14		47	6.1	87		129	62	113		4.2		414	.56	143	38	57	3.2	711	7.7	
Mar. 29-31, Apr. 1-8-----		13		35	4.1	46		106	37	53		6.0		259	.35	104	17	49	2.0	436	7.0	
Apr. 9-13-----		9.6		15	.6	15		39	9.0	20		3.8		144	.20	40	8	45	1.0	159	6.5	
Apr. 14-30-----		14		28	2.5	36		86	24	42		5.0		241	.33	80	10	50	1.8	345	7.2	
May 1-10-----		20		41	4.9	50		117	36	68		2.0		293	.40	122	26	47	2.0	488	7.3	
May 11-20-----		12		48	5.7	70		135	43	98		2.0		364	.50	143	32	52	2.5	634	7.4	
May 21-26, 28-31-----		12		38	3.9	69		100	41	94		3.0		331	.45	110	28	58	2.9	569	7.3	
May 27-----		20		41	4.9	203		125	89	256		11		688	.93	123	20	78	8.0	1,230	7.8	
June 1-15-----		15		44	3.9	66		123	38	90		2.8		332	.45	126	25	53	2.6	569	7.8	
June 16-30-----		12		47	4.7	91		136	42	126		3.0		406	.55	138	26	59	3.4	723	7.6	
July 1-16-----		13		54	5.1	82		166	59	97		1.0		428	.58	161	19	50	2.8	727	7.7	
July 17-31-----		13		54	5.4	72		167	34	98		1.0		374	.51	156	19	50	2.5	659	7.6	
Aug. 1-17-----		17		60	6.0	136		175	37	202		2.2		456	.74	173	30	63	4.5	1,020	7.7	
Aug. 18-28-----		13		--	--	--		--	--	434		--		--	--	--	--	--	--	--	1,850	--
Aug. 29-31-----		13		40	4.3	112		135	42	145		1.0		623	.58	117	6	67	4.5	780	7.6	
Sept. 1-16-----		22		55	6.2	198		175	72	265		1.0		706	.96	162	18	73	6.8	1,230	7.9	
Sept. 17-30-----		14		49	5.1	162		163	50	220		1.2		590	.80	144	10	71	5.9	1,050	7.7	

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued
OLD RIVER NEAR COVE, TEX.

LOCATION--At Barber Hill Pumping Plant, 5 miles northeast of Cove, Chambers County.
RECORDS AVAILABLE--Chemical analyses: Short periods during summer of 1946 to 1949, daily records October 1949 to September 1955.
EXTREMES, 1954-55--Dissolved solids: Maximum, 5,680 ppm Oct. 8, 14; minimum, 183 ppm Jan. 15-26.
Hardness: Maximum, 1,320 ppm Oct. 8, 14; minimum, 33 ppm Jan. 15-26.
Specific conductance: Maximum daily, 10,000 microhos Oct. 14; minimum daily, 260 microhos Jan. 20, 22, 24.
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, 14,900 microhos Aug. 31, 1954; minimum daily, 223 microhos 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 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 1954 to September 1955

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)	Iron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium adsorption ratio	Specific conductance (microhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1, 3-5, 11-12, 15-21, 1954		17		160	111	1,030		199	272	1,870		3.0		3,560	4.8		856	692	72	15	6,290	7.9
Oct. 2, 6-7, 9-10, 13, 25		20		108	54	551		208	142	970		2.2		1,950	2.7		492	321	71	11	3,560	8.1
Oct. 8, 14		22		221	187	1,660		176	426	3,080		--		5,680	7.7		1,320	1,180	73	20	9,510	8.0
Oct. 22-24, 26-31		10		43	12	1,335		70	77	222		5.5		571	78		1,57	100	65	4.7	886	7.2
Nov. 1-3		11		46	16	163		105	78	260		2.8		656	89		181	95	66	5.3	1,170	7.5
Nov. 4-10		14		82	33	332		109	600	600		2.5		1,230	1.7		340	228	68	7.8	2,360	7.6
Nov. 11-18		14		54	23	247		107	84	418		2.8		4898	1.2		229	182	70	7.1	1,860	7.6
Nov. 19-30		14		46	14	148		112	60	240		1.0		4379	.79		172	80	63	4.9	1,070	7.4
Dec. 1-10		13		54	17	182		120	65	322		1.8		768	1.0		204	106	66	5.8	1,330	7.7
Dec. 11-20		14		56	16	186		136	60	208		1.5		749	1.0		208	94	66	5.6	1,340	8.1
Dec. 21-31		14		53	13	181		136	54	280		2.0		645	.88		179	74	65	5.1	1,160	7.9
Jan. 1-6, 1955		17		50	13	131		145	23	235		2.5		617	.84		179	60	65	4.9	1,100	7.8
Jan. 7-14		14		19	3.7	41		60	24	60		2.5		210	.29		55	22	59	2.3	363	7.7
Jan. 15-26		13		16	3.4	36		62	17	45		1.5		183	.25		55	4	58	2.1	290	7.2
Jan. 27-31		14		25	4.8	53		82	26	73		1.0		252	.34		83	16	58	2.5	419	7.7
Feb. 1-10		12		22	3.7	43		72	17	61		2.0		224	.30		71	12	57	2.2	360	7.3
Feb. 11-19		10		21	4.1	46		69	17	66		1.2		228	.31		69	12	59	2.4	377	7.3
Feb. 20-28		12		23	3.9	41		80	16	57		1.5		226	.30		74	8	55	2.1	351	7.5
Mar. 1-10		12		25	4.5	44		93	16	59		1.0		250	.34		82	6	54	2.1	363	7.7
Mar. 11-20		12		33	5.6	51		113	17	74		1.5		282	.38		105	12	51	2.2	466	7.6
Mar. 21-31		12		44	8.8	96		125	37	149		2.2		432	.59		145	42	59	3.5	760	7.6
Apr. 1-10, 15-19		15		39	6.5	75		104	45	108		4.0		375	.51		124	39	57	2.9	617	7.5
Apr. 11-14, 20		14		24	3.2	39		65	28	53		2.0		4195	.27		74	21	53	2.0	347	6.9
Apr. 21-30		13		26	3.5	38		83	23	49		3.0		4196	.27		80	12	51	1.9	344	7.4
May 1-8		17		34	5.2	48		110	27	64		1.8		266	.36		106	16	50	2.0	449	7.5
May 9-20		15		42	7.7	92		133	40	131		1.2		403	.55		137	28	59	3.4	716	7.6
May 21-31		14		43	6.8	84		128	45	116		2.0		392	.53		135	30	57	3.1	676	7.9
June 1-16		--		--	12	--		147	50	250		1.2		--	.83		182	62	65	--	613	--
June 17-20		17		53	12	158		169	38	232		1.5		4613	.91		183	44	67	5.5	1,120	8.0
June 21-26, 29-30		16		54	12	171		157	51	226		5.2		463	.84		174	37	59	3.6	1,797	8.0
June 27-28, July 9-14		13		50	12	163		168	63	228		6.1		4620	.84		152	24	54	3.4	1,150	7.5
July 1-8		16		60	6.8	208		159	78	292		6.3		4643	1.0		178	47	72	6.8	1,360	7.4
July 15-20		17		54	6.0	107		178	49	138		3.0		4663	.63		159	13	60	3.7	843	8.2
July 21-31		15		51	5.8	84		170	27	116		1.0		4384	.52		150	10	55	3.0	698	7.9
Aug. 1-15		15		51	6.6	112		169	32	160		1.0		4611	.63		133	16	61	3.9	849	7.9
Aug. 16-31		16		43	6.2	96		154	23	135		.5		396	.54		133	17	61	3.6	726	8.2
Sept. 1-14		16		57	5.5	138		173	34	204		.8		545	.74		165	23	65	4.7	991	8.0

a Sum of determined constituents.

TRINITY RIVER BASIN--Continued

TRINITY RIVER AT AMARDAC, TEX.--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Aug. 10-15, 17-19, 21, 1955-----		17		102	127	1,270	164	307	2,180			--			4,080	5.55		776	642	78	20	7,110	7.8
Aug. 20, 22-25, 30-----		18		77	58	651	161	153	1,100			4.0			2,140	2.91		430	298	77	14	3,870	7.6
Sept. 20-23-----		14		120	185	1,940	156	457	3,320			--			6,110	8.31		1,060	932	80	26	10,300	7.6
Sept. 24-30-----		14		74	43	672	160	160	1,080			1.5			2,120	2.88		362	230	80	15	3,790	7.7

* Residue on evaporation at 180°C.

b Sum of determined constituents.

TRINITY RIVER BASIN--Continued
TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.

LOCATION.--At four sampling stations in Trinity Bay opposite mouth of Trinity River, near Anahuac, Chambers County. Station 2 - In Anahuac Channel immediately below delta. Station 3 - In Anahuac Channel about 1/4 miles southwest of Station 2. Station 6 - In Anahuac Channel at south end. Station 7 - In Trinity Bay about 1/4 miles west of Station 6.
RECORDS AVAILABLE.--Chemical analyses: Bi-weekly October 1950 to September 1955.

Station Number	Oct. 1, 1954		Nov. 26, 1954		Jan. 21, 1955		Mar. 18, 1955		Apr. 15, 1955		May 4, 1955		May 23, 1955	
	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride
2	21,100	7,300	873	200	877	178	1,320	298	211	29	657	124	1,190	255
3	21,500	7,600	874	192	804	158	1,950	492	220	29	787	157	4,050	1,180
6	24,000	8,680	859	190	836	168	9,820	3,220	207	29	2,210	600	4,520	1,320
7	24,900	8,730	890	194	814	161	10,200	3,270	229	29	2,330	610	--	--
	Oct. 8, 1954		Dec. 3, 1954		Jan. 28, 1955		Mar. 25, 1955		Apr. 18, 1955		May 6, 1955		May 25, 1955	
2	28,300	10,500	2,010	535	698	139	877	161	230	32	1,060	232	1,030	215
3	30,900	11,600	8,040	2,600	612	121	905	174	232	34	1,070	242	2,470	640
6	31,800	12,000	21,600	7,940	640	129	5,420	1,640	227	32	1,640	420	3,990	1,140
7	32,000	12,100	22,200	7,940	619	125	5,540	1,630	226	33	1,660	415	4,670	1,360
	Oct. 15, 1954		Dec. 10, 1954		Feb. 4, 1955		Apr. 1, 1955		Apr. 20, 1955		May 9, 1955		May 27, 1955	
2	8,730	2,650	6,420	1,960	542	107	457	58	353	60	841	175	902	188
3	8,800	2,750	9,380	3,040	498	93	514	60	368	62	1,640	420	876	185
6	32,600	12,500	11,400	3,790	515	97	496	60	364	61	2,020	530	7,630	2,410
7	32,100	12,300	11,600	3,840	523	96	490	65	368	61	2,120	550	7,840	2,430
	Oct. 22, 1954		Dec. 17, 1954		Feb. 11, 1955		Apr. 4, 1955		Apr. 22, 1955		May 11, 1955		May 30, 1955	
2	31,800	12,000	1,490	348	257	43	607	100	474	57	2,570	670	728	116
3	32,800	12,400	1,390	318	266	43	1,610	390	456	57	3,060	850	713	155
6	33,300	12,700	1,320	300	255	41	1,490	352	490	59	2,130	540	682	114
7	33,500	12,800	1,340	295	298	45	1,520	348	506	60	2,310	610	696	116
	Oct. 29, 1954		Dec. 24, 1954		Feb. 18, 1955		Apr. 6, 1955		Apr. 25, 1955		May 13, 1955		June 1, 1955	
2	1,030	195	962	215	494	89	701	120	406	78	892	191	770	132
3	1,030	195	5,090	1,580	464	80	913	186	511	78	1,190	282	764	131
6	23,100	8,180	19,600	7,010	498	85	15,400	5,380	5,810	1,800	1,270	295	758	131
7	22,600	8,040	19,600	6,960	474	78	15,900	5,350	6,300	1,900	1,260	300	779	133
	Nov. 5, 1954		Dec. 31, 1954		Feb. 25, 1955		Apr. 8, 1955		Apr. 27, 1955		May 16, 1955		June 3, 1955	
2	604	124	19,300	6,590	--	--	12,600	4,090	548	92	1,560	388	824	155
3	593	122	20,500	7,010	527	97	13,900	4,610	540	92	1,630	413	816	155
6	651	116	24,700	8,820	531	98	16,600	5,650	540	92	1,640	422	2,160	575
7	582	118	24,900	8,770	535	100	16,600	5,620	537	90	1,650	422	2,210	570
	Nov. 12, 1954		Jan. 7, 1955		Mar. 4, 1955		Apr. 11, 1955		Apr. 29, 1955		May 18, 1955		June 6, 1955	
2	4,580	1,400	2,240	598	--	--	834	165	723	147	4,680	1,390	1,080	240
3	7,360	2,200	2,120	535	883	188	820	162	631	116	4,480	1,310	1,320	322
6	26,400	9,850	2,290	582	908	185	5,240	1,590	613	102	4,280	1,250	7,670	2,400
7	26,100	9,650	2,280	585	908	186	5,370	1,580	588	103	4,270	1,240	7,950	2,500
	Nov. 19, 1954		Jan. 14, 1955		Mar. 11, 1955		Apr. 13, 1955		May 2, 1955		May 20, 1955		June 8, 1955	
2	394	70	15,300	5,230	--	--	253	39	457	63	2,150	570	1,050	228
3	298	48	17,900	6,090	2,650	730	237	38	457	63	2,820	760	1,220	290
6	351	58	23,000	8,090	9,630	3,120	971	244	517	79	5,740	1,370	4,600	1,370
7	361	59	22,900	8,040	9,230	2,900	889	211	533	82	5,840	1,760	4,630	1,360

TRINITY RIVER BASIN--Continued

TRINITY BAY AT MOUTH OF TRINITY RIVER NEAR ANAHUAC, TEX.- Continued

Station Number	June 10, 1955		June 13, 1955		June 29, 1955		July 1, 1955		July 18, 1955		Aug. 5, 1955		Aug. 24, 1955		Sept. 12, 1955		Sept. 30, 1955	
	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride	Specific Conductance	Chloride
2	1,280	280			1,400	278	1,600	3,790	14,300	4,740	11,600	3,720	11,400	3,720	12,700	4,210	12,700	4,210
3	1,240	295			1,350	262	13,900	4,660	13,900	4,660	13,500	4,460	13,500	4,460	14,200	4,790	14,200	4,790
6	1,950	570			3,110	820	15,900	5,230	15,700	5,200	15,900	6,140	17,600	6,140	19,300	6,810	20,300	7,250
7	1,990	522			3,090	850	15,700	5,200	15,700	5,200	15,900	6,220	17,900	6,220	19,200	6,760	20,200	7,250
2	1,240	288			2,380	570	15,300	5,100	15,300	5,100	5,510	1,640	17,400	6,020	9,180	2,900		
3	1,480	362			6,380	1,900	15,800	5,280	15,800	5,280	6,580	2,010	18,100	6,320	12,700	4,240		
6	3,470	990			13,100	4,340	15,600	5,180	15,600	5,180	15,700	5,430	18,700	6,510	23,300	8,430		
7	3,540	1,000			13,400	4,340	15,600	5,200	15,600	5,200	15,700	5,400	18,700	6,460	23,500	8,480		
2	2,070	528			9,970	3,100	13,200	4,260	13,200	4,260	12,400	4,110	7,570	2,350	16,200	5,500		
3	3,610	1,030			12,400	4,040	14,400	4,740	14,400	4,740	13,200	4,440	8,870	2,820	20,200	7,160		
6	5,310	1,600			13,500	4,440	16,400	5,500	16,400	5,500	14,300	4,860	16,700	5,820	23,500	8,430		
7	5,370	1,590			13,600	4,440	16,400	5,530	16,400	5,530	14,400	4,880	17,100	5,870	23,500	8,430		
2	5,360	1,600			11,700	3,740	10,600	3,340	10,600	3,340	12,400	4,110	10,700	3,420	17,600	6,020		
3	6,060	1,840			12,100	3,920	12,500	4,070	12,500	4,070	14,100	4,760	13,400	4,460	20,000	7,160		
6	8,680	2,800			13,100	4,310	16,400	5,550	16,400	5,550	16,100	5,520	17,300	6,000	22,600	8,040		
7	8,700	2,750			12,900	4,190	16,500	5,530	16,500	5,530	16,100	5,550	17,700	6,090	22,600	8,090		
2	5,150	1,520			9,080	2,820	10,100	3,200	10,100	3,200	15,800	5,450	7,170	2,170	18,400	6,270		
3	8,560	2,770			10,400	3,300	12,400	4,070	12,400	4,070	16,500	5,750	10,000	3,250	22,500	8,180		
6	10,900	3,570			13,200	4,340	16,900	5,720	16,900	5,720	16,500	5,700	12,500	4,190	24,200	8,820		
7	11,000	3,540			13,300	4,340	17,000	5,720	17,000	5,720	16,400	5,700	12,500	4,140	24,200	8,730		
2	4,840	1,400			6,770	2,030	8,580	2,680	8,580	2,680	16,700	5,700	12,100	3,990	18,000	6,370		
3	4,930	1,430			7,890	2,410	9,800	3,120	9,800	3,120	19,600	6,860	14,300	4,830	20,200	7,160		
6	9,140	2,900			13,900	4,640	16,800	5,770	16,800	5,770	21,400	7,650	20,600	7,300	23,000	8,430		
7	11,100	3,570			14,100	4,660	16,900	5,720	16,900	5,720	21,700	7,700	20,600	7,250	23,000	8,380		
2	3,870	1,080			12,600	4,040	8,090	2,480	8,090	2,480	9,490	3,020	13,100	4,310	17,500	6,090		
3	5,850	1,750			9,560	3,000	9,830	3,120	9,830	3,120	10,600	3,440	17,100	5,950	20,100	7,200		
6	11,300	3,720			10,500	3,320	13,900	4,560	13,900	4,560	17,400	6,040	21,800	7,850	22,000	7,750		
7	11,300	3,650			10,500	3,340	13,800	4,590	13,800	4,590	17,500	6,070	22,200	7,890	22,000	7,750		
2	1,080	225			8,660	2,700	15,800	5,230	15,800	5,230	7,320	2,260	18,400	6,370	16,300	5,600		
3	1,150	250			11,800	3,620	15,700	5,250	15,700	5,250	11,200	3,670	19,300	6,810	18,200	6,460		
6	8,010	2,520			15,400	5,180	15,800	5,200	15,800	5,200	18,400	6,510	23,800	8,580	23,000	8,580		
7	8,190	2,550			15,500	5,180	15,300	5,180	15,300	5,180	18,500	6,510	23,900	8,680	22,900	8,580		

BRAZOS RIVER BASIN

HUBBARD CREEK NEAR BRECKENRIDGE, TEX.

LOCATION:--At gaging station at bridge on U. S. Highway 183, 2.3 miles downstream from Big Sandy Creek, 6.8 miles northwest of Breckenridge, Stephens County, 7 miles upstream from Gonzales Creek, and 8 miles upstream from Clear Fork Brazos River.

DRAINAGE AREA.--1,087 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1955 to September 1955.

Water temperatures: April 1955 to September 1955.

EXTREMES, 1955.--Dissolved solids: Maximum, 1,930 ppm Apr. 24-28; minimum, 133 ppm Sept. 23-30.

Hardness: Maximum, 616 ppm July 18; minimum, 92 ppm Sept. 25-30.

Specific conductance: Maximum daily, 5,200 microhos Apr. 24; minimum observed, 64 μ July 29, 31, Aug. 24; minimum observed, 64 μ June 10.

Water temperatures: Maximum observed, 84 $^{\circ}$ F July 29, 31, Aug. 24; minimum observed, 64 $^{\circ}$ F June 10.

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 period April to September 1955 given in Water-Supply Paper 1392.

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 (microhos at 25 $^{\circ}$ C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
														Per cent	Per cent	Per cent	Calcium	Non-carbonate				
Apr. 15-16, 1955	1.25	6.2		53	7.9	95		129	15	176	0.1	1.2		458	0.62	1.55	164	59	56	3.2	812	7.8
Apr. 23	538	16		43	4.6	34		116	12	62	.2	5.4		297	.40	431	125	30	37	1.3	420	8.0
Apr. 24-28	15.5	11		169	46	497		86	34	1,120	.0	8.0		1,930	2.62	80.8	610	540	64	8.8	3,660	7.4
May 11-18	106	9.4		72	12	147		112	16	310	--	5.0		4626	.85	179	229	137	58	4.2	1,240	7.6
May 19-22	2,859	11		35	3.3	20		106	9.2	171	.23	4.5		1,320	1.02	102	115	29	.8	301	7.9	
May 23-28	164	11		43	5.0	34		106	18	66	.3	4.0		259	.35	115	128	41	37	1.3	438	7.6
May 29-31, June 1-8, 10	29.9	9.6		50	7.3	62		108	16	129	.3	2.0		370	.50	29.9	155	66	46	2.2	641	7.5
June 9, 11-14	168	12		40	4.7	26		116	13	46	.3	2.8		4202	.27	91.6	120	25	32	1.0	392	7.4
June 15-24	738	10		36	3.9	22		109	9.6	36	.3	2.5		181	.25	370	105	16	31	1.9	708	7.8
June 25-30, July 1-4	2.66	13		43	4.9	30		131	17	46	.4	1.5		224	.30	1.61	127	20	24	1.2	403	8.1
July 18	64	13		196	31	316		118	18	840	.4	2.5		1,470	2.00	246	616	520	53	5.3	2,800	8.2
July 19-20	188	9.8		46	6.1	36		140	20	57	.4	1.8		232	.34	135	140	25	36	1.3	456	8.1
July 21-31, Aug. 1	19.4	8.6		38	4.9	33		106	13	58	.5	2.0		221	.30	111.6	114	27	38	1.3	398	7.9
Aug. 4-20	262	14		38	3.9	21		113	9.8	34	.5	3.2		196	.27	139	110	17	29	.8	321	7.9
Aug. 21-30	10.6	11		40	4.6	25		116	9.0	46	.5	2.5		210	.29	6.01	118	23	32	1.0	361	7.8
Sept. 11-13	48	7.8		47	6.2	77		84	15	158	.3	3.5		396	.54	51.3	144	75	54	2.8	695	7.6
Sept. 14-18	7.26	11		42	4.5	35		127	9.7	58	.4	1.8		234	.32	4.59	123	19	38	1.4	414	8.1
Sept. 23-24	378	9.6		41	4.7	34		121	9.5	59	.4	3.2		236	.32	241	122	23	38	1.3	414	8.1
Sept. 25-30	2,212	9.4		33	2.6	17		107	7.5	22	.4	3.0		153	.21	91.6	92	4	29	.8	254	8.2
Weighted average	b249	11		37	3.7	25		109	9.5	41	0.4	3.4		192	0.26	129	103	18	34	1.1	331	--

a Sum of determined constituents.

b Represents 100 percent of flow Apr. 15 to Sept. 30. No flow on many days.

BRASOS RIVER BASIN--Continued

BRASOS RIVER AT POSSUM KINGDOM DAM NEAR GRAPFORD, TEX.

LOCATION--Immediately below dam on Brasos River, 2.6 miles upstream from Loving Creek, 11.3 miles southwest of Orsford, 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 1955.

Water temperatures: October 1949 to September 1955.

EXTREMES, 1954-55--Dissolved solids: Maximum, 1,550 ppm May 1-31; minimum, 1,130 ppm Sept. 26-30.

Barcodes: Maximum, 460 ppm May 1-31; minimum, 376 ppm Sept. 26-30.

Specific conductance: Maximum daily, 2,940 microhos May 23; minimum observed, 477 on several days during February and March.

Water temperatures: Maximum observed, 74°F on several days in August; minimum observed, 47°F on several days during February and March.

EXTREMES, 1942-55--Dissolved solids: Maximum, 2,130 ppm Feb. 2-9, 1942; minimum, 829 ppm Sept. 1-10, 1942.

Barcodes: Maximum, 661 ppm Feb. 2-9, 1942; minimum, 318 ppm Dec. 21-31, 1942.

Specific conductance: Maximum daily, 3,750 microhos Feb. 11, 1942; minimum daily, 1,100 microhos June 20, 1942.

Water temperatures: Maximum daily, 78°F Sept. 27-30, 1950; minimum observed, 45°F on several days in February 1951.

EXTREMES--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 Palo Pinto for water year October 1934 to September 1955 given in Water Supply Paper 1392. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1934 to September 1955

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)	Iron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (microhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Oct. 1-31, 1954-----	116	12		133	21	295		116	296	465		0.8		1,280	1.74	401	418	324	60	6.3	2,170	7.5
Nov. 1-30-----	47.7	13		130	19	312		117	288	485		1.2		1,310	1.78	169	402	306	63	6.8	2,220	7.4
Dec. 1-31-----	29.5	12		130	19	307		113	291	478		1.2		1,290	1.75	103	402	310	62	6.7	2,160	7.7
Jan. 1-31, 1955-----	217	8.6		132	20	300		111	289	475		1.2		1,280	1.74	750	412	320	61	6.4	2,180	7.5
Feb. 1-28-----	72.6	12		131	21	304		114	291	480		.8		1,300	1.77	255	414	320	61	6.5	2,130	7.6
Mar. 1-31-----	64.2	8.2		135	20	323		116	295	510		.8		1,350	1.84	234	419	324	63	6.9	2,320	7.4
Apr. 1-30-----	89.2	9.4		144	21	383		116	324	600		1.5		1,540	2.09	371	446	351	65	7.9	2,620	7.5
May 1-31-----	699	14		148	22	379		118	333	593		1.0		1,550	2.11	2,930	460	364	64	7.7	2,620	7.6
June 1-30-----	3,376	9.6		142	21	327		110	315	520		1.2		1,390	1.89	12,670	441	351	62	6.8	2,430	7.5
July 1-31-----	821	14		143	22	342		117	319	540		1.0		1,440	1.96	3,190	448	352	62	7.0	2,410	7.5
Aug. 1-31-----	598	11		138	20	312		120	319	478		.8		1,340	1.82	2,160	426	328	61	6.6	2,250	7.9
Sept. 1-25-----	637	16		140	18	295		120	317	450		1.0		1,300	1.77	2,240	424	325	60	6.2	2,140	7.6
Sept. 26-30-----	41,280	1.5		124	16	253		115	286	378		1.0		1,130	1.54	125,900	376	282	59	5.7	1,850	7.5
Weighted average-----	1,120	13		133	18	291		114	301	448		1.0		1,260	1.71	3,810	406	312	61	6.3	2,120	--

BRAZOS RIVER BASIN--Continued
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 non-contributing.

RECORDS AVAILABLE--Chemical analyses: October 1947 to May 1948, October 1948 to September 1955.

Water temperatures: October 1947 to May 1948, October 1948 to September 1955.

EXTREMES, 1954-55--Dissolved solids: Maximum, 1,200 ppm Dec. 1-10, Feb. 1-28, Apr. 1-30; minimum, 850 ppm June 17-30.

Hardness: Maximum, 386 ppm Jan. 1-31; minimum, 277 ppm June 17-30.

Specific conductance: Maximum daily, 2,140 micromhos May 15; minimum daily, 988 micromhos June 21.

Water temperatures: Maximum observed, 90°F July 24, Aug. 7, 29; minimum observed, 38°F Feb. 11.

EXTREMES, 1947-55--Dissolved solids: Maximum, 1,560 ppm Oct. 1, 1948; minimum, 183 ppm June 11-20, 1932.

Hardness: Maximum, 542 ppm Oct. 1-10, 1948; minimum, 96 ppm June 11-20, 1932.

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 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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-10, 1954-----	332	17		114	20	274	127	223	442			2.2		1,150	1,560	1,030	366	262	62	6.2	1,980	7.9
Oct. 11-20-----	218	14		116	20	281	124	232	452			1.8		1,180	1,600	695	372	270	62	6.3	2,040	7.9
Oct. 21-31-----	437	15		116	22	279	124	236	452			1.0		1,180	1,360	380	380	278	61	6.2	2,040	7.9
Nov. 1-10-----	103	12		116	20	284	123	239	452			1.0		1,180	1,600	328	372	270	62	6.4	2,040	7.8
Nov. 11-20-----	52.8	11		117	20	285	122	242	455			1.0		1,190	1,620	170	374	274	62	6.4	2,040	7.9
Nov. 21-30-----	34.5	11		117	20	287	124	237	460			.8		1,190	1,620	111	374	272	62	6.4	2,030	7.8
Dec. 1-10-----	40.5	10		118	19	290	125	240	460			1.8		1,200	1,630	131	372	270	63	6.6	2,030	7.9
Dec. 11-20-----	30.1	11		119	19	284	125	237	455			1.2		1,190	1,620	96.7	375	272	62	6.4	2,040	7.9
Dec. 21-31-----	33.9	9.2		118	19	287	126	240	455			1.2		1,190	1,620	109	372	270	63	6.5	2,030	8.1
Jan. 1-31, 1955-----	31.7	13		122	20	282	129	231	462			1.5		1,190	1,620	102	366	281	61	6.2	2,030	7.6
Feb. 1-28-----	47.1	8.8		120	20	285	127	243	458			1.0		1,200	1,630	153	382	278	62	6.4	2,070	7.8
Mar. 1-31-----	82.9	7.2		120	19	286	128	228	465			1.2		1,190	1,620	202	378	272	62	6.4	2,080	7.5
Apr. 1-30-----	78.3	8.0		120	18	289	130	248	450			2.8		1,200	1,630	254	374	267	63	6.5	2,080	7.7
May 1-31-----	2,298	9.2		120	18	286	130	243	450			1.0		1,190	1,620	7,380	374	267	62	6.4	2,040	7.7
June 1-16-----	3,471	10		102	17	238	120	205	375			2.0		1,010	1,370	9,470	324	226	61	5.7	1,800	7.9
June 17-30-----	4,408	9.0		88	14	190	115	168	298			2.0		6850	1,116	10,120	277	183	60	5.0	1,470	7.8
July 1-31-----	971	11		98	14	218	120	192	338			2.2		932	1,127	2,440	302	204	61	5.2	1,640	7.4
Aug. 1-31-----	671	12		100	15	229	128	193	355			1.8		61,000	1,360	1,610	311	206	62	5.6	1,680	7.8
Sept. 1-30-----	3,486	10		104	16	233	127	202	365			2.2		61,040	1,410	9,790	326	222	61	5.6	1,720	7.6
Weighted average-----	997	10		104	16	238	124	205	374			1.8		1,030	1,400	2,770	326	224	61	5.7	1,760	--

a Based on evaporation at 180° C.

BRAZOS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN BRAZOS RIVER BASIN IN TEXAS

Date of collection	Water discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Residue at 180°C)			Hardness as CaCO ₃		Percent sodium	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Magnesium			
																					Non-carbonate
Chemical analyses, in parts per million, water year October 1954 to September 1955																					
WHITE RIVER AT COUNTY ROAD CROSSING 4 1/2 MILES EAST OF CROSSBTON																					
Jan. 18, 1955	1.98	48	--	--	43	--	--	--	64	23	--	1.0	--	--	--	--	--	--	--	812	
WHITE RIVER AT U. S. HIGHWAY 82 4 1/2 MILES EAST OF CROSSBTON																					
Jan. 18, 1955	2.22	44	--	--	43	--	--	--	44	24	--	.5	--	--	--	--	--	--	--	780	
LAKE MINERAL WELLS NEAR MINERAL WELLS																					
Sept. 15, 1955	--	3.1	0.00	64	9.9	93	122	86	150	0.3	.0	.0	503	0.09	199	99	50	2.9	845	7.6	
LAKE LEON NEAR EASTLAND																					
Apr. 15, 1955	--	.7	.01	50	6.6	12	8.6	186	7.2	20	.4	1.5	0.06	205	.28	152	0	14	.4	364	7.6
LAKE BELTON NEAR BELTON																					
Sept. 9, 1955	--	6.4	.01	44	4.4	16	159	9.2	15	.2	.5	.5	196	.27	128	0	21	.6	.6	319	7.3

COLORADO RIVER BASIN--Continued
 COLORADO RIVER AT AUSTIN, TEX.

LOCATION.--At raw-water intake at Austin City Water Plant, 4 1/2 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.--38,160 square miles, approximately, of which 11,900 square miles is probably non-contributing.
 RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1955.

Water temperatures: October 1947 to September 1955.

EXTREMES, 1954-55.--Dissolved solids: Maximum, 262 ppm Jan. 1-30; minimum, 232 ppm July 1-31.

Hardness: Maximum, 168 ppm Dec. 1-31; minimum, 147 ppm Aug. 1-31.

Specific conductance: Maximum daily, 503 microhos Mar. 28; minimum daily, 410 microhos Oct. 5.

Water temperatures: Maximum observed, 82°F Aug. 27-29; minimum observed, 52°F Dec. 30, Feb. 11-12.

EXTREMES, 1947-55.--Dissolved solids: Maximum, 360 ppm Nov. 1-30, 1951; minimum, 214 ppm July 1-31, 1953.

Hardness: Maximum, 214 ppm Jan. 1-31, 1954; minimum, 144 ppm June 1-30, 1953.

Specific conductance: Maximum daily, 581 microhos July 1, 1948; minimum daily, 243 microhos 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 1954 to September 1955 given in Water-Supply Paper 1392. 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 1954 to September 1955

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 at CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (microhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate					
Oct. 1-31, 1954-----	288	10		43	12	26		178	18	34	0.3	0.8			238	0.32	185	157	11	27	0.9	426	7.7
Nov. 1-30-----	309	11		45	13	27		184	20	36	.2	.8			252	.34	210	166	15	26	.9	432	7.6
Dec. 1-31-----	271	9.6		46	14	26		183	21	36	.2	.8			248	.34	181	168	18	25	.9	440	8.1
Jan. 1-31, 1955-----	287	9.4	0.01	45	13	30		180	22	42	.3	1.2			262	.36	203	167	20	28	1.0	444	7.9
Feb. 1-28-----	530	9.4		42	15	31		185	24	40	.3	1.0			254	.35	363	167	16	29	1.1	437	7.9
Mar. 1-31-----	457	7.6		54	6.7	31		180	23	40	.3	.8			260	.35	321	163	16	29	1.0	451	8.2
Apr. 1-30-----	960	8.4		42	13	31		174	22	41	.3	.8			244	.33	632	158	16	30	1.1	441	8.2
May 1-31-----	1,811	7.6		42	12	31		174	22	39	.3	.8			244	.33	1,190	154	12	30	1.1	427	8.2
June 1-30-----	4,203	9.0		41	12	31		164	22	42	.3	1.0			241	.33	2,730	152	18	30	1.1	429	8.2
July 1-31-----	2,805	7.2		42	11	29		162	21	40	.3	1.0			232	.32	1,760	149	16	30	1.0	428	8.2
Aug. 1-31-----	2,234	8.8		41	11	32		160	21	43	.3	1.5			252	.34	1,520	147	16	32	1.1	428	8.1
Sept. 1-30-----	1,689	9.6		43	9.7	32		162	23	43	.2	.8			240	.33	1,090	148	16	32	1.2	430	8.2
Weighted average-----	1,322	8.6		42	12	31		167	22	41	0.3	1.0			243	0.33	867	154	18	30	1.1	431	--

a Sum of determined constituents.

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 Jones Creek and at mile 67. DRAINAGE AREA--4,150 square miles, approximately, of which 11,800 square miles is probably non-contributing.

RECORDS AVAILABLE--Chemical analyses: April 1944 to September 1955. Water temperatures: October 1945 to September 1948, March 1950 to September 1955.

EXTREMES, 1954-55--Dissolved solids: Maximum, 310 ppm Mar. 1-31; minimum, 182 ppm Feb. 6-15. Hardness: Maximum, 195 ppm Dec. 1-31; minimum, 104 ppm Feb. 6-15.

Specific conductance: Maximum daily, 621 microhos Mar. 21; minimum daily, 207 microhos Feb. 6. Water temperatures: Maximum observed, 93°F July 6, 27, 30, 31; minimum observed, 42°F Jan. 24.

EXTREMES, 1944-55--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 microhos Oct. 3, 1952; minimum daily, 179 microhos Oct. 30, 1953. Water temperatures (1945-48, 1950-55): Maximum observed, 95°F July 26, 1954; minimum observed, 42°F Dec. 26, 1953, Jan. 24, 1955.

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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955

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		Sodium adsorption ratio	Specific conductance (microhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				Percent sodium
Oct. 1-31, 1954-----	370	16		48	14	29	4.5	204	21	40	0.4	1.0	0.08	276	0.38	276	178	10	26	0.9	485	8.1
Nov. 1-30-----	345	10		51	15	29	4.3	215	23	40	.0	.8	.22	288	.39	288	188	12	25	.9	499	7.8
Dec. 1-31-----	348	7.8		54	15	30	3.9	221	25	42	.3	1.0	.14	289	.39	272	196	13	24	.9	509	8.2
Jan. 1-31, 1955-----	403	9.5		52	14	35	4.1	208	28	48	.3	1.2	.14	298	.41	324	187	16	28	1.1	559	8.1
Feb. 1-5, 16-28-----	509	12		50	11	29	4.7	188	29	37	.4	3.0	.11	270	.37	371	170	16	26	1.0	472	8.2
Feb. 6-15-----	2,840	16		32	5.9	16	3.7	116	18	20	.5	4.5	.10	182	.25	1,400	104	10	24	.7	298	7.9
Mar. 1-31-----	360	8.6		54	14	36	4.8	223	29	47	.4	1.5	.14	310	.42	301	192	10	28	1.1	539	8.0
Apr. 1-30-----	701	7.6		45	12	29	4.8	182	23	39	.4	1.2	.12	252	.34	477	162	13	27	1.0	454	8.1
May 1-19, 27-31-----	1,120	11		46	11	26	--	168	23	38	.3	1.2	.17	248	.34	750	159	22	26	.9	432	8.0
May 20-26-----	4,250	13		38	5.3	14	--	126	17	18	.3	3.8	.17	185	.25	2,120	117	14	21	.6	307	7.6
June 1-30-----	3,444	12		40	11	26	5.0	155	24	40	.2	2.0	.09	4236	.32	2,190	145	18	27	.9	422	8.1
July 1-31-----	2,304	10		44	11	28	5.2	164	24	46	.2	1.2	.11	4251	.34	1,560	154	20	28	1.0	448	8.2
Aug. 1-31-----	1,779	12		42	11	29	5.1	164	23	42	.0	2.2	.07	247	.24	1,100	149	14	29	1.0	447	7.6
Sept. 1-30-----	1,168	13		43	12	31	5.1	170	24	46	.0	1.0	.09	259	.33	817	156	16	29	1.1	459	7.9
Weighted average-----	1,196	12		43	11	27	4.8	165	23	39	0.2	1.9	0.11	244	0.33	788	152	18	27	0.9	431	--

a Sum of determined constituents.

COLORADO RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN COLORADO RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Residue at 180°C)		Hardness as CaCO ₃		Percent sodium	Specific conductance (micro-mhos at 25°C)	pH	
														Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate				
LAKE J. B. THOMAS NEAR SNYDER																					
Mar. 7, 1955-----		2.7	0.00	35	6.6	44		154	52	20	0.7	0.5	--	242	0.33	114	0	46	1.8	418	7.2
LAKE BUCHANAN NEAR BURBETT																					
Feb. 8, 1955-----		4.6	.02	38	10	37	5.4	141	30	56	.3	1.0	0.09	260	.35	136	20	36	1.4	476	8.2
LAKE AUSTIN AT AUSTIN																					
Jan. 18, 1955-----		7.0	.02	38	12	23	4.5	161	19	35	.2	.2	.04	225	.31	144	12	25	.8	395	8.1

GUADALUPE RIVER BASIN

GUADALUPE RIVER AT VICTORIA, TEX.

LOCATION --at gaging station at bridge on U. S. Highway 59 in Victoria, Victoria County, 1300 feet upstream from Texas & New Orleans Railroad bridge, 10 miles upstream from Coletto Creek, and at mile 51. DRAINAGE AREA, 5311 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1945 to September 1946, October 1948 to September 1955.

Water temperatures: November 1950 to September 1955. EXTREMES, 1954-55 --Dissolved solids: Maximum, 410 ppm Oct. 21-31, Nov. 11-20; minimum, 223 ppm June 11-20.

Hardness: Maximum, 221 ppm Dec. 1-10; minimum, 130 ppm June 11-20. Specific conductance: Maximum daily, 876 microhos Oct. 22; minimum daily, 308 microhos June 14.

Water temperatures: Maximum observed, 86°F on several days during June, July and August; minimum observed, 46°F Dec. 23. EXTREMES, 1945-46, 1948-55 --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 microhos Jan. 11-17, 1946; minimum daily, 201 microhos Sept. 1, 1953.

Water temperatures: Maximum observed, 90°F Aug. 4, 27, 1952; minimum observed, 40°F Feb. 1-2, 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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955

Table with columns: Date of collection, Mean discharge (cfs), Silica (SiO2), Iron (Fe), Calcium (Ca), Magnesium (Mg), Sodium (Na), Potassium (K), Bicarbonate (HCO3), Chloride (Cl), Fluoride (F), Nitrate (NO3), Boron (B), Dissolved solids (Residue at 180°C), Hardness as CaCO3, Calcium, Magnesium, Specific conductance (microhos at 25°C), pH.

Weighted average --- 374

a Sum of determined constituents.

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE GUADALUPE RIVER BASIN IN TEXAS

Chemical analyses, in parts per million, water year October 1954 to September 1955

Date of collection	Water discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate			
GUADALUPE RIVER AT COUNTY ROAD ABOVE U. S. HIGHWAY 281																				
Jan. 24, 1955	51.5							268	24							240	20		516	8.2
GUADALUPE RIVER, 500 FEET ABOVE SPRING BRANCH CREEK																				
Jan. 24	49.0							271	24							246	24		516	8.0
SPRING BRANCH CREEK AT MOUTH																				
Jan. 24	1.0							285	15							244	10		489	8.1
GUADALUPE RIVER, 0.9 MILE ABOVE U. S. HIGHWAY 281																				
Jan. 24	46.1							272	25							267	24		516	8.1
GUADALUPE RIVER, 1.0 MILE BELOW U. S. HIGHWAY 281																				
Jan. 24	44.5							276	25							251	25		526	8.1
GUADALUPE RIVER AT GAGING STATION NEAR SPRING BRANCH																				
Jan. 24	--							278	26							252	24		527	8.2
GUADALUPE RIVER, 1.4 MILES BELOW GAGING STATION NEAR SPRING BRANCH																				
Jan. 24	44.3							278	26							252	24		532	8.2
GUADALUPE RIVER AT COUNTY ROAD CROSSING 4.3 MILES BELOW GAGING STATION NEAR SPRING BRANCH																				
Jan. 25	28.0							279	26							251	22		528	8.2
GUADALUPE RIVER 6.8 MILES BELOW GAGING STATION NEAR SPRING BRANCH																				
Jan. 25	22.0							274	26							245	20		517	8.1
GUADALUPE RIVER 1.3 MILES UPSTREAM FROM REBECCA CREEK																				
Jan. 25	13.2							275	26							248	22		525	8.0

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE GUADALUPE RIVER BASIN IN TEXAS--Continued

Date of collection	Water 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)	Iron (B)	Dissolved solids			Hardness as CaCO ₃	Percent sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)		
														Parts per million	Tons per acre-foot	Tons per day					
Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued																					
GUADALUPE RIVER, 100 FEET BELOW MOUTH OF REBECCA CREEK																					
Jan. 25, 1955-----	11.4							274		26						248	23			517	8.2
GUADALUPE RIVER, 1.6 MILES DOWNSTREAM FROM REBECCA CREEK																					
Jan. 26-----	9.2							274		26						256	31			525	8.1
GUADALUPE RIVER, 4.2 MILES UPSTREAM FROM COUNTY ROAD CROSSING NEAR CHANES MILL																					
Jan. 27-----	11.1							274		26						252	27			528	8.0
GUADALUPE RIVER, 2.4 MILES UPSTREAM FROM COUNTY ROAD CROSSING NEAR CHANES MILL																					
Jan. 26-----	27.1							275		26						254	28			532	8.0
GUADALUPE RIVER, 2.5 MILES BELOW CHANES MILL																					
Jan. 27-----	31.9							277		24						254	27			531	7.9
GUADALUPE RIVER, 1.5 MILES ABOVE TOM CREEK																					
Jan. 27-----	35.8							280		24						256	26			529	8.1
GUADALUPE RIVER, 200 FEET ABOVE TOM CREEK																					
Jan. 27-----	39.1							279		24						254	25			526	8.0
GUADALUPE RIVER, 2 MILES BELOW TOM CREEK																					
Jan. 28-----	41.9							282		24						260	29			527	8.0
GUADALUPE RIVER, 2.5 MILES BELOW TOM CREEK																					
Jan. 28-----	37.8							280		24						254	24			525	8.0
GUADALUPE RIVER AT BRAUSE RANCH ABOUT 2 MILES ABOVE CANYON DAM SITE																					
Jan. 28-----	41.8							276		24						248	22			520	8.0
GUADALUPE RIVER, 3/4 MILE BELOW CANYON DAM SITE																					
Jan. 28-----	40.8							267		24						240	21			513	8.0

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE GUADALUPE RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Water discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate				
Jan. 29, 1955	37.9									24						240	21			513	8.1
GUADALUPE RIVER, 1 1/4 MILES BELOW CANYON DAM SITE																					
Jan. 29	40.8									24						246	25			513	8.1
GUADALUPE RIVER, ABOUT 1 MILE ABOVE SATTLER																					
Jan. 29	38.1									25						242	25			510	8.1
GUADALUPE RIVER, 1 MILE ABOVE LOWER CROSSING AT SATTLER																					
Jan. 29	35.4									25						240	23			512	8.1
GUADALUPE RIVER, ABOUT 2 MILES BELOW SATTLER																					
Jan. 29	43.0									24						236	21			507	8.1
GUADALUPE RIVER ABOUT 3 MILES BELOW SATTLER																					
Jan. 30	41.6									24						238	23			498	8.1
GUADALUPE RIVER, ABOUT 7 MILES ABOVE RUECO SPRINGS																					
Jan. 30	40.7									24						238	25			501	8.1
GUADALUPE RIVER, ABOUT 6.5 MILES ABOVE RUECO SPRINGS																					
Jan. 30	35.7									24						230	23			492	8.1
GUADALUPE RIVER, 1 MILE ABOVE RUECO SPRINGS																					
Jan. 30	39.4									24						230	23			491	8.1
GUADALUPE RIVER, 3/4 MILE BELOW RUECO SPRINGS																					
Jan. 31	35.9									23						230	23			494	8.1
GUADALUPE RIVER, 3/4 MILE ABOVE GRUERE																					
Jan. 31	38.8									23						232	29			495	8.1
GUADALUPE RIVER, 3/4 MILE ABOVE GAGING STATION ABOVE COMAL RIVER AT NEW BRAUNFELS																					

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE GUADALUPE RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Water dis-charge (cfs)	Silica (SiO ₂)	Iron (Fe)	Cal-cium (Ca)	Mag-ne-sium (Mg)	So-dium (Na)	Po-tas-sium (K)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per mil-lion	Tons per acre-foot	Tons per day	Cal-cium	Non-carbon-ate			
LITTLE BLANCO RIVER ABOUT 3 MILES ABOVE MOUTH																					
Jan. 24, 1955	0.2							344		13							296	14		549	8.0
LITTLE BLANCO RIVER AT MOUTH																					
Jan. 24	0.1							291		13							262	24		523	7.8
BLANCO RIVER 4.0 MILES DOWNSTREAM FROM LITTLE BLANCO RIVER																					
Jan. 25	2.68							314		14							310	52		615	7.7
BLANCO RIVER 4.2 MILES DOWNSTREAM FROM LITTLE BLANCO RIVER																					
Jan. 25	.36							298		15							302	58		584	8.0
BLANCO RIVER 4.6 MILES DOWNSTREAM FROM LITTLE BLANCO RIVER																					
Jan. 25	.11							244		15							253	52		499	8.1
BLANCO RIVER AT FISHERS STORE ROAD																					
Jan. 25	7.50							302		14							296	48		572	8.0
BLANCO RIVER 1.9 MILES BELOW FISHERS STORE ROAD																					
Jan. 26	7.25							283		15							280	48		545	8.1
BLANCO RIVER AT HUNTING LODGE, 6.7 MILES UPSTREAM FROM CYPRESS CREEK																					
Jan. 26	7.30							260		15							274	61		509	8.1
BLANCO RIVER AT GRAVEL ROAD CROSSING, 3.9 MILES UPSTREAM FROM CYPRESS CREEK																					
Jan. 26	7.13							238		15							250	55		479	8.1
BLANCO RIVER 1.8 MILES UPSTREAM FROM CYPRESS CREEK																					
Jan. 26	7.84							236		15							245	52		479	8.2
CYPRESS CREEK AT BRIDGE ON COUNTY ROAD BELOW JACOBS WELL																					
Jan. 26	2.39							326		14							294	27		563	8.0

GUADALUPE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN THE GUADALUPE RIVER BASIN IN TEXAS--Continued

Chemical analyses, in parts per million, water year October 1954 to September 1955--Continued

Date of collection	Water discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Jan. 26, 1955-----	2.55							282	14								247	16			488	8.1
CYRESS CREEK AT MOUTH AT WIMBERLEY																						
Jan. 27-----	10.5							241	14								247	50			476	8.2
BLANCO RIVER AT FARM TO MARKET ROAD 12, 1/4 MILE EAST OF WIMBERLEY																						
Jan. 27-----	11.0							225	16								231	46			450	8.2
BLANCO RIVER AT BRIDGE ON COUNTY ROAD 3.0 MILES DOWNSTREAM FROM WIMBERLEY																						
Jan. 27-----	11.1							222	14								222	40			445	8.2
BLANCO RIVER AT BRIDGE ON COUNTY ROAD 5.6 MILES DOWNSTREAM FROM WIMBERLEY																						
Jan. 27-----	10.6							216	16								216	39			436	8.2
BLANCO RIVER 1/2 MILE BELOW SMITH CREEK																						
Jan. 28-----	10.6							217	16								219	41			440	8.2
BLANCO RIVER, 1.0 MILE ABOVE HALIFAX CREEK																						
Jan. 28-----	1.35							205	16								212	44			420	8.2
BLANCO RIVER, 0.4 MILE BELOW HALIFAX CREEK																						
Jan. 28-----	.14							203	14								204	38			420	8.2
BLANCO RIVER ABOUT 1 MILE BELOW HALIFAX CREEK																						
Jan. 11-----	--							110	4.9	3.5							74	0			241	7.5
June 1-----	--							120	2	3.5							89	0			229	7.2
July 13-----	--	10		32	1.5	4.5	4.9	114	2.9	2.0	0.4	3.8					86	0	10	0.2	230	7.9
RECORDADO RESERVOIR NO. 1 BEAR CREEK																						
Jan. 11-----	--							110	4.9	3.5							74	0			241	7.5
June 1-----	--							120	2	3.5							89	0			229	7.2
July 13-----	--	10		32	1.5	4.5	4.9	114	2.9	2.0	0.4	3.8					86	0	10	0.2	230	7.9

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 U. S. Highway 59, 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 1955.

Water temperatures: October 1947 to September 1955.

EXTREMES, 1954-55.--Dissolved solids: Maximum, 419 ppm May 1-31; minimum, 297 ppm Sept. 1-30.

Hardness: Maximum, 157 ppm Apr. 1-30; minimum, 120 ppm June 1-30.

Specific conductance: Maximum daily, 817 microhos May 18; minimum daily, 424 microhos Sept. 27.

Water temperatures: Maximum observed, 84°F on several days during summer months; minimum observed, 51°F Feb. 13.

EXTREMES, 1947-55.--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 microhos July 1, 1948; minimum daily, 233 microhos 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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1946 to September 1955

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids (Residue at 180°C)		Hardness as CaCO ₃		Percent sodium	Specific conductance (microhos at 25°C)	pH
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 1-31, 1954-----	72.4	27		54	5.4	40	8.6	215	26	38	0.2	3.0	0.34	318	0.43	156	0	34	501	7.8
Nov. 1-30-----	129	26		50	4.9	52	8.1	201	33	45	.2	2.0	.30	330	.45	145	0	42	520	7.9
Dec. 1-31-----	58.4	24		48	4.8	53	7.7	200	34	42	.5	1.8	.20	318	.43	140	0	43	513	8.0
Jan. 1-31, 1955-----	48.5	25		51	5.4	61	8.0	207	40	58	.3	2.0	.22	360	.49	149	0	45	585	8.2
Feb. 1-28-----	54.4	22		52	4.5	64	7.7	217	39	52	.5	2.0	.25	354	.48	148	0	47	573	7.7
Mar. 1-31-----	69.2	18		51	4.5	73	8.2	228	40	59	.5	2.0	.20	378	.51	146	0	50	623	8.0
Apr. 1-30-----	74.1	23		54	5.5	81	8.2	244	40	66	.5	2.2	.27	401	.55	137	0	51	669	8.5
May 1-31-----	281	20		52	4.5	83	8.8	229	46	73	.5	4.0	.31	419	.57	148	0	53	682	7.8
June 1-30-----	255	22		42	3.7	61	7.4	180	39	51	.3	4.2	.19	4320	.44	120	0	51	530	8.2
July 1-31-----	90.3	24		44	3.9	60	7.0	192	39	48	.4	3.2	.22	4324	.44	126	0	49	536	8.2
Aug. 1-31-----	99.6	24		50	3.2	63	7.0	206	40	48	.2	3.5	.20	347	.47	137	0	48	560	8.1
Sept. 1-30-----	385	23		44	3.0	55	6.5	176	35	42	.2	2.8	.35	4297	.60	122	0	47	484	7.9
Weighted average-----	135	23		48	4.1	63	7.6	201	38	52	0.3	3.1	0.27	343	0.47	137	0	48	559	--

a Includes equivalent of 10 ppm carbonate (CO₃).

b Sum of determined constituents.

RIO GRANDE BASIN

PEGOS 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 1955.

Water temperatures: March 1953 to September 1955.

EXTREMES, 1954-55.--Dissolved solids: Maximum, 10,800 ppm Oct. 4-8; minimum, 2,730 ppm Apr. 1-30.

Hardness: Maximum, 2,010 ppm Oct. 4-8; minimum, 952 ppm Apr. 1-30.

Specific conductance: Maximum daily, 17,400 microhos Oct. 5; minimum daily, 3,850 microhos Apr. 23.

Water temperatures: Maximum observed, 80°F on many days during August; minimum observed, 46°F Jan. 25.

EXTREMES, 1917-55.--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, 26,200 microhos Sept. 28, 30, 1953; minimum daily, 1,610 microhos June 2, 1948.

Water temperatures (1953-55): Maximum observed, 80°F on many days during July and August; minimum observed, 40°F on several days during December 1953.

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 1954 to September 1955 given in Water-Supply Paper 1392. 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 1954 to September 1955

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 (microhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-3, 1954----	13.9	14		358	131	1,800		120	1,210	2,820				6,390	8.69	240	1,430	1,330	73	21	9,970	7.5
Oct. 4-8-----	15.1	13		467	206	3,120		96	1,790	5,020				10,800	14.7	440	2,010	1,930	78	31	16,200	7.4
Nov. 1-30-----	24.3	14		354	108	1,130		148	1,140	1,750		4.0		4,570	6.22	300	1,330	1,210	65	13	6,940	7.5
Dec. 1-31-----	28.0	13		352	114	1,030		151	1,150	1,600		3.0		4,340	5.90	328	1,350	1,220	62	12	6,480	8.0
Jan. 1-31, 1955----	30.5	12		370	125	1,060		152	1,230	1,650		3.0		4,520	6.15	372	1,440	1,310	62	12	6,790	7.9
Feb. 1-28-----	29.3	12		374	124	952		154	1,220	1,500		2.5		4,260	5.79	337	1,440	1,320	59	11	6,360	7.7
Mar. 1-31-----	288	10		316	89	781		144	998	1,200		3.5		3,470	4.72	270	1,150	1,040	60	10	5,110	7.7
Apr. 1-30-----	399	10		268	69	593		134	826	900		1.8		2,730	3.71	2,940	952	842	58	8.4	4,280	7.5
May 1-31-----	210	10		298	75	722		138	919	1,100		1.5		3,190	4.34	1,810	1,050	939	60	9.7	4,840	7.7
June 1-30-----	377	13		303	80	722		133	927	1,120		2.5		3,230	4.39	3,290	1,180	976	59	9.5	5,090	7.6
July 1-31-----	328	16		306	79	656		131	930	1,020		2.0		3,070	4.18	4,360	1,090	981	57	8.6	4,890	7.6
Aug. 1-31-----	507	14		340	91	732		121	1,050	1,180		1.5		3,490	4.75	4,780	1,220	1,120	57	9.4	5,320	7.7
Sept. 1-12-----	320	18		406	94	889		118	1,210	1,400		2.5		4,080	5.55	3,530	1,400	1,500	58	10	6,010	7.7
Sept. 13-30-----	43.1	17		500	174	1,990		138	1,670	3,140		--		7,560	10.3	860	1,980	1,850	69	19	11,200	7.6
Weighted average-----	217	13		317	84	743		132	978	1,150		--		3,350	4.56	1,960	1,140	1,030	59	9.6	5,160	--

RIO GRANDE BASIN--Continued
FECOS 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 Chacator Draw.

DRAINAGE AREA--27,820 square miles, approximately (contributing area).

RECORDS AVAILABLE--Chemical analyses: April 1939 to June 1942, October 1946 to September 1955.

EXTREMES, 1934-55.--Hardness: Maximum, 3,590 ppm Jan. 1-31; minimum, 840 ppm Oct. 7.

Specific conductance: Maximum daily, 20,600 microhos June 22; minimum daily, 4,760 microhos Oct. 7.

EXTREMES, 1939-42, 1946-55.--Hardness: Maximum, 4,460 ppm Mar. 1-31, 1953; minimum, 246 ppm June 14, 1954.

Specific conductance: Maximum daily, 35,700 microhos Feb. 9-10, 15, 19-20, 1953; minimum daily, 904 microhos 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 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955

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 (microhos at 25° C)	pH	
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate					
Oct. 1-5, 14-31, 1954	10.8					2,810		147	3,070	4,600								3,500	3,380	62	21	16,100	7.3
Oct. 6, 8-13	49.0					1,460		127	1,570	2,380								1,860	1,760	62	15	9,070	7.5
Oct. 7	59	15				703		65	877	1,180								840	770	63	11	4,760	7.9
Nov. 1-30	10.6					2,740		162	2,950	4,320								3,380	3,250	62	20	16,000	7.6
Dec. 1-31	12.9					2,870		174	2,990	4,720								3,460	3,320	63	21	16,200	8.0
Jan. 1-31, 1955	17.9					3,150		186	3,020	5,140								3,590	3,440	66	23	17,600	7.6
Feb. 1-28	23.2					2,690		160	2,700	4,370								3,140	3,010	65	21	15,200	7.7
Mar. 1-31	17.5					2,590		145	2,680	4,080								3,160	3,040	64	20	14,800	7.5
Apr. 1-30	13.7					2,910		140	2,950	4,690								3,570	3,460	64	21	16,600	7.5
May 1-31	12.4					2,740		136	2,850	4,380								3,280	3,170	64	21	15,600	7.5
June 1-30	11.1					2,820		130	2,950	4,540								3,480	3,370	64	21	16,300	7.4
July 1-20	15.2					2,330		102	2,470	3,780								2,880	2,800	64	19	13,900	7.7
July 21-31	42.5					1,300		130	1,490	2,080								1,740	1,630	62	14	8,340	7.6
Aug. 1-31	17.2					1,950		112	2,160	3,190								2,470	2,380	63	17	11,800	7.8
Sept. 1-30	29.4					1,780		118	2,060	2,890								2,370	2,270	62	16	10,900	7.5
Weighted average	17.6					2,380		140	2,500	3,850								2,920	2,810	64	19	13,800	--

RIO GRANDE BASIN--Continued
 PECOS RIVER NEAR GIRVIN, TEXAS

LOCATION.--At supplementary gage at bridge on U. S. Highway 67, about half a mile downstream from Pamhandle & Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, 6 1/2 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 1955.

Water temperatures: October 1953 to September 1955.
 EXTREMES, 1954-55.--Hardness: Maximum, 4,260 ppm May 1-31; minimum, 1,240 ppm Oct. 6-8.
 Specific conductance: Maximum daily, 23,400 microhos July 23; minimum daily, 2,230 microhos Oct. 7.
 Water temperatures: Maximum observed, 89°F June 23; minimum observed, 41°F Feb. 11-12.
 EXTREMES, 1939-41, 1946-47, 1953-55.--Hardness: Maximum, 4,260 ppm Sept. 1-30, 1954; minimum, 640 ppm June 16-18, 1954.
 Specific conductance: Maximum daily, 23,400 microhos July 23, 1955; minimum daily, 1,480 microhos May 29, 1941.
 Water temperatures (1953-55): Maximum observed, 93°F June 1, 1954; minimum observed, 41°F Dec. 25, 1953, Feb. 11-12, 1955.
 REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1954 to September 1955 given in Water-Supply Paper 1392.

Chemical analyses, in parts per million, water year October 1954 to September 1955

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 (microhos at 25° C)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Oct. 1-5, 23-31, 1954--	17.6					3,490		113	3,530	5,410							3,710	3,620	71	25	18,600	7.5
Oct. 6-8-----	658					82		75	1,700	1,08							1,740	1,180	12	10	2,260	7.2
Oct. 9-13-----	52					1,500		115	1,650	2,400							1,840	1,750	63	15	9,180	7.5
Oct. 14-22-----	25.4					2,350		148	2,420	3,830							2,650	2,530	69	22	13,800	7.7
Nov. 1-30-----	22.9					3,690		129	3,780	5,850							4,000	3,890	65	25	19,500	7.4
Dec. 1-31-----	24.5					3,360		154	3,680	5,670							3,960	3,830	65	25	19,000	7.8
Jan. 1-31, 1955-----	28.2					3,450		177	3,510	5,480							3,990	3,840	65	24	18,900	7.7
Feb. 1-28-----	33.7					3,320		171	3,430	5,580							3,910	3,770	66	24	18,800	7.7
Mar. 1-31-----	30.0					3,310		148	3,350	5,140							3,730	3,610	66	24	18,000	7.3
Apr. 1-30-----	19.1					3,700		128	3,800	5,740							4,120	4,020	66	25	19,900	7.7
May 1-31-----	18.4					3,940		104	3,970	6,140							4,260	4,180	67	26	20,800	7.4
June 1-30-----	20.5					3,720		73	3,830	5,800							4,140	4,080	66	25	20,000	7.2
July 1-29-----	29.1					3,700		60	3,870	5,820							4,160	4,110	66	25	20,400	7.1
July 30-31-----	67					1,520		92	1,660	2,480							1,900	1,820	63	15	9,330	7.8
Aug. 1-9-----	25.4					1,210		75	1,460	1,880							1,530	1,470	63	13	7,690	7.7
Aug. 10-31-----	27.8					1,970		64	2,270	3,060							2,470	2,420	63	17	11,800	7.1
Sept. 1, 6-10-----	31.3					1,390		44	1,900	2,220							2,060	2,020	59	13	8,830	6.9
Sept. 2-5, 11-30-----	34.4					2,390		48	2,600	3,810							2,830	2,790	63	20	13,600	7.1
Weighted average-----	31.5					2,640		108	2,920	4,150							3,180	3,090	64	20	14,800	--