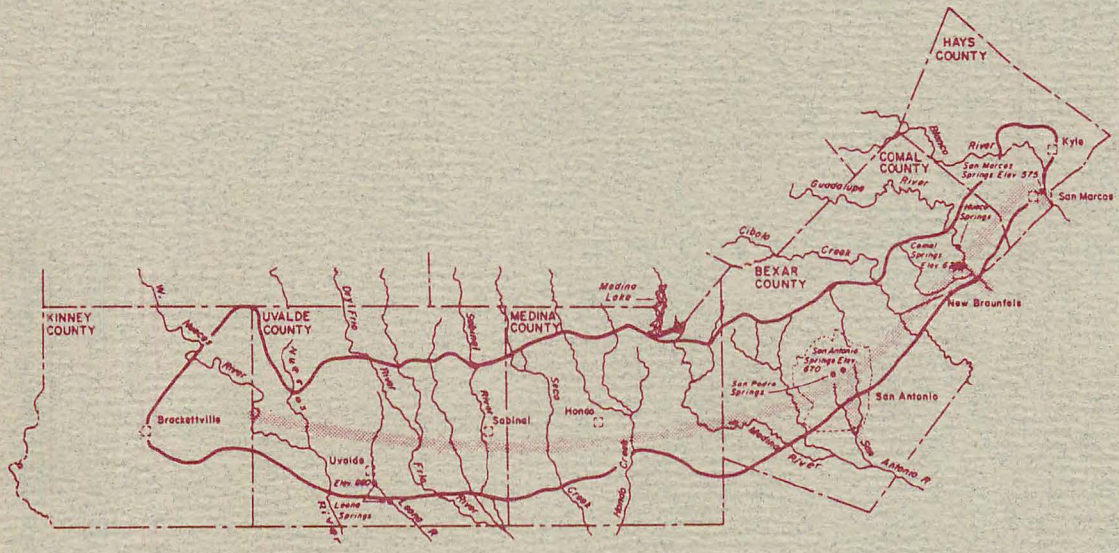
COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1986, WITH 1934-86 SUMMARY

Bulletin 46
Edwards Underground Water District
San Antonio, Texas



Prepared by the U.S. Geological Survey in cooperation with the Edwards Underground Water District

EDWARDS UNDERGROUND WATER DISTRICT

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BULLETIN 46

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Compiled by

G.B. Ozuna, G.M. Nalley,
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U.S. Geological Survey

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February 1988

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COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1986, WITH 1934-86 SUMMARY

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ABSTRACT

The average annual ground-water recharge to the Edwards aquifer in the San Antonio area, Texas, from 1934 through 1986 was 614,900 acre-feet. Recharge in 1986 was 1,153,700 acre-feet, which is the fifth highest estimated annual recharge since 1934. A maximum annual recharge of 1,711,200 acre-feet occurred in 1958, and a minimum annual recharge of 43,700 acre-feet occurred in 1956.

The calculated annual discharge by wells and springs in 1986 was 834,500 acre-feet. Annual discharge by wells and springs ranged from a maximum of 960,900 acre-feet in 1977 to a minimum of 388,800 acre-feet in 1955. In 1986, the annual discharge by wells was 429,300 acre-feet, which is below the midpoint between the record maximum and the record minimum.

In 1986, water levels in many of the wells fluctuated above the midpoint between record high and low levels; consequently, the volume of ground water in storage in the aquifer was above average during most of the year. In 1986, substantial recharge occurred during the summer, and water levels then remained above average in most of the area.

Analyses of water samples from 88 wells and 3 springs in the Edwards aquifer show that the water in the freshwater zone is of a significantly better quality than the level established for public water systems. However, trace

concentrations of organic compounds were detected in many of the analyses. Analyses of water samples collected from two wells in Bexar County and eight wells in Uvalde County showed concentrations of tetrachloroethylene in excess of 5 micrograms per liter. In 1986, samples were collected from wells along the "bad-water" line to detect changes in water quality as the potentiometric head in the Edwards aquifer changed.

INTRODUCTION

This annual compilation of the records of ground-water recharge, discharge, water levels, and water quality for the Edwards aquifer and for surface-water data in the San Antonio area, Texas, is part of a continuing investigation by the U.S. Geological Survey in cooperation with the Edwards Underground Water District. The Edwards aquifer consists of the Georgetown and Edwards Limestones of Cretaceous age and the stratigraphic equivalents of the Edwards Limestone.

The calculations of annual recharge are based on data collected from a network of streamflow-gaging stations and on assumptions that relate the runoff characteristics of gaged areas to ungaged areas (Puente, 1978). The basic approach is a water-balance equation in which recharge within a stream basin is the difference between measured streamflow above and below the infiltration area plus the estimated runoff within the infiltration area. Location of the Edwards aquifer and physiographic regions is shown in figure 1, drainage basins are shown in figure 2, and data-collection sites are shown in figure 3.

Annual discharge is compiled from: (1) Data collected by the Texas Water Development Board on pumpage for municipal, military, and industrial use; (2) calculations of pumpage for irrigation tabulated by the U.S. Soil Conservation Service as determined from records of power consumption and irrigated acreage; and (3) Geological Survey records of spring flow at points of discharge.

Periodic measurements have been made in observation wells in the Edwards aquifer since 1929 to determine changes in ground-water storage in the aquifer. The first continuous water-stage recorders were installed during the late 1930's. During 1986, periodic water-level measurements were made in 17 wells, and continuous water-stage recorders were in operation on 19 other wells.

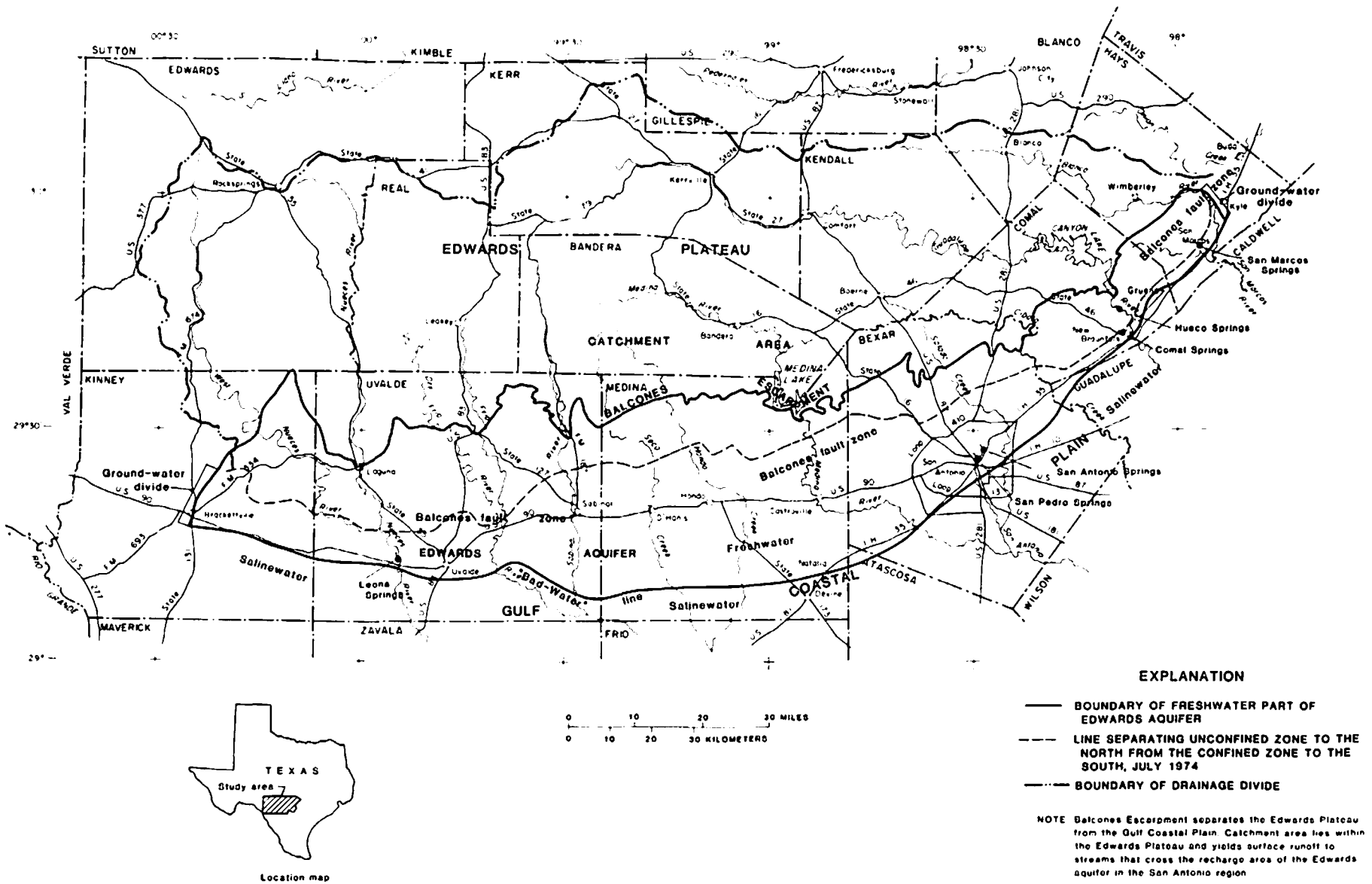

Figure 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio area.

See Plate 1 located in back cover.

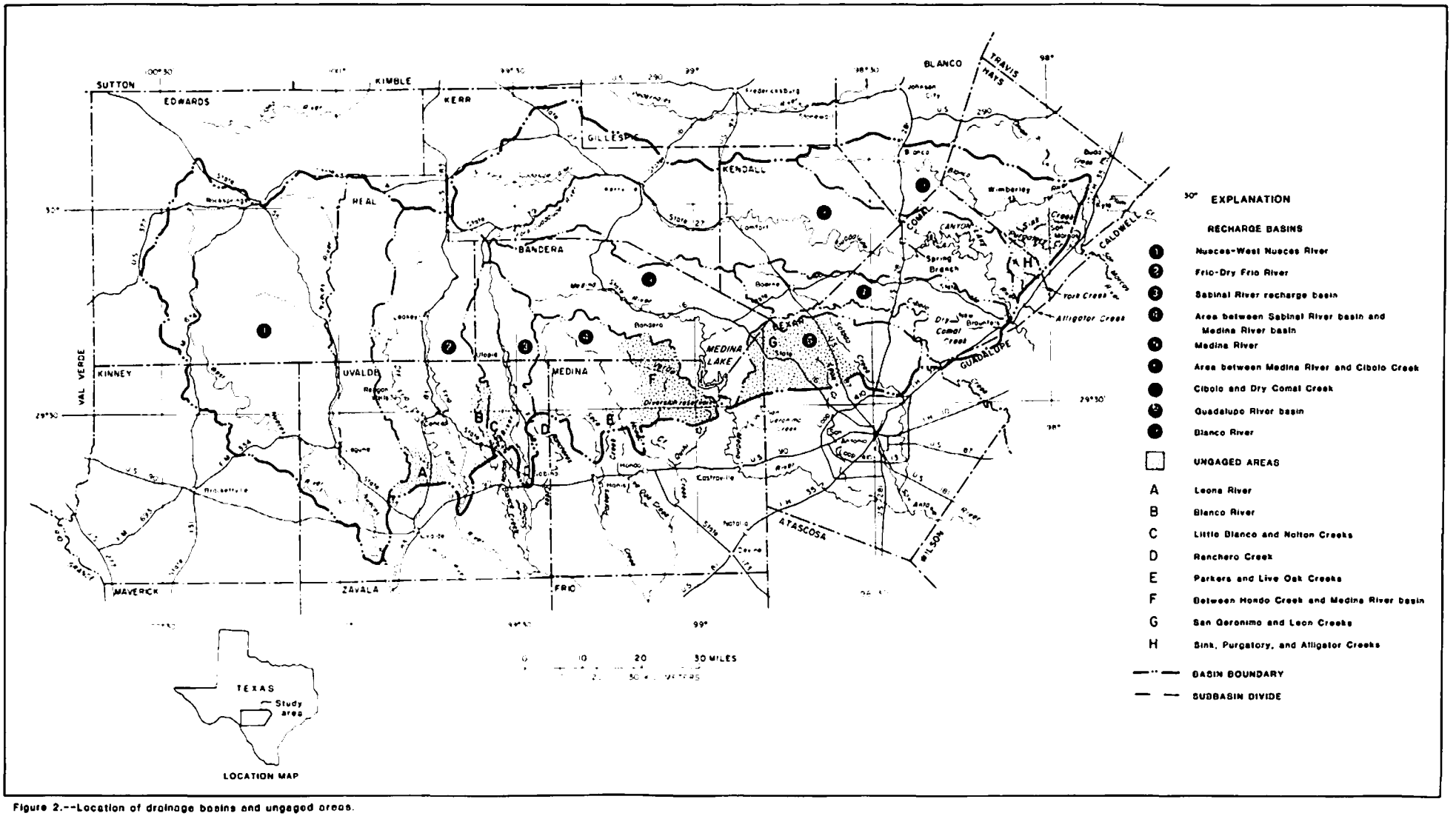

Figure 2.--Location of drainage basins and ungaged areas.

See Plate 2 located in back cover.

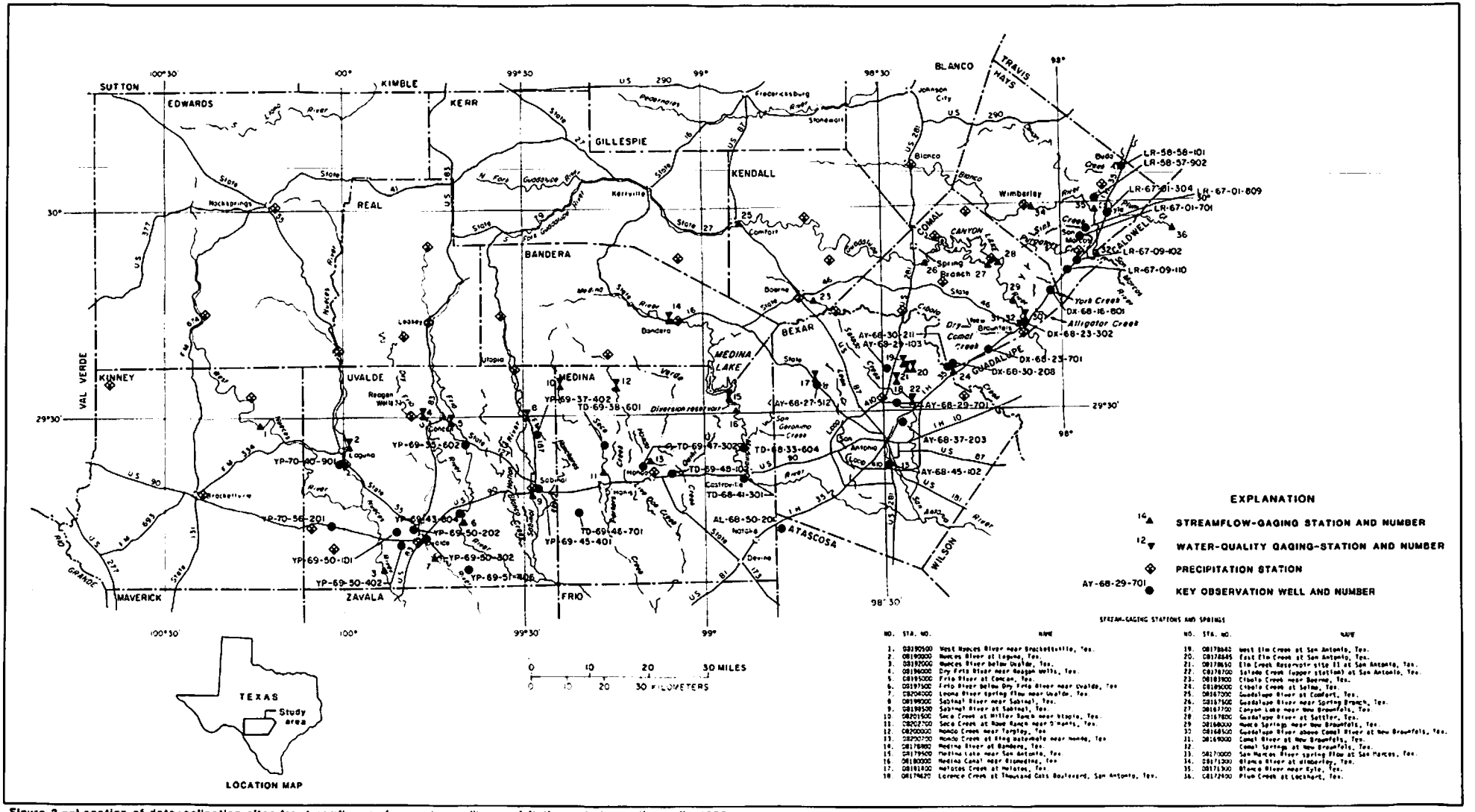

Figure 3.--Location of data-collection sites for streamflow, surface-water quality, precipitation, and observation wells, 1988.

See Plate 3 located in back cover.

Surface-water data for Texas for the 1986 water year are presented in three volumes, respectively identified by river basins. Data in each volume consist of records of stage, discharge, and water quality of streams and canals and records of stage, contents, and water quality of lakes and reservoirs. Records for a few pertinent stations in bordering states also are included. These data are included in the National Water Data Storage and Retrieval System (WATSTORE) operated by the Geological Survey in cooperation with State and Federal agencies in Texas.

PRECIPITATION

The annual and long-term average precipitation at selected stations in the San Antonio area for 1983-86 are given in table 1. Annual precipitation for 1983 and 1984 was below average at nearly all of the stations in the San Antonio area, resulting in below average recharge for 1982-84. In 1985 and 1986, annual precipitation was significantly above average at most stations, resulting in above average recharge for those years. Fluctuation of the reported annual precipitation totals for San Antonio since 1934 are given in figure 4.

GROUND-WATER RECHARGE

The infiltration area used for calculating recharge for the Edwards aquifer in the San Antonio area is modified slightly from the area described by Puente (1978) to reflect existing data-collection sites. The delineation of the infiltration area is based on surface- and ground-water divides. Recharge to the Edwards aquifer is derived mainly from seepage from streams that cross the outcrop of the aquifer and, to a lesser extent, from direct infiltration of precipitation on the outcrop. Some recharge also is derived from other aquifers that are hydraulically connected to the Edwards aquifer. Water can move freely between two aquifers either along solution-widened fractures and faults or where the aquifers are in fault contact (Welder and Reeves, 1962, p. 36).

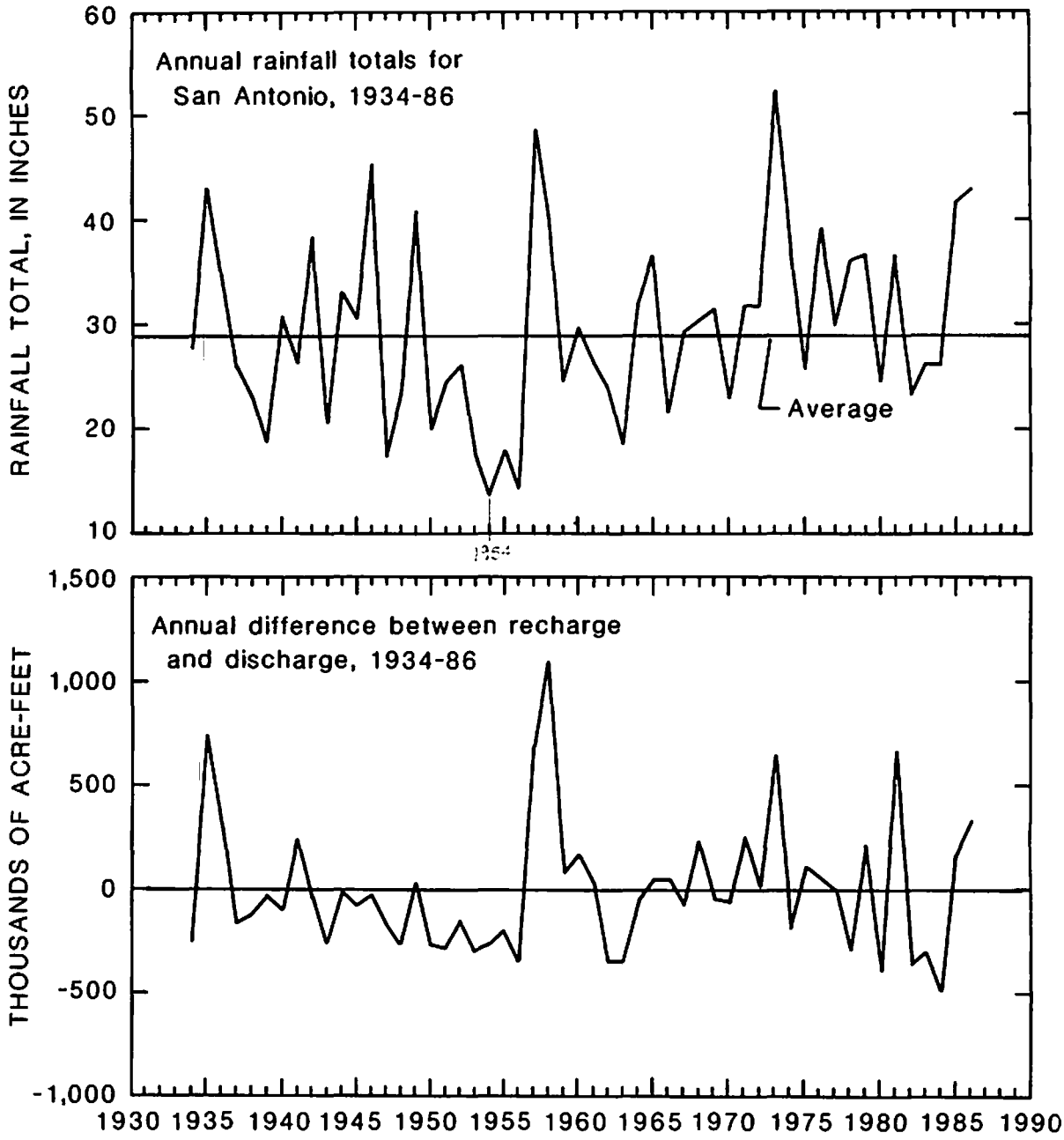

Figure 4.--Annual precipitation totals for San Antonio, 1934-86, and annual difference between recharge and discharge, 1934-86.

Table 1.--Annual and long-term average precipitation at selected stations, 1983-86 [1]

Station	Precipitation (inches)				Long-term average	
	1983	1984	1985	1986	Inches	Years of record
Brackettville	19.35	16.24	18.93	27.44	20.77	95
Uvalde	--	--	--	26.95	24.76	80
Sabinal	23.33	20.67	23.67	30.75	25.72	63
Hondo	--	--	21.94	36.98	28.66	78
San Antonio	26.11	25.95	41.43	42.73	28.78	108
Boerne	--	26.97	37.77	43.52	33.24	89
New Braunfels	34.13	20.90	37.26	47.14	31.86	91
San Marcos	36.95	--	33.54	42.20	33.80	82

[1] Precipitation data from the U.S. Department of Commerce (1983-86).

Other aquifers that contribute recharge to the Edwards aquifer are, from oldest to youngest, Glen Rose Limestone, Buda Limestone, Eagle Ford Shale, and Austin Group. Only recharge derived from the land surface is included in this compilation. The amount and significance of recharge from other aquifers is not known, but is believed to be small in comparison to the surface sources.

The calculated annual recharge by basins for 1934-86 and the average annual recharge for 1934-86 are given in table 2. Recharge in the Guadalupe River basin is not included because the amount of net recharge to the aquifer is not significant.

The annual recharge for 1934-86 ranged from 43,700 acre-ft in 1956 to 1,711,200 acre-ft in 1958. The average annual recharge for 1934-86 was 614,900 acre-ft. The annual recharge for 1986 was 1,153,700 acre-ft, which is significantly above the average annual recharge and is the fifth highest estimated annual recharge since 1934.

GROUND-WATER DISCHARGE

The calculated discharge, by county, from the Edwards aquifer during 1934-86 is given in table 3. The calculated discharge by county and by water use in 1986 is given in table 4.

The discharge from springs was from San Marcos Springs in Hays County, Comal Springs in Comal County, San Antonio and San Pedro Springs in Bexar County, and Leona River Springs in Uvalde County. The calculated discharge from Leona River Springs includes underflow into the alluvial gravels along the stream.

The major discharge from wells was in Bexar, Uvalde, and Medina Counties, while the major spring flow was from Comal and Hays Counties. Many wells in

Table 2.--Calculated annual recharge to the Edwards aquifer by basin, 1934-86
(in thousands of acre-feet)

Calendar year	Nueces-West Nueces River basin	Frio-Dry Frio River basin[1]	Sabinal River basin[1]	Area between Sabinal River and Medina River basins[1]	Medina Lake	Area between Cibolo Creek and Medina River basins[1]	Cibolo-Dry Comal Creek basin	Blanco River basin[1]	Total
1934	8.6	27.9	7.5	19.9	46.5	21.0	28.4	19.8	179.6
1935	411.3	192.3	56.6	166.2	71.1	138.2	182.7	39.8	1,258.2
1936	176.5	157.4	43.5	142.9	91.6	108.9	146.1	42.7	909.6
1937	28.8	75.7	21.5	61.3	80.5	47.8	63.9	21.2	400.7
1938	63.5	69.3	20.9	54.1	65.5	46.2	76.8	36.4	432.7
1939	227.0	49.5	17.0	33.1	42.4	9.3	9.6	11.1	399.0
1940	50.4	60.3	23.8	56.6	38.8	29.3	30.8	18.8	308.8
1941	89.9	151.8	50.6	139.0	54.1	116.3	191.2	57.8	850.7
1942	103.5	95.1	34.0	84.4	51.7	66.9	93.6	28.6	557.8
1943	36.5	42.3	11.1	33.8	41.5	29.5	58.3	20.1	273.1
1944	64.1	76.0	24.8	74.3	50.5	72.5	152.5	46.2	560.9
1945	47.3	71.1	30.8	78.6	54.8	79.6	129.9	35.7	527.8
1946	80.9	54.2	16.5	52.0	51.4	105.1	155.3	40.7	556.1
1947	72.4	77.7	16.7	45.2	44.0	55.5	79.5	31.6	422.6
1948	41.1	25.6	26.0	20.2	14.8	17.5	19.9	13.2	178.3
1949	166.0	86.1	31.5	70.3	33.0	41.8	55.9	23.5	508.1
1950	41.5	35.5	13.3	27.0	23.6	17.3	24.6	17.4	200.2
1951	18.3	28.4	7.3	26.4	21.1	15.3	12.5	10.6	139.9
1952	27.9	15.7	3.2	30.2	25.4	50.1	102.3	20.7	275.5
1953	21.4	15.1	3.2	4.4	36.2	20.1	42.3	24.9	167.6
1954	61.3	31.6	7.1	11.9	25.3	4.2	10.0	10.7	162.1
1955	128.0	22.1	0.6	7.7	16.5	4.3	3.3	9.5	192.0
1956	15.6	4.2	1.6	3.6	6.3	2.0	2.2	8.2	43.7
1957	108.6	133.6	65.4	129.5	55.6	175.6	397.9	76.4	1,142.6
1958	266.7	300.0	223.8	294.9	95.5	190.9	268.7	70.7	1,711.2
1959	109.6	158.9	61.6	96.7	94.7	57.4	77.9	33.6	690.4
1960	88.7	128.1	64.9	127.0	104.0	89.7	160.0	62.4	824.8
1961	85.2	151.3	57.4	105.4	88.3	69.3	110.8	49.4	717.1
1962	47.4	46.6	4.3	23.5	57.3	16.7	24.7	18.9	239.4
1963	39.7	27.0	5.0	10.3	41.9	9.3	21.3	16.2	170.7
1964	126.1	57.1	16.3	61.3	43.3	35.8	51.1	22.2	413.2
1965	97.9	83.0	23.2	104.0	54.6	78.8	115.3	66.7	623.5
1966	169.2	134.0	37.7	78.2	50.5	44.5	66.5	34.6	615.2
1967	82.2	137.9	30.4	64.8	44.7	30.2	57.3	19.0	466.5
1968	130.8	176.0	66.4	198.7	59.9	83.1	120.5	49.3	884.7
1969	119.7	113.8	30.7	84.2	55.4	60.2	99.9	46.6	610.5
1970	112.6	141.9	35.4	81.6	68.0	68.8	113.8	39.5	661.6
1971	263.4	212.4	39.2	155.6	68.7	81.4	82.4	22.2	925.3
1972	108.4	144.6	49.0	154.6	87.9	74.3	104.2	33.4	756.4
1973	190.6	256.9	123.9	286.4	97.6	237.2	211.7	82.2	1,486.5
1974	91.1	135.7	36.1	115.3	96.2	68.1	76.9	39.1	658.5
1975	71.8	143.6	47.9	195.9	93.4	138.8	195.7	85.9	973.0
1976	150.7	238.6	68.2	182.0	94.5	47.9	54.3	57.9	894.1
1977	102.9	193.0	62.7	159.5	77.7	97.9	191.6	66.7	952.0
1978	69.8	73.1	30.9	103.7	76.7	49.6	72.4	26.3	502.5
1979	128.4	201.4	68.6	203.1	89.4	85.4	266.3	75.2	1,117.8
1980	58.6	85.6	42.6	25.3	88.3	18.8	55.4	31.8	406.4
1981	205.0	365.2	105.6	252.1	91.3	165.0	196.8	67.3	1,448.4
1982	19.4	123.4	21.0	90.9	76.8	22.6	40.1	23.5	417.7
1983	79.2	85.9	20.1	42.9	74.4	31.9	62.5	23.2	420.1
1984	32.4	40.4	8.8	18.1	43.9	11.3	16.9	25.9	197.9
1985	105.9	186.9	50.7	148.5	64.7	136.7	259.2	50.7	1,003.3
1986	188.4	192.8	42.2	173.6	74.7	170.2	267.4	44.5	1,153.7
AVERAGE	102.5	112.0	37.9	94.5	60.3	66.9	104.0	36.8	[2]614.9

[1] Includes recharge from gaged and ungaged areas within the basin.
[2] Average totals may not be identical because of rounding procedures.

Table 3.--Calculated annual discharge from the Edwards aquifer by county, 1934-86 (in thousands of acre-feet)

Year	Kinney-Uvalde Counties	Medina County	Bexar County	Comal County	Hays County	Total	Total spring discharge	Total well discharge
1934	12.6	1.3	109.3	229.1	85.6	437.9	336.0	101.9
1935	12.2	1.5	171.8	237.2	96.9	519.6	415.9	103.7
1936	26.6	1.5	215.2	261.7	93.2	598.2	485.5	112.7
1937	28.3	1.5	201.8	252.5	87.1	571.2	451.0	120.2
1938	25.2	1.6	187.6	250.0	93.4	557.8	437.7	120.1
1939	18.2	1.6	122.5	219.4	71.1	432.8	313.9	118.9
1940	16.1	1.6	116.7	203.8	78.4	416.6	296.5	120.1
1941	17.9	1.6	197.4	250.0	134.3	601.2	464.4	136.8
1942	22.5	1.7	203.2	255.1	112.2	594.7	450.1	144.6
1943	19.2	1.7	172.0	249.2	97.2	539.3	390.2	149.1
1944	11.6	1.7	166.3	252.5	135.3	567.4	420.1	147.3
1945	12.4	1.7	199.8	263.1	137.8	614.8	461.5	153.3
1946	6.2	1.7	180.1	261.9	134.0	583.9	428.9	155.0
1947	13.8	2.0	193.3	256.8	127.6	593.5	426.5	167.0
1948	9.2	1.9	159.2	203.0	77.3	450.6	281.9	168.7
1949	13.2	2.0	165.3	209.5	89.8	479.8	300.4	179.4
1950	17.8	2.2	177.3	191.1	78.3	466.7	272.9	193.8
1951	16.9	2.2	186.9	150.5	69.1	425.6	215.9	209.7
1952	22.7	3.1	187.1	133.2	78.8	424.9	209.5	215.4
1953	27.5	4.0	193.7	141.7	101.4	468.3	238.5	229.8
1954	26.6	6.3	208.9	101.0	81.5	424.3	178.1	246.2
1955	28.3	11.1	215.2	70.1	64.1	388.8	127.8	261.0
1956	59.6	17.7	229.6	33.6	50.4	390.9	69.8	321.1
1957	29.0	11.9	189.4	113.2	113.0	456.5	219.2	237.3
1958	23.7	6.6	199.5	231.8	155.9	617.5	398.2	219.3
1959	43.0	8.3	217.5	231.7	118.5	619.0	384.5	234.5
1960	53.7	7.6	215.4	235.2	143.5	655.4	428.3	227.1
1961	56.5	6.4	230.3	249.5	140.8	683.5	455.3	228.2
1962	64.6	8.1	220.0	197.5	98.8	589.0	321.1	267.9
1963	51.4	9.7	217.3	155.7	81.9	516.0	239.6	276.4
1964	49.3	8.6	201.0	141.8	73.3	474.0	213.8	260.2
1965	46.8	10.0	201.1	194.7	126.3	578.9	322.8	256.1
1966	48.5	10.4	198.0	198.9	115.4	571.2	315.3	255.9
1967	81.1	15.2	239.7	139.1	82.3	557.4	216.1	341.3
1968	58.0	9.9	207.1	238.2	146.8	660.0	408.3	251.7
1969	88.5	13.6	216.3	218.2	122.1	658.7	351.2	307.5
1970	100.9	16.5	230.6	229.2	149.9	727.1	397.7	329.4
1971	117.0	32.4	262.8	168.2	99.1	679.5	272.7	406.8
1972	112.6	28.8	247.7	234.3	123.7	747.1	375.8	371.3
1973	96.5	14.9	273.0	289.3	164.3	838.0	527.6	310.4
1974	133.3	28.6	272.1	286.1	141.1	861.2	483.8	377.4
1975	112.0	22.6	259.0	296.0	178.6	868.2	540.4	327.8
1976	136.4	19.4	253.2	279.7	164.7	853.4	503.9	349.5
1977	156.5	19.9	317.5	295.0	172.0	960.9	580.3	380.6
1978	154.3	38.7	269.5	245.7	99.1	807.3	375.5	431.8
1979	130.1	32.9	294.5	300.0	157.0	914.5	523.0	391.5
1980	151.0	39.9	300.3	220.3	107.9	819.4	328.3	491.1
1981	104.2	26.1	280.7	241.8	141.6	794.4	407.3	387.1
1982	129.2	33.4	305.1	213.2	105.5	786.4	333.3	453.1
1983	107.7	29.7	277.6	186.6	118.5	720.1	301.6	418.5
1984	151.1	46.9	309.7	108.9	85.7	702.3	172.5	529.8
1985	156.9	59.2	295.5	200.0	144.9	856.5	334.0	522.5
1986	108.9	41.9	294.0	229.3	160.4	834.5	405.3	429.3

Table 4.--Calculated discharge from the Edwards aquifer by county and by water use, 1986

County	Springs	Municipal supply and military use	Irrigation	Industrial use	Domestic supply, stock, and miscellaneous use	Total (million gallons per day)	Total (thousand acre-feet per year)
	Million gallons per day						
Kinney	--	--	0.2	--	0.2	0.4	0.5
Uvalde	36.1	4.2	53.0	0.6	2.9	96.8	108.4
Medina	--	4.3	32.5	--	.6	37.4	41.9
Bexar	6.3	208.3	6.8	9.7	31.4	262.5	294.0
Comal	188.7	12.1	.3	3.0	.6	204.7	229.3
Hays	130.7	8.8	.2	1.7	1.8	143.2	160.4
Total (million gallons per day)	361.8	237.7	93.0	15.0	37.5	745.0	
Total (thousand acre-feet per year)	405.3	266.3	104.2	16.8	42.0		834.5

Bexar County supplied water for municipal and military use. Other wells in Bexar County and most of the large wells in Uvalde and Medina Counties supplied water for irrigation of about 85,500 acres during 1986. The remaining discharge, principally from wells in Bexar County, was for industrial use, domestic supply, and miscellaneous uses.

The calculated total discharge from wells and springs in 1986 was 834,500 acre-ft. The discharge from wells decreased from 522,500 acre-ft in 1985 to 429,300 acre-ft in 1986. In 1986, about 51 percent of the total discharge was from wells. Approximately 68 percent of this amount was discharged from wells in Bexar County, a decrease of 100,500 acre-ft from 1985. However, spring flow increased by about 21 percent. The total discharge from wells and springs in 1986 was about 3 percent less than in 1985

The annual difference between recharge and discharge for 1934-86 is shown in figure 4.

WATER LEVELS AND GROUND-WATER STORAGE

Water levels have been measured periodically in selected observation wells in the Edwards aquifer since 1929 to determine changes in ground-water storage. During the late 1930's, continuous water-level recorders were installed on some of the observation wells.

Water levels in wells fluctuate mainly in response to change in ground-water storage in the aquifer. When recharge is greater than discharge, water levels rise, and flow of the springs increases; when discharge is greater than recharge, water levels decline, and spring flow decreases. The accumulated difference between recharge and discharge and the annual average water level for the Bexar County observation well are shown in figure 5.

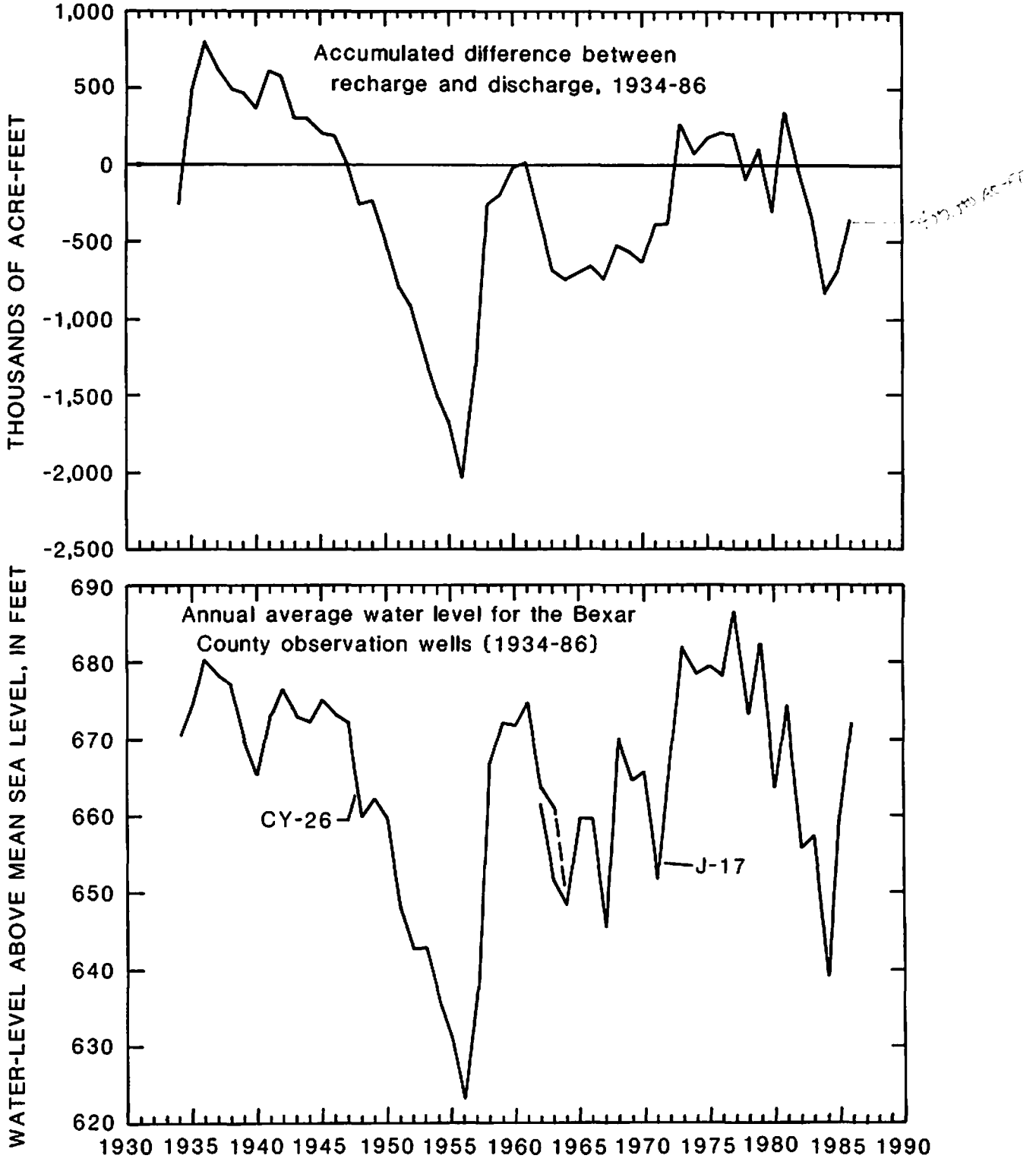

Figure 5.--Accumulated difference between recharge and discharge and annual average water level for the Bexar County observation well, 1934-86.

The annual high and low water levels recorded in five selected observation wells in the artesian part of the aquifer during 1983-86 are given in table 5. The general trend in 1986 was upward, reflecting above normal recharge for the months of May, June, and September through December. The water levels in observation wells in 1986 are given in Appendix A. Water Levels. The measured and recorded data show that the water levels during 1986 fluctuated near or above the midpoint when compared with historically recorded high and low measurements. The data also show that substantial increases occurred during the summer of 1986 due to above average precipitation. The volume in storage in the Edwards aquifer was above average during most of 1986.

In 1986, 17 wells were measured periodically, and continuous recorders were in operation on 19 other wells (fig. 3). Water levels in about 80 additional wells are measured annually in the San Antonio area by personnel of the Texas Water Development Board. Tabulations of current and historical water-level measurements are available on computer printout from the Texas Water Development Board in Austin, Texas. These records also are on file in the office of the Geological Survey in San Antonio, Texas.

Water-level measurements are reported in feet below land-surface datum (lsd) unless otherwise indicated. Water levels above land surface are indicated by a plus (+) sign. Water levels in wells equipped with recorders are reported every fifth day and at the end of the month (eom). If known, the altitude of the land surface above sea level is given in the well description.

WATER QUALITY FOR WELLS AND SPRINGS

The water-quality data-collection sites for the area, along with the sites for which data are given in Reeves (1976, 1978), are shown in figure 6. Figure 7 is an inset for the San Antonio area. Although some of the wells are no

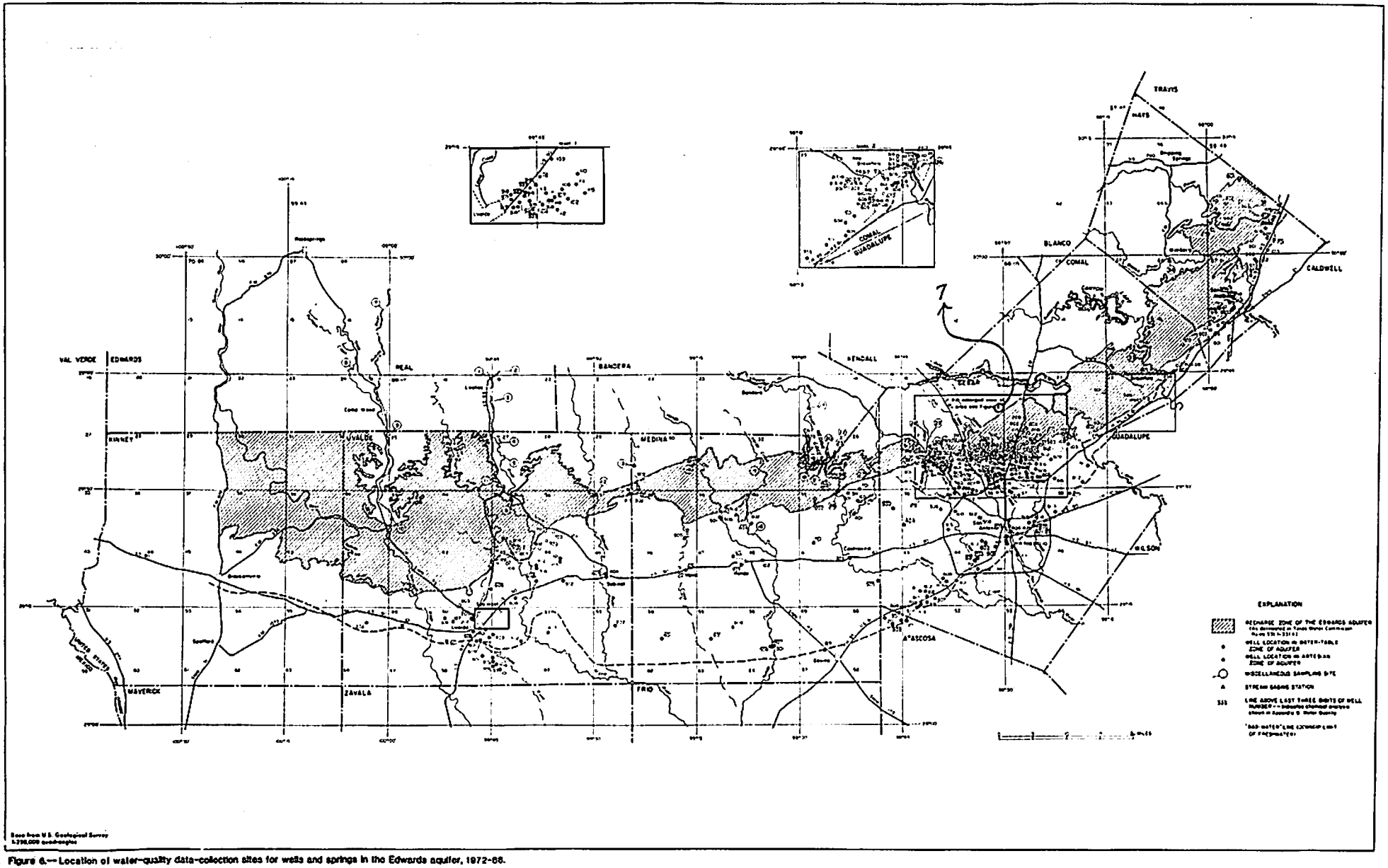

Figure 6.—Location of water-quality data-collection sites for wells and springs in the Edwards aquifer, 1972-88.

See Plate 4 located in back cover.

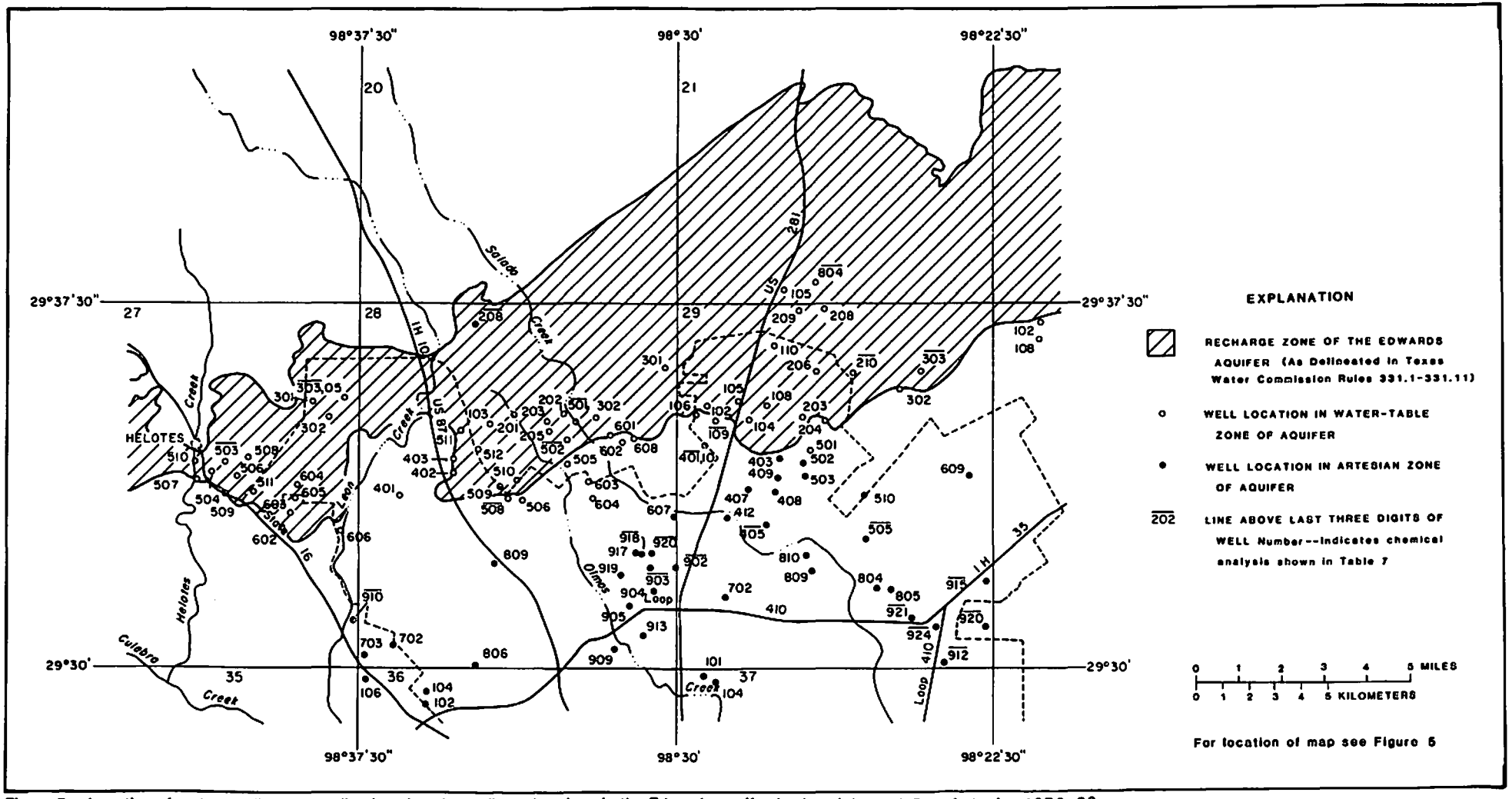

Figure 7.—Location of water-quality data-collection sites for wells and springs in the Edwards aquifer in the vicinty of San Antonio, 1972-86.

See Plate 5 located in back cover.

Table 5.--Annual high and low water levels in selected observation wells in the Edwards aquifer, 1983-86
(feet above sea level)

Well	1983		1984		1985		1986		Record high	Record low	Period of record
	High	Low	High	Low	High	Low	High	Low			
YP-69-50-302[1] H-5-1 (Uvalde Co.)	877.10	871.30	873.31	856.89	876.90	862.29	877.87	872.25	886.26 May 1977	811.0 Apr. 1957	1929-32, 1934-86
TD-68-41-301[1] J-1-82 (Medina Co.)	698.12	667.65	684.48	641.99	698.94	670.64	706.60	676.15	737.78 May 1977	622.3 Aug. 1956	1950-86
AY-68-37-203[1,2] J-17 (Bexar Co.)	669.92	642.11	656.97	623.17	674.50	644.05	685.59	649.81	696.5 Oct. 1973	[3]612.5 Aug. 1956	[4]1932-86
DX-68-23-302[1] G-49 (Comal Co.)	625.64	622.96	624.36	619.61	626.76	623.25	627.70	624.07	630.17 Apr. 1977	613.3 Aug. 1956	1948-86
LR-67-01-304[1] H-23 (Hays Co.)	589.72	560.36	582.53	544.27	591.44	561.75	595.05	579.66	595.05 Dec. 1986	540.4 July 1978	1937-86

[1] New State well number replaces old well number.
[2] Replaces well CY 26 and reflects the same water level; composite record of wells CY 26 and AY-68-37-203.
[3] Record low for well CY 26.
[4] Composite record of wells CY 26 and AY-68-37-203.

longer in use, additional samples can be collected at most of the sites in order to detect changes in water quality.

The results of the analyses of water samples that were collected from 88 wells and 3 springs in the Edwards aquifer during 1986 are given in Appendix B. Water Quality. Many of the samples were analyzed for more than 50 properties or constituents, most of which affect the suitability of the water for domestic use. The analyses included determinations of the concentrations of major inorganic constituents; minor elements, including heavy metals; and pesticides. Analyses of samples from the wells and springs in the freshwater zone of the aquifer show that the water is of a significantly better quality than the level established for public water systems (Appendix B. Water Quality).

For many purposes, the dissolved-solids concentration is a major limitation on the use of water. A general classification of water based on dissolved solids concentration follows (Winslow and Kister, 1956, p. 5):

Description	Dissolved-solids concentration (mg/L) 1/
Fresh	Less than 1,000
Slightly saline	1,000 to 3,000
Moderately saline	3,000 to 10,000
Very saline	10,000 to 35,000
Brine	More than 35,000

1/ Milligrams per liter (mg/L) is considered equivalent to parts per million (ppm) for water containing less than 7,000 mg/L dissolved solids.

A transitional interface exists between the freshwater zone and the downdip, salinewater zone. A 1,000 mg/L dissolved-solids-concentration contour de-

fines an arbitrary boundary between the freshwater zone and the salinewater zone. Locally, this contour is referred to as the "bad-water" line, which defines the farthest extent of potable water (Pavlicek and others, 1986).

The "bad-water" line is shown in figure 5. South and southeast of this line, the water from wells is slightly to moderately saline and is high in sulfate and chloride. Water from some wells north of the line and all wells south of the line is charged with hydrogen sulfide gas. Water from wells in the freshwater zone near the "bad-water" line generally is more mineralized and has been designated as the transition zone in a previous report by Garza (1962, p. 38). Also, higher concentrations of dissolved solids occur in the lower part of the aquifer in the transition zone and in the slightly to moderately saline zone south and southeast of the "bad-water" line. A well drilled in the transition zone near the "bad-water" line can encounter freshwater in the upper part of the aquifer and slightly saline water in the lower part (Reeves, 1971, p. 5).

Because of the concern that increased withdrawals from the aquifer may result in the encroachment of mineralized water into the freshwater zone of the aquifer, a program was begun in 1984 to resample wells along the "bad-water" line in order to detect changes in water quality as the head in the aquifer changes. As part of the water-quality program, about 30 samples are collected annually. The analyses will be used as historical reference data to determine changes in water quality if the head in the aquifer declines below the 1956 record low. Comparison of the analyses of samples collected from wells in 1986 with previous analyses indicates no significant change in the quality of water in the freshwater or transition zones.

Samples from 45 wells in the Edwards aquifer were analyzed for purgeable volatile organics in 1986 (Appendix B. Water Quality). The samples were analyzed for, but are not limited to, the following compounds on the U.S. Environmental Protection Agency Priority Pollutant list:

Volatile Organic Compounds

Benzene	1,2-Dichloroethane
Bromoform	1,1-Dichloroethylene
Carbon tetrachloride	1,2-trans-Dichloroethylene
Chlorobenzene	1,2-Dichloropropene
Chlorodibromomethane	Cis-1,3-Dichloropropene
Chloroethane	Trans-1,3-Dichloropropene
2-Chloroethyl vinyl ether	Ethylbenzene
Chloroform	Methylbromide
Dichlorobromomethane	Methylene chloride
Chloromethane	1,1,2,2-Tetrachlorethane
1,1-Dichloroethane	Tetrachloroethylene
Toluene	Trichloroethylene
1,1,1-Trichloroethane	Trichlorofluoromethane
1,1,2-Trichloroethane	Vinyl chloride

Analytical methods used for the determination of the organic compounds are described by Wershaw and others (1983) in "Methods for the Determination of Organic Substances in Water and Fluvial Sediments." Although concentrations for benzene, chloroform, methylene chloride, and toluene are given, these compounds are common solvents used in the laboratory, and their presence in a sample often can be traced to contamination of the sample by laboratory atmosphere.

The volatile organics are determined by purge and trap followed by gas chromatography/mass spectrometry. A water sample is purged with helium and the purgeable organic compounds are carried by the helium and trapped on a porous polymer trap. The trapped compounds are thermally desorbed into the gas chromatograph and detected by mass spectrometry.

Mass spectra are obtained for every compound that elutes from the gas chromatograph in sufficient concentration to yield a discernible peak. A computerized search is performed for the unknowns using a National Bureau of Standards computer library reference spectra of about 35,000 compounds. Although most common organic compounds can be identified by this method, most of the samples contain compounds that cannot be identified because the concentrations were too low or because reliable library matches could not be obtained.

The Environmental Protection Agency's proposed maximum contaminant levels (MCL's) for eight volatile organic compounds (VOC's) are given in Appendix B. Water Quality. The MCL's were promulgated in the Federal Register on November 13, 1985 (vol. 50, no. 219, p. 46880-46933) as revisions to the National Interim Primary Drinking Water Regulations. The MCL for a ninth VOC (tetrachloroethylene) will be determined after an appropriate public comment period. MCL's are enforceable standards and are set as close to the recommended maximum contaminant levels (RMCL's) as is feasible. MCL's are based upon treatment technologies, costs (affordability), and other feasible factors, such as availability, analytical methods, and treatment technology and costs for achieving various levels of removal.

RMCL's are non-enforceable health goals which are set at levels which would result in no known or anticipated adverse health effects with an adequate margin of safety. RMCL's for substances considered to be probable human carcino-

gens are set at zero, and RMCL's for substances not treated as probable human carcinogens are based upon chronic toxicity or other data. The final RMCL's for eight volatile synthetic organic chemicals in drinking water are:

Compound 1/	Recommended maximum contaminant level
Benzene	0
Vinyl chloride	0
Carbon tetrachloride	0
1,2-Dichloroethane	0
Trichloroethylene	0
1,1-Dichloroethylene	.007 mg/L
1,1,1-Trichloroethane	.20 mg/L
p-Dichlorobenzene	.75 mg/L

1/ The RMCL for tetrachloroethylene was proposed at zero. New toxicological data appear to confirm that zero is appropriate, but the public comment period was reopened for public comment on the new data.

In 1986, no volatile organic compounds were detected in samples from 10 of the 45 wells sampled. Samples from the other 35 wells contained one or more measurable volatile organic compounds. A sample from wells AY-68-28-502, AY-68-28-902, AY-68-28-918, AY-68-29-210, AY-68-29-915, AY-68-35-102, AY-68-36-908, AY-68-44-203, LR-67-01-302, and YP-69-51-104 contained trihalomethanes. The principal source of trihalomethanes in drinking water is chemical interaction of the chlorine (added for disinfection) with natural humic substances in raw water. Samples from 16 wells contained one or more volatile organic compounds with concentrations equal to or greater than 1 µg/L. Three compounds,

tetrachloroethylene, and trichloroethylene, and 1,2-transdichloroethylene, were detected in excess of 5 µg/L. Samples containing the highest concentration of volatile organic compounds were from wells in Bexar and Uvalde Counties.

Samples from wells YP-69-50-312, YP-69-50-316, YP-69-50-322, YP-69-50-323, YP-69-50-332, YP-69-50-333, YP-69-51-104, and YP-69-51-107 in Uvalde County contained tetrachloroethylene in excess of 5 µg/L.

Tritium occurs in the environment as a result of both natural and man-made processes. It is produced naturally by interaction of cosmic radiation with nitrogen and oxygen of the upper atmosphere and enters the hydrologic cycle as part of the water molecules in precipitation. Large amounts of man-made tritium were released to the atmosphere by thermonuclear test explosions during 1953-62. One tritium unit is equal to a concentration of 1 tritium atom per 10^{18} hydrogen atoms and equals 3.2 picocuries per liter (Pearson and others, 1975). A counting error, commonly reported as 1 standard deviation, is reported with each tritium analysis. This error is calculated so that the true tritium content of the sample has a 67-percent probability of being within the reported range (Maclay and others, 1980).

Tritium in ground water is not significantly affected by chemical processes. Its most important use is in distinguishing between water that entered an aquifer prior to 1953 (prior to thermonuclear testing in the atmosphere) and water in contact with the atmosphere after 1953. Pre-1953 water contains no tritium detectable by normal procedures; post-1953 water contains high levels of tritium (Drever, 1982). Pre-1953 water in the San Antonio area has been estimated at 6 to 8 tritium units (Thatcher, 1962).

Tritium levels of water from the Edwards aquifer have been determined periodically. Past records and information can be found in studies by Pearson and others (1975) and Maclay and others (1980). Results of most recent analyses are from wells and springs that have historical data. Repeat sampling of the same wells allows comparison of results for detecting changes in time. Appendix B. Water Quality gives results of four analyses of samples that were collected in 1985, but not analyzed until in 1986. This delay is not expected to affect the accuracy of the data. All data are referenced to the date of sampling.

SURFACE-WATER DATA

Records of discharge (or stage) of streams and of contents (or stage) of lakes and reservoirs, and records of chemical quality, water temperature, and suspended-sediment data for streams are published in Geological Survey water-supply papers or in Geological Survey water-data reports. These reports may be seen in the libraries of principal cities of the United States or in the offices of the Water Resources Division of the Geological Survey.

Records of streamflow, contents of reservoirs, measurements of spring flow, and water quality of streams and reservoirs for selected stations in the vicinity of the Edwards aquifer in the San Antonio area are given in Appendix C. Surface Water. These data are used in the calculation of the annual recharge to the aquifer or in the calculation of the annual discharge from the aquifer.

Water-quality data collected at stations upstream and immediately downstream from the recharge zone are used to evaluate the quality of recharge water for the aquifer. Data collected at gaging stations throughout the area provide streamflow and water-quality information for areas of different types of utilization and for floods of various magnitudes during all seasons of the year. Data-collection sites are shown in figure 3.

APPENDIX A. WATER LEVELS

Water levels in observation wells in the Edwards aquifer, 1986
(Water levels furnished by Edwards Underground Water District)

291342098475401. AL-68-50-201. Public supply artesian well in Edwards aquifer, diam. 10 to 8 in., depth 2,379 ft, cased to 2,304 ft. Lsd 724.14 ft above msl. Highest water level 14.12 ft below lsd, Nov. 12, 1973; lowest 87.62 ft below lsd, Jan. 12, 1957. Records available 1957-86.

Date	Water level
Jan. 31, 1986	40.14
Mar. 27	49.11

293345098405901. AY-68-27-512. Unused water-table well in Edwards aquifer, diam. 6 in., depth 502 ft, cased to 18 ft. Lsd 992.0 ft above msl. Highest water level 130.09 ft below lsd, Oct. 26, 1973; lowest 241.10 ft below lsd, July 6, 1978. Records available 1971-86. No records obtained during current year.

293530098331201. AY-68-28-204. Unused water-table well in Edwards aquifer, diam. 8 in., depth 547 ft, cased to 100 ft. Lsd 1,021 ft above msl. Highest water level 283.35 ft below lsd, Dec. 7, 1985; lowest 290.68 ft below lsd, May 26, 1986. Record established Aug. 14, 1985.

Highest 1986 water level 284.92 ft below lsd on Jan. 1; lowest 1986 water level 290.68 ft on May 26.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	285.14	285.25	286.73	289.39	289.93	.....	.....	.....	.....	.....	.....	.....
10	285.29	285.40	286.75	289.71	290.14	.....	.....	.....	.....	.....	.....	.....
15	285.36	285.65	287.41	290.01	290.29	.....	.....	.....	.....	.....	.....	.....
20	285.45	285.60	288.04	290.02	290.58	.....	.....	.....	.....	.....	.....	.....
25	285.50	286.00	288.14	290.29	290.66	.....	.....	.....	.....	.....	.....	.....
Eom	285.87	286.30	288.80	289.79	.....	.....	.....	.....	.....	.....	.....	.....

293522098291201. AY-68-29-103 (F-214). Unused water-table well in Edwards aquifer, diam. 10 in., depth 547 ft, cased to 100 ft. Lsd 952.67 ft above msl. Highest water level 224.80 ft below lsd, May 31, 1977; lowest 284.35 ft below lsd, Nov. 21, 1957. Records available 1957-86.

Highest 1986 water level 246.60 ft below lsd on Dec. 31; lowest 1986 water level 262.33 ft on May 25.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	255.94	255.85	256.90	258.49	260.92	257.21	254.09	255.75	258.03	257.91	254.17	253.45
10	255.67	255.95	257.19	258.70	261.23	257.04	253.75	256.20	257.95	258.50	254.55	252.90
15	255.71	256.35	257.26	259.74	261.46	256.93	254.34	256.48	258.36	255.69	254.49	252.19
20	255.47	256.36	257.89	259.71	261.88	254.87	254.65	256.87	258.70	255.80	254.44	251.47
25	255.54	256.68	258.24	260.60	262.33	254.27	254.86	257.15	258.35	254.80	254.37	247.44
Eom	255.92	256.84	258.73	260.87	260.16	254.09	254.70	257.76	258.06	254.45	254.32	246.60

293215098274601. AY-68-29-701 (F-172). Unused artesian well in Edwards aquifer, diam. 10 in., depth 500 ft, casing information not available. Lsd 778.8 ft above msl. Highest water level 74.84 ft below lsd, Oct. 21, 1973, lowest 165.10 ft below lsd, Aug. 17, 1956. Records available 1952-86.

Highest 1986 water level 99.35 ft below lsd on June 14; lowest 1986 water level 126.05 ft below lsd on Apr. 30.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.... .	102.11	108.34	115.95	123.64	101.90	103.12	.....	120.28	.....	a101.43	.....
10	.....	101.75	111.02	116.60	122.97	99.20	106.74	.....	116.30	113.95	101.47	.....
15	105.09	102.46	111.35	119.37	122.80	99.54	.....	.....	117.38	.... .	.....	.....
20	104.28	105.26	.....	119.66	120.44	.....	.....	.....	116.83	.....	.....	.....
25	105.55	107.69	.....	125.24	124.05	. ....	.....	.....	117.80	.....	.....	.....
Eom	.....	106.96	115.42	b126.05	112.84	.....	122.01	.....	.....	.....	101.09	.....

293617098194001. AY-68-30-211 (G-69). Unused artesian well in Edwards aquifer, diam. 6 in., depth 777 ft, cased to 230 ft. Lsd 776.45 ft above msl. Highest water level 85.70 ft below lsd, Oct. 16, 1973; lowest 154.16 ft below lsd, Aug. 3, 1984. Records available 1964-86.

Highest 1986 water level 102.99 ft below lsd on Dec. 31; lowest 1986 water level 130.44 ft below lsd on Aug. 20.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	112.43	112.54	115.29	121.22	127.36	114.16	112.50	126.99	126.17	124.44	112.63	111.88
10	112.70	111.99	116.33	121.68	127.44	112.11	114.67	127.54	123.66	121.87	112.20	111.73
15	112.90	112.29	116.47	123.83	127.11	111.59	116.10	128.81	123.43	116.56	112.16	110.87
20	112.55	113.10	117.22	124.19	125.66	109.61	118.38	130.44	124.18	115.59	112.32	109.86
25	112.80	113.85	118.95	128.06	128.26	109.14	121.95	127.89	123.68	113.85	111.95	104.16
Eom	113.49	114.58	120.61	128.86	122.16	110.15	125.60	128.09	123.85	112.99	111.50	102.99

See footnotes at end of table.

292845098255401. AY-68-37-203 (J-17)[c/]. Unused artesian well in Edwards aquifer, diam. 6 in., depth 874 ft, cased to 491 ft. Lsd 730.81 ft above msl. Highest water level 34.29 ft below lsd, Oct. 22, 1973; lowest 110.05 ft[d/] below lsd, Aug. 17, 1956. Records available 1932-86[e/].

Highest 1986 water level 45.22 ft below lsd on Dec. 31; lowest 1986 water level 81.00 ft below lsd on Aug. 21.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	57.65	57.84	61.87	69.22	76.70	57.62	57.78	77.14	73.54	71.61	55.76	55.61
10	58.09	57.86	63.28	69.72	76.57	54.59	61.34	77.36	69.64	67.49	55.52	55.50
15	58.39	57.44	63.15	72.80	75.67	54.54	62.85	79.03	69.79	60.06	55.45	54.45
20	57.70	58.89	64.11	72.91	73.44	51.71	65.94	81.05	70.80	58.86	56.01	52.84
25	58.12	59.71	66.59	78.46	77.80	51.80	71.20	76.46	70.40	56.66	55.62	46.62
Eom	59.33	60.81	68.64	79.53	68.19	53.81	75.94	76.71	70.82	55.83	54.87	45.22

294720098030001. DX-68-16-801 (G-25). Domestic water-table well in Edwards aquifer, diam. 6 in., depth 210 ft, casing information not available. Lsd 752.71 ft above msl. Highest water level 128.19 ft below lsd, June 22, 1981; lowest 169.56 ft below lsd, Oct. 1, 1956. Records available 1936-86.

Date	Water level	Date	Water level
Feb. 4, 1986	138.82	Mar. 30, 1986	141.92
Feb. 27	139.77	Apr. 28	143.83

294310098080001. DX-68-23-302 (G-49). Unused water-table well in Edwards aquifer, diam. 8 to 3 in., depth 230 ft, cased to 24 ft. Lsd 642.7 ft above msl. Highest water level 12.53 ft below lsd, Apr. 20, 1977; lowest 29.36 ft below lsd, Aug. 21, 1956. Records available 1948-86.

Highest 1986 water level 15.00 ft below lsd on Dec. 22; lowest 1986 water level 18.63 ft below lsd on Aug. 21.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	16.11	16.17	.....	17.33	18.28	16.89	16.29	18.10	18.26	17.95	16.55	16.38
10	16.14	16.11	16.56	17.40	18.32	16.55	16.52	18.20	17.99	17.74	16.47	16.38
15	16.15	16.14	16.66	17.61	18.26	16.37	16.71	18.40	17.90	17.16	16.47	15.99
20	16.13	16.20	16.82	17.78	18.15	16.20	16.98	18.64	17.85	16.97	16.45	16.16
25	16.18	16.28	16.98	18.19	18.36	16.08	17.37	18.43	17.87	16.73	16.40	15.16
Eom	16.24	16.36	17.18	18.39	17.50	16.10	17.83	18.44	17.89	16.62	16.33	15.05

293855098125901. DX-68-23-701 (H-20). Domestic artesian well in Edwards aquifer, diam. 4 in., depth 300 ft, cased to 300 ft. Lsd 684.45 ft above msl. Highest water level 17.84 ft below lsd, Oct. 29, 1973; lowest 70.07 ft below lsd, Oct. 2, 1956. Records available 1934, 1937-86.

Date	Water level	Date	Water level
Feb. 4, 1986	33.57	Mar. 27, 1986	35.73
Feb. 28	34.59	Apr. 29	45.28

293636098190901. DX-68-30-208 (H-36). Unused artesian well in Edwards aquifer, diam. 8 in., depth 292 ft, casing slotted 272-292 ft. Lsd 797.81 ft above msl. Highest water level 111.26 ft below lsd, Oct. 17, 1973; lowest 184.45 ft below lsd, Aug. 18, 1956. Records available 1945, 1955-86.

Highest 1986 water level 124.65 ft below lsd on Dec. 23; lowest 1986 water level 151.34 ft below lsd on Aug. 20.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	134.06	134.35	136.88	142.67	148.82	136.48	134.27	147.97	147.95	146.18	134.96	134.04
10	134.38	133.90	137.83	143.08	148.84	134.61	136.19	148.70	145.48	143.83	134.65	133.98
15	134.55	134.14	138.16	144.98	148.27	133.93	137.65	149.80	145.18	138.95	134.46	133.06
20	134.35	134.78	138.78	145.61	147.18	132.21	139.67	151.34	145.66	138.00	134.58	132.19
25	134.59	135.49	140.21	148.85	149.32	131.66	142.87	149.51	145.26	136.34	134.16	125.62
Eom	135.15	136.17	142.07	150.01	144.05	132.31	146.35	149.56	145.60	135.36	133.66	125.37

300025097533501. LR-58-57-902 (E-65). Domestic water-table well in Edwards aquifer, diam. 6 in., depth 450 ft, casing information not available. Lsd 821.55 ft above msl. Highest water level 179.86 ft below lsd, May 25, 1977; lowest 247.63 ft below lsd, Aug. 29, 1956. Records available 1943, 1950-52, 1954, 1956, 1958, 1961, 1971-86.

Date	Water level	Date	Water level
Jan. 29, 1986	196.40	Mar. 26, 1986	199.97
Feb. 27	197.68	Apr. 28	204.99

300510097504001. LR-58-58-101 (E-36). Domestic artesian well in Edwards aquifer, diam. 5 in., depth 244 ft, cased to 230 ft. Lsd 707.23 ft above msl. Highest water level 53.05 ft below lsd, Nov. 29, 1973; lowest 167.38 ft below lsd, Aug. 2, 1984. Records available 1937-86.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1986	83.28	Apr. 28, 1986	107.36	July 30, 1986	108.64	Nov. 4, 1985	96.98
Feb. 27	88.30	May 28	88.13	Sept. 2	98.99	Dec. 1	87.18
Mar. 26	92.30	July 1	92.26	Sept. 29	107.72	Dec. 30	73.19

See footnotes at end of table.

295909097523301. LR-67-01-304 (LR-67-02-102) (H-23). Unused artesian well in Edwards aquifer, diam. 5 in., depth 372 ft, cased to 340 ft. Lsd 718.0 ft above msl. Highest water level 122.95 ft below lsd, Dec. 30, 1986; lowest 177.60 ft below lsd, July 10, 1978. Records available 1937-86.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1986	124.06	Apr. 28, 1986	131.43	July 30, 1986	141.76	Nov. 4, 1986	126.93
Feb. 27	124.57	May 28	126.76	Sept. 2	134.39	Dec. 1	124.90
Mar. 26	128.21	July 1	124.49	Sept. 29	138.34	Dec. 30	122.95

295344097575001. LR-67-01-701 (H-75a). Domestic artesian well in Edwards aquifer, diam. 6 in., depth and casing information not available. Lsd 734.40 ft above msl. Highest water level 150.63 ft below lsd, June 22, 1981; lowest 181.35 ft below lsd, Apr. 29, 1985. Records available 1954-86.

Date	Water level
Feb. 27, 1986	159.00

295443097554201. LR-67-01-809 (H-49). Domestic water-table well in Edwards aquifer, diam. 34 in., depth and casing information not available. Highest water level 19.73 ft below lsd, June 17, 1981; lowest 27.40 ft below lsd, Sept. 11-18, 16, 26, 28-29, Oct. 3, 6, 1984. Records available 1937, 1950, 1954-55, 1980-86.

Highest 1986 water level 21.56 ft below lsd on Dec. 31; lowest 1986 water level 25.41 ft below lsd on May 7.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	22.69	23.70	24.44	24.92	25.38	23.07	22.51	23.86	24.74	25.15	24.27	24.76
10	22.85	23.83	24.56	25.01	24.43	22.65	22.70	24.02	24.79	25.17	24.25	24.80
15	23.04	23.97	24.66	25.09	24.44	22.44	22.93	24.15	24.80	24.51	24.40	24.55
20	23.19	24.08	24.80	25.12	23.90	22.20	23.12	24.33	24.89	24.53	24.50	24.28
25	23.38	24.24	24.90	25.21	23.96	22.22	23.27	24.43	24.95	24.32	24.58	22.03
Eom	23.64	24.33	24.91	25.33	23.71	22.30	23.65	24.65	25.03	24.30	24.63	21.56

295103097583301. LR-67-09-102 (LR-68-16-601) (H-95). Unused artesian well in Edwards aquifer, diam. 6 in., depth 194 ft, casing information not available. Lsd 696.80 ft above msl. Highest water level 108.48 ft below lsd, June 1, 1976; lowest 125.30 ft below lsd, Apr. 11, 1978. Records available 1937-57, 1959-72, 1974-86.

Date	Water level	Date	Water level
Feb. 4, 1986	116.71	Mar. 26, 1986	117.88
Feb. 27	117.18	Apr. 28	118.46

295035097585501. LR-67-09-110. SWT farm well. Unused artesian well in Edwards aquifer, diam. 7 in., depth 634 ft, cased to 141.50 ft. Lsd 685.00 ft above msl. Highest water level 92.17 ft below lsd, June 15, 1975; lowest 102.29 ft below lsd, Oct. 6, 1984. Records available 1973-86.

Highest 1986 water level 94.59 ft below lsd on Dec. 31; lowest 1986 water level 99.59 ft below lsd on May 7.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	96.06	97.41	98.36	99.08	99.58	97.34	96.88	98.17	99.07	99.45	98.28	98.87
10	96.32	97.59	98.49	99.15	99.27	96.86	97.02	98.35	99.15	99.51	98.31	98.92
15	96.59	97.75	98.62	99.23	99.15	96.70	97.25	98.47	99.14	98.37	98.43	98.63
20	96.80	97.88	98.78	99.31	98.85	96.65	97.40	98.64	99.24	98.28	98.53	98.34
25	97.06	98.10	98.93	99.42	98.87	96.66	97.65	98.78	99.30	98.23	98.59	95.42
Eom	97.36	98.20	99.06	99.46	98.34	96.75	97.96	98.96	99.36	98.22	98.68	94.59

292519099531701. TD-68-33-604 (J-1-41). Domestic artesian well in Edwards aquifer, diam. 6 in., depth 641 ft, cased to 58 ft. Lsd 846.00 ft above msl. Highest water level 96.90 ft below lsd, Apr. 28, 1977; lowest 217.74 ft below lsd, Aug. 31, 1956. Records available 1930, 1934-46, 1951-52, 1954-86.

Date	Water level	Date	Water level
Jan. 31, 1986	140.20	Mar. 27, 1986	150.99
Feb. 28	142.14	May 1	166.74

292110098530001. TD-68-41-301 (J-1-82). Unused artesian well in Edwards aquifer, diam. 6 in., depth 712 ft, casing information not available. Lsd 756.80 ft above msl. Highest water level 19.02 ft below lsd, May 1, 1977; lowest 134.53 ft below lsd, Aug. 18, 1956. Records available 1950-86.

Highest 1986 water level 52.20 ft below lsd on June 25; lowest 1986 water level 82.65 ft below lsd on Apr. 29.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	58.30	61.12	69.77	79.66	61.05	57.35	73.67	72.10	69.15	56.10	54.85
10	58.44	57.57	62.54	70.41	79.49	56.59	59.50	74.15	68.89	.....	55.66	.....
15	58.32	57.62	63.63	73.11	77.06	56.19	61.30	75.30	68.34	.....	55.23	.....
20	57.90	58.42	64.44	74.61	74.91	53.88	63.60	76.30	68.95	.....	55.20	.....
25	a58.06	.....	65.93	80.25	81.62	52.20	67.25	74.88	68.40	.....	54.95	.....
Eom	b58.86	b60.42	68.46	82.03	71.82	53.40	71.35	74.12	68.82	.....	54.36	.....

See footnotes at end of table.

292618099165901. TD-69-38-601 (I-2-104). Unused water-table well in Edwards aquifer, diam. 7 in., depth 538 ft, cased to 74 ft. Lsd 1,008.3 ft above msl. Highest water level 73.41 ft below lsd, Sept. 1, 1979; lowest 274.60 ft below lsd, Sept. 21, 1957. Records available 1957-86.

Highest 1986 water level 138.87 ft below lsd on Dec. 31; lowest 1986 water level 151.82 ft below lsd on May 31.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	148.52	147.61	147.76	148.73	150.48	150.43	147.68	148.11	149.08	150.33	145.07	143.30
10	148.49	147.72	147.80	148.94	150.30	150.62	147.70	148.29	149.10	149.26	144.70	142.86
15	148.29	147.66	147.92	149.29	150.69	150.65	147.80	148.40	149.40	146.33	144.37	142.06
20	148.13	147.52	148.30	149.50	151.02	147.16	147.75	148.60	149.64	146.60	144.04	141.32
25	148.14	147.67	148.36	149.85	151.36	147.63	147.85	148.82	149.77	145.84	143.65	139.99
Eom	148.00	147.82	148.57	150.20	151.82	147.64	147.97	149.02	150.02	145.42	143.30	138.87

291550099211001. TD-69-46-701 (I-4-12). Domestic artesian well in Edwards aquifer, diam. 8 in., depth 1,303 ft, casing information not available. Lsd 950.00 ft above msl. Highest water level 132.42 ft below lsd, Apr. 28, 1977; lowest 291.37 ft below lsd, Aug. 31, 1956. Records available 1930, 1934, 1937-38, 1940-86.

Date	Water level	Date	Water level
Jan. 29, 1986	192.58	Mar. 26, 1986	200.70
Feb. 27	193.88	May 1	212.24

292209099094801. TD-69-47-302 (I-3-148). Unused artesian well in Edwards aquifer, diam. 5 in., depth 1,410 ft, casing information not available. Lsd 956.1 ft above msl. Highest water level 182.26 ft below lsd, May 18, 1977; lowest 294.74 ft below lsd, June 15, 1971. Records available 1960-86.

Highest 1986 water level 215.98 ft below lsd on Dec. 31; lowest 1986 water level 257.92 ft below lsd on May 9.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	234.88	234.66	237.88	247.67	.....	237.40	235.78	250.89	247.55	245.61	.....	227.27
10	234.72	233.76	240.00	247.65	254.99	234.07	237.38	250.57	244.68	.....	.....	226.83
15	234.52	233.14	241.17	251.60	252.47	233.60	239.25	251.76	244.34	.....	.....	226.15
20	234.02	234.94	241.64	.....	.....	230.42	242.00	252.77	244.77	.....	.....	224.73
25	234.28	236.12	243.63	.....	.....	228.78	245.79	250.11	244.99	.....	.....	218.57
Eom	235.12	236.78	245.93	.....	.....	230.56	249.05	.....	244.92	.....	.....	215.98

292045099081801. TD-69-47-306 (I-3-134). Unused artesian well in Edwards aquifer, diam. 12 in., depth 1,600 ft, casing to 1,485 ft. Lsd 887.5 ft above msl. Highest water level 149.11 ft below lsd, Dec. 31, 1986; lowest water level 179.98 ft below lsd, Oct. 4, 1986. Record established Sept. 8, 1986.

Highest 1986 water level 149.11 ft below lsd on Dec. 31; lowest 1986 water level 179.98 ft below lsd on Oct. 4.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	.....	.....	.....	.....	.....	.....	.....	.....	179.45	162.65	160.50
10	.....	.....	.....	.....	.....	.....	.....	.....	178.22	175.60	161.95	160.15
15	.....	.....	.....	.....	.....	.....	.....	.....	177.90	169.45	161.25	159.43
20	.....	.....	.....	.....	.....	.....	.....	.....	178.95	167.15	160.90	158.00
25	.....	.....	.....	.....	.....	.....	.....	.....	178.79	164.07	160.66	152.10
Eom	.....	.....	.....	.....	.....	.....	.....	.....	179.05	162.15	160.20	149.11

292110099054501. TD-69-48-102 (I-3-146). Irrigation artesian well in Edwards aquifer, diam. 12 in., depth 1,654 ft, cased to 1,320 ft. Lsd 867.2 ft above msl. Highest water level 95.26 ft below lsd, Apr. 28, 1977; lowest 257.36 ft below lsd, Aug. 14, 1963. Records available 1958-86.

Date	Water level	Date	Water level
Jan. 31, 1986	147.64	Mar. 27, 1986	159.50
Feb. 28	149.59	May 1	171.76

292339099401501. YP-69-35-602 (YP-69-35-501) (H-2-23). Unused water-table well in Edwards aquifer, diam. 7 in., depth 237 ft, cased to 57 ft. Lsd 1,170.8 ft above msl. Highest water level 23.52 ft below lsd, July 18, 1976; lowest 69.15 ft below lsd, Jan. 28, 1964. Records available 1957-86.

Highest 1986 water level 48.75 ft below lsd on June 20; lowest 1986 water level 65.62 ft below lsd on Apr. 28.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	60.86	62.79	64.22	64.96	64.94	55.86	.....	.....	.....	.....	.....	.....
10	61.45	62.98	64.34	65.06	63.86	53.77	.....	.....	.....	.....	.....	.....
15	62.00	63.53	64.49	65.00	64.81	55.36	.....	.....	.....	.....	.....	.....
20	62.14	63.51	64.75	65.05	64.52	48.75	.....	.....	.....	.....	.....	.....
25	62.48	63.89	64.77	65.43	65.56	50.82	.....	.....	.....	.....	.....	.....
Eom	63.11	64.11	64.91	64.03	60.08	.....	.....	.....	.....	.....	.....	.....

See footnotes at end of table.

292711099282201. YP-69-37-402. Unused water-table well in Edwards aquifer, diam. 6 in., depth 694 ft, cased to 233 ft. Lsd 1,158 ft above msl. Highest water level 256.05 ft below lsd, July 21, 1977; lowest 385.67 ft below lsd, Dec. 25, 1984. Records available 1974-86.

Highest 1986 water level 324.05 ft below lsd on Dec. 24; lowest 1986 water level 345.26 ft below lsd on June 12.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	337.04	336.82	.....	340.05	343.20	345.10	340.56	.....	343.52	345.07	336.15	328.65
10	336.96	337.07	337.97	340.53	343.85	345.16	340.14	.....	343.53	344.77	334.63	327.63
15	336.77	337.10	338.41	341.21	343.83	345.07	340.21	.....	343.85	343.35	333.16	326.48
20	336.69	337.07	339.07	341.52	344.29	344.25	340.14	.....	344.13	341.54	332.04	325.25
25	336.82	337.45	339.11	342.07	344.74	342.59	340.39	.....	344.28	339.79	330.55	.....
Eom	336.90	337.74	339.57	342.68	345.10	341.26	340.79	343.62	344.65	337.76	329.31	.....

291633099413301. YP-69-43-804. Irrigation artesian well in Edwards aquifer, diam. 16 in., depth 967 ft, cased to 365 ft. Lsd 975.00 ft above msl. Highest water level 80.28 ft below lsd, May 26, 1977; lowest 305.60 ft below lsd, Dec. 7, 1971. Records available 1971-86.

Date	Water level	Date	Water level
Jan. 29, 1986	157.75	Mar. 27, 1986	196.01
Feb. 27	165.20	Apr. 24	187.22

291909099281001. YP-69-45-401 (I-4-35) (I-4-4). Unused artesian well in Edwards aquifer, diam. 10 in., depth 1,476 ft, cased to 937 ft. Lsd 954.04 ft above msl. Highest water level 118.64 ft below lsd, May 20, 1977; lowest 290.03 ft below lsd, Oct. 13, 1956. Records available 1956-86.

Highest 1986 water level 167.60 ft below lsd on Dec. 31; lowest 1986 water level 205.97 ft below lsd on Apr. 29.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	187.41	186.21	188.69	196.00	202.96	195.21	193.29	200.38	197.27	196.43	181.00	176.64
10	f186.85	186.00	190.91	195.45	202.44	192.32	193.03	199.70	196.12	194.67	179.43	136.13
15	186.42	186.22	192.13	196.90	200.86	191.40	195.00	199.45	195.70	190.25	178.21	175.40
20	186.11	186.41	192.31	199.51	200.06	188.70	198.21	199.22	195.90	187.00	177.38	174.11
25	186.25	187.23	193.71	204.41	205.10	186.43	197.70	198.90	195.68	184.40	176.82	171.00
Eom	186.78	187.71	195.63	204.82	199.89	187.95	198.93	198.18	196.00	182.24	176.35	167.60

291426099510201. YP-69-50-101 (H-4-6). Stock artesian well in Edwards aquifer, diam. 8 in., depth 100 ft, casing information not available. Lsd 950.6 ft above msl. Highest water level 48.15 ft below lsd, May 29, 1980; lowest 126.17 ft below lsd, Mar. 14, 1957. Records available 1929-33, 1935-42, 1944-86

Date	Water level	Date	Water level
Jan. 29, 1986	59.64	Mar. 26, 1986	62.06
Feb. 26	62.17	May 1	63.66

291414099475301. YP-69-50-202. Unused artesian well in Edwards aquifer, diam. 6 in., depth 137 ft, cased 65 ft. Lsd 928.00 ft above msl. Highest water level 33.10 ft below lsd, Apr. 6, 1977; lowest water level 115.02 ft below lsd, Mar. 11, 1957. Records available 1956-86.

Date	Water level	Date	Water level
Jan. 29, 1986	47.22	Mar. 26, 1986	50.00
Feb. 27	49.39	Apr. 24	50.27

291237099471201. YP-69-50-302 (H-5-1). Unused artesian well in Edwards aquifer, diam. 12 in., depth 350 ft, casing information not available. Lsd 904.9 ft above msl. Highest water level 18.64 ft below lsd, May 23, 1977; lowest 93.90 ft below lsd, Apr. 13, 1957. Records available 1929-32, 1934-86.

Highest 1986 water level 27.03 ft below lsd on Dec. 31; lowest 1986 water level 32.65 ft below lsd on Aug. 19, 20.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	28.00	28.11	30.20	30.46	31.34	31.34	31.06	32.52	31.86	31.70	29.30	28.16
10	27.91	28.47	30.35	30.35	31.37	31.12	31.22	32.60	.....	31.25	29.06	27.91
15	27.82	28.89	30.35	30.37	31.25	31.01	31.42	32.64	.....	30.72	28.85	27.70
20	27.75	29.35	30.36	30.47	31.28	30.85	31.75	32.65	.....	30.45	28.63	27.56
25	27.77	29.79	30.47	30.78	31.86	30.60	32.00	32.30	.....	30.00	28.40	27.25
Eom	27.96	30.01	30.63	31.32	31.78	30.63	32.27	32.05	b31.77	29.60	28.20	27.03

291127099501201. YP-69-50-403 (H-4-60). Unused artesian well in Edwards aquifer, diam. 10 in., depth 536 ft, casing information not available. Lsd 918.9 ft above msl. Highest water level 39.19 ft below lsd, May 26, 1977; lowest 111.31 ft below lsd, Feb. 13, 1957. Records available 1954, 1957, 1961-82, 1984-86.

Date	Water level	Date	Water level
Jan. 1, 1986	46.74	Mar. 26, 1986	50.54
Feb. 26	49.41	May 1	50.73

See footnotes at end of table.

291025099442701. YP-69-51-406 (H-5-259). Unused water-table well in Leona Formation, diam. 14 in., depth 74 ft, casing information not available. Lsd 874.9 ft above msl. Highest water level 23.25 ft below lsd, June 6, 1979; lowest 61.38 ft below lsd, Mar. 13, 1957. Records available 1956-57, 1966-86.

Highest 1986 water level 27.58 ft below lsd on June 6, 7; lowest 1986 water level 34.86 ft[f/] below lsd on July 31.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	28.73	31.06	32.28	30.82	30.74	27.59	31.35	33.33	33.15	31.79	28.40	28.76
10	28.48	32.03	31.83	30.30	29.83	27.65	f31.79	33.18	31.86	30.27	28.15	28.73
15	28.10	32.06	31.66	f29.75	29.13	27.98	33.28	.....	31.15	28.54	28.10	28.44
20	28.15	f31.98	31.23	29.87	28.83	27.87	32.58	....	31.65	28.37	28.10	28.22
25	f29.32	f32.21	30.94	31.14	30.37	27.77	f33.57	.....	30.90	28.23	28.57	27.84
Eom	30.22	f32.91	f30.98	31.35	29.28	f28.87	f34.86	32.34	32.06	28.26	28.51	27.66

292344100002701. YP-70-40-901 (G-3-19). Unused water-table well in Edwards aquifer, diam. 7 in., depth 140 ft, cased to 70 ft. Lsd 1,122.0 ft above msl. Highest water level 38.85 ft below lsd, Sept. 15, 1974; lowest 42.95 ft below lsd, Sept. 19, 1964. Records available 1957-86.

Highest 1986 water level 42.07 ft below lsd on June 22; lowest 1986 water level 42.61 ft below lsd on May 22, 23.

Highest water level for the day, from recorder graph, 1986

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	42.53	42.53	42.53	42.52	42.58	42.30	.....	.....	.....	.....	.....	.....
10	42.52	42.49	42.50	42.54	42.57	42.33	.....	.....	.....	.....	.....	.....
15	42.53	42.51	42.53	42.57	42.58	42.32	.....	.....	.....	.....	.....	.....
20	42.53	42.52	42.52	42.57	42.60	42.11	.....	.....	.....	.....	.....	.....
25	42.53	42.50	42.54	42.55	42.59	42.16	.....	.....	.....	.....	.....	.....
Eom	42.57	42.53	42.54	42.58	42.39	.....	.....	.....	.....	.....	.....	.....

291412100033001. YP-70-56-201 (G-6-4). Domestic water-table well in Austin Chalk, diam. 6 in., depth 120 ft, casing information not available. Lsd 1,008.00 ft above msl. Highest water level 34.00 ft below lsd, Dec. 1, 1976; lowest 77.78 ft below lsd, Apr. 8, 1953. Records available 1937-86.

Date	Water level
Jan. 29, 1986	47.36
Feb. 26	48.03
May 1, 1986	49.86

a Estimated.
b Measured.
c Replaces well CY 26 and reflects the same water level; composite record of wells CY 26 and AY-68-37-203.
d Record low for well CY 26. Equivalent water level for AY-68-37-203 would be 118.30 ft below lsd.
e Composite record of wells CY 26 and AY-68-37-203.
f Nearby well pumping.

APPENDIX B. WATER QUALITY

Water-quality data for wells and springs in the Edwards aquifer, 1986

BEXAR COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARDNESS (MG/L AS CACO3)
AY-68-21-804	06-11-86	1240	279.00	60	10	523	6.90	24.0	255	280
	08-14-86	1510	279.00	50	10	540	6.90	24.0	257	280
AY-68-27-303	06-20-86	1350	354.00	60	15	530	7.10	23.0	255	270
	08-14-86	1220	354.00	40	15	540	7.00	23.0	253	270
AY-68-27-503	06-12-86	1215	375.00	120	20	520	7.20	22.0	232	260
	08-14-86	1030	375.00	40	15	550	7.10	22.0	261	280
AY-68-27-910	08-20-86	1405	400.00	35	10	626	6.90	22.0	277	290
AY-68-28-208	08-27-86	1530	326.00	35	250	584	7.10	23.5	262	320
AY-68-28-501	03-10-86	1405	468.00	365	100	525	7.00	22.5	249	270
AY-68-28-502	03-10-86	1535	506.00	25	115	552	7.10	22.5	259	280
	1985 SHOWS 396'									
	08-21-86	1445	506.00	165	125	565	6.90	24.0	265	270
AY-68-28-508	02-20-86	0945	464.00	165	150	454	7.30	22.5	192	230
AY-68-28-902	07-17-86	1135	811.00	35	935	633	7.00	22.5	288	300
AY-68-28-903	08-06-86	1115	762.00	65	3500	849	6.80	22.0	399	390
AY-68-28-918	08-12-86	1135	400.00	35	15	1040	6.60	23.0	471	470
AY-68-28-920	07-15-86	1400	360.00	--	--	919	6.90	23.0	417	430
AY-68-29-109	04-27-86	1305	460.00	305	250	582	6.80	23.0	270	320
AY-68-29-210	06-11-86	1445	329.00	60	15	552	7.00	23.0	263	280
AY-68-29-303	02-20-86	1445	527.00	105	940	479	7.20	22.0	205	250
AY-68-29-401	04-27-86	1210	517.00	1440	650	551	7.10	23.5	267	290
AY-68-29-405	03-17-86	1425	395.00	40	100	639	6.90	23.5	304	320
AY-68-29-505	08-21-86	1000	807.00	120	700	633	6.80	22.0	281	290
AY-68-29-912	08-28-86	1105	630.00	35	1000	474	7.10	25.0	208	220
AY-68-29-915	08-21-86	1055	824.00	55	5670	495	7.20	24.5	215	230
AY-68-29-920	08-20-86	1000	655.00	240	980	479	7.10	24.0	208	210
AY-68-29-921	08-20-86	1155	585.00	25	25	483	7.10	24.0	208	230
AY-68-29-924	08-22-86	0930	577.00	--	--	270	7.50	24.0	89	100
AY-68-34-302	06-06-86	1200	525.00	15	165	525	7.40	24.0	206	240
AY-68-35-102	07-17-86	1315	796.00	1440	1880	551	7.30	23.0	221	270
AY-68-35-404	06-06-86	1025	314.00	25	15	493	7.20	24.0	206	230
AY-68-36-802	04-21-86	1315	1479.00	35	1000	491	7.30	26.5	206	--
	06-16-86	1210	1479.00	20	1000	498	7.40	27.0	201	--
AY-68-36-803	04-21-86	1215	1409.00	35	2000	484	7.40	25.0	203	230
	06-16-86	1145	1409.00	285	200	497	7.40	25.5	198	--
AY-68-36-908	04-21-86	0900	1708.00	45	--	468	7.20	26.5	199	230
	06-16-86	0940	1708.00	20	--	491	7.30	27.0	198	--
AY-68-37-505	07-29-86	1020	840.00	200	250	500	7.20	27.0	201	240
AY-68-37-508	07-30-86	1105	1311.00	185	5000	482	7.20	27.0	199	220
	11-19-86	0700	1311.00	60	5000	468	6.90	26.0	200	230
	12-17-86	0715	1311.00	70	5000	457	6.80	25.5	196	230

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (GPM)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARD-NESS (MG/L AS CACO3)
AY-68-37-521	03-13-86	1230	1275.00	180	43	5840	6.70	32.5	241	2400
	07-14-86	1330	1275.00	210	40	5740	6.30	33.0	235	2200
	08-15-86	0845	1275.00	180	26	6160	6.60	32.5	244	2200
	09-18-86	0830	1275.00	60	35	5780	6.80	32.0	246	2100
	10-16-86	0930	1275.00	75	37	5940	6.90	32.5	258	2000
	11-20-86	0900	1275.00	60	37	5600	6.70	32.5	248	2000
	12-17-86	1145	1275.00	60	41	5780	6.60	32.0	239	2000
AY-68-37-522	03-13-86	1245	1075.00	180	42	4700	6.70	31.5	225	1900
	07-14-86	1345	1075.00	225	35	4710	6.20	31.5	220	1800
	08-15-86	0900	1075.00	180	13	4750	6.70	31.0	225	2400
	09-18-86	0900	1075.00	90	35	4550	6.80	31.5	223	1600
	10-16-86	0945	1075.00	105	37	4860	7.00	31.5	237	1600
	11-20-86	1000	1075.00	120	37	4700	6.80	31.5	223	1600
	12-17-86	1200	1075.00	60	41	4810	6.70	31.0	220	1600
AY-68-37-523	03-13-86	1300	1175.00	180	11	5900	6.70	31.0	241	2400
	07-14-86	1400	1175.00	240	17	5860	6.40	31.5	235	2200
	08-15-86	0915	1175.00	180	27	6040	6.60	32.0	242	2400
	09-18-86	0930	1175.00	90	15	5440	6.60	31.0	253	2100
	10-16-86	1000	1175.00	135	16	5980	7.00	30.5	266	1900
	11-20-86	1100	1175.00	150	18	5720	6.70	30.5	241	2100
	12-17-86	1230	1175.00	60	20	5980	6.60	29.5	242	1800
AY-68-37-524	03-13-86	1345	881.00	285	50	769	6.90	28.5	195	310
	07-15-86	1100	881.00	150	43	740	6.70	28.5	199	280
	08-15-86	1045	881.00	60	31	682	6.90	28.0	209	300
	09-18-86	1200	881.00	120	38	668	7.40	28.5	205	280
	10-16-86	1330	881.00	120	40	644	7.20	29.0	205	330
	11-20-86	1230	881.00	60	48	644	7.20	28.0	212	260
	12-17-86	0940	881.00	45	50	636	7.00	27.5	195	250
AY-68-37-525	03-13-86	1400	1150.00	300	25	5940	6.60	30.0	250	2500
	07-15-86	1130	1150.00	180	26	6000	6.40	30.0	243	2200
	08-15-86	1015	1150.00	60	18	6190	6.60	27.0	236	2200
	09-18-86	1130	1150.00	150	23	5730	6.70	29.5	259	2200
	10-16-86	1300	1150.00	90	27	6050	6.80	30.0	243	2100
	11-20-86	1130	1150.00	40	31	5750	6.90	29.5	240	2100
	12-17-86	1000	1150.00	60	33	6240	6.70	29.0	227	2000
AY-68-37-526	03-04-86	1815	1223.00	60	412	511	6.90	25.0	197	230
	03-05-86	1330	1223.00	60	713	520	6.80	26.5	198	230
	03-06-86	1230	1223.00	60	--	480	6.80	26.5	199	230
	03-07-86	1435	1223.00	60	--	475	6.90	26.5	200	230
	03-12-86	2040	1223.00	60	--	495	6.80	26.5	198	230

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (GPM)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARD-NESS (MG/L AS CACO3)
AY-68-37-526	03-14-86	0700	1223.00	60	--	482	6.80	26.5	197	230
	03-17-86	0950	1223.00	60	--	495	6.90	26.5	192	230
	03-18-86	0810	1223.00	60	--	495	6.70	26.5	190	230
	03-19-86	0815	1223.00	60	--	482	6.90	26.5	198	220
	03-24-86	1530	1223.00	420	1320	490	7.00	26.5	188	220
	03-25-86	1610	1223.00	420	31	1860	6.90	26.5	204	710
	03-26-86	1600	1223.00	480	30	6380	6.90	26.5	255	2700
	03-27-86	1500	1223.00	480	65	474	6.90	26.5	198	230
	07-18-86	1045	1223.00	210	17	1040	6.80	26.5	206	430
	08-15-86	1330	1223.00	150	8.0	860	6.90	26.5	205	390
	09-18-86	1330	1223.00	120	16	881	6.90	26.5	202	390
	10-16-86	1430	1223.00	150	18	944	7.30	27.5	208	430
	11-20-86	1330	1223.00	60	20	1060	7.30	27.0	203	380
	12-17-86	0840	1223.00	45	30	1030	7.20	26.0	198	360
AY-68-37-527	07-18-86	1115	926.00	240	36	474	6.70	26.5	199	230
	08-15-86	1300	926.00	360	18	410	6.90	27.0	197	240
	09-18-86	1400	926.00	150	210	427	7.00	27.0	197	220
	10-16-86	1500	926.00	180	200	444	7.20	27.0	201	250
	11-20-86	1430	926.00	90	200	454	7.20	26.5	200	210
	12-17-86	0820	926.00	50	200	462	6.90	26.0	195	170
AY-68-37-701	07-30-86	1030	1582.00	1440	3000	481	7.10	27.0	201	230
	11-19-86	0820	1582.00	120	4000	520	7.20	27.0	197	230
	12-17-86	1430	1582.00	60	5000	460	6.60	26.5	184	210
AY-68-37-703	11-19-86	1030	1300.00	1440	50	562	7.30	25.5	203	250
AY-68-43-816	05-20-86	1100	1993.00	1440	--	1010	7.00	35.5	193	410
AY-68-44-203	04-21-86	0950	1580.00	35	1000	443	7.40	26.5	200	230
	06-16-86	1020	1580.00	20	1000	490	7.30	27.0	194	--
AY-68-44-212	04-21-86	1100	1517.00	20	2000	476	7.10	26.5	198	--
	06-16-86	1105	1517.00	20	2000	490	7.20	27.0	194	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
AY-68-21-804	30	110	2.4	4.0	0.70	3.0	7.7	<0.10	12
	27	110	2.2	3.5	0.70	9.8	8.7	0.34	12
AY-68-27-303	16	92	10	5.5	0.80	8.4	9.2	0.10	11
	21	94	9.5	5.2	0.80	40	9.9	0.35	12
AY-68-27-503	29	75	18	7.6	1.0	19	13	0.20	11
	22	87	16	7.3	1.0	12	8.7	0.44	12
AY-68-27-910	14	100	10	11	1.5	15	7.7	0.47	13
AY-68-28-208	58	110	11	6.3	0.80	28	12	0.20	11
AY-68-28-501	16	97	5.6	6.5	1.1	6.9	14	0.20	12
AY-68-28-502	25	99	9.0	6.5	1.2	13	14	0.30	13
	8	91	11	6.7	1.2	15	12	0.38	12
AY-68-28-508	38	74	11	6.4	0.80	15	13	0.20	11
AY-68-28-902	15	100	13	11	1.4	20	16	0.20	13
AY-68-28-903	0	140	11	33	2.5	28	35	0.30	18
AY-68-28-918	0	180	5.1	59	2.3	42	54	0.56	28
AY-68-28-920	14	160	7.6	43	2.5	36	44	0.20	19
AY-68-29-109	54	110	12	9.4	0.70	10	15	0.10	13
AY-68-29-210	21	100	8.4	4.8	0.70	16	8.0	<0.10	12
AY-68-29-303	42	88	6.6	5.2	0.80	14	12	0.10	10
AY-68-29-401	20	87	17	6.8	0.80	11	11	0.20	13
AY-68-29-405	12	110	9.9	10	1.8	15	14	0.20	14
AY-68-29-505	5	98	10	14	3.9	23	21	0.53	13
AY-68-29-912	10	61	16	7.7	1.2	20	17	0.20	12
AY-68-29-915	17	68	15	9.6	1.3	19	16	0.33	12
AY-68-29-920	0	57	16	6.8	1.5	20	17	0.20	12
AY-68-29-921	19	66	15	8.7	1.4	18	15	0.41	12
AY-68-29-924	14	23	11	11	1.8	18	21	0.34	1.2
AY-68-34-302	35	65	19	7.3	1.3	46	12	0.20	11
AY-68-35-102	50	77	19	8.4	1.5	49	12	0.20	12
AY-68-35-404	23	67	15	8.2	1.2	29	14	0.20	12
AY-68-36-802	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-36-803	30	67	16	9.4	1.1	15	18	0.20	12
	--	--	--	--	--	--	--	--	--
AY-68-36-908	33	65	17	9.5	1.2	18	18	0.30	12
	--	--	--	--	--	--	--	--	--
AY-68-37-505	38	66	18	11	1.2	32	19	0.30	12
AY-68-37-508	24	63	16	9.8	1.1	23	17	0.30	12
	32	65	17	10	0.90	22	20	0.30	12
	33	67	17	--	--	24	20	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
AY-68-37-521	2100	600	210	460	28	1800	930	2.8	21
	1900	540	200	--	--	1800	920	--	--
	1900	560	190	--	--	1600	850	--	--
	1800	510	190	--	--	1900	980	--	--
	1700	490	180	480	29	1800	970	2.8	20
	1700	530	220	--	--	1900	1100	--	--
	1700	530	210	--	--	1900	1000	--	--
AY-68-37-522	1700	490	170	370	23	1400	730	2.8	19
	1500	440	160	--	--	1400	730	--	--
	2200	610	220	--	2.2	--	--	--	--
	1400	410	150	--	--	1400	790	--	--
	1400	400	150	390	23	1400	750	2.7	2.7
	1300	430	170	--	--	1500	740	--	--
	1300	430	170	--	--	1500	780	--	--
AY-68-37-523	2100	580	220	510	29	1800	940	3.1	21
	1900	520	210	--	--	1900	1100	--	--
	2200	590	230	--	--	1900	980	--	--
	1900	500	210	--	--	1900	1000	--	--
	1700	492	200	490	28	1800	1000	2.8	2.3
	1800	540	240	--	--	1900	1100	--	--
AY-68-37-524	1600	470	210	--	--	1900	1100	--	--
	110	81	25	31	3.2	120	52	0.90	13
	83	80	20	--	--	110	51	--	--
	89	78	25	--	--	110	52	--	--
	79	79	21	--	--	120	50	--	--
	130	89	27	33	3.1	120	48	0.90	14
	51	77	25	--	--	97	46	--	--
	54	73	24	--	--	88	45	--	--
AY-68-37-525	2300	590	250	600	29	1900	1000	2.9	19
	1900	510	220	--	--	1900	1000	--	--
	2000	520	230	--	--	1600	900	--	--
	1900	510	220	--	--	1900	1100	--	--
	1800	540	240	530	30	2000	1100	2.7	19
	1800	530	250	--	--	2000	1100	--	--
	1700	490	240	--	--	2000	1100	--	--
AY-68-37-526	30	63	17	10	1.4	23	16	0.30	12
	32	64	17	10	1.3	24	17	0.30	12
	31	64	17	10	1.3	27	16	0.30	12
	32	65	17	10	1.3	17	17	0.30	12
	32	64	17	10	1.3	17	17	0.30	11

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
AY-68-37-526	33	64	17	10	1.3	16	17	0.30	12
	38	64	17	10	1.3	24	17	0.30	12
	40	64	17	10	1.2	23	17	0.30	11
	25	63	16	9.7	1.2	18	16	0.30	11
	35	63	16	9.8	1.3	23	17	0.40	11
	500	170	69	120	7.8	470	220	1.2	13
	2500	630	280	600	33	2000	1100	3.3	20
	28	64	16	9.9	1.2	16	17	0.30	12
	220	110	37	52	3.9	200	100	0.80	13
	180	100	33	--	--	150	79	--	--
	180	97	35	--	--	190	99	--	--
	220	110	37	54	3.9	200	110	0.80	13
	170	100	39	--	--	220	110	--	--
	160	100	38	--	--	210	110	--	--
AY-68-37-527	36	66	17	9.7	1.3	24	19	0.30	12
	39	68	16	--	3.4	--	--		--
	21	61	16	--	--	25	18	--	--
	48	70	18	11	1.3	24	20	0.30	13
	6	63	18	--	--	23	20	--	--
	0	49	17	--	--	24	20	--	--
AY-68-37-701	31	65	17	9.6	1.1	25	17	0.30	12
	38	66	17	10	0.90	24	20	0.30	12
	24	64	18	--	--	25	20	--	--
AY-68-37-703	47	62	23	13	1.0	49	22	0.70	13
AY-68-43-816	210	110	32	46	3.5	200	93	1.1	15
AY-68-44-203	32	65	17	9.7	1.2	18	18	0.30	12
	--	--	--	--	--	--	--	--	--
AY-68-44-212	--	--	--	--	--	--	--	--	--
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Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-21-804	290	--	0.040	--	<0.010	<0.20	2.10	0.010	0.6
	300	--	--	--	--	--	--	--	--
AY-68-27-303	290	2.5	0.030	--	<0.010	0.20	2.30	0.010	1.7
	320	--	--	--	--	--	--	--	--
AY-68-27-503	280	--	0.030	--	<0.010	<0.20	1.60	0.010	1.9
	300	--	--	--	--	--	--	--	--
AY-68-27-910	330	--	--	--	--	--	--	--	--
AY-68-28-208	340	--	--	--	--	--	--	--	--
AY-68-28-501	290	1.2	0.030	--	<0.010	0.20	1.00	0.010	1.5
AY-68-28-502	310	1.2	0.030	--	<0.010	0.20	1.00	0.010	0.9
	310	--	--	--	--	--	--	--	--
AY-68-28-508	250	2.3	0.030	--	<0.010	0.40	1.90	0.020	1.2
AY-68-28-902	350	2.3	0.060	--	<0.010	0.30	2.00	0.020	0.7
AY-68-28-903	510	--	--	--	--	--	--	--	--
AY-68-28-918	650	--	--	--	--	--	--	--	--
AY-68-28-920	560	0.80	0.270	--	0.050	0.60	0.200	0.040	2.5
AY-68-29-109	330	1.8	0.030	--	<0.010	0.20	1.60	0.010	0.9
AY-68-29-210	310	--	0.030	--	<0.010	<0.20	1.20	0.010	1.0
AY-68-29-303	260	1.9	0.030	--	<0.010	0.30	1.60	0.020	1.6
AY-68-29-401	310	1.3	0.020	--	<0.010	0.20	1.10	0.010	0.7
AY-68-29-405	360	2.2	0.020	--	<0.010	0.20	2.00	0.010	1.0
AY-68-29-505	350	--	--	--	--	--	--	--	--
AY-68-29-912	260	--	--	--	--	--	--	--	--
AY-68-29-915	270	--	--	--	--	--	--	--	--
AY-68-29-920	260	--	--	--	--	--	--	--	--
AY-68-29-921	260	--	--	--	--	--	--	--	--
AY-68-29-924	140	--	--	--	--	--	--	--	--
AY-68-34-302	290	--	--	--	--	--	--	--	--
AY-68-35-102	310	1.7	0.030	--	<0.010	0.30	1.40	<0.010	1.0
AY-68-35-404	270	--	--	--	--	--	--	--	--
AY-68-36-802	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-36-803	260	2.3	0.010	--	<0.010	0.30	2.00	<0.010	0.8
	--	--	--	--	--	--	--	--	--
AY-68-36-908	260	1.9	0.020	--	<0.010	0.30	1.60	<0.010	1.1
	--	--	--	--	--	--	--	--	--
AY-68-37-505	280	--	--	--	--	--	--	--	--
AY-68-37-508	260	--	--	--	--	--	--	--	--
	270	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-37-521	4200	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	4100	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-522	3300	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	3300	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-523	4200	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	4100	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-524	440	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	460	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-525	4500	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	4500	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-526	260	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--
	270	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-37-526	260	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--
	250	--	--	--	--	--	--	--	--
	250	--	--	--	--	--	--	--	--
	1200	--	--	--	--	--	--	--	--
	4800	--	--	--	--	--	--	--	--
	260	--	--	--	--	--	--	--	--
	640	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	650	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-527	270	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	280	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-701	270	--	--	--	--	--	--	--	--
	270	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
AY-68-37-703	310	--	--	--	--	--	--	--	--
AY-69-43-816	620	--	--	<0.010	--	--	--	--	--
AY-68-44-203	260	--	--	--	--	--	--	--	-
	--	--	--	--	--	--	--	--	--
AY-68-44-212	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
AY-68-21-804	06-11-86	1240	279.00	60	10	<1	34	<1	<10
AY-68-27-303	06-20-86	1350	354.00	60	15	<1	38	<1	<10
AY-68-27-503	06-12-86	1215	375.00	120	20	<1	33	<1	<10
AY-68-28-501	03-10-86	1405	468.00	365	100	<1	42	<1	<10
AY-68-28-502	03-10-86	1535	506.00	25	115	<1	46	<1	<10
AY-68-28-508	02-20-86	0945	464.00	165	150	<1	36	<1	<10
AY-68-28-902	07-17-86	1135	811.00	35	935	<1	43	<1	<10
AY-68-28-920	07-15-86	1400	360.00	--	--	1	110	<1	<10
AY-68-29-109	04-27-86	1305	460.00	305	250	<1	50	<1	<10
AY-68-29-210	06-11-86	1445	329.00	60	15	<1	38	<1	<10
AY-68-29-303	02-20-86	1445	527.00	105	940	<1	38	<1	<10
AY-68-29-401	04-27-86	1210	517.00	1440	650	<1	39	<1	<10
AY-68-29-405	03-17-86	1425	395.00	40	100	<1	55	<1	<10
AY-68-35-102	07-17-86	1315	796.00	1440	1880	<1	36	<1	<10
AY-68-36-803	04-21-86	1215	1409.00	35	2000	<1	60	<1	<10
AY-68-36-908	04-21-86	0900	1708.00	45	1500	<1	99	<1	<10

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
AY-68-21-804	2	4	7	<1	0.2	--	<1	<1	700
AY-68-27-303	<1	6	<5	<1	<0.1	--	<1	<1	230
AY-68-27-503	3	4	<5	<1	<0.1	--	<1	<1	210
AY-68-28-501	1	3	1	<1	<0.1	--	<1	<1	9
AY-68-28-502	3	7	2	<1	0.1	--	<1	<1	23
AY-68-28-508	4	<3	10	<1	<0.1	--	<1	<1	9
AY-68-28-902	5	5	<5	<1	0.1	--	<1	<1	11
AY-68-28-920	2	6	<5	650	0.1	--	<1	<1	67
AY-68-29-109	5	<3	5	<1	<0.1	--	<1	<1	15
AY-68-29-210	<1	7	<5	<1	<0.1	--	<1	<1	470
AY-68-29-303	1	<3	2	<1	<0.1	--	<1	<1	11
AY-68-29-401	2	<3	2	<1	<0.1	--	<1	<1	12
AY-68-29-405	4	6	2	<1	0.2	--	<1	<1	7
AY-68-35-102	7	5	<5	<1	0.1	--	<1	<1	8
AY-68-36-803	3	8	2	<1	--	--	1	<1	19
AY-68-36-908	4	8	5	<1	--	--	<1	<1	20

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
AY-68-27-303	06-20-86	1350	354.00	60	15	<0.1	<0.10	<0.010
AY-68-28-501	03-10-86	1405	468.00	365	100	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
AY-68-27-303	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
AY-68-28-501	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENT-I-FIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
AY-68-27-303	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
AY-68-28-501	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENT-I-FIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
AY-68-27-303	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-28-501	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

COMAL COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARDNESS (MG/L AS CACO3)
DX-68-15-901	04-30-86	1315	36.00	--	--	582	7.00	21.5	286	300
DX-68-16-502	06-25-86	1300	230.00	45	--	562	7.20	23.0	258	280
DX-68-23-301	04-30-86	1120	--	--	--	510	7.10	23.5	300	260
	06-19-86	1355	--	--	--	536	7.20	23.5	223	--
DX-68-23-303	05-05-86	1150	1045.00	230	4200	543	7.10	24.0	229	260
DX-68-23-316	06-19-86	1220	350.00	70	15	536	7.10	23.0	257	280
DX-68-23-501	07-01-86	1335	210.00	335	200	533	7.30	23.5	242	270
DX-68-23-602	05-05-86	1220	790.00	260	2750	515	7.20	23.0	226	250
DX-68-23-703	07-08-86	1310	380.00	20	15	558	7.60	24.0	220	260
DX-68-23-708	07-08-86	1120	380.00	35	10	2220	6.90	23.5	838	640

LOCAL IDENTIFIER	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
DX-68-15-901	18	97	15	7.7	1.3	15	11	0.20	11
DX-68-16-502	23	86	16	8.7	1.1	21	12	0.20	12
DX-68-23-301	0	78	16	9.2	1.4	17	14	0.20	12
	--	--	--	--	--	--	--	--	--
DX-68-23-303	31	76	17	10	1.5	29	17	0.20	12
DX-68-23-316	19	89	13	5.3	0.80	10	8.6	0.10	11
DX-68-23-501	26	81	16	10	1.3	24	15	0.20	12
DX-68-23-602	24	77	14	8.3	1.5	22	15	0.20	11
DX-68-23-703	35	51	31	18	2.2	35	25	2.1	12
DX-68-23-708	0	90	100	230	22	2.4	460	5.2	12

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
DX-68-15-901	330	1.8	0.040	--	<0.010	0.20	1.60	0.010	1.1
DX-68-16-502	310	2.1	0.030	--	<0.010	0.30	1.80	0.010	1.1
DX-68-23-301	330	2.1	0.030	--	<0.010	0.20	1.90	<0.010	0.7
	--	--	--	--	--	--	--	--	--
DX-68-23-303	300	2.0	0.030	--	<0.010	0.20	1.80	<0.010	0.8
DX-68-23-316	290	1.7	0.050	--	<0.010	0.20	1.50	0.020	1.4
DX-68-23-501	300	--	--	--	--	--	--	--	--
DX-68-23-602	280	2.4	0.030	--	<0.010	0.30	2.10	0.010	1.0.
DX-68-23-703	310	--	--	--	--	--	--	--	--
DX-68-23-708	1400	--	--	--	--	--	--	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

COMAL COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
DX-68-15-901	04-30-86	1315	--	--	--	<1	44	<1	<10
DX-68-16-502	06-25-86	1300	230.00	45	800	<1	45	<1	<10
DX-68-23-301	04-30-86	1120	--	--	--	<1	58	<1	<10
DX-68-23-303	05-05-86	1150	1045.00	230	4200	<1	55	<1	<10
DX-68-23-316	06-19-86	1220	350.00	70	15	<1	33	<1	<10
DX-68-23-602	05-05-86	1220	790.00	260	2750	<1	42	<1	<10

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
DX-68-15-901	1	6	2	11	<0.1	--	1	<1	33
DX-68-16-502	2	6	<5	<1	<0.1	--	<1	<1	12
DX-68-23-301	1	9	2	2	--	--	<1	<1	8
DX-68-23-303	2	<3	4	<1	<0.1	--	<1	<1	26
DX-68-23-316	<1	5	<5	<1	<0.1	--	<1	<1	330
DX-68-23-602	4	<3	<1	<1	<0.1	--	1	<1	13

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
DX-68-23-301	04-30-86	1120	--	--	--	--	<0.10	--
DX-68-23-316	06-19-86	1220	350.00	70	15	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
DX-68-23-301	--	--	<0.010	--	--	--	--	<0.010
DX-68-23-316	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENT-I-FIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
DX-68-23-301	--	--	<0.010	--	--	<0.01	--	--
DX-68-23-316	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

COMAL COUNTY--Continued

LOCAL IDENT-I-FIER	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DX-68-23-301	--	--	<0.1	--	--	<0.01	--	--
DX-68-23-316	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

HAYS COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARDNESS (MG/L AS CACO3)
LR-58-58-403	06-24-86	1420	390.00	50	800	591	7.40	22.5	267	290
LR-58-58-701	06-24-86	1140	492.00	25	15	1610	7.50	23.0	245	380
LR-58-58-707	06-24-86	1505	450.00	20	15	1650	7.60	24.0	250	370
LR-67-01-301	05-29-86	1355	336.00	45	15	514	7.60	24.0	218	240
LR-67-01-302	05-29-86	1225	360.00	85	300	691	7.20	25.0	224	310
LR-67-01-402	09-08-86	1240	120.00	40	20	544	7.00	22.5	273	290
LR-67-01-502	09-08-86	0935	125.00	45	15	573	6.90	22.0	294	310
LR-67-01-703	09-08-86	1050	165.00	40	10	512	7.10	23.0	252	280
LR-67-01-801	02-12-86	1040	--	--	--	595	7.20	21.5	255	290
LR-67-01-806	02-12-86	1220	115.00	35	470	606	7.20	22.5	262	300
LR-67-09-105	06-25-86	1110	330.00	1440	2330	631	7.30	23.0	258	300
LR-67-09-111	06-26-86	1110	264.00	1440	350	581	7.10	23.0	257	280

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
LR-58-58-403	23	75	25	6.4	1.2	27	9.0	0.50	11
LR-58-58-701	130	79	44	190	12	260	220	3.8	12
LR-58-58-707	120	73	46	170	12	280	190	3.9	12
LR-67-01-301	20	46	30	11	2.2	34	10	2.8	12
LR-67-01-302	85	61	38	8.8	1.7	110	12	3.1	13
LR-67-01-402	17	100	9.7	4.9	0.80	6.9	8.5	<0.10	12
LR-67-01-502	14	110	8.1	5.6	1.2	6.9	7.5	0.20	13
LR-67-01-703	27	87	15	4.5	0.70	5.9	8.1	0.10	12
LR-67-01-801	37	84	20	13	1.7	18	20	0.20	11
LR-67-01-806	39	91	18	13	1.3	19	21	0.20	12
LR-67-09-105	39	91	17	15	1.6	35	24	0.40	12
LR-67-09-111	26	87	16	10	1.3	26	18	0.20	12

LOCAL IDENT-I-FIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
LR-58-58-403	320	1.8	0.020	--	<0.010	0.30	1.50	0.010	0.6
LR-58-58-701	970	--	--	--	--	--	--	--	--
LR-58-58-707	940	--	--	--	--	--	--	--	--
LR-67-01-301	280	--	0.070	--	<0.010	<0.20	<0.100	<0.010	--
LR-67-01-302	380	--	0.030	--	<0.010	0.20	<0.100	<0.010	1.0

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

HAYS COUNTY--Continued

LOCAL IDENT-I-FIER	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)
LR-67-01-402	310	--	--	--	--	--	--	--	--
LR-67-01-502	330	--	--	--	--	--	--	--	--
LR-67-01-703	280	--	--	--	--	--	--	--	--
LR-67-01-801	320	1.6	0.020	--	<0.010	0.30	1.30	<0.010	1.1
LR-67-01-806	330	2.1	0.030	--	<0.010	0.30	1.80	0.010	0.7
LR-67-09-105	350	--	0.020	--	<0.010	<0.20	1.70	0.010	0.6
LR-67-09-111	320	--	0.060	--	<0.010	<0.20	1.70	0.010	1.1

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (GPM)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)
LR-58-58-403	06-24-86	1420	390.00	50	800	<1	140	1	<10
LR-67-01-302	05-29-86	1225	360.00	85	300	<1	66	<1	<10
LR-67-01-801	02-12-86	1040	--	--	--	<1	41	<1	<10
LR-67-01-806	02-12-86	1220	115.00	35	470	<1	49	<1	<10
LR-67-09-105	06-25-86	1110	330.00	1440	2330	<1	47	1	<10
LR-67-09-111	06-26-86	1110	264.00	1440	350	<1	45	<1	<10

LOCAL IDENT-I-FIER	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
LR-58-58-403	1	5	<5	<1	<0.1	--	<1	<1	9
LR-67-01-302	90	5	5	<1	<0.1	--	<1	<1	71
LR-67-01-801	2	<3	4	1	<0.1	--	<1	<1	13
LR-67-01-806	3	<3	2	<1	<0.1	--	<1	<1	14
LR-67-09-105	3	8	<5	<1	<0.1	--	<1	<1	11
LR-67-09-111	4	6	<5	<1	<0.1	--	<1	<1	15

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (GPM)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
LR-67-01-801	02-12-86	1040	--	--	--	<0.1	<0.10	<0.010
LR-67-09-105	06-25-86	1110	330.00	1440	2330	<0.1	<0.10	<0.010

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

HAYS COUNTY--Continued

LOCAL IDENTIFIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
LR-67-01-801	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
LR-67-09-105	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENTIFIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
LR-67-01-801	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
LR-67-09-105	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
LR-67-01-801	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

MEDINA COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARDNESS (MG/L AS CACO3)
TD-68-33-202	07-16-86	1105	279.00	40	15	445	7.20	22.5	192	230
TD-68-33-701	05-08-86	1525	1348.00	1440	1950	474	7.30	24.0	210	230
TD-68-41-303	04-08-86	1035	717.00	50	330	474	7.60	24.0	205	240
TD-68-42-503	03-27-86	1220	1373.00	20	700	471	7.40	26.0	200	220
TD-68-49-813	05-14-86	1345	3194.00	135	100	1210	7.30	43.0	289	230
TD-69-40-403	05-06-86	1330	518.00	1440	1000	455	7.30	23.5	215	230
TD-69-46-601	02-26-86	1535	1289.00	60	350	453	7.30	23.5	204	230
TD-69-47-301	03-26-86	1140	1510.00	220	1000	455	7.40	22.0	206	230
	08-19-86	1415	1510.00	555	1000	471	7.40	24.5	208	220
TD-69-47-303	03-26-86	1045	1803.00	105	1150	459	7.50	24.0	203	230
TD-69-54-401	08-19-86	1205	2000.00	35	10	501	7.40	24.0	194	210
TD-69-55-401	08-19-86	1505	2260.00	425	1410	539	7.40	24.5	208	230
TD-69-56-501	05-13-86	1315	2646.00	1440	3700	513	7.30	28.0	205	240
TD-69-56-507	05-13-86	1225	2720.00	1440	1750	483	7.50	34.0	198	210
TD-69-56-508	05-13-86	1245	2715.00	1440	2700	493	7.40	33.0	203	220

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
TD-68-33-202	34	74	9.9	6.2	1.1	28	11	0.10	12
TD-68-33-701	21	71	13	7.2	1.2	17	13	0.20	12
TD-68-41-303	31	68	16	9.1	1.2	23	19	0.20	12
TD-68-42-503	21	62	16	8.5	1.0	13	18	0.20	12
TD-68-49-813	0	56	22	130	6.5	98	170	4.8	22
TD-69-40-403	13	75	9.9	5.5	1.0	7.0	10	0.10	12
TD-69-46-601	30	69	15	8.0	1.1	15	12	0.20	12
TD-69-47-301	21	66	15	7.8	1.2	15	11	0.20	13
	11	63	15	6.1	1.1	18	13	0.20	13
TD-69-47-303	25	65	16	7.5	1.2	14	12	0.20	12
TD-69-54-401	18	62	14	13	1.2	14	25	0.13	11
TD-69-55-401	26	69	15	9.4	1.1	18	29	0.20	12
TD-69-56-501	31	68	16	12	1.2	21	21	0.20	12
TD-69-56-507	16	51	21	10	1.2	30	13	0.70	14
TD-69-56-508	17	52	22	12	1.3	25	16	0.90	14

Water-quality data for wells in the Edwards aquifer, 1986--Continued

MEDINA COUNTY--Continued

LOCAL IDENT-I-FIER	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)
TD-68-33-202	260	1.2	0.030	--	<0.010	0.30	0.900	0.010	0.6
TD-68-33-701	260	1.8	0.020	--	<0.010	0.20	1.60	<0.010	0.9
TD-68-41-303	270	2.4	0.050	--	<0.010	0.30	2.10	0.010	1.3
TD-68-42-503	250	2.1	0.010	--	<0.010	0.20	1.90	<0.010	1.5
TD-68-49-813	680	--	0.630	--	<0.010	0.70	<0.100	<0.010	0.7
TD-69-40-403	250	1.7	0.020	--	<0.010	0.20	1.50	0.010	0.9
TD-69-46-601	250	1.6	<0.010	--	<0.010	0.20	1.40	0.010	--
TD-69-47-301	250	1.8	0.020	--	<0.010	0.20	1.60	<0.010	0.7
	250	--	--	--	--	--	--	--	--
TD-69-47-303	250	1.9	0.020	--	<0.010	0.20	1.70	<0.010	0.6
TD-69-54-401	260	--	--	--	--	--	--	--	--
TD-69-55-401	280	--	--	--	--	--	--	--	--
TD-69-56-501	270	--	--	<0.010	--	--	--	--	--
TD-69-56-507	260	--	--	<0.010	--	--	--	--	--
TD-69-56-508	260	--	--	<0.010	--	--	--	--	--

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (GPM)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)
TD-68-33-202	07-16-86	1105	279.00	40	15	1	38	<1	<10
TD-68-33-701	05-08-86	1525	1348.00	1440	1950	<1	43	<1	<10
TD-68-41-303	04-08-86	1035	717.00	50	330	<1	54	<1	<10
TD-68-42-503	03-27-86	1220	1373.00	20	700	<1	81	<1	<10
TD-68-49-813	05-14-86	1345	3194.00	135	100	<1	310	<1	<10
TD-69-40-403	05-06-86	1330	518.00	1440	1000	<1	35	<1	<10
TD-69-46-601	02-26-86	1535	1289.00	60	350	<1	48	<1	<10
TD-69-47-301	03-26-86	1140	1510.00	220	1000	<1	44	<1	<10
TD-69-47-303	03-26-86	1045	1803.00	105	1150	<1	48	<1	<10

LOCAL IDENT-I-FIER	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
TD-68-33-202	2	4	<5	<1	<0.1	--	<1	<1	140
TD-68-33-701	2	<3	<1	<1	<0.1	--	<1	<1	7
TD-68-41-303	5	<3	2	<1	--	--	<1	<1	14
TD-68-42-503	4	<3	1	3	0.1	--	<1	<1	12
TD-68-49-813	<1	50	<1	24	<0.1	--	<1	<1	8
TD-69-40-403	1	<3	1	<1	<0.1	--	<1	<1	4
TD-69-46-601	3	6	1	<1	2.0	--	<1	<1	13
TD-69-47-301	2	3	2	<1	<0.1	--	<1	<1	18
TD-69-47-303	1	6	2	<1	0.2	--	<1	<1	17

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

MEDINA COUNTY--Continued

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
TD-68-33-202	07-16-86	1105	279.00	40	15	<0.1	<0.10	<0.010
TD-69-40-403	05-06-86	1330	518.00	1440	1000	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
TD-68-33-202	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
TD-69-40-403	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENT-I-FIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
TD-68-33-202	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
TD-69-40-403	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENT-I-FIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
TD-68-33-202	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
TD-69-40-403	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

UVALDE COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	HARDNESS (MG/L AS CACO3)
YP-69-43-606	03-03-86	1220	698.00	20	430	517	7.10	23.5	200	240
	05-12-86	1230	698.00	430	30	530	7.40	24.0	207	240
YP-69-45-405	02-26-86	1100	1211.00	40	520	463	7.40	22.5	206	240
YP-69-50-312	05-22-86	1130	162.00	30	15	858	7.00	24.0	293	370
	09-04-86	1145	162.00	--	--	859	6.80	24.0	295	370
YP-69-50-316	05-21-86	1610	183.00	--	--	592	7.30	24.0	230	260
	09-04-86	0950	183.00	--	--	553	7.10	24.0	228	260
YP-69-50-317	05-21-86	1130	199.00	--	--	523	7.40	24.0	210	240
YP-69-50-322	05-21-86	1735	150.00	35	10	770	6.90	24.0	288	350
	09-04-86	1345	150.00	--	--	790	6.80	24.0	290	340
YP-69-50-323	05-21-86	1445	151.40	--	--	747	7.10	24.0	301	350
	09-03-86	1230	151.40	--	--	724	7.10	24.0	299	320
YP-69-50-332	05-21-86	1330	--	45	10	698	7.00	23.0	285	310
	09-03-86	1400	--	10	--	683	6.80	23.0	290	330
YP-69-50-333	08-28-86	1045	109.00	15	--	855	6.70	24.0	299	400
YP-69-51-104	05-22-86	0900	430.00	150	555	808	6.80	24.5	266	350
	09-04-86	1050	430.00	25	560	857	6.80	24.5	259	380
YP-69-51-107	05-22-86	1010	310.00	30	15	803	7.00	25.0	255	360
YP-69-51-116	09-03-86	1040	300.00	--	--	934	6.90	24.0	240	380

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
YP-69-43-606	39	79	10	13	1.1	15	30	0.10	12
	34	80	10	12	1.0	13	25	0.20	12
YP-69-45-405	33	71	15	7.6	1.1	16	12	0.20	13
YP-69-50-312	81	130	12	29	1.0	31	69	0.30	15
	79	130	12	31	1.0	34	71	0.20	16
YP-69-50-316	34	90	9.6	17	1.2	16	32	0.20	14
	33	89	9.4	14	1.1	17	32	0.20	13
YP-69-50-317	34	82	9.5	12	1.3	15	30	0.20	12
YP-69-50-322	57	120	11	32	1.1	33	54	0.20	14
	55	120	11	32	1.3	31	61	0.20	15
YP-69-50-323	44	120	11	28	1.1	22	45	0.30	14
	17	110	10	25	1.4	22	43	0.30	14
YP-69-50-332	22	110	7.9	25	3.2	19	39	0.20	14
	42	120	7.9	17	3.7	19	33	0.20	14
YP-69-50-333	100	140	13	31	1.1	35	72	0.30	16
YP-69-51-104	87	120	13	28	1.1	38	70	0.50	16
	120	130	14	30	1.3	45	87	0.50	16
YP-69-51-107	100	120	14	25	1.3	43	66	0.60	16
YP-69-51-116	140	130	14	34	1.4	40	110	0.40	15

Water-quality data for wells and springs in the Edwards aquifer, 1986--Continued

UVALDE COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
YP-69-43-606	280	3.5	0.020	--	<0.010	0.50	3.00	<0.010	1.5
	280	--	--	--	--	--	--	--	--
YP-69-45-405	260	--	0.030	--	<0.010	<0.10	1.50	0.010	1.0
YP-69-50-312	460	--	--	--	--	--	--	--	--
	470	--	--	--	--	--	--	--	--
YP-69-50-316	320	--	--	--	--	--	--	--	--
	310	--	--	--	--	--	--	--	--
YP-69-50-317	290	--	--	--	--	--	--	--	--
YP-69-50-322	440	4.1	0.070	--	<0.010	0.40	3.70	0.020	1.5
	450	--	--	--	--	--	--	--	--
YP-69-50-323	420	3.1	0.070	--	<0.010	0.30	2.80	0.020	1.4
	400	--	--	--	--	--	--	--	--
YP-69-50-332	390	3.8	0.060	--	<0.010	0.40	3.40	0.010	1.0
	390	--	--	--	--	--	--	--	--
YP-69-50-333	490	--	--	--	--	--	--	--	--
YP-69-51-104	450	4.2	0.060	--	<0.010	0.40	3.80	<0.010	1.7
	480	--	--	--	--	--	--	--	--
YP-69-51-107	440	--	--	--	--	--	--	--	--
YP-69-51-116	490	12	0.050	--	<0.010	0.70	11.0	0.010	--

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
YP-69-43-606	03-03-86	1220	698.00	20	430	<1	60	<1	<10
	05-12-86	1230	698.00	430	30	<1	56	<1	<10
YP-69-45-405	02-26-86	1100	1211.00	40	520	<1	78	9	<10
YP-69-50-322	05-21-86	1735	150.00	35	10	<1	84	<1	<10
YP-69-50-323	05-21-86	1445	151.40	--	--	<1	93	<1	<10
YP-69-50-332	05-21-86	1330	--	45	10	<1	77	<1	<10
YP-69-51-104	05-22-86	0900	430.00	150	555	<1	120	<1	<10

LOCAL IDENTIFIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
YP-69-43-606	7	6	<1	<1	0.9	--	<1	<1	11
	3	<3	<1	<1	<0.1	--	<1	<1	8
YP-69-45-405	4	12	1	160	<0.1	--	<1	<1	490
YP-69-50-322	4	7	3	<1	<0.1	--	<1	<1	22
YP-69-50-323	<1	5	6	2	<0.1	--	<1	<1	24
YP-59-50-332	5	5	5	1	<0.1	--	<1	<1	360
YP-69-51-104	10	20	1	<1	0.6	--	<1	<1	35

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986

BEXAR COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLORIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
AY-68-21-804	08-14-86	1510	279.00	50	10	<0.20	<0.20	<0.20
AY-68-27-303	08-14-86	1220	354.00	40	15	<0.20	<0.20	<0.20
AY-68-27-503	08-14-86	1030	375.00	40	15	<0.20	<0.20	<0.20
AY-68-27-910	08-20-86	1405	400.00	35	10	<0.20	<0.20	<0.20
AY-68-28-208	08-27-86	1530	326.00	35	250	<0.20	<0.20	<0.20
AY-68-28-502	08-21-86	1445	506.00	165	125	0.50	<0.20	<0.20
AY-68-28-902	07-17-86	1135	811.00	35	935	0.20	<0.20	<0.20
AY-68-28-903	08-06-86	1115	762.00	65	3500	<0.20	<0.20	<0.20
AY-68-28-918	08-12-86	1135	400.00	35	15	<0.20	<0.20	<0.20
AY-68-28-920	07-15-86	1400	360.00	--	--	<0.20	<0.20	<0.20
AY-68-29-210	06-11-86	1445	329.00	60	15	<0.20	<0.20	0.30
AY-68-29-405	03-17-86	1425	395.00	40	100	<0.20	<0.20	<0.20
AY-68-29-505	08-21-86	1000	807.00	120	700	<0.20	<0.20	<0.20
AY-68-29-912	08-28-86	1105	630.00	35	1000	<0.20	<0.20	<0.20
AY-68-29-915	08-21-86	1055	824.00	55	5670	<0.20	<0.20	<0.20
AY-68-29-920	08-20-86	1000	655.00	240	980	<0.20	<0.20	<0.20
AY-68-29-921	08-20-86	1155	585.00	25	25	<0.20	<0.20	<0.20
AY-68-29-924	08-22-86	0930	577.00	--	--	<0.20	<0.20	<0.20
AY-68-34-302	06-06-86	1200	525.00	15	165	<0.20	<0.20	0.30
AY-68-35-102	07-17-86	1315	796.00	1440	1880	0.20	<0.20	<0.20
AY-68-35-404	06-06-86	1025	314.00	25	15	<0.20	<0.20	0.20
AY-68-36-802	06-16-86	1210	1479.00	20	1000	<0.20	<0.20	0.20
AY-68-36-803	06-16-86	1145	1409.00	285	200	<0.20	<0.20	0.20
AY-68-36-908	06-16-86	0940	1708.00	20	--	<0.20	0.20	0.20
AY-68-44-203	06-16-86	1020	1580.00	20	1000	<0.20	<0.20	0.20
AY-68-44-212	06-16-86	1105	1517.00	20	2000	<0.20	<0.20	<0.20

LOCAL IDENT-I-FIER	BROMO-FORM TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)
AY-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-910	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-208	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-502	3.1	<0.20	3.0	0.20	<0.20	<0.20	<0.20	0.20
AY-68-28-902	0.90	0.50	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-903	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	<0.20	<0.20
AY-68-28-918	<0.20	<0.20	0.20	<0.20	0.50	0.50	<0.20	<0.20
AY-68-28-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-210	<0.20	<0.20	0.50	0.30	<0.20	<0.20	<0.20	<0.20
AY-68-29-405	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-505	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-912	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-915	0.80	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	BROMO-FORM TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)
AY-68-29-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-921	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-924	<0.20	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	0.50
AY-68-34-302	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-102	0.60	0.40	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-404	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-802	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-803	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-908	<0.20	<0.20	0.30	0.30	<0.20	<0.20	<0.20	0.20
AY-68-44-203	<0.20	<0.20	0.20	0.20	<0.20	<0.20	<0.20	0.20
AY-68-44-212	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENT-I-FIER	METHYL-BROMIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)
AY-68-21-804	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-303	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-503	<0.20	<1.0	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-910	<0.20	<3.4	0.30	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-208	<0.20	<2.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-502	<0.20	<0.30	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-902	<0.20	<8.0	2.1	0.40	<0.20	<0.20	<0.20	<0.20
AY-68-28-903	<0.20	<1.5	5.0	0.30	0.50	<0.20	<0.20	<0.20
AY-68-28-918	<0.20	4.0	9.9	0.60	1.8	<0.20	<0.20	<0.20
EUND @ WEST AVE AY-68-28-920	<0.20	<5.0	4.0	0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-210	<0.20	<0.20	0.20	0.30	<0.20	<0.20	<0.20	<0.20
AY-68-29-405	<0.20	0.70	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-505	<0.20	<3.0	0.30	<0.20	0.30	<0.20	<0.20	<0.20
WINDCREST @ CROSS-WIND AY-68-29-912	<0.20	<10	0.70	<0.20	<0.20	<0.20	<0.20	<0.20
CWB-RANDOLPH → AY-68-29-915	<0.20	<6.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-920	<0.20	<3.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-921	<0.20	<3.0	<0.20	0.30	<0.20	<0.20	<0.20	<0.20
AY-68-29-924	<0.20	<6.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-34-302	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-102	<0.20	<10	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-404	<0.20	<0.20	0.50	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-802	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-803	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-908	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-44-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-44-212	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHYLENE TOTAL (UG/L)	1,3-DICHLOROPROPANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
AY-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-27-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-27-910	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-208	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-502	1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-902	<0.20	<0.20	3.8	<0.20	<0.20	<0.20	<0.20	0.5
AY-68-28-903	<0.20	<0.20	1.9	<0.20	<0.20	<0.20	0.20	1.0
AY-68-28-918	<0.20	1.5	11	<0.20	<0.20	<0.20	<0.20	3.2
WEST AVE AY-68-28-920	<0.20	<0.20	4.6	<0.20	<0.20	2.2	<0.20	0.9
AY-68-29-210	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	0.6
AY-68-29-405	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-505	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20	1.4
AY-68-29-912	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
AY-68-29-915	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-921	<0.20	<0.20	<0.20	<0.20	<0.20	0.50	<0.20	<0.2
AY-68-29-924	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	130 F-188
AY-68-34-302	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-35-404	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-36-802	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-36-803	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
AY-68-36-908	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	0.6
AY-68-44-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.3
AY-68-44-212	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	DICHLOROBROMOMETHANE TOTAL (UG/L)	CARBON TETRACHLORIDE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)
LR-67-01-302	05-29-86	1225	360.00	85	300	8.8	<0.20	<0.20
LR-67-01-402	09-08-86	1240	120.00	40	20	<0.20	<0.20	<0.20
LR-67-01-502	09-08-86	0935	125.00	45	15	<0.20	<0.20	<0.20
LR-67-01-703	09-08-86	1050	165.00	40	10	<0.20	<0.20	<0.20
LR-67-01-801	02-12-86	1040	--	--	--	<0.20	<0.20	<0.20
LR-67-01-806	02-12-86	1220	115.00	35	470	<0.20	<0.20	<0.20
LR-67-09-111	06-26-86	1110	264.00	1440	350	<0.20	<0.20	0.30

LOCAL IDENTIFIER	BROMOFORM TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)
LR-67-01-302	2.0	5.6	8.6	0.40	<0.20	<0.20	<0.20	<0.20
LR-67-01-402	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-502	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-703	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-801	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-806	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	METHYLBROMIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)
LR-67-01-302	<0.20	<5.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-402	<0.20	14	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-502	<0.20	<3.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-703	<0.20	<3.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-801	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
CITY OF SAN MARCOS LR-67-01-806	<0.20	<1.0	0.30	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHYLENE TOTAL (UG/L)	1,3-DICHLOROPROPANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
LR-67-01-302	<0.20	<0.20	0.40	<0.20	<0.20	<0.20	<0.20	0.2
LR-67-01-402	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

HAYS COUNTY--Continued

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHYLENE TOTAL (UG/L)	1,3-DICHLOROPROPANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
LR-67-01-502	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
LR-67-01-703	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
LR-67-01-801	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
LR-67-01-806	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

MEDINA COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	DICHLOROBROMOMETHANE TOTAL (UG/L)	CARBON TETRACHLORIDE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)
TD-69-47-301	08-19-86	1415	1510.00	555	1000	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	BROMOFORM TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	ETHYLBENZENE TOTAL (UG/L)
TD-69-47-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	METHYLBROMIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)
TD-69-47-301	<0.20	<3.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHYLENE TOTAL (UG/L)	1,3-DICHLOROPROPANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
TD-69-47-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

UVALDE COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (GPM)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
YP-69-45-405	02-26-86	1100	1211.00	40	520	<0.20	<0.20	<0.20
YP-69-50-312	05-22-86	1130	162.00	30	15	<0.20	<0.20	0.20
	09-04-86	1145	162.00	--	--	<0.20	<0.20	<0.20
YP-69-50-316	05-21-86	1610	183.00	--	--	<0.20	<0.20	0.20
	09-04-86	0950	183.00	--	--	<0.20	<0.20	<0.20
YP-69-50-317	05-21-86	1130	199.00	--	--	<0.20	<0.20	0.20
YP-69-50-322	05-21-86	1735	150.00	35	10	<0.20	<0.20	0.30
	09-04-86	1345	150.00	--	--	<0.20	<0.20	<0.20
YP-69-50-323	05-21-86	1445	151.40	--	--	<0.20	<0.20	0.20
	09-03-86	1230	151.40	--	--	<0.20	<0.20	<0.20
YP-69-50-332	05-21-86	1330	--	45	10	<0.20	<0.20	0.20
	09-03-86	1400	--	25	10	<0.20	<0.20	<0.20
YP-69-50-333	08-28-86	1045	109.00	15	10	<0.20	<0.20	<0.20
YP-69-51-104	05-22-86	0900	430.00	150	555	0.50	<0.20	0.30
	09-04-86	1050	430.00	25	560	<0.20	<0.20	<0.20
YP-69-51-107	05-22-86	1010	310.00	30	15	<0.20	<0.20	0.20
YP-69-51-116	09-03-86	1040	300.00	--	--	<0.20	<0.20	<0.20

LOCAL IDENT-I-FIER	BROMO-FORM TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L)	CHLORO-FORM TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	CHLORO-BENZENE TOTAL (UG/L)	CHLORO-ETHANE TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)
YP-69-45-405	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-312	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-317	<0.20	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20
YP-69-50-322	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-323	<0.20	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-332	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-333	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	8.1	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-107	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-116	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1986--Continued

UVALDE COUNTY--Continued

LOCAL IDENTIFIER	METHYL-BROMIDE TOTAL (UG/L)	METHYLENE CHLORIDE TOTAL (UG/L)	TETRACHLOROETHYLENE TOTAL (UG/L)	TRICHLOROFLUOROMETHANE TOTAL (UG/L)	1,1-DICHLOROETHANE TOTAL (UG/L)	1,1-DICHLOROETHYLENE TOTAL (UG/L)	1,1,1-TRICHLOROETHANE TOTAL (UG/L)	1,1,2-TRICHLOROETHANE TOTAL (UG/L)
YP-69-45-405	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-312	<0.20	<0.20	36	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<1.0	49	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-316	<0.20	<0.20	19	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	12	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-317	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-322	<0.20	<0.20	79	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<3.0	120	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-323	<0.20	<0.20	27	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<2.0	49	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-332	<0.20	<0.20	5.5	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	6.0	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-333	<0.20	<2.0	49	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	<0.20	<0.20	7.7	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	7.5	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-107	<0.20	<0.20	9.6	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-116	<0.20	<1.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHYLENE TOTAL (UG/L)	1,3-DICHLOROPROPANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
YP-69-45-405	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-312	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20	0.2
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.4
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	7.4
YP-69-50-317	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
YP-69-50-322	<0.20	<0.20	1.3	<0.20	<0.20	<0.20	<0.20	0.5
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-323	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	34.0
YP-69-50-332	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-333	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-51-104	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-51-107	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-51-116	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for tritium from wells in the Edwards aquifer

[Tritium unit = 1 tritium atom per 10^{18} hydrogen atoms]

Well number	Date sampled	Tritium units	± Standard deviation
TD-68-39-502	06-11-85	8.8	--
YP-69-45-404	04-17-85	6.0	--
YP-69-50-101	04-17-85	7.2	--
YP-69-50-308	06-25-85	6.9	--

Summary of maximum contaminant levels for selected water-quality constituents and properties for public water systems [1]

[µg/L, microgram per liter; mg/L, milligram per liter; °C, degree Celsius]

Constituent [2]	Maximum contaminant level [3]	Secondary maximum contaminant level [4]
	Inorganic chemicals and related properties	
pH (standard units)	--	6.5 - 8.5
Arsenic (As)	50 µg/L	--
Barium (Ba)	1,000 µg/L	--
Cadmium (Cd)	10 µg/L	--
Chloride (Cl)	--	250 mg/L
Chromium (Cr)	50 µg/L	--
Copper (Cu)	--	1,000 µg/L
Iron (Fe)	--	300 µg/L
Lead (Pb)	50 µg/L	--
Manganese (Mn)	--	50 µg/L
Mercury (Hg)	2 µg/L	--
Nitrate (as N)	10 mg/L	--
Selenium (Se)	10 µg/L	--
Silver (Ag)	50 µg/L	--
Sulfate (SO_4)	--	250 mg/L
Zinc (Zn)	--	5,000 µg/L
Dissolved solids	--	500 mg/L
Fluoride [5]	4 mg/L	2 mg/L
	Organic chemicals	
Chlorinated hydrocarbons		
Endrin	0.2 µg/L	--
Lindane	4 µg/L	--
Methoxychlor	100 µg/L	--
Toxaphene	5 µg/L	--
Chlorophenoxys		
2,4-D	100 µg/L	--
Silvex	10 µg/L	--

Summary of maximum contaminant levels for selected water-quality constituents and properties for public water systems--Continued [1]

Constituent [2]	Maximum contaminant level [3]	Secondary maximum contaminant level [4]
	Volatile organic compounds [6]	
Trichloroethylene	.005 mg/L	--
Carbon tetrachloride	.005 mg/L	--
Vinyl chloride	.001 mg/L	--
1,2-Dichloroethane	.005 mg/L	--
Benzene	.005 mg/L	--
1,1-Dichloroethylene	.007 mg/L	--
1,1,1-Trichloroethane	.20 mg/L	--
p-Dichlorobenzene	.75 mg/L	--

1 Public water system.--A system for the provision of piped water to the public for human consumption, if such system has at least 15 service connections or regularly serves at least 25 individuals daily at least 60 days out of the year.
2 Constituent.--Any physical, chemical, biological, or radiological substance or matter in water.
3 Maximum contaminant level.--The maximum permissible level of a contaminant in water which is delivered to the free-flowing outlet of the ultimate user of a public water system. Maximum contaminant levels are those levels set by the U.S. Environmental Protection Agency (1986a) in the National Primary Drinking Water Regulations. These regulations deal with contaminants that may have a significant direct impact on the health of the consumer and are enforceable by Federal law.
4 Secondary maximum contaminant level.--The maximum permissible level of a contaminant in water which is delivered to the free-flowing outlet of the ultimate user of a public water system. Secondary maximum contaminant levels are those levels proposed by the Environmental Protection Agency (1986b) in the National Secondary Drinking Water Regulations. These regulations deal with contaminants that may not have a significant direct impact on the health of the consumer, but their presence in excessive quantities may affect the esthetic qualities of the water and may discourage the use of a drinking-water supply by the public.
5 Fluoride.--Revised (U.S. Environmental Protection Agency, 1986a,b).
6 Proposed maximum contaminant levels (U.S. Environmental Protection Agency, 1985). The maximum contaminant level for tetrachloroethylene will be proposed later.

APPENDIX C. SURFACE WATER

Streamflow, spring flow, reservoir contents, and water-quality data for streams, October 1985 to September 1986

08167000 GUADALUPE RIVER AT COMFORT, TX

LOCATION.--Lat 29°58'10", long 98°53'33", Kendall County, Hydrologic Unit 12100201, on right bank at downstream side of southbound bridge on Interstate Highway 10 at Comfort, 0.5 mi downstream from Cypress Creek, and at mile 396.2.

DRAINAGE AREA.--839 mi².

PERIOD OF RECORD.--May 1939 to current year.

REVISED RECORDS.--WSP 1632: 1958. WSP 1732: 1939(M). WSP 2123: Drainage area, 1944(M), 1952(M), 1957(M), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,371.83 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 27, 1939, nonrecording gage. Nov. 27, 1939, to June 2, 1980, water-stage recorder at site 0.4 mi upstream at datum 0.22 ft higher.

REMARKS.--Estimated daily discharges: Oct. 19-21 and Jan. 30 to Feb. 25. Records good except for estimated daily discharges, which are poor. Many small diversions above station for irrigation. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--47 years (water years 1940-86), 190 ft³/s (137,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 240,000 ft³/s Aug. 2, 1978 (gage height, 40.90 ft), from high-water mark in well, from rating curve extended above 74,000 ft³/s on basis of current-meter measurement of 124,000 ft³/s at gage height 32.47 ft and slope-area measurement of 182,000 ft³/s at gage height 38.4 ft, made at former gaging station "near Comfort" 5 mi upstream; no flow at times in 1952-57, 1963-64. All stages are at site and datum then in use.
Maximum stage since at least 1848, that of Aug. 2, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1869 reached a stage of 40.3 ft, from report by U.S. Army Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft, from floodmark, and from information by State Department of Highways and Public Transportation. Flood of July 16, 1900, reached about the same stage as that of July 1, 1932, from information by local residents. All stages are at site and datum then in use.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	Unknown	*73,700	a*27.50	Sept. 26	1800	21,800	16.14
Sept. 6	1100	5,200	8.14				

a From floodmark.

Minimum daily discharge, 61 ft³/s Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	131	283	244	209	195	172	122	126	380	208	76	107
2	124	290	223	188	480	170	130	114	1120	204	75	113
3	120	280	241	154	1190	173	128	112	778	197	73	112
4	118	269	258	163	450	163	136	112	496	190	73	109
5	112	246	239	181	350	125	134	108	416	184	72	99
6	108	292	232	188	330	140	129	112	366	177	78	1630
7	104	265	230	165	330	131	128	130	427	174	83	572
8	99	241	230	229	320	166	132	215	438	171	76	379
9	90	238	229	272	310	161	151	122	390	171	72	307
10	90	234	228	217	308	157	213	1300	345	166	69	235
11	99	598	416	211	300	114	183	416	343	163	69	199
12	102	380	294	237	295	85	163	290	403	156	71	275
13	95	300	280	235	290	77	147	228	570	147	74	219
14	80	271	268	183	280	77	133	204	413	160	74	179
15	124	252	262	193	265	125	124	199	325	160	74	168
16	130	246	255	200	265	141	120	182	289	153	71	155
17	132	240	248	223	270	139	114	140	396	143	70	146
18	132	239	242	217	245	142	118	100	486	134	69	137
19	25700	231	237	250	230	143	119	128	487	138	68	132
20	31400	223	236	231	228	132	116	128	422	137	65	127
21	11300	219	239	178	220	130	110	118	361	124	64	126
22	1000	222	240	146	210	130	106	112	321	118	61	126
23	579	217	237	160	220	124	98	110	296	111	64	123
24	498	214	236	211	218	121	96	108	285	107	72	120
25	443	208	224	233	218	123	94	108	275	101	86	119
26	403	215	210	213	212	123	93	207	266	98	93	4570
27	372	367	223	178	207	123	92	717	246	91	88	1310
28	343	282	221	163	190	121	96	480	237	92	83	429
29	319	269	219	182	---	116	96	359	226	88	78	316
30	304	261	216	180	---	119	105	293	216	85	81	239
31	291	---	214	180	---	122	---	438	---	80	85	---
TOTAL	74942	8092	7571	6170	8626	4085	3726	7516	12019	4428	2307	12878
MEAN	2417	270	244	199	308	132	124	242	401	143	74.4	429
MAX	31400	598	416	272	1190	173	213	1300	1120	208	93	4570
MIN	80	208	210	146	190	77	92	100	216	80	61	99
AC-FT	148600	16050	15020	12240	17110	8100	7390	14910	23840	8780	4580	25540

CAL YR 1985 TOTAL 165720 MEAN 454 MAX 31400 MIN 40 AC-FT 328700
WTR YR 1986 TOTAL 152360 MEAN 417 MAX 31400 MIN 61 AC-FT 302200

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°23'00", long 98°23'00", Comal County, Hydrologic Unit 12100201, at downstream side of bridge on Ranch Road 311, 1.9 mi southeast of Spring Branch Post Office, 7.5 mi downstream from Curry Creek, and at mile 334.4.

DRAINAGE AREA.--1,315 mi².

PERIOD OF RECORD.--June 1922 to current year.
Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982.

REVISED RECORDS.--WSP 1562: 1923-24, 1926, 1927-28(M), 1929, 1930(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 948.10 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 14, 1981, at site 220 ft downstream at same datum.

REMARKS.--Estimated daily discharges: May 9-11. Records good. Several small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--64 years, 314 ft³/s (227,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 160,000 ft³/s Aug. 3, 1978 (gage height, 45.25 ft, from floodmark), from rating curve extended above 55,600 ft³/s on basis of slope-area measurement of peak flow; no flow at times in 1951-52, 1954-56, and 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1859, about 53 ft in 1869; flood in July 1900 reached a stage of about 49 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 20	0600	*55,500	*32.06	Sept. 6	2100	10,100	13.98
Sept. 6	1000	11,500	15.12	Sept. 27	1400	11,300	14.98

Minimum daily discharge, 106 ft³/s Aug. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	267	483	648	467	315	367	233	178	1080	387	142	180
2	214	520	597	461	340	361	236	183	904	370	138	279
3	193	510	557	443	649	352	240	177	1910	357	131	201
4	180	468	566	412	1790	375	244	171	1080	345	135	174
5	171	449	556	385	710	348	246	173	802	332	132	169
6	163	429	537	397	603	319	246	173	667	322	131	4990
7	159	444	527	407	550	302	240	170	821	305	129	2680
8	157	430	516	393	571	309	235	178	731	295	136	731
9	155	407	512	435	550	326	239	390	711	287	133	515
10	150	396	506	479	534	327	272	230	649	280	128	426
11	138	388	1210	428	514	320	295	1900	590	277	125	355
12	142	674	1050	408	499	302	290	475	1170	270	146	748
13	145	520	790	435	490	263	270	375	938	267	128	470
14	144	445	712	422	490	245	249	318	854	263	136	390
15	411	418	680	370	480	242	227	298	654	260	127	328
16	306	405	670	370	440	252	216	285	564	266	125	295
17	245	393	652	371	466	281	215	277	526	259	123	276
18	227	388	631	375	448	283	215	258	936	247	119	261
19	387	383	608	369	409	277	218	208	898	234	116	250
20	27600	372	595	387	396	273	214	200	802	226	111	247
21	2720	364	576	375	380	263	207	208	692	226	110	240
22	1580	366	573	334	369	258	200	200	616	220	107	230
23	1160	366	567	315	364	255	190	190	563	208	106	226
24	939	387	550	293	380	254	184	183	523	199	108	222
25	806	381	529	338	373	246	176	185	502	189	112	215
26	735	369	517	353	378	247	172	436	485	182	125	211
27	674	1320	516	353	399	246	173	999	466	173	133	4620
28	606	1010	512	346	380	244	174	797	439	165	136	1070
29	548	747	503	313	---	238	173	581	422	157	147	559
30	520	687	488	319	---	234	174	457	407	152	131	431
31	501	---	477	306	---	235	---	1110	---	148	124	---
TOTAL	42343	14919	18928	11859	14267	8844	6663	11963	22402	7868	3930	21989
MEAN	1366	497	611	383	510	285	222	386	747	254	127	733
MAX	27600	1320	1210	479	1790	375	295	1900	1910	387	147	4990
MIN	138	364	477	293	315	234	172	170	407	148	106	169
AC-FT	83990	29590	37540	23520	28300	17540	13220	23730	44430	15610	7800	43620

CAL YR 1985 TOTAL 249203 MEAN 683 MAX 27600 MIN 85 AC-FT 494300
WTR YR 1986 TOTAL 185975 MEAN 510 MAX 27600 MIN 106 AC-FT 368900

GUADALUPE RIVER MAIN STEM

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°52'07", long 98°11'55", Comal County, Hydrologic Unit 12100201, in intake structure of Canyon Dam on Guadalupe River, 12 mi northwest of New Braunfels, and at mile 303.0.

DRAINAGE AREA.--1,432 mi².

PERIOD OF RECORD.--July 1962 to current year. Prior to October 1970, published as Canyon Reservoir.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 24, 1964, nonrecording gage at present site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 6,830 ft long, consisting of the main dam 4,410 ft long, an earthen dike 210 ft long, a 1,260-foot-long uncontrolled broad-crested-type spillway, and a 950-foot concrete and earthen nonoverflow section. Deliberate impoundment began June 16, 1964, and main part of dam was completed in August 1964. The flood-control outlet works consist of a 10.0-foot-diameter conduit controlled by two 5.7 by 10.0-foot hydraulically operated slide gates. The lake was built for water conservation and flood control. Capacity table beginning Oct. 1, 1974, is based on a sedimentation survey of August 1972. Small diversions above the lake for irrigation. Gage-height telemeter at station. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	974.0	-
Crest of spillway	943.0	736,700
Top of conservation pool	909.0	382,000
Lowest gated outlet (invert)	775.0	240

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 588,400 acre-ft Aug. 4, 1978 (elevation, 930.61 ft); minimum observed since conservation pool first reached in April 1968, 311,200 acre-ft Nov. 24, 1984 (elevation, 899.85 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 429,900 acre-ft Oct. 13 at 1400 hours (elevation, 914.60 ft); minimum daily, 371,200 acre-ft May 8 at 0100 hours (elevation, 907.68 ft).

Capacity table (elevation, in feet, and total contents, in acre-feet)

907.0	365,800	911.0	398,700	915.0	433,500
909.0	382,000	913.0	415,900		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	375500	401600	390800	384800	377000	378200	375500	372400	386600	389800	376800	371900
2	375100	400700	390900	384300	377100	378200	375300	372400	387600	388900	376300	372000
3	374800	399600	391200	383600	379500	379200	375200	372100	390100	388100	376100	372100
4	374300	398600	391500	382700	382700	379200	375200	372000	391600	387400	375900	372100
5	373800	397400	391500	382000	383600	379200	375000	372000	391900	386600	375600	372100
6	373300	396300	391500	381500	383800	379100	375100	371900	392000	386000	375500	382700
7	372900	395100	391700	381100	383800	379000	375000	371700	393400	385200	375400	388300
8	372800	394000	391700	381100	383700	378800	374800	372600	393700	384600	375100	389500
9	372800	392900	391700	380800	383600	378800	375100	376400	393900	383900	374900	389600
10	373000	391800	391900	380800	383400	378900	374900	378500	393900	383300	374700	389000
11	373200	390600	392300	380500	383100	378900	375000	380200	393800	383000	374500	388700
12	373200	390300	393100	380400	382700	378800	374900	380800	395400	382700	374500	392300
13	373200	389400	393000	380100	382500	378600	374800	381100	396000	382400	374200	393000
14	373700	388400	392700	379900	382400	378400	374600	381500	396500	382200	374000	392800
15	374900	387400	392500	379600	382100	378100	374200	381700	396300	382200	373800	392000
16	375100	386100	392300	379400	381900	377800	374000	381300	396300	381900	373600	391100
17	375100	385000	392100	379400	381800	377700	373900	382100	395900	381700	373500	390000
18	375100	384100	391800	379000	381400	377700	373700	381800	396300	381300	373300	389000
19	375500	383300	391300	378700	381100	377400	373600	381300	396500	381100	373200	387900
20	423400	382500	391000	378600	380700	377100	373300	380800	396700	380800	373200	387100
21	427600	382000	390600	378400	380200	376900	372900	380300	396500	380500	373200	386200
22	429600	381700	390200	378100	379500	376800	372700	379900	396300	380200	372900	385100
23	426800	381300	389900	377900	379000	376600	372400	379500	395900	379800	372800	383600
24	419100	382500	389300	377700	378600	376400	372400	379000	395400	379400	372800	382100
25	411200	382700	388600	377700	378400	376300	372200	378700	394800	379000	372600	381000
26	407300	383300	388200	377600	378500	376200	372200	379500	394100	378600	372500	380800
27	406400	387200	387600	377400	378500	376200	372100	381000	393400	378100	372400	387600
28	405600	388700	387100	377400	378400	376100	372000	381800	392700	377800	372500	389400
29	404500	389700	386600	377200	---	375800	372000	382000	391700	377600	372400	389600
30	403200	390500	386100	377200	---	375800	372000	382700	390700	377300	372000	388600
31	401900	---	385500	377000	---	375500	---	385000	---	377000	371700	---
MAX	429600	401600	393100	384800	383800	379200	375500	385000	396700	389800	376800	393000
MIN	372800	381300	385500	377000	377000	375500	372000	371700	386600	377000	371700	371900
(†)	911.37	910.02	909.42	908.39	908.56	908.21	907.78	909.36	910.05	908.39	907.74	909.80
(Φ)	+26400	-11400	-5000	-8500	+1400	-2900	-3500	+13000	+5700	-13700	-5300	+16900

CAL YR 1985 MAX 429600 MIN 327200 (Φ) +71400
WTR YR 1986 MAX 429600 MIN 371700 (Φ) +13100

(†) Elevation, in feet, at end of month.
(Φ) Change in contents, in acre-feet.

08167800 GUADALUPE RIVER AT SATTLER, TX

LOCATION.--Lat 29°51'32", long 98°10'47", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from Horseshoe Falls, 0.8 mi north of Sattler, 1.8 mi downstream from Canyon Dam, 2.3 mi upstream from Heiser Hollow, 11.2 mi north of New Braunfels, and at mile 301.2.

DRAINAGE AREA.--1,436 mi², of which 1,432 mi² is above Canyon Dam.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1960 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 742.24 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--No estimated daily discharges. Records good. Flow completely regulated since July 21, 1962, by Canyon Lake (station 08167700) 1.8 mi upstream. Small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--24 years (water years 1962-86) since regulation began at Canyon Lake, 391 ft³/s (283,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,800 ft³/s Oct. 29, 1960 (gage height, 12.20 ft). Maximum discharge since closure of Canyon Dam on July 21, 1962, 5,850 ft³/s Aug. 5, 1978 (gage height, 8.31 ft); no flow July 31 to Aug. 6, 1962 (result of closure of Canyon Dam), and part of Jan. 29, 30, Feb. 1, 1965 (result of closure while constructing present control).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1869 (stage unknown) has not been exceeded since that date; flood in July 1900 (stage unknown) exceeded 39 ft; maximum stage since at least 1904, 39 ft in July 1932 and June 1935, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,110 ft³/s Oct. 24 at 1400 hours (gage height, 8.10 ft); minimum daily, 122 ft³/s Aug. 25-28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	258	926	551	763	395	370	296	206	574	795	206	188
2	341	926	549	763	395	370	296	206	574	791	206	191
3	341	926	549	763	397	375	296	206	674	694	203	144
4	341	926	549	763	400	374	296	206	730	615	171	172
5	341	926	549	763	400	374	296	206	776	614	143	179
6	341	926	544	642	487	374	296	206	781	614	143	182
7	341	926	542	541	642	374	296	206	784	614	143	183
8	233	926	542	536	642	374	296	206	791	614	143	184
9	148	926	621	536	642	374	296	207	791	578	143	479
10	148	926	729	536	637	374	296	209	800	481	143	746
11	148	926	755	536	631	374	296	209	800	366	143	756
12	148	926	755	536	628	374	296	209	800	309	143	485
13	148	926	755	536	628	374	296	209	800	306	143	209
14	148	926	755	536	628	374	296	209	800	304	143	548
15	152	936	755	536	628	374	296	331	800	304	143	772
16	188	936	755	536	628	374	296	426	792	304	142	772
17	281	936	755	542	628	374	296	434	795	304	141	772
18	283	936	755	542	628	374	296	437	792	304	132	765
19	285	763	755	542	628	353	296	437	791	304	124	763
20	287	608	755	542	630	301	296	437	791	304	124	763
21	287	607	755	542	630	300	296	437	791	304	124	763
22	446	568	755	472	628	300	245	437	791	304	124	853
23	2570	536	755	406	628	300	206	437	791	304	124	930
24	5060	549	755	395	628	300	206	437	791	304	123	936
25	5050	558	755	395	481	300	206	437	791	302	122	600
26	2910	549	755	395	371	300	206	438	795	300	122	322
27	926	585	755	395	370	300	206	432	800	300	122	322
28	926	567	755	395	370	300	206	478	800	250	122	322
29	926	557	759	395	---	300	185	568	800	206	136	563
30	926	555	763	395	---	296	204	570	800	206	182	772
31	926	---	763	395	---	296	---	574	---	206	186	---
TOTAL	25854	23710	21600	16570	15428	10671	8086	10647	23186	12505	4509	15636
MEAN	834	790	697	535	551	344	270	343	773	403	145	521
MAX	5060	936	763	763	642	375	296	574	800	795	206	936
MIN	148	536	542	395	370	296	185	206	574	206	122	144
AC-FT	51280	47030	42840	32870	30600	21170	16040	21120	45990	24800	8940	31010

CAL YR 1985 TOTAL 233952 MEAN 641 MAX 5060 MIN 142 AC-FT 464000
WTR YR 1986 TOTAL 188402 MEAN 516 MAX 5060 MIN 122 AC-FT 373700

GUADALUPE RIVER BASIN

08168000 HUECO SPRINGS NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°45'34", long 98°08'24", Comal County, Hydrologic Unit 12100202, two springs located 1,700 ft upstream from mouth of unnamed tributary which enters the Guadalupe River at Slumber Falls, and 4.2 mi north of New Braunfels.

DRAINAGE AREA.--Not applicable.

PERIOD OF RECORD.--August 1944 to current year. Miscellaneous measurements only.

GAGE.--None.

REMARKS.--Discharge represents flow from springs. Surface runoff from precipitation is excluded. No diversion above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum spring discharge measured 131 ft^3/s Jan. 21, 1968; no flow at times in 1948-49, 1951-57, 1963-64, 1967, 1984.

DISCHARGE MEASUREMENTS, IN CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Oct. 28, 1985	64.2	Mar. 4, 1986	50.2	June 25, 1986	84.0
Nov. 22	36.6	Apr. 29	22.8	Aug. 21	36.9
Jan. 17, 1986	59.0				

08168500 GUADALUPE RIVER ABOVE COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'53", long 98°06'35", Comal County, Hydrologic Unit 12100202, on right bank at New Braunfels, 1.1 mi upstream from Comal River, 21.9 mi downstream from Canyon Lake, and at mile 281.1.

DRAINAGE AREA.--1,518 mi².

PERIOD OF RECORD.--December 1927 to current year.

REVISED RECORDS.--WSP 898: 1935. WSP 1562: 1932. WSP 2123: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 586.65 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Small diversions for irrigation below station 08167800 and above this station. Since July 21, 1962, flow is largely regulated by Canyon Lake (station 08167700) 21.9 mi upstream. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--34 years (water years 1929-62) prior to regulation by Canyon Lake, 372 ft³/s (269,500 acre-ft/yr); 24 years (water years 1963-86) regulated, 480 ft³/s (347,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 101,000 ft³/s June 15, 1935 (gage height, 32.95 ft); no flow July 8, 9, July 17 to Aug. 20, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1845, 38 ft July 8, 1869, and in December 1913, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,600 ft³/s Nov. 24 at 0700 hours (gage height, 10.20 ft); minimum daily discharge, 167 ft³/s Aug. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	277	1130	885	1000	466	456	351	246	918	946	292	242
2	426	1160	834	998	466	458	351	230	824	947	291	246
3	422	1140	817	991	504	489	345	228	851	885	287	224
4	422	1140	799	990	565	469	345	226	1250	737	280	191
5	418	1130	779	980	539	458	345	228	1170	732	220	229
6	421	1130	766	912	538	458	345	223	1120	729	218	243
7	426	1130	760	689	789	455	338	223	1100	729	217	254
8	400	1120	755	691	790	457	335	229	1120	725	212	243
9	230	1130	792	688	784	458	340	225	1090	709	212	336
10	222	1140	965	681	781	453	333	280	1070	615	209	813
11	218	1140	1030	678	775	451	331	247	1080	512	208	880
12	215	1140	1020	678	770	452	330	234	1110	417	206	857
13	212	1140	1010	678	769	450	325	229	1110	411	201	288
14	211	1140	1000	678	765	445	323	237	1070	408	196	423
15	307	1140	1000	678	760	445	318	280	1050	404	194	836
16	251	1130	1000	680	761	442	318	457	1040	403	193	842
17	360	1120	1000	695	760	442	323	476	1060	402	192	838
18	380	1130	1000	678	760	445	326	507	1040	400	190	837
19	387	994	996	678	760	435	325	480	1030	397	171	838
20	390	689	993	675	760	366	319	471	1020	394	170	844
21	407	688	995	670	759	358	318	466	1020	390	170	839
22	473	666	995	634	756	357	309	463	1020	388	170	907
23	1790	612	997	507	753	356	234	458	1000	387	172	1090
24	5410	2270	995	492	750	351	232	456	990	387	179	1100
25	5370	1180	991	487	677	351	229	450	985	386	178	915
26	4100	929	993	483	459	351	229	529	982	385	170	356
27	1160	1540	994	480	458	351	229	549	981	382	171	351
28	1140	1240	992	475	455	350	229	529	979	370	167	364
29	1140	1050	991	475	---	351	216	672	977	299	168	462
30	1130	955	991	466	---	351	225	721	964	298	215	836
31	1120	---	995	466	---	350	---	942	---	295	235	---
TOTAL	29835	33243	29130	21051	18929	12861	9116	12191	31021	15869	6354	17724
MEAN	962	1108	940	679	676	415	304	393	1034	512	205	591
MAX	5410	2270	1030	1000	790	489	351	942	1250	947	292	1100
MIN	211	612	755	466	455	350	216	223	824	295	167	191

CAL YR 1985 TOTAL 291473 MEAN 799 MAX 5410 MIN 196
WTR YR 1986 TOTAL 237324 MEAN 650 MAX 5410 MIN 167

GUADALUPE RIVER BASIN

08169000 COMAL RIVER AT NEW BRAUNFELS, TX

LOCATION.--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi upstream from mouth.

DRAINAGE AREA.--130 mi². Normal flow of river comes from springs; drainage area not applicable.

PERIOD OF RECORD.--1882 to current year (1882 to November 1927, discharge measurements only).

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones Fault Zone. Except during periods of rainfall, flow of river is primarily from Comal Springs about 1.0 mi upstream. Flow is affected at times by cleanup operations by the city of New Braunfels at Landa Park Lake and at times by discharge from the flood-detention pools of five floodwater-retarding structures with a combined detention capacity of 17,580 acre-ft. These structures control runoff from 74.6 mi² above station. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--54 years (water years 1933-86), 294 ft³/s (213,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,800 ft³/s May 11, 1972 (gage height, 36.55 ft, from floodmark), from rating curve extended above 13,000 ft³/s on basis of contracted-opening measurements on Blieders and Dry Comal Creeks and unit rainfall-runoff studies; no flow from Comal Springs from June 13 to Nov. 3, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood information begins with flood of July 8, 1869, which reached a stage of 36.91 ft, from painted and dated marks in old Remmert Brewery 0.5 mi downstream; the flood of Oct. 17, 1870, reached a stage of 37.65 ft at same site (probably some backwater from Guadalupe River).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Nov. 24	0700	3,130	8.92	June 4	1000	*4,500	*10.82

Minimum daily discharge, 226 ft³/s Aug. 19, 20, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	242	290	330	326	317	308	278	246	308	317	250	251
2	238	322	330	326	312	308	278	246	278	322	250	246
3	238	299	326	326	366	313	282	246	270	326	246	246
4	242	290	322	322	330	304	282	250	1900	317	250	242
5	238	290	322	326	322	304	270	246	400	317	246	246
6	242	290	322	322	322	304	278	242	322	317	246	246
7	242	286	322	322	322	304	278	242	317	317	250	262
8	242	286	322	326	317	304	274	246	312	308	242	258
9	246	290	322	326	322	304	278	242	322	308	246	254
10	246	294	322	322	322	299	274	238	308	312	242	254
11	246	294	326	322	322	304	278	242	312	299	242	316
12	246	294	326	322	326	304	274	246	322	308	234	278
13	246	290	326	317	326	304	274	242	312	308	244	258
14	252	290	326	322	326	294	270	250	317	308	246	262
15	336	294	326	326	326	304	266	258	312	299	234	262
16	266	294	322	327	322	294	266	242	312	299	238	258
17	258	294	326	365	317	294	266	242	312	308	238	258
18	258	299	326	330	312	299	266	242	322	290	238	262
19	294	294	326	326	317	299	266	246	340	294	226	262
20	304	294	330	322	312	294	266	242	322	290	226	266
21	286	294	330	322	312	290	262	246	326	290	230	266
22	282	294	326	317	308	286	254	238	322	282	226	262
23	282	294	330	317	312	290	250	234	322	278	234	262
24	282	1090	330	317	308	286	250	238	317	282	250	258
25	278	708	326	322	304	286	250	238	322	266	250	258
26	278	441	330	317	304	286	246	242	326	270	238	258
27	278	803	326	318	304	286	246	262	317	270	234	258
28	278	396	330	322	314	286	246	246	322	270	242	262
29	278	345	326	317	---	282	241	246	322	258	234	258
30	278	335	327	312	---	282	242	392	325	258	242	258
31	278	---	326	317	---	286	---	682	---	254	242	---
TOTAL	8200	10874	10107	10021	8924	9188	7951	8160	11141	9142	7456	7787
MEAN	265	362	326	323	319	296	265	263	371	295	241	260
MAX	336	1090	330	365	366	313	282	682	1900	326	250	316
MIN	238	286	322	312	304	282	241	234	270	254	226	242

CAL YR 1985 TOTAL 97084 MEAN 266 MAX 1760 MIN 184
WTR YR 1986 TOTAL 108951 MEAN 298 MAX 1900 MIN 226

GUADALUPE RIVER BASIN

COMAL SPRINGS AT NEW BRAUNFELS, TX

LOCATION.--Lat 29 42'21", long 98 07'20", Comal County, Hydrologic unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi upstream from mouth.

DRAINAGE AREA.--Not applicable. Flow at station has been corrected to reflect only flow from Comal Springs.

PERIOD OF RECORD.--1882 to current year (1882 to November 1927, discharge measurements only).

GAGE.--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft National Geodetic Vertical Datum of 1929.

REMARKS.--The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones fault zone. Except during period of rainfall, flow of river is primarily from Comal Springs about 1.0 mi upstream. Flow to gaging station 08169000 Comal River at New Braunfels, Tex., has been corrected to reflect only that flow from Comal Springs.

AVERAGE DISCHARGE.--59 years (water years 1928-86), 284 ft^3/s, 206,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge, 671 ft^3/s Nov. 25, 1985; no flow June 13 to Nov. 4, 1956.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	242	286	330	326	317	308	278	246	308	317	250	242
2	238	322	330	326	312	308	278	246	278	322	250	246
3	238	299	326	326	330	308	282	246	270	326	246	246
4	242	290	322	322	330	304	282	246	380	317	250	242
5	238	290	322	326	322	304	270	246	360	317	246	246
6	242	290	322	322	322	304	278	242	322	317	246	246
7	242	286	322	322	322	304	278	242	317	317	250	258
8	242	286	322	326	317	304	274	242	312	308	242	258
9	246	290	322	326	322	304	274	242	312	308	246	254
10	246	294	322	322	322	299	274	238	308	312	242	254
11	246	294	326	322	322	304	278	242	312	299	242	258
12	246	284	326	322	326	304	274	246	312	308	234	270
13	246	290	326	317	326	304	274	242	312	308	234	258
14	246	290	326	322	326	294	270	246	317	308	246	262
15	274	294	326	326	326	304	266	254	312	299	234	262
16	266	294	322	326	322	294	266	242	312	299	238	258
17	258	294	326	355	317	294	266	238	312	308	238	258
18	258	299	326	330	312	299	266	242	322	290	238	262
19	262	294	326	326	317	299	266	246	340	294	226	258
20	286	294	330	322	312	294	266	242	322	290	226	226
21	278	294	330	322	312	290	262	242	326	290	230	266
22	282	294	326	317	308	286	254	238	322	282	226	262
23	282	294	330	317	312	290	250	234	322	278	234	262
24	282	561	330	317	308	286	250	238	317	282	246	258
25	278	671	326	322	304	286	250	238	322	266	250	258
26	278	429	330	317	304	286	246	238	326	270	238	258
27	278	478	326	318	304	286	246	254	317	270	234	258
28	278	390	330	322	314	286	246	246	322	270	242	258
29	278	345	326	317	---	282	241	242	322	258	234	258
30	278	335	327	312	---	282	242	257	325	258	242	258
31	278	---	326	317	---	286	---	396	---	254	242	---
TOTAL	8074	9961	10107	10010	8888	9183	7947	7699	9561	9142	7442	7700
MEAN	260	332	326	323	317	296	265	248	319	295	240	257
MAX	286	671	330	355	330	308	282	396	380	326	250	270
MIN	238	286	322	312	304	282	241	234	270	254	226	242

CAL YR 1985 TOTAL 93,000 MEAN 254 MAX 671 MIN 226 AC-FT 184,466
WTR YR 1986 TOTAL 105,714 MEAN 290 MAX 671 MIN 226 AC-FT 154,449

08170000 SAN MARCOS RIVER SPRINGFLOW AT SAN MARCOS, TX

LOCATION.--Lat 29°52'06", long 97°55'38", Hays County, Hydrologic Unit 12100203, on left bank 0.7 mi downstream from bridge on Interstate Highway 35 and U.S. Highway 81, 1.2 mi southeast of courthouse in San Marcos, and 2.1 mi upstream from Blanco River.

DRAINAGE AREA.--93.0 mi². Normal flow of river comes from springs, drainage area of stream not applicable.

PERIOD OF RECORD.--May 1956 to current year. June 1915 to January 1916, March 1916 to September 1921, and May to September 1956, published as San Marcos River at San Marcos; records include some surface runoff. Periodic measurements of springflow were made at this location outside period of records since Nov. 14, 1894, and are published as miscellaneous measurements.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 536.82 ft above National Geodetic Vertical Datum of 1929. June 10, 1915, to Jan. 19, 1916, nonrecording gage at site 1.2 mi upstream, and Mar. 13, 1916, to Sept. 7, 1921, water-stage recorder near present site, datum relations unknown.

REMARKS.--Estimated daily discharges: Oct. 18 to Nov. 5. Records good except those for estimated discharges, which are fair. Flow is slightly regualted by utilites dam about 1.5 mi upstream. Flow is affected at times by discharge from the flood-detention pool of one floodwater-retarding structure with a detention capacity of 8,580 acre-ft. This structure controls runoff from 33.6 mi². Entire flow of river is from San Marcos springs, about 1.8 mi upstream, except during periods of local runoff. San Marcos springs emerge from the Edwards and associated limestones in the Balcones Fault Zone. There is a small diversion for operation of State fish hatchery, some of which is returned above gage. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--30 years (water years 1957-86), 165 ft³/s (119,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge (estimated), 350 ft³/s June 20, 1981; maximum discharge, 76,600 ft³/s May 15, 1970 (gage height, 35.12 ft); minimum daily spring discharge, 46 ft³/s Aug. 15, 16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1913, 38.6 ft Sept. 10, 1921 (from floodmark, backwater from Blanco River), present datum.

EXTREMES FOR CURRENT YEAR.--Maximum daily spring discharge, 316 ft³/s Nov. 27; maximum gage height, 24.30 ft Oct. 24 at 0800 hours (flood runoff); minimum daily spring discharge, 156 ft³/s Apr. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169	e158	254	236	204	195	168	e168	230	248	220	e191
2	169	e158	250	233	202	197	167	164	224	248	217	e191
3	169	e158	251	232	e205	198	169	160	224	245	215	189
4	168	e159	251	231	e218	197	168	159	e240	244	213	190
5	168	e160	250	230	216	197	168	159	e244	244	212	187
6	168	e163	247	228	e209	196	167	158	240	244	212	e190
7	167	163	248	230	206	195	168	158	e244	243	211	e199
8	164	164	248	232	204	e197	167	e162	253	241	209	193
9	162	164	248	230	202	199	e168	e163	e261	239	209	190
10	163	163	e251	227	201	196	168	e205	254	240	e210	188
11	160	e164	e257	227	199	e194	167	e212	250	239	e215	e186
12	158	166	e257	224	197	192	168	201	e250	238	212	e191
13	e157	164	252	223	196	191	167	195	e257	237	208	e195
14	e157	163	250	224	197	190	166	e191	254	236	208	185
15	e174	163	248	223	196	189	166	e194	253	e234	205	183
16	168	163	247	e223	199	186	163	189	251	237	206	181
17	163	164	246	e227	197	186	e164	e199	e257	237	206	180
18	e160	162	244	221	196	e186	164	e226	e257	235	205	179
19	e159	162	243	217	195	184	164	210	e263	234	203	174
20	e159	159	241	213	196	183	164	e208	e258	233	200	175
21	e158	159	241	212	195	182	160	206	258	233	200	e183
22	e158	158	e243	210	196	180	159	204	257	231	200	184
23	e158	e162	244	209	196	180	157	202	254	229	204	180
24	e158	e230	242	209	196	179	156	201	253	228	e200	179
25	e158	e242	240	209	197	179	e157	199	251	228	198	178
26	e158	219	238	206	197	179	157	e200	252	227	198	178
27	e158	e316	238	206	195	177	159	e201	251	227	197	178
28	e158	e294	238	206	195	175	157	200	252	224	195	177
29	e158	263	236	205	---	172	158	199	251	223	193	175
30	e158	259	236	204	---	168	159	e208	248	223	191	174
31	e158	---	236	204	---	168	---	e230	---	222	191	---
TOTAL	5020	5542	7615	6811	5602	5787	4910	5931	7491	7291	6363	5523
MEAN	162	185	246	220	200	187	164	191	250	235	205	184
MAX	174	316	257	236	218	199	169	230	263	248	220	199
MIN	157	158	236	204	195	168	156	158	224	222	191	174
CFSM	1.74	1.99	2.65	2.37	2.15	2.01	1.76	2.05	2.69	2.53	2.20	1.98
IN.	2.01	2.22	3.05	2.72	2.24	2.31	1.96	2.37	3.00	2.92	2.55	2.21
AC-FT	9960	10990	15100	13510	11110	11480	9740	11760	14860	14460	12620	10950

CAL YR 1985	TOTAL	66562	MEAN	182	MAX	316	MIN	120	CFSM	1.96	IN.	26.62	AC-FT	132000
WTR YR 1986	TOTAL	73886	MEAN	202	MAX	316	MIN	156	CFSM	2.17	IN.	29.55	AC-FT	146600

e Discharge estimated.

08171000 BLANCO RIVER AT WIMBERLEY, TX

LOCATION.--Lat 29°59'39", long 98°05'19", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of highway, near left end of bridge on Ranch Road 12, 0.3 mi southeast of Wimberley, 2,200 ft downstream from Cypress Creek, and at mile 29.0.

DRAINAGE AREA.--355 mi².

PERIOD OF RECORD.--August 1924 to September 1926, June 1928 to current year.

REVISED RECORDS.--WSP 1562: 1929, 1930-31(M), 1935-36(M), 1938(M), 1941-42(M), 1947(M), 1949(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 797.23 ft above National Geodetic Vertical Datum of 1929. Aug. 6, 1924, to Sept. 30, 1926, nonrecording gage at site 1,030 ft upstream at datum 5.00 ft higher. Recording gage from June 6, 1928, to June 12, 1975, at site 1,000 ft upstream at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. There are many small diversions above stations. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--60 years (water years 1925-26, 1929-86), 124 ft³/s (4.74 in/yr), 89,840 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 113,000 ft³/s May 28, 1929 (gage height, 33.3 ft, from floodmark), present site and datum, from rating curve extended above 30,000 ft³/s on basis of slope-area measurements of 95,000 and 113,000 ft³/s; minimum, 0.6 ft³/s Aug. 16, 1956.
Maximum stage since at least 1869, that of May 28, 1929.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1869 reached a stage of 25 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Feb. 4	0030	3,280	7.82	Sept. 6	1430	*33,900	*20.39
May 9	2300	19,100	15.67	Sept. 12	0530	2,290	6.97

Minimum daily discharge, 47 ft³/s Oct. 11-13 and Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	92	370	177	105	130	81	91	202	133	57	61
2	73	105	329	173	105	129	81	72	169	121	55	59
3	68	102	313	170	297	129	81	68	154	121	54	58
4	67	102	299	166	1050	129	81	66	169	119	54	56
5	59	100	275	156	334	129	81	66	178	114	54	56
6	51	97	259	149	260	129	78	66	170	108	54	6220
7	51	89	246	149	235	124	78	66	225	104	56	743
8	51	89	235	149	217	123	78	75	345	100	56	313
9	49	89	227	149	208	121	84	1820	275	98	56	221
10	48	87	240	149	207	118	79	3130	234	95	56	176
11	47	89	500	149	203	117	75	344	222	92	56	151
12	47	86	503	145	193	115	75	213	343	91	55	753
13	47	84	362	140	192	114	75	161	282	90	54	255
14	52	83	324	136	192	112	75	136	262	88	54	174
15	97	83	312	133	188	111	73	129	236	86	54	147
16	80	81	303	129	188	108	73	124	211	82	49	134
17	78	81	291	129	181	105	73	395	252	75	49	126
18	78	81	280	129	174	105	73	481	653	72	49	124
19	84	89	265	129	170	102	73	248	322	69	49	119
20	427	83	252	124	164	100	73	201	263	69	47	112
21	202	81	247	123	158	94	70	178	237	70	52	110
22	158	81	239	121	150	92	70	163	220	67	51	106
23	142	81	235	117	147	91	69	151	204	66	55	106
24	127	137	226	114	146	91	68	140	197	66	54	102
25	114	173	213	114	146	91	66	133	189	63	52	99
26	106	157	203	111	148	91	68	149	179	63	51	97
27	102	966	202	108	143	89	71	150	169	60	50	92
28	99	701	199	108	137	89	68	149	163	58	49	104
29	94	486	192	108	---	87	63	139	151	59	52	99
30	94	416	188	108	---	86	63	149	140	61	62	90
31	92	---	184	106	---	85	---	169	---	58	61	---
TOTAL	2957	5071	8513	4168	6038	3336	2216	9622	7016	2618	1657	11063
MEAN	95.4	169	275	134	216	108	73.9	310	234	84.5	53.5	369
MAX	427	966	503	177	1050	130	84	3130	653	133	62	6220
MIN	47	81	184	106	105	85	63	66	140	58	47	56
CFSM	.27	.48	.77	.38	.61	.30	.21	.87	.66	.24	.15	1.04
IN.	.31	.53	.89	.44	.63	.35	.23	1.01	.74	.27	.17	1.16
AC-FT	5870	10060	16890	8270	11980	6620	4400	19090	13920	5190	3290	21940

CAL YR 1985	TOTAL	90203	MEAN	247	MAX	14400	MIN	44	CFSM	.70	IN.	9.45	AC-FT	178900
WTR YR 1986	TOTAL	64275	MEAN	176	MAX	6220	MIN	47	CFSM	.50	IN.	6.74	AC-FT	127500

08171300 BLANCO RIVER NEAR KYLE, TX

LOCATION.--Lat 29 58'45", long 97 54'35", Hays County, Hydrologic Unit 12100203, on left bank 800 ft downstream from Tarbutton Ranch House (Hatchett Ranch), 2.2 mi southwest of Kyle, 4.2 mi downstream from Halifax Creek, and 6.3 mi upstream from bridge on U.S. Highway 81.

DRAINAGE AREA.--412 mi².

PERIOD OF RECORD.--May 1956 to current year.

REVISED RECORDS.--WSP 1923: 1957-58, 1960(M). WSP 2123: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 620.12 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--No estimated daily discharges. Records good. Small diversions above station for irrigation. Most of the low flow of the Blanco River enters the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin upstream from this station and below the station at Wimberley. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--30 years, 147 ft³/s (4.85 in/yr), 106,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,000 ft³/s May 2, 1958 (gage height, 36.3 ft, from floodmark), from rating curve extended above 37,000 ft³/s on basis of slope-area measurement of 139,000 ft³/s and slope-conveyance study; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, about 40 ft in May 1929, from information by local residents (discharge, 139,000 ft³/s). Flood of Sept. 11, 1952, reached a stage of 38.0 ft (discharge, 115,000 ft³/s).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Feb. 4	0300	2,680	10.94	June 12	1700	3,650	12.05
May 10	0130	19,900	21.84	Sept. 6	unknown	*32,900	a*25.91

a From floodmark.

Minimum daily discharge, 26 ft³/s Aug. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	77	481	181	98	117	67	74	257	132	42	33
2	55	97	416	178	98	115	66	75	214	121	41	39
3	51	86	385	175	135	115	66	56	188	114	41	31
4	47	83	366	171	1070	115	67	53	209	108	40	31
5	41	80	340	162	347	113	66	54	218	102	41	32
6	39	79	316	158	257	111	65	53	203	97	40	5340
7	38	77	299	154	224	106	66	50	188	93	41	1770
8	37	76	285	158	207	105	65	59	402	89	38	301
9	37	74	273	157	199	103	65	423	342	85	38	201
10	37	74	276	159	197	102	76	5100	277	82	36	148
11	35	179	379	154	193	99	65	531	254	78	36	124
12	34	101	659	149	184	100	66	288	645	76	37	650
13	33	88	405	143	180	98	65	214	456	74	36	248
14	33	83	356	139	179	99	61	176	323	72	34	155
15	90	83	337	134	175	97	58	172	285	71	33	117
16	70	82	328	131	171	93	58	159	249	72	33	103
17	62	81	315	135	168	90	59	388	279	67	33	95
18	61	83	301	130	161	92	60	742	679	65	31	88
19	67	83	287	126	157	86	60	350	404	61	29	89
20	322	90	276	122	151	84	57	271	300	60	28	89
21	218	80	266	119	147	81	55	225	263	59	29	89
22	149	82	257	116	140	77	54	208	240	58	29	80
23	130	81	248	113	134	77	53	184	221	56	32	76
24	116	250	238	110	132	77	53	171	207	54	36	73
25	102	363	223	109	132	76	52	160	195	53	34	72
26	93	279	213	105	129	74	52	171	184	51	30	71
27	86	1190	210	102	127	73	54	181	171	50	28	69
28	82	1050	204	102	121	71	53	174	160	47	27	69
29	79	665	197	102	---	71	51	161	151	45	26	79
30	77	553	191	101	---	68	57	179	140	44	29	69
31	75	---	186	99	---	68	---	207	---	44	33	---
TOTAL	2453	6349	9513	4194	5613	2853	1812	11309	8304	2280	1061	10431
MEAN	79.1	212	307	135	200	92.0	60.4	365	277	73.5	34.2	348
MAX	322	1190	659	181	1070	117	76	5100	679	132	42	5340
MIN	33	74	186	99	98	68	51	50	140	44	26	31
CFSM	.19	.51	.75	.33	.49	.22	.15	.89	.67	.18	.08	.84
IN.	.22	.57	.86	.38	.51	.26	.16	1.02	.75	.21	.10	.94
AC-FT	4870	12590	18870	8320	11130	5660	3590	22430	16470	4520	2100	20690

CAL YR 1985	TOTAL	95502	MEAN	262	MAX	16200	MIN	28	CFSM	.64	IN.	8.62	AC-FT	189400
WTR YR 1986	TOTAL	66172	MEAN	181	MAX	5340	MIN	26	CFSM	.44	IN.	5.97	AC-FT	131300

08172400 PLUM CREEK AT LOCKHART, TX

LOCATION.--Lat 29°55'22", long 97°40'44", Caldwell County, Hydrologic Unit 12100203, on right bank 548 ft upstream from bridge on U.S. Highway 183, 2.7 mi north of Lockhart, 3.7 mi upstream from Town Creek, 5.0 mi downstream from Brushy Creek, and 30.4 mi upstream from mouth.

DRAINAGE AREA.--112 mi².

PERIOD OF RECORD.--April 1959 to current year.

REVISED RECORDS.--WSP 2123: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 431.19 ft above National Geodetic Vertical Datum of 1929. Apr. 30, 1959, to July 25, 1968, at site 548 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station. Flow is affected at times by discharge from the flood-detention pools of 17 floodwater-retarding structures with a combined capacity of 24,850 acre-ft. These structures control runoff from 67.8 mi² above this station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--27 years, 47.5 ft³/s (34,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,700 ft³/s Nov. 24, 1985 (gage height, 20.89 ft); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1905, 22 ft in June 1936 at present site; flood in 1951 reached a stage of 20 ft at present site, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Nov. 24	0930	*27,700	*20.89	May 10	0630	7,350	16.69
Nov. 27	1330	4,320	15.80				

Minimum daily discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	.00	496	11	6.2	3.1	2.8	.52	368	2.9	.00	.00
2	.61	.00	423	11	6.2	3.1	2.6	3.8	285	2.4	.00	.00
3	.18	.00	358	11	127	3.3	2.4	9.5	157	2.1	.00	.00
4	.07	.27	338	11	224	22	2.1	7.0	99	1.8	.00	.00
5	.01	.46	313	9.6	83	33	1.8	4.9	162	1.5	.00	.00
6	.00	.17	285	9.1	45	21	1.6	4.1	89	1.2	.00	.00
7	.00	.18	262	8.9	30	16	1.5	3.0	53	.98	.00	.00
8	.00	.18	233	9.7	21	13	1.3	48	106	.90	.00	.00
9	.00	.20	194	13	17	11	1.2	89	82	.84	.00	.00
10	.00	.21	147	13	15	9.0	1.1	3010	69	.71	.00	.00
11	.00	.28	284	12	12	7.7	1.2	704	46	.56	.00	.00
12	.00	.41	194	11	11	6.9	1.6	544	43	.44	.00	97
13	.00	.43	126	9.7	9.5	6.0	1.6	418	81	.25	.00	20
14	.00	.78	91	9.1	8.8	5.7	1.4	340	61	.13	.00	13
15	.00	1.0	72	8.6	8.3	5.3	1.0	291	39	.06	.00	4.5
16	.00	1.3	50	14	7.9	4.4	.79	224	25	.04	.00	1.3
17	.16	1.4	41	172	7.7	3.7	.58	210	166	.00	.00	.31
18	.12	1.3	33	42	7.0	3.7	.51	327	311	.00	.00	.10
19	.09	1.4	27	23	6.4	3.1	.46	211	297	.00	.00	.04
20	.80	1.4	20	17	5.7	2.7	.31	142	128	.00	.00	.00
21	1.1	1.4	18	15	5.2	2.3	.25	100	62	.00	.00	.74
22	1.6	1.0	17	12	4.6	2.0	.18	67	36	.00	.00	3.7
23	1.7	.99	16	11	4.2	1.8	.17	42	23	.00	.00	76
24	1.1	9700	15	9.7	3.9	1.6	.40	25	16	.00	.00	11
25	.41	1800	14	9.1	3.9	1.6	1.0	18	12	.00	.00	4.8
26	.16	853	13	8.2	3.8	1.5	.67	16	9.5	.00	.00	2.4
27	.07	3040	12	7.7	3.8	2.1	.42	16	7.4	.00	.00	1.2
28	.01	1050	12	7.3	3.4	4.3	.27	13	5.9	.00	.00	.55
29	.00	675	12	6.8	---	4.2	.15	9.3	4.5	.00	.00	.10
30	.00	576	11	6.6	---	3.6	.17	138	3.6	.00	.00	.02
31	.00	---	12	6.3	---	3.0	---	365	---	.00	.00	---
TOTAL	9.79	17708.76	4139	525.4	691.5	211.7	31.53	7400.12	2846.9	16.81	.00	236.76
MEAN	.32	590	134	16.9	24.7	6.83	1.05	239	94.9	.54	.00	7.89
MAX	1.7	9700	496	172	224	33	2.8	3010	368	2.9	.00	97
MIN	.00	.00	11	6.3	3.4	1.5	.15	.52	3.6	.00	.00	.00
AC-FT	19	35130	8210	1040	1370	420	63	14680	5650	33	.00	470

CAL YR 1985 TOTAL 37300.07 MEAN 102 MAX 9700 MIN .00 AC-FT 73980
WTR YR 1986 TOTAL 33818.27 MEAN 92.7 MAX 9700 MIN .00 AC-FT 67080

GUADALUPE RIVER BASIN

08178640 WEST ELM CREEK AT SAN ANTONIO, TX
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°37'23", long 98°26'29", Bexar County, Hydrologic Unit 12100301, at mid-channel, 1.8 mi upstream from mouth of East Elm Creek, 2.1 mi upstream from Farm Road 1604, and 7.0 mi north of San Antonio International Airport.

DRAINAGE AREA.--2.45 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1976 to current year.

GAGE.--Digital recorders (stage and rainfall) and crest-stage gages. Gage is not referenced to National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,000 ft³/s Nov. 1, 1977 (gage height, 5.82 ft); maximum gage height, 6.88 ft May 6, 1982; no flow most of time.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1245	134	4.00	Feb. 3	1410	134	4.00
Nov. 24	0400	153	4.13	June 4	0540	129	3.96
25	0120	*169	*4.23	Sept. 5	2110	156	4.15

Minimum, no flow most of time.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
MAY											
26-26	0800	<1.0	155	--	--	200	300	--	--	1.3	--
26...	1000	1.0	150	--	--	100	290	--	--	1.6	--
26...	1146	E0.1	68	7.20	22.0	30	15	7.5	88	4.3	--
27...	1005	E10	112	8.00	20.0	250	130	7.4	83	3.5	--
JUN											
04...	1130	31	182	7.80	22.5	--	--	7.5	89	1.6	K3000

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
MAY											
26-26	--	64	8	24	0.9	2.2	0.1	4.9	56	11	3.2
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	30	0	11	0.6	1.5	0.1	2.8	31	5.4	1.9
27...	--	49	6	18	0.9	1.9	0.1	4.0	43	8.6	2.1
JUN											
04...	K16000	85	1	32	1.3	1.8	0.1	3.7	84	8.4	1.9

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
MAY											
26-26	0.1	5.3	85	518	2.73	0.07	2.80	0.95	1.1	2.1	0.26
26...	--	--	--	644	1.72	0.08	1.80	0.14	1.7	1.8	0.35
26...	<0.1	2.7'	45	12	0.19	0.01	0.20	0.10	0.5	0.6	0.11
27...	<0.1	5.5	67	94	0.83	0.07	0.90	0.12	1.1	1.2	0.18
JUN											
04...	<0.1	10	110	--	--	--	--	--	--	--	--

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)
MAY											
26-26	20	1	21	<1	<10	5	30	<5	<1	<0.1	<1
26...	24	--	--	--	--	--	--	--	--	--	--
26...	5.9	<1	14	<1	<10	1	19	<5	2	<0.1	<1
27...	11	1	17	<1	<10	2	33	<5	4	<0.1	<1
JUN											
04...	--	<1	21	<1	<10	<1	46	<5	2	<0.1	<1

08178640 WEST ELM CREEK AT SAN ANTONIO, TX--Continued
(Flood-hydrograph partial-record station)

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
MAY											
26-26	<1	82	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	0.07	<0.01
26...	--	--	--	--	--	--	--	--	--	--	--
26...	<1	6	--	--	--	--	--	--	--	--	--
27...	<1	<3	--	--	--	--	--	--	--	--	--
JUN											
04...	<1	7	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	0.16	<0.01

DATE	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
MAY										
26-26	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
JUN										
04...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
MAY										
26-26	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
JUN										
04...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08178645 EAST ELM CREEK AT SAN ANTONIO, TX

(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°37'04", long 98°25'41", Bexar County, Hydrologic Unit 12100301, at mid-channel, 2.1 mi upstream from West Elm Creek, 2.4 mi upstream from Farm Road 1604, and 6.9 mi north of San Antonio International Airport.

DRAINAGE AREA.--2.33 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1975 to current year.

GAGE.--Digital recorders (stage and rainfall) and crest-stage gages. Gage is not referenced to National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480 ft³/s May 6, 1982 (gage height, 7.96 ft); no flow most of time.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 4	1125	*30	*4.15				

Minimum, no flow most of time.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUN											
04...	0600	10	80	--	--	--	--	--	--	4.6	K12000
04...	0700	19	87	--	--	--	--	--	--	3.9	K11000
04...	0930	19	110	8.40	22.0	120	20	7.7	91	3.3	K15000
04...	1435	8.4	154	7.60	26.0	--	--	7.4	95	1.8	--

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JUN											
04...	38000	--	--	--	--	--	--	--	--	--	--
04...	44000	37	1	13	1.0	0.7	0	5.9	36	7.8	1.5
04...	K19000	49	1	18	1.0	0.8	0	5.6	48	8.1	1.5
04...	--	70	1	26	1.3	1.0	0	5.0	69	9.5	1.5

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
JUN											
04...	--	--	--	--	--	--	--	--	--	--	--
04...	<0.1	18	69	--	--	--	--	--	--	--	--
04...	<0.1	19	83	24	13	0.38	0.02	0.40	0.09	0.91	1.0
04...	<0.1	18	100	--	--	--	--	--	--	--	--

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
JUN											
04...	--	--	<1	15	<1	<10	5	110	<5	3	<0.1
04...	--	--	--	--	--	--	--	--	--	--	--
04...	0.06	15	<1	15	<1	<10	2	61	<5	1	<0.1
04...	--	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
JUN											
04...	<1	<1	21	--	--	--	--	--	--	--	--
04...	--	--	--	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
04...	<1	<1	40	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
04...	--	--	--	--	--	--	--	--	--	--	--

DATE	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
JUN											
04...	--	--	--	--	--	--	--	--	--	--	--
04...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
04...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
04...	--	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
JUN										
04...	--	--	--	--	--	--	--	--	--	--
04...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
04...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
04...	--	--	--	--	--	--	--	--	--	--

GUADALUPE RIVER BASIN

08178650 ELM CREEK RESERVOIR SITE 11 AT SAN ANTONIO, TX

LOCATION.--Lat 29°36'11", long 98°25'50", Bexar County, Hydrologic Unit 12100301, located on left bank on upstream side of dam, 2.4 mi east of U.S. Highway 281, 0.7 mi upstream from highway 1604, and 8.0 mi upstream from mouth.

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: March 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
JUN 04...	1530	162	24.0	65	28	7.5	1.9	77	6	29	1.2	1.6

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)	SOLIDS, VOLATILE, SUSPENDED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)
JUN 04...	0.1	3.9	71	10	2.4	<0.1	11	100	42	13	0.28	0.02

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)
JUN 04...	0.30	0.03	0.77	0.8	0.11	13	1	19	<1	<10	<1	23

DATE	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
JUN 04...	<5	2	<0.1	<1	<1	6	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01

DATE	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)
JUN 04...	<0.01	0.15	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

DATE	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
JUN 04...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

GUADALUPE RIVER BASIN

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX

LOCATION.-Lat 29°30'57", long 98°25'51", Bexar County, Hydrologic Unit 12100301, on right bank at downstream side of eastbound bridge on Interstate Highway 410 in San Antonio, 1.0 mi west of Northeast School, 1.1 mi upstream from Perrin-Beitel Creek, and 2.7 mi east of San Antonio International Airport.

DRAINAGE AREA.--137 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1960 to current year.
Water-quality records.--Chemical, biochemical, and pesticide analyses: November 1968 to September 1985. Sediment analyses: November 1971 to September 1973. Water temperatures: November 1968 to September 1985. Bacteria analyses May 1976 to September 1985.

GAGE.--Water-stage recorder with concrete control. Datum of gage is 684.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Nov. 25 to Dec. 5, Apr. 9-30, May 5-9, 11-16, July 11, 12, July 24 to and Sept. 4 Records good except those for estimated daily discharges, which are fair. Some diversions upstream from gage for irrigation. Flow is affected at times by discharge from the flood-detention pools of eleven floodwater-retarding structures with a combined detention capacity of 26,770 acre-ft. These structures control runoff from 74.6 mi above this station. Recording rain gage at station with four additional recording rain gages located in the watershed.

AVERAGE DISCHARGE.--26 years, 9.56 ft³/s (6,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s May 12, 1972 (gage height, 15.22 ft), from rating curve extended above 8,000 ft³/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1853, 23 to 24 ft in October 1913. Flood in September 1921 reached a stage of 18 ft, and flood of Sept. 27, 1946, reached a stage of 18.2 ft, and are the second and third highest since 1899.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,660 ft³/s June 4 at 0800 hours (gage height, 10.66 ft); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	7.2	7.8	2.3	2.8	2.9	.83	5.5	35	9.2	.00	.00
2	7.5	51	7.6	2.3	2.0	2.8	1.4	1.1	9.9	8.7	.00	.00
3	4.5	14	7.4	2.3	165	2.0	.75	1.2	29	8.6	.00	.00
4	.23	8.9	7.2	2.2	36	2.0	1.2	1.1	1890	8.6	.00	.00
5	.08	6.1	7.0	2.0	3.9	2.0	.88	1.0	70	8.5	.00	1.0
6	.04	2.1	6.8	2.0	2.0	2.0	.78	.90	36	8.1	.00	3.9
7	.03	2.8	3.3	2.4	1.4	2.0	.80	.80	60	8.1	.00	14
8	.02	3.0	2.9	9.0	1.2	2.0	.77	.70	28	8.1	.00	.97
9	.02	2.9	4.3	5.4	.81	2.0	.80	.70	22	6.8	.00	.98
10	.00	2.9	7.6	2.9	1.9	2.2	.75	1.3	21	.73	.00	4.5
11	.00	2.6	8.1	2.4	3.3	2.1	.70	3.5	19	.60	.00	4.0
12	1.2	4.2	5.7	2.3	2.4	2.7	.65	2.0	25	.40	.00	1.6
13	1.5	7.0	2.9	2.3	3.3	2.1	.60	1.0	33	.70	.00	.52
14	1.7	2.3	2.9	2.1	2.9	2.0	.55	10	21	2.4	.00	.51
15	48	2.0	2.9	2.0	2.2	2.1	.50	7.0	18	2.3	.00	.51
16	10	1.8	2.9	2.1	2.0	1.5	.45	5.0	17	2.6	.00	.51
17	3.6	1.8	2.9	4.5	2.9	1.3	.40	1.3	31	4.6	.00	.51
18	2.5	1.8	2.8	2.4	1.6	2.2	.35	1.6	1160	6.5	.00	.51
19	126	1.8	2.9	2.3	.85	1.7	.30	.93	73	4.8	.00	.51
20	92	1.5	2.9	2.2	3.9	1.9	.25	.93	24	4.3	.00	.66
21	31	1.5	2.9	2.0	4.3	1.8	.20	.83	16	3.8	.00	.71
22	20	1.6	2.9	2.0	5.3	2.3	.15	.77	13	.82	.00	.63
23	9.9	2.4	3.2	1.9	4.0	2.5	.10	.77	13	.63	.00	1.2
24	7.3	153	3.1	1.8	4.1	2.5	.05	.71	15	.40	.00	2.6
25	2.9	10	2.8	1.8	3.9	2.5	.00	3.3	13	.20	.00	2.6
26	2.6	50	2.6	1.8	3.6	2.9	.00	23	11	.10	.00	2.5
27	2.5	15	2.6	1.8	3.7	2.5	.03	64	11	.08	.00	.65
28	2.3	10	2.7	1.8	2.2	2.0	.10	16	10	.04	.00	1.6
29	1.8	9.0	2.6	1.8	---	.90	.40	5.8	9.6	.02	.00	1.6
30	.21	8.0	2.7	1.5	---	.81	.62	21	9.2	.01	.00	2.1
31	1.6	---	3.1	1.5	---	.78	---	226	---	.00	.00	---
TOTAL	388.53	388.2	130.0	77.1	273.46	62.99	15.36	409.74	3742.7	110.73	.00	51.38
MEAN	12.5	12.9	4.19	2.49	9.77	2.03	.51	13.2	125	3.57	.00	1.71
MAX	126	153	8.1	9.0	165	2.9	1.4	226	1890	9.2	.00	14
MIN	.00	1.5	2.6	1.5	.81	.78	.00	.70	9.2	.00	.00	.00
AC-FT	771	770	258	153	542	125	30	813	7420	220	.00	102

CAL YR 1985 TOTAL 6355.40 MEAN 17.4 MAX 1360 MIN .00 AC-FT 12610
WTR YR 1986 TOTAL 5650.19 MEAN 15.5 MAX 1890 MIN .00 AC-FT 11210

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: October 1968 to September 1973.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
21...	1114	22	405	7.50	32.0	25	--	7.3	--	1.8	K1900
MAY											
26...	1328	50	937	7.60	24.0	25	32	3.3	40	4.9	4600
27...	1035	150	166	7.60	20.5	200	210	8.4	96	5.7	--
JUN											
04...	0938	5400	140	7.70	20.5	80	700	7.6	87	3.8	--
18...	1227	2400	148	8.00	23.0	100	230	6.3	75	5.9	52000

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT											
21...	8300	170	41	60	4.0	12	0.4	13	125	56	11
MAY											
26...	--	380	260	120	19	41	1	23	118	290	49
27...	--	--	--	--	--	--	--	--	56	--	--
JUN											
04...	--	57	2	21	1.1	2.8	0.2	4.2	55	9.2	3.1
18...	76000	59	5	22	1.0	2.7	0.2	4.7	54	10	3.4

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
21...	0.4	12	240	237	78	0.47	0.03	0.50	0.11	0.39	0.5
MAY											
26...	0.6	8.0	620	48	--	0.75	0.05	0.80	0.11	0.89	1.0
27...	--	--	--	487	--	0.35	0.05	0.40	0.12	0.98	1.1
JUN											
04...	0.1	7.9	82	1050	138	0.28	0.02	0.30	0.08	1.4	1.5
18...	0.1	7.9	84	300	52	0.33	0.07	0.40	0.08	0.42	0.5

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT											
21...	0.14	5.8	--	--	--	--	--	--	--	--	--
MAY											
26...	0.11	11	2	110	<1	<10	4	10	<5	21	<0.1
27...	0.52	14	--	--	--	--	--	--	--	--	--
JUN											
04...	0.86	38	3	23	<1	<10	1	67	<5	2	<0.1
18...	0.38	17	--	--	--	--	--	--	--	--	--

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
OCT											
21...	--	--	--	--	--	--	--	--	--	--	--
MAY											
26...	1	<1	8	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	0.1
27...	--	--	--	--	--	--	--	--	--	--	--
JUN											
04...	<1	<1	4	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	0.27
18...	--	--	--	--	--	--	--	--	--	--	--

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
OCT											
21...	--	--	--	--	--	--	--	--	--	--	--
MAY											
26...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
27...	--	--	--	--	--	--	--	--	--	--	--
JUN											
04...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
18...	--	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
OCT										
21...	--	--	--	--	--	--	--	--	--	--
MAY										
26...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
27...	--	--	--	--	--	--	--	--	--	--
JUN										
04...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.03	<0.01	<0.01
18...	--	--	--	--	--	--	--	--	--	--

GUADALUPE RIVER BASIN

08178880 MEDINA RIVER AT BANDERA, TX

LOCATION.--Lat 29°43'25", long 99°04'11", Bandera County, Hydrologic Unit 12100302, on left bank, 40 ft downstream from centerline of State Highway 173 at Bandera, 1.9 mi upstream from Bandera Creek, and 5.6 mi downstream from Indian Creek.

DRAINAGE AREA.--427 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,189.46 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good except those for discharges above 1,000 cfs, which are fair. Several small diversions upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,400 ft³/s Dec. 31, 1984 (gage height, 16.09 ft); minimum daily, 2.2 ft³/s Aug. 7, 11, 13, 14, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1880, 46.62 ft Aug. 2, 1978.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 7,640 ft³/s June 18 at 1000 hours (gage height, 14.53 ft); minimum daily, 30 ft³/s Apr. 28, Aug. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	103	130	84	67	63	51	81	317	352	99	83
2	98	108	121	86	69	65	51	54	263	341	93	300
3	87	104	117	84	128	69	51	47	231	332	93	386
4	77	98	117	83	142	67	52	43	239	320	86	234
5	69	89	109	78	121	65	52	42	211	307	82	179
6	61	86	105	79	110	65	51	41	199	297	75	1460
7	57	81	103	77	107	65	49	39	243	287	73	719
8	55	76	101	88	102	65	52	41	224	278	70	405
9	53	73	100	96	100	65	52	94	246	270	70	349
10	52	71	100	97	98	65	52	504	204	258	65	301
11	52	86	146	93	96	65	52	246	192	249	57	266
12	49	82	130	90	94	61	54	174	193	237	53	254
13	48	73	125	88	92	61	54	146	236	235	53	265
14	48	71	117	84	93	61	54	129	223	252	50	230
15	231	70	114	80	89	61	54	122	189	235	48	201
16	165	73	112	81	90	59	54	118	181	219	46	185
17	110	71	110	83	89	59	50	116	960	208	42	169
18	75	71	108	85	85	57	50	110	2250	198	41	153
19	274	68	104	81	83	57	50	102	816	188	38	142
20	396	62	104	77	81	56	47	94	672	177	35	136
21	300	64	105	77	77	54	43	87	580	172	30	125
22	271	66	103	74	74	54	41	81	527	164	31	120
23	232	65	101	73	74	56	38	74	491	157	37	116
24	197	64	96	72	75	56	36	72	466	147	43	109
25	176	62	93	72	75	54	37	77	451	141	47	106
26	161	65	92	69	73	54	34	135	430	134	48	101
27	146	233	93	69	71	54	31	262	416	130	47	99
28	132	157	91	69	67	51	30	336	397	123	44	94
29	122	143	89	69	---	48	33	248	381	115	40	98
30	113	137	88	67	---	49	75	199	367	109	37	93
31	107	---	86	67	---	51	---	263	---	103	33	---
TOTAL	4129	2672	3310	2472	2522	1832	1430	4177	12795	6735	1706	7478
MEAN	133	89.1	107	79.7	90.1	59.1	47.7	135	427	217	55.0	249
MAX	396	233	146	97	142	69	75	504	2250	352	99	1460
MIN	48	62	86	67	67	48	30	39	181	103	30	83
AC-FT	8190	5300	6570	4900	5000	3630	2840	8290	25380	13360	3380	14830

CAL YR 1985 TOTAL 55774 MEAN 153 MAX 1120 MIN 20 AC-FT 110600
WTR YR 1986 TOTAL 51258 MEAN 140 MAX 2250 MIN 30 AC-FT 101700

08178880 MEDINA RIVER AT BANDERA, TX--Continued

LOCATION.--Lat 29°43'25", long 99°04'11", Bandera County, Hydrologic Unit 12100302, on left bank 40 ft downstream from centerline of State Highway 173, 1.9 mi upstream from Bandera Creek, and 5.6 mi downstream from Indian Creek.

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1983 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 11...	1720	98	546	8.00	11.5	5	1.0	--	--	0.5	K19
JUN 01...	1500	305	469	8.10	24.5	5	4.0	8.2	101	0.6	K140
AUG 04...	1700	87	583	7.90	29.0	5	2.2	7.4	--	0.6	110

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 11...	K8	290	91	85	19	8.3	0.2	1.3	200	89	8.5
JUN 01...	150	220	39	65	15	5.2	0.2	1.2	185	44	8.3
AUG 04...	86	290	100	85	20	7.6	0.2	1.5	194	97	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
FEB 11...	0.2	10	340	4	2	--	<0.01	0.40	0.02	--	<0.2
JUN 01...	0.2	9.9	260	14	5	--	<0.01	0.30	0.03	0.27	0.3
AUG 04...	0.2	13	350	2	1	0.39	<0.01	0.40	0.03	0.17	<0.2

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
FEB 11...	<0.01	0.6	<1	44	<1	<10	1	4	1	2	<0.1
JUN 01...	0.01	2.0	--	--	--	--	--	--	--	--	--
AUG 04...	0.01	2.2	<1	51	<1	<10	<1	7	<5	1	<0.1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 11...	<1	<1	10	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN 01...	--	--	--	--	--	--	--	--	--	--	--
AUG 04...	<1	<1	<3	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 11...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN 01...	--	--	--	--	--	--	--	--	--	--
AUG 04...	--	--	--	--	--	--	--	--	--	--

08178880 MEDINA RIVER AT BANDERA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
11...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
01...	--	--	--	--	--	--	--	--	--	--
AUG										
04...	--	--	--	--	--	--	--	--	--	--

08179500 MEDINA LAKE NEAR SAN ANTONIO, TX

LOCATION.--Lat 29°32'24", long 98°56'01", Medina County, Hydrologic Unit 12100302, at gate-operating platform, 576 ft from left end of Medina Dam on Medina River, 4.2 mi upstream from Medina diversion dam, 13 mi north of Castroville, 28 mi west of San Antonio, and 70.4 mi upstream from mouth. Water-quality sampling site at the center of low-water bridge 0.6 mi downstream.

DRAINAGE AREA.--634 mi².

PERIOD OF RECORD.--May 1913 to current year. Prior to October 1965, monthend contents only.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Nonrecording gage read once daily if stage changing materially, otherwise intermittently. Datum of gage is 7.80 ft below National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a gravity-type concrete dam, 1,580 ft long. The dam was completed and storage began May 7, 1913. The uncontrolled spillway is a cut through natural rock 880 ft long, with a 3-foot-wide cutoff wall, locate near right end of dam. The dam and lake are owned and operated by Bexar-Medina-Atascosa Counties Water Improvement District No. 1, that has a permit (from the Texas Department of Water Resources) to irrigate 150,000 acres annually. An undetermined amount of water from the lake enters the Edwards and associated limestones in the Balcones Fault Zone, part of which is above and part below the dam. Water is released downstream to Medina Diversion Reservoir where it is diverted into Medina Canal by the Water District. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,084.0	-
Crest of spillway	1,072.0	254,000
Water-supply outlet pipes (invert)	966.5	4,780
Lowest gated outlet (invert)	920.0	0

COOPERATION.--Capacity table, based on survey made prior to June 1912, and gage-height record were provided by the Bexar-Medina-Atascosa Counties Water Improvement District No. 1.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents observed, 288,800 acre-ft Sept. 16, 1919 (gage height, 1,078.0 ft); minimum observed since lake first filled, 780 acre-ft about Apr. 11, 1948 (gage height, 944.0 ft).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents, 189,900 acre-ft July 15-21 (gage height, 1,059.5 ft); minimum, 124,400 acre-ft Oct. 14 (gage height, 1,042.8 ft).

Capacity table (gage height, in feet, and contents, in acre-feet)

1,040.0	114,500	1,055.0	171,000
1,045.0	132,200	1,060.0	192,000
1,050.0	150,000		

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	125100	135400	141100	147100	148900	152500	148500	142200	145300	187000	187400	178500
2	125900	135800	141100	147100	148900	152500	148500	142200	145300	187400	187400	178100
3	125900	136100	140700	147100	148900	152500	148500	141800	146100	187800	187000	178100
4	125900	136100	141400	147100	150000	152100	148500	141400	147100	189100	186500	178100
5	125500	136100	141400	147100	150400	152100	148200	141100	147800	188600	186100	178100
6	125500	136500	141800	147100	150400	152100	147800	140700	149200	189100	185700	178500
7	125500	136500	142200	147500	150800	152100	147800	140400	150000	189100	185700	180600
8	125500	136800	142200	147500	150800	151600	147800	140400	150800	189100	185300	181500
9	125100	136800	142200	147800	150800	151600	147800	140400	150800	189100	184900	181500
10	125100	137200	142500	147800	150800	151600	148200	140700	151600	189500	184900	181900
11	125100	137200	143200	147800	151200	151600	147800	141100	152100	189500	184400	181900
12	125100	137200	143200	147800	151200	151600	147800	141100	152500	189500	184000	182300
13	124800	137500	143900	148200	151600	151600	147100	141100	152900	189500	183600	182300
14	124400	137500	143900	148200	151600	151600	147100	141100	153300	189500	183600	182300
15	125500	137500	144300	148200	151600	151600	146800	141400	154200	189900	183200	182300
16	125500	137900	144600	148200	152100	151600	146400	141400	154200	189900	183200	182700
17	125500	137900	144600	148500	152100	150800	146400	141400	154600	189900	182700	182700
18	125900	137900	145000	148500	152500	150800	146100	141400	163800	189900	182300	182700
19	128700	138300	145300	148500	152900	150800	146100	141400	173900	189900	182300	182700
20	130100	138600	145300	148900	152900	150800	145700	141800	176900	189900	181900	182700
21	130800	138300	145700	148500	152900	150400	145700	141400	179400	189900	181900	182300
22	131900	138300	146100	148500	153300	150000	145000	141400	180600	189100	181500	182300
23	132600	138300	146100	148900	152900	150000	144600	141400	181500	189100	180600	181900
24	133300	138600	146100	148500	152900	150000	144300	141100	182300	189100	180200	181900
25	134000	138600	146100	148500	152500	149600	144300	141100	183600	188600	179800	181900
26	134400	138600	146100	148500	152500	149600	143900	141400	184400	188600	179400	181500
27	134700	139300	146400	148500	152500	149600	143600	141800	185300	189500	179400	181900
28	134700	139700	146400	148500	152500	149200	142900	143200	186100	188600	179000	181900
29	135100	140400	146800	148500	---	149200	142900	143600	186100	188200	179000	181500
30	135400	140700	146800	148900	---	148900	142500	144600	186500	187800	178500	181100
31	135400	---	146800	148900	---	148900	---	145300	---	187400	178500	---
MAX	135400	140700	146800	148900	153300	152500	148500	145300	186500	189900	187400	182700
MIN	124400	135400	140700	147100	148900	148900	142500	140400	135300	187000	178500	178100
(†)	1045.9	1047.4	1049.1	1049.7	1050.6	1049.7	1047.9	1048.7	1058.7	1058.9	1056.8	1057.4
(Φ)	+9500	+5300	+6100	+2100	+3600	-3600	-6400	+2800	+41200	-900	-8900	+2600

CAL YR 1985 MAX 146800 MIN 80740 (Φ) -75840
WTR YR 1986 MAX 189900 MIN 124400 (Φ) +55200

(†) Elevation, in feet, at end of month.
(Φ) Change in contents, in acre-feet.

08180000 MEDINA CANAL NEAR RIOMEDINA, TX

LOCATION.--Lat 29°30'19", long 98°54'11", Medina County, Hydrologic Unit 12100302, in center of canal, 350 ft downstream from county highway bridge, 1,900 ft downstream from head of canal and diversion dam, 4.6 mi downstream from Medina Dam, 4.7 mi north of Riomedina, and 25 mi northwest of San Antonio.

PERIOD OF RECORD.--March 1922 to May 1934, July 1957 to current year.

REVISED RECORDS.--WSP 568: 1922. WSP 1712: 1922(M), 1924, 1926.

GAGE.--Water-stage recorder. Elevation of gage is 910 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Station is above all diversions from canal. Canal diverts from right end of Medina Diversion Dam 1,900 ft upstream from gage for irrigation downstream near Lacoste and Natalia. Prior to November 1984, double-barrel flume in canal 54 ft downstream from gage.

AVERAGE DISCHARGE.--40 years (water years 1923-33, 1958-86), 42.7 ft³/s (30,940 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 216 ft³/s May 6, 1971; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	29	19	71	102	157	.00	46	124	51
2	.00	.00	.00	29	10	71	102	142	.00	46	126	38
3	.00	.00	4.0	30	9.4	71	85	117	.00	47	125	43
4	.00	.00	14	30	.00	71	63	105	.00	62	125	51
5	42	.00	13	31	.00	58	44	97	.00	62	120	57
6	85	.00	12	32	.00	57	38	89	.00	67	104	64
7	74	.00	16	32	.00	58	68	88	.00	78	105	23
8	86	.00	26	12	.00	60	63	83	.00	82	105	.00
9	61	.00	32	.00	.00	60	61	77	.00	93	105	.00
10	60	.00	20	3.5	.00	61	64	78	.00	96	106	.00
11	56	33	14	11	.00	51	62	78	.00	94	114	.00
12	52	41	6.8	10	.00	45	68	70	.00	89	116	20
13	51	29	.00	21	.00	55	89	63	.00	84	114	33
14	53	28	.00	30	5.2	62	98	72	12	82	110	33
15	20	23	.00	29	13	62	117	14	52	79	109	58
16	.00	11	15	28	13	62	129	3.0	50	76	107	69
17	.00	17	30	27	24	62	126	19	39	99	106	61
18	.00	31	30	27	33	54	123	25	14	100	109	52
19	.45	31	29	26	33	53	120	38	28	95	118	56
20	.00	31	29	26	37	64	120	49	24	95	123	55
21	.00	30	29	23	40	64	127	48	13	96	130	53
22	.00	30	28	12	39	63	126	58	19	99	133	54
23	.00	29	28	9.6	37	62	141	62	44	107	128	51
24	.00	29	23	9.5	45	71	148	62	23	115	122	49
25	.00	28	17	9.4	68	75	148	61	4.7	115	108	50
26	.00	26	16	9.3	76	78	145	20	18	114	106	52
27	.00	9.1	25	11	76	82	147	.01	18	117	101	53
28	.00	.00	31	17	73	96	147	.00	18	119	79	54
29	.00	.00	31	17	---	102	149	.00	18	125	72	53
30	.00	.00	30	21	---	101	153	.00	30	123	80	60
31	.00	---	30	26	---	101	---	.05	---	125	72	---
TOTAL	640.45	456.10	578.80	628.30	650.60	2103	3173	1775.06	424.70	2827	3402	1293.00
MEAN	20.7	15.2	18.7	20.3	23.2	67.8	106	57.3	14.2	91.2	110	43.1
MAX	86	41	32	32	76	102	153	157	52	125	133	69
MIN	.00	.00	.00	.00	.00	45	38	.00	.00	46	72	.00
AC-FT	1270	905	1150	1250	1290	4170	6290	3520	842	5610	6750	2560

CAL YR 1985	TOTAL	11703.25	MEAN	32.1	MAX	166	MIN	.00	AC-FT	23210
WTR YR 1986	TOTAL	17952.01	MEAN	49.2	MAX	157	MIN	.00	AC-FT	35610

08181400 HELOTES CREEK AT HELOTES, TX

LOCATION.--Lat 29°34'42", long 98°41'29", Bexar County, Hydrologic Unit 12100302, 42 ft to left and 44 ft downstream from centerline of bridge on State Highway 16, 0.1 mi northwest of Helotes, and 8.6 mi upstream from mouth.

DRAINAGE AREA.--15.0 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR TX-73-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 1,014.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Oct. 21 to Nov. 24. Records good except for estimated daily discharges, which are poor. An undetermined amount of flow is diverted for domestic use above station, and some streamflow enters the Edwards and associated limestones through the Balcones Fault Zone in the vicinity of the gage. Recording rain gage at station.

AVERAGE DISCHARGE.--18 years, 4.04 ft³/s (3.66 in/yr), 2,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,680 ft³/s July 16, 1973 (gage height, 10.8 ft, from floodmarks), from rating curve extended above 5,000 ft³/s; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1923, 13.7 ft in 1927, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 140 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1400	499	3.32	June 4	0430	194	2.81
May 31	1230	*640	*3.59	18	0730	607	3.58

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.15	3.2	.00	.00	.00	.00	.00	36	4.3	.00	.01
2	.00	.03	2.3	.00	.00	.00	.00	.00	21	2.7	.00	.00
3	.00	.00	1.5	.00	.09	.00	.00	.00	14	1.1	.00	.00
4	.00	.00	1.4	.00	.00	.00	.00	.00	76	.11	.00	.00
5	.00	.00	.67	.00	.00	.00	.00	.00	54	.00	.00	.00
6	.00	.00	.27	.00	.00	.00	.00	.00	35	.00	.00	.00
7	.00	.00	.18	.00	.00	.00	.00	.00	29	.00	.00	.79
8	.00	.00	.03	.00	.00	.00	.00	.00	24	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.09	21	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	17	.00	.00	.00
11	.00	.00	.07	.00	.00	.00	.00	.00	14	.00	.00	.00
12	.00	.00	.01	.00	.00	.00	.00	.00	11	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	9.5	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.08	8.0	.00	.00	.00
15	.09	.00	.00	.00	.00	.00	.00	.00	6.5	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	4.8	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	3.0	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	243	.00	.00	.00
19	96	.00	.00	.00	.00	.00	.00	.00	162	.00	.00	.00
20	61	.00	.00	.00	.00	.00	.00	.00	96	.00	.00	.00
21	40	.00	.00	.00	.00	.00	.00	.00	63	.00	.00	.00
22	30	.00	.00	.00	.00	.00	.00	.00	45	.00	.00	.00
23	25	.00	.00	.00	.00	.00	.00	.00	33	.00	.00	.00
24	18	.00	.00	.00	.00	.00	.00	.00	27	.00	.00	.00
25	12	.00	.00	.00	.00	.00	.00	.98	22	.00	.00	.00
26	10	.00	.00	.00	.00	.00	.00	.33	18	.00	.00	.00
27	5.0	1.3	.00	.00	.00	.00	.00	1.1	15	.00	.00	.00
28	2.0	7.2	.00	.00	.00	.00	.00	.00	12	.00	.00	.00
29	1.2	4.9	.00	.00	---	.00	.00	.00	9.6	.00	.00	.00
30	.50	3.7	.00	.00	---	.00	.00	.00	7.6	.00	.00	.00
31	.35	---	.00	.00	---	.00	---	95	---	.00	.09	---
TOTAL	301.14	17.28	9.63	.00	.09	.00	.00	97.58	1137.0	8.21	.09	.80
MEAN	9.71	.58	.31	.00	.00	.00	.00	3.15	37.9	.26	.00	.03
MAX	96	7.2	3.2	.00	.09	.00	.00	95	243	4.3	.09	.79
MIN	.00	.00	.00	.00	.00	.00	.00	.00	3.0	.00	.00	.00
CFSM	.65	.04	.02	.00	.00	.00	.00	.21	2.53	.02	.00	.00
IN.	.75	.04	.02	.00	.00	.00	.00	.24	2.82	.02	.00	.00
AC-FT	597	34	19	.00	.2	.00	.00	194	2260	16	.2	1.6

CAL YR 1985	TOTAL	2507.68	MEAN	6.87	MAX	361	MIN	.00	CFSM	.46	IN.	6.22	AC-FT	4970
WTR YR 1986	TOTAL	1571.82	MEAN	4.31	MAX	243	MIN	.00	CFSM	.29	IN.	3.90	AC-FT	3120

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: May 1969 to current year. Pesticide analyses: May 1969 to June 1981, October 1984 to current year. Sediment analyses: October 1968 to September 1973.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
21...	1225	31	462	8.60	17.0	15	17	8.3	88	0.5	1400
MAY											
31...	1320	586	303	7.80	--	--	--	--	--	5.0	--
JUN											
04...	0854	71	414	7.90	21.0	25	15	7.3	85	1.6	--
18...	1030	424	324	7.90	22.5	40	30	6.5	77	2.1	12000

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT											
21...	4000	230	14	74	10	6.6	0.2	1.4	212	19	11
MAY											
31...	--	140	19	45	6.5	5.7	0.2	2.9	120	16	11
JUN											
04...	23000	200	11	63	9.8	6.1	0.2	1.7	187	19	9.2
18...	22000	150	5	48	7.0	4.3	0.2	2.4	144	13	6.5

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
21...	<0.1	9.6	260	20	<1	1.19	0.01	1.20	0.04	0.36	0.4
MAY											
31...	<0.1	8.3	170	--	--	--	--	--	--	--	--
JUN											
04...	0.1	9.4	230	28	15	0.79	0.01	0.80	0.05	0.45	0.5
18...	<0.1	8.1	180	70	31	0.59	0.01	0.60	0.03	0.47	0.5

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT											
21...	<0.01	3.0	<1	29	<1	<10	1	9	1	3	<0.1
MAY											
31...	--	--	<1	24	2	<10	2	61	6	4	<0.1
JUN											
04...	0.05	--	--	--	--	--	--	--	--	--	--
18...	0.06	9.8	--	--	--	--	--	--	--	--	--

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
OCT											
21...	<1	<1	6	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
MAY											
31...	<1	<1	43	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	0.01
JUN											
04...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
OCT											
21...	<0.01	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MAY											
31...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN											
04...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
OCT										
21...	<0.01	<0.1	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
31...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
04...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--

08183900 CIBOLO CREEK NEAR BOERNE, TX

LOCATION.--Lat 29°46'26", long 98°41'50", Kendall County, Hydrologic Unit 12100304, on left bank 0.6 mi upstream from Southern Pacific Lines bridge, 0.9 mi downstream from Menger Creek, and 2.5 mi southeast of Boerne.

DRAINAGE AREA.--68.4 mi².

PERIOD OF RECORD.--March 1962 to current year.

REVISED RECORDS.--WDR TX-73-1: 1964-65, 1966(P), 1968-72(P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 1,339.61 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station. Flow is affected at times by discharge from the flood-detention pools of four floodwater-retarding structures with a combined detention capacity of 8,850 acre-ft. These structures control runoff from 34.0 mi². Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 27.3 ft³/s (5.42 in/yr), 19,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,400 ft³/s Sept. 27, 1964 (gage height, 19.15 ft, from floodmark), from rating curve extended above 2,500 ft³/s on basis of slope-area measurement at 12,000 ft³/s and contracted-opening measurement of 36,400 ft³/s; no flow at times in 1962-64, 1966-67, 1971, and 1984.
Maximum stage since at least 1892, that of Sept. 27, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Second highest flood in 1952 reached a stage of 16.3 ft (discharge, 25,600 ft³/s), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 31	1230	*711	*4.06				

Minimum daily discharge, 4.5 ft³/s Oct. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	13	44	26	17	20	12	7.9	66	43	20	48
2	7.3	22	35	26	17	20	11	10	71	39	19	57
3	5.9	19	34	26	169	20	11	11	80	37	21	46
4	5.5	17	33	25	121	21	12	9.6	88	35	21	28
5	4.9	16	33	23	78	21	12	9.4	66	31	24	22
6	4.9	15	30	23	61	21	12	8.5	55	29	20	26
7	4.9	15	29	20	49	21	12	7.9	86	27	19	39
8	4.8	15	29	29	45	21	12	12	157	25	16	29
9	4.8	15	29	30	42	21	11	6.7	232	25	12	22
10	5.3	15	29	30	37	21	15	9.8	133	25	13	18
11	4.9	15	147	27	35	20	11	10	103	26	12	17
12	4.6	16	89	25	32	22	11	9.6	89	25	13	73
13	4.5	15	67	24	32	19	11	9.0	87	23	15	35
14	4.9	15	57	23	31	19	10	8.8	76	24	12	24
15	54	13	52	22	30	18	8.9	13	67	29	11	20
16	7.5	15	50	22	30	18	8.3	11	62	26	10	17
17	7.1	13	45	22	29	17	7.9	11	57	23	10	12
18	6.9	13	45	21	29	18	8.0	10	228	22	9.3	11
19	15	14	41	21	28	16	8.5	11	216	24	8.6	13
20	22	13	40	20	26	14	8.4	12	147	24	8.4	11
21	24	12	39	20	24	13	7.8	18	119	23	9.7	11
22	26	12	38	19	23	13	7.5	18	98	24	9.8	11
23	23	12	37	18	23	13	7.0	18	87	31	13	11
24	21	14	35	18	22	13	6.4	17	78	31	13	11
25	19	16	32	18	22	13	6.1	18	71	29	13	9.6
26	18	15	30	16	23	13	6.0	70	64	27	11	9.2
27	16	205	30	16	23	13	6.9	126	58	24	11	8.3
28	15	74	30	15	21	13	9.3	40	55	23	11	8.3
29	14	58	29	16	---	13	8.1	27	51	20	13	8.7
30	13	51	29	16	---	13	7.8	23	46	19	13	8.4
31	12	---	28	16	---	12	---	197	---	19	18	---
TOTAL	390.4	773	1315	673	1119	530	285.9	770.2	2893	832	429.8	664.5
MEAN	12.6	25.8	42.4	21.7	40.0	17.1	9.53	24.8	96.4	26.8	13.9	22.1
MAX	54	205	147	30	169	22	15	197	232	43	24	73
MIN	4.5	12	28	15	17	12	6.0	6.7	46	19	8.4	8.3
CFSM	.18	.38	.62	.32	.58	.25	.14	.36	1.41	.39	.20	.32
IN.	.21	.42	.72	.37	.61	.29	.16	.42	1.57	.45	.23	.36
AC-FT	774	1530	2610	1330	2220	1050	567	1530	5740	1650	853	1320

CAL YR 1985	TOTAL	10312.4	MEAN	28.3	MAX	250	MIN	1.0	CFSM	.41	IN.	5.61	AC-FT	20450
WTR YR 1986	TOTAL	10675.8	MEAN	29.2	MAX	232	MIN	4.5	CFSM	.43	IN.	5.81	AC-FT	21180

GUADALUPE RIVER BASIN

08185000 CIBOLO CREEK AT SELMA, TX

LOCATION.--Lat 29°35'38", long 98°18'39", Bexar-Guadalupe County line, Hydrologic Unit 12100304, on right bank 0.6 mi downstream from Missouri-Kansas-Texas Railroad Co. bridge and 0.9 mi upstream from bridge on Interstate Highway 35 at Selma.

DRAINAGE AREA.--274 mi².

PERIOD OF RECORD.--March 1946 to current year. Figures for water year 1960 in WSP 1813 are in error and should be disregarded.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 728.34 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Small diversion above station. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08183900. Considerable flow of Cibolo Creek enters the Edwards and associated limestones in the Balcones Fault Zone, which crosses basin between this station and the station near Boerne (station 08183900).

AVERAGE DISCHARGE.--40 years, 14.5 ft³/s (10,510 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,000 ft³/s July 16, 1973 (gage height, 26.2 ft, from floodmark), from rating curve extended above 16,000 ft³/s on basis of field estimate of 54,000 ft³/s and contracted-opening measurement of 65,000 ft³/s; no flow most of time.
Maximum stage since at least 1869, that of July 16, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 26 ft occurred in 1889, but stage for flood in 1913 is unknown, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 4	1100	*481	*4.93	No other peak greater than base discharge.			

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	130	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	5.6	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	63	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	35	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.34	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	3.2	---	.00	.00	---
TOTAL	.00	124.34	.00	.00	.00	.00	.00	3.20	135.68	.00	.00	.00
MEAN	.00	4.14	.00	.00	.00	.00	.00	.10	4.52	.00	.00	.00
MAX	.00	63	.00	.00	.00	.00	.00	3.2	130	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	247	.00	.00	.00	.00	.00	6.3	269	.00	.00	.00

CAL YR 1985 TOTAL 12295.30 MEAN 33.7 MAX 8490 MIN .00 AC-FT 24390
WTR YR 1986 TOTAL 263.22 MEAN .72 MAX 130 MIN .00 AC-FT 522

08190000 NUECES RIVER AT LAGUNA, TX

LOCATION.--Lat 29°25'42", long 99°59'49", Uvalde County, Hydrologic Unit 12110101, on right bank 0.5 mi downstream from Sycamore Creek, 1.0 mi northeast of Laguna, and at mile 370.8.

DRAINAGE AREA.--737 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year.

REVISED RECORDS.--WSP 1562: 1930, 1931(M), 1932, 1939. WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,119.72 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 26, 1925, nonrecording gage at site 2 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Many small diversions above station for irrigation.

AVERAGE DISCHARGE.--63 years, 147 ft³/s (2.71 in/yr), 106,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307,000 ft³/s Sept. 24, 1955, (gage height, 29.95 ft, in gage well, 32.7 ft, from outside floodmarks), from rating curve extended above 40,000 ft³/s on basis of float measurement of 110,000 ft³/s and slope-area measurements of 213,000 and 307,000 ft³/s; minimum, 2.6 ft³/s Mar. 14-16, 1957. Maximum stage since at least 1866, that of Sept. 24, 1955.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1913 reached a stage of about 29 ft (discharge, 210,000 ft³/s); flood of Sept. 21, 1923, reached a stage of about 26.5 ft (discharge, 160,000 ft³/s); from information by local residents. Discharges based on rating curve mentioned above.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1930	3,970	7.05	Sept. 26	1700	*8,550	*8.97
May 31	1200	3,370	6.76				

Minimum daily discharge, 34 ft³/s Aug. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	529	155	116	97	80	85	68	57	240	128	46	36
2	322	160	114	97	80	85	66	56	269	124	45	36
3	238	149	114	97	84	85	66	57	222	119	44	36
4	195	143	115	95	105	84	84	57	192	114	44	36
5	165	140	113	94	163	82	72	55	172	106	43	37
6	145	137	111	93	143	81	71	54	160	103	42	38
7	125	133	110	93	133	80	71	54	152	98	41	56
8	114	131	110	99	127	80	67	55	144	96	41	49
9	106	128	112	100	122	82	66	55	150	93	40	47
10	101	127	113	100	117	80	66	59	148	89	40	46
11	95	125	129	97	115	80	66	54	143	86	40	50
12	88	124	125	94	111	80	66	53	143	83	40	86
13	84	122	116	93	108	80	66	55	136	82	39	63
14	80	121	113	92	106	79	65	58	132	80	38	58
15	79	119	113	92	102	79	65	60	127	76	37	57
16	80	119	112	92	99	76	64	62	127	75	37	56
17	83	119	110	91	98	76	66	66	147	73	37	55
18	80	119	110	90	96	77	66	66	157	70	36	54
19	959	117	110	90	94	75	66	66	322	68	35	53
20	1240	117	108	90	93	75	66	65	379	64	35	53
21	637	113	107	90	90	73	62	63	300	62	34	53
22	445	114	107	87	90	73	63	60	238	61	36	53
23	326	116	106	86	89	73	61	60	201	59	35	52
24	277	115	105	85	90	72	58	58	181	57	40	50
25	246	113	105	84	90	72	60	64	170	55	37	50
26	223	114	102	83	89	72	59	73	163	53	36	1760
27	205	125	102	83	86	70	60	87	154	52	35	1090
28	187	121	101	83	86	69	59	96	148	50	35	492
29	176	118	101	81	---	69	59	93	142	49	35	326
30	166	116	99	80	---	69	59	89	135	48	35	220
31	160	---	98	80	---	68	---	408	---	47	35	---
TOTAL	7956	3770	3407	2808	2886	2381	1953	2315	5494	2420	1193	5148
MEAN	257	126	110	90.6	103	76.8	65.1	74.7	183	78.1	38.5	172
MAX	1240	160	129	100	163	85	84	408	379	128	46	1760
MIN	79	113	98	80	80	68	58	53	127	47	34	36
CFSM	.35	.17	.15	.12	.14	.10	.09	.10	.25	.11	.05	.23
IN.	.40	.19	.17	.14	.15	.12	.10	.12	.28	.12	.06	.26
AC-FT	15780	7480	6760	5570	5720	4720	3870	4590	10900	4800	2370	10210

CAL YR 1985	TOTAL	68317	MEAN	187	MAX	3670	MIN	31	CFSM	.25	IN.	3.45	AC-FT	135500
WTR YR 1986	TOTAL	41731	MEAN	114	MAX	1760	MIN	34	CFSM	.15	IN.	2.11	AC-FT	82770

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1949 to June 1952, September 1964 to current year. Chemical, biochemical, and pesticide analyses: February 1970 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 14...	1045	131	440	8.00	15.0	7	0.5	10.0	101	0.4	K8
JUN 03...	1022	221	412	7.70	22.5	5	1.0	7.9	94	0.4	100
AUG 05...	1700	50	409	8.00	30.0	5	0.2	8.4	--	0.6	--

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 14...	K10	210	25	58	15	8.6	0.3	0.8	182	14	12
JUN 03...	150	190	14	57	12	6.3	0.2	0.9	178	11	9.7
AUG 05...	44	200	18	57	14	7.3	0.2	1.1	182	13	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 14...	0.1	11	230	3	1	0.89	<0.01	0.90	0.01	0.19	<0.2
JUN 03...	0.1	11	210	5	2	--	<0.01	0.80	0.02	--	<0.2
AUG 05...	0.2	13	230	1	1	0.59	<0.01	0.60	0.02	0.18	<0.2

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
FEB 14...	<0.01	7.3	<1	37	<1	<10	1	<3	<1	<1	<0.1
JUN 03...	<0.01	1.3	--	--	--	--	--	--	--	--	--
AUG 05...	<0.01	1.1	<1	48	<1	<10	<1	11	<5	1	<0.1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 14...	<1	<1	3	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN 03...	--	--	--	--	--	--	--	--	--	--	--
AUG 05...	<1	<1	5	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 14...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN 03...	--	--	--	--	--	--	--	--	--	--
AUG 05...	--	--	--	--	--	--	--	--	--	--

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
14...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
03...	--	--	--	--	--	--	--	--	--	--
AUG										
05...	--	--	--	--	--	--	--	--	--	--

08190500 WEST NUECES RIVER NEAR BRACKETTVILLE, TX

LOCATION.--Lat 29°28'21", long 100°14'10", Kinney County, Hydrologic Unit 12110102, at Wilson Ranch on Farm Road 3199, 1.3 mi upstream from Miguel Canyon, 16.0 mi northeast of Brackettville, and 40.2 mi upstream from mouth.

DRAINAGE AREA.--694 mi².

PERIOD OF RECORD.--September 1939 to September 1950, April 1956 to current year.

REVISED RECORDS.--WSP 1312: 1949(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,326.79 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 14, 1940, nonrecording gage at same site and datum.

REMARKS.--Estimated daily discharges: Oct. 1 to Apr. 8. Records good except for estimated daily discharges and those below 1 ft³/s, which are poor. In ordinary years, a large part of streamflow is lost by seepage into the Balcones Fault Zone of the Edwards and associated limestones above station. No known diversion above station.

AVERAGE DISCHARGE.--41 years (water years 1940-50, 1957-86), 35.1 ft³/s (25,430 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 246,000 ft³/s Sept. 20, 1964 (gage height, 31.3 ft, from floodmark), from rating curve extended above 4,500 ft³/s on basis of slope-area measurements of 10,000, 51,000, 150,000, and 246,000 ft³/s; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1879, about 40 ft June 14, 1935 (discharge, 550,000 ft³/s, based on slope-area measurements of 580,000 ft³/s at site 33 mi upstream from gage) and 536,000 ft³/s (at site 24 mi downstream from gage, present site and datum), from gage-height relation of 1935 and 1955 flood peaks at site 0.6 mi upstream. Flood in 1900 reached a stage of about 34 ft, and flood of Sept. 24, 1955, reached a stage of 27.1 ft, from floodmark at present site (discharge, 150,000 ft³/s, by slope-area measurement).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 31	2200	*2,080	a*6.71	No other peak greater than base discharge.			

a From floodmark.

Minimum daily discharge, 0.04 ft³/s Jan. 11 to Feb. 3, Apr. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	.24	.07	.05	.04	.18	.10	.07	505	3.0	.20	.12
2	.22	.23	.07	.05	.04	.17	.10	.06	51	2.7	.16	.12
3	.21	.22	.07	.05	.04	.17	.10	.06	12	2.6	.16	.12
4	.18	.22	.07	.05	.52	.16	.10	.06	7.4	2.5	.16	.10
5	.16	.21	.07	.05	3.0	.16	.10	.06	5.9	2.4	.16	.09
6	.14	.20	.06	.05	1.6	.15	.09	.06	5.1	2.0	.16	.13
7	.13	.19	.06	.05	.90	.15	.09	.06	4.2	2.0	.16	.73
8	.12	.18	.06	.05	.56	.14	.09	.06	3.9	1.9	.16	.44
9	.10	.18	.06	.05	.47	.14	.09	.08	3.6	1.8	.14	.36
10	.09	.17	.06	.05	.42	.13	.09	.17	3.2	1.7	.14	.33
11	.09	.16	.06	.04	.37	.13	.09	.15	2.9	1.4	.14	.31
12	.08	.16	.06	.04	.34	.13	.09	.14	2.6	1.3	.14	.34
13	.07	.15	.05	.04	.32	.12	.09	.18	2.6	1.3	.14	.32
14	.06	.14	.05	.04	.30	.12	.09	.25	2.5	1.3	.14	.31
15	.06	.14	.05	.04	.28	.12	.08	.35	2.0	1.2	.12	.31
16	.06	.13	.05	.04	.27	.12	.05	.30	1.9	1.1	.12	.29
17	.05	.12	.05	.04	.26	.11	.07	.27	1.8	.95	.12	.24
18	.05	.12	.05	.04	.25	.11	.08	.17	1.9	.80	.10	.20
19	1.2	.12	.05	.04	.24	.11	.09	.16	1.7	.73	.07	.18
20	4.5	.11	.05	.04	.23	.11	.07	.16	306	.61	.06	.15
21	2.3	.11	.05	.04	.22	.11	.07	.16	78	.55	.06	.14
22	.90	.10	.05	.04	.22	.11	.06	.16	15	.49	.15	.12
23	.52	.10	.05	.04	.21	.11	.05	.14	6.2	.45	.12	.11
24	.45	.09	.05	.04	.21	.10	.04	.14	5.4	.43	.11	.10
25	.39	.09	.05	.04	.20	.10	.05	.25	4.8	.38	.12	.09
26	.36	.08	.05	.04	.20	.10	.05	.37	4.5	.36	.12	.09
27	.33	.08	.05	.04	.20	.10	.05	.67	4.2	.34	.12	.09
28	.31	.08	.05	.04	.19	.10	.05	.66	3.9	.31	.12	.09
29	.28	.08	.05	.04	---	.10	.06	.96	3.6	.29	.12	.12
30	.27	.08	.05	.04	---	.10	.06	.95	3.4	.23	.12	.10
31	.26	---	.05	.04	---	.10	---	216	---	.21	.12	---
TOTAL	14.19	4.28	1.72	1.34	12.10	3.86	2.29	223.33	1056.2	37.33	4.03	6.24
MEAN	.46	.14	.05	.04	.43	.12	.08	7.20	35.2	1.20	.13	.21
MAX	4.5	.24	.07	.05	3.0	.18	.10	216	505	3.0	.20	.73
MIN	.05	.08	.05	.04	.04	.10	.04	.06	1.7	.21	.06	.09
AC-FT	28	8.5	3.4	2.7	24	7.7	4.5	443	2090	74	8.0	12

CAL YR 1985	TOTAL	2651.89	MEAN	7.27	MAX	1150	MIN	.05	AC-FT 5260
WTR YR 1986	TOTAL	1366.91	MEAN	3.74	MAX	505	MIN	.04	AC-FT 2710

08192000 NUECES RIVER BELOW UVALDE, TX

LOCATION.--Lat 29°07'25", long 99°53'40", Uvalde County, Hydrologic Unit 12110103, on right bank at McDaniel Ranch, 5.7 mi upstream from bridge on U.S. Highway 83, 8.8 mi southwest of Uvalde, 18.2 mi downstream from West Nueces River, and at mile 338.7.

DRAINAGE AREA.--1,861 mi².

PERIOD OF RECORD.--April 1939 to current year. October 1927 to April 1939, published as "near Uvalde"; records equivalent only during periods of flood flow.

REVISED RECORDS.--WSP 1732: 1956(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 796.12 ft above National Geodetic Vertical Datum of 1929. Oct. 4, 1927, to Apr. 30, 1939, water-stage recorder at site 6.2 mi upstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Part of the flow of the Nueces River enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin downstream from Laguna (station 08190000) and upstream from this station. At low stage, most of headwater flow enters this formation. There are many small diversions above station for irrigation. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--47 years, 118 ft³/s (85,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189,000 ft³/s Sept. 24, 1955 (gage height, 24.61 ft, from floodmark), from rating curve extended above 34,000 ft³/s on basis of conveyance study and slope-area measurement of peak flow; no flow at times in 1951-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1836, 40.4 ft June 14, 1935, from floodmark (discharge at former site, 616,000 ft³/s, by slope-area measurement). Large floods also occurred in 1901 and 1913, stages unknown.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1500	*11,600	*11.10	June 21	0400	402	4.45
June 1	0530	402	4.45	Sept. 27	1300	1,200	5.23

Minimum daily discharge, 22 ft³/s Sept. 23-26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	382	136	70	49	37	30	28	26	153	73	30	26
2	176	141	69	49	37	30	28	28	51	68	29	25
3	115	133	66	49	36	30	28	25	42	63	29	24
4	85	119	64	48	36	30	31	24	51	59	29	23
5	66	111	63	47	36	30	28	24	38	57	29	23
6	58	105	62	47	35	30	28	24	36	53	28	25
7	54	101	60	48	35	30	28	24	37	51	28	37
8	49	97	60	53	35	29	27	23	37	48	27	28
9	46	93	60	47	35	29	27	24	36	46	27	26
10	43	91	59	46	35	29	27	32	37	44	27	25
11	42	89	59	46	34	30	27	26	37	43	27	24
12	40	87	59	45	34	30	27	24	37	43	33	24
13	39	87	57	43	32	30	27	24	38	42	27	23
14	39	84	57	43	32	30	27	24	39	41	27	23
15	39	81	57	43	32	31	26	25	39	39	26	23
16	39	79	57	43	32	30	26	24	40	38	26	23
17	39	77	57	43	32	30	27	24	50	37	26	23
18	39	77	56	42	31	29	27	23	185	37	25	23
19	3400	76	55	42	32	29	27	23	191	36	24	23
20	2520	74	55	42	31	29	25	23	277	35	25	23
21	1070	72	55	40	32	29	26	23	356	35	25	23
22	551	71	55	40	31	29	26	23	262	34	31	23
23	463	70	54	39	31	29	26	23	195	34	27	22
24	342	69	53	39	31	29	26	23	155	33	27	22
25	269	69	53	39	31	29	26	23	130	32	27	22
26	256	68	52	38	31	29	26	25	113	32	26	22
27	219	71	52	37	31	29	26	27	102	31	25	541
28	191	70	52	37	30	29	26	23	94	31	25	440
29	171	73	51	37	---	29	32	23	86	31	24	168
30	156	72	49	37	---	29	26	23	79	30	24	94
31	144	---	49	37	---	28	---	33	---	30	25	---
TOTAL	11242	2643	1777	1335	927	913	812	763	3023	1306	835	1871
MEAN	363	88.1	57.3	43.1	33.1	29.5	27.1	24.6	101	42.1	26.9	62.4
MAX	3400	141	70	53	37	31	32	33	356	73	33	541
MIN	39	68	49	37	30	28	25	23	36	30	24	22
AC-FT	22300	5240	3520	2650	1840	1810	1610	1510	6000	2590	1660	3710

CAL YR 1985 TOTAL 58194 MEAN 159 MAX 10100 MIN 23 AC-FT 115400
WTR YR 1986 TOTAL 27447 MEAN 75.2 MAX 3400 MIN 22 AC-FT 54440

08195000 FRIO RIVER AT CONCAN, TX

LOCATION.--Lat 29°29'18", long 99°42'16", Uvalde County, Hydrologic Unit 12110106, on left bank 0.7 mi southeast of Concan Post Office, 15 mi upstream from Dry Frio River, and 222.8 mi upstream from mouth.

DRAINAGE AREA.--389 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to September 1929, October 1930 to current year.

REVISED RECORDS.--WSP 1342: Drainage area. WSP 1512: 1926, 1931-32, 1934(M), 1935-36. WSP 1712: 1958. WSP 1923: 1954(M), 1957(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,203.71 ft above National Geodetic Vertical Datum of 1929. Oct. 26, 1923, to July 28, 1924, nonrecording gage at site 86 ft upstream at datum 5.08 ft lower. July 29, 1924, to Oct. 3, 1930, nonrecording gage, and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records good. Many small diversions for irrigation above station.

AVERAGE DISCHARGE.--61 years (water years 1925-29, 1931-86), 113 ft³/s (3.94 in/yr), 81,870 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 162,000 ft³/s July 1, 1932 (gage height, 34.44 ft, from floodmarks), from rating curve extended above 44,000 ft³/s on basis of flow-over-dam measurement of 56,600 ft³/s and slope-area measurement of 162,000 ft³/s; no flow Aug. 5, 1956, to Jan 6, 1957.
Maximum stage since at least 1869, that of July 1, 1932.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1430	*14,700	*11.58	June 19	1530	959	5.21
May 31	1500	1,110	5.35	Sept. 26	1930	630	4.86
June 18	1130	1,180	5.41				

Minimum daily discharge, 44 ft³/s Aug. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	175	123	92	71	67	62	57	181	119	58	61
2	83	179	117	94	71	67	63	54	123	115	58	54
3	80	170	115	92	75	68	63	54	111	115	56	54
4	82	161	115	92	86	67	65	56	106	107	57	52
5	81	155	112	90	84	67	63	54	102	104	58	52
6	78	149	111	89	80	66	63	53	97	100	56	53
7	79	145	111	89	82	65	60	52	96	98	56	81
8	80	141	111	96	83	64	60	56	161	97	54	74
9	80	141	111	96	83	66	58	54	254	94	52	65
10	80	141	111	92	81	67	61	64	194	92	52	64
11	79	144	115	89	80	65	72	56	153	89	51	60
12	80	139	118	89	80	67	72	54	131	86	51	58
13	80	137	116	88	80	67	70	52	121	89	53	58
14	77	137	115	86	78	66	69	53	116	89	52	55
15	82	133	115	87	77	67	65	68	109	87	51	53
16	101	131	115	83	77	67	64	57	104	83	48	53
17	99	129	111	83	75	67	65	57	197	80	49	53
18	95	129	111	83	75	67	65	54	287	77	48	53
19	2910	129	109	81	72	65	63	52	382	76	46	52
20	850	125	108	80	72	65	59	52	342	75	45	52
21	436	122	108	80	72	65	58	50	219	75	44	52
22	331	118	107	80	70	65	56	47	187	72	61	52
23	284	118	102	80	70	64	55	49	169	70	56	52
24	256	118	102	78	70	64	54	50	159	69	59	51
25	237	118	102	77	70	63	54	51	152	68	70	50
26	223	122	102	75	70	63	54	57	143	67	58	153
27	213	123	102	75	68	63	54	75	135	65	56	236
28	202	127	98	75	67	63	55	70	132	63	54	114
29	192	126	98	72	---	63	59	66	128	63	54	87
30	183	126	97	73	---	62	76	65	125	61	52	75
31	179	---	93	74	---	63	---	305	---	60	52	---
TOTAL	8008	4108	3381	2610	2119	2025	1857	1994	4916	2605	1667	2079
MEAN	258	137	109	84.2	75.7	65.3	61.9	64.3	164	84.0	53.8	69.3
MAX	2910	179	123	96	86	68	76	305	382	119	70	236
MIN	77	118	93	72	67	62	54	47	96	60	44	50
CFSM	.64	.34	.27	.21	.19	.16	.15	.16	.40	.21	.13	.17
IN.	.74	.38	.31	.24	.19	.19	.17	.18	.45	.24	.15	.19
AC-FT	15880	8150	6710	5180	4200	4020	3680	3960	9750	5170	3310	4120

CAL YR 1985 TOTAL 61334 MEAN 168 MAX 2910 MIN 44 CFSM .41 IN. 5.63 AC-FT 121700
WTR YR 1986 TOTAL 37369 MEAN 102 MAX 2910 MIN 44 CFSM .25 IN. 3.43 AC-FT 74120

PERIOD OF RECORD.--Chemical analyses: June 1952, December 1964 to July 1965. Chemical, biochemical, and pesticide analyses: August 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 13...	1300	92	424	8.00	11.0	3	0.4	10.8	100	0.3	K12
JUN 03...	1830	101	428	8.00	24.5	5	1.2	8.0	99	0.7	74
AUG 06...	1600	55	396	7.80	28.5	5	0.4	10.0	--	0.7	K12

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 13...	K5	210	24	61	15	8.0	0.2	0.8	190	13	11
JUN 03...	120	200	14	62	12	6.2	0.2	1.0	190	13	9.5
AUG 06...	54	200	26	55	15	7.3	0.2	0.9	173	17	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 13...	0.1	10	200	2	2	--	<0.01	1.00	0.01	0.29	0.3
JUN 03...	0.1	11	230	3	2	--	<0.01	1.10	0.03	0.37	0.4
AUG 06...	0.2	13	220	3	2	0.39	<0.01	0.40	<0.01	0.19	<0.2

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
FEB 13...	<0.01	2.0	<1	43	<1	<10	2	<3	3	<1	<0.1
JUN 03...	<0.01	1.4	--	--	--	--	--	--	--	--	--
AUG 06...	<0.01	1.6	<1	44	<1	<10	2	6	<5	1	<0.1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 13...	<1	<1	5	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN 03...	--	--	--	--	--	--	--	--	--	--	--
AUG 06...	<1	<1	<3	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 13...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN 03...	--	--	--	--	--	--	--	--	--	--
AUG 06...	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
13...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
03...	--	--	--	--	--	--	--	--	--	--
AUG										
06...	--	--	--	--	--	--	--	--	--	--

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX

LOCATION.--Lat 29°30'16", long 99°46'52", Uvalde County, Hydrologic Unit 12110106, on right bank 2.3 mi upstream from bridge on U.S. Highway 83, 3.1 mi upstream from Rocky Creek, 4.3 mi southeast of Reagan Wells, and 25.9 mi upstream from mouth.

DRAINAGE AREA.--126 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1952 to current year.

REVISED RECORDS.--WSP 1712: 1953. WSP 1923: 1955(M). WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,335.2 ft above National Geodetic Vertical Datum of 1929, from State Department of Highways and Public Transportation datum.

REMARKS.--No estimated daily discharges. Records good. There are several small diversions above station.

AVERAGE DISCHARGE.--34 years, 34.2 ft³/s (3.69 in/yr), 24,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 123,000 ft³/s Aug. 13, 1966 (gage height, 27.6 ft, from floodmark), from rating curve extended above 900 ft³/s on basis of slope-area measurements of 11,400, 30,700, 64,700, and 123,000 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875 occurred in 1880 (about 33 ft). Flood of June 14, 1935, reached a stage of 26.0 ft (discharge, 64,700 ft³/s, determined at site 2.6 mi upstream), and flood of July 1, 1932, reached a stage of 23 ft (discharge, 30,700 ft³/s, determined at site 2.0 mi upstream), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1300	928	4.25	June 19	0730	2,330	6.58
May 31	1200	*6,270	*10.75				

Minimum daily discharge, 6.2 ft³/s Aug. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	30	25	16	14	11	7.5	9.8	379	37	9.5	9.6
2	57	34	24	16	14	11	7.6	9.5	142	34	9.2	9.8
3	48	30	23	16	18	11	7.7	8.9	98	32	8.7	9.0
4	42	28	22	16	21	11	10	8.5	80	30	9.0	8.4
5	37	26	21	16	18	11	9.0	8.4	66	28	8.9	8.1
6	34	25	21	15	17	11	8.5	8.1	56	26	8.7	8.1
7	32	24	21	15	16	11	8.2	7.8	50	25	8.4	30
8	30	23	20	20	16	10	8.0	8.1	49	24	8.0	36
9	29	23	20	20	16	11	7.6	8.1	43	22	7.8	28
10	29	22	20	19	16	11	7.9	8.9	38	21	7.5	25
11	27	23	22	18	15	11	7.9	9.1	35	20	7.5	22
12	26	22	22	18	15	12	7.8	7.9	32	19	7.5	20
13	25	22	21	17	14	12	7.4	7.4	31	19	7.6	19
14	25	21	21	17	14	11	7.1	10	29	19	7.2	17
15	26	21	21	17	14	12	6.9	21	27	18	6.9	16
16	24	21	19	17	14	11	7.1	15	25	19	6.7	16
17	24	21	19	16	14	10	7.4	15	92	17	6.7	14
18	24	21	19	16	14	11	7.5	14	165	16	6.6	14
19	123	21	18	16	14	9.8	7.4	11	704	15	6.3	13
20	79	23	18	16	15	9.7	6.9	9.4	232	14	6.2	13
21	69	24	18	16	14	9.5	6.5	8.3	159	14	6.4	12
22	65	22	18	15	13	9.3	6.5	7.6	124	14	11	12
23	55	21	17	15	12	8.8	6.5	7.1	100	13	9.2	12
24	47	21	17	15	12	9.2	6.3	6.8	82	13	13	11
25	42	21	17	14	12	9.2	6.3	7.5	72	12	21	10
26	39	21	17	14	12	9.1	6.6	13	65	12	14	10
27	39	29	17	14	12	8.7	6.7	50	57	12	12	10
28	36	32	17	14	11	8.0	7.2	53	50	11	11	9.7
29	34	27	16	14	---	7.9	8.8	48	45	11	10	9.4
30	32	26	16	14	---	7.5	12	38	41	10	9.8	9.0
31	31	---	16	14	---	7.4	---	1150	---	9.7	9.4	---
TOTAL	1306	725	603	496	407	313.1	228.8	1595.2	3168	586.7	281.7	441.1
MEAN	42.1	24.2	19.5	16.0	14.5	10.1	7.63	51.5	106	18.9	9.09	14.7
MAX	123	34	25	20	21	12	12	1150	704	37	21	36
MIN	24	21	16	14	11	7.4	6.3	6.8	25	9.7	6.2	8.1
CFSM	.36	.21	.17	.14	.12	.09	.07	.44	.91	.16	.08	.13
IN.	.42	.23	.19	.16	.13	.10	.07	.51	1.01	.19	.09	.14
AC-FT	2590	1440	1200	984	807	621	454	3160	6280	1160	559	875

CAL YR 1985	TOTAL	16435.3	MEAN	45.0	MAX	503	MIN	7.8	CFSM	.38	IN.	5.23	AC-FT	32600
WTR YR 1986	TOTAL	10151.6	MEAN	27.8	MAX	1150	MIN	6.2	CFSM	.24	IN.	3.23	AC-FT	20140

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: February 1970 to current year. Pesticide analyses: January 1974 to current year. Sediment analyses: January 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 13...	1025	13	374	7.90	12.0	5	0.3	9.7	92	0.6	K6
JUN 04...	1330	78	426	7.90	24.0	3	1.0	7.7	95	0.6	120
AUG 06...	1130	12	401	7.90	27.5	5	0.3	8.0	--	0.4	K8

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 13...	K31	200	21	58	13	7.2	0.2	0.5	177	15	11
JUN 04...	170	210	4	67	11	5.3	0.2	0.7	209	12	8.3
AUG 06...	160	200	20	60	12	6.4	0.2	0.8	179	14	10

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 13...	0.1	9.0	220	1	1	--	<0.01	0.80	0.01	--	<0.2
JUN 04...	<0.1	9.8	240	2	1	--	<0.01	1.10	0.02	0.28	0.3
AUG 06...	0.1	12	220	3	3	0.29	<0.01	0.30	<0.01	0.19	<0.2

DATE	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
FEB 13...	<0.01	0.8	<1	49	<1	<10	<1	<3	<1	<1	<0.1
JUN 04...	<0.01	2.9	--	--	--	--	--	--	--	--	--
AUG 06...	<0.01	1.8	<1	48	<1	<10	<1	7	<5	2	<0.1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 13...	<1	<1	16	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN 04...	--	--	--	--	--	--	--	--	--	--	--
AUG 06...	<1	<1	<3	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 13...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN 04...	--	--	--	--	--	--	--	--	--	--
AUG 06...	--	--	--	--	--	--	--	--	--	--

08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 13...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN 04...	--	--	--	--	--	--	--	--	--	--
AUG 06...	--	--	--	--	--	--	--	--	--	--

08197500 FRIO RIVER BELOW DRY FRIO RIVER NEAR UVALDE, TX

LOCATION.--Lat 29°14'44", long 99°40'27", Uvalde County, Hydrologic Unit 12110106, on right bank 1.1 mi upstream from Farm Road 1023, 5.7 mi downstream from Dry Frio River, 6.3 mi downstream from bridge on U.S. Highway 90, 7.2 mi northeast of Uvalde, and 194.5 mi upstream from mouth.

DRAINAGE AREA.--631 mi².

PERIOD OF RECORD.--September 1952 to current year. Sum of records published as Frio River at Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 882.47 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Part of flow of Frio River enters the Edwards and associated limestones in the Balcones Fault Zone, which crosses basin between Concan (station 08195000) and this station. Most of low flow enters this formation. Many diversions for irrigation above station. Satellite telemeter at station.

AVERAGE DISCHARGE.--34 years, 29.6 ft³/s (21,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 88,500 ft³/s Aug. 13, 1966 (gage height, 23.88 ft, from floodmark), from rating curve extended above 12,000 ft³/s on basis of slope-area measurements of 24,400, 53,000, and 88,500 ft³/s; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1887, about 35 ft in 1894. Flood of July 1, 1932, reached a stage of about 30 ft. A higher flood than that of 1894 occurred prior to 1887. Above information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	2030	*16,100	*12.50	May 31	2030	5,420	8.68

Minimum discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.43	.00	.00	.00	.00	.00	.00	.00	248	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.65	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	3160	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	1690	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	274	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	91	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	3.9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.90	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	635	---	.00	.00	---
TOTAL	5244.55	.00	.00	.00	.00	.00	.00	635.00	248.73	.00	.00	.00
MEAN	169	.00	.00	.00	.00	.00	.00	20.5	8.29	.00	.00	.00
MAX	3160	.00	.00	.00	.00	.00	.00	635	248	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	10400	.00	.00	.00	.00	.00	.00	1260	493	.00	.00	.00

CAL YR 1985	TOTAL	12193.73	MEAN	33.4	MAX	3160	MIN	.00	AC-FT	24190
WTR YR 1986	TOTAL	6128.28	MEAN	16.8	MAX	3160	MIN	.00	AC-FT	12160

08198000 SABINAL RIVER NEAR SABINAL, TX

LOCATION.--Lat 29°29'27", long 99°29'33", Uvalde County, Hydrologic Unit 12110106, on right bank 108 ft upstream from concrete dam, 2.3 mi downstream from mouth of Onion Creek, 12.5 mi north of Sabinal, and 41.6 mi upstream from mouth.

DRAINAGE AREA.--206 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WSP 1312: 1943(M), 1944(M), 1947(M).

GAGE.--Water-stage recorder. Datum of gage is 1,131.20 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 9, 1971, at site 0.3 mi downstream at same datum.

REMARKS.--Estimated daily discharges: June 26 to Aug. 6. Records good except those for estimated daily discharges which are fair. There are several small diversions above station for irrigation.

AVERAGE DISCHARGE.--44 years, 55.7 ft³/s (3.67 in/yr), 40,350 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,200 ft³/s June 17, 1958 (gage height, 28.3 ft, from floodmark, at present site), from rating curve extended above 6,900 ft³/s on basis of slope-area measurement of 55,200 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1892, about 33 ft July 2, 1932, from information by local residents. There is a legend that a flood in the middle 1800's reached a stage of nearly 63 ft, see flood history for station 08198500.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1200	*10,900	*12.58	No other peak greater than base discharge.			

Minimum daily discharge, 11 ft³/s Apr. 23-28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	66	57	42	30	23	18	16	52	36	20	230
2	28	69	55	42	30	24	18	12	47	34	20	110
3	23	65	56	42	44	24	18	12	44	32	20	82
4	24	63	56	42	36	24	18	12	42	31	20	53
5	22	62	53	40	35	23	18	12	40	30	20	47
6	22	60	53	41	33	23	17	12	40	28	20	42
7	23	59	53	40	34	23	17	12	37	28	20	55
8	23	58	52	44	34	23	17	14	48	27	20	59
9	24	58	52	44	34	23	15	13	54	26	20	56
10	24	58	52	44	34	23	14	70	51	25	21	54
11	24	57	52	41	30	23	15	33	47	24	20	46
12	25	54	50	39	30	23	16	22	48	24	20	43
13	26	54	51	39	30	20	16	18	44	24	20	41
14	27	53	51	37	31	21	14	20	42	23	22	39
15	88	52	52	38	32	22	13	37	40	23	20	37
16	50	54	52	39	32	21	13	26	39	23	21	36
17	47	54	51	40	31	22	13	26	204	23	20	37
18	43	53	49	37	28	23	13	23	157	22	22	35
19	1520	54	47	36	27	20	13	20	130	22	20	34
20	174	48	47	36	27	20	13	20	138	22	18	32
21	148	48	48	35	26	20	12	19	113	22	18	32
22	133	51	48	34	26	20	12	19	102	22	22	32
23	117	52	47	34	26	20	11	19	88	21	23	30
24	102	52	45	34	26	20	11	19	73	21	27	30
25	91	52	44	34	26	20	11	19	63	21	27	30
26	84	52	44	33	26	19	11	21	56	21	22	29
27	79	59	45	32	25	19	11	35	50	21	22	29
28	76	58	44	32	24	19	11	40	45	21	20	28
29	72	58	43	33	---	18	12	38	41	20	22	27
30	67	60	43	30	---	18	27	33	38	20	23	24
31	69	---	43	30	---	18	---	44	---	20	22	---
TOTAL	3312	1693	1535	1164	847	659	438	736	2013	757	652	1459
MEAN	107	56.4	49.5	37.5	30.3	21.3	14.6	23.7	67.1	24.4	21.0	48.6
MAX	1520	69	57	44	44	24	27	70	204	36	27	230
MIN	22	48	43	30	24	18	11	12	37	20	18	24
CFSM	.52	.27	.24	.18	.15	.10	.07	.12	.33	.12	.10	.24
IN.	.60	.31	.28	.21	.15	.12	.08	.13	.36	.14	.12	.26
AC-FT	6570	3360	3040	2310	1680	1310	869	1460	3990	1500	1290	2890

CAL YR 1985	TOTAL	30166.7	MEAN	82.6	MAX	1520	MIN	8.1	CFSM	.40	IN.	5.45	AC-FT	59840
WTR YR 1986	TOTAL	15265	MEAN	41.8	MAX	1520	MIN	11	CFSM	.20	IN.	2.76	AC-FT	30280

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1964 to July 1965. Chemical and biochemical analyses: February 1970 to current year. Pesticide analyses: August 1971 to current year. Sediment analyses: November 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB											
13...	1510	34	472	8.00	11.0	5	0.4	10.6	98	0.4	26
JUN											
04...	1653	40	462	--	25.0	3	1.0	--	--	0.3	48
AUG											
07...	1200	20	418	7.90	27.5	5	0.8	8.0	--	0.7	44

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
13...	K13	240	31	75	13	9.0	0.3	0.9	210	30	12
JUN											
04...	51	210	18	66	12	7.3	0.2	1.2	196	25	10
AUG											
07...	140	210	29	64	13	8.1	0.3	0.9	184	26	12

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB											
13...	0.2	11	280	2	2	<0.01	0.60	0.02	<0.2	<0.01	0.8
JUN											
04...	0.2	12	250	10	5	<0.01	0.20	0.04	<0.2	<0.01	1.2
AUG											
07...	0.2	15	250	1	1	<0.01	0.20	0.03	<0.2	<0.01	1.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)
FEB										
13...	<1	47	<1	<10	1	<3	<1	<1	<0.1	<1
JUN										
04...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	<1	43	<1	<10	<1	12	<5	2	<0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB										
13...	<1	7	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN										
04...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	<1	7	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB										
13...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN										
04...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
13...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
04...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	--	--	--	--	--	--	--	--	--	--

08198500 SABINAL RIVER AT SABINAL, TX

LOCATION.--Lat 29°18'05", long 99°28'46", Uvalde County, Hydrologic Unit 12110106, on left bank 80 ft downstream from bridge on U.S. Highway 90, 1,100 ft downstream from Southern Pacific Lines railroad bridge, 0.8 mi west of Sabinal, 5.8 mi upstream from Ranchero Creek, and 223 mi upstream from mouth.

DRAINAGE AREA.--241 mi².

PERIOD OF RECORD.--September 1952 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 882.17 ft above National Geodetic Vertical Datum of 1929. Prior to July 29, 1958, nonrecording gage, and July 29, 1958, to Mar. 19, 1964, water-stage recorder at site 80 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Feb. 6 to Apr. 14 and June 18 to July 27. Records good except those for estimated daily discharges, which are poor. Several small diversions for irrigation above station. Most of low flow of the Sabinal River enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin upstream from this station and downstream from Sabinal River near Sabinal (station 08198000). Several observations of water emperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--34 years, 30.1 ft³/s (21,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 73,300 ft³/s June 17, 1958 (gage height, 33.3 ft); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1890, 40 ft Aug. 24, 1919, from information by local residents. Flood of July 2, 1932, reached a stage of 31 ft (discharge, 60,000 ft³/s), from information by Southern Pacific Lines. There is a legend that a flood in 1858 covered the townsite of Sabinal. The stage would have been 70 to 80 ft, which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	1700	*12,800	*18.61	May 27	0630	200	5.85

Minimum daily discharge, 0.35 ft³/s May 1-7, 11-13, 16-25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.1	2.1	2.0	1.8	1.1	.96	.35	1.8	1.5	.59	1.2
2	1.8	2.3	2.1	2.0	1.9	1.2	.94	.35	1.6	1.4	.68	.91
3	1.9	2.0	2.1	2.0	4.4	1.2	.90	.35	1.8	1.5	.85	.85
4	2.0	2.0	2.1	1.9	1.5	1.2	.86	.35	5.4	1.4	1.1	.85
5	2.2	2.0	2.1	1.9	1.5	1.1	.84	.35	1.5	1.3	1.1	.85
6	2.4	2.0	2.1	1.9	1.4	1.0	.80	.35	1.4	1.3	1.0	.87
7	2.5	2.0	2.1	2.0	1.4	1.1	.80	.35	1.5	1.4	1.2	6.1
8	2.6	2.0	2.1	3.6	1.4	1.1	.80	.36	1.6	1.5	1.1	4.0
9	2.7	1.9	2.1	3.3	1.4	1.1	.80	.64	1.6	1.6	.97	2.1
10	2.9	1.9	2.1	2.9	1.3	1.1	.76	.43	1.6	1.5	.85	1.1
11	3.0	1.9	2.2	2.7	1.3	1.1	.74	.35	1.8	1.4	.88	.87
12	3.0	1.9	2.2	2.7	1.3	1.1	.74	.35	1.8	1.2	.87	.85
13	3.1	1.9	2.2	2.7	1.3	1.2	.74	.35	1.8	1.4	.93	.85
14	3.4	1.8	2.2	2.7	1.3	1.3	.70	.36	2.0	1.5	.91	.82
15	5.0	1.8	2.2	2.7	1.4	1.4	.71	.36	2.1	1.4	.85	.79
16	4.5	1.8	2.2	2.7	1.4	1.2	.69	.35	1.9	1.4	.85	.78
17	4.9	1.8	2.2	2.6	1.4	1.1	.65	.35	2.2	1.3	.85	.78
18	5.1	1.8	2.2	2.4	1.3	1.0	.65	.35	1.5	1.1	.85	.78
19	1280	1.9	2.1	2.4	1.2	.94	.63	.35	1.6	1.2	.85	.78
20	271	2.0	2.1	2.2	1.2	.96	.58	.35	1.4	1.3	.85	.78
21	90	2.0	2.1	2.2	1.2	1.0	.56	.35	1.4	1.4	.85	.78
22	51	2.0	2.2	2.0	1.3	1.1	.51	.35	1.5	1.3	.85	.78
23	27	2.0	2.4	2.0	1.3	1.1	.46	.35	1.7	1.2	.85	.78
24	15	2.0	2.1	2.1	1.2	1.1	.45	.35	1.6	1.3	1.1	.78
25	9.6	2.0	2.1	2.1	1.2	1.1	.40	.35	1.4	1.3	.95	.78
26	6.7	2.0	2.1	1.7	1.2	1.2	.40	.43	1.4	1.3	.85	.78
27	4.6	2.2	2.3	1.7	1.1	1.1	.40	11	1.3	1.2	.85	.78
28	2.8	2.1	2.3	1.6	1.1	1.2	.40	1.3	1.4	1.3	.82	.78
29	2.0	2.1	2.0	1.9	---	1.1	.41	1.3	1.5	1.0	.78	.78
30	2.1	2.1	2.1	1.6	---	1.0	.40	1.3	1.5	1.1	.78	.73
31	2.1	---	2.3	1.7	---	.98	---	1.6	---	1.1	.79	---
TOTAL	1818.5	59.3	66.8	69.9	40.7	34.48	19.68	26.08	52.6	41.1	27.60	34.66
MEAN	58.7	1.98	2.15	2.25	1.45	1.11	.66	.84	1.75	1.33	.89	1.16
MAX	1280	2.3	2.4	3.6	4.4	1.4	.96	11	5.4	1.6	1.2	6.1
MIN	1.6	1.8	2.0	1.6	1.1	.94	.40	.35	1.3	1.0	.59	.73
AC-FT	3610	118	132	139	81	68	39	52	104	82	55	69

CAL YR 1985	TOTAL	8223.64	MEAN	22.5	MAX	1280	MIN .82	AC-FT 16310
WTR YR 1986	TOTAL	2291.40	MEAN	6.28	MAX	1280	MIN .35	AC-FT 4540

08200000 HONDO CREEK NEAR TARPLEY, TX

LOCATION.--Lat 29°34'10", long 99°14'47", Medina County, Hydrologic Unit 12110107, on left bank 460 ft downstream from bridge on Ranch Road 462, 6.3 mi southeast of Tarpley, and 16.6 mi northwest of Hondo.

DRAINAGE AREA.--95.6 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1952 to current year.

REVISED RECORDS.--WSP 1712: 1957. WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,169.1 ft, from Magnolia Oil Company datum.

REMARKS.--No estimated daily discharges. Records good. There are several small diversions for irrigation above station.

AVERAGE DISCHARGE.--34 years, 37.8 ft³/s (5.37 in/yr), 27,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,800 ft³/s June 17, 1958 (gage height, 28.2 ft, from floodmark), from rating curve extended above 2,600 ft³/s on basis of slope-area measurements of 18,600 and 69,800 ft³/s; no flow at times in 1952-57, 1962-64, 1967, 1971, and 1984.
Maximum stage since at least 1907, that of June 17, 1958.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1932 reached a stage of about 26 ft (discharge, 58,500 ft³/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 14	2330	4,180	6.80	May 9	2130	937	3.90
Nov. 27	0100	3,180	6.00	June 18	0445	*5,840	*8.13

Minimum daily discharge, 4.4 ft³/s Oct. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	30	58	29	18	14	9.6	8.1	30	37	13	36
2	11	32	54	28	18	14	9.4	7.7	29	35	13	40
3	9.6	28	53	27	36	14	9.7	7.5	29	33	13	37
4	7.6	28	52	27	25	14	10	7.4	35	31	13	31
5	6.0	26	48	26	23	13	9.6	7.2	30	30	12	30
6	5.2	26	47	26	21	13	9.5	6.9	27	29	12	30
7	5.0	25	47	26	21	13	9.1	6.8	27	28	12	43
8	5.0	24	45	30	21	13	8.7	9.5	30	27	11	31
9	5.2	24	44	27	20	13	19	105	34	26	11	30
10	5.0	24	45	26	20	13	9.6	84	30	25	11	27
11	4.7	25	61	26	20	13	9.7	24	32	24	11	27
12	4.7	24	46	25	19	13	9.5	18	29	24	12	26
13	4.4	24	43	24	19	13	8.7	16	34	25	12	25
14	251	23	40	24	19	13	8.5	19	29	24	11	24
15	209	25	39	23	18	14	8.0	31	28	23	10	24
16	20	23	39	23	18	12	8.2	19	27	22	11	24
17	16	23	38	22	18	11	8.4	18	124	21	11	23
18	14	23	38	22	17	12	8.9	15	888	20	10	23
19	58	23	37	22	17	11	8.6	13	126	20	9.9	22
20	61	21	37	21	17	11	7.8	13	91	19	9.6	22
21	63	21	37	21	16	11	7.4	12	75	18	20	21
22	58	21	35	20	16	11	7.2	12	67	17	40	21
23	52	21	34	20	15	10	6.9	12	62	17	40	21
24	48	21	33	21	15	10	6.8	12	57	16	45	20
25	43	21	32	20	15	10	6.9	12	53	16	21	20
26	39	22	32	20	15	10	6.7	17	50	15	18	20
27	35	410	32	19	15	10	6.8	44	49	15	18	19
28	32	72	31	19	14	9.9	6.6	33	44	15	17	22
29	31	64	31	19	---	9.9	7.2	28	41	14	17	21
30	30	64	30	18	---	9.9	17	25	38	14	16	19
31	29	---	29	18	---	9.6	---	32	---	13	21	---
TOTAL	1175.4	1238	1267	719	526	368.3	270.0	675.1	2245	693	501.5	779
MEAN	37.9	41.3	40.9	23.2	18.8	11.9	9.00	21.8	74.8	22.4	16.2	26.0
MAX	251	410	61	30	36	14	19	105	888	37	45	43
MIN	4.4	21	29	18	14	9.6	6.6	6.8	27	13	9.6	19
CFSM	.44	.48	.47	.27	.22	.14	.10	.25	.87	.26	.19	.30
IN.	.51	.53	.55	.31	.23	.16	.12	.29	.97	.30	.22	.34
AC-FT	2330	2460	2510	1430	1040	731	536	1340	4450	1370	995	1550

CAL YR 1985	TOTAL	20578.0	MEAN	56.4	MAX	972	MIN	2.1	CFSM	.65	IN.	8.88	AC-FT	40820
WTR YR 1986	TOTAL	10457.3	MEAN	28.7	MAX	888	MIN	4.4	CFSM	.33	IN.	4.51	AC-FT	20740

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: February 1970 to current year. Pesticide analyses: August 1971 to current year. Sediment analyses: November to December 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB											
12...	1245	19	449	8.00	9.5	7	0.6	12.0	0.6	K8	K12
JUN											
05...	1550	32	385	8.10	30.0	3	1.2	7.5	0.2	120	110
AUG											
07...	1200	11	419	7.90	--	3	0.5	6.8	0.7	K10	120

DATE	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB											
12...	230	36	74	11	8.0	0.2	1.0	194	32	11	0.2
JUN											
05...	180	17	56	10	5.7	0.2	1.3	164	25	7.9	0.2
AUG											
07...	200	32	61	11	8.0	0.3	0.9	166	33	10	0.2

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB											
12...	10	260	1	1	<0.01	0.40	0.02	--	<0.2	<0.01	1.5
JUN											
05...	8.9	210	3	2	<0.01	<0.10	0.02	0.18	0.2	<0.01	1.8
AUG											
07...	15	240	8	5	<0.01	0.10	0.05	0.15	0.2	0.02	2.1

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)
FEB										
12...	<1	35	<1	<10	<1	3	<1	2	<0.1	<1
JUN										
05...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	<1	38	<1	<10	<1	12	<5	2	<0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB										
12...	<1	4	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN										
05...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	<1	<3	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB										
12...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN										
05...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	--	--	--	--	--	--	--	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
12...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN										
05...	--	--	--	--	--	--	--	--	--	--
AUG										
07...	--	--	--	--	--	--	--	--	--	--

08200700 HONDO CREEK AT KING WATERHOLE NEAR HONDO, TX

LOCATION.--Lat 29°23'26", long 99°09'04", Medina County, Hydrologic Unit 12110107, on left bank 0.3 mi downstream from county road low-water crossing, 3.1 mi north of Hondo, 7.8 mi upstream from Verde Creek, and 55.4 mi upstream from mouth.

DRAINAGE AREA.--149 mi².

PERIOD OF RECORD.--October 1960 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 897.87 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Most of the low flow of Hondo Creek enters Edwards and associated limestones in the Balcones Fault Zone, which crosses basin between Tarpley (station 08200000) and this station. Small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--26 years, 12.8 ft³/s (9,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,900 ft³/s July 15, 1973 (gage height, 16.4 ft, from floodmark), from rating curve extended above 9,800 ft³/s on basis of contracted-opening measurement of peak flow; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, 21 ft in September 1919, from information by local resident. Other floods occurred in July 1932, stage 18 ft, and June 17, 1958, stage 17 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 14	1330	899	3.77	June 18	0930	*4,730	*6.33
Oct. 19	0400	1,340	4.24				

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	14	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	4.7	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	127	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	4.7	.00	.00	.00
18	5.0	.00	.00	.00	.00	.00	.00	.00	754	.00	.00	.00
19	257	.00	.00	.00	.00	.00	.00	.00	76	.00	.00	.00
20	13	.00	.00	.00	.00	.00	.00	.00	12	.00	.00	.00
21	3.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	1.9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	42	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	427.40	55.00	.00	.00	.00	.00	.00	.00	865.40	.00	.00	.00
MEAN	13.8	1.83	.00	.00	.00	.00	.00	.00	28.8	.00	.00	.00
MAX	257	42	.00	.00	.00	.00	.00	.00	754	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	848	109	.00	.00	.00	.00	.00	.00	1720	.00	.00	.00

CAL YR 1985	TOTAL	1314.92	MEAN	3.60	MAX	508	MIN	.00	AC-FT	2610
WTR YR 1986	TOTAL	1347.80	MEAN	3.69	MAX	754	MIN	.00	AC-FT	2670

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

LOCATION.--Lat 29°34'23", long 99°24'10", Medina County, Hydrologic Unit 12110107, on right bank 200 ft upstream from county road crossing, 4.5 mi downstream from Cascade Creek, 7.9 mi southeast of Utopia, and 58.0 mi upstream from mouth.

DRAINAGE AREA.--45.0 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1961 to current year.

REVISED RECORDS.--WDR TX-83-3: Drainage area.

GAGE.--Water-stage recorder, crest-stage gages, and concrete control. Datum of gage is 1,265.8 ft, from Magnolia Oil Company datum, adjustment unknown.

REMARKS.--Estimated daily discharges: Oct. 19-21. Records good. No known diversion above station.

AVERAGE DISCHARGE.--25 years, 17.9 ft³/s (5.40 in/yr), 12,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,500 ft³/s July 15, 1973 (gage height, 14.4 ft, from floodmark), from rating curve extended above 910 ft³/s on basis of field estimate of flow over and around end of dam, 14,100 ft³/s, and slope-area measurement of 52,600 ft³/s; no flow for many days in 1963-64.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1901, 16.4 ft June 17, 1958, from floodmarks (discharge 52,600 ft³/s, by slope-area measurement of peak flow).

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 9	1900	1,750	4.33	June 18	0330	*4,710	*5.99

Minimum daily discharge, 2.6 ft³/s Apr. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	24	22	9.6	6.5	5.7	4.6	4.6	28	35	6.5	42
2	4.9	26	21	9.6	6.5	5.7	4.6	3.4	25	34	6.3	18
3	4.1	20	20	9.1	22	6.0	4.4	3.2	24	30	6.0	13
4	3.5	18	20	8.9	13	5.9	4.9	3.1	24	28	6.1	11
5	2.9	18	18	8.1	9.8	5.7	4.6	3.1	21	27	5.7	10
6	2.8	18	18	7.9	9.0	5.7	4.6	3.1	19	25	5.3	9.6
7	2.8	17	17	8.0	8.4	5.4	4.6	3.1	18	24	5.3	23
8	2.8	16	17	10	8.4	5.3	4.6	4.7	32	23	5.3	19
9	2.8	16	16	9.4	8.4	5.3	4.4	140	21	22	5.3	17
10	3.0	16	16	8.6	8.4	5.3	4.3	45	18	20	4.9	15
11	3.0	16	20	8.0	8.4	5.5	4.3	18	21	19	4.9	16
12	2.8	15	16	7.9	8.0	6.1	4.3	13	19	18	4.6	15
13	2.8	15	15	7.6	7.9	5.6	3.9	11	17	24	5.1	13
14	6.5	14	14	7.4	8.0	6.2	3.8	13	16	19	4.5	12
15	16	14	14	7.3	7.9	6.4	3.6	16	15	16	4.3	11
16	7.1	14	14	7.0	7.4	5.7	3.6	12	15	16	3.9	11
17	6.8	14	14	9.1	7.4	5.7	3.5	11	154	14	3.9	10
18	6.0	14	14	7.9	7.7	6.1	3.7	9.2	399	14	3.9	9.5
19	300	13	13	7.4	7.9	5.3	3.9	8.2	87	13	3.9	9.0
20	56	11	13	7.4	7.4	5.3	3.5	7.4	78	13	3.7	8.4
21	48	11	12	7.4	7.4	5.3	3.4	6.9	69	11	3.9	7.9
22	44	11	12	7.2	7.0	5.3	3.0	6.1	62	11	4.8	9.1
23	40	11	12	7.0	6.6	5.3	2.8	6.1	57	10	4.2	8.3
24	39	11	11	7.0	6.5	4.9	2.8	6.1	53	9.7	4.7	7.4
25	35	11	11	6.9	6.5	4.7	2.8	5.8	52	9.6	5.9	7.4
26	33	12	11	6.5	6.5	4.7	2.6	8.5	46	9.0	4.5	7.0
27	32	37	11	6.5	6.4	4.9	2.6	30	42	8.5	4.3	7.0
28	31	25	11	6.5	5.7	4.9	2.7	19	41	8.0	3.8	6.7
29	26	24	10	6.5	---	4.9	3.4	15	38	7.6	3.6	6.3
30	24	24	10	6.5	---	4.6	23	14	36	7.4	3.6	6.3
31	24	---	9.8	6.5	---	4.6	---	32	---	6.9	3.5	---
TOTAL	818.7	506	452.8	240.7	231.0	168.0	132.8	481.6	1547	532.7	146.2	365.9
MEAN	26.4	16.9	14.6	7.76	8.25	5.42	4.43	15.5	51.6	17.2	4.72	12.2
MAX	300	37	22	10	22	6.4	23	140	399	35	6.5	42
MIN	2.8	11	9.8	6.5	5.7	4.6	2.6	3.1	15	6.9	3.5	6.3
CFSM	.61	.39	.34	.18	.19	.13	.10	.36	1.20	.40	.11	.28
IN.	.71	.44	.39	.21	.20	.15	.11	.42	1.34	.46	.13	.32
AC-FT	1620	1000	898	477	458	333	263	955	3070	1060	290	726

CAL YR 1985	TOTAL	9399.8	MEAN	25.8	MAX	300	MIN	1.1	CFSM	.60	IN.	8.11	AC-FT	18640
WTR YR 1986	TOTAL	5623.4	MEAN	15.4	MAX	399	MIN	2.6	CFSM	.36	IN.	4.85	AC-FT	11150

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: March 1970 to current year. Pesticide analyses: January 1974 to current year. Sediment analyses: November 1965.

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 12...	1620	7.4	436	8.10	12.5	5	0.6	10.8	104	0.4	22
JUN 05...	1320	22	427	8.00	27.5	3	1.0	8.4	--	0.1	K12
AUG 07...	1500	5.5	386	8.10	34.0	5	0.3	8.0	--	0.3	46

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WH WAT TOTAL FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 12...	K1	220	54	70	12	7.3	0.2	0.9	170	55	8.3
JUN 05...	K13	190	36	58	11	5.6	0.2	1.1	154	37	8.4
AUG 07...	62	180	40	54	11	7.4	0.2	0.8	140	36	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	SOLIDS, VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
FEB 12...	0.2	10	270	3	2	<0.01	0.50	0.02	<0.2	<0.01	1.3
JUN 05...	0.2	9.9	220	12	4	<0.01	0.20	0.02	<0.2	<0.01	1.3
AUG 07...	0.2	14	220	1	1	<0.01	0.20	--	--	--	1.5

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)
FEB 12...	<1	36	<1	<10	<1	4	1	<1	<0.1	<1
JUN 05...	--	--	--	--	--	--	--	--	--	--
AUG 07...	<1	33	<1	<10	<1	6	<5	1	<0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 12...	<1	6	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
JUN 05...	--	--	--	--	--	--	--	--	--	--
AUG 07...	<1	4	--	--	--	--	--	--	--	--

DATE	DI-ELORIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 12...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
JUN 05...	--	--	--	--	--	--	--	--	--	--
AUG 07...	--	--	--	--	--	--	--	--	--	--

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 12...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUN 05...	--	--	--	--	--	--	--	--	--	--
AUG 07...	--	--	--	--	--	--	--	--	--	--

08202700 SECO CREEK AT ROWE RANCH NEAR D'HANIS, TX

LOCATION.--Lat 29°21'43", long 99°17'05", Medina County, Hydrologic Unit 12110107, on left bank 2.9 mi north of D'Hanis and 8.0 mi downstream from Rocky Creek.

DRAINAGE AREA.--168 mi².

PERIOD OF RECORD.--November 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 900.88 ft above National Geodetic Vertical Datum of 1929. Prior to October 1970, published as "at Crook Ranch, near D'Hanis".

REMARKS.--Estimated daily discharges: Oct. 20 to Nov. 4. Records fair. All of low flow of Seco Creek enters Edwards and associated limestones in the Balcones Fault Zone, which crosses the basin between Miller Ranch (station 08201500) and this station. No known diversion above station.

AVERAGE DISCHARGE.--25 years (water years 1962-86), 7.75 ft³/s (5,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,500 ft³/s July 15, 1973 (gage height, 26.0 ft, from floodmark), from rating curve extended above 16,000 ft³/s on basis of slope-area measurement of 35,800 ft³/s; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 35.7 ft May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft; September 1919, 28 ft; July 2, 1932, 28.2 ft (discharge, 35,800 ft³/s), by slope-area measurement; and June 17, 1958, 32.4 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 19	Unknown	*6,920	a*14.88	No other peak greater than base discharge.			

a From floodmark.

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	147	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	3.2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.33	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00
19	838	.00	.00	.00	.00	.00	.00	.00	9.3	.00	.00	.00
20	85	.00	.00	.00	.00	.00	.00	.00	.97	.00	.00	.00
21	10	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00
22	6.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	1.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	1091.12	.00	.00	.00	.00	.00	.00	.00	28.31	.00	.00	.00
MEAN	35.2	.00	.00	.00	.00	.00	.00	.00	.94	.00	.00	.00
MAX	838	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2160	.00	.00	.00	.00	.00	.00	.00	56	.00	.00	.00

CAL YR 1985	TOTAL	1192.96	MEAN	3.27	MAX	838	MIN	.00	AC-FT	2370
WTR YR 1986	TOTAL	1119.43	MEAN	3.07	MAX	838	MIN	.00	AC-FT	2220

08204000 LEONA RIVER SPRING FLOW NEAR UVALDE, TX

LOCATION.--Lat 29°09'15", long 99°44'35", Uvalde County, Hydrologic Unit 12110106 at old road crossing on White's Ranch, 2.0 mi downstream from Cooks Slough, and 4.7 mi southeast of Uvalde.

DRAINAGE AREA.--Not applicable. Normal flow of river comes from springs.

PERIOD OF RECORD.--1939 to current year. Occasional discharge measurements 1925-39 in connection with seepage investigations. Operated as continuous record station from January 1939 to September 1965. Occasional discharge measurements since September 1965.

GAGE.--Nonrecording. Datum of gage is 838.39 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Discharge represents flow from several springs that enter river above station and below Uvalde. Surface runoff from precipitation is excluded. No known diversion above station.

AVERAGE DISCHARGE.--26 years (during period of continuous record, water years 1940-65), 9.72 ft^3/s, 7,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--(1939 to current year) Maximum measured spring discharge, 82 ft^3/s May 25, 1977; no flow at times in 1948-49, 1951-59, 1964-68, 1984-85.

DISCHARGE MEASUREMENTS, IN CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Dec. 16, 1985	33.3	Feb. 4, 1986	25.0	June 10, 1986	24.3
	31.2	Apr. 16	21.5	Aug. 13	10.3

APPENDIX D. SUPPLEMENTAL INFORMATION

DEFINITIONS OF TERMS

Technical terms and abbreviations as used in this report are defined as follows:

acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet, about 326,000 gallons, or 1,233 cubic meters.

bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped in colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

total-coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C (degrees Celsius). In the laboratory these bacteria are defined as the organisms which produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C $\pm$ 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL (milliliters) of sample.

fecal-coliform bacteria are bacteria that are present in the intestines or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C $\pm$ 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

fecal-streptococcal bacteria are bacteria found in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons or 2,447 cubic meters.

chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

color unit is produced by 1 milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

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

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

cubic foot per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

cubic foot per second (FT^3/S, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second. This rate is equivalent to approximately 7.48 gallons per second, 448.8 gallons per minute, or 0.02832 cubic meter per second.

discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

instantaneous discharge is the discharge at a particular instant of time.

dissolved refers to that material in a representative water sample which passes through a 0.45-µm (micrometer) membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

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

drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

gage height (G.HT.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general

term "stage" although gage height is more appropriate when used with a reading on a gage.

gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter.

milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in milligrams per liter and is based on the mass of sediment per liter of water-sediment mixture.

partial record station is a particular site where limited streamflow and (or) water-quality data are collected systematically over a period of years for use in hydrologic analyses.

pesticides are chemical compounds used to control undesirable plants and animals. Major categories of pesticides include insecticides and herbicides, which control insects and plants, respectively, and are the two categories reported.

polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

runoff in inches (IN, in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

sea level in this report refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)--a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada, formerls called "Mean Sea Level of 1929." Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. This ratio should be known especially for water used for irrigation.

solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids concentration in the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens) for streams. This relation is not constant from well to well or from stream to stream, and it may vary in the same source with changes in the composition of the water.

stage-discharge relation is the relation between gage height (stage) and the amount of water per unit of time, flowing in a channel.

streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

suspended, recoverable refers to the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45-µm membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

suspended, total refers to the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45-µm membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total." Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or more commonly, by difference, based on determinations of (1) dis-

solved and (2) total concentrations of the constituent.

total refers to the total amount of a given constituent in a representative water-suspended sediment sample regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

total, recoverable refers to the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual basic-data reports.

WRD is used as an abbrevation for "Water Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

METRIC CONVERSIONS

The inch-pound units of measurement used in this report may be converted to metric units by using the following conversions factors:

From	Multiply by	To obtain
acre-feet (acre-ft)	1233	cubic meters (m^3)
	0.001233	cubic hectometers (hm^3)
cubic feet per second (ft^3/s)	0.02832	cubic meters per second (m^3/s)
feet (ft)	0.3048	meters (m)
feet per mile (ft/mi)	0.189	meters per kilometer (m/km)
inches (in.)	25.4	millimeters (mm)
miles (mi)	1.609	kilometers (km)
million gallons per day (Mgal/d)	0.04381	cubic meters per second (m^3/s)
square miles (mi^2)	2.590	square kilometers (km^2)

To convert °C (degrees Celsius) to °F (degrees Fahrenheit): °F = 9/5 x °C + 32.

PREVIOUS AND RELATED STUDIES

The Geological Survey and the Texas Water Development Board have been collecting hydrologic and geologic data in the San Antonio area on a continuing basis since 1929. Comprehensive reports of previous investigations include Arnow (1959); Bennett and Sayre (1962); DeCook (1963); Garza (1962, 1966); George (1952); Holt (1959); Lang (1954); Livingston, Sayre, and White (1936); Maclay and Small (1976); Petitt and George (1956); and Welder and Reeves (1962). The Texas Water Development Board has conducted extensive hydrologic and geologic studies to provide data for construction of a digital model of the aquifer.

In 1968, the Geological Survey, in cooperation with the Texas Water Development Board and the Edwards Underground Water District, began a continuing program to collect historical-reference data for detecting pollution and for determining changes in the quality of water in the Edwards aquifer. The results of the study from August 1968 to August 1969 were reported by Reeves and Blakey (1970), and the results from August 1968 to April 1972 were reported by Reeves, Rawson, and Blakey (1972). A progress report for August 1968 to January 1975 was made by Reeves (1976). Compilations of water-quality data for February 1975 to September 1977 were reported by Reeves (1978), for October 1977 to September 1978 and October 1978 to December 1979 were reported by Reeves, Maclay, Grimm, and Davis (1980, 1981), for January 1980 to December 1980 were reported by Reeves, Maclay, and Davis (1982), for January 1981 to December 1981 were reported by Reeves, Maclay, and Ozuna (1984), for January 1982 to December 1982 and January 1983 to December 1984 were reported by Reeves and Ozuna (1985, 1986), and for January 1985 to December 1985 were reported by Ozuna, Nallet, and Bowman (1987).

In related studies, the Geological Survey, in cooperation with the Texas Water Development Board and the City of San Antonio, collected data from 1969 to 1980 on the quantity and quality of urban runoff in San Antonio. Data collected in the urban study have been reported in an annual series of hydrologic-data reports by Land (1971-72), Steger (1973-75), Gonzalez (1976), Harmsen (1977-78), Perez and Harmsen (1980), and Perez (1981-83).

Additional reports on the geology and hydrology of the San Antonio area as well as reports on recharge, discharge, water levels, and water quality for the Edwards aquifer are given in the section "Selected References."

WELL-NUMBERING SYSTEM

The well-numbering system in Texas was developed by the Texas Water Development Board for use throughout the State. Under this system, each 1-degree quadrangle is given a number consisting of two digits. These are the first two digits in the well number. Each 1-degree quadrangle is divided into 7-1/2-minute quadrangles which are given two-digit numbers from 01 to 64. These are the third and fourth digits of the well number. Each 7-1/2-minute quadrangle is divided into 2-1/2-minute quadrangles which are given a single-digit number from 1 to 9. This is the fifth digit of the well number. Finally, each well within a 2-1/2-minute quadrangle is given a two-digit number in the order in which it was inventoried, starting with 01. These are the last two digits of the well number.

In addition to the seven-digit well number, a two-letter prefix is used to identify the county. The prefix for each county in the San Antonio area is as follows: AL, Atascosa; AY, Bexar; DX, Comal; LR, Hays; TD, Medina; and YP, Uvalde.

Each water-level observation well is also identified by a 15-digit number based on latitude and longitude and by a local number that is provided for continuity with older reports. The first 6 digits of the 15-digit number are degrees, minutes, and seconds of north latitude; the next 7 digits are degrees (including a leading 0 for those less than 100), minutes, and seconds of west longitude; and the final 2 digits are sequential numbers assigned in the order in which the wells are established in that 1-second quadrangle. The second seven-digit number is the State well number. Where there is a number inside parentheses, it is a number assigned to the well in some publication prior to 1978.

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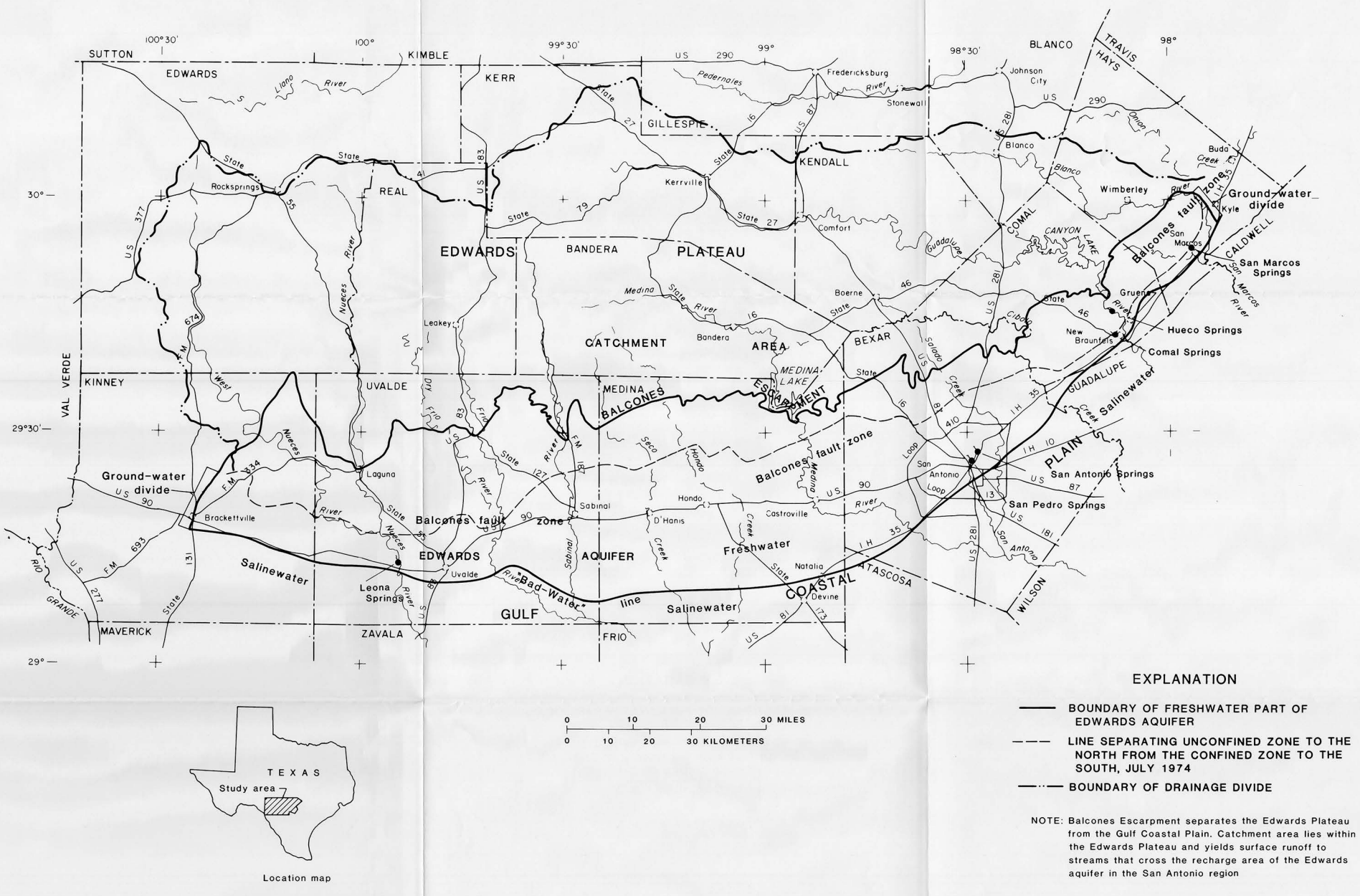


Plate 1. --Location of the Edwards aquifer and physiographic regions in the San Antonio area.

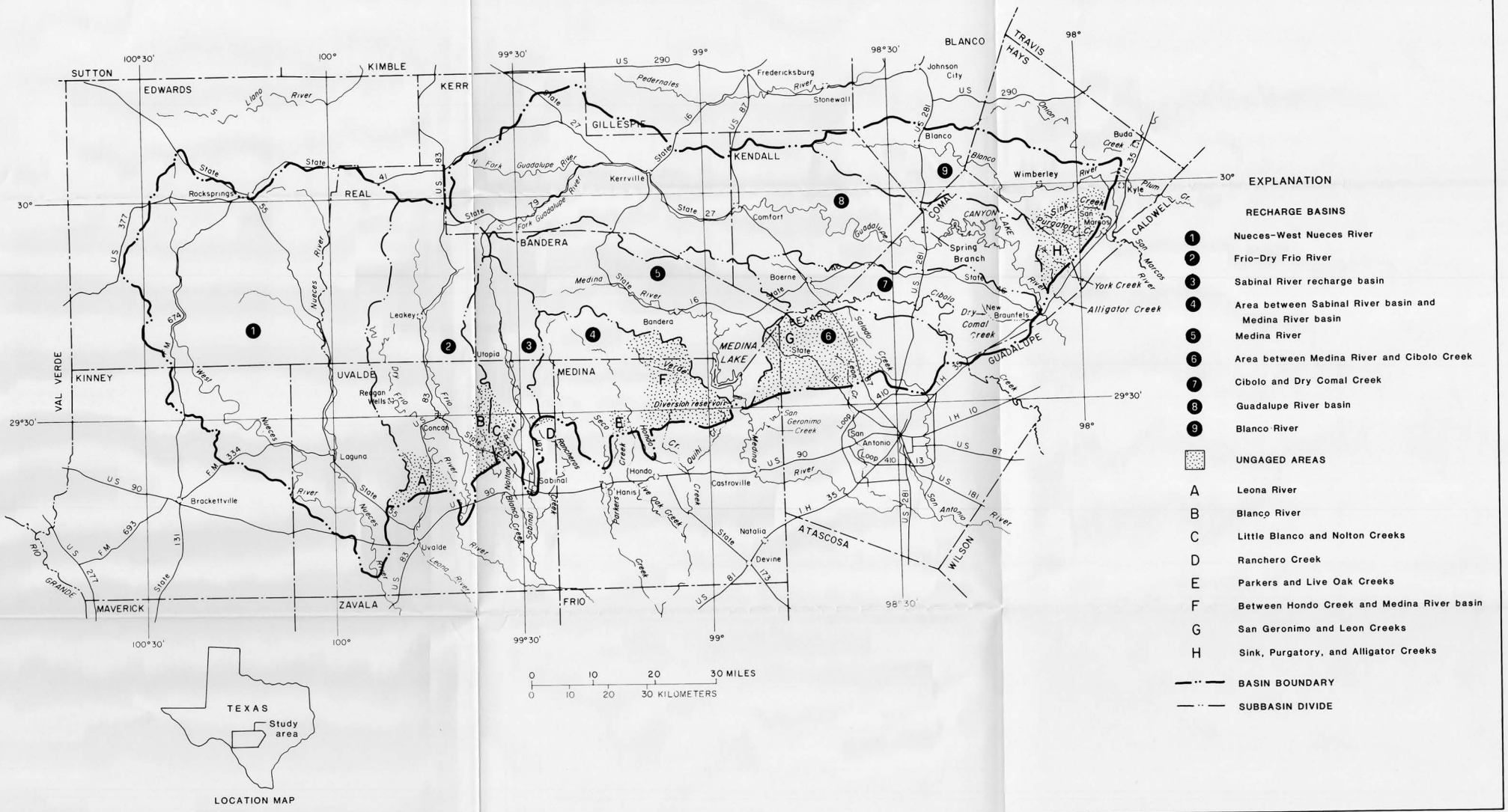
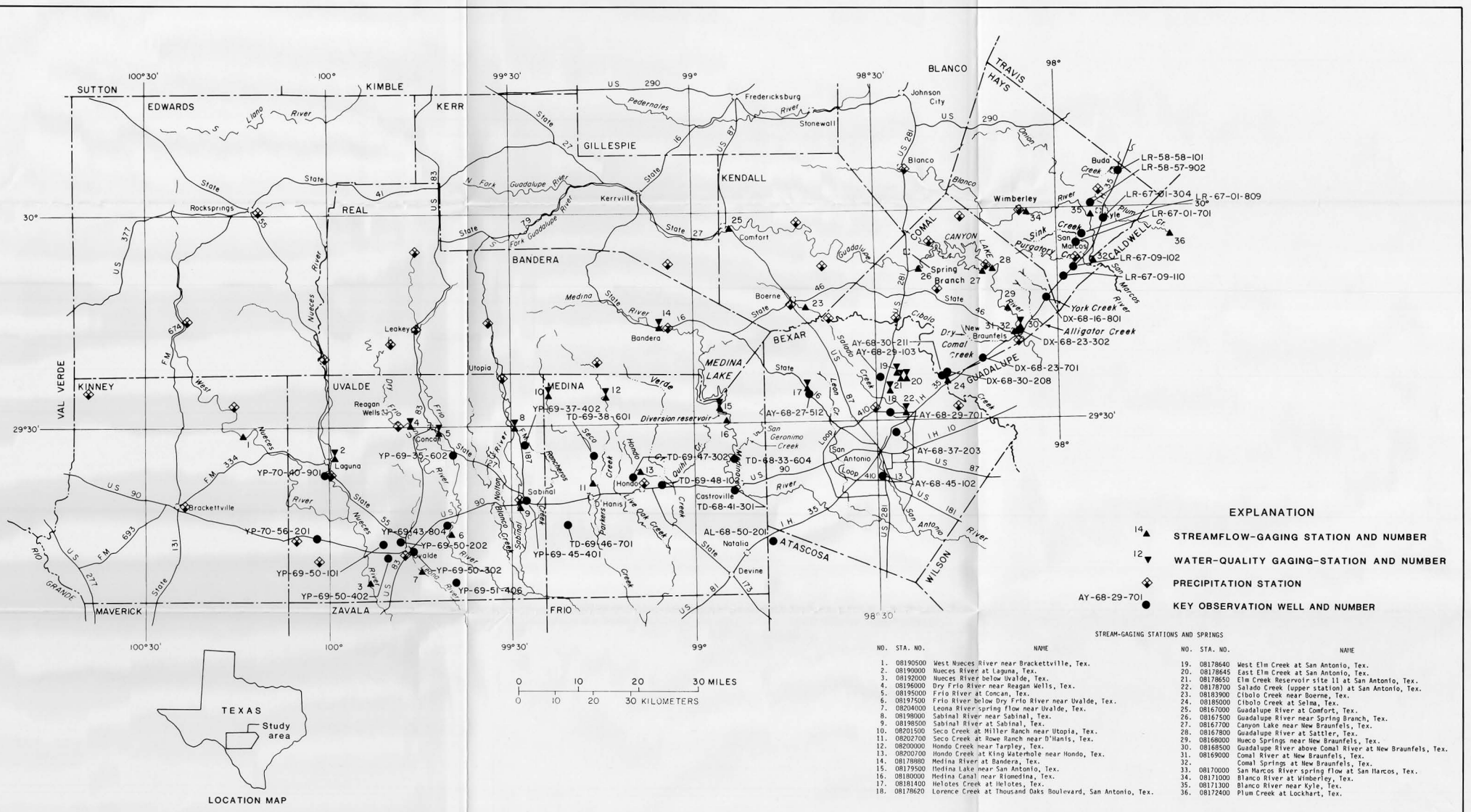


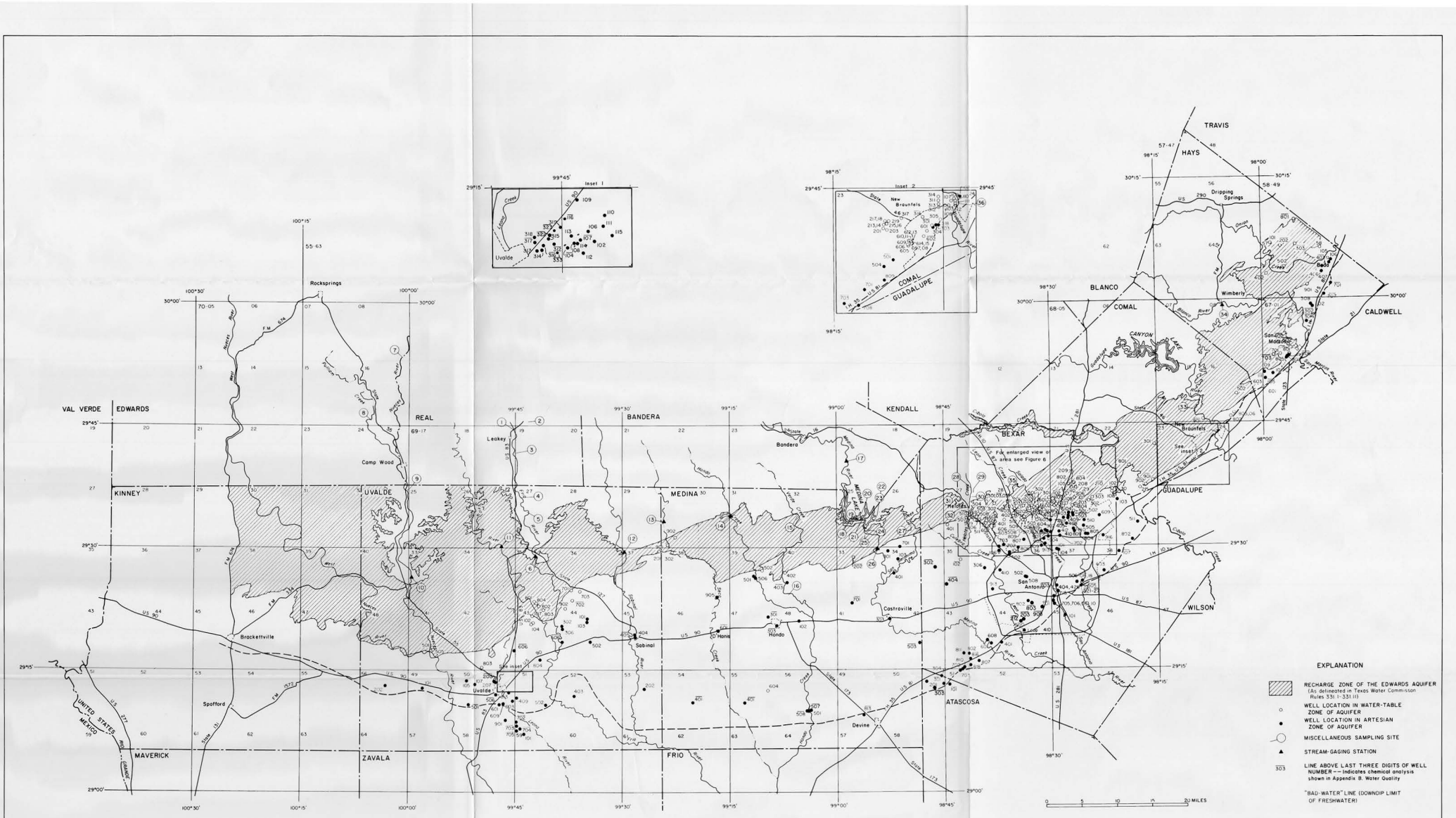
Plate 2. --Location of drainage basins and ungaged areas.



STREAM-GAGING STATIONS AND SPRINGS

NO.	STA. NO.	NAME
1.	08190500	West Nueces River near Brackettville, Tex.
2.	08190000	Nueces River at Laguna, Tex.
3.	08192000	Nueces River below Uvalde, Tex.
4.	08196000	Dry Frio River near Reagan Wells, Tex.
5.	08195000	Frio River at Concan, Tex.
6.	08197500	Frio River below Dry Frio River near Uvalde, Tex.
7.	08204000	Leona River spring flow near Uvalde, Tex.
8.	08198000	Sabinal River near Sabinal, Tex.
9.	08198500	Sabinal River at Sabinal, Tex.
10.	08201500	Seco Creek at Miller Ranch near Utopia, Tex.
11.	08202700	Seco Creek at Rowe Ranch near D'Hanis, Tex.
12.	08200000	Hondo Creek near Tarpley, Tex.
13.	08200700	Hondo Creek at King Waterhole near Hondo, Tex.
14.	08178880	Medina River at Bandera, Tex.
15.	08179500	Medina Lake near San Antonio, Tex.
16.	08180000	Medina Canal near Riomedina, Tex.
17.	08181400	Helotes Creek at Helotes, Tex.
18.	08178620	Lorence Creek at Thousand Oaks Boulevard, San Antonio, Tex.
19.	08178640	West Elm Creek at San Antonio, Tex.
20.	08178645	East Elm Creek at San Antonio, Tex.
21.	08178650	Elm Creek Reservoir site 11 at San Antonio, Tex.
22.	08178700	Salado Creek (upper station) at San Antonio, Tex.
23.	08183900	Cibolo Creek near Boerne, Tex.
24.	08185000	Cibolo Creek at Selma, Tex.
25.	08167000	Guadalupe River at Comfort, Tex.
26.	08167500	Guadalupe River near Spring Branch, Tex.
27.	08167700	Canyon Lake near New Braunfels, Tex.
28.	08167800	Guadalupe River at Sattler, Tex.
29.	08168000	Hueco Springs near New Braunfels, Tex.
30.	08168500	Guadalupe River above Comal River at New Braunfels, Tex.
31.	08169000	Comal River at New Braunfels, Tex.
32.		Comal Springs at New Braunfels, Tex.
33.	08170000	San Marcos River spring flow at San Marcos, Tex.
34.	08171000	Blanco River at Wimberley, Tex.
35.	08171300	Blanco River near Kyle, Tex.
36.	08172400	Plum Creek at Lockhart, Tex.

Plate 3. --Location of data-collection sites for streamflow, surface-water quality, precipitation, and observation wells, 1986.



Base from U.S. Geological Survey
1:250,000 quadrangles

Plate 4 -- Location of water-quality data-collection sites for wells and springs in the Edwards aquifer, 1972-86.

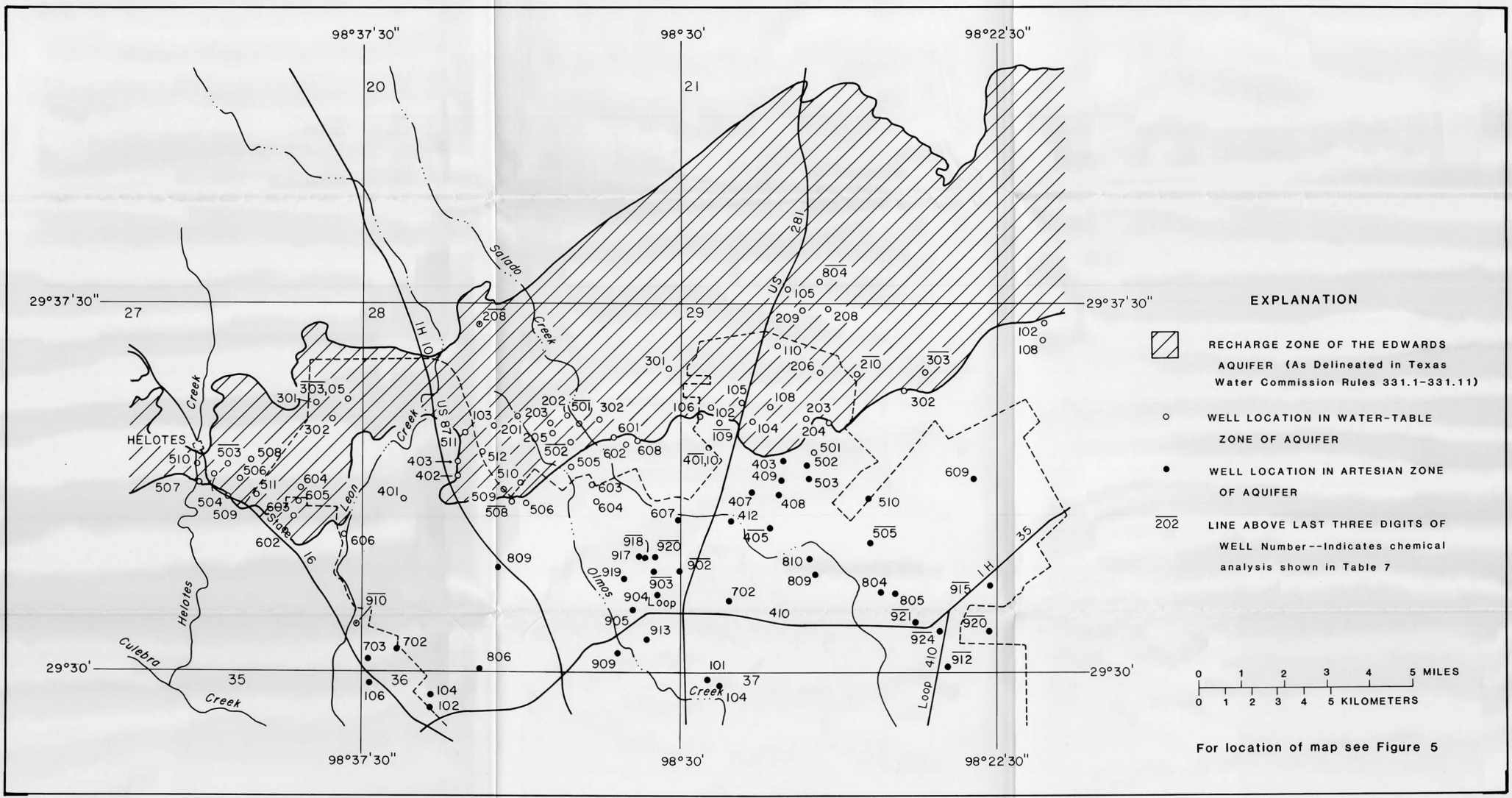


Plate 5. --Location of water-quality data-collection sites for wells and springs in the Edwards aquifer in the vicinty of San Antonio, 1972-86.