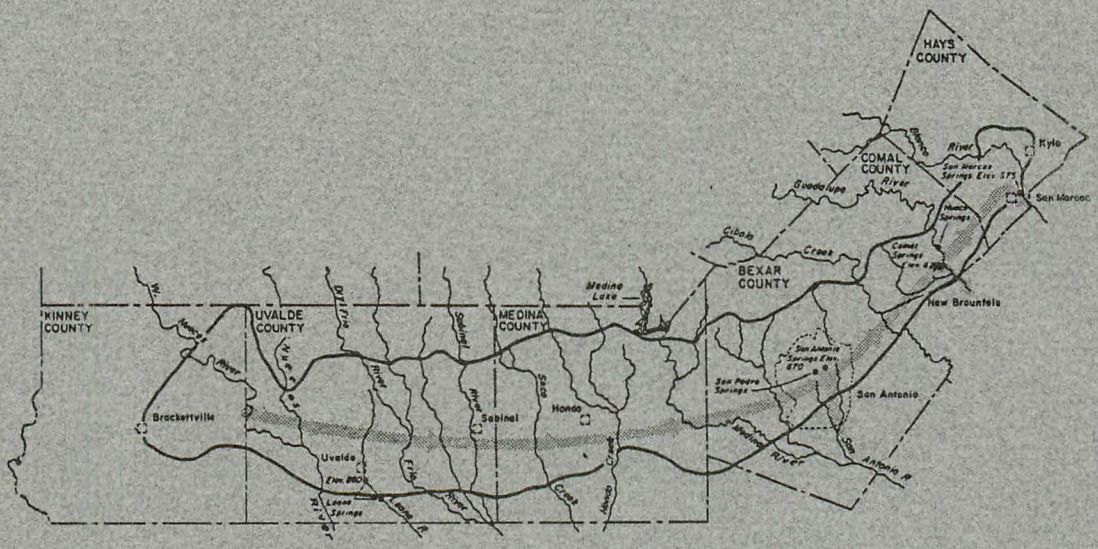
COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1987, WITH 1934-87 SUMMARY

Bulletin 47
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 47

COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1987, WITH 1934-87 SUMMARY

Compiled by

G.M. Nalley and P.L. Rettman
U.S. Geological Survey

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COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1987, WITH 1934-87 SUMMARY

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ABSTRACT

The average estimated annual ground-water recharge to the Edwards aquifer in the San Antonio area, Texas, from 1934 through 1987 was 640,600 acre-feet. Recharge in 1987 was 2,003,600 acre-feet, which is the highest estimated annual recharge since 1934. The previous 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 from the Edwards aquifer by wells and springs in 1987 was 940,400 acre-feet, which is the second highest calculated annual discharge since 1934. 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.

Water levels in many of the wells during 1987 fluctuated above the mid-point between record high and low levels, indicating an above average volume of ground water in storage in the aquifer during most of the year. In 1987, substantial increases in storage occurred during the late spring and early summer, after which water levels remained above average in most of the area.

Analyses of water samples from 83 wells and 3 springs in the Edwards aquifer show that the water quality in the freshwater zone is significantly better 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 10 wells in Uvalde County showed concentrations of tetrachloroethylene in excess of 5 micrograms per liter. In 1987, samples were collected and analyzed from wells along the "bad-water" line and did not detect changes in water quality as the potentiometric head in the Edwards aquifer changed.

INTRODUCTION

This annual compilation of 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 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 equal to 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 by the U.S. Geological Survey as determined from records of power consumption and also from irrigated acreage data supplied by the U.S. Soil Conservation Service; and (3) U.S. 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 1987, periodic water-level measurements were made in 16 wells, and continuous water-stage recorders were in operation on 15 other wells.

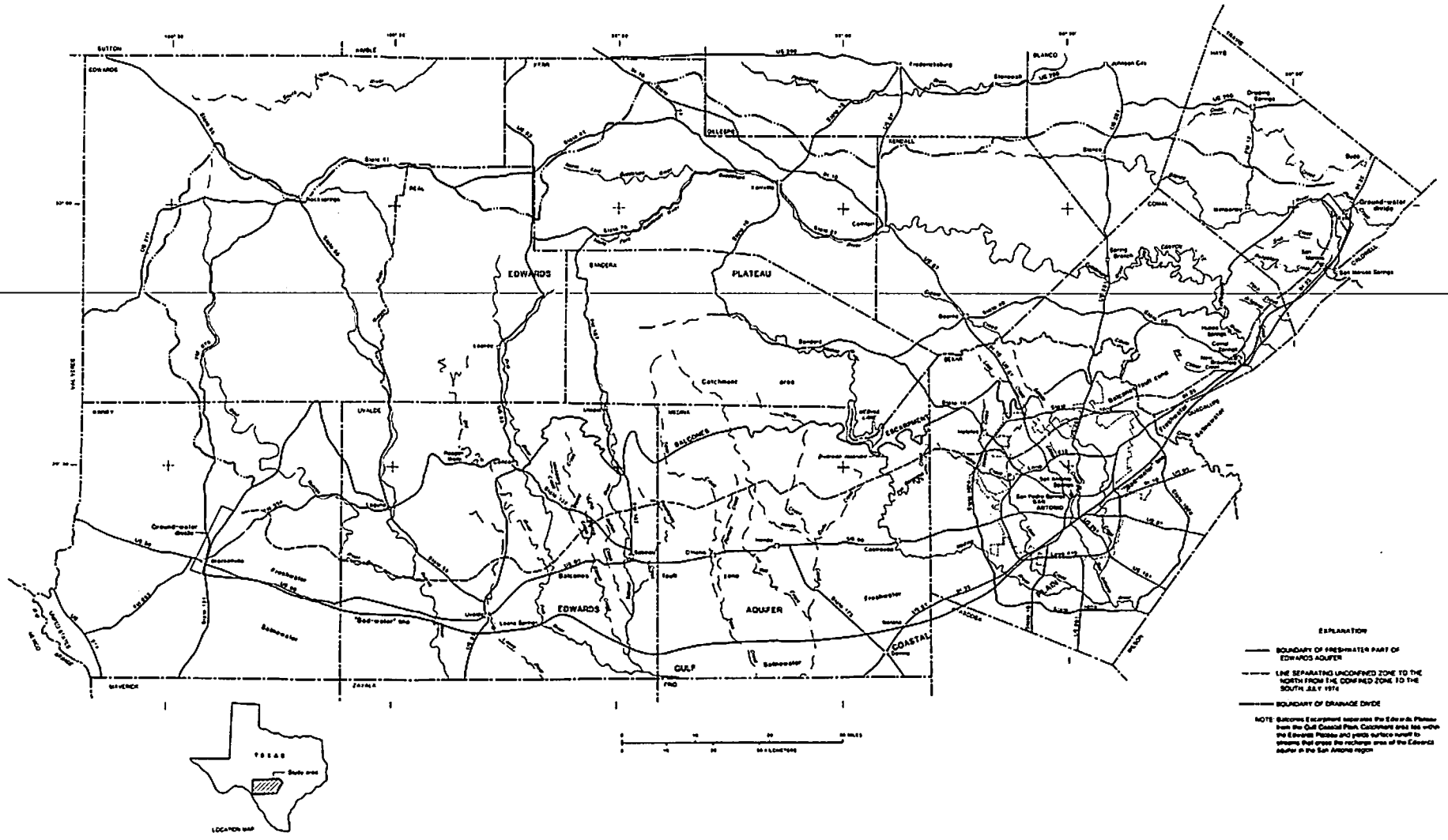

Figure 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio region.

See Plate1 in back cover.

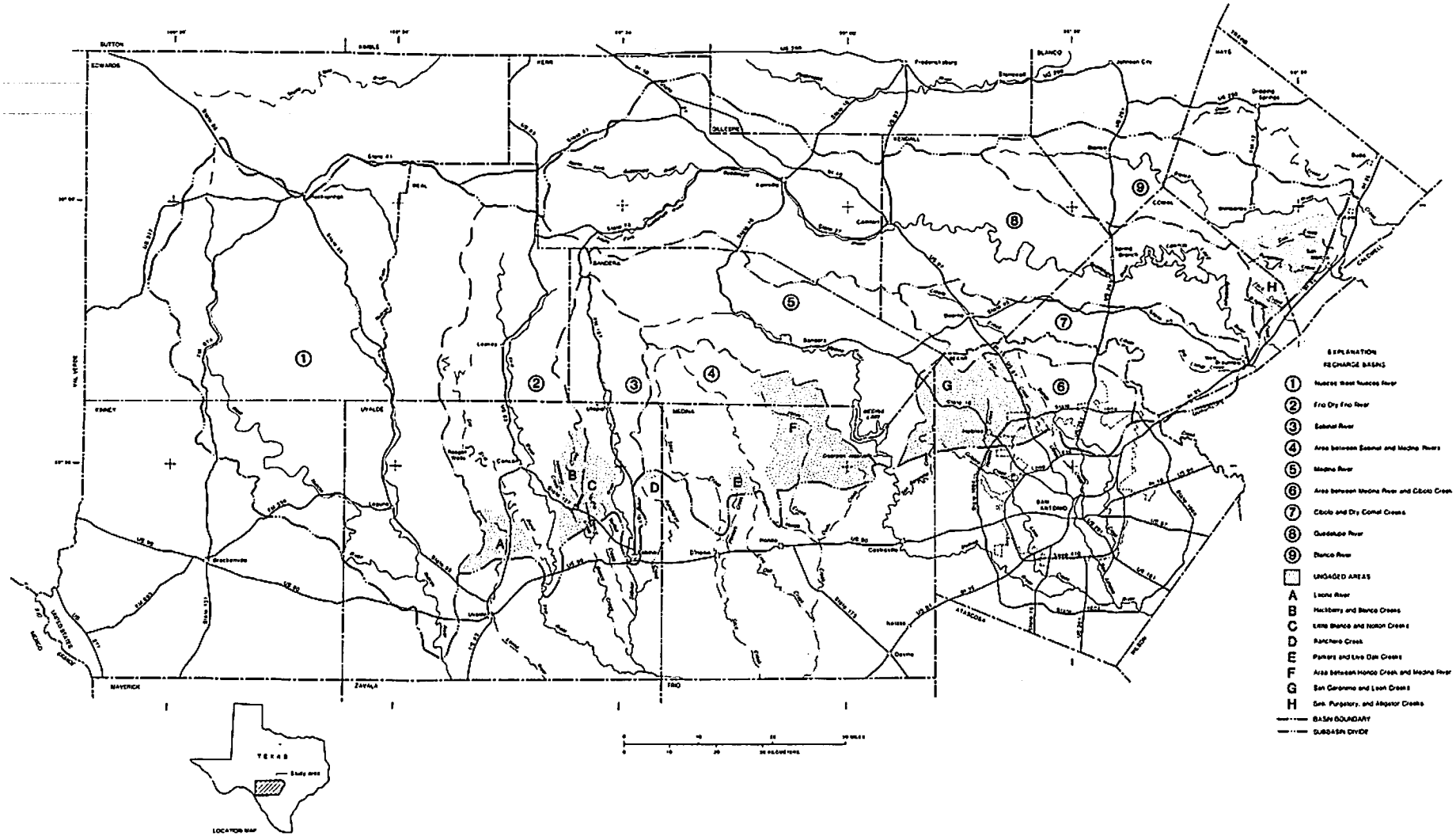

Figure 2.--Location of drainage basins and ungaged areas.

See Plate 2 in back cover.

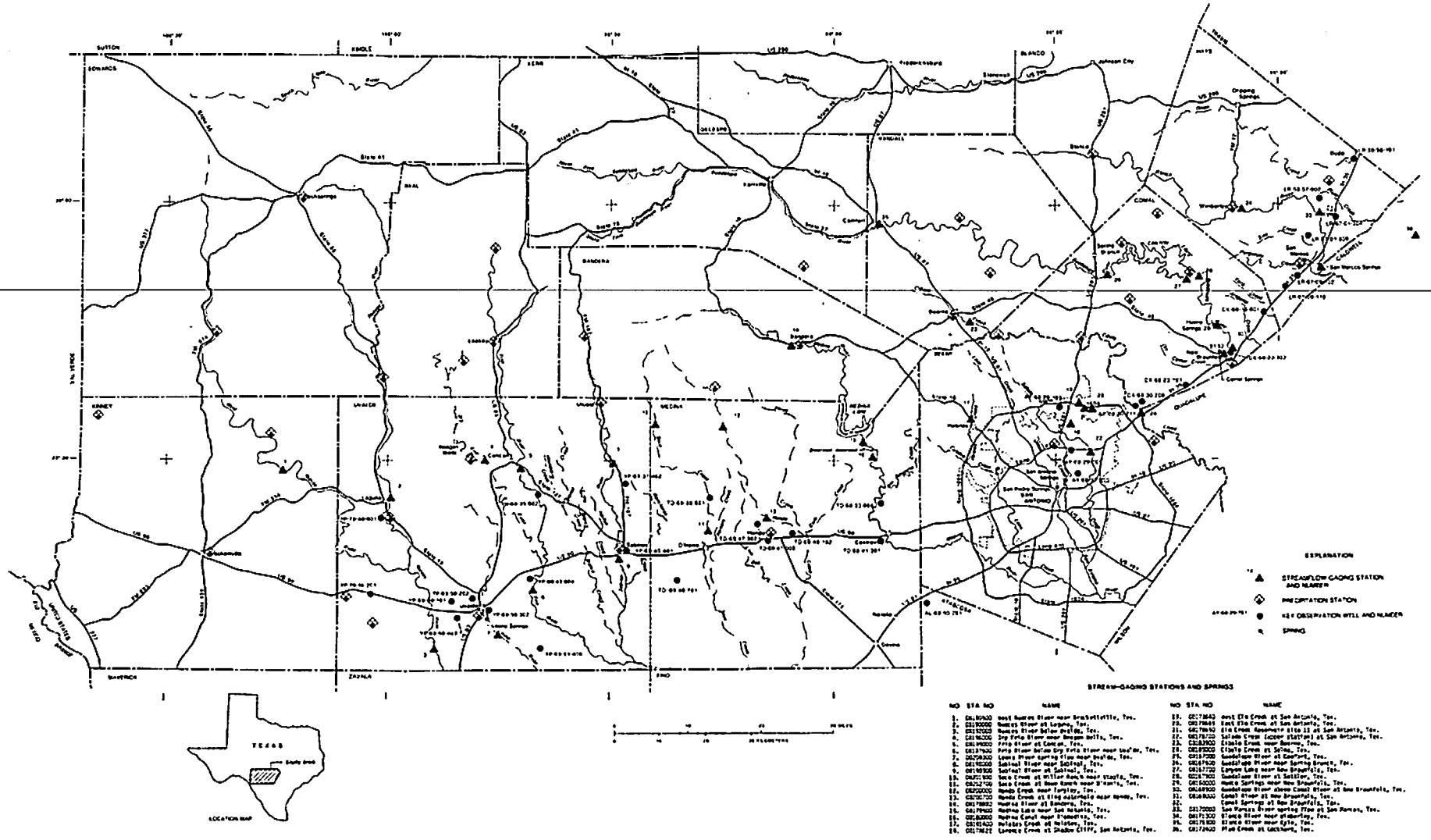

Figure 3--Location of data-collection sites for streamflow, precipitation, and observation wells, 1987.

See Plate 3 in back cover.

Surface-water data for Texas for the 1987 water year are presented in three volumes, which are 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. Data for a few pertinent stations in bordering states also are included. These data are in computer storage in the National Water Information System operated by the U.S. Geological Survey in cooperation with State and Federal agencies in Texas.

PRECIPITATION

The annual precipitation for 1934-87 and the long-term average, based on period of record, at selected stations in the San Antonio area are given in table 1. Annual precipitation for 1987 was above average at all of the selected stations and ranged from 12 percent above the long-term average in the San Marcos area to 85 percent above the long-term average in the Brackettville area. This above average precipitation across the aquifer produced a new record maximum estimated annual recharge for 1987.

In the 5 years prior to 1987, precipitation fluctuations ranged from 35 percent below the long-term average, for both 1982 and 1984, to 46 percent above the long-term average for 1986, based on reported data. The annual precipitation for most stations for 1982-84 was near to below average, resulting in below average recharge. However, in 1985-86, the annual precipitation was significantly above average at most stations, resulting in above average recharge for those years. Fluctuations of reported annual precipitation totals for San Antonio since 1934 are given in figure 4.

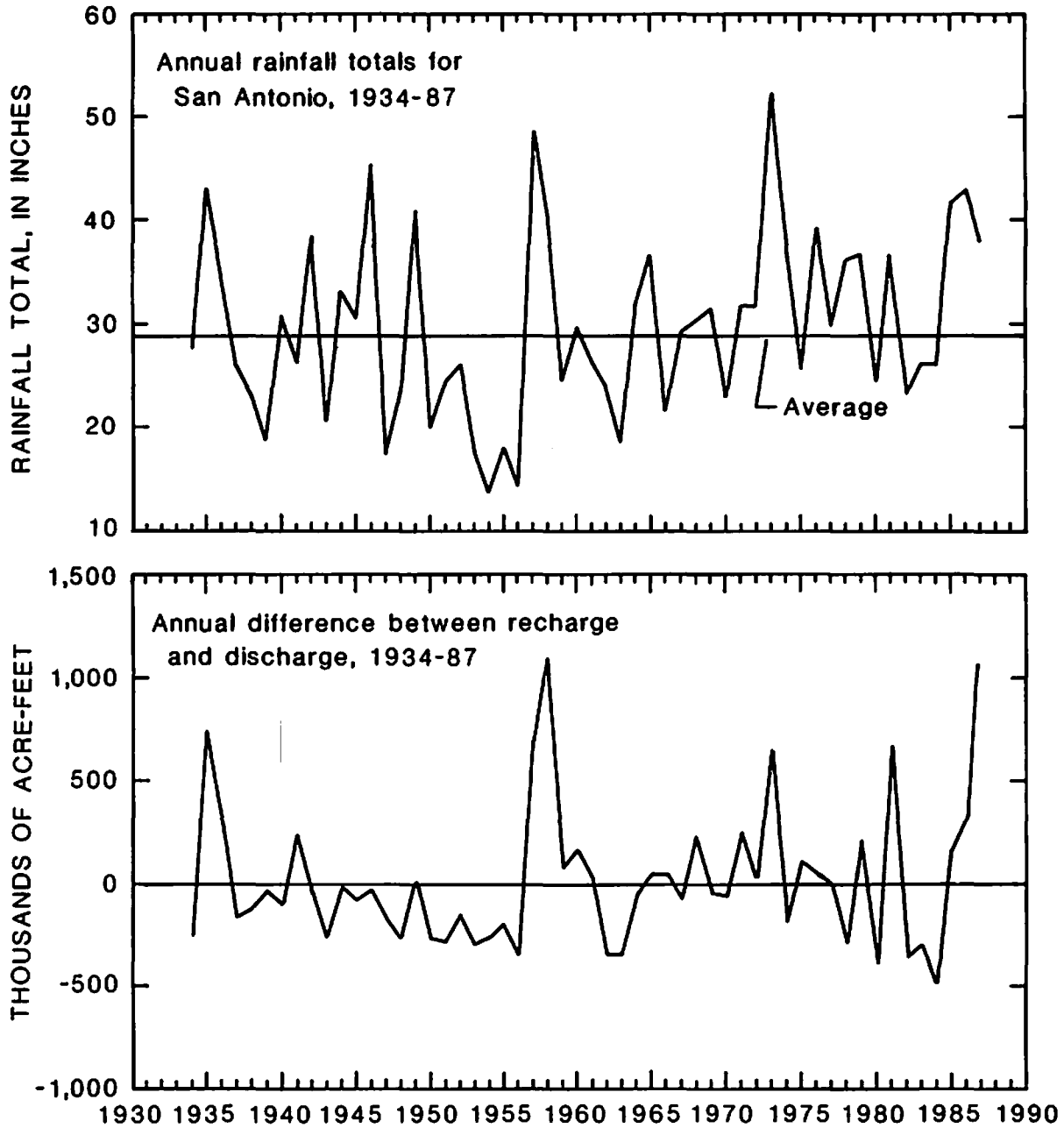

Figure 4.--Annual precipitation totals for San Antonio, 1934-87, and annual difference between recharge and discharge, 1934-87.

Table 1.--Annual precipitation for 1934-87 and long-term average at selected stations. a/
[inches]

Calendar year	Brackettville	Uvalde	Sabinal	Hondo	San Antonio	Boerne	New Braunfels	San Marcos
1934	---	16.70	18.07	23.97	27.65	26.78	30.80	35.67
1935	---	41.17	48.21	58.73	42.93	52.93	41.67	41.09
1936	22.34	24.53	26.53	35.27	34.11	47.59	30.41	33.48
1937	16.85	17.88	b/ 9.57	22.93	26.07	32.81	29.19	b/ 26.03
1938	19.97	13.12	15.39	27.56	23.26	24.14	28.32	28.17
1939	18.38	25.30	c/ 13.98	23.14	18.83	26.20	13.35	18.59
1940	22.43	27.66	27.51	28.13	30.79	32.29	38.11	43.57
1941	21.52	31.79	b/ 33.74	44.07	26.34	41.60	42.99	48.41
1942	21.01	19.01	b/ 11.37	34.83	38.46	31.12	42.08	44.65
1943	c/ 23.39	20.63	17.21	31.43	20.51	26.33	29.93	25.45
1944	24.76	32.76	b/ 27.62	32.46	33.19	42.98	43.14	47.42
1945	15.69	22.37	26.60	29.57	30.46	33.50	39.38	c/ 31.74
1946	19.10	26.41	b/ 14.16	29.65	45.17	45.62	61.60	52.24
1947	c/ 22.92	22.67	---	18.98	17.32	21.89	27.52	27.53
1948	b/ 20.02	18.31	---	28.82	23.64	23.77	c/ 19.88	b/ 21.27
1949	31.32	34.41	---	39.90	40.81	41.15	43.21	36.22
1950	17.70	18.27	b/ 15.28	24.91	19.86	24.94	21.13	21.10
1951	14.71	16.07	15.63	b/ 24.05	24.44	18.76	24.84	30.88
1952	12.26	18.24	23.16	24.56	26.24	37.54	33.87	39.91
1953	10.12	18.34	21.44	20.61	17.56	21.42	30.06	33.39
1954	19.38	15.60	14.72	11.92	13.70	10.29	10.12	13.42
1955	26.55	18.36	20.87	21.21	18.18	19.27	23.12	26.44
1956	7.58	9.29	11.29	15.54	14.31	12.05	18.41	18.37
1957	34.21	39.30	40.03	35.09	48.83	52.55	51.88	46.51
1958	45.37	39.03	41.18	41.60	39.69	40.94	36.40	39.08
1959	27.51	31.51	27.02	30.68	24.50	35.64	40.45	43.47
1960	19.12	23.98	26.24	32.37	29.76	32.55	34.28	45.48
1961	17.91	26.26	27.24	27.36	26.47	25.45	b/ 15.70	30.02
1962	10.87	14.12	13.58	17.85	23.90	25.26	27.40	28.47
1963	15.07	16.70	18.99	18.90	18.65	20.66	23.41	19.90
1964	20.75	22.30	23.78	28.29	31.88	27.36	30.65	30.27
1965	21.48	26.21	29.41	30.80	36.65	42.41	45.16	45.00
1966	21.63	20.87	21.54	29.46	21.44	29.05	25.98	27.12
1967	21.95	20.10	23.89	30.33	29.26	26.75	31.74	26.41
1968	17.26	25.20	c/ 29.88	31.91	30.40	35.14	35.97	37.13
1969	28.53	33.38	33.05	32.30	31.42	38.07	33.01	36.59
1970	16.50	13.59	22.13	30.96	22.74	27.79	35.23	32.30
1971	29.46	31.01	31.00	32.96	31.80	45.24	29.43	31.10
1972	21.21	15.49	21.10	25.43	31.49	35.09	42.02	31.90
1973	30.61	30.85	c/ 35.14	47.82	52.28	50.93	51.66	47.91
1974	18.25	30.94	c/ 20.93	c/ 36.41	37.00	41.80	42.85	b/ 37.28
1975	26.62	24.92	23.65	b/ 25.84	25.67	33.49	35.82	48.64
1976	34.40	46.04	40.82	45.21	39.13	45.24	49.06	47.46
1977	15.06	19.90	17.06	19.40	29.64	32.43	24.83	27.69
1978	19.04	18.48	21.28	24.64	35.99	35.17	c/ 36.35	33.08
1979	16.34	32.35	31.44	28.83	36.64	39.97	36.72	38.74
1980	18.33	23.05	22.67	21.27	24.23	29.02	33.69	29.56
1981	28.73	26.24	30.19	27.40	36.37	41.05	43.23	49.62
1982	19.10	23.35	18.44	21.99	22.96	27.64	21.04	c/ 22.47
1983	19.35	b/ 24.45	23.33	c/ 20.92	26.11	34.60	34.13	36.95
1984	16.24	c/ 15.33	20.67	b/ 21.19	25.95	26.97	20.90	b/ 8.26
1985	18.93	b/ 5.76	23.67	21.94	41.43	37.77	37.26	33.54
1986	27.44	c/ 29.86	c/ 29.62	c/ 36.01	42.73	43.52	47.14	42.20
1987	39.45	36.39	38.36	40.09	37.96	39.86	b/ 37.33	37.94
Years of record	90	87	70	86	104	85	94	88
Long-term average d/	21.31	24.31	25.34	28.42	31.29	32.96	32.19	33.83

a/ Precipitation data from the U.S. Department of Commerce (1934-87).
b/ Partial record not included in long-term average; missing one month.
c/ Partial record not included in long-term average; missing more than one month.
d/ Long-term average may differ with previous bulletin due to a change in the period of record.

GROUND-WATER RECHARGE

The infiltration area used for calculating recharge to the Edwards aquifer in the San Antonio area is modified slightly from the area described by Puente (1978) to encompass existing data-collection sites used in the model. 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 from direct infiltration of precipitation on the outcrop. The western part of the recharge zone is comprised of the Nueces, Frio-Sabinal, and the Seco-Hondo-Medina basins. Collectively, these three basins have a catchment area of about 2,950 mi^2, which is about 60 percent of the total catchment area for the Edwards aquifer, supplying about 70 percent of the total recharge to the aquifer (Burchett and others, 1986). 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). Other aquifers that may contribute recharge to the Edwards aquifer are, from oldest to youngest, Glen Rose Limestone, Buda Limestone, 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 estimated annual recharge by basins and the average annual recharge for 1934-87 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 (Puente, 1978).

The annual recharge for 1934-87 ranged from 43,700 acre-ft in 1956 to 2,003,600 acre-ft in 1987. The average annual recharge for 1934-87 was

Table 2.--Calculated annual recharge to the Edwards aquifer by basin, 1934-87
[thousands of acre-feet]

Calendar year	Nueces-West Nueces River basin	Frio-Dry Frio River basin 1/	Sabinal River basin1	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
1987	308.5	473.3	110.7	405.5	90.4	229.3	270.9	114.9	2,003.6
AVERAGE	106.3	118.6	39.3	100.3	60.9	69.9	107.1	38.2	640.6

1/ Includes recharge from gaged and ungaged areas within the basin.

$\bar{x}$ = 813.7 past 20 years

640,600 acre-ft. The annual recharge for 1987 established a new record maximum for estimated annual recharge since 1934. The previous maximum estimated annual recharge was 1,711,200 acre-ft for 1958.

GROUND-WATER DISCHARGE

The calculated total discharge from wells and springs in 1987 was 940,400 acre-ft, which is an increase of 13 percent over 1986. In 1987, most of the calculated discharge was from spring flow and constituted 61 percent of the total discharge. Well discharge comprised 39 percent of the total discharge for the year. The calculated annual discharge, by county, from the Edwards aquifer during 1934-87 is given in table 3. The calculated discharge by county and by water use in 1987 is given in table 4.

The total calculated spring flow was 576,300 acre-ft for 1987, an increase of about 42 percent from 1986. The combined major spring flow in Comal and Hays Counties was 447,200 acre-ft, which is about 78 percent of the total spring flow for the year. The major springs from which discharge was calculated include 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 total calculated discharge from wells was 364,100 acre-ft, a decrease of 65,200 acre-ft, or about 15 percent, from 1986. Bexar County well discharge was 275,600 acre-ft, which is a decrease of 11,400 acre-ft, or about a 4-percent decrease, from 1986. In 1987, approximately 76 percent of the total well discharge was from wells in Bexar County. Most of this well discharge was for municipal, military, and domestic use. Other wells in Bexar County along with most of the large wells in Uvalde and Medina Counties supplied water from the Edwards aquifer for the irrigation of approximately 38,900

Table 3.--Calculated annual discharge from the Edwards aquifer by county, 1934-87
[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	15.4	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	271.6	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
1987	113.3	15.9	326.6	286.2	198.4	940.4	576.3	364.1

Table 4.--Calculated discharge from the Edwards aquifer by county and by water use, 1987

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	--	--	1.5	--	0.2	1.7	1.9
Uvalde	69.7	3.9	23.0	0.3	2.5	99.4	111.4
Medina	--	4.4	9.1	--	0.6	14.2	15.9
Bexar	45.6	203.1	2.6	7.1	33.2	291.6	326.6
Comal	234.4	11.9	0.2	8.4	0.6	255.5	286.2
Hays	164.8	9.6	0.1	0.9	1.7	177.1	198.4
Total (million gallons per day)	514.5	232.9	36.5	16.7	38.8	839.5	
Total (thousand acre-feet per year)	576.3	260.9	40.9	18.7	43.5		940.4

acres. The remaining discharge, primarily from wells in Comal and Bexar Counties, was for industrial use.

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 early 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. On the average, when recharge is greater than discharge, water levels rise, and spring flow increases; when discharge is greater than recharge, water levels decline, and spring flow decreases. During the previous 5 years, discharge was greater than recharge during 1983-84 and was indicated by decreasing water levels. However, recharge was greater than discharge during 1985-87 and was indicated by increasing water levels for those years. The annual difference between recharge and discharge for 1934-87 is shown in figure 4. The accumulated difference between recharge and dis- charge and the annual average water-level for the Bexar County observation well are shown in figure 5.

New record high water levels were established for five selected observation wells in the artesian part of the aquifer in 1987. The annual and record high and low water levels recorded in these five selected observation wells during 1984-87 are given in table 5. The data from these wells show that the water levels during 1987 fluctuated above the midpoint when compared with historical records of high and low measurements.

In 1987, 16 wells were measured periodically, and continous recorders were in operation on 15 other wells (fig. 3). The general trend was upward, reflecting above normal recharge for the months of May, June, and July. The

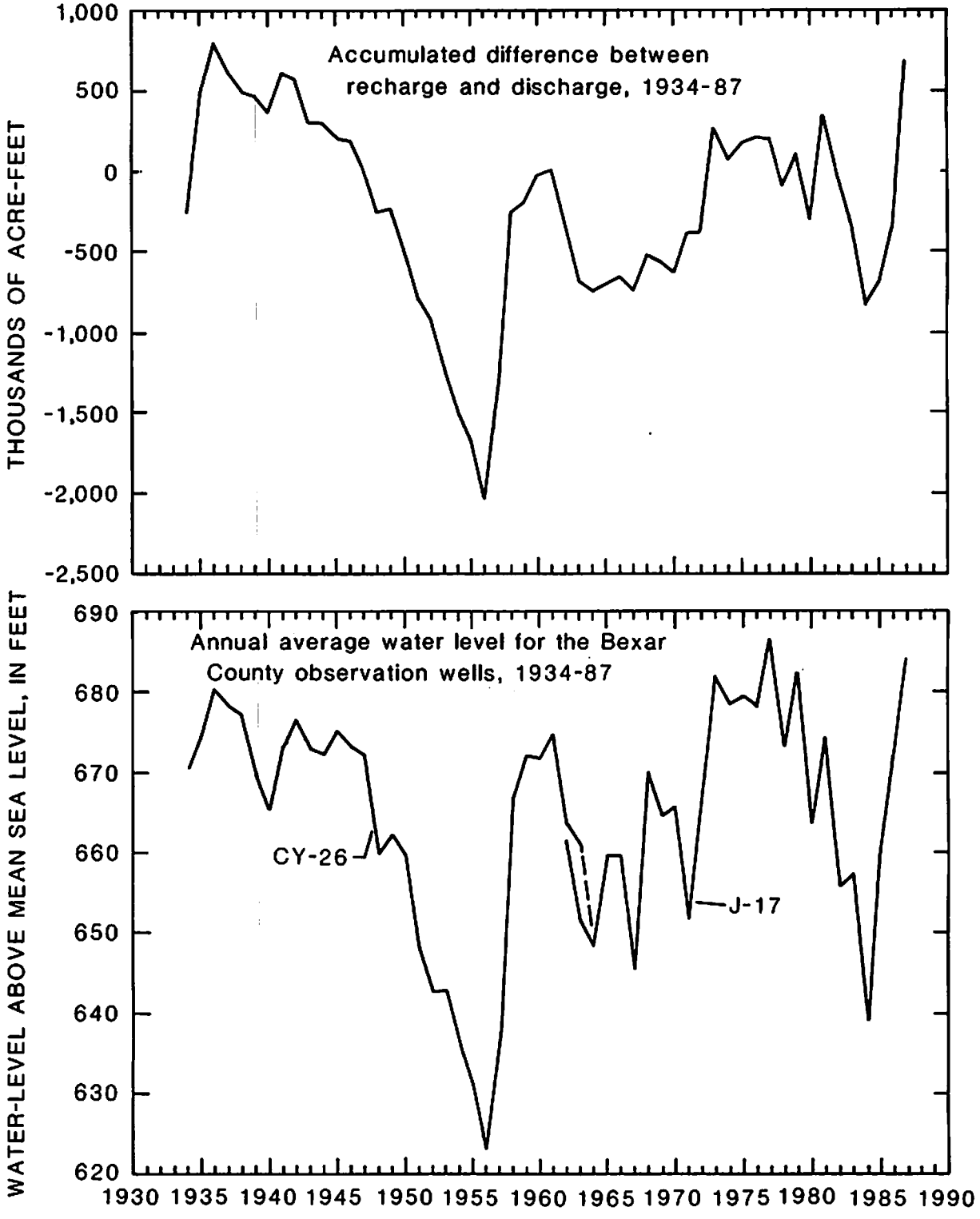

Figure 5.--Accumulated difference between recharge and discharge and annual average water level for the Bexar County observation well, 1934-87.

Table 5.--High and low water levels in selected observation wells in the Edwards aquifer for 1984-87 and period of record
[feet above NGVD of 1929]

Well	1984		1985		1986		1987		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.)	873.31	856.89	876.90	862.29	877.87	872.25	889.08	877.91	889.08 June 1987	811.0 Apr. 1957	1929-32, 1934-87
TD-68-41-301 1/ J-1-82 (Medina Co.)	684.48	641.99	698.94	670.64	704.60	674.15	743.44	711.08	743.44 June 1987	622.3 Aug. 1956	1950-87
AY-68-37-203 1/ 2/ J-17 (Bexar Co.)	656.97	623.17	674.50	644.05	685.59	649.81	699.23	676.88	699.23 June 1987	3/ 612.5 Aug. 1956	1932-87 4/
DX-68-23-302 1/ G-49 (Comal Co.)	624.36	619.61	626.76	623.25	627.70	624.07	630.40	627.20	630.40 June 1987	613.3 Aug. 1956	1948-87
LR-67-01-304 1/ H-23 (Hays Co.)	582.53	544.27	591.44	561.75	595.05	576.24	595.86	583.52	595.86 Sept. 1987	540.4 July 1978	1937-87

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.

data also show that substantial increases in storage occurred during the late spring and early summer of 1987, caused by above average precipitation. The volume of water in storage in the Edwards aquifer was above average during most of 1987. The water levels in observation wells for 1987 are given in Appendix A. Water Levels.

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 U.S. 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 the National Geodetic Vertical Datum (NGVD) of 1929 is given in the well description.

WATER QUALITY FOR WELLS AND SPRINGS

Water-quality samples were collected at 83 selected wells and 3 springs during 1987. The locations of these sites are shown in figure 6. The water-quality data-collection sites previously sampled for the area, along with the sites for which data are given in Reeves (1976, 1978), are shown in figures 7 and 8. An enlargement of part of northern Bexar County and San Antonio is shown in figure 8. Although some of the wells previously sampled are no longer in use, additional samples can be collected at most of the sites in order to detect changes in water quality.

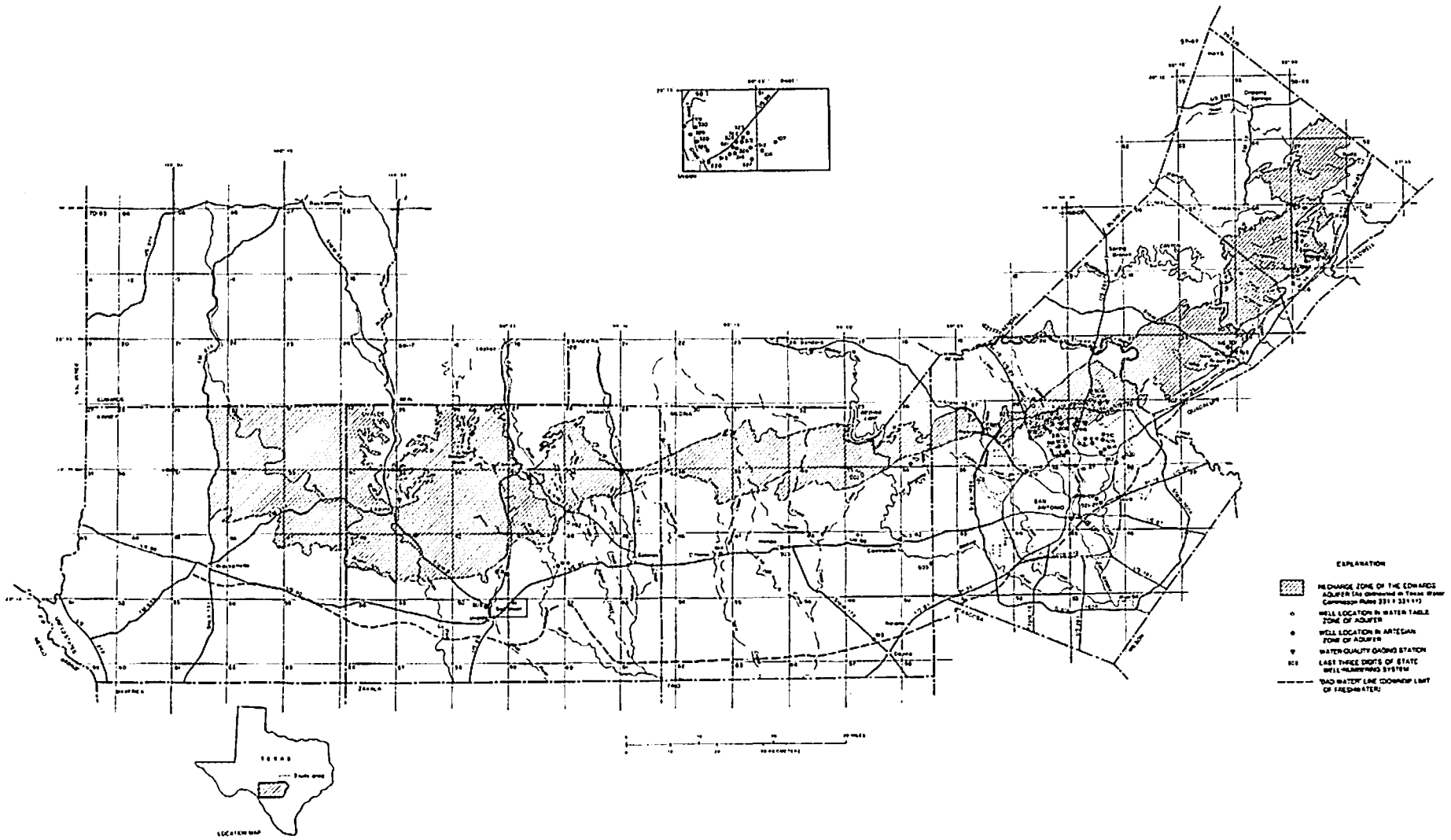

Figure 6.--Location of water-quality data-collection sites for wells, springs, and streams sampled in 1987.

See Plate 4 in back cover.

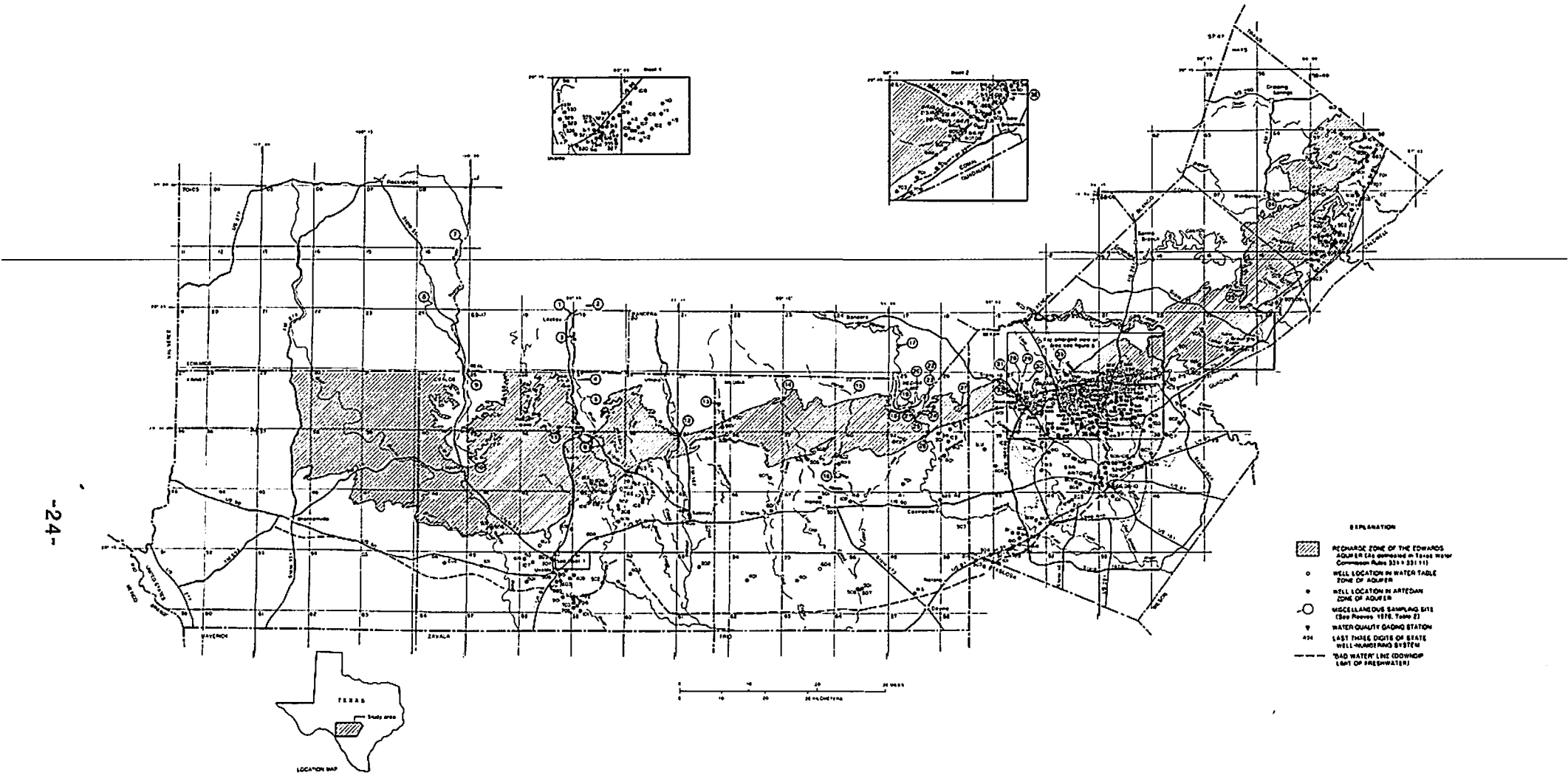

Figure 7.--Location of water-quality data-collection sites for wells, springs, and streams sampled within the period 1972-87.

See Plate 5 in back cover.

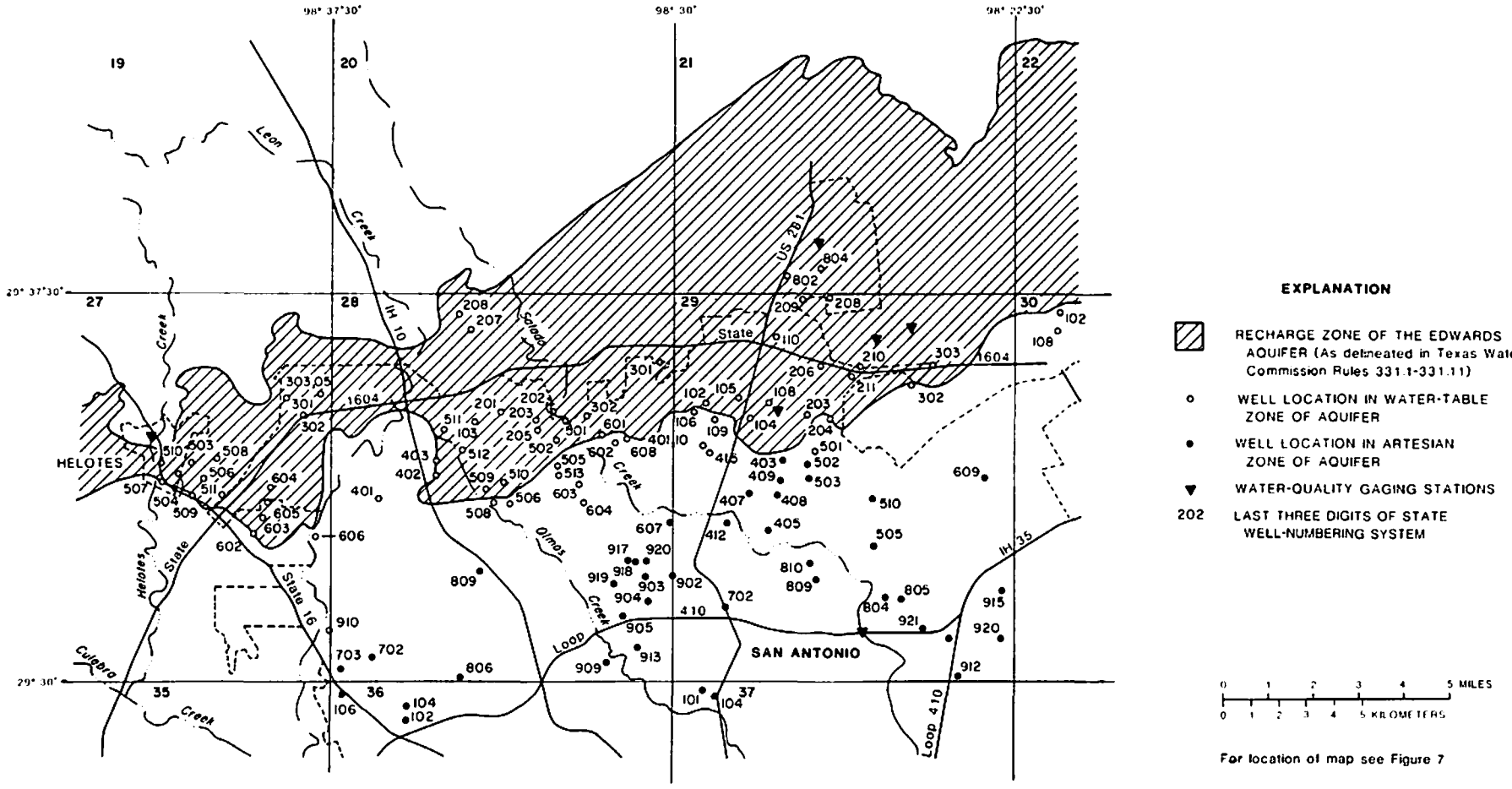

Figure 8.--Location of water-quality data-collection sites, for wells, springs, and streams in the vinicity of San Antonio sampled within the period 1972-87.

See Plate 6 in back cover.

The results of the analyses of water samples that were collected from the Edwards aquifer during 1987 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; pesticides; and volatile organic compounds. 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. A summary of maximum contaminant levels for selected water-quality constituents and properties for public water systems is given in Appendix B.

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 zone exists between the freshwater and the downdip, saline water. A 1,000 mg/L (milligrams per liter) dissolved-solids-concentration contour defines an arbitrary boundary between the freshwater zone and the

saline-water zone. Locally, this contour is referred to as the "bad-water" line which defines the farthest downdip extent of potable water (Pavlicek and others, 1987).

The "bad-water" line is shown in figures 1, 6 and 7. South and southeast of this line, the water from wells is slightly to moderately saline and has higher concentrations of sulfate and chloride. Water from some wells north of the line and all wells south of the line contains 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 water that is slightly saline in the lower part (Reeves, 1971, p. 5). For many purposes, the dissolved-solids concentration is a major limitation on the use of water.

Because of the concern that increased withdrawals from the aquifer may result in the encroachment of saline water into the freshwater zone of the aquifer, a program was begun in 1985 to drill wells that transect 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, monthly samples and continuously monitored water levels are collected and analyzed at the transect wells. Other samples are to be collected and analyzed as certain water-level and spring-flow criteria are met. Comparison of the analyses of samples collected from wells in 1987 with previous analyses indicates no environmentally significant change in the quality of water in the freshwater or transition zones.

Samples from 62 wells in the Edwards aquifer were analyzed for purgeable volatile organics in 1987 (Appendix B). 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 may 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 sorbent. 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 National Bureau of Standards computer library reference spectra of about 35,000 compounds. Although most common organic compounds can be identified by this method, many 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 U.S. Environmental Protection Agency's proposed maximum contaminant levels (MCL's) for eight volatile organic compounds (VOC's) are given at the end of Appendix B. Water Quality. The MCL's were promulgated in the Federal Register on July 8, 1987 (vol. 52, no. 130, p. 25690-25702) as revisions to the National Interim Primary Drinking Water Regulations. The public comment period to determine the MCL for a ninth VOC (tetrachloroethylene) closed in January 1986, but no final decision has been received. The MCL's are enforceable standards and are set as close to the maximum contaminant levels goals (MCLG's) as is feasible. The MCL's are based upon availability and performance of treatment technologies; the availability, performance and cost of analytical methods; and costs for achieving various levels of removal.

MCLG'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. MCLG's for substances considered to be probable

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

Compound 1/	Maximum contaminant level goal (MCLG) (micrograms per liter)	Maximum contaminant level goal (MCL) (micrograms per liter)
Benzene	0	5
Vinylchloride	0	2
Carbon tetrachloride	0	5
1,2-Dichloroethane	0	5
Trichloroethylene	0	5
1,1-Dichloroethylene	7	7
1,1,1-Trichloroethane	200	200
p-Dichlorobenzene	75	75

1/ The MCLG for tetrachloroethylene was proposed at zero. Although the public comment period closed in January of 1986, no final proposal has been received.

Sampling for volatile organic compounds in 1987 was concentrated and conducted in areas where possible or suspected degradation of water quality may occur. These areas included the water table part of the aquifer and localized study areas. Sampling in other areas of the aquifer was conducted on a rotational monitoring basis.

In 1987, 62 wells were sampled and analyzed for volatile organic compounds. The results of the analyses showed that 33 of the wells contained no dectectable amounts of volatile organic compounds. However, samples from

29 wells contained one or more measurable volatile organic compounds. The results ranged from the detection limit of 0.20 µg/l (micrograms per liter) at seven wells to 110 µg/l at one well. Samples from 16 wells contained one or more volatile organic compounds with concentrations equal to or greater than 1 µg/l.

Trihalomethanes, which include bromoform, chloroform, chlorodibromomethane, and dichlorobromomethane, were detected in samples from eight wells. These wells were AY-68-28-508, AY-68-29-405, TD-68-42-503, TD-69-47,303, YP-69-50-324, YP-69-50-327, YP-69-51-104, and YP-69-51-107. The results ranged from the detection limit of 0.20 µg/l in five wells to 2.0 µg/l in one well. The principal source of trihalomethanes in drinking water is chemical interaction of the chlorine (added for disinfection) with natural humic substances in raw water.

One or more of the following three compounds, tetrachloroethylene, trichloroethylene, and 1,2-transdichloroethylene were detected in 23 of the wells sampled. Concentrations of these compounds ranged from the detection limit of 0.20 µg/l in five wells to 110 µg/l in one well. Tetrachloroethylene was detected in excess of 5 µg/l in samples from 10 wells. The source of trichloroethylene and 1,2-transdichloroethylene is unknown at the present time. Samples containing the highest concentration of volatile organic compounds were from wells in Uvalde County.

In Uvalde County, samples from 10 wells contained tetrachloroethylene in excess of 5 µg/L. Samples from seven wells, YP-69-50-203, YP-69-50-312, YP-69-50-315, YP-69-50-322, YP-69-50-324, YP-69-50-325, and YP-69-50-327 contained tetrachloroethylene in excess of 25 µg/l, with one well, YP-69-50-324, at 110 µg/l.

In 1987, seven wells that transect the "bad-water" line were sampled and analyzed for radio-chemical elements or compounds including tritium, cesium-137, strontium-90, and natural uranium. Most ground water contains these radio-chemical elements or compounds in varying concentrations primarily from contact with various types of rock material and from man's activities, such as with tritium.

Tritium exists 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.

Tritium in ground water is not significantly affected by chemical processes. Tritium concentrations in ground water can be used to distinguish 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 ground water contains no tritium detectable by commonly used procedures; post-1953 water contains high levels of tritium (Drever, 1982). Pre-1953 rainwater in the San Antonio area has been estimated by Thatcher (1962) at 6 to 8 TU (tritium units). Samples taken from the wells that transect the fresh/saline-water transition zone contained tritium concentrations that ranged from 2.7 to 0.1 TU. The results are given in Appendix B. Water Quality.

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, Rettman, and Small (1980). Results of the 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.

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 U.S. Geological Survey Water-Supply Papers or in U.S. 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 U.S. Geological Survey.

Records of streamflow, contents of reservoirs, and 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 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, 1987
(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 1957-87.

Date	Water level
Mar. 9, 1987	23.53
Sept. 29	23.93

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 224.38 ft below lsd, July 29, 1987; lowest 284.35 ft below lsd, Nov. 21, 1957. Records available 1957-87.

Highest 1987 water level 224.38 ft below lsd on July 29; lowest 1987 water level 246.63 ft on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	245.92	243.29	240.10	238.62	239.53	233.08	226.41	224.47	225.77	227.07	228.80	229.80
10	245.48	243.18	239.62	238.40	239.42	231.24	225.75	224.54	225.77	227.68	229.17	230.10
15	244.54	242.50	238.95	238.76	239.63	228.39	225.33	224.83	225.93	227.88	228.84	230.61
20	244.32	243.00	238.78	239.15	239.58	227.87	225.04	225.26	226.20	228.15	229.61	230.49
25	243.73	242.36	238.62	239.31	239.64	227.26	224.78	225.44	226.45	228.17	229.45	230.57
Eom	243.19	240.55	238.63	239.32	237.60	226.70	224.45	225.70	226.80	228.54	229.63	231.81

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 71.15 ft below lsd, June 16, 1987; lowest 165.10 ft below lsd, Aug. 17, 1956. Records available 1952-87.

Highest 1987 water level 71.15 ft below lsd on June 16; lowest 1987 water level 98.99 ft below lsd on May 12.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	.....	88.64	91.99	98.15	80.35	.....	90.03	93.88	92.91	94.58	91.74
10	89.65	.....	89.44	92.86	97.11	76.80	.....	92.01	92.00	94.17	93.54	92.40
15	90.25	.....	89.29	95.02	97.76	71.68	.....	94.59	90.83	94.11	92.02	92.58
20	90.55	.....	89.64	97.89	96.40	72.40	.....	96.89	91.27	94.43	91.64	9[illegible]22
25	.....	.....	90.45	97.63	96.00	75.50	.....	98.04	92.28	92.85	91.58	90.94
Eom	91.86	88.73	91.41	98.44	90.05	79.15	a88.04	94.02	92.10	93.41	91.61	90.93

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. No records available for 1987.

292845098255401. AY-68-37-203 (J-17) b/. 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 31.58 ft below lsd, June 17, 1987; lowest 110.05 ft c/ below lsd, Aug. 17, 1956. Records available 1932-87 d/.

Highest 1987 water level 31.58 ft below lsd on June 17; lowest 1987 water level 53.93 ft below lsd on May 3.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	45.13	47.46	44.60	47.32	52.86	39.25	41.03	46.04	49.10	47.85	49.21	46.53
10	45.55	47.62	45.16	48.25	51.79	36.05	42.19	48.02	47.72	49.04	48.53	47.09
15	45.90	47.57	44.89	49.81	52.34	31.71	42.87	50.26	47.65	49.68	47.46	47.40
20	46.16	48.02	45.34	52.09	51.25	31.99	42.24	52.38	47.25	49.62	47.07	46.65
25	46.30	47.45	45.77	52.29	50.44	34.87	42.29	53.06	47.86	47.96	47.13	46.07
Eom	46.85	45.32	46.52	52.84	46.94	37.58	43.52	49.45	47.46	48.35	46.25	46.12

FOOTNOTE CY26

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 1936-87.

Date	Water level
Mar. 2, 1987	134.39
Oct. 1	134.59

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 12.30 ft below lsd, June 25, 1987; lowest 29.36 ft below lsd, Aug. 21, 1956. Records available 1948-87.

Highest 1987 water level 12.30 ft below lsd on June 25; lowest 1987 water level 15.50 ft below lsd on May 5.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	14.94	15.03	14.81	14.92	15.50	13.97	13.18	13.91	14.65	14.62	14.89	14.76
10	14.96	15.15	14.78	14.95	15.44	13.16	13.33	14.10	14.60	14.73	14.85	14.81
15	14.94	15.15	14.72	15.05	15.48	12.92	13.50	14.32	14.58	14.76	14.79	.....
20	14.94	15.21	14.75	15.24	15.42	12.84	13.56	14.52	14.54	14.83	14.81	14.80
25	14.94	14.83	14.78	15.39	15.35	12.30	13.60	14.70	14.59	14.75	14.77	14.77
Eom	14.99	14.88	14.86	15.43	15.00	12.94	13.76	14.63	14.60	14.81	14.73	14.82

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, 1937-87.

Date	Water level
Mar. 2, 1987	25.25
Oct. 10	26.88

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 109.05 ft below lsd, June 14 and 15, 1987; lowest 184.45 ft below lsd, Aug. 18, 1956. Records available 1945, 1955-87.

Highest 1987 water level 109.05 ft below lsd on June 14 and 15; lowest 1987 water level 129.60 ft below lsd on May 4.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	124.98	125.67	123.21	125.01	129.37	113.82	.....	120.72	125.35	125.05	126.54	.....
10	124.99	125.76	123.45	125.44	128.86	113.15	.....	122.40	124.79	125.82	126.33	.....
15	124.95	125.78	123.43	126.53	129.23	109.05	.....	124.10	124.62	126.30	125.67	.....
20	124.99	126.07	123.57	128.13	128.39	110.02	.....	125.86	124.51	126.60	125.53	.....
25	125.01	125.39	123.90	128.59	127.96	111.25	.....	126.80	124.78	125.75	125.47	.....
Eom	125.30	122.95	124.38	128.99	123.57	.....	119.13	125.61	124.74	126.03	.....	125.09

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, 1971-87.

Date	Water level
Oct. 1, 1987	191.97
Oct. 1	191.97

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 1937-87.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1987	90.59	Apr. 28, 1987	87.05	July 30, 1987	95.68	Oct. 29, 1987	99.18
Mar. 2	76.64	June 1	95.42	Sept. 1	89.58	Nov. 30	103.02
Mar. 30	76.07	July 7	77.08	Sept. 30	90.24		

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 122.14 ft below lsd, Sept. 30, 1987; lowest 177.60 ft below lsd, July 10, 1978. Records available 1937-87.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1987	128.16	Apr. 28, 1987	124.86	July 30, 1987	127.33	Oct. 29, 1987	131.01
Mar. 2	133.53	June 1	134.14	Sept. 1	134.48	Nov. 30	124.80
Mar. 30	125.57	July 7	128.43	Sept. 30	122.14		

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 17.60 ft below lsd, June 15, 1987; lowest 27.40 ft below lsd, Sept. 11-18, 16, 26, 28-29, Oct. 3, 6, 1984. Records available 1937, 1950, 1954-55, 1980-87.

Highest 1987 water level 17.60 ft below lsd on June 15; lowest 1987 water level 24.85 ft below lsd on Nov 24.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	21.51	22.25	22.16	22.71	23.70	19.71	18.08	19.69	21.70	23.15	24.31	23.71
10	21.63	22.44	22.20	22.84	23.80	19.37	18.35	20.00	21.99	23.36	24.45	23.83
15	21.65	22.56	22.20	23.10	23.92	17.60	18.49	20.35	22.24	23.57	24.62	24.08
20	21.71	22.81	22.30	23.26	23.67	17.66	18.73	20.72	22.51	23.80	24.80	24.15
25	21.77	22.83	22.40	23.45	23.84	17.83	18.99	21.13	22.76	23.90	24.15	24.23
Eom	22.06	22.25	22.59	23.65	22.74	17.94	19.35	21.40	23.00	24.15	23.50	24.39

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, 1974-87.

Date	Water level
Mar. 2, 1987	114.36
Oct. 1	115.15

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 89.18 ft below lsd, June 22, 1987; lowest 102.29 ft below lsd, Oct. 6, 1984. Records available 1973-87.

Highest 1987 water level 89.18 ft below lsd on June 22; lowest 1987 water level 98.22 ft below lsd on Nov. 24.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	94.41	95.42	95.26	95.96	97.19	93.31	89.45	91.53	94.16	96.01	97.57	97.33
10	94.47	95.64	95.26	96.13	97.30	91.96	89.73	91.85	94.49	96.33	97.74	97.52
15	94.59	95.80	95.31	96.35	97.46	89.56	89.99	92.25	94.78	96.59	97.88	97.74
20	94.76	96.06	95.40	96.59	97.45	89.25	90.34	92.67	95.10	96.88	98.10	97.86
25	94.92	95.96	95.57	96.84	97.54	89.24	90.71	93.15	95.42	97.12	98.05	97.98
Eom	95.20	95.34	95.81	97.03	96.50	89.29	91.20	93.70	95.76	97.35	97.24	98.16

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, 1954-87.

Date	Water level
Mar. 9, 1987	117.20
Sept. 29	108.43

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 13.36 ft below lsd, June 21, 1987; lowest 134.53 ft below lsd, Aug. 18, 1956. Records available 1950-87.

Highest 1987 water level 13.36 ft below lsd on June 21; lowest 1987 water level 45.72 ft below lsd on May 4.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	44.05	41.98	39.35	40.25	45.45	.....	.....	28.91	32.31	.....	33.99	31.90
10	41.85	42.17	39.07	40.48	43.95	.....	29.38	30.84	31.67	.....	.....	32.38
15	41.48	41.97	38.68	41.80	44.12	.....	27.82	.....	31.11	.....	.....	32.89
20	41.64	42.41	38.81	43.57	43.40	13.69	26.75	.....	31.15	.....	32.10	32.36
25	41.60	41.93	39.03	44.38	42.63	19.38	26.44	.....	31.42	.....	31.91	31.56
Eom	41.70	40.57	39.69	44.73	a39.29	23.24	26.67	35.24	a31.50	33.22	31.48	31.50

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 1957-87.

Highest 1987 water level 75.75 ft below lsd on Dec. 13; lowest 1987 water level 138.75 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	138.03	133.87	129.63	.....	122.00	101.12	83.38	81.05	78.97	77.12	76.22	75.76
10	137.43	133.19	128.81	.....	121.48	94.43	83.08	80.65	78.60	77.06	76.18	75.83
15	136.48	132.39	127.90	.....	120.86	88.10	82.72	80.33	78.25	76.75	75.81	76.05
20	135.88	132.12	127.15	.....	119.80	84.64	82.36	80.09	78.01	76.60	76.11	76.04
25	135.13	131.26	126.48	.....	118.86	84.15	81.98	79.69	77.68	76.46	75.86	75.97
Eom	134.24	130.43	125.28	122.36	110.55	83.74	81.40	79.43	77.49	76.30	75.82	76.13

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 130.28 ft below lsd, Sept. 29, 1987; lowest 291.37 ft below lsd, Aug. 31, 1956. Records available 1930, 1934, 1937-38, 1940-87.

Date	Water level
Mar. 9, 1987	163.18
Sept. 29	130.28

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 181.17 ft below lsd, June 22, 1987; lowest 294.74 ft below lsd, June 15, 1971. Records available 1960-87.

Highest 1987 water level 181.17 ft below lsd on June 22; lowest 1987 water level 215.87 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	215.13	.....	a210.65	210.10	214.68	a201.57	.....	191.43	.....	.....	.....	.....
10	.....	.....	210.41	210.50	a213.48	.....	.....	192.33	.....	.....	.....	.....
15	.....	213.63	210.04	212.10	a212.97	.....	.....	194.36	.....	.....	.....	.....
20	.....	214.05	209.56	a213.70	a212.09	.....	.....	195.60	.....	.....	.....	.....
25	.....	213.53	209.40	.....	a211.81	.....	.....	196.65	.....	.....	.....	.....
Eom	.....	211.71	209.73	214.06	.....	.....	189.15	.....	.....	.....	.....	.....

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 113.51 ft below lsd, June 22, 1987; lowest water level 179.98 ft below lsd, Oct. 4,1986. Record available 1986-87.

Highest 1987 water level 113.51 ft below lsd on June 22; lowest 1987 water level 149.00 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	148.54	147.60	a144.23	143.83	148.52	126.92	129.97	124.87	127.03	126.72	129.97	128.46
10	148.50	147.00	143.43	144.27	147.00	.....	127.98	126.96	126.52	127.80	129.60	129.04
15	147.56	.....	143.25	146.22	147.00	.....	125.40	130.02	126.08	128.60	128.27	128.89
20	147.59	.....	143.17	147.91	145.87	.....	123.85	130.35	126.15	128.94	128.14	129.68
25	147.30	.....	143.09	147.39	144.95	116.83	123.48	131.31	126.30	128.57	128.15	128.21
Eom	146.90	.....	143.44	147.90	138.35	124.59	123.72	128.44	126.37	129.32	127.76	128.25

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 1958-87.

Date	Water level
Mar. 9, 1987	123.77
Oct. 1	109.34

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 1957-87.

Date	Water level
Sept. 29, 1987	45.00

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 1974-87.

Highest 1987 water level 262.35 ft below lsd on Nov. 15; lowest 1987 water level 319.42 ft below lsd on Jan. 7.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	312.13	306.42	300.47	297.06	290.02	279.46	272.25	267.12	263.58	262.76	262.67
10	318.50	310.95	.....	.....	296.45	287.76	278.14	271.28	266.41	263.48	263.04	263.02
15	.....	309.75	.....	298.76	296.16	285.71	276.95	270.43	265.73	263.03	262.35	263.56
20	.....	309.27	.....	298.38	295.58	283.90	275.83	269.78	265.25	262.87	262.93	263.63
25	.....	308.30	302.28	297.85	294.84	282.53	274.62	268.84	264.58	.....	262.65	263.45
Eom	312.82	307.51	301.27	297.12	292.65	280.83	273.35	268.09	264.26	262.71	262.75	263.67

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 74.60 ft below lsd, Sept. 29, 1987; lowest 305.60 ft below lsd, Dec. 7, 1971. Records available 1971-87.

Date	Water level
Mar. 10, 1987	99.80
Sept. 29	74.60

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 1956-87.

Highest 1987 water level 118.87 ft below lsd on Sept. 29; lowest 1987 water level 167.28 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	165.52	160.53	.....	152.30	153.91	133.60	.....	122.95	120.80	.....	e125.62	126.36
10	163.99	159.72	.....	151.88	153.55	129.81	.....	123.20	120.49	.....	125.64	127.27
15	162.43	159.26	.....	152.63	153.13	123.75	.....	123.53	120.01	.....	124.68	128.27
20	161.68	159.48	.....	153.85	152.20	.....	.....	123.03	119.39	.....	.....	127.78
25	160.92	158.85	.....	153.79	151.24	121.55	.....	123.45	119.05	.....	.....	127.02
Eom	160.29	157.83	e152.52	153.60	143.17	.....	122.17	122.24	119.02	.....	.....	126.94

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, 1944-87

Date	Water level
Mar. 10, 1987	57.30
Sept. 29	49.18

291414099475301. YP-69-50-202 (H-5-209). Unused artesian well in Edwards aquifer, diam. 6 in., depth 137 ft, cased 65 ft. Lsd 928.00 ft above msl. Highest water level 30.95 ft below lsd, Sept. 29, 1987; lowest water level 115.02 ft below lsd, Mar. 11, 1957. Records available 1956-87.

Date	Water level
Mar. 10, 1987	43.01
Sept. 29	30.95

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 15.82 ft below lsd, June 15-18, 1987; lowest 93.90 ft below lsd, Apr. 13, 1957. Records available 1929-32, 1934-87.

Highest 1987 water level 15.82 ft below lsd on June 15-18; lowest 1987 water level 26.99 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	26.81	25.72	24.65	.....	.....	17.94	16.63	17.27	17.28	17.17	17.68	17.80
10	26.60	25.51	24.50	.....	23.27	17.08	16.82	17.47	17.27	17.38	17.70	17.87
15	26.34	25.36	24.27	.....	23.03	15.82	16.99	17.67	17.22	17.37	17.57	17.95
20	26.25	25.34	23.91	.....	22.78	15.95	17.05	17.85	17.24	17.48	17.65	17.91
25	26.00	25.08	23.67	.....	22.52	15.85	17.11	17.81	17.21	17.51	17.64	17.80
Eom	25.83	24.87	23.60	.....	20.21	16.10	17.10	17.41	17.22	17.70	17.66	17.85

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, 1984-87.

Date	Water level
Mar. 10, 1987	44.77
Sept. 29	40.60

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 15.81 ft below lsd, June 5, 1987; lowest 61.38 ft below lsd, Mar. 13, 1957. Records available 1956-57, 1966-87.

Highest 1987 water level 15.81 ft below lsd on June 5; lowest 1987 water level 29.87 ft below lsd on Aug 16.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	27.50	28.97	27.15	27.60	27.61	15.81	27.50	29.09	27.75	27.45	28.18	27.49
10	27.53	28.46	27.08	27.71	27.28	20.41	28.53	28.89	27.66	28.10	28.06	27.92
15	27.72	28.38	26.97	27.66	27.04	18.99	28.71	29.80	27.67	28.20	27.84	28.14
20	28.12	28.19	26.56	27.87	25.91	21.53	28.38	29.57	28.05	28.22	27.63	27.84
25	28.10	27.63	26.70	27.70	26.23	23.03	28.51	29.06	28.08	28.09	27.64	27.53
Eom	28.82	27.37	27.15	27.41	21.93	25.14	28.22	28.28	27.62	28.04	27.57	27.33

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. No data available for 1987.

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 1937-87.

Date	Water level
Mar. 10, 1987	53.28

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

sampling of the same wells allows comparison of results for detecting changes in time.

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 U.S. Geological Survey Water-Supply Papers or in U.S. 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 U.S. Geological Survey.

Records of streamflow, contents of reservoirs, and 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 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, 1987
(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 1957-87.

Date	Water level
Mar. 9, 1987	23.53
Sept. 29	23.93

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 224.38 ft below lsd, July 29, 1987; lowest 284.35 ft below lsd, Nov. 21, 1957. Records available 1957-87.

Highest 1987 water level 224.38 ft below lsd on July 29; lowest 1987 water level 246.63 ft on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	245.92	243.29	240.10	238.62	239.53	233.08	226.41	224.47	225.77	227.07	228.80	229.80
10	245.48	243.18	239.62	238.40	239.42	231.24	225.75	224.54	225.77	227.68	229.17	230.10
15	244.54	242.50	238.95	238.76	239.63	228.39	225.33	224.83	225.93	227.88	228.84	230.61
20	244.32	243.00	238.78	239.15	239.58	227.87	225.04	225.26	226.20	228.15	229.61	230.49
25	243.73	242.36	238.62	239.31	239.64	227.26	224.78	225.44	226.45	228.17	229.45	230.57
Eom	243.19	240.55	238.63	239.32	237.60	226.70	224.45	225.70	226.80	228.54	229.63	231.81

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 71.15 ft below lsd, June 16, 1987; lowest 165.10 ft below lsd, Aug. 17, 1956. Records available 1952-87.

Highest 1987 water level 71.15 ft below lsd on June 16; lowest 1987 water level 98.99 ft below lsd on May 12.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	.....	88.64	91.99	98.15	80.35	.....	90.03	93.88	92.91	94.58	91.74
10	89.65	.....	89.44	92.86	97.11	76.80	.....	92.01	92.00	94.17	93.54	92.40
15	90.25	.....	89.29	95.02	97.76	71.68	.....	94.59	90.83	94.11	92.02	92.58
20	90.55	.....	89.64	97.89	96.40	72.40	.....	96.89	91.27	94.43	91.64	9[illegible] 22
25	.....	.....	90.45	97.63	96.00	75.50	.....	98.04	92.28	92.85	91.58	90.94
Eom	91.86	88.73	91.41	98.44	90.05	79.15	a88.04	94.02	92.10	93.41	91.61	90.93

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. No records available for 1987.

292845098255401. AY-68-37-203 (J-17) b/. 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 31.58 ft below lsd, June 17, 1987; lowest 110.05 ft c/ below lsd, Aug. 17, 1956. Records available 1932-87 d/.

Highest 1987 water level 31.58 ft below lsd on June 17; lowest 1987 water level 53.93 ft below lsd on May 3.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	45.13	47.46	44.60	47.32	52.86	39.25	41.03	46.04	49.10	47.85	49.21	46.53
10	45.55	47.62	45.16	48.25	51.79	36.05	42.19	48.02	47.72	49.04	48.53	47.09
15	45.90	47.57	44.89	49.81	52.34	31.71	42.87	50.26	47.65	49.68	47.46	47.40
20	46.16	48.02	45.34	52.09	51.25	31.99	42.24	52.38	47.25	49.62	47.07	46.65
25	46.30	47.45	45.77	52.29	50.44	34.87	42.29	53.06	47.86	47.96	47.13	46.07
Eom	46.85	45.32	46.52	52.84	46.94	37.58	43.52	49.45	47.46	48.35	46.25	46.12

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 1936-87.

Date	Water level
Mar. 2, 1987	134.39
Oct. 1	134.59

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 12.30 ft below lsd, June 25, 1987; lowest 29.36 ft below lsd, Aug. 21, 1956. Records available 1948-87.

Highest 1987 water level 12.30 ft below lsd on June 25; lowest 1987 water level 15.50 ft below lsd on May 5.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	14.94	15.03	14.81	14.92	15.50	13.97	13.18	13.91	14.65	14.62	14.89	14.76
10	14.96	15.15	14.78	14.95	15.44	13.16	13.33	14.10	14.60	14.73	14.85	14.81
15	14.94	15.15	14.72	15.05	15.48	12.92	13.50	14.32	14.58	14.76	14.79	.....
20	14.94	15.21	14.75	15.24	15.42	12.84	13.56	14.52	14.54	14.83	14.81	14.80
25	14.94	14.83	14.78	15.39	15.35	12.30	13.60	14.70	14.59	14.75	14.77	14.77
Eom	14.99	14.88	14.86	15.43	15.00	12.94	13.76	14.63	14.60	14.81	14.73	14.82

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, 1937-87.

Date	Water level
Mar. 2, 1987	25.25
Oct. 10	26.88

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 109.05 ft below lsd, June 14 and 15, 1987; lowest 184.45 ft below lsd, Aug. 18, 1956. Records available 1945, 1955-87.

Highest 1987 water level 109.05 ft below lsd on June 14 and 15; lowest 1987 water level 129.60 ft below lsd on May 4.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	124.98	125.67	123.21	125.01	129.37	113.82	.....	120.72	125.35	125.05	126.54	.....
10	124.99	125.76	123.45	125.44	128.86	113.15	.....	122.40	124.79	125.82	126.33	.....
15	124.95	125.78	123.43	126.53	129.23	109.05	.....	124.10	124.62	126.30	125.67	.....
20	124.99	126.07	123.57	128.13	128.39	110.02	.....	125.86	124.51	126.60	125.53	.....
25	125.01	125.39	123.90	128.59	127.96	111.25	.....	126.80	124.78	125.75	125.47	.....
Eom	125.30	122.95	124.38	128.99	123.57	.....	119.13	125.61	124.74	126.03	.....	125.09

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, 1971-87.

Date	Water level
Oct. 1, 1987	191.97
Oct. 1	191.97

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 1937-87.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1987	90.59	Apr. 28, 1987	87.05	July 30, 1987	95.68	Oct. 29, 1987	99.18
Mar. 2	76.64	June 1	95.42	Sept. 1	89.58	Nov. 30	103.02
Mar. 30	76.07	July 7	77.08	Sept. 30	90.24		

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 122.14 ft below lsd, Sept. 30, 1987; lowest 177.60 ft below lsd, July 10, 1978. Records available 1937-87.

Date	Water level	Date	Water level	Date	Water level	Date	Water level
Jan. 29, 1987	128.16	Apr. 28, 1987	124.86	July 30, 1987	127.33	Oct. 29, 1987	131.01
Mar. 2	133.53	June 1	134.14	Sept. 1	134.48	Nov. 30	124.80
Mar. 30	125.57	July 7	128.43	Sept. 30	122.14		

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 17.60 ft below lsd, June 15, 1987; lowest 27.40 ft below lsd, Sept. 11-18, 16, 26, 28-29, Oct. 3, 6, 1984. Records available 1937, 1950, 1954-55, 1980-87.

Highest 1987 water level 17.60 ft below lsd on June 15; lowest 1987 water level 24.85 ft below lsd on Nov 24.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	21.51	22.25	22.16	22.71	23.70	19.71	18.08	19.69	21.70	23.15	24.31	23.71
10	21.63	22.44	22.20	22.84	23.80	19.37	18.35	20.00	21.99	23.36	24.45	23.83
15	21.65	22.56	22.20	23.10	23.92	17.60	18.49	20.35	22.24	23.57	24.62	24.08
20	21.71	22.81	22.30	23.26	23.67	17.66	18.73	20.72	22.51	23.80	24.80	24.15
25	21.77	22.83	22.40	23.45	23.84	17.83	18.99	21.13	22.76	23.90	24.15	24.23
Eom	22.06	22.25	22.59	23.65	22.74	17.94	19.35	21.40	23.00	24.15	23.50	24.39

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, 1974-87.

Date	Water level
Mar. 2, 1987	114.36
Oct. 1	115.15

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 89.18 ft below lsd, June 22, 1987; lowest 102.29 ft below lsd, Oct. 6, 1984. Records available 1973-87.

Highest 1987 water level 89.18 ft below lsd on June 22; lowest 1987 water level 98.22 ft below lsd on Nov. 24.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	94.41	95.42	95.26	95.96	97.19	93.31	89.45	91.53	94.16	96.01	97.57	97.33
10	94.47	95.64	95.26	96.13	97.30	91.96	89.73	91.85	94.49	96.33	97.74	97.52
15	94.59	95.80	95.31	96.35	97.46	89.56	89.99	92.25	94.78	96.59	97.88	97.74
20	94.76	96.06	95.40	96.59	97.45	89.25	90.34	92.67	95.10	96.88	98.10	97.86
25	94.92	95.96	95.57	96.84	97.54	89.24	90.71	93.15	95.42	97.12	98.05	97.98
Eom	95.20	95.34	95.81	97.03	96.50	89.29	91.20	93.70	95.76	97.35	97.24	98.16

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, 1954-87.

Date	Water level
Mar. 9, 1987	117.20
Sept. 29	108.43

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 13.36 ft below lsd, June 21, 1987; lowest 134.53 ft below lsd, Aug. 18, 1956. Records available 1950-87.

Highest 1987 water level 13.36 ft below lsd on June 21; lowest 1987 water level 45.72 ft below lsd on May 4.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	44.05	41.98	39.35	40.25	45.45	.....	.....	28.91	32.31	.....	33.99	31.90
10	41.85	42.17	39.07	40.48	43.95	.....	29.38	30.84	31.67	.....	.....	32.38
15	41.48	41.97	38.68	41.80	44.12	.....	27.82	.....	31.11	.....	.....	32.89
20	41.64	42.41	38.81	43.57	43.40	13.69	26.75	.....	31.15	.....	32.10	32.36
25	41.60	41.93	39.03	44.38	42.63	19.38	26.44	.....	31.42	.....	31.91	31.56
Eom	41.70	40.57	39.69	44.73	a39.29	23.24	26.67	35.24	a31.50	33.22	31.48	31.50

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 1957-87.

Highest 1987 water level 75.75 ft below lsd on Dec. 13; lowest 1987 water level 138.75 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	138.03	133.87	129.63	.....	122.00	101.12	83.38	81.05	78.97	77.12	76.22	75.76
10	137.43	133.19	128.81	.....	121.48	94.43	83.08	80.65	78.60	77.06	76.18	75.83
15	136.48	132.39	127.90	.....	120.86	88.10	82.72	80.33	78.25	76.75	75.81	76.05
20	135.88	132.12	127.15	.....	119.80	84.64	82.36	80.09	78.01	76.60	76.11	76.04
25	135.13	131.26	126.48	.....	118.86	84.15	81.98	79.69	77.68	76.46	75.86	75.97
Eom	134.24	130.43	125.28	122.36	110.55	83.74	81.40	79.43	77.49	76.30	75.82	76.13

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 130.28 ft below lsd, Sept. 29, 1987; lowest 291.37 ft below lsd, Aug. 31, 1956. Records available 1930, 1934, 1937-38, 1940-87.

Date	Water level
Mar. 9, 1987	163.18
Sept. 29	130.28

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 181.17 ft below lsd, June 22, 1987; lowest 294.74 ft below lsd, June 15, 1971. Records available 1960-87.

Highest 1987 water level 181.17 ft below lsd on June 22; lowest 1987 water level 215.87 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	215.13	.....	a210.65	210.10	214.68	a201.57	.....	191.43	.....	.....	.....	.....
10	.....	.....	210.41	210.50	a213.48	.....	.....	192.33	.....	.....	.....	.....
15	.....	213.63	210.04	212.10	a212.97	.....	.....	194.36	.....	.....	.....	.....
20	.....	214.05	209.56	a213.70	a212.09	.....	.....	195.60	.....	.....	.....	.....
25	.....	213.53	209.40	.....	a211.81	.....	.....	196.65	.....	.....	.....	.....
Eom	.....	211.71	209.73	214.06	.....	.....	189.15	.....	.....	.....	.....	.....

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 113.51 ft below lsd, June 22, 1987; lowest water level 179.98 ft below lsd, Oct. 4,1986. Record available 1986-87.

Highest 1987 water level 113.51 ft below lsd on June 22; lowest 1987 water level 149.00 ft below lsd on Jan 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	148.54	147.60	a144.23	143.83	148.52	126.92	129.97	124.87	127.03	126.72	129.97	128.46
10	148.50	147.00	143.43	144.27	147.00	.....	127.98	126.96	126.52	127.80	129.60	129.04
15	147.56	.....	143.25	146.22	147.00	.....	125.40	130.02	126.08	128.60	128.27	128.89
20	147.59	.....	143.17	147.91	145.87	.....	123.85	130.35	126.15	128.94	128.14	129.68
25	147.30	.....	143.09	147.39	144.95	116.83	123.48	131.31	126.30	128.57	128.15	128.21
Eom	146.90	.....	143.44	147.90	138.35	124.59	123.72	128.44	126.37	129.32	127.76	128.25

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 1958-87.

Date	Water level
Mar. 9, 1987	123.77
Oct. 1	109.34

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 1957-87.

Date	Water level
Sept. 29, 1987	45.00

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 1974-87.

Highest 1987 water level 262.35 ft below lsd on Nov. 15; lowest 1987 water level 319.42 ft below lsd on Jan. 7.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	.....	312.13	306.42	300.47	297.06	290.02	279.46	272.25	267.12	263.58	262.76	262.67
10	318.50	310.95	.....	.....	296.45	287.76	278.14	271.28	266.41	263.48	263.04	263.02
15	.....	309.75	.....	298.76	296.16	285.71	276.95	270.43	265.73	263.03	262.35	263.56
20	.....	309.27	.....	298.38	295.58	283.90	275.83	269.78	265.25	262.87	262.93	263.63
25	.....	308.30	302.28	297.85	294.84	282.53	274.62	268.84	264.58	.....	262.65	263.45
Eom	312.82	307.51	301.27	297.12	292.65	280.83	273.35	268.09	264.26	262.71	262.75	263.67

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 74.60 ft below lsd, Sept. 29, 1987; lowest 305.60 ft below lsd, Dec. 7, 1971. Records available 1971-87.

Date	Water level
Mar. 10, 1987	99.80
Sept. 29	74.60

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 1956-87.

Highest 1987 water level 118.87 ft below lsd on Sept. 29; lowest 1987 water level 167.28 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	165.52	160.53	.....	152.30	153.91	133.60	.....	122.95	120.80	.....	e125.62	126.36
10	163.99	159.72	.....	151.88	153.55	129.81	.....	123.20	120.49	.....	125.64	127.27
15	162.43	159.26	.....	152.63	153.13	123.75	.....	123.53	120.01	.....	124.68	128.27
20	161.68	159.48	.....	153.85	152.20	.....	.....	123.03	119.39	.....	.....	127.78
25	160.92	158.85	.....	153.79	151.24	121.55	.....	123.45	119.05	.....	.....	127.02
Eom	160.29	157.83	e152.52	153.60	143.17	.....	122.17	122.24	119.02	.....	.....	126.94

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, 1944-87

Date	Water level
Mar. 10, 1987	57.30
Sept. 29	49.18

291414099475301. YP-69-50-202 (H-5-209). Unused artesian well in Edwards aquifer, diam. 6 in., depth 137 ft, cased 65 ft. Lsd 928.00 ft above msl. Highest water level 30.95 ft below lsd, Sept. 29, 1987; lowest water level 115.02 ft below lsd, Mar. 11, 1957. Records available 1956-87.

Date	Water level
Mar. 10, 1987	43.01
Sept. 29	30.95

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 15.82 ft below lsd, June 15-18, 1987; lowest 93.90 ft below lsd, Apr. 13, 1957. Records available 1929-32, 1934-87.

Highest 1987 water level 15.82 ft below lsd on June 15-18; lowest 1987 water level 26.99 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	26.81	25.72	24.65	.....	.....	17.94	16.63	17.27	17.28	17.17	17.68	17.80
10	26.60	25.51	24.50	.....	23.27	17.08	16.82	17.47	17.27	17.38	17.70	17.87
15	26.34	25.36	24.27	.....	23.03	15.82	16.99	17.67	17.22	17.37	17.57	17.95
20	26.25	25.34	23.91	.....	22.78	15.95	17.05	17.85	17.24	17.48	17.65	17.91
25	26.00	25.08	23.67	.....	22.52	15.85	17.11	17.81	17.21	17.51	17.64	17.80
Eom	25.83	24.87	23.60	.....	20.21	16.10	17.10	17.41	17.22	17.70	17.66	17.85

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, 1984-87.

Date	Water level
Mar. 10, 1987	44.77
Sept. 29	40.60

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 15.81 ft below lsd, June 5, 1987; lowest 61.38 ft below lsd, Mar. 13, 1957. Records available 1956-57, 1966-87.

Highest 1987 water level 15.81 ft below lsd on June 5; lowest 1987 water level 29.87 ft below lsd on Aug 16.

Highest water level for the day, from recorder graph, 1987

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	27.50	28.97	27.15	27.60	27.61	15.81	27.50	29.09	27.75	27.45	28.18	27.49
10	27.53	28.46	27.08	27.71	27.28	20.41	28.53	28.89	27.66	28.10	28.06	27.92
15	27.72	28.38	26.97	27.66	27.04	18.99	28.71	29.80	27.67	28.20	27.84	28.14
20	28.12	28.19	26.56	27.87	25.91	21.53	28.38	29.57	28.05	28.22	27.63	27.84
25	28.10	27.63	26.70	27.70	26.23	23.03	28.51	29.06	28.08	28.09	27.64	27.53
Eom	28.82	27.37	27.15	27.41	21.93	25.14	28.22	28.28	27.62	28.04	27.57	27.33

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. No data available for 1987.

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 1937-87.

Date	Water level
Mar. 10, 1987	53.28

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

APPENDIX B. WATER QUALITY

Water-quality data for wells and springs in the Edwards aquifer, 1987

[MIN, minute; G/M, gallons per minute; US/CM, microsiemens per centimeter; DEG C, degrees Celsius; MG/L, milligrams per liter; UG/L, micrograms per liter]

BEXAR COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAM-PLING (MIN)	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3
AY-68-21-804	06-15-87	1230	279.00	60	10	526	6.70	24.0	276
AY-68-27-303	06-16-87	1300	354.00	60	20	460	6.90	22.5	253
AY-68-27-503	06-16-87	1445	375.00	60	20	475	7.00	22.0	242
AY-68-28-202	07-29-87	1000	457.00	180	90	557	7.10	22.5	256
AY-68-28-203	04-27-87	1100	435.00	1440	100	515	6.90	23.5	249
AY-68-28-205	08-14-87	1130	485.00	1440	210	480	6.90	23.5	264
AY-68-28-207	06-16-87	1115	265.00	60	6.0	418	6.90	22.0	210
AY-68-28-501	04-27-87	1230	468.00	1440	250	521	6.80	23.0	256
AY-68-28-508	04-29-87	1420	464.00	1440	200	425	7.00	23.0	194
AY-68-28-512	06-16-87	0930	400.00	60	10	492	6.90	23.0	256
AY-68-28-513	08-25-87	1400	510.00	1440	1250	511	7.00	23.0	271
AY-68-28-608	06-17-87	1400	500.00	60	20	460	7.00	22.0	258
AY-68-28-903	07-17-87	1045	762.00	60	1500	719	6.70	22.0	348
AY-68-28-904	04-22-87	0930	640.00	1440	800	550	6.80	22.0	264
AY-68-28-919	04-22-87	1030	550.00	1440	1500	575	7.10	22.0	260
AY-68-29-208	06-15-87	1500	266.00	60	10	450	7.00	23.5	249
AY-68-29-209	06-15-87	1400	315.00	60	9.0	475	7.00	23.5	249
AY-68-29-210	06-15-87	1030	329.00	60	15	532	6.90	23.0	266
AY-68-29-211	07-10-87	1300	260.00	30	100	472	6.80	27.0	269
AY-68-29-303	04-22-87	1300	527.00	1440	700	455	6.90	22.0	212
AY-68-29-405	04-22-87	1115	395.00	180	100	643	6.80	22.5	311
AY-68-29-410	04-27-87	1400	318.00	1440	650	522	6.90	23.0	280
AY-68-29-415	08-19-87	1345	1100.00	210	4600	600	7.00	24.0	279
AY-68-29-505	08-19-87	1150	807.00	30	600	656	6.90	22.0	299
AY-68-29-510	04-22-87	1430	500.00	30	15	560	6.90	22.0	281
AY-68-29-804	04-21-87	1145	761.00	1440	2100	525	7.20	24.0	235
AY-68-29-810	04-21-87	1400	500.00	180	10	545	7.00	22.0	228
AY-68-29-912	08-19-87	1045	630.00	210	1250	484	7.20	25.0	206
AY-68-29-920	08-19-87	0920	655.00	1440	1150	482	7.20	25.5	205
AY-68-35-102	04-27-87	1500	796.00	1440	2000	505	7.10	22.0	224
AY-68-36-102	04-24-87	1520	786.00	1440	2000	531	7.00	22.0	240
AY-68-37-101	04-21-87	0900	1005.00	60	5000	515	7.10	22.5	232
AY-68-37-506	03-25-87	0615	1407.00	15	7000	411	7.30	26.0	200
	03-25-87	1735	1407.00	660	7000	465	7.00	26.0	197
AY-68-37-507	03-25-87	0645	1108.00	45	7000	408	7.30	25.5	200
	03-25-87	1720	1108.00	660	7000	473	7.00	25.5	196
	04-17-87	1245	1108.00	60	6000	474	6.90	27.0	196
	05-21-87	1015	1108.00	60	7000	501	7.40	27.0	198
	07-15-87	1100	1108.00	30	6000	471	7.20	26.5	200
	08-18-87	0745	1108.00	120	6000	481	7.10	26.5	202
	09-22-87	1445	1108.00	120	6000	499	7.10	26.5	204
AY-68-37-508	01-22-87	0830	1311.00	30	4000	508	6.60	25.5	190
	02-18-87	1030	1311.00	60	4000	471	7.10	26.5	202
	03-25-87	0630	1311.00	30	7000	421	7.30	25.0	198
	03-25-87	1755	1311.00	660	7000	459	7.00	25.0	195
	06-22-87	0830	1311.00	1440	2000	467	7.30	27.0	205
AY-68-37-521	01-22-87	1430	1275.00	60	46	5820	6.50	32.0	243
	02-19-87	1315	1275.00	60	43	5430	6.30	31.5	236
	03-18-87	1300	1275.00	60	44	5600	6.40	32.0	237
	04-17-87	0700	1275.00	60	40	5920	6.70	32.5	241
	05-21-87	1400	1275.00	60	45	5490	6.80	32.0	241
	06-22-87	1100	1275.00	60	50	5460	6.70	32.0	241
	07-20-87	1045	1275.00	30	45	5270	6.72	32.0	243
	08-20-87	0930	1275.00	45	45	5980	6.70	32.0	247

Water-quality data for wells and springs in the Edwards aquifer, 1987--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 (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3
AY-68-37-521	09-22-87	0900	1275.00	45	45	5600	6.80	32.0	250
	10-22-87	1200	1275.00	60	45	5500	6.80	32.0	278
	11-24-87	1045	1275.00	60	45	5700	6.80	31.5	253
	12-23-87	1015	1275.00	60	45	5670	6.80	32.0	254
AY-68-37-522	01-22-87	1500	1075.00	90	43	4740	6.60	31.5	231
	02-19-87	1330	1075.00	60	43	4580	6.40	30.5	217
	03-18-87	1315	1075.00	60	41	4540	6.60	31.0	221
	04-17-87	0715	1075.00	60	40	4850	6.80	31.0	223
	05-21-87	1415	1075.00	60	42	4490	6.80	31.0	223
	06-22-87	1115	1075.00	60	50	4520	6.80	31.0	223
	07-20-87	1100	1075.00	60	30	4360	6.74	31.0	226
	08-20-87	1000	1075.00	60	45	4800	6.76	31.0	229
	09-22-87	0930	1075.00	75	45	4350	6.80	31.0	231
	10-22-87	1215	1075.00	60	45	4420	6.90	30.5	228
	11-24-87	1100	1075.00	60	45	4490	6.80	30.5	226
	12-23-87	1045	1075.00	90	45	4490	6.80	30.5	230
AY-68-37-523	01-22-87	1530	1175.00	120	20	6020	6.40	30.0	238
	02-19-87	1345	1175.00	60	20	5750	6.50	28.0	239
	03-18-87	1330	1175.00	60	22	5730	6.60	30.0	241
	04-17-87	0730	1175.00	60	25	6190	6.70	30.5	241
	05-21-87	1430	1175.00	60	28	5730	6.80	30.5	242
	06-22-87	1130	1175.00	60	30	5690	6.70	31.0	243
	07-20-87	1115	1175.00	60	30	5320	6.71	31.0	243
	08-20-87	1030	1175.00	90	30	6200	6.71	31.0	251
	09-22-87	1000	1175.00	60	30	5790	6.70	31.0	251
	10-22-87	1230	1175.00	90	30	5720	6.80	29.5	249
	11-24-87	1115	1175.00	60	30	5900	6.80	29.5	253
	12-23-87	1115	1175.00	120	30	5900	6.80	31.0	252
AY-68-37-524	01-22-87	1245	881.00	60	53	660	6.30	28.5	178
	02-19-87	1500	881.00	60	41	630	6.70	28.0	195
	03-18-87	1000	881.00	60	51	660	6.80	28.0	198
	04-17-87	1030	881.00	60	47	635	6.80	28.0	197
	05-21-87	1100	881.00	60	42	643	6.90	28.0	200
	06-22-87	0930	881.00	60	50	606	7.20	28.0	200
	07-20-87	0915	881.00	30	45	581	7.15	28.0	199
	08-20-87	1200	881.00	70	45	566	7.08	28.5	199
	09-22-87	1200	881.00	75	45	652	7.10	28.0	209
	10-22-87	1000	881.00	60	45	627	7.20	27.5	203
	11-24-87	0930	881.00	60	45	643	6.90	28.0	204
	12-23-87	1330	881.00	90	45	642	7.00	28.0	203
AY-68-37-525	01-22-87	1330	1150.00	120	33	6300	6.00	30.0	231
	02-19-87	1440	1150.00	60	34	5900	6.40	29.0	219
	03-18-87	1015	1150.00	60	35	6200	6.60	29.0	231
	04-17-87	1000	1150.00	60	42	6010	6.70	29.5	231
	05-21-87	1115	1150.00	60	40	5930	6.60	29.0	215
	06-22-87	0945	1150.00	60	50	6010	6.70	29.5	238
	07-20-87	0930	1150.00	45	30	5780	6.74	29.5	238
	08-20-87	1130	1150.00	40	30	6030	6.81	31.0	230
	09-22-87	1130	1150.00	45	30	6070	6.80	29.0	241
	10-22-87	1015	1150.00	60	30	6010	6.90	29.5	244
	11-24-87	0945	1150.00	60	30	6170	6.70	29.0	244
AY-68-37-525	12-23-87	1245	1150.00	60	30	6210	6.60	29.5	244
AY-68-37-526	01-22-87	1045	1223.00	60	30	1060	6.80	26.5	210
	02-19-87	1545	1223.00	60	35	1080	7.00	26.5	199
	03-18-87	0830	1223.00	60	30	1110	7.10	26.5	202
	04-17-87	1115	1223.00	60	40	1180	7.10	26.0	197

Water-quality data for wells and springs in the Edwards aquifer, 1987--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 (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3
AY-68-37-526	05-21-87	1000	1223.00	60	42	1150	7.10	26.5	203
	06-22-87	0815	1223.00	60	50	1020	7.00	26.0	203
	07-20-87	1235	1223.00	60	200	1070	7.21	26.0	203
	08-18-87	0845	1223.00	1440	20	1020	7.00	26.5	202
	09-22-87	1320	1223.00	1440	35	1040	7.00	27.0	204
	10-22-87	0830	1223.00	60	35	948	7.10	26.0	212
	11-24-87	0815	1223.00	60	35	973	7.20	26.0	213
	12-23-87	1335	1223.00	95	35	971	7.10	26.5	222
AY-68-37-527	01-22-87	1000	926.00	20	200	480	6.50	26.5	190
	02-19-87	1600	926.00	60	200	484	6.80	27.0	197
	03-18-87	0800	926.00	30	200	472	6.90	26.0	199
	04-17-87	1100	926.00	30	250	472	6.80	26.5	193
	05-21-87	0940	926.00	60	200	501	7.20	26.5	200
	06-22-87	0800	926.00	60	250	469	7.00	26.5	201
	07-20-87	1215	926.00	60	35	460	7.17	26.5	200
	08-18-87	0945	926.00	60	200	481	7.10	26.5	200
	09-22-87	1400	926.00	75	200	499	7.10	26.5	207
	10-22-87	0845	926.00	60	200	480	6.80	26.0	212
	11-24-87	0830	926.00	60	200	497	7.00	26.0	203
	12-23-87	1450	926.00	50	200	497	7.00	26.5	205
AY-68-37-609	04-17-87	0845	1100.00	30	40	6700	6.80	31.5	278
AY-68-37-701	01-22-87	1545	1582.00	60	4000	456	6.60	26.0	192
	02-18-87	1245	1582.00	60	4000	478	7.10	26.5	201
	03-18-87	1230	1582.00	60	5000	456	6.60	26.5	197
	04-17-87	1310	1582.00	60	5000	480	7.10	27.0	198
	05-21-87	1245	1582.00	60	5000	507	7.20	27.0	200
	06-22-87	1230	1582.00	60	7000	462	7.20	27.0	200
	07-15-87	1230	1582.00	60	4000	492	7.00	27.0	202
	08-20-87	1500	1582.00	240	3000	448	7.20	27.5	198
	09-22-87	1600	1582.00	60	3000	504	7.10	27.0	205

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
AY-68-21-804	280	8	110	2.2	4.2	0.60	3.6	8.1	<0.10
AY-68-27-303	280	26	95	10	5.5	0.80	10	11	0.10
AY-68-27-503	290	44	88	16	7.7	0.90	22	15	0.20
AY-68-28-202	310	56	100	15	11	1.4	63	13	<0.10
AY-68-28-203	270	24	91	11	7.6	0.90	11	12	0.20
AY-68-28-205	290	25	91	15	6.6	1.4	15	12	0.20
AY-68-28-207	240	31	80	10	3.1	1.6	33	4.1	0.10
AY-68-28-501	280	20	98	7.4	7.1	1.1	11	12	0.20
AY-68-28-508	220	31	74	9.6	6.6	0.70	17	12	0.20
AY-68-28-512	280	23	100	7.1	6.0	0.90	13	12	<0.10
AY-68-28-513	270	3	95	8.8	7.0	1.2	20	13	0.10
AY-68-28-608	270	11	93	8.9	5.7	1.1	12	8.8	<0.10
AY-68-28-903	350	6	120	13	26	1.9	26	26	0.20
AY-68-28-904	290	25	91	15	7.1	1.0	18	12	0.20
AY-68-28-919	300	44	95	16	10	1.1	24	21	0.20
AY-68-29-208	260	11	96	4.7	4.3	0.50	6.5	7.7	<0.10
AY-68-29-209	250	5	98	2.1	4.3	0.70	3.8	6.9	<0.10
AY-68-29-210	280	18	100	8.2	4.8	0.70	13	8.2	<0.10
AY-68-29-211	280	7	94	10	5.4	0.50	15	8.4	<0.10
AY-68-29-303	250	35	88	6.6	5.8	0.70	17	15	0.10
AY-68-29-405	350	35	120	11	11	1.5	16	20	0.20
AY-68-29-410	300	20	100	12	8.9	0.80	14	14	0.20
AY-68-29-415	300	21	100	12	9.8	1.5	17	14	0.20
AY-68-29-505	--	--	--	--	--	--	--	--	--
AY-68-29-510	310	27	100	14	8.7	1.4	16	20	0.20
AY-68-29-804	270	37	79	18	9.1	1.2	28	13	0.30
AY-68-29-810	280	56	89	15	9.8	1.5	29	11	0.30
AY-68-29-912	230	25	66	16	9.1	1.5	17	15	0.20
AY-68-29-920	--	--	--	--	--	--	--	--	--
AY-68-35-102	270	49	78	19	8.1	1.2	45	18	0.20
AY-68-36-102	280	41	86	16	9.6	1.3	31	13	0.20
AY-68-37-101	260	32	76	18	9.1	1.2	32	14	0.30
AY-68-37-506	220	25	62	17	--	--	21	18	--
	220	28	62	17	--	--	21	18	--
AY-68-37-507	220	25	62	17	--	--	22	19	--
	220	27	61	17	--	--	22	19	--
	230	39	66	17	10	1.3	23	21	0.30
	230	32	64	17	--	--	48	21	--
	230	26	64	16	9.9	1.1	22	18	0.30
	210	5	58	15	--	--	21	18	--
	230	29	65	17	--	--	23	24	--
AY-68-37-508	240	50	68	17	10	1.1	22	25	0.30
	240	41	69	17	--	--	24	21	--
	220	25	61	17	--	--	22	18	--
	220	30	62	17	--	--	22	19	--
	220	19	63	16	--	--	23	18	--
AY-68-37-521	2300	2000	560	210	470	27	1900	930	2.9
	2100	1800	520	190	--	--	1900	960	--
	2000	1800	490	190	--	--	1800	960	--
	2200	1900	540	200	490	29	1900	990	2.9
	1500	1300	380	140	--	--	1600	2000	--
	2000	1800	520	180	--	--	1900	980	--
	2500	2200	620	220	460	29	1800	970	2.8
	1900	1700	470	180	--	--	1800	840	--
	2100	1800	510	190	--	--	1900	840	--

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
AY-68-37-521	2000	1700	500	180	470	38	1800	790	2.9
	2000	1800	510	180	--	--	1800	890	--
	1900	1600	480	170	--	--	1700	900	--
AY-68-37-522	1800	1600	440	170	380	22	1400	730	2.9
	1600	1400	400	150	--	--	1500	770	--
	1600	1300	380	150	--	--	1400	740	--
	1700	1500	430	150	380	24	1500	740	2.7
	2000	1700	490	180	--	--	1400	1500	--
	1600	1400	410	140	--	--	1400	780	--
	1900	1700	500	170	380	24	1400	740	2.6
	1500	1300	370	140	--	--	1400	670	--
	1600	1400	390	150	--	--	1400	730	--
	1800	1600	470	160	380	25	1400	630	2.8
	1500	1300	380	130	--	--	1300	530	--
	1500	1300	380	130	--	--	1300	580	--
AY-68-37-523	2300	2000	550	220	500	27	1800	990	2.8
	2100	1800	520	190	--	--	1900	1100	--
	2000	1800	480	200	--	--	1800	1000	--
	2200	1900	530	210	520	30	1900	1000	2.9
	2100	1900	520	200	--	--	1800	2100	--
	2100	1800	520	190	--	--	1900	1000	--
	2600	2300	640	240	490	31	1900	1000	2.8
	2000	1800	480	200	--	--	1800	910	--
	2100	1900	520	200	--	--	1800	1100	--
	2400	2200	600	230	580	30	2000	870	3.0
	2000	1800	500	190	--	--	1900	1000	--
	1900	1700	480	180	--	--	1900	950	--
AY-68-37-524	290	110	80	22	23	2.2	90	44	0.70
	290	96	80	22	--	--	83	42	--
	260	66	71	21	--	--	72	37	--
	280	85	78	21	21	2.3	80	38	0.60
	280	77	76	21	--	--	82	38	--
	280	77	76	21	--	--	78	37	--
	280	78	76	21	21	2.4	77	35	0.10
	270	69	74	20	--	--	74	35	--
	280	73	78	21	--	--	77	42	--
	280	76	77	21	22	2.4	84	38	0.60
	290	88	82	21	--	--	78	42	--
	300	98	84	22	--	--	78	38	--
AY-68-37-525	2300	2100	560	220	530	29	2000	1000	2.9
	2100	1900	500	210	--	--	2000	1100	--
	2100	1900	490	220	--	--	1900	1100	--
	2300	2000	530	230	540	31	2000	1100	2.6
	2100	1900	500	210	--	--	1800	--	--
	2200	2000	530	210	--	--	2000	1100	--
	2600	2400	630	250	510	32	2000	1100	2.7
	2000	1800	450	220	--	--	1900	940	--
	2200	2000	520	230	--	--	2000	1100	--
	2300	2100	510	260	530	32	1900	940	2.8
	2100	1800	490	210	--	--	2000	1100	--
	2000	1800	480	200	--	--	1900	1000	--
AY-68-37-526	440	230	110	40	57	4.0	210	110	1.0
	430	230	110	38	--	--	220	110	--
	430	230	110	38	--	--	220	110	--
	460	270	120	40	59	4.3	230	120	1.1
	440	230	110	39	--	--	240	110	--

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARD-NESS TOTAL (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)	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)
AY-68-37-526	430	230	110	38	--	--	220	110	--
	470	270	120	41	61	4.2	230	120	0.90
	400	200	100	36	--	--	170	100	--
	430	220	110	37	--	--	200	100	--
	390	180	100	34	47	3.4	160	86	0.80
	420	210	110	36	--	--	170	91	--
	380	160	97	33	--	--	170	90	--
AY-68-37-527	240	48	67	17	10	1.1	23	23	0.40
	240	46	69	17	--	--	26	23	--
	220	24	61	17	--	--	22	18	--
	230	42	66	17	10	1.2	24	19	0.30
	230	33	65	17	--	--	24	20	--
	230	25	64	16	--	--	23	17	--
	230	33	65	17	10	1.2	22	18	0.30
	220	19	61	16	--	--	22	18	--
	260	57	76	18	--	--	24	24	--
	230	23	66	17	10	1.2	23	20	0.30
	240	42	70	17	--	--	22	22	--
	230	24	65	16	--	--	25	19	--
AY-68-37-609	2400	2100	580	220	580	32	2200	1200	3.4
AY-68-37-701	250	55	69	18	10	1.1	25	24	0.40
	240	44	70	17	--	--	28	23	--
	230	32	62	18	--	--	25	19	--
	240	40	67	17	10	1.3	26	19	0.30
	230	33	65	17	--	--	27	21	--
	230	30	64	17	--	--	26	18	--
	230	33	66	17	10	1.2	25	18	0.30
	220	23	62	16	--	--	24	18	--
	230	30	66	17	--	--	25	24	--

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-21-804	12	307	1.6	0.070	<0.010	0.30	1.30	0.020	3.2
AY-68-27-303	11	295	2.6	0.030	<0.010	0.40	2.20	0.030	3.1
AY-68-27-503	11	306	2.4	0.030	<0.010	0.60	1.80	0.030	3.5
AY-68-28-202	11	368	1.8	0.050	<0.010	0.30	1.50	0.010	2.1
AY-68-28-203	13	296	1.7	0.050	<0.010	0.50	1.20	0.010	1.0
AY-68-28-205	13	313	1.2	0.020	<0.010	0.40	0.800	<0.010	--
AY-68-28-207	10	271	2.2	0.080	0.010	1.6	0.600	0.100	4.8
AY-68-28-501	13	303	1.4	0.050	<0.010	0.50	0.900	0.010	0.7
AY-68-28-508	11	248	2.3	0.030	<0.010	0.30	2.00	0.010	2.2
AY-68-28-512	12	305	--	0.050	<0.010	<0.20	1.70	0.050	2.6
AY-68-28-513	11	319	--	--	--	--	--	--	--
AY-68-28-608	11	296	0.90	0.060	<0.010	0.40	0.500	0.030	4.1
AY-68-28-903	16	438	1.9	0.280	<0.010	1.1	0.800	<0.010	--
AY-68-28-904	12	315	3.6	0.030	<0.010	2.3	1.30	0.010	0.8
AY-68-28-919	13	336	3.6	0.030	<0.010	1.9	1.70	0.020	1.1
AY-68-29-208	13	282	1.5	0.050	<0.010	0.40	1.10	0.030	3.1
AY-68-29-209	13	279	1.9	0.050	<0.010	0.20	1.70	0.030	2.5
AY-68-29-210	11	306	1.4	0.060	<0.010	0.20	1.20	0.030	2.8
AY-68-29-211	11	306	1.7	0.050	<0.010	0.50	1.20	0.020	1.5
AY-68-29-303	11	271	2.4	0.040	<0.010	0.60	1.80	0.020	1.2
AY-68-29-405	15	381	2.2	0.030	<0.010	0.20	2.00	0.020	1.7
AY-68-29-410	13	331	2.0	0.060	<0.010	0.40	1.60	0.010	0.7
AY-68-29-415	13	335	--	--	--	--	--	--	--
AY-68-29-505	--	--	--	--	--	--	--	--	--
AY-68-29-510	13	342	1.8	0.040	<0.010	0.40	1.40	0.020	1.0
AY-68-29-804	12	302	2.0	0.030	<0.010	0.30	1.70	0.010	1.0
AY-68-29-810	13	306	2.0	0.030	<0.010	0.40	1.60	0.010	0.9
AY-68-29-912	12	260	--	--	--	--	--	--	--
AY-68-29-920	--	--	--	--	--	--	--	--	--
AY-68-35-102	12	316	8.9	0.030	<0.010	7.6	1.30	0.010	1.4
AY-68-36-102	13	314	2.4	0.030	<0.010	0.30	2.10	0.010	0.7
AY-68-37-101	13	303	2.0	0.030	<0.010	0.40	1.60	0.010	0.8
AY-68-37-506	--	--	--	--	--	--	--	--	--
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AY-68-37-507	--	--	--	--	--	--	--	--	--
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	12	268	--	--	--	--	--	--	--
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	12	263	--	--	--	--	--	--	--
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AY-68-37-508	13	270	--	--	--	--	--	--	--
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AY-68-37-521	20	4270	--	--	--	--	--	--	--
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	20	4320	--	--	--	--	--	--	--
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	20	4270	--	--	--	--	--	--	--
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	20	3970	--	--	--	--	--	--	--

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) (70301)	NITRO-GEN, TOTAL (MG/L AS N) (00600)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO-GEN, NITRITE TOTAL (MG/L AS N) (00615)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	PHOS-PHOROUS TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)
AY-68-37-521	--	--	--	--	--	--	--	--	--
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AY-68-37-522	19	3300	--	--	--	--	--	--	--
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	19	3380	--	--	--	--	--	--	--
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	19	3370	--	--	--	--	--	--	--
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	18	3220	--	--	--	--	--	--	--
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AY-68-37-523	19	4250	--	--	--	--	--	--	--
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	19	4360	--	--	--	--	--	--	--
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	19	4470	--	--	--	--	--	--	--
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	19	4480	--	--	--	--	--	--	--
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AY-68-37-524	13	382	--	--	--	--	--	--	--
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	13	372	--	--	--	--	--	--	--
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	12	364	--	--	--	--	--	--	--
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	12	379	--	--	--	--	--	--	--
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AY-68-37-525	19	4500	--	--	--	--	--	--	--
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	19	4590	--	--	--	--	--	--	--
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	19	4690	--	--	--	--	--	--	--
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	19	4340	--	--	--	--	--	--	--
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AY-68-37-525	--	--	--	--	--	--	--	--	--
AY-68-37-526	13	672	--	--	--	--	--	--	--
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	13	706	--	--	--	--	--	--	--
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Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-37-526	--	--	--	--	--	--	--	--	--
	13	712	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--
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	12	570	--	--	--	--	--	--	--
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AY-68-37-527	12	268	--	--	--	--	--	--	--
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	--	--	--	--	--	--	--	--	--
	12	265	--	--	--	--	--	--	--
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	12	265	--	--	--	--	--	--	--
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	12	277	--	--	--	--	--	--	--
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AY-68-37-609	19	5000	--	--	--	--	--	--	--
AY-68-37-701	13	276	--	--	--	--	--	--	--
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	12	271	--	--	--	--	--	--	--
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	12	271	--	--	--	--	--	--	--
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LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	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	06-15-87	1230	279.00	60	10	<1	29	<1	200
AY-68-27-303	06-16-87	1300	354.00	60	20	<1	32	<1	<10
AY-68-27-503	06-16-87	1445	375.00	60	20	<1	31	<1	<10
AY-68-28-202	07-29-87	1000	457.00	180	90	<1	36	1	<10
AY-68-28-203	04-27-87	1100	435.00	1440	100	<1	32	<1	<10
AY-68-28-205	08-14-87	1130	485.00	1440	210	<1	31	<1	<10
AY-68-28-207	06-16-87	1115	265.00	60	6.0	<1	28	2	<10
AY-68-28-501	04-27-87	1230	468.00	1440	250	<1	35	1	<10
AY-68-28-508	04-29-87	1420	464.00	1440	200	<1	26	<1	30
AY-68-28-512	06-16-87	0930	400.00	60	10	<1	35	<1	<10
AY-68-28-608	06-17-87	1400	500.00	60	20	1	31	<1	40
AY-68-28-903	07-17-87	1045	762.00	60	1500	<1	56	<1	10
AY-68-28-904	04-22-87	0930	640.00	1440	800	<1	29	<1	30
AY-68-28-919	04-22-87	1030	550.00	1440	1500	<1	35	<1	<10
AY-68-29-208	06-15-87	1500	266.00	60	10	<1	30	<1	<10
AY-68-29-209	06-15-87	1400	315.00	60	9.0	<1	32	<1	<10
AY-68-29-210	06-15-87	1030	329.00	60	15	<1	31	<1	<10
AY-68-29-211	07-10-87	1300	260.00	30	100	<1	30	<1	20
AY-68-29-303	04-22-87	1300	527.00	1440	700	<1	26	<1	<10
AY-68-29-405	04-22-87	1115	395.00	180	100	<1	47	<1	<10

Water-quality data for wells and springs in the Edwards aquifer, 1987--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 (G/M)	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-68-29-410	04-27-87	1400	318.00	1440	650	<1	37	<1	<10
AY-68-29-415	08-19-87	1345	1100.00	210	4600	<1	39	<1	<10
AY-68-29-510	04-22-87	1430	500.00	30	15	<1	36	<1	<10
AY-68-29-804	04-21-87	1145	761.00	1440	2100	<1	33	<1	<10
AY-68-29-810	04-21-87	1400	500.00	180	10	<1	34	<1	<10
AY-68-35-102	04-27-87	1500	796.00	1440	2000	<1	30	<1	<10
AY-68-36-102	04-24-87	1520	786.00	1440	2000	<1	34	<1	<10
AY-68-37-101	04-21-87	0900	1005.00	60	5000	<1	34	<1	<10
AY-68-37-521	01-22-87	1430	1275.00	60	46	<1	<100	1	<10
AY-68-37-522	01-22-87	1500	1075.00	90	43	<1	<100	1	<10
AY-68-37-523	01-22-87	1530	1175.00	120	20	1	<100	1	<10
AY-68-37-524	01-22-87	1245	881.00	60	53	2	84	<1	<10
AY-68-37-525	01-22-87	1330	1150.00	120	33	<1	200	1	10
AY-68-37-526	01-22-87	1045	1223.00	60	30	1	110	<1	<10
AY-68-37-527	01-22-87	1000	926.00	20	200	<1	110	<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)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
AY-68-21-804	2	11	<5	1	<0.1	<1	<1.0	660
AY-68-27-303	2	5	<5	<1	0.2	<1	<1.0	270
AY-68-27-503	2	<3	<5	<1	<0.1	<1	<1.0	400
AY-68-28-202	19	25	<5	2	<0.1	<1	<1.0	30
AY-68-28-203	5	<3	<5	1	--	<1	<1.0	25
AY-68-28-205	1	7	<5	<1	<0.1	2	6.0	8
AY-68-28-207	16	41	<5	120	<0.1	<1	<1.0	3400
AY-68-28-501	4	<3	<5	<1	--	<1	<1.0	42
AY-68-28-508	4	<3	<5	<1	--	<1	<1.0	22
AY-68-28-512	6	10	<5	<1	0.3	<1	<1.0	470
AY-68-28-608	3	14	<5	<1	<0.1	<1	<1.0	270
AY-68-28-903	29	11	<5	5	<0.1	<1	<1.0	71
AY-68-28-904	6	<3	<5	<1	--	<1	<1.0	20
AY-68-28-919	9	<3	<5	<1	--	<1	<1.0	12
AY-68-29-208	2	5	<5	<1	<0.1	<1	<1.0	350
AY-68-29-209	2	6	<5	<1	--	<1	<1.0	380
AY-68-29-210	5	17	<5	<1	0.1	<1	<1.0	430
AY-68-29-211	5	<3	5	<1	0.1	<1	<1.0	49
AY-68-29-303	13	<3	<5	<1	--	<1	<1.0	50
AY-68-29-405	5	<3	<5	<1	--	<1	<1.0	23
AY-68-29-410	3	<3	<5	<1	--	<1	<1.0	15
AY-68-29-415	10	12	<5	<1	--	1	<1.0	20
AY-68-29-510	4	3	<5	<1	--	<1	<1.0	130
AY-68-29-804	1	<3	<5	<1	--	<1	<1.0	<3
AY-68-29-810	1	19	<5	<1	--	<1	<1.0	250
AY-68-35-102	7	<3	<5	<1	--	<1	<1.0	11
AY-68-36-102	8	<3	<5	<1	--	<1	<1.0	18
AY-68-37-101	5	<3	<5	<1	--	<1	<1.0	16
AY-68-37-521	<1	120	<5	70	--	<1	<1.0	<10
AY-68-37-522	<1	120	<5	50	--	<1	<1.0	30
AY-68-37-523	<1	90	<5	60	--	<1	<1.0	30
AY-68-37-524	2	450	<5	4	--	7	<1.0	33
AY-68-37-525	<1	100	<5	40	--	<1	<1.0	30
AY-68-37-526	<1	1400	<5	17	--	<1	<1.0	15
AY-68-37-527	<1	38	<5	7	--	1	<1.0	40

Water-quality data for wells and springs in the Edwards aquifer, 1987--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 (G/M)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
AY-68-27-503	06-16-87	1445	375.00	60	20	<0.1	<0.10	<0.010
AY-68-28-207	06-16-87	1115	265.00	60	6.0	<0.1	<0.10	<0.010
AY-68-28-513	08-25-87	1400	510.00	1440	1250	<0.1	<0.10	<0.010
AY-68-28-919	04-22-87	1030	550.00	1440	1500	<0.1	<0.10	<0.010
AY-68-29-209	06-15-87	1400	315.00	60	9.0	<0.1	<0.10	<0.010
AY-68-29-303	04-22-87	1300	527.00	1440	700	<0.1	<0.10	<0.010
AY-68-29-810	04-21-87	1400	500.00	180	10	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	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)	ENDRIN, TOTAL (UG/L)
AY-68-27-503	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-28-207	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-28-513	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-28-919	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-29-209	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-29-303	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
AY-68-29-810	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010

LOCAL IDENT-I-FIER	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)	MIREX, TOTAL (UG/L)
AY-68-27-503	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-28-207	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-28-513	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-28-919	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-29-209	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-29-303	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
AY-68-29-810	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

LOCAL IDENT-I-FIER	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-68-27-503	<0.01	<0.1	<1	<0.01	0.01	<0.01	<0.01
AY-68-28-207	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-28-513	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-28-919	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-29-209	<0.01	<0.1	<1	<0.01	0.01	<0.01	<0.01
AY-68-29-303	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-29-810	<0.01	<0.1	<1	<0.01	0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

COMAL COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3
DX-68-15-901	04-23-87	1315	--	--	--	548	6.90	20.5	282
DX-68-22-902	07-16-87	1345	240.00	30	850	465	6.90	22.0	252
DX-68-23-301	04-24-87	1045	--	--	-	513	7.00	23.0	230
DX-68-23-303	04-24-87	1230	1045.00	1440	3000	520	7.20	24.0	229
DX-68-23-316	06-18-87	1000	350.00	60	10	507	7.10	22.5	260
DX-68-23-602	04-24-87	1300	790.00	1440	2000	503	7.10	23.5	232

LOCAL IDENT-I-FIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
DX-68-15-901	300	18	100	12	8.3	1.2	19	11	0.20
DX-68-22-902	270	23	90	12	6.9	0.90	11	11	0.20
DX-68-23-301	260	31	78	16	9.5	1.3	24	13	0.20
DX-68-23-303	270	41	80	17	10	1.3	30	19	0.30
DX-68-23-316	270	15	90	12	5.4	0.80	9.9	9.2	0.10
DX-68-23-602	270	37	83	15	8.4	1.2	21	15	0.20

LOCAL IDENT-I-FIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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	11	332	1.6	0.070	<0.010	0.20	1.40	0.010	1.2
DX-68-22-902	12	295	2.4	0.040	<0.010	0.50	1.90	0.020	1.2
DX-68-23-301	9.4	289	3.1	0.020	<0.010	0.60	2.50	0.010	0.8
DX-68-23-303	13	308	3.4	0.030	<0.010	1.6	1.80	0.010	0.7
DX-68-23-316	11	295	1.3	0.040	<0.010	0.20	1.10	0.030	3.2
DX-68-23-602	12	295	--	0.040	<0.010	<0.20	2.00	0.010	0.9

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	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	04-23-87	1315	--	--	--	<1	33	<1	<10
DX-68-22-902	07-16-87	1345	240.00	30	850	<1	28	<1	<10
DX-68-23-301	04-24-87	1045	--	--	--	<1	44	<1	<10
DX-68-23-303	04-24-87	1230	1045.00	1440	3000	2	51	<1	<10
DX-68-23-316	06-18-87	1000	350.00	60	10	<1	30	<1	<10
DX-68-23-602	04-24-87	1300	790.00	1440	2000	2	36	<1	<10

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

COMAL COUNTY--Continued

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)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
DX-68-15-901	13	5	<5	<1	--	<1	<1.0	30
DX-68-22-902	17	<3	<5	<1	0.1	<1	<1.0	7
DX-68-23-301	7	<3	<5	<1	--	<1	<1.0	20
DX-68-23-303	6	<3	<5	<1	--	<1	<1.0	100
DX-68-23-316	1	18	<5	<1	<0.1	<1	<1.0	330
DX-68-23-602	7	<3	<5	<1	--	<1	<1.0	15

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
DX-68-15-901	04-23-87	1315	--	--	--	<0.1	<0.10	<0.010
DX-68-23-301	04-24-87	1045	--	--	--	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	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)	ENDRIN, TOTAL (UG/L)
DX-68-15-901	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
DX-68-23-301	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	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)	MIREX, TOTAL (UG/L)
DX-68-15-901	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	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)
DX-68-15-901	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3
LR-67-01-402	07-31-87	1450	120.00	60	10	570	6.98	22.0	293
LR-67-01-801	04-23-87	0900	--	--	--	573	6.90	21.0	262
LR-67-01-806	07-16-87	1100	115.00	1440	4500	552	6.90	22.5	266
LR-67-01-811	07-31-87	1215	265.00	60	15	566	7.26	22.0	260
LR-67-09-105	04-23-87	1100	330.00	1440	2000	603	6.90	22.5	261
LR-67-09-111	07-16-87	0915	264.00	1440	280	540	7.00	23.0	262

LOCAL IDENTIFIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
LR-67-01-402	310	14	110	7.6	5.4	0.70	7.6	8.8	0.10
LR-67-01-801	290	29	85	19	11	1.5	24	17	0.20
LR-67-01-806	300	38	95	16	12	1.3	26	18	0.20
LR-67-01-811	310	47	65	35	6.7	1.2	42	10	1.2
LR-67-09-105	300	38	90	18	14	1.5	32	23	0.20
LR-67-09-111	300	34	92	16	11	1.3	24	17	0.20

LOCAL IDENTIFIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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-67-01-402	12	328	--	--	--	--	--	--	--
LR-67-01-801	11	326	1.6	0.020	<0.010	0.30	1.30	0.010	0.9
LR-67-01-806	12	340	2.3	0.100	<0.010	0.50	1.80	0.010	1.3
LR-67-01-811	12	329	--	--	--	--	--	--	--
LR-67-09-105	12	347	2.1	0.040	<0.010	0.40	1.70	0.010	0.7
LR-67-09-111	12	331	2.1	0.080	<0.010	0.40	1.70	<0.010	1.5

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
LR-67-01-801	04-23-87	0900	--	--	--	<1	34	<1	<10
LR-67-01-806	07-16-87	1100	115.00	1440	4500	<1	37	<1	<10
LR-67-09-105	04-23-87	1100	330.00	1440	2000	<1	40	<1	<10
LR-67-09-111	07-16-87	0915	264.00	1440	280	<1	38	<1	<10

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

HAYS COUNTY--Continued

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)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
LR-67-01-801	5	<3	<5	<1	--	<1	1.0	6
LR-67-01-806	20	<3	<5	<1	0.3	<1	<1.0	11
LR-67-09-105	5	<3	<5	<1	--	<1	1.0	22
LR-67-09-111	23	<3	<5	<1	<0.1	<1	<1.0	19

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
LR-67-01-801	04-23-87	0900	--	--	--	<0.1	<0.10	<0.010
LR-67-09-105	04-23-87	1100	330.00	1440	2000	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	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)	ENDRIN, TOTAL (UG/L)
LR-67-01-801	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010
LR-67-09-105	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	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)	MIREX, TOTAL (UG/L)
LR-67-01-801	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	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	<0.1	<1	<0.01	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Water-quality for wells and springs in the Edwards aquifer, 1987--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 (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3
TD-68-26-701	07-29-87	1230	750.00	300	500	490	7.20	23.0	205
TD-68-33-202	07-29-87	1430	279.00	40	15	430	7.10	22.5	195
TD-68-41-303	07-23-87	0900	717.00	60	425	443	7.20	23.5	203
TD-68-42-503	04-28-87	1030	1373.00	1440	600	1240	6.60	25.0	238
TD-68-49-813	04-28-87	1300	3194.00	90	340	1260	7.20	41.5	286
TD-69-46-601	04-29-87	1150	1289.00	30	325	445	7.60	23.5	--
TD-69-47-303	04-29-87	0905	1803.00	1440	1110	465	7.30	26.0	206

LOCAL IDENT-I-FIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
TD-68-26-701	270	63	74	20	8.7	1.3	53	12	0.10
TD-68-33-202	230	34	75	10	6.9	1.0	27	10	0.10
TD-68-41-303	240	41	71	16	10	1.1	17	18	0.10
TD-68-42-503	550	320	190	19	9.3	1.0	14	240	0.20
TD-68-49-813	230	0	57	22	130	6.9	76	190	4.8
TD-69-46-601	230	--	69	15	7.6	1.0	18	12	0.20
TD-69-47-303	230	27	65	17	7.9	1.1	17	15	0.20

LOCAL IDENT-I-FIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
TD-68-26-701	13	305	--	0.040	<0.010	<0.20	1.10	0.010	1.5
TD-68-33-202	12	259	1.4	0.040	<0.010	0.60	0.800	0.010	2.4
TD-68-41-303	13	268	2.3	0.030	<0.010	0.30	2.00	0.010	1.8
TD-68-42-503	13	629	2.1	0.090	<0.010	0.30	1.80	0.010	2.8
TD-68-49-813	22	680	--	0.700	<0.010	0.70	<0.100	0.020	1.5
TD-69-46-601	13	295	2.1	0.030	<0.010	0.50	1.60	0.010	1.2
TD-69-47-303	13	260	2.0	0.030	<0.010	0.40	1.60	0.010	0.8

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
TD-68-26-701	07-29-87	1230	750.00	300	500	<1	34	2	<10
TD-68-33-202	07-29-87	1430	279.00	40	15	<1	34	<1	<10
TD-68-41-303	07-23-87	0900	717.00	60	425	<1	47	1	<10
TD-68-42-503	04-28-87	1030	1373.00	1440	600	<1	100	1	<10
TD-68-49-813	04-28-87	1300	3194.00	90	340	<1	240	<1	<10
TD-69-46-601	04-29-87	1150	1289.00	30	325	<1	36	<1	<10
TD-69-47-303	04-29-87	0905	1803.00	1440	1110	<1	43	<1	10

Water-quality for wells and springs in the Edwards aquifer, 1987--Continued

MEDINA COUNTY--Continued

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)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
TD-68-26-701	8	22	<5	<1	0.1	<1	<1.0	31
TD-68-33-202	14	5	<5	<1	<0.1	<1	<1.0	190
TD-68-41-303	15	24	<5	2	0.1	<1	<1.0	27
TD-68-42-503	9	3	<5	4	--	<1	<1.0	32
TD-68-49-813	<1	54	<5	11	--	<1	<1.0	<3
TD-69-46-601	3	9	<5	<1	--	<1	<1.0	42
TD-69-47-303	7	<3	<5	<1	--	<1	<1.0	13

Water-quality data for wells and springs in the Edwards aquifer, 1987--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 (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3
YP-69-35-803	07-09-87	1100	682.00	1440	800	403	7.00	23.0	206
YP-69-36-702	07-08-87	1730	538.00	120	800	433	6.90	22.0	205
YP-69-42-606	07-14-87	1130	525.00	2880	1000	577	7.00	23.0	207
YP-69-43-606	07-08-87	1630	698.00	30	400	480	7.00	23.5	190
YP-69-50-203	03-24-87	1437	525.00	515	1400	550	--	23.0	--
	07-09-87	1000	525.00	1440	1410	505	7.00	23.0	211
YP-69-50-312	03-23-87	1825	162.00	35	15	875	6.80	23.5	292
YP-69-50-313	03-24-87	1344	120.00	35	40	540	--	23.5	--
YP-69-50-314	03-24-87	1115	300.00	25	10	593	--	23.0	--
YP-69-50-315	03-26-87	1300	156.00	--	--	595	6.73	21.5	277
YP-69-50-320	03-25-87	1425	637.00	20	1400	669	6.95	23.0	244
YP-69-50-321	03-25-87	1115	160.00	80	12	538	6.70	22.0	248
YP-69-50-322	03-24-87	1030	150.00	40	10	920	--	23.5	--
YP-69-50-323	03-26-87	0950	151.40	--	--	894	6.60	22.0	320
YP-69-50-324	03-25-87	1500	180.00	85	12	648	7.00	23.0	233
YP-69-50-325	03-25-87	1300	160.00	65	12	603	6.80	23.5	256
YP-69-50-326	03-26-87	1055	200.00	30	--	529	6.80	23.0	210
YP-69-50-327	03-23-87	1720	110.00	50	--	773	6.80	23.5	271
YP-69-50-328	03-23-87	1600	120.00	30	--	525	6.60	23.0	215
YP-69-50-329	03-23-87	1505	120.00	35	--	549	6.80	23.0	215
YP-69-50-330	03-23-87	1140	--	60	15	508	6.90	23.0	205
YP-69-50-331	03-23-87	1315	120.00	40	--	530	6.90	23.0	203
YP-69-51-104	03-24-87	1155	430.00	360	555	843	--	24.0	--
	07-09-87	0900	430.00	720	750	887	6.80	24.0	271
YP-69-51-107	03-24-87	0850	310.00	45	15	798	6.64	24.5	253

LOCAL IDENT-I-FIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
YP-69-35-803	230	25	71	13	7.4	0.60	9.3	15	<0.10
YP-69-36-702	220	19	65	15	8.8	0.80	13	19	0.20
YP-69-42-606	270	59	90	9.9	20	1.1	17	56	0.20
YP-69-43-606	240	46	78	10	12	1.1	23	33	0.10
YP-69-50-203	--	0	--	--	--	--	--	--	--
	260	49	86	11	15	0.60	16	40	<0.10
YP-69-50-312	--	0	--	--	--	--	--	--	--
YP-69-50-313	--	0	--	--	--	--	--	--	--
YP-69-50-314	--	0	--	--	--	--	--	--	--
YP-69-50-315	290	9	99	9.4	14	1.0	13	27	0.20
YP-69-50-320	300	52	100	11	22	1.0	24	52	0.10
YP-69-50-321	250	7	91	6.7	15	3.6	15	19	0.20
YP-69-50-322	--	0	--	--	--	--	--	--	--
YP-69-50-323	--	0	--	--	--	--	--	--	--
YP-69-50-324	280	51	97	10	22	1.5	24	44	0.20
YP-69-50-325	280	26	98	9.0	15	3.1	13	27	0.20
YP-69-50-326	250	36	82	9.8	14	1.0	12	32	0.10
YP-69-50-327	350	79	120	12	27	1.0	41	62	0.30
YP-69-50-328	250	37	85	9.5	12	1.0	11	26	0.10
YP-69-50-329	250	36	84	9.8	15	1.0	15	33	0.10

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

UVALDE COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS TOTAL (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)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
YP-69-50-330	240	34	80	9.4	12	1.0	14	27	0.10
YP-69-50-331	250	43	82	9.9	14	0.90	13	34	0.10
YP-69-51-104	--	0	--	--	--	--	--	--	--
	420	150	140	16	38	1.0	61	120	0.40
YP-69-51-107	--	0	--	--	--	--	--	--	--

LOCAL IDENTIFIER	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (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-69-35-803	13	253	3.1	0.020	<0.010	0.50	2.60	0.030	0.9
YP-69-36-702	12	257	2.8	0.050	<0.010	0.80	2.00	0.020	0.7
YP-69-42-606	13	331	5.4	0.100	<0.010	0.50	4.90	<0.010	1.4
YP-69-43-606	13	284	3.9	0.040	<0.010	0.90	3.00	0.020	1.3
YP-69-50-203	--	--	--	--	--	--	--	--	--
	13	308	3.7	0.030	<0.010	0.80	2.90	0.010	0.9
YP-69-50-312	--	--	--	--	--	--	--	--	--
YP-69-50-313	--	--	--	--	--	--	--	--	--
YP-69-50-314	--	--	--	--	--	--	--	--	--
YP-69-50-315	14	344	--	--	--	--	--	--	--
YP-69-50-320	13	369	--	--	--	--	--	--	--
YP-69-50-321	13	312	--	--	--	--	--	--	--
YP-69-50-322	--	--	--	--	--	--	--	--	--
YP-69-50-323	--	--	--	--	--	--	--	--	--
YP-69-50-324	14	352	--	--	--	--	--	--	--
YP-69-50-325	13	332	--	--	--	--	--	--	--
YP-69-50-326	13	290	--	--	--	--	--	--	--
YP-69-50-327	15	441	--	--	--	--	--	--	--
YP-69-50-328	13	287	--	--	--	--	--	--	--
YP-69-50-329	13	300	--	--	--	--	--	--	--
YP-69-50-330	12	278	--	--	--	--	--	--	--
YP-69-50-331	12	288	--	--	--	--	--	--	--
YP-69-51-104	--	--	--	--	--	--	--	--	--
	16	555	5.2	0.060	<0.010	0.60	4.60	0.010	1.1
YP-69-51-107	--	--	--	--	--	--	--	--	--

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	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-69-35-803	07-09-87	1100	682.00	1440	800	<1	47	<1	<10
YP-69-36-702	07-08-87	1730	538.00	120	800	<1	34	<1	<10
YP-69-42-606	07-14-87	1130	525.00	2880	1000	<1	60	<1	40
YP-69-43-606	07-08-87	1630	698.00	30	400	<1	53	<1	40
YP-69-50-203	07-09-87	1000	525.00	1440	1410	<1	50	<1	<10
YP-69-51-104	07-09-87	0900	430.00	720	750	<1	110	<1	40

Water-quality data for wells and springs in the Edwards aquifer, 1987--Continued

UVALDE COUNTY--Continued

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)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
YP-69-35-803	12	14	<5	2	0.1	<1	<1.0	23
YP-69-36-702	1	<3	11	<1	0.4	4	<1.0	13
YP-69-42-606	20	7	<5	<1	<0.1	<1	<1.0	12
YP-69-43-606	7	<3	20	<1	0.1	1	<1.0	12
YP-69-50-203	2	7	19	<1	0.3	<1	<1.0	9
YP-69-51-104	5	5	<5	<1	<0.1	1	<1.0	17

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
YP-69-36-702	07-08-87	1730	538.00	120	800	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	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)	ENDRIN, TOTAL (UG/L)
YP-69-36-702	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	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)	MIREX, TOTAL (UG/L)
YP-69-36-702	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	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)
YP-69-36-702	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1987

[MIN, minute; G/M, gallons per minute; UG/L, micrograms per liter]

BEXAR COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
AY-68-21-804	06-15-87	1230	279.00	60	10	<0.20	<0.20	<0.20
AY-68-27-303	06-16-87	1300	354.00	60	20	<0.20	<0.20	<0.20
AY-68-27-503	06-16-87	1445	375.00	60	20	<0.20	<0.20	<0.20
AY-68-28-202	07-29-87	1000	457.00	180	90	<0.20	<0.20	<0.20
AY-68-28-203	04-27-87	1100	435.00	1440	100	<0.20	<0.20	<0.20
AY-68-28-207	06-16-87	1115	265.00	60	6.0	<0.20	<0.20	<0.20
AY-68-28-501	04-27-87	1230	468.00	1440	250	<0.20	<0.20	<0.20
AY-68-28-508	04-29-87	1420	464.00	1440	200	<0.20	<0.20	<0.20
AY-68-28-512	06-16-87	0930	400.00	60	10	<0.20	<0.20	<0.20
AY-68-28-608	06-17-87	1400	500.00	60	20	<0.20	<0.20	<0.20
AY-68-28-903	07-17-87	1045	762.00	60	1500	<0.20	<0.20	<0.20
AY-68-28-904	04-22-87	0930	640.00	1440	800	<0.20	<0.20	<0.20
AY-68-28-919	04-22-87	1030	550.00	1440	1500	<0.20	<0.20	<0.20
AY-68-29-208	06-15-87	1500	266.00	60	10	<0.20	<0.20	<0.20
AY-68-29-209	06-15-87	1400	315.00	60	9.0	<0.20	<0.20	<0.20
AY-68-29-210	06-15-87	1030	329.00	60	15	<0.20	<0.20	<0.20
AY-68-29-211	07-10-87	1300	260.00	30	100	<0.20	<0.20	<0.20
AY-68-29-303	04-22-87	1300	527.00	1440	700	<0.20	<0.20	<0.20
AY-68-29-405	04-22-87	1115	395.00	180	100	<0.20	<0.20	<0.20
AY-68-29-410	04-27-87	1400	318.00	1440	650	<0.20	<0.20	<0.20
AY-68-29-415	08-19-87	1345	1100.00	210	4600	<0.20	<0.20	<0.20
AY-68-29-505	08-19-87	1150	807.00	30	600	<0.20	<0.20	<0.20
AY-68-29-804	04-21-87	1145	761.00	1440	2100	<0.20	<0.20	<0.20
AY-68-29-810	04-21-87	1400	500.00	180	10	<0.20	<0.20	<0.20
AY-68-29-912	08-19-87	1045	630.00	210	1250	<0.20	<0.20	<0.20
AY-68-29-920	08-19-87	0920	655.00	1440	1150	<0.20	<0.20	<0.20
AY-68-35-102	04-27-87	1500	796.00	1440	2000	<0.20	<0.20	<0.20
AY-68-36-102	04-24-87	1520	786.00	1440	2000	<0.20	<0.20	<0.20
AY-68-37-101	04-21-87	0900	1005.00	60	5000	<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-68-28-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-207	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-501	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-508	<0.20	<0.20	0.90	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-512	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-608	<0.20	<0.20	<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-68-28-904	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-919	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-208	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-209	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-210	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-211	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-303	<0.20	<0.20	<0.20	<0.20	<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

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

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)
AY-68-29-410	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-415	<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-68-29-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-810	<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-68-29-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-101	<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)
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-68-28-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-207	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-501	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-508	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-512	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-608	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-903	<0.20	<0.20	3.1	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-904	<0.20	<0.20	0.60	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-919	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-208	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-209	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-210	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-211	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-303	<0.20	<0.20	<0.20	<0.20	<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-68-29-410	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-415	<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-68-29-804	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-810	<0.20	<0.20	0.30	<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-68-29-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-102	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-101	<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-TRANSDICHLOROETHENE TOTAL (UG/L)	1,3-DICHLOROPROPENE 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

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1987--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	1,3-DICHLOROPROPENE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
AY-68-28-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-207	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-501	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-508	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-512	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-608	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-903	<0.20	<0.20	1.0	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-904	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-919	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-208	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-209	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-210	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-211	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-405	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-410	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-415	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-505	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	2.3
AY-68-29-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.2
AY-68-29-810	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-912	<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-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-36-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-37-101	<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, 1987--Continued

COMAL COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
DX-68-15-901	04-23-87	1315	--	--	--	<0.20	<0.20	<0.20
DX-68-22-902	07-16-87	1345	240.00	30	850	<0.20	<0.20	<0.20
DX-68-23-301	04-24-87	1045	--	--	--	<0.20	<0.20	<0.20
DX-68-23-303	04-24-87	1230	1045.00	1440	3000	<0.20	<0.20	<0.20
DX-68-23-316	06-18-87	1000	350.00	60	10	<0.20	<0.20	<0.20
DX-68-23-602	04-24-87	1300	790.00	1440	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)
DX-68-15-901	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-602	<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)
DX-68-15-901	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	<0.20
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-602	<0.20	<0.20	0.30	<0.20	<0.20	<0.20	0.40	<0.20

LOCAL IDENT-I-FIER	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	2-CHLORO-ETHYL-VINYL-ETHER TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)
DX-68-15-901	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
DX-68-23-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
DX-68-23-602	<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, 1987--Continued

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DICHLOROBROMOMETHANE TOTAL (UG/L)	CARBON TETRACHLORIDE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)
LR-67-01-402	07-31-87	1450	120.00	60	10	<0.20	<0.20	<0.20
LR-67-01-801	04-23-87	0900	--	--	--	<0.20	<0.20	<0.20
LR-67-01-806	07-16-87	1100	115.00	1440	4500	<0.20	<0.20	<0.20
LR-67-01-811	07-31-87	1215	265.00	60	15	<0.20	<0.20	<0.20
LR-67-09-111	07-16-87	0915	264.00	1440	280	<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)
LR-67-01-402	<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-67-01-811	<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-67-01-402	<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-67-01-811	<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	1,1,2,2 TETRACHLOROETHANE TOTAL (UG/L)	1,2-DICHLOROPROPANE TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE TOTAL (UG/L)	1,3-DICHLOROPROPENE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
LR-67-01-402	<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-67-01-811	<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, 1987--Continued

MEDINA COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DICHLOROBROMOMETHANE TOTAL (UG/L)	CARBON TETRACHLORIDE TOTAL (UG/L)	1,2-DICHLOROETHANE TOTAL (UG/L)
TD-68-33-202	07-29-87	1430	279.00	40	15	<0.20	<0.20	<0.20
TD-68-41-303	07-23-87	0900	717.00	60	425	<0.20	<0.20	<0.20
TD-68-42-503	04-28-87	1030	1373.00	1440	600	1.5	<0.20	<0.20
TD-68-49-813	04-28-87	1300	3194.00	90	340	<0.20	<0.20	<0.20
TD-69-46-601	04-29-87	1150	1289.00	30	325	<0.20	<0.20	<0.20
TD-69-47-303	04-29-87	0905	1803.00	1440	1110	<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-68-33-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-41-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-42-503	2.0	3.4	0.60	<0.20	<0.20	2.4	<0.20	1.7
TD-68-49-813	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-303	0.30	<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-68-33-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-41-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-42-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	<0.20
TD-68-49-813	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-303	<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-TRANSDICHLOROETHENE TOTAL (UG/L)	1,3-DICHLOROPROPENE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
TD-68-33-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-68-41-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-68-42-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-68-49-813	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-69-47-303	<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, 1987--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 (G/M)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
YP-69-36-702	07-08-87	1730	538.00	120	800	<0.20	<0.20	<0.20
YP-69-43-606	07-08-87	1630	698.00	30	400	<0.20	<0.20	<0.20
YP-69-50-203	03-24-87	1437	525.00	515	1400	<0.20	<0.20	<0.20
	07-09-87	1000	525.00	1440	1410	<0.20	<0.20	<0.20
YP-69-50-312	03-23-87	1825	162.00	35	15	<0.20	<0.20	<0.20
YP-69-50-313	03-24-87	1344	120.00	35	40	<0.20	<0.20	<0.20
YP-69-50-314	03-24-87	1115	300.00	25	10	<0.20	<0.20	<0.20
YP-69-50-315	03-26-87	1300	156.00	--	--	<0.20	<0.20	<0.20
YP-69-50-320	03-25-87	1425	637.00	20	1400	<0.20	<0.20	<0.20
YP-69-50-321	03-25-87	1115	160.00	80	12	<0.20	<0.20	<0.20
YP-69-50-322	03-24-87	1030	150.00	40	10	<0.40	<0.40	<0.40
YP-69-50-323	03-26-87	0950	151.40	--	--	<0.20	<0.20	<0.20
YP-69-50-324	03-25-87	1500	180.00	85	12	<0.20	<0.20	<0.20
YP-69-50-325	03-25-87	1300	160.00	65	12	<0.20	<0.20	<0.20
YP-69-50-326	03-26-87	1055	200.00	30	--	<0.20	<0.20	<0.20
YP-69-50-327	03-23-87	1720	110.00	50	--	<0.20	<0.20	<0.20
YP-69-50-328	03-23-87	1600	120.00	30	--	<0.20	<0.20	<0.20
YP-69-50-329	03-23-87	1505	120.00	35	--	<0.20	<0.20	<0.20
YP-69-50-330	03-23-87	1140	--	60	15	<0.20	<0.20	<0.20
YP-69-50-331	03-23-87	1315	120.00	40	--	<0.20	<0.20	<0.20
YP-69-51-104	03-24-87	1155	430.00	360	555	<0.20	<0.20	<0.20
	07-09-87	0900	430.00	720	750	<0.20	<0.20	<0.20
YP-69-51-107	03-24-87	0850	310.00	45	15	<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-69-36-702	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-43-606	<0.20	<0.20	<0.20	<0.20	15	<0.20	<0.20	<0.20
YP-69-50-203	<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-69-50-312	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-313	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-314	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-315	<0.20	<0.20	<0.20	0.30	<0.20	<0.20	0.20	<0.20
YP-69-50-320	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-321	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-322	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
YP-69-50-323	<0.20	<0.20	<0.20	0.40	<0.20	<0.20	<0.20	<0.20
YP-69-50-324	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-325	<0.20	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-326	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-327	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-328	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-329	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-330	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-331	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	0.40	<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-69-51-107	<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, 1987--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-69-36-702	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-43-606	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-203	<0.20	<0.20	44	<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-69-50-312	<0.20	<0.20	39	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-313	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-314	<0.20	<0.20	0.60	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-315	<0.20	<0.20	30	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-320	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-321	<0.20	<0.20	1.6	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-322	<0.40	<0.40	48	<0.40	<0.40	<0.40	<0.40	<0.40
YP-69-50-323	<0.20	<0.20	12	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-324	<0.20	<0.20	110	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-325	<0.20	<0.20	55	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-326	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-327	<0.20	<0.20	29	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-328	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-329	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-330	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-331	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	<0.20	<0.20	10	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	13	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-107	<0.20	<0.20	7.4	<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-TRANSDICHLOROETHENE TOTAL (UG/L)	1,3-DICHLOROPROPENE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	DICHLORODIFLUOROMETHANE TOTAL (UG/L)	VINYL CHLORIDE TOTAL (UG/L)	TRICHLOROETHYLENE TOTAL (UG/L)
YP-69-36-702	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-43-606	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-203	<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-69-50-312	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-313	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-314	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-315	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-320	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-321	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-322	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.4
YP-69-50-323	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-324	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.4
YP-69-50-325	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
YP-69-50-326	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-327	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.2
YP-69-50-328	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-329	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-330	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
YP-69-50-331	<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

Analyses for radio-chemical elements or compounds from wells and springs in the Edwards aquifer, 1987

Well number	Date sampled	Tritium units 1/	Gross beta, dissolved cesium-137 (pCi/L) 2/	Gross alpha, dissolved uranium, natural (pCi/L)	Gross beta, dissolved strontium-90 (pCi/L)
AY-68-37-521	01-22-87	0.1	50	5.1	33
AY-68-37-522	01-22-87	0.1	43	19	28
AY-68-37-523	01-22-87	0.1	53	27	35
AY-68-37-524	01-22-87	1.7	5.0	4.9	3.8
AY-68-37-525	01-22-87	0.1	52	12	35
AY-68-37-526	01-22-87	2.0	7.1	3.6	4.8
AY-68-37-527	01-22-87	2.7	2.2	3.7	1.7

1/ Tritium units = 1 tritium atom per 10^{18} hydrogen atoms
= 3.193 pCi/L

2/ pCi/L = pico-Curies per liter

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]

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 (SO4)	--	250 mg/L
Zinc (Zn)	--	5,000 µg/L
Dissolved solids	--	500 mg/L
Fluoride 5/	4 mg/L	2mg/L
	Organic chemicals	
Chlorinated hydrocarbons		
Endrin	0.2 µg/L	--
Lindane	4 µg/L	--
Methoxychlor	100 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/
	Organic chemicals--Continued	
Toxaphene	5 µg/L	--
Chlorophenoxys		
2,4-D	100 µg/L	--
Silvex	10 µg/L	--
	Volatile organic compounds 6/	
Trichloroethylene	5 µg/l	--
Carbon tetrachloride	5 µg/l	--
Vinyl chloride	2 µg/l	--
1,2-Dichloroethane	5 µg/l	--
Benzene	5 µg/l	--
1,1-Dichloroethylene	7 µg/l	--
1,1,1-Trichloroethane	200 µg/l	--
p-Dichlorobenzene	75 µg/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 contaminant$ that may have a significant direct impact on the health of the consumer and are enforceable by the U.S. Environmental Protection Agency.

4 Secondary maximum contaminant level.--The advisable maximum 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, 1987). 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 1986 to September 1987

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 1,369.83 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 2.22 ft higher. June 2, 1980, to Sept. 30, 1986, at present site at datum 2.00 ft higher.

REMARKS.--Estimated daily discharges: Oct. 7, Mar. 9-15. Records good except those for estimated daily discharges, which are fair. Many small diversions above station for irrigation. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--48 years (water years 1940-87), 203 ft³/s (147,100 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 42.3 ft, present datum, 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. 12	1000	9,210	12.89	June 4	0100	30,600	19.20
Dec. 22	--	Unknown	Unknown	June 10	2100	4,830	10.16
May 29	1000	27,200	18.45	June 11	0800	16,600	15.69
May 31	1700	3,330	8.71	June 12	1000	10,300	13.41
June 2	1200	3,010	8.36	June 13	1900	4,380	9.76
June 3	1400	23,800	17.66	July 17	1000	*130,000	*31.50

Minimum daily discharge, 158 ft³/s Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	211	388	321	789	426	542	433	271	2040	885	601	465
2	191	381	313	764	410	524	422	273	1880	818	581	423
3	167	371	307	738	401	500	416	311	11200	759	564	400
4	158	921	302	699	397	484	412	557	14700	728	550	391
5	166	907	306	686	439	478	433	435	3720	706	536	381
6	423	643	310	675	551	473	484	352	2640	678	516	373
7	343	586	353	655	465	465	446	317	2220	646	503	372
8	326	530	347	643	430	460	428	295	2000	629	487	383
9	289	497	329	672	408	470	420	289	2030	625	481	367
10	254	474	447	627	401	480	411	278	2620	646	474	360
11	385	462	539	590	397	570	402	258	5490	598	464	547
12	3900	443	477	575	390	510	399	262	5800	577	460	518
13	1470	435	434	570	386	490	395	255	3390	556	541	431
14	902	415	532	566	388	480	363	261	3060	538	475	400
15	674	410	676	553	400	470	348	247	2310	539	451	390
16	562	405	614	539	360	480	354	278	2030	551	436	395
17	506	393	582	649	363	881	349	358	1830	36700	427	384
18	456	388	609	606	357	659	341	300	1700	2940	416	385
19	419	376	579	536	353	582	334	1100	1560	1460	406	381
20	399	369	549	515	390	549	325	969	1460	1170	396	364
21	396	356	538	523	379	546	321	583	1370	1000	385	356
22	514	348	2700	520	362	535	328	456	1320	953	380	336
23	956	341	2170	493	346	528	343	406	1230	862	375	332
24	756	330	1370	483	433	492	374	394	1180	801	369	327
25	609	495	1160	459	427	484	382	391	1110	762	360	324
26	550	389	1080	446	800	476	348	352	1050	727	359	318
27	496	357	986	444	671	476	315	326	953	718	356	314
28	466	345	929	443	639	466	294	323	933	691	595	315
29	438	337	904	437	---	454	288	8570	890	662	513	320
30	418	327	863	429	---	450	289	3000	897	638	487	312
31	401	---	827	419	---	442	---	2120	---	622	500	---
TOTAL	18201	13419	22453	17743	12169	15896	11197	24587	84613	61185	14444	11364
MEAN	587	447	724	572	435	513	373	793	2820	1974	466	379
MAX	3900	921	2700	789	800	881	484	8570	14700	36700	601	547
MIN	158	327	302	419	346	442	288	247	890	538	356	312
AC-FT	36100	26620	44540	35190	24140	31530	22210	48770	167800	121400	28650	22540

CAL YR 1986 TOTAL 115827 MEAN 317 MAX 4570 MIN 61 AC-FT 229700
WTR YR 1987 TOTAL 307271 MEAN 842 MAX 36700 MIN 158 AC-FT 609500

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.--No estimated daily discharges. Records good. Several small diversions above station for irrigation. Satellite telemeter at station. One observation of water temperature was made during the year.

AVERAGE DISCHARGE.--65 years, 333 ft³/s (241,300 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. 12	0900	11,500	15.15	June 1	0900	7,160	11.42
Dec. 23	0100	7,860	12.06	June 4	2000	31,000	25.86
May 29	1000	6,620	10.91	June 12	0200	22,800	22.43
May 30	0400	20,000	20.99	June 13	0500	15,800	18.38
May 31	2000	6,870	11.14	July 18	0200	*76,500	*35.58

Minimum daily discharge, 249 ft³/s Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	354	907	629	1850	758	1250	733	447	5900	1730	991	683
2	319	872	611	1730	747	1140	721	433	4850	1630	947	634
3	288	844	599	1650	723	1090	699	433	9430	1530	913	580
4	262	912	588	1580	703	1050	686	484	23700	1400	884	548
5	249	1830	581	1510	701	992	683	671	15600	1330	860	528
6	340	1300	582	1430	816	976	721	569	7580	1270	832	516
7	574	1110	602	1380	834	961	733	503	5710	1210	799	507
8	534	1040	646	1340	749	945	691	465	4820	1180	770	515
9	467	950	631	1250	701	916	671	445	4700	1150	742	510
10	416	899	689	1310	678	907	659	435	7020	1140	731	489
11	625	861	1250	1220	673	999	646	429	12800	1120	713	560
12	7090	837	1060	1170	662	1050	626	412	14800	1060	695	738
13	6280	810	941	1130	646	965	610	408	12100	1010	683	665
14	2260	786	934	1110	645	932	582	398	9350	970	750	570
15	1540	779	1590	1080	651	914	555	398	6760	941	674	528
16	1200	773	1520	1050	643	894	542	469	5350	961	639	514
17	1050	761	1390	1050	602	1030	543	498	4640	8310	619	518
18	938	746	1350	1220	594	1250	531	502	4130	32000	600	531
19	849	730	1360	1090	586	1040	522	475	3790	3430	585	521
20	786	720	1270	997	605	979	513	2230	3450	2360	568	498
21	754	698	1200	968	626	956	500	1130	3150	1970	552	473
22	1170	696	4030	969	609	943	498	770	2910	1790	538	459
23	2220	687	6530	934	587	925	505	644	2730	1690	526	438
24	2420	674	4420	917	715	894	517	589	2510	1530	518	434
25	1680	759	3390	890	796	847	549	571	2360	1430	508	425
26	1480	848	3010	847	1460	839	545	554	2200	1350	495	422
27	1320	711	2750	825	1590	831	511	515	2070	1340	483	417
28	1180	674	2400	814	1400	826	481	494	1900	1260	485	418
29	1080	661	2260	813	---	785	460	6000	1810	1180	804	412
30	1010	643	2150	782	---	765	446	13100	1740	1100	717	406
31	955	---	1990	761	---	749	---	4990	---	1040	695	---
TOTAL	41690	25518	52953	35667	21500	29640	17679	40461	189860	81412	21316	15457
MEAN	1345	851	1708	1151	768	956	589	1305	6329	2626	688	515
MAX	7090	1830	6530	1850	1590	1250	733	13100	23700	32000	991	738
MIN	249	643	581	761	586	749	446	398	1740	941	483	406
AC-FT	82690	50610	105000	70750	42650	58790	35070	80250	376600	161500	42280	30660

CAL YR 1986 TOTAL 229937 MEAN 630 MAX 7090 MIN 106 AC-FT 456100
WTR YR 1987 TOTAL 573153 MEAN 1570 MAX 32000 MIN 249 AC-FT 1137000

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, 732,600 acre-ft June 19, 1987 (elevation, 942.68 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 contents, 732,600 acre-ft June 19 at 2000 hours (elevation, 942.68 ft); minimum, 339,900 acre-ft Sept. 30 at 2200 hours (elevation, 903.71 ft).

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

903.0	334,500	918.0	460,800	933.0	615,200
908.0	373,800	923.0	508,700	938.0	674,100
913.0	415,900	928.0	560,100	943.0	736,700

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	387700	396500	379900	422500	383000	392900	393200	380200	435400	661400	510000	391100
2	386900	395400	379900	418400	382700	394500	392700	380000	447500	654200	502000	390600
3	385800	394300	379700	414300	382300	396100	392000	379700	468000	646900	493900	389900
4	384800	393800	379700	410100	382000	397300	391100	379900	512600	639200	485800	389200
5	383700	394100	379600	405900	382500	398100	390900	380100	544300	631500	477700	388600
6	383300	393800	379700	402300	382600	398700	390300	380100	558600	624200	469400	387800
7	383000	393300	379900	400200	382700	399500	389800	380200	569500	615800	461200	387200
8	382500	392700	380100	399400	382700	400100	389100	380000	579000	608000	453000	386600
9	382000	391700	380100	399400	382600	400600	388600	379700	588600	600900	444900	384600
10	381400	390800	380800	399100	382500	400900	387900	379500	602200	593600	436800	381900
11	382700	389300	382200	398700	382300	401000	387200	379400	627700	589700	428600	380300
12	398200	388200	383000	398200	382500	401000	386600	379100	657000	581800	420200	380000
13	408300	387000	383700	397600	382400	400900	386100	379000	680900	573600	411900	379400
14	410400	386300	385400	397100	382300	400700	385000	378700	698700	565500	405600	376700
15	408600	385600	387300	396400	382300	400600	384100	378400	711200	557500	404000	373700
16	405700	385100	388800	395700	382000	401000	383200	379100	721300	549300	402200	370700
17	402700	384400	390200	395400	381800	401100	382200	379000	727400	549700	400400	367800
18	399400	383700	391500	394700	381300	401600	381800	378900	730500	599100	398400	366000
19	397300	383000	392700	393800	381300	401700	381800	379200	731300	595300	396900	365600
20	396400	382000	393700	392800	381200	401500	381700	382600	727200	593900	396200	364600
21	396100	381500	394800	392100	381000	401500	381600	384000	722600	593000	395600	361200
22	396500	381200	406200	391000	380700	401400	381400	384400	717500	586300	394900	358100
23	399800	381000	417700	390000	380700	400800	381300	384600	712300	579100	394300	354800
24	402400	381100	425100	389000	381000	399600	381300	384600	706800	571800	393600	351700
25	403700	381000	430600	387800	382300	398300	381300	384600	701400	564400	392800	349500
26	404800	381100	435100	386600	385300	397000	381300	384300	695200	556800	392100	349200
27	404000	380900	437100	385300	388500	396000	371200	384000	688700	549300	391400	348400
28	402000	380700	435600	384200	391000	395700	381000	383400	681900	541700	391300	345400
29	399800	380400	432600	383600	---	395100	380700	394700	675100	533800	391100	342400
30	398400	380200	429400	383400	---	394300	380400	417200	668300	526000	391700	338800
31	397500	---	426000	383100	---	393800	---	425700	---	518000	391400	---
MAX	410400	396500	437100	422500	391000	401700	393200	425700	731300	661400	510000	391100
MIN	381400	380200	379600	383100	380700	392900	371200	378400	435400	518000	391100	338800
(†)	910.85	908.78	914.16	909.13	910.08	910.42	908.81	914.12	937.52	923.93	910.13	903.56
(Φ)	+8900	-17300	+45800	-42900	+7900	+2800	-13400	+45300	+242600	-150300	-126600	-52600

CAL YR 1986 MAX 437100 MIN 371700 (Φ) +40500
WTR YR 1987 MAX 731300 MIN 338800 (Φ) -49800

(†) 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.--25 years (water years 1962-87) since regulation began at Canyon Lake, 442 ft³/s (320,200 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, 5,560 ft³/s June 24 at 1400 hours (gage height, 8.30 ft); minimum daily, 99 ft³/s June 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	772	1440	706	3820	988	476	999	574	753	5360	4950	807
2	772	1450	635	3810	988	476	999	574	591	5320	4930	808
3	772	1440	635	3790	988	476	999	574	439	5390	4930	809
4	772	1440	635	3780	931	587	999	574	150	5400	4900	809
5	772	1420	635	3770	800	737	999	574	132	5380	4860	809
6	774	1420	635	3340	790	745	999	574	118	5130	4820	809
7	772	1430	635	2630	791	755	999	502	113	5100	4820	809
8	772	1420	606	1860	800	755	999	555	110	5090	4790	809
9	772	1430	574	1540	800	859	999	555	110	5060	4790	1320
10	647	1430	574	1540	800	1040	999	555	108	4860	4760	1810
11	553	1420	574	1530	800	1070	999	555	120	3010	4760	1530
12	570	1420	574	1540	800	1090	999	510	134	5050	4700	763
13	689	1250	574	1540	800	1090	999	461	117	5050	4700	853
14	1240	1120	574	1540	800	1090	999	565	108	5040	3890	1780
15	2550	1120	691	1540	802	1100	999	581	103	5050	1460	1840
16	2670	1120	818	1540	791	1100	999	580	99	5160	1460	1890
17	2680	1130	818	1540	744	1100	999	574	1150	5040	1460	1890
18	2670	1130	818	1540	800	1100	753	574	2340	5130	1460	1590
19	1970	1130	818	1540	800	1100	616	577	3450	5130	1290	755
20	1270	1130	818	1540	800	1180	590	574	5480	2980	874	851
21	1120	995	818	1540	800	1110	574	574	5470	2220	818	1870
22	1120	876	857	1540	800	1110	574	574	5470	5160	818	1880
23	1130	864	882	1540	789	1270	574	574	5470	5150	818	1870
24	1130	824	866	1550	755	1540	574	574	5450	5130	818	1880
25	1130	774	866	1540	755	1540	574	574	5310	5030	818	1450
26	1130	772	866	1540	359	1540	574	644	5300	5010	818	614
27	1730	772	1830	1540	221	1360	574	692	5280	5010	818	724
28	2290	772	3400	1540	476	1010	574	730	5270	5000	813	1860
29	2290	772	3870	1240	---	1000	574	807	5220	5010	809	1840
30	1850	772	3840	988	---	999	574	792	5280	4970	810	1840
31	1450	---	3830	988	---	999	---	809	---	4960	809	---
TOTAL	40829	34483	35272	60816	21568	31404	24682	18506	69245	151380	83571	39169
MEAN	1317	1149	1138	1962	770	1013	823	597	2308	4883	2696	1306
MAX	2680	1450	3870	3820	988	1540	999	809	5480	5400	4950	1890
MIN	553	772	574	988	221	476	574	461	99	2220	809	614
AC-FT	80980	68400	69960	120600	42780	62290	48960	36710	137300	300300	165800	77690

CAL YR 1986 TOTAL 227820 MEAN 624 MAX 3870 MIN 122 AC-FT 451900
WTR YR 1987 TOTAL 610925 MEAN 1674 MAX 5480 MIN 99 AC-FT 1212000

08167800 GUADALUPE RIVER AT SATTLER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: September 1962 to August 1982.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURE: June 1984 to September 1987.

INSTRUMENTATION.--From June 1984 to September 1987, water temperature was continuously recorded at this station.

EXTREMES FOR PERIOD OF RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C Sept. 3-9, 1987; minimum, 9.5°C Mar. 8-10, 1985.

EXTREMES FOR CURRENT YEAR.--
WATER TEMPERATURE: Maximum, 25.5°C Sept. 3-9; minimum, 11.0°C on several days during January and February 1987.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	20.0	19.5	20.0	20.0	20.0	20.0	16.5	16.0	16.0	12.5	12.5	12.5
2	20.0	19.5	20.0	20.0	20.0	20.0	16.5	16.0	16.0	12.5	12.5	12.5
3	20.0	20.0	20.0	20.0	20.0	20.0	16.5	15.5	16.0	12.5	12.5	12.5
4	20.5	20.0	20.0	20.0	20.0	20.0	16.0	15.5	16.0	12.5	12.5	12.5
5	20.5	20.0	20.0	20.5	20.0	20.0	16.0	15.5	15.5	12.5	12.5	12.5
6	20.0	20.0	20.0	20.0	20.0	20.0	15.5	15.5	15.5	12.5	12.5	12.5
7	20.0	20.0	20.0	20.0	20.0	20.0	15.5	15.5	15.5	12.5	12.5	12.5
8	20.0	20.0	20.0	20.0	20.0	20.0	15.5	15.0	15.5	12.5	12.5	12.5
9	20.5	20.0	20.0	20.0	20.0	20.0	15.0	15.0	15.0	12.5	12.5	12.5
10	20.0	20.0	20.0	20.0	20.0	20.0	15.0	14.5	15.0	12.5	12.0	12.5
11	20.5	20.0	20.0	20.0	20.0	20.0	14.5	14.5	14.5	12.5	12.0	12.5
12	20.0	19.0	19.5	20.0	19.5	20.0	15.0	14.5	14.5	12.5	12.0	12.5
13	20.5	19.5	20.0	19.5	19.0	19.5	14.5	14.0	14.5	12.5	12.0	12.5
14	21.0	20.0	20.5	19.0	19.0	19.0	14.0	14.0	14.0	12.5	12.0	12.5
15	21.0	21.0	21.0	19.0	18.0	18.5	14.0	14.0	14.0	12.5	12.5	12.5
16	21.0	20.5	21.0	18.5	18.0	18.0	14.0	14.0	14.0	12.5	12.5	12.5
17	20.5	20.0	20.5	18.0	17.5	18.0	14.0	14.0	14.0	12.0	12.0	12.0
18	20.5	20.0	20.5	18.0	17.5	17.5	14.0	13.5	14.0	12.0	11.5	12.0
19	20.0	19.5	20.0	17.5	17.5	17.5	14.0	13.5	14.0	12.0	11.5	11.5
20	20.0	19.5	19.5	17.5	17.0	17.5	14.0	13.5	14.0	12.0	11.5	11.5
21	19.5	19.5	19.5	17.5	17.0	17.0	13.5	13.5	13.5	11.5	11.5	11.5
22	19.5	19.5	19.5	17.0	16.5	17.0	13.5	13.0	13.0	11.5	11.0	11.5
23	20.0	19.5	19.5	16.5	16.5	16.5	13.5	13.0	13.0	11.5	11.0	11.5
24	20.0	19.5	19.5	16.5	16.5	16.5	13.5	13.0	13.0	11.5	11.0	11.5
25	20.0	19.5	19.5	17.0	16.5	16.5	13.5	13.0	13.0	11.5	11.0	11.5
26	20.0	19.5	19.5	16.5	16.5	16.5	13.0	13.0	13.0	11.5	11.0	11.5
27	20.0	19.5	20.0	16.5	16.5	16.5	13.0	12.5	13.0	11.5	11.0	11.0
28	20.5	20.0	20.0	16.5	16.0	16.5	13.0	12.5	13.0	11.5	11.0	11.0
29	20.5	20.0	20.0	16.5	16.0	16.5	12.5	12.5	12.5	11.5	11.0	11.0
30	20.0	20.0	20.0	16.5	16.0	16.0	12.5	12.5	12.5	11.5	11.0	11.0
31	20.0	20.0	20.0	---	---	---	12.5	12.5	12.5	11.0	11.0	11.0
MONTH	21.0	19.0	20.0	20.5	16.0	18.5	16.5	12.5	14.0	12.5	11.0	12.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	11.0	11.0	11.0	13.5	12.0	12.5	14.5	13.5	14.0	14.5	14.0	14.5
2	11.5	11.0	11.0	13.5	12.0	12.5	14.0	13.5	14.0	14.5	14.0	14.5
3	11.5	11.0	11.0	13.0	12.0	12.5	14.5	13.5	14.0	14.5	14.0	14.5
4	11.0	11.0	11.0	13.5	12.0	12.5	14.0	13.5	14.0	14.5	14.0	14.5
5	11.0	11.0	11.0	13.0	12.0	12.5	13.5	13.5	13.5	14.5	14.0	14.5
6	11.5	11.0	11.0	13.0	12.0	12.5	14.5	13.5	14.0	15.0	14.0	14.5
7	12.0	11.5	11.5	13.0	12.0	12.5	14.5	14.0	14.0	15.5	14.0	14.5
8	12.0	11.5	11.5	13.0	12.0	12.5	14.5	14.0	14.0	15.0	14.0	14.5
9	12.0	11.0	11.5	13.0	12.5	12.5	14.5	13.5	14.0	15.0	14.0	14.5
10	11.5	11.0	11.5	13.0	12.5	12.5	14.5	14.0	14.0	15.0	14.0	14.5
11	12.0	11.5	11.5	12.5	12.5	12.5	14.5	14.0	14.0	14.5	14.0	14.5
12	12.0	11.5	11.5	12.5	12.5	12.5	14.5	14.0	14.0	16.0	14.0	14.5
13	12.0	11.5	11.5	13.0	12.5	12.5	14.5	14.0	14.0	15.0	14.0	14.5
14	12.0	11.5	11.5	13.0	12.5	12.5	14.5	14.0	14.0	15.0	14.0	14.5
15	12.0	11.5	11.5	12.5	12.5	12.5	14.5	14.0	14.0	15.0	14.0	14.5
16	12.5	11.5	12.0	13.0	12.5	12.5	14.5	14.0	14.0	14.5	14.0	14.5
17	12.5	11.5	12.0	13.0	12.5	13.0	14.5	14.0	14.5	15.0	14.0	14.5
18	12.5	11.5	12.0	13.5	12.5	13.0	15.0	14.0	14.5	15.0	14.5	14.5
19	12.0	11.5	12.0	13.0	12.5	13.0	15.0	14.0	14.5	15.0	14.0	14.5
20	12.0	11.5	12.0	13.5	12.5	13.0	15.0	14.0	14.5	15.0	14.0	14.5
21	12.0	12.0	12.0	13.0	13.0	13.0	14.5	14.0	14.0	15.5	14.5	14.5
22	12.5	12.0	12.0	13.5	13.0	13.0	15.0	14.0	14.0	15.0	14.5	14.5
23	12.5	12.0	12.0	14.0	13.0	13.5	15.0	14.0	14.5	15.0	14.5	14.5
24	12.0	12.0	12.0	14.0	13.0	13.5	14.5	14.0	14.0	15.0	14.5	14.5
25	12.0	12.0	12.0	13.5	13.0	13.0	15.0	14.0	14.0	15.0	14.5	14.5
26	13.0	12.0	12.5	13.5	13.0	13.5	15.0	14.0	14.5	15.0	14.5	15.0
27	13.5	12.0	13.0	13.5	13.0	13.5	15.0	14.0	14.5	15.0	14.5	14.5
28	13.0	11.5	12.5	13.5	13.0	13.5	15.0	14.0	14.5	15.0	14.5	15.0
29	---	---	---	13.5	13.0	13.5	15.0	14.0	14.5	15.5	14.5	15.0
30	---	---	---	14.0	13.5	13.5	15.0	14.0	14.5	15.5	14.5	15.0
31	---	---	---	14.5	14.0	14.0	---	---	---	15.5	14.5	15.0
MONTH	13.5	11.0	11.5	14.5	12.0	13.0	15.0	13.5	14.0	16.0	14.0	14.5

08167800 GUADALUPE RIVER AT SATTLER, TX--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	15.5	15.0	15.0	19.0	19.0	19.0	23.5	23.0	23.5	25.0	24.5	25.0
2	16.0	15.0	15.5	19.5	19.0	19.0	23.5	23.0	23.5	25.0	24.5	25.0
3	17.5	15.0	16.0	19.5	19.0	19.5	23.5	23.5	23.5	25.5	24.5	25.0
4	18.0	17.0	17.5	20.0	19.5	19.5	23.5	23.5	23.5	25.5	24.5	25.0
5	19.5	16.5	17.5	20.0	19.5	20.0	24.0	23.5	23.5	25.5	24.5	25.0
6	18.5	16.5	17.5	20.0	20.0	20.0	24.0	23.5	24.0	25.5	24.5	25.0
7	18.0	16.0	17.0	20.5	20.0	20.5	24.0	23.5	24.0	25.5	25.0	25.0
8	17.0	16.0	16.5	20.5	20.5	20.5	24.0	24.0	24.0	25.5	25.0	25.0
9	17.0	16.0	16.5	20.5	20.5	20.5	24.5	24.0	24.0	25.5	25.0	25.0
10	17.0	16.0	16.5	21.0	20.5	20.5	24.5	24.0	24.5	---	---	---
11	18.0	16.0	17.0	21.0	19.5	20.5	24.5	24.5	24.5	---	---	---
12	20.0	17.0	18.5	21.0	21.0	21.0	25.0	24.5	24.5	---	---	---
13	18.0	17.5	17.5	21.0	21.0	21.0	25.0	24.5	25.0	---	---	---
14	19.0	16.5	17.5	21.5	21.0	21.5	25.0	24.0	25.0	---	---	---
15	19.5	16.0	17.5	21.5	21.5	21.5	24.5	24.0	24.5	---	---	---
16	19.5	16.0	17.5	21.5	21.5	21.5	24.5	24.0	24.5	---	---	---
17	17.0	15.0	16.0	22.0	21.5	21.5	24.5	24.0	24.5	---	---	---
18	15.5	15.0	15.5	22.0	21.5	22.0	25.0	24.5	24.5	---	---	---
19	15.5	15.0	15.5	22.0	21.5	22.0	25.0	24.0	24.5	---	---	---
20	16.0	15.5	16.0	22.0	21.0	21.5	24.5	24.0	24.5	---	---	---
21	16.5	16.0	16.0	22.0	21.0	21.5	24.5	24.0	24.5	---	---	---
22	16.5	16.0	16.5	22.5	22.0	22.5	24.5	24.0	24.5	---	---	---
23	16.5	16.5	16.5	22.5	22.0	22.5	25.0	24.0	24.5	---	---	---
24	17.0	16.5	17.0	22.5	22.5	22.5	25.0	24.0	24.5	---	---	---
25	17.0	16.5	17.0	22.5	22.5	22.5	25.0	24.5	24.5	---	---	---
26	17.5	17.5	17.5	22.5	22.5	22.5	25.0	24.5	24.5	---	---	---
27	18.0	17.5	18.0	23.0	22.5	23.0	25.0	24.5	24.5	---	---	---
28	18.5	18.0	18.0	23.0	23.0	23.0	24.5	24.5	24.5	---	---	---
29	18.5	18.5	18.5	23.0	23.0	23.0	24.5	24.5	24.5	---	---	---
30	19.0	18.5	18.5	23.0	23.0	23.0	25.0	24.5	24.5	---	---	---
31	---	---	---	23.5	23.0	23.0	25.0	24.5	24.5	---	---	---
MONTH	20.0	15.0	17.0	23.5	19.0	21.5	25.0	23.0	24.5	25.5	24.5	25.0

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, and 1984.

DISCHARGE MEASUREMENTS, IN CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Nov. 14, 1986	80.7	Feb. 4, 1987	83.2	June 10, 1987	116.0
Dec. 12	69.1	Apr. 6	74.0	July 30	78.3

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); 25 years (water years 1963-87) regulated, 535 ft³/s (387,600 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, 6,180 ft³/s June 25 at 2000 hours (gage height, 7.35 ft); minimum daily, 328 ft³/s Feb. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	839	1550	810	4010	1080	674	1140	688	1270	5490	5270	973
2	840	1550	698	3970	1080	669	1140	688	1120	5470	5260	970
3	838	1550	698	3930	1080	660	1140	686	1690	5460	5260	967
4	836	1560	698	3910	1060	677	1140	689	1270	5450	5260	967
5	836	1550	698	3890	900	894	1140	683	925	5450	5250	967
6	857	1550	698	3560	895	894	1140	683	723	5450	5240	962
7	851	1550	698	2780	894	876	1140	613	623	5440	5220	961
8	848	1550	689	2050	894	870	1140	667	560	5430	5200	955
9	843	1550	647	1620	894	885	1140	669	545	5460	5180	1290
10	769	1550	655	1600	894	1150	1140	669	562	5440	5170	2020
11	639	1540	650	1590	894	1190	1140	669	685	3050	5160	1960
12	936	1540	648	1590	894	1230	1140	637	919	5380	5150	917
13	870	1440	649	1590	899	1220	1140	545	768	5370	5130	893
14	1080	1200	667	1590	905	1220	1140	667	674	5360	4830	1890
15	2560	1200	772	1590	900	1220	1140	672	594	5350	1840	2050
16	2780	1200	960	1590	894	1230	1140	706	528	5350	1750	2110
17	2730	1200	952	1620	849	1250	1130	691	995	5350	1740	2110
18	2720	1210	951	1590	906	1230	1000	678	2720	5370	1730	2040
19	2290	1200	942	1590	909	1230	749	687	3190	5390	1680	916
20	1470	1200	942	1580	913	1280	720	688	5670	4080	1120	887
21	1230	1130	942	1590	906	1220	698	687	5640	1580	1010	1960
22	1240	923	1610	1580	906	1210	698	685	5620	5330	995	2090
23	1240	918	1710	1580	905	1250	698	678	5600	5330	993	2090
24	1250	898	1350	1580	864	1630	698	675	5590	5330	993	2110
25	1240	855	1240	1580	876	1630	698	669	5680	5320	991	1920
26	1240	840	1180	1580	848	1630	695	700	5600	5310	990	723
27	1550	838	1620	1580	328	1600	688	781	5540	5310	990	727
28	2310	837	3320	1580	677	1160	688	803	5520	5290	1020	1930
29	2320	836	4130	1410	---	1150	688	1170	5510	5280	982	2080
30	2080	836	4080	1080	---	1140	688	1080	5510	5280	1010	2080
31	1560	---	4050	1080	---	1140	---	1120	---	5270	980	---
TOTAL	43692	37351	40354	63460	24944	35309	28776	22423	81841	159220	93394	44515
MEAN	1409	1245	1302	2047	891	1139	959	723	2728	5136	3013	1484
MAX	2780	1560	4130	4010	1080	1630	1140	1170	5680	5490	5270	2110
MIN	639	836	647	1080	328	660	688	545	528	1580	980	723
AC-FT	86660	74090	80040	125900	49480	70040	57080	44480	162300	315800	185200	88300

CAL YR 1986 TOTAL 266482 MEAN 730 MAX 4130 MIN 167 AC-FT 528600
WTR YR 1987 TOTAL 675279 MEAN 1850 MAX 5680 MIN 328 AC-FT 1339000

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.--55 years (water years 1933-87), 295 ft³/s (213,700 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)
Dec. 22	1900	*4,020	*10.19	June 11	1600	1,680	6.65
June 3	1330	1,430	6.23	June 25	2230	1,350	7.15
June 10	1830	2,200	7.50				

Minimum daily discharge, 245 ft³/s Oct. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	248	299	312	375	349	396	351	326	552	400	384	343
2	246	301	310	375	347	390	368	326	678	400	384	346
3	246	302	310	374	343	377	356	330	907	394	381	345
4	245	305	307	372	342	373	355	335	861	399	377	345
5	245	303	311	373	352	375	366	331	503	394	373	350
6	259	304	315	365	350	372	365	330	390	390	376	350
7	257	304	314	351	346	371	364	326	375	390	369	350
8	250	308	313	351	345	371	360	322	420	385	371	345
9	250	308	313	352	347	372	360	322	493	432	368	345
10	250	309	318	350	343	371	360	326	828	404	369	350
11	322	305	313	350	345	380	359	326	1070	384	362	345
12	520	308	314	350	345	372	355	322	569	385	365	350
13	290	303	313	350	344	375	362	322	664	384	360	350
14	278	304	339	351	354	371	354	322	449	380	355	350
15	277	305	478	349	435	371	351	317	426	381	360	355
16	278	307	339	349	360	375	342	361	409	381	357	353
17	280	307	326	432	350	375	342	333	413	379	355	352
18	280	307	360	374	345	371	341	322	416	383	345	371
19	283	308	332	357	350	370	339	334	408	390	340	360
20	284	308	326	352	360	370	339	338	411	378	344	355
21	292	308	330	354	354	365	335	338	414	368	344	358
22	299	309	2140	353	349	365	330	326	411	384	349	355
23	306	311	916	352	353	365	326	335	409	382	350	355
24	303	320	398	354	500	360	330	333	405	377	344	355
25	297	326	361	355	503	360	330	330	589	380	339	355
26	297	313	355	354	763	360	335	322	501	380	339	350
27	306	310	350	348	444	360	338	322	409	382	342	396
28	299	312	362	348	478	360	326	326	404	378	340	365
29	297	312	384	350	---	360	326	434	407	378	343	355
30	300	312	375	348	---	360	322	374	403	378	344	355
31	300	---	376	348	---	360	---	506	---	377	343	---
TOTAL	8884	9238	12910	11116	10796	11473	10387	10517	15594	11977	11072	10609
MEAN	287	308	416	359	386	370	346	339	520	386	357	354
MAX	520	326	2140	432	763	396	368	506	1070	432	384	396
MIN	245	299	307	348	342	360	322	317	375	368	339	343
AC-FT	17620	18320	25610	22050	21410	22760	20600	20860	30930	23760	21960	21040

CAL YR 1986 TOTAL 107976 MEAN 296 MAX 1900 MIN 226 AC-FT 214200
WTR YR 1987 TOTAL 134573 MEAN 369 MAX 2140 MIN 245 AC-FT 266900

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.--60 years (water years 1928-87), 285 ft^3/s, 206,394 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 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	248	299	312	375	349	396	351	326	365	400	384	343
2	246	301	310	375	347	390	368	326	390	400	384	346
3	246	302	310	374	343	377	356	330	434	394	381	345
4	245	305	307	372	342	373	355	330	429	399	377	345
5	245	303	311	373	344	375	366	330	407	394	373	350
6	256	304	315	365	350	372	365	330	390	390	376	350
7	254	304	314	351	346	371	364	326	375	390	369	350
8	250	308	313	351	345	371	360	322	375	385	371	345
9	250	308	313	352	347	372	360	322	418	385	368	345
10	250	309	317	350	343	371	360	326	446	390	369	350
11	262	305	313	350	345	378	359	326	484	384	362	345
12	286	308	314	350	345	372	355	322	456	385	365	350
13	290	303	313	350	344	375	355	322	468	384	360	350
14	278	304	322	351	351	371	354	322	449	380	355	350
15	277	305	345	349	370	371	351	317	426	381	360	355
16	278	307	335	349	360	375	342	322	409	381	357	353
17	280	307	326	365	350	375	342	333	413	379	355	352
18	280	307	350	370	345	371	341	322	416	383	345	355
19	283	308	332	357	350	370	339	327	408	390	340	360
20	284	308	326	352	360	370	339	338	411	378	344	355
21	284	308	330	354	354	365	335	332	414	368	344	358
22	292	309	370	353	349	365	330	326	411	380	349	355
23	299	311	385	352	352	365	326	335	409	382	350	355
24	303	315	370	354	370	360	330	333	405	377	344	355
25	297	323	361	355	380	360	330	330	402	380	339	355
26	297	313	355	354	402	360	335	322	412	380	339	350
27	304	310	350	348	402	360	338	322	409	382	342	350
28	299	312	362	348	412	360	326	322	404	378	340	365
29	297	312	384	350	---	360	326	330	407	378	343	355
30	300	312	375	348	---	360	322	340	403	378	344	355
31	300	---	376	348	---	360	---	335	---	377	343	---
TOTAL	8560	9230	10416	11045	9997	11471	10380	10146	12445	11912	11072	10547
MEAN	276	308	336	356	357	370	346	327	415	384	357	352
MAX	304	323	385	375	412	396	368	340	484	400	384	365
MIN	245	299	307	348	342	360	322	317	365	368	339	343
AC-FT	16980	18310	20660	21910	19830	22750	20590	20120	24680	23630	21960	20920

CAL YR 1986 TOTAL 107,976 MEAN 296 MAX 1900 MIN 226 AC-FT 214,200
WTR YR 1987 TOTAL 127,221 MEAN 349 MAX 484 MIN 245 AC-FT 252,300

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.--Records fair. Flow is slightly regulated by utilities 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 mi. 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.--31 years (water years 1957-87), 168 ft³/s (121,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge (estimated), 427 ft³/s June 14, 1987; 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 (estimated), 427 ft³/s June 14; maximum gage height, 14.67 ft June 4 at 1000 hours (flood runoff); minimum daily spring discharge, 165 ft³/s Oct. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	186	194	171	272	230	242	239	204	246	340	334	289
2	181	192	168	268	226	239	236	202	290	339	333	288
3	177	191	167	266	227	238	233	207	315	337	331	289
4	175	191	167	262	225	245	226	215	369	335	329	283
5	180	188	167	257	224	253	228	205	383	332	326	285
6	175	188	166	258	222	262	228	206	383	328	323	284
7	175	186	166	259	218	262	227	204	372	330	321	288
8	175	186	166	261	217	260	226	204	370	328	318	282
9	172	185	166	266	212	259	225	190	373	329	318	278
10	165	185	167	262	210	258	224	187	383	328	318	278
11	177	185	168	257	211	270	224	186	404	328	316	281
12	196	185	168	255	209	257	225	185	415	325	314	277
13	212	184	168	255	207	256	226	184	425	322	313	274
14	201	184	173	255	208	255	223	182	427	321	311	271
15	197	183	185	252	207	254	221	184	424	314	310	270
16	193	183	188	250	207	253	219	204	416	321	307	267
17	190	183	184	253	205	255	215	200	403	320	305	265
18	189	183	188	253	202	253	213	192	405	381	302	263
19	186	181	186	250	199	251	215	204	388	364	300	267
20	186	179	185	246	207	249	213	206	380	357	305	265
21	191	178	185	246	203	248	210	193	372	352	303	261
22	199	178	225	241	201	248	212	185	367	353	302	257
23	199	178	245	240	196	251	212	185	363	352	300	259
24	218	177	255	241	210	250	210	187	359	351	299	255
25	213	180	260	236	207	247	210	186	355	351	296	253
26	206	175	265	236	254	246	209	184	352	347	295	252
27	203	175	268	235	246	245	206	184	348	345	293	250
28	200	173	270	234	244	252	207	182	346	341	298	252
29	197	172	273	234	---	246	207	195	343	341	292	249
30	196	171	275	231	---	241	206	212	342	338	293	246
31	195	---	273	230	---	240	---	227	---	337	289	---
TOTAL	5905	5473	6258	7761	6034	7785	6575	6071	11118	10487	9594	8078
MEAN	190	182	202	250	215	251	219	196	371	338	309	269
MAX	218	194	275	272	254	270	239	227	427	381	334	289
MIN	165	171	166	230	196	238	206	182	246	314	289	246
AC-FT	11710	10860	12410	15390	11970	15440	13040	12040	22050	20800	19030	16020

CAL YR 1986	TOTAL	73345	MEAN	201	MAX	275	MIN	156	AC-FT	145500
WTR YR 1987	TOTAL	91139	MEAN	250	MAX	427	MIN	165	AC-FT	180800

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.--Records good except those for estimated daily discharges, which are fair. There are many small diversions above station. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--61 years (water years 1925-26, 1929-87), 130 ft³/s (4.97 in/yr), 94,180 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)
Oct. 12	0800	9,680	11.77	June 4	1030	5,730	9.55
Oct. 23	1230	5,080	9.13	June 9	0900	1,930	6.63
Dec. 22	1900	9,740	11.80	June 10	1730	7,830	10.79
May 29	1800	2,310	6.99	June 11	1130	9,640	11.75
June 1	0030	4,150	8.48	June 13	2330	10,200	12.03
June 2	2230	10,600	12.22	July 17	1530	*21,600	*16.54

Minimum daily discharge, 66 ft³/s May 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91	377	191	735	232	477	220	115	1920	358	187	92
2	91	355	184	671	225	451	213	136	4520	346	180	89
3	87	339	177	637	218	430	205	130	3980	315	176	86
4	84	347	174	576	214	415	200	114	4170	304	171	84
5	83	444	170	545	212	391	200	106	2400	e280	166	81
6	96	339	168	524	209	386	203	105	1710	e270	160	78
7	91	330	172	494	206	367	202	105	1340	e260	153	84
8	91	319	183	465	199	354	193	105	1240	e260	145	79
9	91	300	179	467	193	340	187	104	1650	e280	142	78
10	91	285	188	449	188	333	183	100	3370	e320	139	79
11	125	274	431	417	188	356	178	97	6760	e280	132	85
12	3410	259	323	398	180	346	173	96	3540	e250	128	87
13	1000	251	291	386	177	325	168	97	4840	e230	123	88
14	532	244	313	381	174	316	159	98	3500	e220	120	86
15	417	243	644	367	180	307	156	98	2030	e220	116	85
16	356	243	565	351	176	303	152	112	1640	e950	113	85
17	320	238	516	359	163	407	149	110	1360	3800	111	85
18	290	228	562	366	156	355	147	108	1220	751	105	81
19	270	216	562	334	155	317	141	129	1040	381	105	86
20	247	208	511	320	165	303	135	121	902	322	102	83
21	243	199	486	312	181	292	130	115	799	293	100	83
22	298	199	4790	309	167	288	126	121	714	287	98	80
23	2170	199	4090	294	161	285	125	115	640	275	96	76
24	1180	199	2120	290	201	270	126	103	589	262	94	73
25	779	253	1680	277	271	260	123	92	534	253	91	73
26	652	257	1440	264	873	252	122	84	484	239	89	75
27	570	215	1220	256	601	248	118	73	441	230	88	76
28	505	203	1070	252	572	244	115	66	408	225	94	77
29	456	199	975	248	---	232	113	926	385	219	86	75
30	426	196	887	241	---	225	111	948	372	206	95	75
31	399	---	807	230	---	224	---	1440	---	195	97	---
TOTAL	15541	7958	26069	12215	6837	10099	4773	6269	58498	13081	3802	2444
MEAN	501	265	841	394	244	326	159	202	1950	422	123	81.5
MAX	3410	444	4790	735	873	477	220	1440	6760	3800	187	92
MIN	83	196	168	230	155	224	111	66	372	195	86	73
AC-FT	30830	15780	51710	24230	13560	20030	9470	12430	116000	25950	7540	4850
CFSM	1.41	.75	2.37	1.11	.69	.92	.45	.57	5.49	1.19	.35	.23
IN.	1.63	.83	2.73	1.28	.72	1.06	.50	.66	6.13	1.37	.40	.26

CAL YR 1986 TOTAL 97300 MEAN 267 MAX 6220 MIN 47 AC-FT 193000 CFSM .75 IN. 10.2
WTR YR 1987 TOTAL 167586 MEAN 459 MAX 6760 MIN 66 AC-FT 332400 CFSM 1.29 IN. 17.6

e Estimated.

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.--31 years, 158 ft³/s (5.21 in/yr), 114,500 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)
Oct. 12	0930	7,900	15.80	June 10	2200	6,940	15.10
Oct. 23	1530	4,080	12.53	June 11	1530	9,290	16.73
Dec. 22	2400	7,070	15.19	June 13	1200	6,240	14.55
June 1	0430	4,140	12.60	June 14	0300	9,190	16.67
June 3	0130	10,500	17.47	July 17	1900	*19,500	*21.66
June 4	1400	5,710	14.10				

Minimum daily discharge, 57 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	403	192	825	250	602	234	107	2480	496	188	95
2	70	377	185	759	245	545	227	107	3500	474	183	89
3	65	358	179	724	234	515	218	107	4880	428	179	85
4	65	361	173	663	231	487	212	117	4370	394	170	83
5	67	451	170	625	228	464	211	107	2820	366	161	80
6	75	364	167	601	228	447	214	104	1960	340	156	78
7	86	342	171	572	226	432	211	101	1560	319	151	87
8	79	332	177	545	217	415	203	100	1390	305	144	84
9	77	312	181	539	209	400	194	100	1850	307	139	74
10	77	292	187	522	202	387	190	96	2700	332	135	77
11	105	279	393	481	199	407	185	93	6550	295	132	85
12	2890	265	349	460	198	411	180	90	4000	270	129	85
13	1320	257	303	445	193	373	179	89	3870	255	125	82
14	652	250	317	435	190	358	168	89	4230	249	120	79
15	493	248	627	419	195	350	162	91	2250	246	116	76
16	407	244	634	402	192	339	159	105	1840	241	113	72
17	354	235	568	420	181	443	157	122	1560	3170	110	72
18	314	225	585	426	169	426	152	101	1500	1160	107	68
19	285	216	617	393	169	364	149	110	1260	496	103	70
20	259	207	559	369	184	342	144	145	1100	384	101	70
21	250	199	532	357	195	332	139	114	985	331	96	68
22	288	197	3290	352	186	324	136	113	900	310	93	67
23	1710	199	4400	333	176	317	132	110	829	290	92	64
24	1290	196	2270	326	199	300	132	99	770	273	88	61
25	824	242	1780	312	285	282	129	94	711	261	85	60
26	699	277	1540	294	837	275	125	88	661	250	85	60
27	620	223	1330	284	796	269	120	85	606	244	84	65
28	551	207	1170	277	694	262	116	84	559	227	96	67
29	503	201	1060	272	---	253	113	762	526	218	90	62
30	463	197	973	261	---	241	110	1270	507	207	91	57
31	431	---	891	251	---	238	---	1340	---	196	102	---
TOTAL	15435	8156	25970	13944	7508	11600	5001	6240	62724	13334	3764	2222
MEAN	498	272	838	450	268	374	167	201	2091	430	121	74.1
MAX	2890	451	4400	825	837	602	234	1340	6550	3170	188	95
MIN	65	196	167	251	169	238	110	84	507	196	84	57
AC-FT	30620	16180	51510	27660	14890	23010	9920	12380	124400	26450	7470	4410
CFSM	1.21	.66	2.03	1.09	.65	.91	.40	.49	5.07	1.04	.29	.18
IN.	1.39	.74	2.34	1.26	.68	1.05	.45	.56	5.66	1.20	.34	.20

CAL YR 1986 TOTAL 97417 MEAN 267 MAX 5340 MIN 26 AC-FT 193200 CFSM .65 IN. 8.80
WTR YR 1987 TOTAL 175898 MEAN 482 MAX 6550 MIN 57 AC-FT 348900 CFSM 1.17 IN. 15.9

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.--28 years, 50.0 ft³/s (36,220 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)
Dec. 22	2230	5,090	16.04	June 3	2230	3,690	15.59
Feb. 26	0530	3,100	15.34	June 4	1300	*6,120	*16.33
May 29	1600	2,920	15.23	June 11	2000	2,530	14.97
June 2	2230	2,790	15.15	June 13	0900	4,650	15.90

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	7.6	4.0	115	15	357	3.5	.05	717	11	.01	.00
2	.01	7.0	3.2	91	14	270	3.4	.02	632	8.7	.00	.00
3	.00	6.5	3.0	67	13	179	3.2	.01	1700	6.9	.00	.00
4	.00	7.2	2.6	49	12	136	3.0	.17	3510	5.4	.00	.00
5	.00	7.9	2.4	36	12	105	3.1	.78	1010	4.2	.00	.00
6	.00	6.9	2.3	30	11	77	3.7	92	560	3.2	.00	.00
7	.00	6.0	2.4	26	11	56	3.6	43	462	2.7	.00	.00
8	.02	6.0	2.7	24	10	45	3.2	25	522	2.3	.00	.00
9	.12	6.1	3.4	27	8.8	37	2.8	19	783	2.8	.00	.00
10	.09	5.0	4.8	28	7.9	31	2.8	15	881	4.4	.00	.00
11	.24	4.1	16	23	7.7	38	2.9	13	1660	3.8	.00	.00
12	228	3.6	16	21	7.7	41	2.8	11	1400	2.5	.00	.00
13	234	3.4	13	19	7.7	35	3.0	10	2780	1.9	.00	.00
14	159	3.1	25	20	7.4	30	3.1	7.3	1170	1.5	.00	.00
15	105	3.1	662	21	10	27	3.2	4.4	572	1.3	.00	.00
16	76	3.0	304	21	10	25	2.5	4.7	478	1.1	.00	.00
17	53	3.0	172	109	7.4	48	2.2	21	386	1.5	.00	.00
18	36	3.4	236	191	6.0	46	1.8	19	354	1.4	.00	.00
19	25	3.4	139	104	5.8	34	1.6	20	297	1.3	.00	.00
20	19	3.4	91	70	42	26	1.4	213	250	1.9	.00	.00
21	17	3.1	70	55	41	20	1.2	63	197	2.1	.00	.00
22	53	4.0	2320	49	30	15	.95	41	133	3.6	.00	.00
23	86	3.6	2630	40	24	14	.84	25	95	3.7	.00	.00
24	72	3.7	767	32	301	15	.78	16	76	3.3	.00	.00
25	48	14	550	27	284	10	.67	13	59	3.0	.00	.00
26	32	14	434	23	2180	7.9	.51	10	42	2.8	.00	.00
27	24	8.9	373	20	570	6.2	.37	8.3	26	2.0	.00	.00
28	18	7.0	315	19	519	5.5	.26	6.6	19	.66	.00	.00
29	15	5.8	225	18	---	6.8	.19	1300	14	.23	.00	.00
30	11	4.9	169	17	---	5.5	.10	576	11	.08	.00	.00
31	8.7	---	142	15	---	4.3	---	390	---	.04	.00	---
TOTAL	1320.20	168.7	9699.8	1407	4175.4	1753.2	62.67	2967.33	20796	91.31	.01	.00
MEAN	42.6	5.62	313	45.4	149	56.6	2.09	95.7	693	2.95	.0	.00
MAX	234	14	2630	191	2180	357	3.7	1300	3510	11	.01	.00
MIN	.00	3.0	2.3	15	5.8	4.3	.10	.01	11	.04	.00	.00
AC-FT	2620	335	19240	2790	8280	3480	124	5890	41250	181	.0	.0

CAL YR 1986	TOTAL	23148.34	MEAN	63.4	MAX	3010	MIN	.00	AC-FT 45910
WTR YR 1987	TOTAL	42441.44	MEAN	116	MAX	3510	MIN	.00	AC-FT 84180

08178622 LORENCE CREEK AT SHADOW CLIFF DRIVE, SAN ANTONIO, TX

(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°34'58", long 98°27'36", Bexar County, Hydrologic Unit 12310030l, at downstream side of culvert on Shadow Cliff Drive, 0.8 mi downstream from Thousand Oaks Boulevard, 1.6 mi downstream from San Pedro Avenue, and 3.4 mi upstream from mouth.

DRAINAGE AREA.--4.57 mi².

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1980 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
DEC											
22...	0940	121	140	7.20	8.5	96	64	--	--	2.1	K18000
22...	1715	121	131	7.00	--	110	46	--	--	2.0	74000
FEB											
05...	1530	4.4	110	7.90	14.5	48	14	8.6	86	5.0	14000
MAY											
29...	0825	289	78	8.20	19.0	110	90	8.1	89	6.8	40000
29...	0905	167	93	8.00	18.5	120	56	7.6	83	4.9	K35000
29...	1040	174	129	7.40	19.0	110	34	7.0	77	6.1	21000
JUN											
02...	0930	54	131	7.90	22.0	90	51	7.2	85	3.5	--
02...	1035	180	106	8.30	23.0	130	120	7.2	86	4.1	--

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)
DEC											
22...	58000	67	5	23	2.3	2.0	0.1	3.0	62	10	2.8
22...	440000	--	--	--	--	--	--	--	57	--	--
FEB											
05...	13000	47	1	17	1.0	1.9	0.1	2.5	46	4.0	2.9
MAY											
29...	62000	30	4	11	0.60	1.3	0.1	3.1	26	9.9	2.1
29...	K11000	--	--	--	--	--	--	--	33	--	--
29...	52000	--	--	--	--	--	--	--	43	--	--
JUN											
02...	30000	57	13	21	1.1	1.9	0.1	4.0	44	16	3.4
02...	50000	--	--	--	--	--	--	--	43	--	--

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)
DEC											
22...	<0.10	7.2	88	90	13	0.370	0.030	0.400	0.070	1.0	1.1
22...	--	--	--	24	4	0.470	0.030	0.500	0.070	0.93	1.0
FEB											
05...	0.10	3.6	61	21	4	0.470	0.030	0.500	0.130	0.87	1.0
MAY											
29...	<0.10	3.5	47	213	48	0.370	0.030	0.400	0.150	1.7	1.9
29...	--	--	--	153	38	0.360	0.040	0.400	0.130	1.4	1.5
29...	--	--	--	43	19	0.460	0.040	0.500	0.090	1.0	1.1
JUN											
02...	<0.10	9.0	83	77	<1	0.280	0.020	0.300	0.100	0.50	0.60
02...	--	--	--	306	58	0.170	0.030	0.200	0.080	1.6	1.7

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)
DEC											
22...	0.050	--	1	15	6	<10	3	31	5	<1	<0.1
22...	0.180	--	--	--	--	--	--	--	--	--	--
FEB											
05...	0.130	7.8	<1	10	1	<10	2	16	<5	3	<0.1
MAY											
29...	0.220	15	<1	8	<1	<10	5	37	<5	7	<0.1
29...	0.270	14	--	--	--	--	--	--	--	--	--
29...	0.310	11	--	--	--	--	--	--	--	--	--
JUN											
02...	0.200	11	<1	13	1	30	4	97	<5	6	<0.1
02...	0.310	16	--	--	--	--	--	--	--	--	--

08178622 LORENCE CREEK AT SHADOW CLIFF DRIVE, SAN ANTONIO, TX

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
DEC											
22...	6	<1	20	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.17
22...	--	--	--	--	--	--	--	--	--	--	--
FEB											
05...	<1	<1	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.19
MAY											
29...	<1	<1	4	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.36
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	<1	<1	18	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--	--

DATE	DIELDRIN 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)
DEC										
22...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
22...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.02	<0.01	<0.01
MAY										
29...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.02	<0.01	<0.01
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
JUN										
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--

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)
DEC										
22...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	0.02
22...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.02	<0.01	<0.01
MAY										
29...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.04	<0.01	<0.01
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
JUN										
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--

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. 12	0355	459	6.23	June 2	1100	117	4.51
May 31	1530	*648	*6.87	June 3	1330	113	4.48

Minimum discharge, 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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
DEC											
22...	1203	35	136	7.20	8.5	47	16	--	--	1.3	K8000
22...	1640	44	134	7.10	8.5	43	17	--	--	1.3	6000
FEB											
05...	1620	0.01	89	8.10	14.5	25	6.9	7.8	78	4.8	8800
MAY											
29...	0715	4.2	79	7.10	--	55	14	--	--	4.7	18000
29...	0745	55	90	6.20	--	65	88	--	--	5.3	5800
29...	0810	76	80	8.46	18.0	110	94	8.2	89	4.7	38000
29...	0843	42	85	8.06	18.0	85	57	8.0	87	4.3	40000
29...	0934	23	106	8.02	18.0	90	28	7.8	85	4.4	36000
29...	1300	25	130	7.20	19.0	100	38	7.1	79	5.3	10000
SEP											
08...	1815	12	109	7.75	--	120	150	--	--	4.7	--
08...	1845	12	105	7.74	--	98	120	--	--	6.0	--
08...	1915	3.1	107	7.90	--	96	170	--	--	4.7	--

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)
DEC											
22...	K26000	69	10	26	1.0	1.2	0.1	2.3	59	10	1.6
22...	36000	--	--	--	--	--	--	--	59	--	--
FEB											
05...	8000	35	1	13	0.50	3.7	0.3	1.9	34	5.1	5.0
MAY											
29...	76000	30	7	11	0.52	1.4	0.1	3.7	23	8.9	2.5
29...	290000	--	--	--	--	--	--	--	71	--	--
29...	99000	32	0	12	0.60	1.5	0.1	3.5	--	8.7	2.4
29...	210000	--	--	--	--	--	--	--	103	--	--
29...	84000	--	--	--	--	--	--	--	41	--	--
29...	34000	--	--	--	--	--	--	--	51	--	--
SEP											
08...	--	--	--	--	--	--	--	--	28	--	--
08...	--	--	--	--	--	--	--	--	32	--	--
08...	--	--	--	--	--	--	--	--	30	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	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)	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)
DEC											
22...	<0.10	7.0	85	13	11	0.290	0.010	0.300	0.040	0.76	0.80
22...	--	--	--	16	2	0.190	0.010	0.200	0.020	0.58	0.60
FEB											
05...	<0.10	2.2	52	14	7	0.280	0.020	0.300	0.140	0.66	0.80
MAY											
29...	<0.10	3.2	45	24	23	0.280	0.020	0.300	0.190	1.5	1.7
29...	--	--	--	139	37	0.350	0.050	0.400	0.160	2.0	2.2
29...	<0.10	3.3	--	170	44	0.370	0.030	0.400	0.120	1.3	1.4
29...	--	--	--	82	26	0.360	0.040	0.400	0.130	1.4	1.5
29...	--	--	--	45	28	0.460	0.040	0.500	0.120	1.5	1.6
29...	--	--	--	59	26	0.460	0.040	0.500	0.110	1.3	1.4
SEP											
08...	--	--	--	164	28	0.960	0.040	1.00	0.050	1.2	1.3
08...	--	--	--	264	30	0.970	0.030	1.00	0.060	--	<0.20
08...	--	--	--	--	36	0.960	0.040	1.00	0.060	1.0	1.1

DATE	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)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)
DEC											
22...	0.060	--	<1	10	<1	<10	1	48	<5	<1	<0.1
22...	0.020	--	--	--	--	--	--	--	--	--	--
FEB											
05...	0.110	4.9	5	6	<1	<10	2	34	<5	<1	<0.1
MAY											
29...	0.240	6.3	2	6	<1	<10	3	33	<5	7	0.3
29...	0.360	11	--	--	--	--	--	--	--	--	--
29...	0.270	10	<1	6	<1	<10	1	44	<5	7	<0.1
29...	0.200	11	--	--	--	--	--	--	--	--	--
29...	0.050	9.2	--	--	--	--	--	--	--	--	--
29...	0.300	11	--	--	--	--	--	--	--	--	--
SEP											
08...	0.180	16	--	--	--	--	--	--	--	--	--
08...	0.190	21	--	--	--	--	--	--	--	--	--
08...	0.160	18	--	--	--	--	--	--	--	--	--

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)
DEC											
22...	<1	<1	14	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.02
22...	--	--	--	--	--	--	--	--	--	--	--
FEB											
05...	<1	<1	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY											
29...	<1	<1	8	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	<1	<1	12	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.39
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
SEP											
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--	--

DATE	DIELORIN 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)
DEC										
22...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
22...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY										
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.02	<0.01	<0.01
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
SEP										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
DEC										
22...	<0.01	<0.01	<0.01	<0.1	--	<1	<0.01	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01
MAY										
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.02	<0.01	<0.01
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
SEP										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--

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-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	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)
JUN											
02...	0642	105	108	7.80	130	21	48	2	18	0.81	0.80
02...	0657	170	100	8.20	34	52	--	--	--	--	--
02...	0708	144	99	8.30	55	130	--	--	--	--	--
02...	1000	8.5	116	7.80	220	72	--	--	--	--	--
02...	1110	3.4	108	8.10	200	88	--	--	--	--	--

DATE	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)	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)
JUN										
02...	0.0	4.6	46	11	1.6	<0.10	15	79	23	13
02...	--	--	41	--	--	--	--	--	75	12
02...	--	--	39	--	--	--	--	--	147	29
02...	--	--	39	--	--	--	--	--	71	26
02...	--	--	47	--	--	--	--	--	46	10

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
JUN										
02...	0.070	0.030	0.100	0.080	0.82	0.90	0.120	15	<1	9
02...	0.160	0.040	0.200	0.100	1.1	1.2	0.120	15	--	--
02...	0.130	0.070	0.200	0.130	1.1	1.2	0.120	18	--	--
02...	0.170	0.030	0.200	0.030	1.6	1.6	0.080	12	--	--
02...	0.160	0.040	0.200	0.060	1.2	1.3	0.240	15	--	--

DATE	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)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
JUN										
02...	<1	<10	2	63	<5	5	0.1	<1	<1	11
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--

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 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)
DEC												
22...	1300	110	7.00	8.5	58	26	2.2	11000	40000	51	2	19
22...	1555	105	7.00	8.5	90	39	2.0	K14000	K10000	48	7	18
MAY												
29...	1140	108	8.20	18.0	220	390	4.6	12000	56000	45	4	17

DATE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	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)
DEC												
22...	0.80	0.80	0.0	3.3	49	5.4	1.3	0.10	6.9	67	28	11
22...	0.80	0.80	0.0	2.5	41	9.8	1.1	0.10	9.9	68	68	11
MAY												
29...	0.60	1.0	0.1	3.5	41	10	1.7	<0.10	5.0	63	482	82

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	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)
DEC												
22...	0.190	0.010	0.200	0.100	0.60	0.70	0.070	--	<1	8	1	<10
22...	0.180	0.020	0.200	0.060	1.2	1.3	0.180	--	--	--	--	--
MAY												
29...	0.850	0.050	0.900	0.130	2.4	2.5	0.230	22	<1	8	1	<10

DATE	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)	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)
DEC												
22...	1	34	<5	<1	<0.1	<1	<1	7	<0.1	<0.10	<0.010	<0.1
22...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
29...	4	41	<5	10	0.8	<1	<1	17	<0.1	<0.10	<0.010	<0.1

DATE	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN 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)
DEC												
22...	<0.010	<0.010	<0.010	0.02	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01
22...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
29...	<0.010	<0.010	<0.010	0.14	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01

DATE	METHOXYCHLOR, TOTAL (UG/L)	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)
DEC												
22...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
22...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
29...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01

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: Jan. 15 to Feb. 5. Records good. 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.--27 years, 10.0 ft³/s (7,240 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, 5,400 ft³/s May 31 at 1830 hours (gage height, 9.35 ft); no flow some days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.77	2.8	1.7	.97	2.5	6.0	1.0	.08	310	18	5.7	3.0
2	1.1	2.9	5.2	.11	9.0	3.5	1.2	3.0	549	17	5.7	8.9
3	.51	2.7	2.1	.11	12	2.9	1.8	3.6	319	18	3.5	6.3
4	.51	7.5	1.8	.44	5.0	2.7	2.2	23	261	18	.00	1.0
5	.51	.07	1.9	.54	7.0	2.6	4.1	6.6	115	17	3.2	.82
6	23	.00	2.1	.63	9.0	2.4	4.7	5.2	87	16	14	.90
7	12	.00	3.5	.85	5.1	2.0	4.0	1.3	78	15	9.1	9.1
8	4.6	.15	2.6	3.1	2.1	2.0	3.6	1.1	67	18	3.5	19
9	2.9	.27	3.0	2.4	1.8	2.0	3.6	1.1	78	22	3.6	10
10	2.0	2.0	4.4	1.4	1.8	2.0	3.9	.70	525	21	3.6	8.6
11	50	.54	7.7	1.5	1.6	11	4.0	.51	635	20	3.2	2.3
12	551	3.9	59	1.7	1.3	3.2	4.0	.91	310	20	1.2	1.4
13	51	8.4	23	4.2	1.3	2.4	4.4	3.5	215	11	.18	1.1
14	16	9.5	14	20	1.4	.65	4.2	2.2	123	3.5	.73	.95
15	9.2	7.2	19	11	16	.63	4.3	.00	101	6.5	2.8	.99
16	8.4	1.1	19	4.5	2.5	.64	4.2	.00	97	13	2.6	2.1
17	8.0	1.2	18	4.0	1.9	25	4.5	.01	99	14	2.8	8.2
18	7.9	1.3	5.1	3.5	1.8	.24	4.5	.13	102	3.3	1.7	12
19	7.8	1.3	2.3	4.2	2.2	.34	4.9	117	92	2.5	4.5	8.0
20	7.5	1.3	2.2	5.0	10	.40	4.9	73	86	5.6	.02	1.3
21	9.0	1.4	.01	3.5	3.0	.40	4.9	43	76	18	.74	1.2
22	17	1.5	.04	3.0	2.0	.40	4.9	13	43	20	4.0	.48
23	14	3.3	.09	2.8	2.0	.57	4.9	7.6	28	19	4.0	.27
24	11	9.9	.40	2.7	33	.01	25	6.8	16	16	4.0	.26
25	4.9	18	13	2.6	36	.00	2.0	6.1	23	4.9	4.0	.39
26	9.4	1.1	8.9	2.5	100	.00	.13	5.6	23	.02	2.1	.31
27	5.3	2.3	1.5	2.5	20	.00	.08	4.4	16	2.2	.14	.54
28	3.2	1.2	5.5	2.4	32	.00	.06	.00	18	8.5	.25	2.5
29	3.4	.96	6.9	2.4	---	.22	.23	533	18	7.1	.52	6.2
30	2.8	.93	8.1	2.4	---	.82	2.0	37	17	7.1	1.1	5.5
31	2.6	---	6.2	2.4	---	.93	---	789	---	4.6	1.8	---
TOTAL	847.30	94.72	248.24	99.35	323.3	75.95	118.20	1688.44	4527	386.82	94.28	123.61
MEAN	27.3	3.16	8.01	3.20	11.5	2.45	3.94	54.5	151	12.5	3.04	4.12
MAX	551	18	59	20	100	25	25	789	635	22	14	19
MIN	.51	.00	.01	.11	1.3	.00	.06	.00	16	.02	.00	.26
AC-FT	1680	188	492	197	641	151	234	3350	8980	767	187	245

CAL YR 1986 TOTAL 5933.67 MEAN 16.3 MAX 1890 MIN .00 AC-FT 11770
WTR YR 1987 TOTAL 8627.15 MEAN 23.6 MAX 789 MIN .00 AC-FT 17110

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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 06...	1454	8.9	541	7.80	14.5	--	--	9.0	90	3.2	--
APR 08...	1630	3.7	692	7.90	19.5	2	2.4	12.5	139	1.5	740
MAY 19...	0955	6.6	665	7.30	25.0	14	18	11.7	146	2.1	3400
21...	1330	72	280	7.90	24.0	80	150	7.2	88	5.4	9600
29...	1330	1560	135	6.40	--	110	400	--	--	6.5	50000

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 06...	--	220	43	77	6.0	23	0.7	12	174	66	29
APR 08...	K36	280	39	95	9.9	30	0.8	17	239	70	35
MAY 19...	3800	240	44	82	9.1	28	0.8	18	198	65	32
21...	62000	100	22	38	2.3	9.3	0.4	7.6	82	35	11
29...	37000	54	5	20	0.90	3.3	0.2	4.9	49	12	4.0

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 06...	0.40	10	330	--	--	--	--	--	--	--	--
APR 08...	0.40	13	410	6	<1	1.59	0.010	1.60	0.030	0.27	0.30
MAY 19...	0.30	14	370	27	27	0.570	0.030	0.600	0.130	1.3	1.4
21...	0.20	9.7	160	34	34	0.550	0.050	0.600	0.450	1.0	1.5
29...	0.10	6.0	81	681	80	0.360	0.040	0.400	0.160	1.7	1.9

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 06...	--	--	--	--	--	--	--	--	--	--	--
APR 08...	0.020	3.2	<1	63	1	<10	<1	20	<5	8	<0.1
MAY 19...	0.060	6.1	2	80	<1	<10	1	8	<5	6	0.2
21...	0.370	11	--	--	--	--	--	--	--	--	--
29...	0.270	25	1	16	1	<10	3	63	<5	8	<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 06...	--	--	--	--	--	--	--	--	--	--	--
APR 08...	<1	<1	14	<0.1	<0.10	--	<0.1	--	<0.010	--	0.01
MAY 19...	<1	<1	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.03
21...	--	--	--	--	--	--	--	--	--	--	--
29...	<1	<1	18	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.39

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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										
06...	--	--	--	--	--	--	--	--	--	--
APR										
08...	<0.010	--	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	--
MAY										
19...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
21...	--	--	--	--	--	--	--	--	--	--
29...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.02	<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)
FEB										
06...	--	--	--	--	--	--	--	--	--	--
APR										
08...	<0.01	<0.01	--	--	<0.01	<1	<0.01	0.03	<0.01	<0.01
MAY										
19...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01
21...	--	--	--	--	--	--	--	--	--	--
29...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.07	<0.01	0.01

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.--Records good except those for estimated daily discharges, which are fair. Several small diversions upstream from station.

AVERAGE DISCHARGE.--5 years, 186 ft³/s (5.91 in/yr), 134,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,800 ft³/s June 3, 1987 (gage height, 24.90 ft), from rating curve extended above 27,000 ft³/s; 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 YEAR.--Maximum discharge, 55,800 ft³/s June 3 at 1400 hours (gage height, 24.90 ft), from rating curve extended above 27,000 ft³/s; minimum daily, 75 ft³/s Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	399	253	598	233	366	257	160	1830	752	e205	e120
2	79	388	246	568	226	342	252	158	1510	674	e200	e119
3	77	369	245	549	220	330	245	160	15600	624	e195	e118
4	75	577	238	515	216	320	240	205	9700	e580	e190	e117
5	95	688	238	491	224	312	246	191	4590	e550	e185	e116
6	457	549	238	474	266	305	271	172	3190	e520	e183	e114
7	336	504	260	457	241	305	250	164	2610	e500	e180	e112
8	284	472	273	442	224	295	236	157	2450	e475	e177	e110
9	246	443	260	444	214	288	229	153	2270	e455	e173	e109
10	209	423	301	438	207	282	225	149	2870	e430	e170	e108
11	304	409	386	401	205	319	218	144	4230	e410	e168	e107
12	5620	395	364	385	201	310	219	143	4400	e385	e163	e106
13	1440	375	336	375	197	283	230	141	3850	e370	e160	e104
14	934	362	365	363	197	270	218	508	3140	e350	e157	e103
15	753	e350	447	347	200	266	209	187	2520	e335	e153	e102
16	658	e340	444	338	190	269	204	160	2170	e320	e150	e100
17	588	e330	442	369	186	498	200	153	1900	e500	e148	e100
18	536	e320	448	354	184	421	192	149	1690	e350	e146	e150
19	492	e312	445	327	181	358	185	552	1530	e310	e144	e130
20	456	306	422	311	189	336	180	344	1410	e290	e142	e118
21	447	296	413	309	185	330	178	282	1280	e280	e140	e108
22	532	293	707	302	180	323	188	250	1220	266	e138	e104
23	684	285	975	293	176	333	186	229	1130	e255	e137	e101
24	685	282	882	288	205	312	185	219	1070	e250	e136	98
25	597	335	813	280	202	296	252	210	1010	e240	e134	e94
26	564	305	810	268	391	291	216	196	1060	e235	e131	e92
27	524	277	758	260	406	292	191	183	890	e230	e130	e90
28	484	274	716	254	420	283	177	178	835	e225	e128	e88
29	454	268	681	250	---	277	171	11300	801	e220	e127	e86
30	435	259	648	241	---	278	164	2460	781	e215	e125	e84
31	416	---	618	233	---	267	---	1910	---	e210	e123	---
TOTAL	19543	11185	14672	11524	6366	9757	6414	21567	83537	11806	4838	3208
MEAN	630	373	473	372	227	315	214	696	2785	381	156	107
MAX	5620	688	975	598	420	498	271	11300	15600	752	205	150
MIN	75	259	238	233	176	266	164	141	781	210	123	84
AC-FT	38760	22190	29100	22860	12630	19350	12720	42780	165700	23420	9600	6360

CAL YR 1986 TOTAL 86542 MEAN 237 MAX 5620 MIN 30 AC-FT 171700
WTR YR 1987 TOTAL 204417 MEAN 560 MAX 15600 MIN 75 AC-FT 405500

e Estimated.

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN											
20...	1340	302	545	7.80	11.0	2	0.20	10.7	100	0.5	K34
MAY											
05...	1340	179	532	8.10	21.0	3	0.50	8.7	102	1.1	94
29...	1905	8180	270	7.90	20.0	50	240	--	--	3.8	--
AUG											
31...	1458	123	508	8.10	24.0	2	0.40	8.4	103	0.4	K130

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)
JAN											
20...	62	300	76	89	18	6.6	0.2	1.1	220	61	18
MAY											
05...	100	270	72	80	18	7.0	0.2	1.0	202	68	13
29...	--	130	11	43	6.4	3.3	0.1	2.2	123	11	4.4
AUG											
31...	56	260	62	76	17	7.9	0.2	1.3	198	59	14

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)
JAN											
20...	0.20	11	340	2	<1	--	<0.010	1.00	0.020	0.48	0.50
MAY											
05...	0.20	11	320	<1	<1	--	<0.010	0.500	0.030	0.37	0.40
29...	0.10	9.2	150	422	39	0.290	0.010	0.300	0.020	1.8	1.8
AUG											
31...	0.20	13	310	2	<1	--	<0.010	0.700	0.010	--	<0.20

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)
JAN											
20...	<0.010	1.0	<1	30	<1	<10	<1	3	<5	2	<0.1
MAY											
05...	0.010	1.3	--	--	--	--	--	--	--	--	--
29...	0.120	13	--	--	--	--	--	--	--	--	--
AUG											
31...	0.010	1.3	<1	40	<1	<10	<1	4	<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)
JAN											
20...	<1	<1	15	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY											
05...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
AUG											
31...	2	<1	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN										
20...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY										
05...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
AUG										
31...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08178880 MEDINA RIVER AT BANDERA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
20...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
05...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
AUG										
31...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01

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, located near right end of dam. The dam and lake are owned and operated by Bexar-Medina-Atascosa Counties Water Improvement District No. 1, which 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, 289,900 acre-ft May 29, 1987 (gage height, 1,078.2 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, 289,900 acre-ft May 29 (gage height, 1,078.2 ft); minimum, 180,600 acre-ft Oct. 3-5 (gage height, 1,057.3 ft).

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

1,057.0	179,400	1,070.0	242,400
1,060.0	192,000	1,075.0	271,400
1,065.0	217,200	1,079.0	294,500

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	181100	219200	234400	258600	256300	256900	255700	255200	264400	258100	255700	255700
2	181100	219700	234400	258600	256300	256900	255700	255200	262700	258100	255700	255200
3	180600	220200	234400	258100	256300	256900	255700	255200	262700	257500	255700	255200
4	180600	221200	234900	258100	255700	256900	255700	255700	283500	257500	255200	254600
5	180600	222300	234900	257500	256300	256900	255700	255700	273700	257500	255200	255200
6	182300	222800	235400	257500	256300	256900	255700	256300	267900	256900	255200	255200
7	182700	223800	235400	257500	256900	256900	255700	255700	265600	256900	255200	255200
8	183200	224800	235900	257500	256300	256900	255700	255700	264400	256900	255200	255200
9	183600	225300	236400	257500	256300	256300	255700	255700	263300	256900	255200	255200
10	183600	226300	237400	257500	255700	256300	255700	255700	263300	256900	255200	254600
11	184900	226300	237400	257500	255700	256300	255700	255200	267300	257500	255200	254600
12	193000	227300	238400	257500	255700	256300	255700	255200	269600	257500	255200	254600
13	198100	227300	238400	256900	255700	256300	255700	255200	267300	256900	255200	254600
14	200100	227800	239400	256900	255700	256300	255700	255700	267300	256300	255200	254600
15	201600	228300	239900	256900	255700	256300	255700	255700	265600	256300	255200	254600
16	203100	229300	240400	256900	256300	256300	255700	255700	263900	256300	255200	254600
17	204100	229300	241400	256900	255700	256900	255700	255700	262700	256300	255200	254000
18	205100	229800	242400	256900	255700	256900	255200	255200	262100	256300	255200	254000
19	206100	230300	243600	256900	255700	256900	255200	255700	261500	256300	255200	254600
20	206100	230800	244700	256300	256300	256300	255200	257500	261000	256300	254600	254600
21	206600	231300	246500	256900	255700	256900	255200	257500	261000	256300	254600	254600
22	208100	231300	247600	256900	255700	256900	255200	257500	259800	256300	254600	254600
23	209700	232300	251700	256900	255700	256900	255200	256900	259800	256300	254600	254000
24	211700	232300	254600	256900	256300	256900	255200	256300	259200	256300	254600	254000
25	212700	232300	256900	256900	255700	256900	255200	256300	259200	255700	254600	254000
26	214200	233400	258600	256900	256300	256300	255700	256300	259800	255700	254000	254000
27	215200	233400	259200	256300	256900	256300	255700	255700	259800	255700	254000	254000
28	215700	233400	259800	256300	256900	256300	255700	255700	259200	255700	254000	252900
29	216700	233900	259200	256300	---	256300	255200	289900	258100	255700	254600	253400
30	217200	234400	259200	256300	---	256300	255200	272000	258100	255200	255200	252900
31	218200	---	258600	256300	---	255700	---	265000	---	255200	255200	---
MAX	218200	234400	259800	258600	256900	256900	255700	289900	283500	258100	255700	255700
MIN	180600	219200	234400	256300	255700	255700	255200	255200	258100	255200	254000	252900
(↑)	1065.2	1068.4	1072.8	1072.4	1072.5	1072.3	1072.2	1073.9	1072.7	1072.2	1072.2	1071.8
(Φ)	+37100	+16200	+24200	-2300	+600	-1200	-500	+9800	-6900	-2900	0	-2300

CAL YR 1986 MAX 259800 MIN 140400 (Φ) +111800
WTR YR 1987 MAX 289900 MIN 180600 (Φ) +71800

(↑) 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 water from right end of Medina Diversion Dam 1,900 ft upstream from gage. Water is used for irrigation downstream near Lacoste and Natalia. Prior to November 1984, double-barrel flume in canal 54 ft downstream from gage.

AVERAGE DISCHARGE.--41 years (water years 1923-33, 1958-87), 42.5 ft³/s (30,790 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 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	69	.00	12	.00	21	.00	29	55	6.8	106	68	50
2	67	.00	28	.00	23	.00	35	55	7.1	109	68	43
3	63	.00	28	.00	28	.00	40	55	8.2	102	68	59
4	70	.00	28	.00	28	.00	40	43	12	100	72	55
5	69	.00	28	.00	12	.00	40	28	9.4	91	84	41
6	15	.00	28	.00	.00	.00	41	15	8.6	92	85	41
7	.00	.00	28	.00	.00	.00	42	.00	8.7	102	97	41
8	.00	.00	9.9	.00	.00	.00	42	.00	8.9	103	100	41
9	.00	.00	.00	7.4	.00	7.5	42	.00	9.2	103	96	41
10	.00	6.4	.00	21	.00	10	42	.00	9.6	100	95	41
11	.11	14	.00	21	.00	.00	42	.00	11	90	99	36
12	.01	14	8.3	20	.00	.00	42	1.2	11	91	102	25
13	.00	9.2	27	20	3.9	.00	49	22	11	91	102	25
14	.00	20	27	20	17	.00	65	22	11	93	101	39
15	.00	34	9.6	20	17	2.6	60	22	10	101	102	45
16	.00	34	.00	20	17	19	60	22	10	95	102	46
17	.00	34	.00	11	17	19	60	22	9.8	78	101	45
18	.00	34	.00	.00	17	19	60	22	9.7	77	108	45
19	.00	34	.00	.00	17	19	60	22	9.5	78	111	45
20	.00	34	.00	.00	17	19	60	21	9.5	92	109	45
21	.00	34	.00	.00	17	19	60	22	9.5	99	107	45
22	.00	34	.21	9.0	17	19	61	22	36	100	105	45
23	.00	34	.0	26	13	19	60	23	56	97	103	57
24	.00	34	.00	20	.01	24	60	23	63	94	104	65
25	.00	13	.00	20	.00	32	60	23	72	87	107	66
26	.00	.00	.00	20	.00	32	34	23	51	87	106	66
27	.00	.00	.00	20	.00	32	47	23	53	81	106	66
28	.00	.00	.00	20	.00	32	55	23	51	68	101	62
29	.00	.00	.00	21	---	31	55	26	66	68	94	50
30	.00	.00	.00	21	---	29	55	10	84	68	85	58
31	.00	---	.00	21	---	29	---	7.1	---	67	59	---
TOTAL	353.12	416.60	262.01	358.40	281.91	413.10	1498	652.30	732.5	2810	2947	1429
MEAN	11.4	13.9	8.45	11.6	10.1	13.3	49.9	21.0	24.4	90.6	95.1	47.6
MAX	70	34	28	26	28	32	65	55	84	109	111	66
MIN	.00	.00	.00	.00	.00	.00	29	.00	6.8	67	59	25
AC-FT	700	826	520	711	559	819	2970	1290	1450	5570	5850	2830

CAL YR 1986 TOTAL 17306.37 MEAN 47.4 MAX 157 MIN .00 AC-FT 34330
WTR YR 1987 TOTAL 12153.93 MEAN 33.3 MAX 111 MIN .00 AC-FT 24110

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.--No estimated daily discharges. Records good. 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.--19 years, 4.57 ft³/s (4.14 in/yr), 3,310 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)
May 29	0930	826	4.03	June 4	0600	719	3.82
May 31	1715	408	3.38	June 11	1100	*7,140	*10.33

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.27	.00	10	.00	.00	.00	.00	99	3.5	.00	.00
2	.00	.00	.00	8.8	.00	.00	.00	.00	77	2.9	.00	.00
3	.00	.00	.00	7.8	.00	.00	.00	.00	134	2.4	.00	.00
4	.00	.00	.00	6.9	.00	.00	.00	.00	491	1.8	.00	.00
5	.05	.00	.00	6.3	.01	.00	.00	.00	314	1.5	.00	.00
6	.18	.00	.00	5.2	.00	.00	.00	.00	249	1.2	.00	.00
7	.01	.00	.00	4.5	.00	.00	.00	.00	170	1.1	.00	.42
8	.00	.00	.00	3.8	.00	.00	.00	.00	123	1.0	.00	.00
9	.00	.00	.00	3.4	.00	.00	.00	.00	98	4.1	.00	.00
10	.00	.00	.00	3.1	.00	.00	.00	.00	217	2.9	.00	.00
11	.14	.00	.00	2.4	.00	.00	.00	.00	932	1.6	.00	.00
12	11	.00	.00	1.9	.00	.00	.00	.00	359	1.2	.00	.00
13	18	.00	.00	1.5	.00	.00	.00	.00	290	.86	.00	.00
14	10	.00	.00	1.1	.00	.00	.00	.00	200	.44	.00	.00
15	5.8	.00	.11	.95	.00	.00	.00	.00	134	1.7	.00	.00
16	3.1	.00	.58	.64	.00	.00	.00	.00	90	.88	.00	.00
17	1.4	.00	.00	.77	.00	.00	.00	.00	69	.42	.00	.00
18	.18	.00	.69	.68	.00	.00	.00	.00	55	.02	.00	.00
19	.00	.00	1.4	.13	.00	.00	.00	.00	39	.00	.00	.00
20	.00	.00	1.5	.00	.00	.00	.00	.00	24	.00	.00	.00
21	.04	.00	1.3	.22	.00	.00	.00	.00	19	.00	.00	.00
22	5.5	.00	41	.08	.00	.00	.00	.00	20	.00	.00	.00
23	7.4	.00	80	.00	.00	.00	.00	.00	13	.00	.00	.00
24	6.9	.04	58	.00	.00	.00	.00	.00	11	.00	.00	.00
25	5.7	.00	39	.00	.00	.00	.00	.00	8.7	.00	.00	.00
26	6.6	.00	32	.00	.01	.00	.00	.00	6.5	.00	.00	.00
27	5.0	.00	25	.00	.01	.00	.00	.00	6.5	.00	.00	.00
28	3.5	.00	21	.00	.01	.00	.00	.00	5.7	.00	.00	.00
29	2.7	.00	17	.00	---	.00	.00	174	5.1	.00	.00	.00
30	1.8	.00	14	.00	---	.00	.00	73	4.2	.00	.00	.00
31	1.1	---	12	.00	---	.00	---	90	---	.00	.00	---
TOTAL	96.10	.31	344.58	70.17	.04	.00	.00	337.00	4263.7	29.52	.00	.42
MEAN	3.10	.01	11.1	2.26	.0	.00	.00	10.9	142	.95	.00	.01
MAX	18	.27	80	10	.01	.00	.00	174	932	4.1	.00	.42
MIN	.00	.00	.00	.00	.00	.00	.00	.00	4.2	.00	.00	.00
AC-FT	191	.6	683	139	.1	.0	.0	668	8460	59	.0	.8
CFSM	.21	.0	.74	.15	.0	.00	.00	.72	9.47	.06	.00	.0
IN.	.24	.0	.85	.17	.0	.00	.00	.84	10.6	.07	.00	.0

CAL YR 1986	TOTAL	1684.76	MEAN	4.62	MAX	243	MIN	.00	AC-FT	3340	CFSM	.31	IN.	4.18
WTR YR 1987	TOTAL	5141.83	MEAN	14.1	MAX	932	MIN	.00	AC-FT	10200	CFSM	.94	IN.	12.8

08181400 HELOTES CREEK AT HELOTES, TX--Continued

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
DEC											
22...	1220	39	410	7.40	11.0	7	20	8.0	--	1.3	K1600
MAY											
29...	1042	393	233	6.30	18.5	85	200	4.2	46	5.0	20000
29...	1715	64	290	1.80	20.0	50	32	8.3	95	3.6	4200
JUN											
02...	1606	76	500	7.80	23.0	8	7.4	8.3	101	0.8	--
JUL											
16...	1110	3.2	460	8.10	27.5	<1	1.2	7.4	96	1.0	--

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)
DEC											
22...	8800	220	19	67	12	7.1	0.2	1.3	198	18	12
MAY											
29...	28000	110	6	34	5.2	3.5	0.2	2.5	100	7.6	5.1
29...	3400	150	14	48	7.1	4.2	0.2	2.2	135	12	11
JUN											
02...	--	270	0	88	13	7.4	0.2	1.1	--	16	10
JUL											
16...	--	220	35	65	14	11	0.3	0.80	185	19	33

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)
DEC											
22...	0.20	8.1	240	7	<1	--	<0.010	0.600	0.030	0.47	0.50
MAY											
29...	<0.10	6.6	120	328	60	0.380	0.020	0.400	0.180	2.7	2.9
29...	<0.10	8.8	170	48	22	0.380	0.020	0.400	0.050	0.95	1.0
JUN											
02...	0.10	11	--	31	31	--	<0.010	0.800	0.020	1.5	1.5
JUL											
16...	0.10	10	260	295	23	--	<0.010	0.300	0.060	0.34	0.40

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)
DEC											
22...	0.020	3.0	<1	23	<1	<10	<1	8	<5	<1	<0.1
MAY											
29...	0.340	13	1	15	<1	<10	<1	71	<5	2	<0.1
29...	0.020	--	--	--	--	--	--	--	--	--	--
JUN											
02...	0.030	3.1	--	--	--	--	--	--	--	--	--
JUL											
16...	<0.010	2.7	<1	39	<1	<10	<1	6	19	<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)
DEC											
22...	<1	<1	10	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY											
29...	<1	<1	<3	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
JUL											
16...	<1	<1	3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
DEC										
22...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY										
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
JUN										
02...	--	--	--	--	--	--	--	--	--	--
JUL										
16...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<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)
DEC										
22...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
JUN										
02...	--	--	--	--	--	--	--	--	--	--
JUL										
16...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--Records good except those for Dec. 21-31, which are poor. 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. An observation of water temperature was made during the year.

AVERAGE DISCHARGE.--25 years, 30.1 ft³/s (5.98 in/yr), 21,810 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 RECORDS.--The second highest flood occurred in 1952, and reached a stage of 16.3 ft (discharg 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)
Oct. 12	0545	1,560	5.05	June 4	0445	*4,410	*7.42
Dec. 22	Unknown	3,560	a6.68	June 10	1045	1,510	5.00
May 29	0900	4,100	7.15	June 11	1130	2,940	6.19
June 3	1845	1,910	5.35	June 13	0315	1,200	4.69

a From floodmark.

Minimum daily discharge, 4.2 ft³/s Sept. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	91	37	e160	38	101	39	18	464	56	19	7.8
2	7.3	85	36	e150	39	91	39	18	328	50	16	6.9
3	6.8	81	36	e140	38	87	35	19	875	46	15	6.0
4	6.4	109	34	e130	37	81	31	24	2110	42	14	5.2
5	25	96	34	e120	54	76	34	13	917	38	13	5.2
6	101	79	35	e112	61	75	39	12	555	34	13	4.5
7	46	80	45	e105	48	72	33	11	413	31	13	9.2
8	36	76	42	e99	43	69	29	8.9	339	29	12	5.2
9	32	71	40	94	39	68	28	8.7	324	34	13	6.0
10	27	67	39	e88	39	66	28	8.9	718	32	13	5.2
11	147	63	e39	e81	39	101	28	8.9	1340	30	14	22
12	799	59	e39	e76	39	75	29	9.4	538	28	17	7.3
13	328	57	e38	71	40	69	37	11	643	27	19	6.0
14	185	55	e38	67	41	67	33	12	409	25	18	5.6
15	134	54	e37	65	48	65	30	12	314	26	18	4.9
16	107	54	e37	62	40	67	29	19	260	27	16	5.2
17	90	54	e36	71	38	81	28	7.5	225	28	14	4.9
18	77	53	e36	67	37	68	25	6.4	197	26	13	7.2
19	69	51	e35	58	36	64	22	29	172	25	12	6.0
20	64	48	e35	53	48	63	21	60	150	22	11	5.2
21	67	46	e200	52	40	64	21	41	136	23	10	5.2
22	e90	45	e1500	51	37	62	21	26	125	26	9.4	4.9
23	e110	45	e1000	47	35	59	20	16	113	26	8.3	4.5
24	149	46	e600	46	129	50	20	11	102	23	7.8	4.5
25	174	63	e400	44	106	46	22	9.3	93	23	7.3	4.5
26	160	51	e340	39	238	44	23	8.5	86	22	6.9	4.5
27	137	45	e290	39	137	42	23	7.4	74	21	6.4	4.2
28	120	44	e250	39	124	43	21	6.7	63	20	6.4	4.5
29	109	41	e220	39	---	47	20	1250	62	21	6.4	4.9
30	100	39	e200	39	---	44	18	1020	57	20	7.3	4.9
31	93	---	e180	37	---	41	---	942	---	20	8.9	---
TOTAL	3604.1	1848	5928	2341	1688	2048	826	3654.6	12202	901	378.1	182.1
MEAN	116	61.6	191	75.5	60.3	66.1	27.5	118	407	29.1	12.2	6.07
MAX	799	109	1500	160	238	101	39	1250	2110	56	19	22
MIN	6.4	39	34	37	35	41	18	6.4	57	20	6.4	4.2
AC-FT	7150	3670	11760	4640	3350	4060	1640	7250	24200	1790	750	361
CFSM	1.70	.90	2.80	1.10	.88	.97	.40	1.72	5.95	.42	.18	.09
IN.	1.96	1.01	3.22	1.27	.92	1.11	.45	1.99	6.64	.49	.21	.10

CAL YR 1986 TOTAL 19576.5 MEAN 53.6 MAX 1500 MIN 6.0 AC-FT 38830 CFSM .78 IN. 10.6
WTR YR 1987 TOTAL 35600.8 MEAN 97.5 MAX 2110 MIN 4.2 AC-FT 70610 CFSM 1.43 IN. 19.4

e Estimated.

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.--41 years, 16.5 ft³/s (11,950 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)
Dec. 22	1900	566	5.08	June 3	0100	786	5.42
Dec. 23	0700	2,400	7.30	June 3	1500	677	5.26
May 30	1000	979	5.69	June 4	1300	*19,000	a*15.41
June 1	1200	1,040	5.78	June 12	0100	9,170	11.45
June 2	0800	891	5.57				

a From floodmark.

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	775	7.7	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	562	1.8	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	557	.35	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	9550	.1	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	2700	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	1290	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	822	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	580	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	465	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	801	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	3320	.00	.00	.00
12	11	.00	.00	.00	.00	.00	.00	.00	3030	.00	.00	.00
13	93	.00	.00	.00	.00	.00	.00	.00	1440	.00	.00	.00
14	58	.00	.00	.00	.00	.00	.00	.00	1030	.00	.00	.00
15	.21	.00	.00	.00	.00	.00	.00	.00	708	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	530	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	411	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	324	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	261	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	219	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	187	.00	.00	.00
22	.00	.00	202	.00	.00	.00	.00	.00	158	.00	.00	.00
23	.00	.00	1550	.00	.00	.00	.00	.00	134	.00	.00	.00
24	.00	.00	607	.00	.00	.00	.00	.00	113	.00	.00	.00
25	.00	.00	346	.00	.00	.00	.00	.00	92	.00	.00	.00
26	.00	.00	217	.00	15	.00	.00	.00	73	.00	.00	.00
27	.00	.00	161	.00	.00	.00	.00	.00	62	.00	.00	.00
28	.00	.00	93	.00	.00	.00	.00	.00	47	.00	.00	.00
29	.00	.00	48	.00	---	.00	.00	21	35	.00	.00	.00
30	.00	.00	18	.00	---	.00	.00	453	19	.00	.00	.00
31	.00	---	2.6	.00	---	.00	---	623	---	.00	.00	---
TOTAL	162.21	.00	3244.60	.00	15.00	.00	.00	1097.00	30295	9.95	.00	.00
MEAN	5.23	.00	105	.00	.54	.00	.00	35.4	1010	.32	.00	.00
MAX	93	.00	1550	.00	15	.00	.00	623	9550	7.7	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	19	.00	.00	.00
AC-FT	322	.00	6440	.00	30	.00	.00	2180	60090	20	.00	.00

CAL YR 1986	TOTAL	3545.69	MEAN	9.71	MAX	1550	MIN	.00	AC-FT	7030
WTR YR 1987	TOTAL	34823.73	MEAN	95.4	MAX	9550	MIN	.00	AC-FT	69070

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.--64 years, 152 ft³/s (2.80 in/yr), 110,100 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. 7	0500	2,600	6.23	June 3	2300	7,640	8.56
Oct. 12	0800	5,080	7.56	June 11	2330	6,770	8.10
Nov. 5	0330	1,440	5.33	July 17	1700	2,440	5.60
May 29	0500	14,900	11.23	Aug. 28	1000	760	4.11
May 31	1530	13,700	10.82	Sept. 15	1300	*20,300	*12.82

Minimum daily discharge, 149 ft³/s Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	213	329	222	318	209	225	199	207	1830	563	287	307
2	184	321	217	310	206	219	196	206	1080	538	280	288
3	164	312	212	305	203	217	193	204	2740	516	274	276
4	149	351	210	298	200	218	190	232	4910	498	268	266
5	151	1060	209	294	225	215	196	271	2540	479	263	260
6	170	653	205	289	248	212	201	258	1920	458	258	255
7	1560	524	212	285	237	209	196	237	1560	443	251	250
8	865	463	210	283	228	208	192	225	1370	435	246	248
9	580	421	205	286	220	207	189	218	1350	428	242	244
10	465	396	215	280	216	209	187	213	1440	414	238	241
11	1100	385	214	275	212	216	184	213	1910	397	234	240
12	3090	373	209	271	209	212	181	221	3780	387	231	234
13	1490	351	205	269	207	208	179	379	2780	378	233	230
14	982	335	220	265	206	206	176	393	2470	376	227	226
15	771	320	231	262	203	204	175	363	1800	381	226	5520
16	652	309	228	257	199	209	174	331	1530	389	222	2030
17	573	301	226	258	196	281	172	304	1370	958	216	844
18	516	293	223	258	193	262	169	308	1230	841	209	627
19	471	284	220	252	192	247	168	362	1130	522	210	514
20	438	276	218	248	196	238	192	347	1040	437	205	453
21	423	269	220	246	192	233	272	339	968	397	204	407
22	446	263	260	243	190	230	319	321	931	375	200	369
23	426	258	307	237	189	227	276	309	853	356	198	351
24	411	250	328	233	206	224	255	336	803	345	195	336
25	388	253	335	230	209	220	244	326	761	331	192	322
26	405	251	348	226	218	217	236	313	725	327	190	309
27	409	243	345	222	221	216	228	306	681	328	192	301
28	386	237	337	219	227	212	220	302	645	319	380	301
29	367	232	334	216	---	206	215	5090	616	312	408	290
30	353	226	328	213	---	205	209	1070	590	302	367	284
31	340	---	322	210	---	203	---	3640	---	293	334	---
TOTAL	18938	10539	7775	8058	5857	6815	6183	17844	47353	13523	7680	16823
MEAN	611	351	251	260	209	220	206	576	1578	436	248	561
MAX	3090	1060	348	318	248	281	319	5090	4910	958	408	5520
MIN	149	226	205	210	189	203	168	204	590	293	190	226
AC-FT	37560	20900	15420	15980	11620	13520	12260	35390	93920	26820	15230	33370
CFSM	.83	.48	.34	.35	.28	.30	.28	.78	2.14	.59	.34	.76
IN.	.96	.53	.39	.41	.30	.34	.31	.90	2.39	.68	.39	.85

CAL YR 1986	TOTAL	63848	MEAN	175	MAX	3090	MIN	34	AC-FT	126600	CFSM	.24	IN.	3.22
WTR YR 1987	TOTAL	167388	MEAN	459	MAX	5520	MIN	149	AC-FT	332000	CFSM	.62	IN.	8.45

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. Sediment analyses: January 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN 22...	1345	240	408	8.20	13.0	<1	0.20	11.0	107	0.6	K2
MAY 06...	0925	256	421	8.10	20.5	1	0.40	8.3	96	0.5	K22
SEP 02...	1755	91	460	8.00	28.0	3	2.5	8.2	108	0.6	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)
JAN 22...	K6	220	25	62	15	6.9	0.2	0.70	192	14	12
MAY 06...	K22	200	20	59	14	7.2	0.2	0.70	185	14	14
SEP 02...	40	220	34	65	15	12	0.4	1.1	190	17	20

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN 22...	0.10	11	240	5	<1	<0.010	1.40	<0.010	--	0.50	<0.010
MAY 06...	0.10	11	230	<1	<1	<0.010	1.10	0.020	2.3	2.3	0.010
SEP 02...	0.10	13	260	7	4	<0.010	1.70	0.010	0.29	0.30	0.020

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)
JAN 22...	0.9	<1	38	<1	<10	1	<3	<5	2	<0.1	<1
MAY 06...	1.1	--	--	--	--	--	--	--	--	--	--
SEP 02...	1.8	<1	50	<1	<10	<1	3	<5	<1	0.1	2

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)
JAN 22...	<1	4	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<1	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN 22...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
22...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
06...	--	--	--	--	--	--	--	--	--	--
SEP										
02...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--Records good. 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.--42 years (water years 1940-50, 1957-87), 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 6	0430	1,170	5.64	Sept. 15	Unknown	*4,600	a*8.73
July 17	0800	2,400	7.02				

a From inside floodmark.

Minimum daily discharge, 0.09 ft³/s Oct. 2-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	28	4.4	7.3	2.0	1.6	1.2	8.2	93	29	14	15
2	.09	25	4.2	6.7	1.9	1.6	1.1	7.5	83	26	12	14
3	.09	22	4.2	5.5	1.9	1.6	1.1	7.0	87	24	11	13
4	.09	24	4.2	5.2	2.0	1.5	1.2	9.1	105	21	11	11
5	.20	21	4.0	5.2	2.1	1.5	1.4	11	122	19	9.8	9.8
6	.56	18	3.8	5.2	1.6	1.5	1.0	398	124	17	9.2	8.7
7	1.8	18	3.8	5.0	1.3	1.5	.81	165	115	16	8.9	8.2
8	5.4	18	3.6	4.5	1.5	1.4	.76	117	103	15	8.7	7.6
9	7.1	16	3.4	4.0	1.5	1.4	.80	85	99	14	8.3	7.0
10	7.7	14	3.5	3.8	1.5	1.4	.83	68	96	13	8.0	6.8
11	48	13	3.4	3.8	1.5	1.4	.83	56	98	12	7.6	6.2
12	128	12	3.4	3.8	1.5	1.2	.83	45	114	11	7.3	6.0
13	147	11	3.4	3.6	1.5	1.2	.72	246	111	9.9	7.1	5.9
14	150	11	3.4	3.4	1.5	1.2	.69	354	102	10	7.0	5.5
15	150	9.9	3.5	3.2	1.2	1.2	.67	184	97	9.5	6.8	1000
16	147	8.9	4.4	3.2	1.3	1.5	.69	148	92	9.1	6.7	e350
17	144	8.5	5.0	3.0	1.3	1.4	.69	128	86	581	6.5	e200
18	138	8.0	4.6	2.4	1.3	2.2	.69	107	80	163	6.4	e150
19	129	7.5	4.0	2.7	1.4	3.6	.69	101	73	99	6.2	e120
20	117	7.2	4.0	2.8	1.3	3.8	1.4	95	68	71	6.1	e100
21	109	6.8	3.9	2.8	1.2	3.2	2.1	95	64	54	5.9	e85
22	112	6.6	4.0	2.5	1.1	2.6	7.0	89	64	43	5.5	e75
23	106	6.3	5.9	2.5	1.3	2.1	9.1	86	57	36	5.1	e66
24	97	5.9	8.6	2.4	1.7	1.8	10	85	53	31	5.1	e58
25	84	6.0	9.3	2.2	1.5	1.8	11	81	48	27	5.1	e52
26	72	5.5	9.7	2.2	1.6	1.7	12	76	43	24	4.8	e47
27	62	5.5	9.5	2.2	1.6	1.6	12	69	41	23	4.8	e43
28	53	5.1	9.5	2.2	1.6	1.6	11	64	37	21	7.3	e40
29	45	4.6	9.1	2.1	---	1.4	10	64	34	18	9.5	e37
30	39	4.7	8.3	2.0	---	1.1	9.6	56	31	16	12	e35
31	34	---	7.5	2.2	---	1.1	---	122	---	15	15	---
TOTAL	2134.13	358.0	163.5	109.6	42.7	53.7	111.90	3226.8	2420	1477.5	248.7	2582.7
MEAN	68.8	11.9	5.27	3.54	1.52	1.73	3.73	104	80.7	47.7	8.02	86.1
MAX	150	28	9.7	7.3	2.1	3.8	12	398	124	581	15	1000
MIN	.09	4.6	3.4	2.0	1.1	1.1	.67	7.0	31	9.1	4.8	5.5
AC-FT	4230	710	324	217	85	107	222	6400	4800	2930	493	5120

CAL YR 1986 TOTAL 4002.33 MEAN 11.0 MAX 505 MIN .04 AC-FT 7940
WTR YR 1987 TOTAL 12929.17 MEAN 35.4 MAX 1000 MIN .09 AC-FT 25650

e Estimated.

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.--48 years, 127 ft³/s (92,010 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. 8	0530	1,100	5.15	May 31	2230	28,000	13.61
Oct. 12	1800	4,000	7.00	June 4	0930	7,350	9.27
Nov. 6	0130	1,050	5.11	June 14	0400	4,680	7.43
Dec. 27	1000	324	4.33	July 18	0700	1,680	5.41
May 15	0500	331	4.32	Aug. 29	0830	7,100	9.12
May 21	0330	394	4.41	Sept. 16	0030	10,700	10.83
May 29	1400	*67,200	*16.54				

Minimum daily discharge, 37 ft³/s Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63	234	165	312	145	159	145	143	8770	742	338	483
2	51	221	158	300	142	161	142	140	2580	711	329	427
3	43	210	153	287	139	159	139	139	2610	689	318	391
4	39	212	151	276	135	158	137	141	5970	657	311	367
5	37	420	154	276	151	157	139	158	3910	636	303	351
6	52	925	152	270	164	154	140	191	2830	609	298	344
7	57	716	150	264	168	153	140	190	2270	587	290	340
8	978	592	150	259	167	149	136	170	1910	570	284	330
9	652	506	150	253	162	147	133	159	1740	557	279	323
10	425	440	157	248	155	149	131	150	1790	546	272	315
11	588	407	168	232	149	161	129	172	2010	528	272	319
12	2380	385	164	227	146	156	127	154	3620	511	265	311
13	2310	357	161	227	145	153	123	145	3160	491	271	305
14	1460	327	164	217	143	150	118	220	3730	487	267	299
15	1070	310	176	212	143	150	116	305	2590	484	262	1940
16	837	293	180	208	137	151	114	282	2090	507	259	4390
17	656	279	185	212	132	171	111	253	1810	504	257	1660
18	570	264	185	206	129	194	108	239	1640	1290	252	1120
19	472	250	176	200	127	204	107	274	1510	904	248	914
20	396	238	172	194	129	200	105	281	1390	696	245	747
21	362	230	172	185	127	194	112	347	1280	581	240	660
22	381	221	203	179	124	191	154	289	1220	521	240	584
23	369	213	227	176	125	182	204	264	1160	484	234	532
24	338	207	259	174	141	172	197	255	1080	450	233	491
25	312	208	287	171	139	168	189	260	998	432	228	469
26	289	199	312	166	153	167	179	255	957	417	227	443
27	299	194	324	161	153	165	169	249	916	411	223	426
28	303	188	324	159	156	163	160	246	853	388	327	405
29	285	179	324	153	---	157	152	15700	823	380	2240	413
30	266	173	318	149	---	152	146	2970	767	362	755	393
31	249	---	318	149	---	150	---	5390	---	353	566	---
TOTAL	16589	9598	6339	6702	4026	5097	4202	30131	67984	17485	11133	20492
MEAN	535	320	204	216	144	164	140	972	2266	564	359	683
MAX	2380	925	324	312	168	204	204	15700	8770	1290	2240	4390
MIN	37	173	150	149	124	147	105	139	767	353	223	299
AC-FT	32900	19040	12570	13290	7990	10110	8330	59760	134800	34680	22080	40650

CAL YR 1986	TOTAL	44305	MEAN	121	MAX	2380	MIN	22	AC-FT	87880
WTR YR 1987	TOTAL	199778	MEAN	547	MAX	15700	MIN	37	AC-FT	396300

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.--62 years (water years 1925-29, 1931-87), 118 ft³/s (4.12 in/yr), 85,490 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. 12	0800	5,290	7.93	June 11	1330	6,730	8.62
May 29	0830	*35,800	*18.36	June 13	1830	8,440	9.37
May 31	2000	2,910	6.64	July 17	1230	11,200	10.40
June 3	2300	10,400	10.11	Sept. 15	1330	14,100	11.37

Minimum daily discharge, 64 ft³/s Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	204	168	347	204	222	199	145	1690	639	299	262
2	67	200	167	339	199	218	195	141	1170	608	286	242
3	65	196	166	330	196	213	192	143	4050	579	280	228
4	64	266	164	323	194	208	191	158	4410	556	271	219
5	67	379	165	319	217	208	200	159	2460	535	264	213
6	113	301	165	314	219	204	203	153	1890	516	259	209
7	127	276	176	309	212	204	196	148	1580	500	253	207
8	157	262	174	305	204	204	187	145	1430	497	247	204
9	141	249	167	303	196	202	185	142	1390	497	239	201
10	127	244	179	294	193	204	180	137	2020	485	233	201
11	344	237	182	287	190	213	179	153	3360	473	230	214
12	2290	235	180	281	190	208	176	221	3930	458	239	203
13	780	229	176	277	185	203	174	231	3160	449	289	195
14	455	224	186	274	185	199	167	175	2950	445	244	189
15	357	219	197	270	181	199	170	171	1960	494	230	2850
16	309	220	203	265	179	204	167	158	1700	479	222	840
17	278	215	204	268	176	279	166	153	1520	2200	217	459
18	259	212	204	258	173	269	162	145	1380	812	211	421
19	246	206	204	254	170	255	162	164	1250	536	208	381
20	233	201	204	248	173	244	158	177	1160	463	202	331
21	238	199	206	244	171	238	164	181	1080	425	198	308
22	265	194	271	240	167	234	168	167	1040	413	188	291
23	253	191	413	234	167	230	163	160	953	392	184	278
24	250	189	427	231	181	231	163	255	897	377	180	268
25	241	194	396	225	187	225	175	220	842	366	179	259
26	257	189	397	220	220	221	174	197	838	354	176	252
27	244	184	380	218	220	218	163	188	763	355	176	246
28	228	180	373	213	226	216	157	185	724	345	260	243
29	219	176	366	211	---	208	153	9460	693	330	264	238
30	212	173	361	208	---	205	150	1360	662	319	289	234
31	207	---	353	206	---	204	---	1750	---	309	285	---
TOTAL	9163	6644	7574	8315	5375	6790	5239	17342	52952	16206	7302	10886
MEAN	296	221	244	268	192	219	175	559	1765	523	236	363
MAX	2290	379	427	347	226	279	203	9460	4410	2200	299	2850
MIN	64	173	164	206	167	199	150	137	662	309	176	189
AC-FT	18170	13180	15020	16490	10660	13470	10390	34400	105000	32140	14480	21590
CFSM	.76	.57	.63	.69	.49	.56	.45	1.44	4.54	1.34	.61	.93
IN.	.88	.64	.72	.80	.51	.65	.50	1.66	5.06	1.55	.70	1.04

CAL YR 1986	TOTAL	45250	MEAN	124	MAX	2290	MIN	44	AC-FT	89750	CFSM	.32	IN.	4.33
WTR YR 1987	TOTAL	153788	MEAN	421	MAX	9460	MIN	64	AC-FT	305000	CFSM	1.08	IN.	14.7

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN 21...	1000	258	422	8.10	10.5	1	0.10	10.3	95	0.5	55
MAY 06...	1155	146	415	8.20	22.5	3	0.60	8.6	104	0.6	K16
SEP 02...	1040	244	437	8.10	23.5	2	0.20	8.3	100	0.8	K100

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)
JAN 21...	53	230	27	68	14	6.5	0.2	0.80	200	17	20
MAY 06...	K14	200	20	59	14	7.0	0.2	0.70	185	15	14
SEP 02...	44	220	25	64	14	8.6	0.3	1.0	193	15	15

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN 21...	0.10	11	260	1	<1	<0.010	1.30	0.020	0.88	0.90	<0.010
MAY 06...	0.10	12	230	<1	<1	<0.010	0.800	0.020	1.9	1.9	0.020
SEP 02...	0.20	13	250	1	<1	<0.010	1.30	<0.010	--	<0.20	<0.010

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)
JAN 21...	1.1	<1	32	<1	<10	<1	5	<5	<1	<0.1	<1
MAY 06...	1.0	--	--	--	--	--	--	--	--	--	--
SEP 02...	1.3	<1	43	<1	<10	1	11	<5	<1	<0.1	2

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)
JAN 21...	<1	22	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<1	14	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.01

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)
JAN 21...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
21...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
06...	--	--	--	--	--	--	--	--	--	--
SEP										
02...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--Records good except those for estimated daily discharges, which are poor. There are several small diversions above station.

AVERAGE DISCHARGE.--35 years, 36.7 ft³/s (3.96 in/yr), 26,590 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. 12	0615	4,100	8.67	May 29	0500	*26,200	a*21.31
May 13	0800	1,910	5.95	May 31	b1400	6,100	a10.6
May 15	0700	282	3.68	bJune 12	1500	4,320	a8.9
May 24	0145	1,080	4.74	Sept. 15	1130	2,600	6.93

a From inside floodmark.
b Estimated.

Minimum daily discharge, 12 ft³/s Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	57	39	62	43	76	26	27	e1200	167	53	62
2	13	54	36	59	41	78	27	27	e800	158	51	56
3	13	51	34	56	40	64	29	27	e900	148	50	53
4	12	88	33	54	41	60	40	30	e1000	143	48	48
5	13	124	33	60	62	64	40	31	e600	137	47	46
6	20	100	33	59	79	64	40	30	e450	123	46	44
7	21	88	37	56	101	59	29	28	e400	113	43	41
8	21	79	36	54	67	61	29	26	e370	110	41	40
9	23	75	34	53	57	74	28	26	e350	108	40	38
10	22	72	39	51	59	e76	28	25	e500	106	38	37
11	38	69	43	48	58	e78	29	26	e700	101	38	38
12	1130	63	43	47	54	80	29	25	e1000	94	40	36
13	316	58	41	47	55	84	29	290	e800	90	80	35
14	138	57	46	47	56	83	30	171	e700	88	51	32
15	100	56	54	46	50	82	31	174	e550	90	46	442
16	84	55	56	44	52	71	31	108	e470	90	43	274
17	76	56	56	46	47	84	31	78	e400	96	41	161
18	68	54	56	44	38	83	30	65	e370	94	40	78
19	63	59	54	44	33	74	29	84	e350	84	38	78
20	56	51	53	48	34	58	29	83	e325	78	37	64
21	57	50	53	48	31	39	31	78	e300	74	35	59
22	79	49	99	43	29	48	32	66	e280	74	34	54
23	69	45	182	42	27	47	32	63	e260	70	32	53
24	76	44	176	42	34	63	32	343	e240	67	31	51
25	72	44	134	44	39	42	35	164	230	64	30	48
26	74	49	115	42	71	40	36	131	211	62	29	47
27	70	45	101	41	76	34	33	105	198	62	28	47
28	67	45	86	41	77	33	30	94	185	62	81	46
29	63	42	78	37	---	29	28	5100	179	60	90	46
30	59	41	70	40	---	30	27	e1160	173	57	78	44
31	56	---	65	42	---	26	---	e1800	---	54	78	---
TOTAL	2982	1820	2015	1487	1451	1884	930	10485	14491	2924	1457	2198
MEAN	96.2	60.7	65.0	48.0	51.8	60.8	31.0	338	483	94.3	47.0	73.3
MAX	1130	124	182	62	101	84	40	5100	1200	167	90	442
MIN	12	41	33	37	27	26	26	25	173	54	28	32
AC-FT	5910	3610	4000	2950	2880	3740	1840	20800	28740	5800	2890	4360
CFSM	.76	.48	.52	.38	.41	.48	.25	2.68	3.83	.75	.37	.58
IN.	.88	.54	.59	.44	.43	.56	.27	3.10	4.28	.86	.43	.65

CAL YR 1986	TOTAL	14466	MEAN	39.6	MAX	1150	MIN	6.3	AC-FT	28690	CFSM	.31	IN.	4.27
WTR YR 1987	TOTAL	44124	MEAN	121	MAX	5100	MIN	12	AC-FT	87520	CFSM	.96	IN.	13.0

e Estimated.

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN 21...	1234	49	412	8.10	10.5	1	0.10	10.2	94	0.4	K79
MAY 06...	1326	30	400	8.10	24.5	2	0.30	7.3	92	0.5	K14
SEP 02...	1315	56	415	8.00	26.5	2	0.20	8.2	105	0.8	K30

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)
JAN 21...	K12	220	22	67	13	6.1	0.2	0.50	199	16	17
MAY 06...	K32	200	20	57	13	7.0	0.2	0.50	176	16	14
SEP 02...	K12	200	18	60	13	8.0	0.3	0.70	185	14	13

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN 21...	0.10	8.9	250	3	<1	<0.010	1.20	0.010	0.39	0.40	<0.010
MAY 06...	<0.10	10	220	<1	<1	<0.010	0.600	0.010	0.99	1.0	0.010
SEP 02...	0.10	12	230	4	2	<0.010	1.10	<0.010	--	0.40	<0.010

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)
JAN 21...	1.2	<1	37	1	<10	<1	3	<5	<1	<0.1	<1
MAY 06...	1.5	--	--	--	--	--	--	--	--	--	--
SEP 02...	1.5	<1	49	<1	20	<1	7	<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)
JAN 21...	<1	23	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<1	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN 21...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 02...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
21...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
06...	--	--	--	--	--	--	--	--	--	--
SEP										
02...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--Records good except those for estimated daily discharges, which are poor. 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.--35 years, 35.0 ft³/s (25,360 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 99,600 ft³/s May 29, 1987 (gage height, 25.05 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. 12	1600	3,060	7.34	June 12	--	Unknown	Unknown
May 29	1200	*99,600	a*25.05	July 17	1900	6,160	9.03
June 4	Unknown	13,000	a11.61	Sept. 15	2030	8,000	9.84

a From floodmark.

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	2.0	.0	.0	.0	.00	e1200	289	6.0	2.0
2	.0	.0	.0	.77	.0	.0	.0	.00	e1000	257	5.5	2.0
3	.0	.0	.0	.30	.0	.0	.0	.00	e4000	224	5.2	1.9
4	.0	.0	.0	.12	.0	.0	.0	.00	e4500	198	4.9	1.9
5	.0	.0	.0	.01	.0	.0	.0	.00	e2000	172	4.5	1.9
6	.0	.0	.0	.0	.0	.0	.0	.00	e1500	150	4.2	1.7
7	.0	.0	.0	.0	.0	.0	.0	.00	e1300	128	4.1	1.8
8	.0	.0	.0	.0	.0	.0	.0	.00	e1200	117	3.9	1.9
9	.0	.0	.0	.0	.0	.0	.0	.00	e1100	108	3.8	1.7
10	.0	.0	.0	.0	.0	.0	.0	.00	e1700	101	3.8	1.7
11	.0	.0	.0	.0	.0	.0	.0	.00	e3000	85	3.8	1.7
12	966	.0	.0	.0	.0	.0	.0	.00	e4000	77	4.4	1.7
13	863	.0	.0	.0	.0	.0	.0	.00	e2500	65	5.3	1.7
14	197	.0	.0	.0	.0	.0	.0	.00	e2000	56	4.2	1.7
15	61	.0	.0	.0	.0	.0	.0	.00	e1700	67	3.5	1150
16	17	.0	.0	.0	.0	.0	.0	.00	e1400	110	3.2	1010
17	2.6	.0	.0	.0	.0	.0	.0	.00	1260	1080	3.0	194
18	.49	.0	.0	.0	.0	.0	.0	.00	1130	852	2.8	96
19	.15	.0	.0	.0	.0	.0	.0	.00	1010	244	2.7	111
20	.0	.0	.0	.0	.0	.0	.0	.00	900	137	2.4	44
21	.0	.0	.0	.0	.0	.0	.0	.00	822	92	2.2	18
22	.0	.0	.0	.0	.0	.0	.0	.00	765	71	2.0	6.4
23	.0	.0	.0	.0	.0	.0	.0	.00	684	58	1.9	4.2
24	.0	.0	.0	.0	.0	.0	.0	.00	603	41	1.8	3.5
25	.0	.0	27	.0	.0	.0	.0	.00	538	31	1.7	3.0
26	.0	.0	36	.0	.0	.0	.0	.00	507	24	1.6	2.7
27	.0	.0	28	.0	.0	.0	.0	.00	440	19	1.5	3.0
28	.0	.0	17	.0	.0	.0	.0	.00	389	14	1.6	3.1
29	.0	.0	12	.0	---	.0	.0	24100	360	9.0	1.6	2.9
30	.0	.0	8.1	.0	---	.0	.00	e1200	320	7.2	1.7	2.6
31	.0	---	4.6	.0	---	.0	---	e1500	---	6.4	1.9	---
TOTAL	2107.24	.0	132.7	3.20	.0	.0	.00	26800.00	43828	4889.6	100.7	2679.7
MEAN	68.0	.00	4.28	.10	.00	.00	.00	865	1461	158	3.25	89.3
MAX	966	.00	36	2.0	.00	.00	.00	24100	4500	1080	6.0	1150
MIN	.00	.00	.00	.00	.00	.00	.00	.00	320	6.4	1.5	1.7
AC-FT	4180	.0	263	6.3	.0	.0	.0	53160	86930	9700	200	5320

CAL YR 1986	TOTAL	3123.67	MEAN	8.56	MAX	966	MIN	.00	AC-FT	6200
WTR YR 1987	TOTAL	80540.72	MEAN	221	MAX	24100	MIN	.00	AC-FT	159800

e Estimated.

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

AVERAGE DISCHARGE.--45 years, 60.9 ft³/s (4.01 in/yr), 44,120 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. 12	0930	4,930	9.02	June 3	1000	16,500	16.05
May 29	1030	*20,200	*18.01	June 11	1400	11,000	12.62
May 31	1800	2,070	7.47	June 13	1730	6,870	10.09

Minimum daily discharge, 23 ft³/s Oct. 2-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	151	105	280	135	148	130	88	1220	480	158	150
2	23	145	100	268	132	145	129	88	971	450	154	136
3	23	142	99	263	130	145	124	88	5050	422	151	127
4	23	164	99	250	130	143	124	93	3020	401	147	121
5	25	212	99	246	136	143	126	94	2020	381	141	118
6	60	180	99	243	139	143	130	87	1610	360	138	116
7	51	175	101	237	131	142	127	85	1380	342	135	115
8	50	168	105	231	126	142	121	82	1270	326	130	114
9	46	161	102	228	124	141	115	81	1260	318	127	112
10	42	154	106	217	121	141	114	79	1600	305	124	108
11	94	152	113	210	121	148	113	80	4420	290	121	116
12	1300	148	113	205	118	147	110	81	2750	279	118	115
13	321	143	110	202	115	142	109	93	2880	267	116	108
14	204	141	115	200	115	141	105	96	1980	268	118	104
15	178	141	128	193	114	141	103	88	1620	315	115	102
16	158	138	130	189	109	141	104	86	1430	303	112	122
17	143	136	130	186	107	192	102	101	1290	285	107	112
18	134	132	132	182	105	164	100	86	1160	263	104	122
19	128	128	134	175	105	155	99	84	1070	237	102	150
20	122	127	138	174	105	154	99	101	983	225	99	120
21	124	123	139	168	105	154	99	94	906	217	97	107
22	156	121	258	164	105	152	99	89	873	227	97	102
23	198	120	355	157	102	150	99	81	786	211	94	98
24	200	115	333	157	114	145	102	111	736	201	92	96
25	183	121	316	152	113	145	102	111	680	196	89	94
26	182	119	339	149	163	141	100	98	645	189	87	92
27	173	115	319	145	158	141	94	93	599	186	85	92
28	165	113	309	144	151	138	92	92	560	182	114	92
29	163	109	302	142	---	133	90	7130	540	174	172	91
30	158	105	292	138	---	132	90	1150	511	168	200	87
31	154	---	286	135	---	132	---	1260	---	161	176	---
TOTAL	5005	4199	5506	6030	3429	4521	3251	12070	45820	8629	3820	3339
MEAN	161	140	178	195	122	146	108	389	1527	278	123	111
MAX	1300	212	355	280	163	192	130	7130	5050	480	200	150
MIN	23	105	99	135	102	132	90	79	511	161	85	87
AC-FT	9930	8330	10920	11960	6800	8970	6450	23940	90880	17120	7580	6620
CFSM	.78	.68	.86	.94	.59	.71	.53	1.89	7.41	1.35	.60	.54
IN.	.90	.76	.99	1.09	.62	.82	.59	2.18	8.27	1.56	.69	.60

CAL YR 1986 TOTAL 23434 MEAN 64.2 MAX 1300 MIN 11 AC-FT 46480 CFSM .31 IN. 4.23
WTR YR 1987 TOTAL 105619 MEAN 289 MAX 7130 MIN 23 AC-FT 209500 CFSM 1.40 IN. 19.1

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN 23...	1000	166	483	7.90	10.5	1	0.10	10.1	93	1.0	28
MAY 06...	1725	79	459	8.20	23.0	1	0.50	8.4	103	0.8	39
SEP 03...	1105	127	464	8.10	23.5	2	0.20	8.4	101	0.7	K63

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)
JAN 23...	22	260	29	82	13	7.8	0.2	0.80	229	24	10
MAY 06...	45	230	26	69	13	7.9	0.2	0.80	200	24	14
SEP 03...	21	230	30	72	13	9.0	0.3	1.1	203	21	14

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN 23...	0.20	12	290	<1	<1	<0.010	1.20	0.020	0.28	0.30	<0.010
MAY 06...	0.20	13	260	<1	<1	<0.010	0.600	0.020	0.28	0.30	0.020
SEP 03...	0.20	14	270	2	<1	<0.010	1.20	0.010	0.29	0.30	<0.010

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)
JAN 23...	1.1	<1	36	<1	<10	1	5	<5	<1	<0.1	<1
MAY 06...	1.2	--	--	--	--	--	--	--	--	--	--
SEP 03...	1.2	<1	41	<1	20	<1	5	<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)
JAN 23...	<1	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 03...	<1	58	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN 23...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 06...	--	--	--	--	--	--	--	--	--	--
SEP 03...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
23...	<0.01	<0.01	<0.01	<0.1	--	<1	<0.01	--	--	--
MAY										
06...	--	--	--	--	--	--	--	--	--	--
SEP										
03...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--Records good. 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 temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--35 years, 35.3 ft³/s (25,570 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. 12	1630	2,440	10.46	June 3	1400	15,200	20.64
Dec. 23	1600	258	6.23	June 11	1800	9,840	17.40
May 29	1330	*34,100	*26.61	July 16	0700	287	6.27
May 31	2330	1,980	9.79	Aug. 31	0130	206	5.96

Minimum daily discharge, 0.71 ft³/s Oct. 1-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.71	30	11	169	51	63	47	10	1390	389	61	60
2	.71	28	10	159	47	60	43	9.6	987	366	57	48
3	.71	26	9.2	155	46	58	40	9.2	4550	338	54	41
4	.71	26	8.8	143	44	56	37	e9.0	3260	311	50	37
5	2.8	54	8.7	138	48	56	37	e8.9	2140	279	48	33
6	8.2	56	8.1	133	53	55	38	e8.8	1650	257	45	31
7	5.3	50	8.0	125	51	55	38	e8.7	1400	240	41	29
8	4.3	45	7.9	117	47	55	34	e8.6	1270	227	39	28
9	3.1	40	7.7	114	43	54	31	e8.6	1230	221	37	27
10	2.4	37	8.1	108	40	54	29	e8.5	1410	211	35	24
11	9.1	37	8.3	103	38	58	27	e8.4	4070	195	33	24
12	576	34	12	100	36	59	25	e8.4	2880	185	32	26
13	367	34	16	97	35	56	24	e8.3	2550	174	34	24
14	104	33	17	96	33	54	22	e8.3	2210	167	32	21
15	57	33	23	90	34	53	20	e8.2	1640	187	31	19
16	39	31	26	86	32	55	20	e8.2	1440	238	29	18
17	30	29	27	85	29	76	20	e8.2	1280	184	26	16
18	24	26	28	87	28	78	18	e8.1	1160	186	24	17
19	19	22	29	83	27	68	17	e8.1	1060	150	23	23
20	15	19	30	80	27	63	16	e8.1	959	135	22	32
21	14	18	32	77	29	61	16	e8.1	881	124	22	24
22	19	16	61	76	29	59	16	e8.1	838	127	21	19
23	39	15	236	72	28	59	17	e8.1	755	120	21	16
24	59	14	241	72	34	56	17	e8.1	686	108	20	15
25	50	17	216	70	37	54	16	e8.1	620	102	19	13
26	48	20	221	66	51	53	16	8.1	581	96	19	12
27	46	18	217	63	70	53	14	8.1	523	93	18	11
28	40	15	200	60	67	52	12	8.1	486	89	22	11
29	37	14	196	57	---	49	11	9600	458	80	22	11
30	35	12	187	54	---	46	10	2320	422	72	55	10
31	32	---	178	52	---	47	---	1080	---	67	101	---
TOTAL	1688.04	849	2288.8	2987	1134	1775	728	13237.0	44786	5718	1093	720
MEAN	54.5	28.3	73.8	96.4	40.5	57.3	24.3	427	1493	184	35.3	24.0
MAX	576	56	241	169	70	78	47	9600	4550	389	101	60
MIN	.71	12	7.7	52	27	46	10	8.1	422	67	18	10
AC-FT	3350	1680	4540	5920	2250	3520	1440	26260	88830	11340	2170	1430

CAL YR 1986 TOTAL 5171.83 MEAN 14.2 MAX 576 MIN .35 AC-FT 10260
WTR YR 1987 TOTAL 77003.81 MEAN 211 MAX 9600 MIN .71 AC-FT 152700

e Estimated.

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.--Records good except those for estimated daily discharges, which are poor. There are several small diversions for irrigation above station.

AVERAGE DISCHARGE.--35 years, 41.9 ft³/s (5.95 in/yr), 30,360 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. 12	0715	988	3.97	June 3	Unknown	18,200	a15.17
May 14	0230	988	3.97	June 12	Unknown	5,430	a7.8
May 29	0800	*43,800	a*22.7				

a From floodmark.

Minimum daily discharge, 11 ft³/s Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	77	52	174	60	114	61	36	e1500	e190	56	37
2	19	74	51	172	58	112	59	36	e2500	180	54	25
3	19	72	51	166	57	109	57	37	e4500	167	52	22
4	18	107	51	151	55	105	56	51	e2500	153	50	20
5	23	89	51	143	65	103	63	42	e1500	143	48	19
6	91	82	52	136	59	99	60	38	e1100	136	46	19
7	62	81	61	129	54	96	55	35	e900	131	44	20
8	53	77	56	125	53	94	53	34	e800	122	42	20
9	44	73	54	119	51	91	52	33	e900	122	41	18
10	39	72	83	111	51	90	51	33	e1100	112	39	17
11	93	70	85	107	50	99	50	33	e1400	105	37	18
12	311	69	85	103	50	86	50	32	e1700	101	36	17
13	146	66	87	99	49	83	49	32	e1500	97	36	16
14	122	65	115	97	49	81	47	122	e1300	96	33	16
15	100	64	132	93	49	80	46	49	e1100	169	31	15
16	86	64	139	89	48	83	45	45	e1000	124	30	15
17	75	62	142	103	47	109	44	43	e900	101	29	15
18	69	61	145	91	46	83	44	42	e800	91	27	22
19	66	60	132	83	46	80	43	114	e700	87	26	24
20	63	58	128	80	47	80	42	78	e630	83	25	18
21	71	57	129	82	45	80	42	78	e560	92	25	16
22	94	57	204	76	45	78	42	70	e480	87	24	15
23	135	55	199	74	44	83	42	65	e420	76	23	14
24	135	56	188	72	55	73	58	62	e370	75	23	13
25	120	70	180	69	65	72	54	59	e320	72	22	13
26	110	56	194	67	136	71	46	56	e290	71	21	12
27	104	54	179	66	111	70	42	55	e260	72	20	13
28	96	54	179	65	117	68	40	54	e240	67	31	13
29	90	54	179	63	---	65	38	7600	e220	63	29	12
30	85	53	177	62	---	63	36	e1700	202	61	30	11
31	81	---	177	61	---	62	---	e1700	---	58	26	---
TOTAL	2639	2009	3737	3128	1662	2662	1467	12464	31692	3304	1056	525
MEAN	85.1	67.0	121	101	59.4	85.9	48.9	402	1056	107	34.1	17.5
MAX	311	107	204	174	136	114	63	7600	4500	190	56	37
MIN	18	53	51	61	44	62	36	32	202	58	20	11
AC-FT	5230	3980	7410	6200	3300	5280	2910	24720	62860	6550	2090	1040
CFSM	.89	.70	1.26	1.06	.62	.90	.51	4.21	11.1	1.11	.36	.18
IN.	1.03	.78	1.45	1.22	.65	1.04	.57	4.85	12.3	1.29	.41	.20

CAL YR 1986	TOTAL	15162	MEAN	41.5	MAX	888	MIN	6.6	AC-FT	30070	CFSM	.43	IN.	5.90
WTR YR 1987	TOTAL	66345	MEAN	182	MAX	7600	MIN	11	AC-FT	131600	CFSM	1.90	IN.	25.8

e Estimated.

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN											
20...	1516	79	468	7.80	11.0	1	0.20	10.8	101	0.7	K8
MAY											
05...	1607	42	435	8.00	27.5	1	0.50	9.0	120	1.3	56
SEP											
01...	1252	42	424	8.00	25.0	2	0.40	8.5	105	1.0	52

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)
JAN											
20...	K19	250	29	85	10	6.8	0.2	0.90	224	28	17
MAY											
05...	K20	220	32	70	10	7.4	0.2	1.1	184	31	13
SEP											
01...	K26	210	36	67	10	9.0	0.3	1.2	173	32	13

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN											
20...	0.20	11	290	1	<1	<0.010	0.800	0.020	0.48	0.50	<0.010
MAY											
05...	0.20	12	260	<1	<1	<0.010	0.300	0.020	0.78	0.80	0.010
SEP											
01...	0.20	13	250	2	<1	<0.010	0.400	0.010	0.29	0.30	<0.010

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)
JAN											
20...	1.0	<1	38	1	<10	<1	6	<5	2	<0.1	<1
MAY											
05...	1.6	--	--	--	--	--	--	--	--	--	--
SEP											
01...	1.2	<1	36	<1	10	<1	8	<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)
JAN										
20...	<1	81	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY										
05...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	<1	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN										
20...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY										
05...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08200000 HONDO CREEK NEAR TARPLEY, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN										
20...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
05...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.02	<0.01	<0.01

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.--Records good. Most of the low flow of Hondo Creek enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Tarpley (station 08200000) and this station. There are several small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--27 years, 17.0 ft³/s (12,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,800 ft³/s May 29, 1987 (gage height, 17.19 ft), from rating curve extended above 16.0 ft; no flow most of time.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1875, 21 ft in September 1919, from information provided 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)
May 29	1030	*51,800	*17.19	June 10	2330	4,380	6.16
May 31	2000	3,600	5.75	June 12	0300	4,900	6.41
June 3	1330	22,800	11.78	June 13	1830	3,080	5.47

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	1820	e19	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	1580	14	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	6250	e10	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	4590	e7.0	.00	.00
5	.13	.00	.00	.00	.00	.00	.00	.00	1700	e4.5	.00	.00
6	3.9	.00	.00	.00	.00	.00	.00	.00	1230	e3.5	.00	.00
7	.31	.00	.00	.00	.00	.00	.00	.00	1000	e2.5	.00	.00
8	.01	.00	.00	.00	.00	.00	.00	.00	910	e1.5	.00	.00
9	.11	.00	.00	.00	.00	.00	.00	.00	875	.75	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	1420	e.70	.00	.00
11	6.4	.00	.00	.00	.00	.00	.00	.00	1690	e.65	.00	.00
12	5.3	.00	.00	.00	.00	.00	.00	.00	1910	e.64	.00	.00
13	73	.00	.00	.00	.00	.00	.00	.00	1500	e.63	.00	.00
14	8.6	.00	.00	.00	.00	.00	.00	.00	1270	e.62	.00	.00
15	.59	.00	.00	.00	.00	.00	.00	.00	e900	e.61	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	e700	e.61	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	e550	.60	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	e450	e.50	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	5.2	e350	e.40	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.53	e250	.25	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	e200	.11	.00	.00
22	1.5	.00	3.5	.00	.00	.00	.00	.00	e150	.14	.00	.00
23	.99	.00	13	.00	.00	.13	.00	.00	e125	.10	.00	.00
24	.38	.00	88	.00	.00	.00	.00	.00	e100	.03	.00	.00
25	.00	.00	53	.00	.00	.00	.00	.00	e80	.00	.00	.00
26	.00	.00	36	.00	.00	.00	.00	.00	e60	.00	.00	.00
27	.00	.00	36	.00	.00	.00	.00	.00	e45	.00	.00	.00
28	.00	.00	10	.00	.00	.00	.00	.00	e35	.00	.00	.00
29	.00	.00	1.9	.00	---	.00	.00	10500	e30	.00	.00	.00
30	.00	.00	.35	.00	---	.00	.00	1990	e25	.00	.00	.00
31	.00	---	.03	.00	---	.00	---	2000	---	.00	.00	---
TOTAL	101.22	.00	241.78	.00	.00	.13	.00	14495.73	31795	69.34	.00	.00
MEAN	3.27	.00	7.80	.00	.00	.0	.00	468	1060	2.24	.00	.00
MAX	73	.00	88	.00	.00	.13	.00	10500	6250	19	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	25	.00	.00	.00
AC-FT	201	.0	480	.0	.0	.3	.0	28750	63070	138	.0	.0

CAL YR 1986	TOTAL	1208.40	MEAN	3.31	MAX	754	MIN	.00	AC-FT 2400
WTR YR 1987	TOTAL	46703.15	MEAN	128	MAX	10500	MIN	.00	AC-FT 92640

e Estimated.

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: Dec. 10 to Jan. 22. Records good except those for estimated daily discharges, which are poor. No known diversion above station.

AVERAGE DISCHARGE.--26 years, 20.3 ft³/s (6.13 in/yr), 14,710 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)
Oct. 12	0500	1,200	3.88	June 3	0830	*14,400	*9.51
May 29	0700	8,330	7.57	June 11	0900	3,010	5.10
May 31	1530	928	3.62	June 13	1400	3,690	5.47

Minimum daily discharge, 5.3 ft³/s Oct. 3, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	65	27	66	28	48	28	14	377	91	25	11
2	5.5	61	27	62	27	46	26	14	303	84	24	10
3	5.3	61	26	58	27	46	27	14	2870	80	23	10
4	5.6	88	25	56	25	44	25	20	1240	77	23	9.6
5	14	70	25	54	31	44	27	15	820	74	23	9.6
6	51	65	24	52	27	42	28	13	605	69	21	9.0
7	44	64	30	50	25	42	25	13	502	66	20	9.3
8	42	61	26	49	25	42	24	12	461	64	20	9.5
9	38	58	25	48	24	42	23	12	457	61	19	8.5
10	36	57	26	47	24	40	22	14	693	60	18	8.5
11	82	55	25	46	21	44	21	12	877	56	18	8.8
12	297	51	24	45	23	39	21	12	577	54	17	7.4
13	143	49	23	44	23	38	20	14	776	52	16	7.4
14	114	50	23	43	23	38	19	41	522	54	16	7.0
15	99	49	22	43	20	36	19	14	408	57	15	7.2
16	90	46	22	42	19	37	19	13	343	51	15	7.4
17	82	44	24	41	19	46	18	13	295	45	14	7.4
18	75	43	27	40	19	38	18	12	258	45	13	11
19	74	40	32	40	19	36	18	20	228	43	13	9.6
20	66	39	45	40	21	35	18	16	202	40	12	7.4
21	71	38	68	40	20	35	20	13	178	43	12	6.9
22	84	38	170	39	19	35	19	13	164	44	11	6.5
23	122	36	140	38	18	33	18	14	144	38	11	6.5
24	105	37	120	38	25	31	18	14	132	35	10	6.2
25	95	38	100	36	29	31	18	14	127	34	9.9	6.1
26	96	35	130	35	53	31	17	13	135	33	9.5	6.1
27	87	33	110	32	46	31	15	12	108	32	9.3	6.1
28	81	33	96	31	50	30	15	12	102	31	14	6.1
29	76	31	86	30	---	28	14	2380	96	29	13	5.8
30	71	30	78	30	---	30	14	441	117	28	11	5.3
31	67	---	70	28	---	28	---	471	---	26	12	---
TOTAL	2324.0	1465	1696	1343	730	1166	614	3705	14117	1596	487.7	237.2
MEAN	75.0	48.8	54.7	43.3	26.1	37.6	20.5	120	471	51.5	15.7	7.91
MAX	297	88	170	66	53	48	28	2380	2870	91	25	11
MIN	5.3	30	22	28	18	28	14	12	96	26	9.3	5.3
AC-FT	4610	2910	3360	2660	1450	2310	1220	7350	28000	3170	967	470
CFSM	1.67	1.09	1.22	.96	.58	.84	.45	2.66	10.5	1.14	.35	.18
IN.	1.92	1.21	1.40	1.11	.60	.96	.51	3.06	11.7	1.32	.40	.20

CAL YR 1986 TOTAL 9329.9 MEAN 25.6 MAX 399 MIN 2.6 AC-FT 18510 CFSM .57 IN. 7.71
WTR YR 1987 TOTAL 29480.9 MEAN 80.8 MAX 2870 MIN 5.3 AC-FT 58480 CFSM 1.79 IN. 24.4

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 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (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)
JAN 23...	1200	39	463	8.00	10.0	2	0.20	10.8	99	0.6	K6
MAY 07...	1122	13	420	8.30	23.0	2	0.50	9.2	112	1.1	56
SEP 01...	1630	11	404	8.10	28.5	3	0.20	8.3	111	0.7	K6

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)
JAN 23...	K8	250	35	82	11	7.4	0.2	0.80	215	29	10
MAY 07...	K10	210	39	65	11	7.6	0.2	0.90	169	35	15
SEP 01...	68	200	43	61	11	9.4	0.3	1.1	155	33	15

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, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
JAN 23...	0.20	12	280	3	2	<0.010	0.800	0.010	0.79	0.80	<0.010
MAY 07...	0.20	13	250	<1	<1	<0.010	0.200	0.010	0.19	0.20	0.010
SEP 01...	0.20	14	240	3	<1	<0.010	0.300	<0.010	--	<0.20	0.010

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)
JAN 23...	1.1	<1	31	<1	<10	<1	6	<5	4	<0.1	<1
MAY 07...	1.7	--	--	--	--	--	--	--	--	--	--
SEP 01...	1.3	<1	34	<1	<10	<1	4	<5	<1	0.4	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)
JAN 23...	<1	7	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 07...	--	--	--	--	--	--	--	--	--	--
SEP 01...	<1	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01

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)
JAN 23...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 07...	--	--	--	--	--	--	--	--	--	--
SEP 01...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

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)
JAN 23...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 07...	--	--	--	--	--	--	--	--	--	--
SEP 01...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

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.--No estimated daily discharges. Records good. All of the low flow of Seco Creek enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Miller Ranch (station 08201500) and this station. No known diversion above station.

AVERAGE DISCHARGE.--26 years (water years 1962-87), 9.45 ft³/s (6,850 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,800 ft³/s May 29, 1987 (gage height, 28.20 ft), from rating curve extended above 25,100 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)
May 29	1100	*35,800	*28.20	June 10	2300	3,530	12.73
June 3	1300	24,800	23.55				

Minimum daily discharge, no flow most of year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.00	111	2.4	.00	.00
2	.0	.0	.0	.0	.0	.0	.0	.00	9.0	2.1	.00	.00
3	.0	.0	.0	.0	.0	.0	.0	.00	4170	2.1	.00	.00
4	.0	.0	.0	.0	.0	.0	.0	.00	1480	1.8	.00	.00
5	.0	.0	.0	.0	.0	.0	.0	.00	596	1.5	.00	.00
6	.0	.0	.0	.0	.0	.0	.0	.00	353	1.2	.00	.00
7	.0	.0	.0	.0	.0	.0	.0	.00	235	1.1	.00	.00
8	.0	.0	.0	.0	.0	.0	.0	.00	188	1.0	.00	.00
9	.0	.0	.0	.0	.0	.0	.0	.00	166	.89	.00	.00
10	.0	.0	.0	.0	.0	.0	.0	.00	561	.97	.00	.00
11	.0	.0	.0	.0	.0	.0	.0	.00	761	.71	.00	.00
12	.0	.0	.0	.0	.0	.0	.0	.00	385	.62	.00	.00
13	.0	.0	.0	.0	.0	.0	.0	.00	460	.53	.00	.00
14	.0	.0	.0	.0	.0	.0	.0	.00	335	.49	.00	.00
15	.0	.0	.0	.0	.0	.0	.0	.00	190	.62	.00	.00
16	.0	.0	.0	.0	.0	.0	.0	.00	131	.61	.00	.00
17	.0	.0	.0	.0	.0	.0	.0	.00	84	.45	.00	.00
18	.0	.0	.0	.0	.0	.0	.0	.00	45	.32	.00	.00
19	.0	.0	.0	.0	.0	.0	.0	.00	22	.22	.00	.00
20	.0	.0	.0	.0	.0	.0	.0	.00	14	.16	.00	.00
21	.0	.0	.0	.0	.0	.0	.0	.00	11	.13	.00	.00
22	.0	.0	.0	.0	.0	.0	.0	.00	9.1	.15	.00	.00
23	.0	.0	.0	.0	.0	.0	.0	.00	8.2	.11	.00	.00
24	.0	.0	.0	.0	.0	.0	.0	.00	6.7	.10	.00	.00
25	.0	.0	.0	.0	.0	.0	.0	.00	5.4	.05	.00	.00
26	.0	.0	.0	.0	.0	.0	.0	.00	5.1	.04	.00	.00
27	.0	.0	.0	.0	.0	.0	.0	.00	3.7	.10	.00	.00
28	.0	.0	.0	.0	.0	.0	.0	.00	3.2	.04	.00	.00
29	.0	.0	.0	.0	---	.0	.0	8310	3.0	.00	.00	.00
30	.0	.0	.0	.0	---	.0	.00	226	2.5	.00	.00	.00
31	.0	---	.0	.0	---	.0	---	42	---	.00	.00	---
TOTAL	.0	.0	.0	.0	.0	.0	.00	8578.00	10353.9	20.51	.00	.00
MEAN	.00	.00	.00	.00	.00	.00	.00	277	345	.66	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	8310	4170	2.4	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	2.5	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	17010	20540	41	.0	.0

CAL YR 1986 TOTAL 28.31 MEAN .08 MAX 18 MIN .00 AC-FT 56
WTR YR 1987 TOTAL 18952.35 MEAN 51.9 MAX 8310 MIN .00 AC-FT 37590

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 ft³/s, 7,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--(1939 to current year) Maximum measured spring discharge, 82 ft³/s May 25, 1977; no flow at times in 1948-49, 1951-59, 1964-68, and 1984-85.

DISCHARGE MEASUREMENTS, IN CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Discharge (ft³/s)	Date	Discharge (ft³/s)	Date	Discharge (ft³/s)
Nov. 17, 1986	30.0	Jan. 22, 1987	39.1	Sep. 3, 1987	92.8
Dec. 9	32.3	Mar. 20	49.4		

APPENDIX D. SUPPLEMENTAL INFORMATION

DEFINITIONS OF TERMS

Technical terms and abbreviations 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 + 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 + 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.

National Geodetic Vertical Datum of 1929 (NGVD) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called Sea Level Datum of 1929 or mean sea level. 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 Mexico,

and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

pCi/L notation for pico-Curies per liter and is equal to 3.7x10-2 radioactive nuclide disintegrations per second per liter.

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.

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 parts 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 parts of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved 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 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.

tritium unit is equal to a concentration of 1 tritium atom per 10^{18} hydrogen atoms and is equal to 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 concentration of the sample has a 67-percent probability of being within the reported range, (Maclay, Rettman, and Small, 1980).

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published after 1975.

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	0.4047	hectare (ha)
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):

$$°F = 9/5 \times °C + 32.$$

PREVIOUS AND RELATED STUDIES

The U.S. 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 and others, (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 U.S. 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 were reported by Reeves and Ozuna (1985), for January 1983 to December 1984 were reported by Reeves and Ozuna (1986), for January 1985 to December 1985 were reported by Ozuna, Nalley, and Bowman (1987),

and for January 1986 to December 1986 were reported by Ozuna, Nalley, and Stein (1988).

In related studies, the U.S. 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.

SELECTED REFERENCES

Arnow, Ted, 1959, Ground-water geology of Bexar County, Texas: Texas Board of Water Engineers Bulletin 5911, 62 p.

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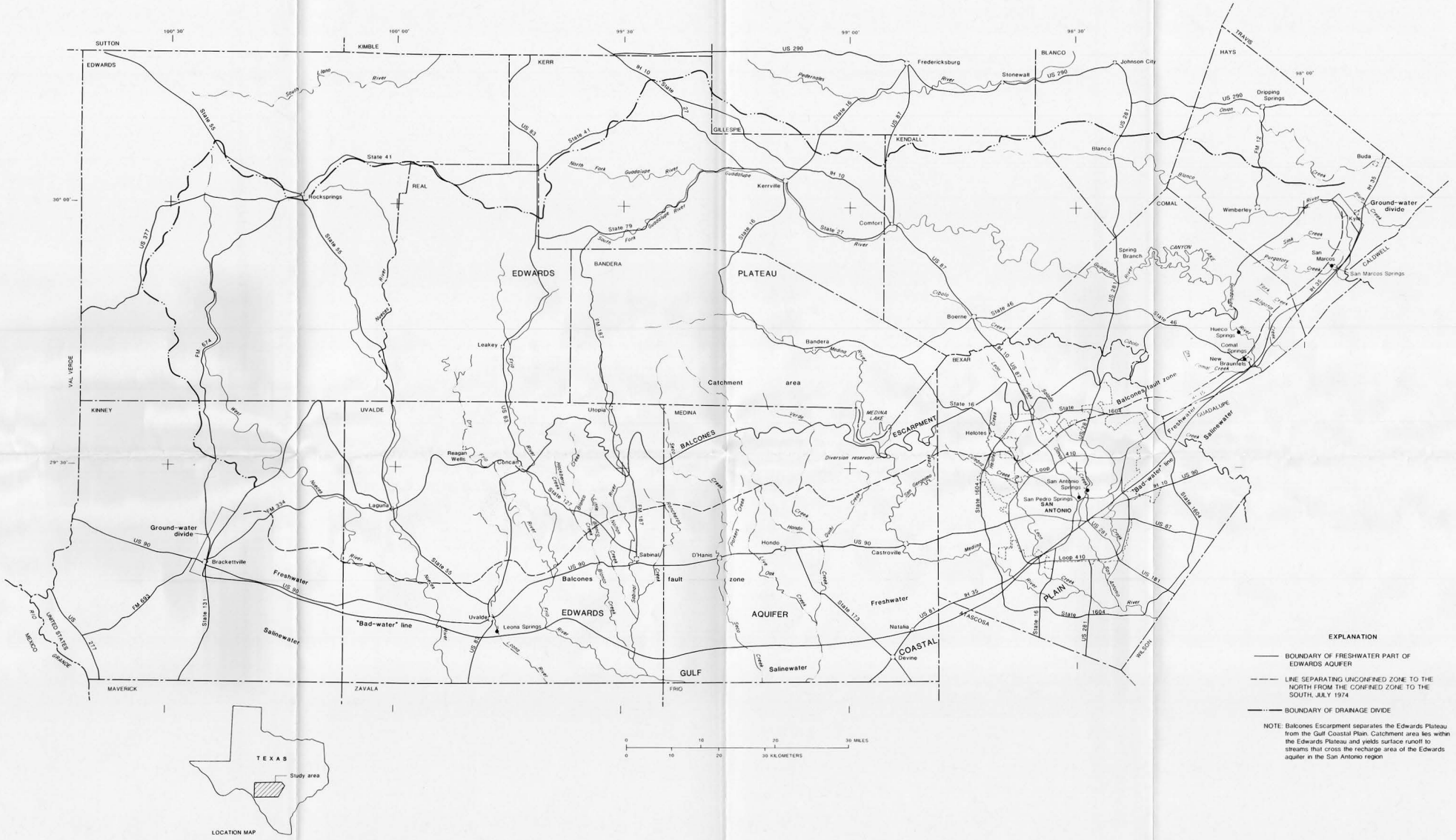


Plate 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio region.

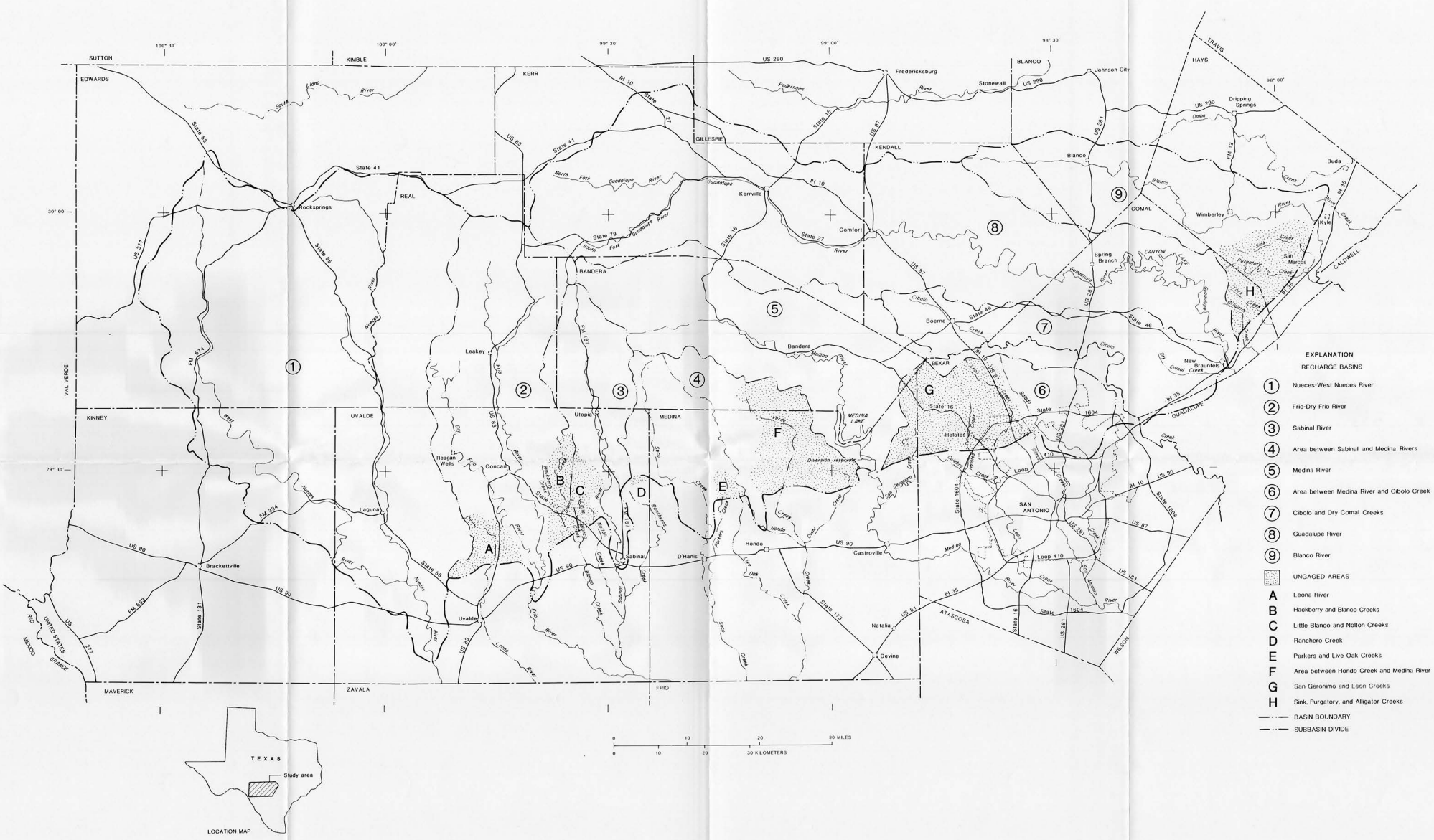
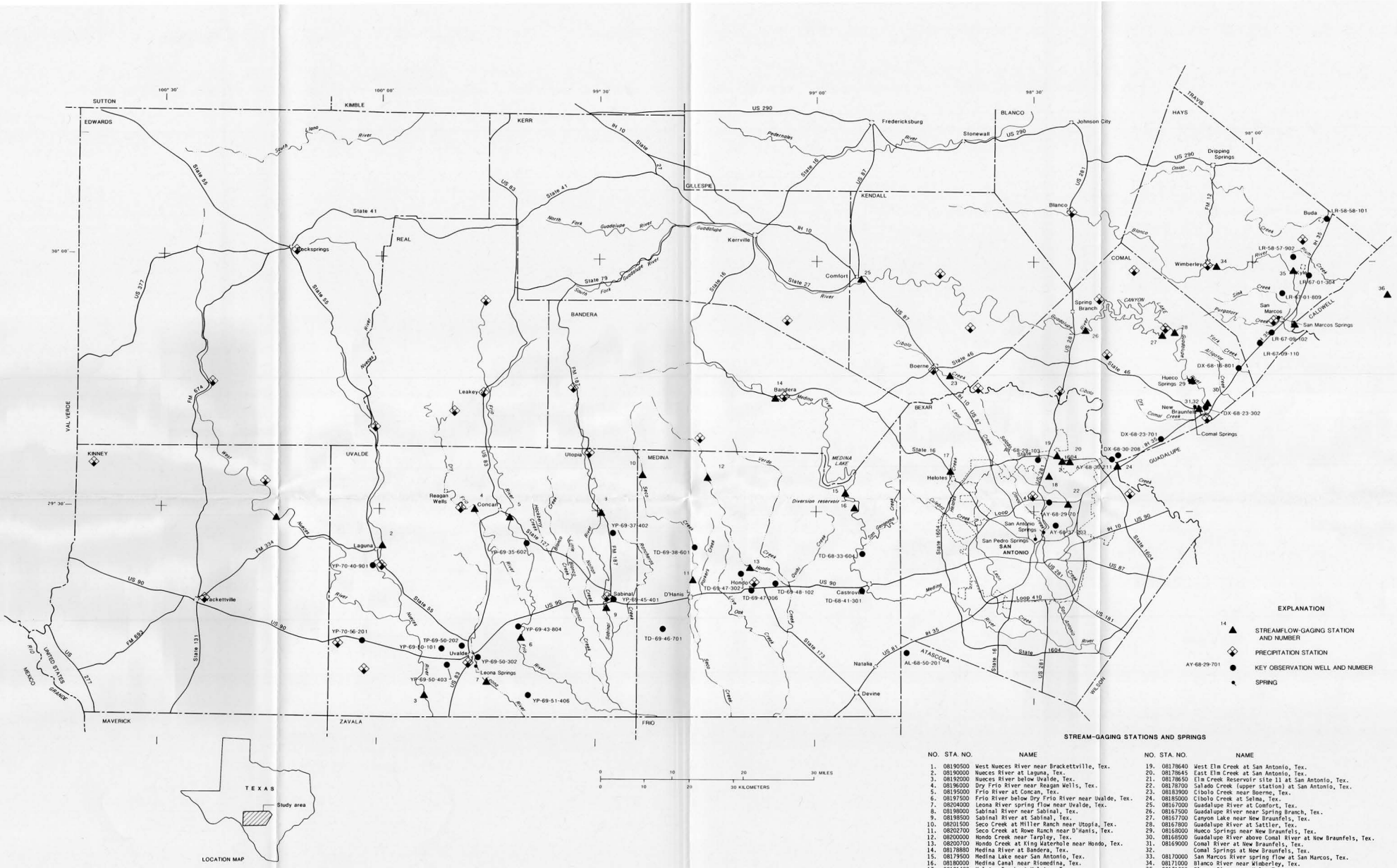


Plate 2.--Location of drainage basins and ungaged areas.



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.	08178622	Lorence Creek at Shadow Cliff, 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 near 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, precipitation, and observation wells, 1987.

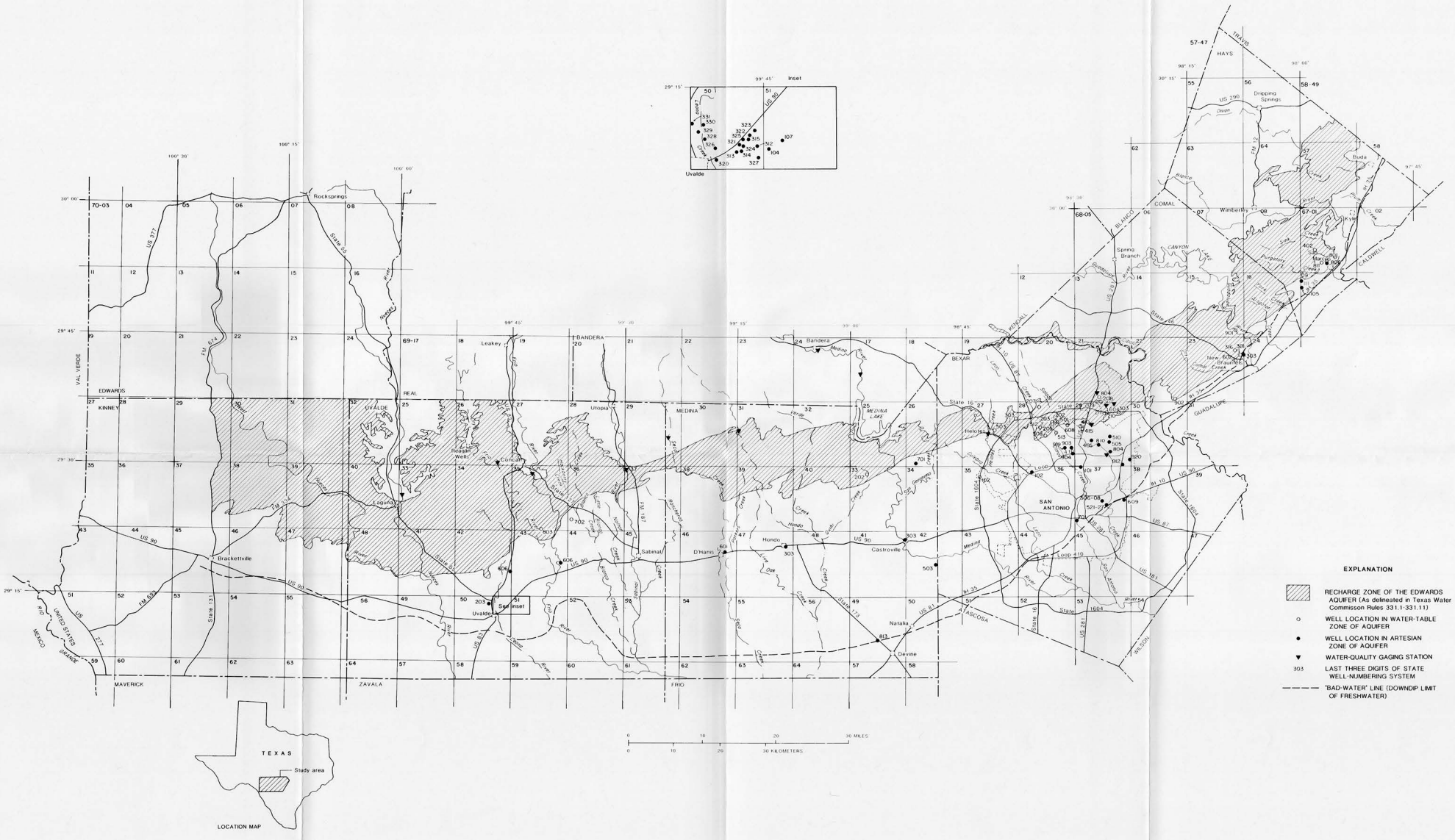


Plate 4.--Location of water-quality data-collection sites for wells, springs, and streams sampled in 1987.

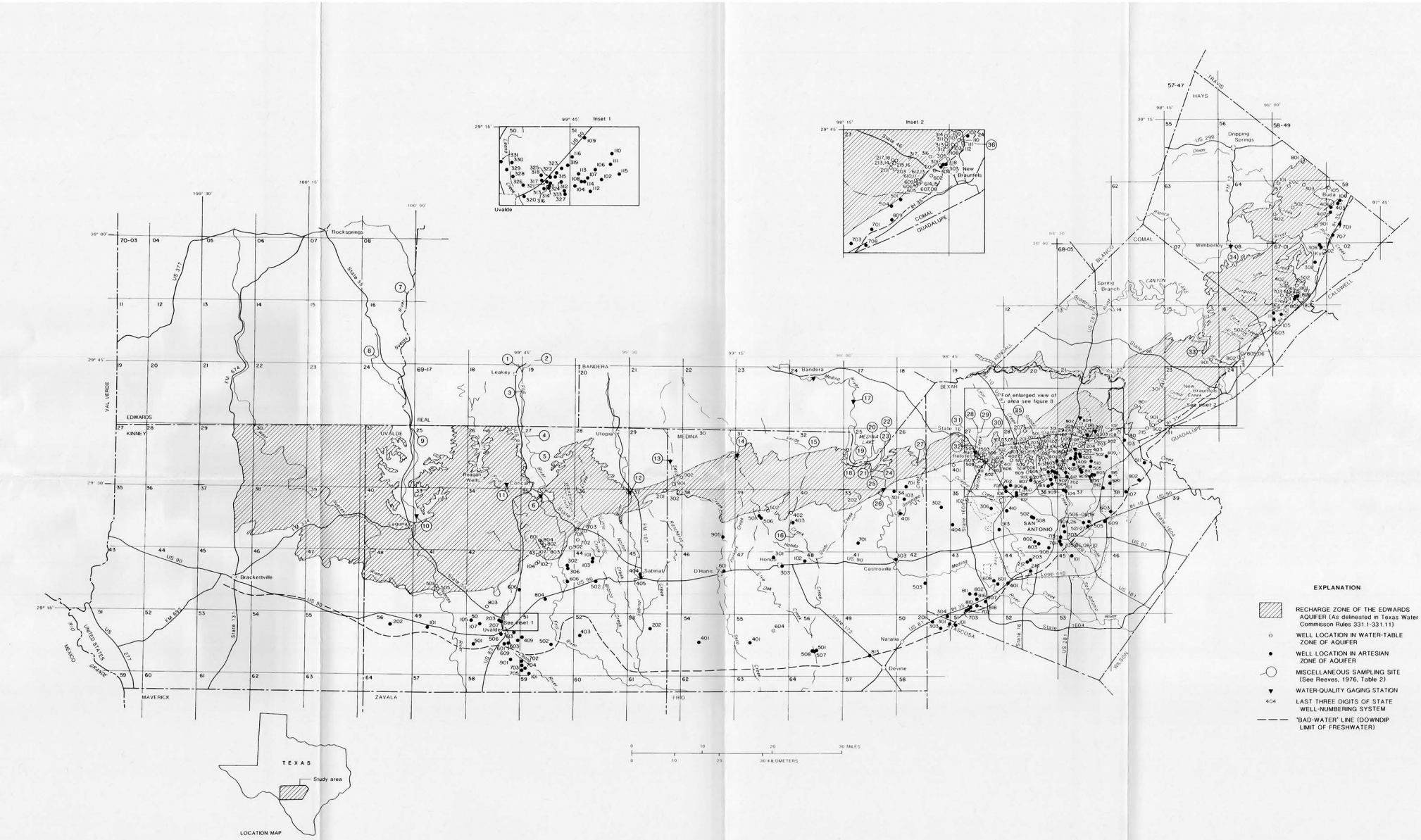
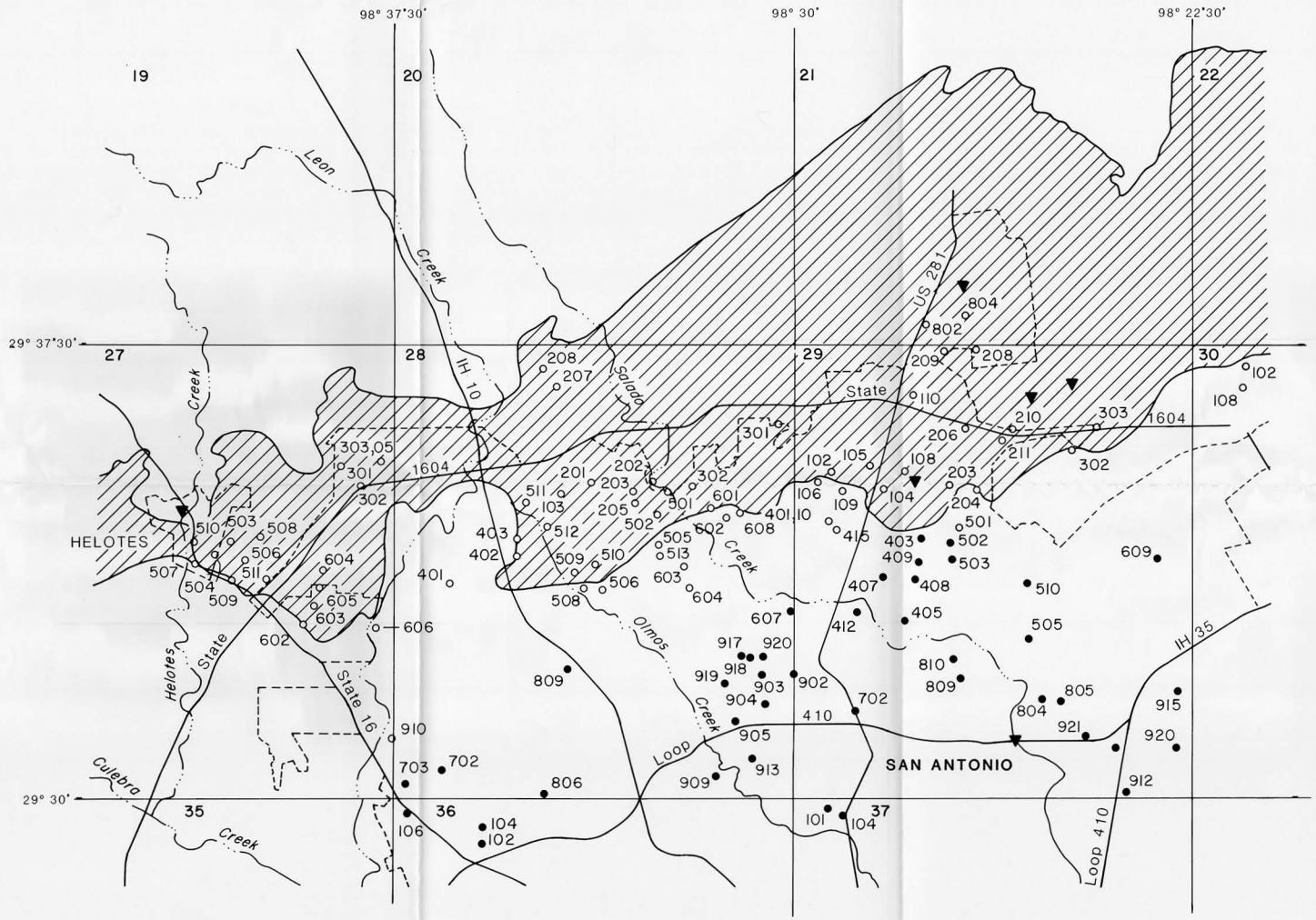


Plate 5.--Location of water-quality data-collection sites for wells, springs, and streams sampled within the period 1972-87.



EXPLANATION

- RECHARGE ZONE OF THE EDWARDS AQUIFER (As delineated in Texas Water Commission Rules 331.1-331.11)
- o WELL LOCATION IN WATER-TABLE ZONE OF AQUIFER
- ● WELL LOCATION IN ARTESIAN ZONE OF AQUIFER
- ▼ WATER-QUALITY GAGING STATIONS
- 202 LAST THREE DIGITS OF STATE WELL-NUMBERING SYSTEM

0 1 2 3 4 5 MILES

0 1 2 3 4 5 KILOMETERS

For location of map see Figure 7

Plate 6.--Location of water-quality data-collection sites, for wells, springs, and streams in the vinicity of San Antonio sampled within the period 1972-87.

Note: Large-format versions of the plates for this report are available at:

http://www.edwardsaquifer.org/documents/1988_NalleyRettman_1987HydrologicData-Plates.pdf