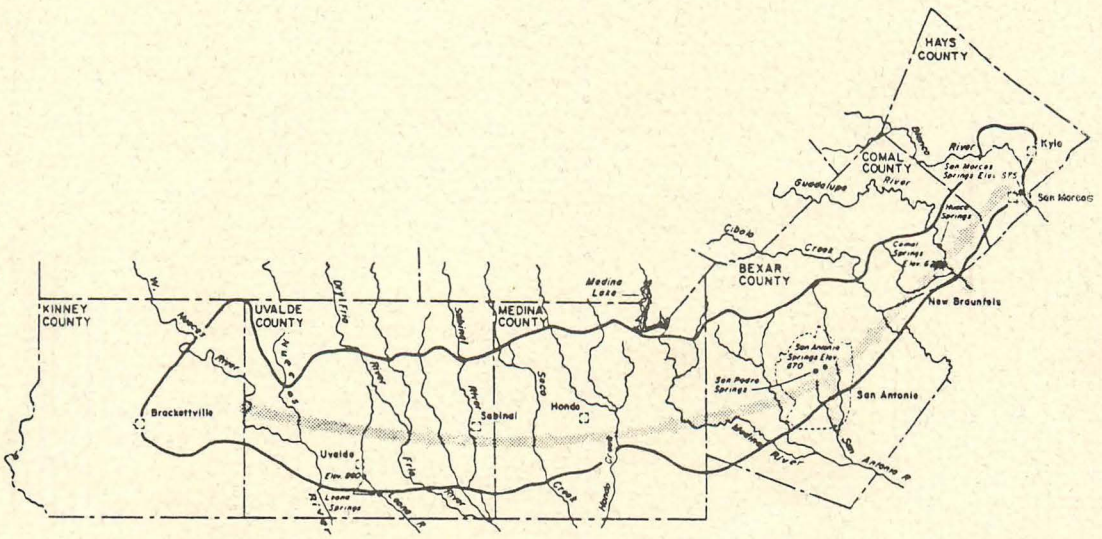
COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1988, WITH 1934–88 SUMMARY

Bulletin 48
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 48

COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1988, WITH 1934-88 SUMMARY

Compiled by

G.M. Nalley
U.S. Geological Survey

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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 1988 was 635,500 acre-feet. Recharge in 1988 was 355,500 acre-feet, which is the fifteenth smallest estimated annual recharge since 1934. The maximum annual recharge of 2,003,600 acre-feet occurred in 1987, 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 1988 was 926,400 acre-feet, which is the third largest 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 1988 fluctuated above to near the mid-point between record high and low levels, reflecting an above to near average volume of ground water in storage in the aquifer during most of the year. In 1987, substantial increases occurred during the late spring and early summer, after which water levels remained above average in most of the area. Water levels then remained above to near average throughout 1988.

Analyses of water samples from 56 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. In 1988, samples were collected and analyzed from wells transecting the "bad-water" line and no significant changes in water quality were detected 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 to use a water-balance equation in which recharge within a stream basin is equal to the difference between measured streamflow above and below the area used for calculating recharge plus the estimated runoff within this area. Locations of the Edwards aquifer and physiographic regions are 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.

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 early 1930's. During 1988, periodic water-level measurements were made in 18 wells, and continuous water-stage recorders were in operation on 14 other wells.

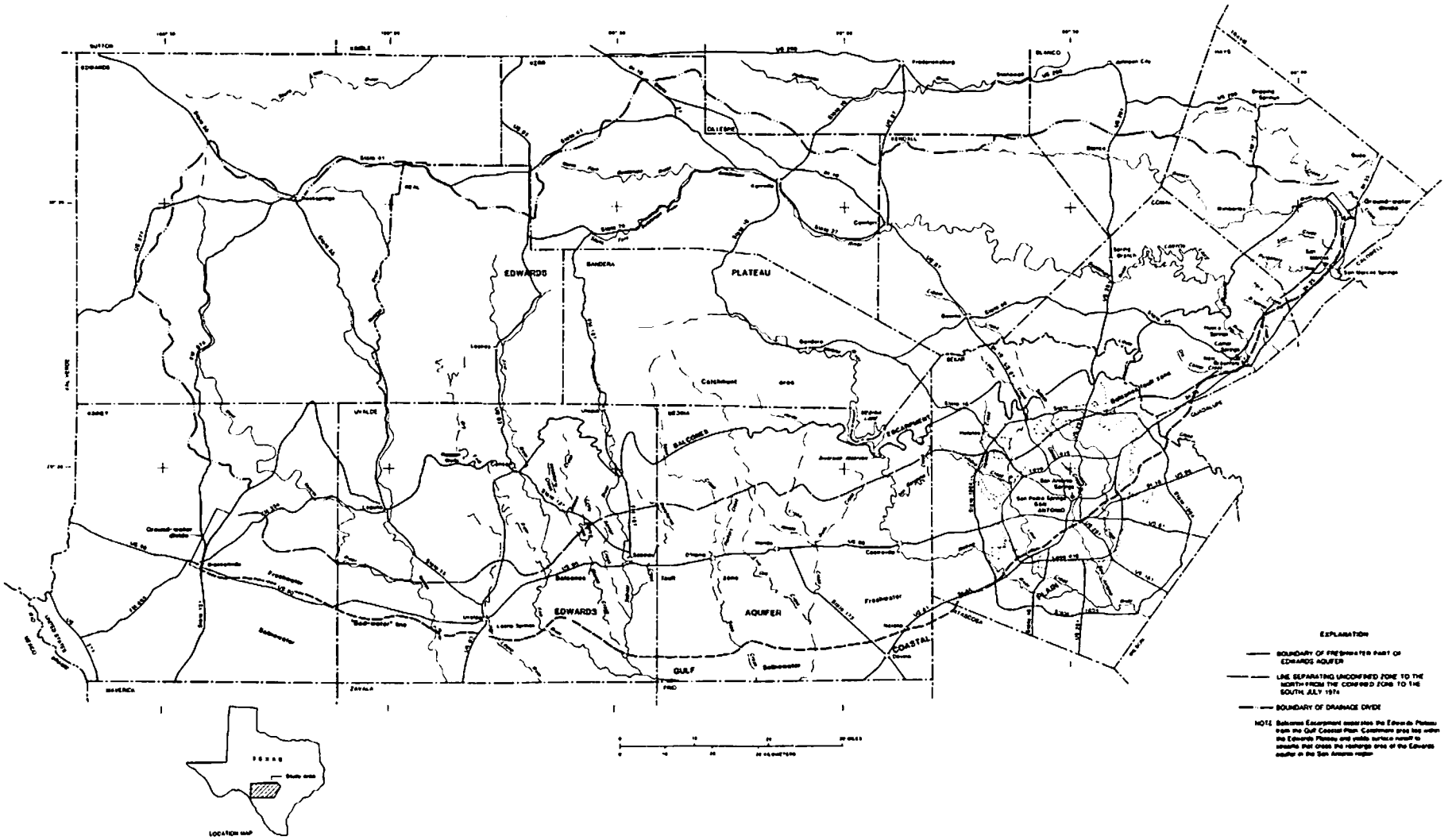

Figure 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio region.

See Plate 1 in back cover.

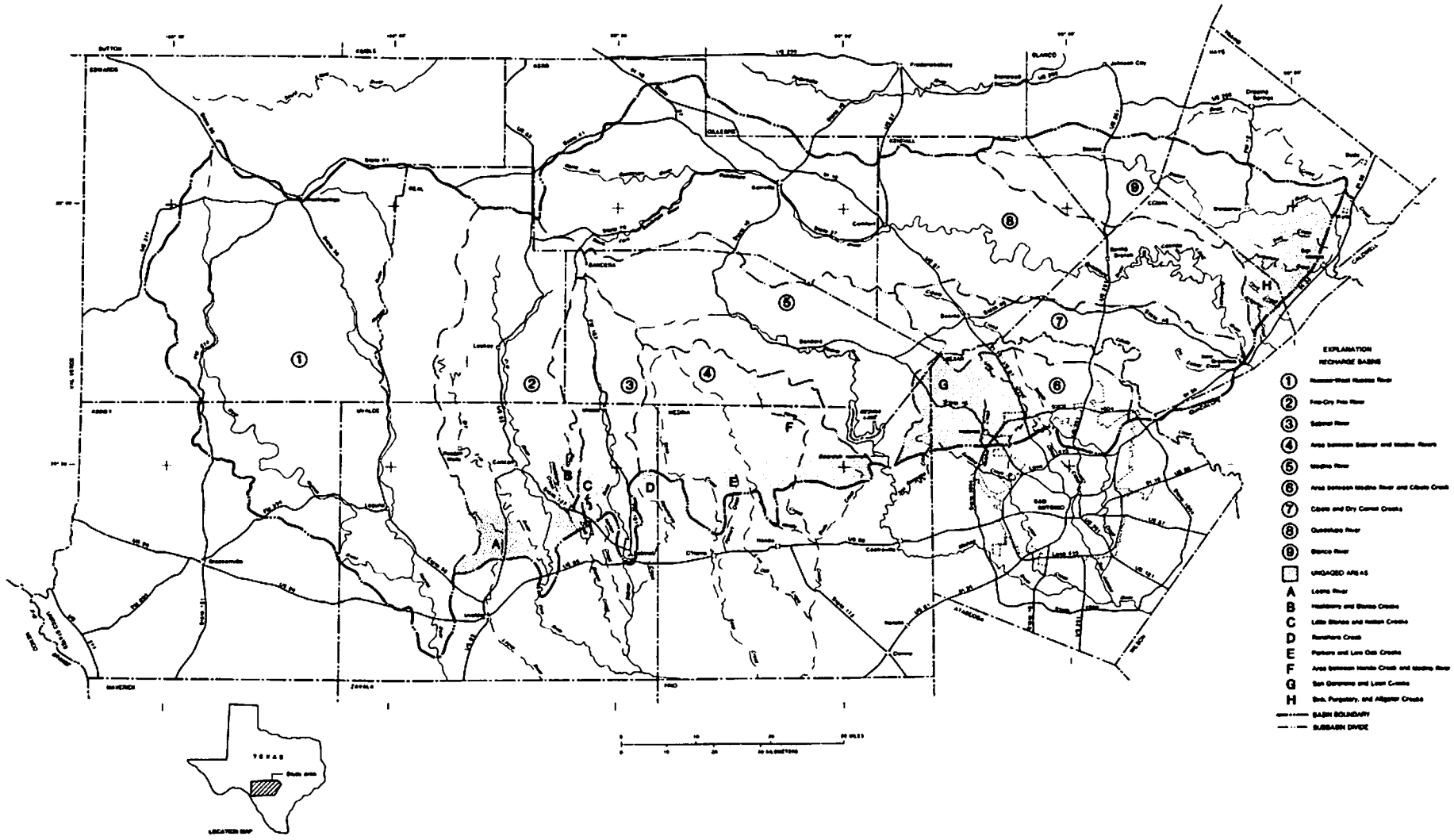

Figure 2.--Location of drainage basins and ungaged areas.

See Plate 2 in back cover.

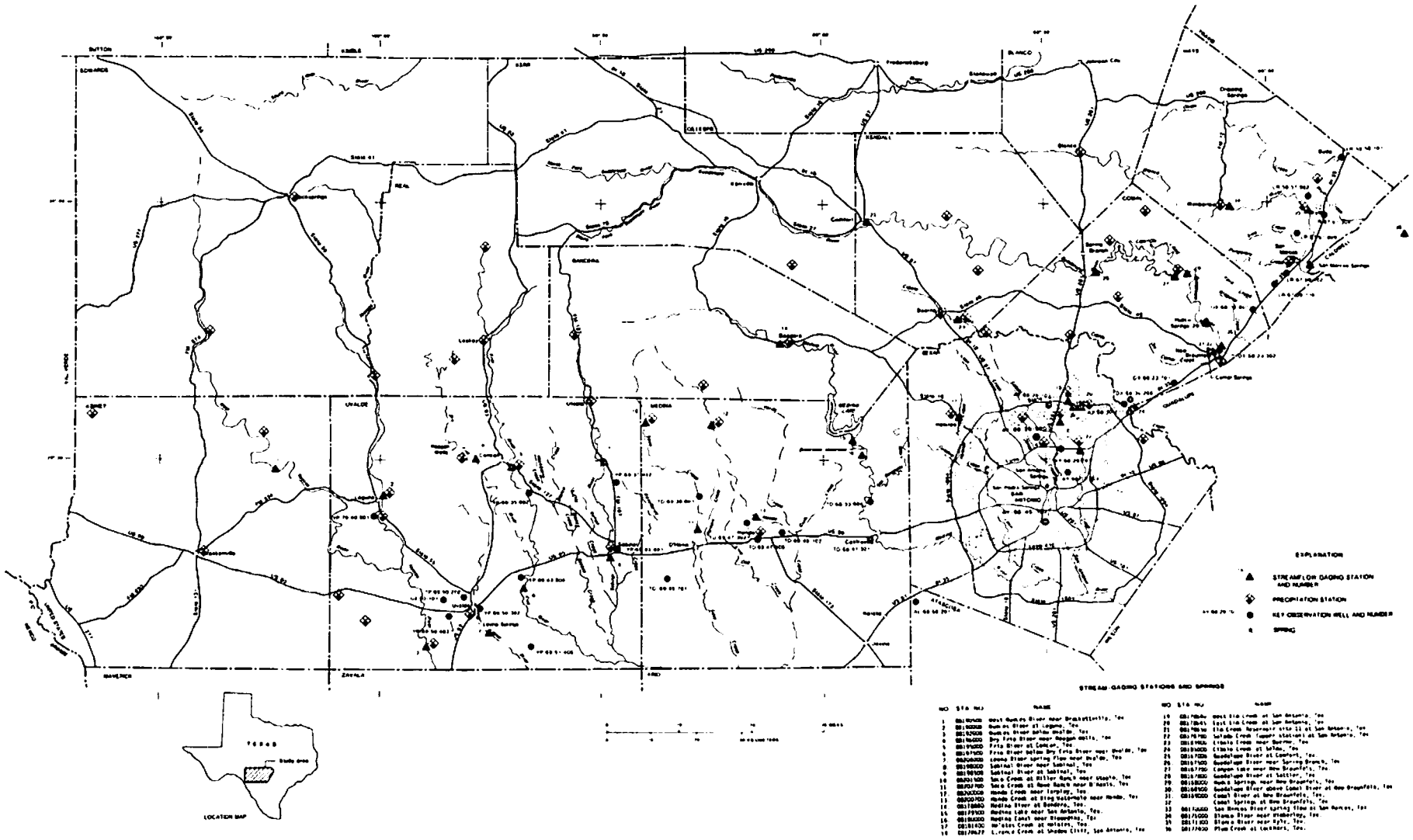

Figure 3.--Location of data-collection sites for streamflow, precipitation, and observation wells, 1988.

See Plate 3 in back cover.

Surface-water data for Texas for the 1988 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 Federal, State and local agencies in Texas.

PRECIPITATION

The annual precipitation for 1934-88 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 1988 was below average at all of the selected stations with complete record and ranged from 36 percent below the long-term average in the San Marcos area to 46 percent below the long-term average in the Sabinal area. This below average precipitation across the aquifer produced a below average estimated annual recharge for 1988.

In the 5 years prior to 1988, precipitation fluctuations at selected stations with complete record ranged from 35 percent below the long-term average, for 1984, to 86 percent above the long-term average for 1987. The annual precipitation for most stations for 1983-84 was near to below average, resulting in below average recharge. However, in 1985-87, the annual precipitation was near average to substantially above average at most stations, resulting in above average estimated recharge for 1985-86 and the largest estimated recharge since 1934 for 1987. Fluctuations of reported annual precipitation totals for San Antonio for 1934-88 and the annual difference between recharge and discharge for 1934-88 are shown in figure 4.

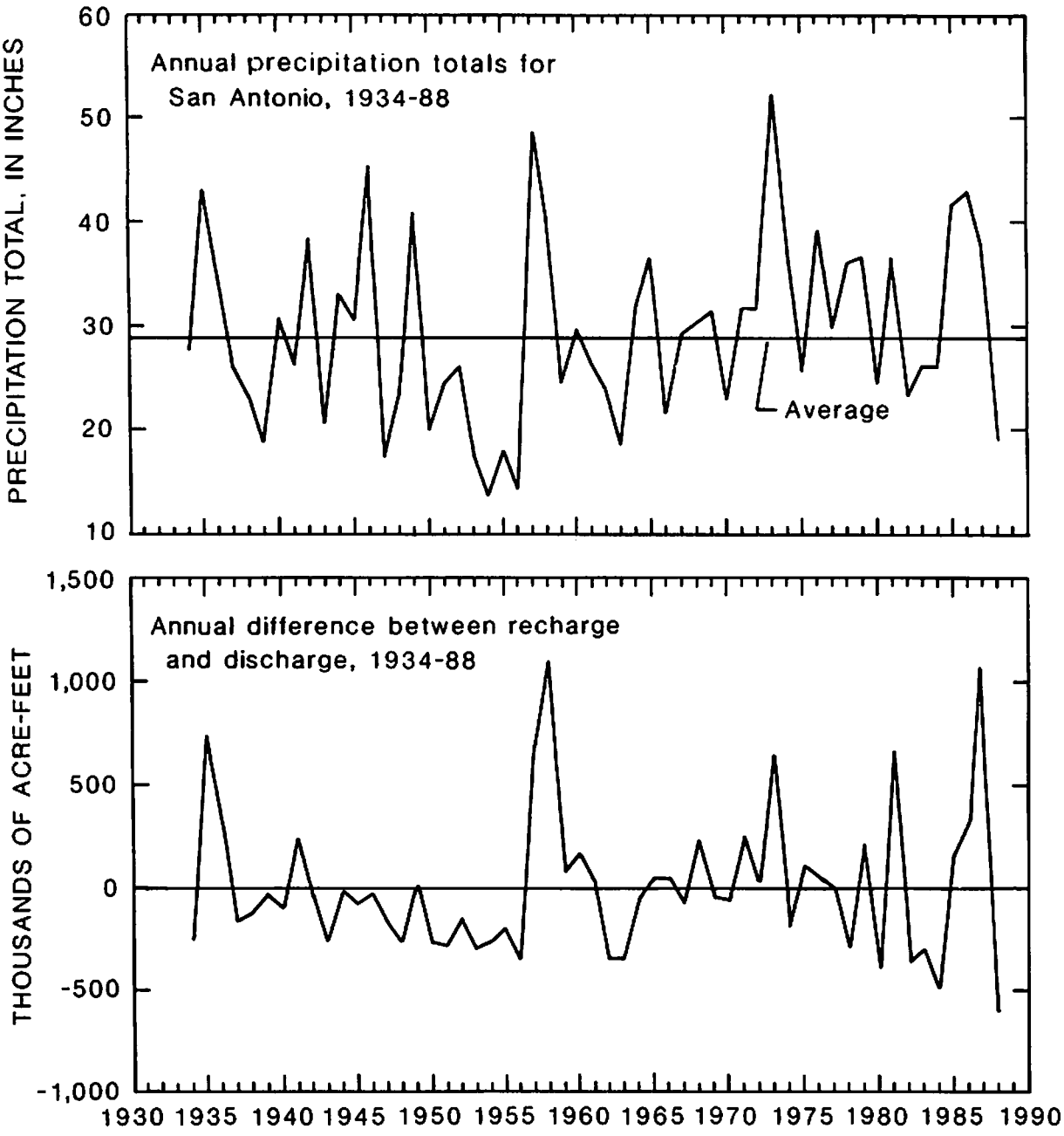

Figure 4.--Annual precipitation totals for San Antonio, 1934–88, and annual difference between recharge and discharge, 1934–88.

Table 1.--Annual precipitation for 1934-88 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
1988	12.08	15.20	13.52	c 9.81	19.01	19.49	c 16.27	21.50
Years of record	91	88	71	86	105	86	94	89
Long-term average	21.21	24.20	25.18	28.42 (1885 – 1989)	31.18 29.05	32.80	32.19	33.69

a Precipitation data from the U.S. Department of Agriculture (1934-40) and U.S. Department of Commerce (1941-88).
b Partial record not included in long-term average; missing more than 1 month.
c Partial record not included in long-term average; missing 1 month.

NOTE: Explanations for footnotes b and c were reversed in table 1 of Bulletin 47.

650.6/20 → Σ(1969-1988)/20 YRS = 32.53

Σ(1969-1989)/21 YRS = 31.92 (670.4/21)

GROUND-WATER RECHARGE

The area used for estimating recharge to the Edwards aquifer in the San Antonio area is modified slightly from the area described by Puente (1978) to reflect existing data-collection sites. Delineation of this 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, the Frio-Sabinal, and the Seco-Hondo-Medina River 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 contact from movement along faults (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 basin and the average annual recharge for 1934-88 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 1934-88 ranged from 43,700 acre-ft in 1956 to 2,003,600 acre-ft in 1987. The average annual recharge for 1934-88 was

Table 2.--Estimated annual recharge to the Edwards aquifer by basin, 1934-88 a/
[thousands of acre-feet]

Calendar year	Nueces-West Nueces River basin	Frio-Dry Frio River basin b/	Sabinal River basin b/	Area between Sabinal River and Medina River basins b/	Medina Lake	Area between Cibolo Creek and Medina River basins b/	Cibolo-Dry Comal Creek basin	Blanco River basin b/	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	c/ 44.8	23.5	c/ 422.4
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
1988	59.2	117.9	17.0	24.9	69.9	12.6	28.5	25.5	355.5
AVERAGE	105.4	120.8	38.8	98.9	61.0	68.9	c/ 105.7	38.0	635.5

1989 212.0
6278

a/ Differences may occur due to rounding procedures.
b/ Includes recharge from gaged and ungaged areas within the basin.
c/ Differs from previous bulletin due to correction.

635,500 acre-ft. The annual recharge for 1988 was 355,500 acre-ft, which is 44 percent below the average annual recharge and is the fifteenth smallest estimated annual recharge since 1934.

GROUND-WATER DISCHARGE

The estimated total discharge from wells and springs in 1988 was 926,400 acre-ft, which is a decrease of about 2 percent from 1987. In 1988, most of the estimated discharge was from well discharge and constituted 58 percent of the total discharge. Spring flow comprised 42 percent of the total discharge for the year. The estimated annual discharge, by county, from the Edwards aquifer during 1934-88 is given in table 3. The calculated average daily and total annual discharge by county and by water use for 1988 is given in table 4.

The total calculated spring flow was 386,500 acre-ft for 1988, a decrease of about 33 percent from 1987. The major springs from which discharge was calculated include San Marcos Springs in Hays County, Comal and Hueco Springs in Comal County, San Antonio and San Pedro Springs in Bexar County, and Leona River Springs in Uvalde County. The combined major spring flow in Comal and Hays Counties was 316,400 acre-ft, which is about 82 percent of the total spring flow for the year. The calculated discharge from Leona River Springs includes underflow into the alluvial gravels along the stream.

The total calculated discharge from wells was 539,900 acre-ft, an increase of 175,800 acre-ft, which is about 48 percent, from 1987. Bexar County well discharge was 302,900 acre-ft, which is an increase of 27,300 acre-ft, or about a 10-percent increase, from 1987. In 1988, approximately 56 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

Table 3.--Estimated annual discharge from the Edwards aquifer by county, 1934-88
[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
1988	173.4	82.2	317.4	236.5	116.9	926.4	386.5	539.9
1989								542.0

n = 55
Intcp 51.9
slope 7.15
$\bar{x}$ = 273.665
AV INCREASE
%/YR 1.8%

Table 4.--Calculated average daily and total annual discharge from the Edwards aquifer by county and by water use, 1988 [a]

County	Springs	Municipal supply and military use	Irrigation	Industrial use	Domestic supply, stock, and miscellaneous use	Total (million gallons per year)	Total (thousand acre-feet per year)
	Million gallons per day						
Kinney	--	--	1.0	--	0.2	438.0	1.3
Uvalde	49.7	4.8	96.3	0.6	2.2	56,064.7	172.1
Medina	--	5.5	67.2	--	0.6	26,770.8	82.2
Bexar	12.9	223.9	7.6	6.7	32.2	103,418.2	317.4
Comal	190.8	11.4	0.2	8.1	0.6	77,073.0	236.5
Hays	91.6	9.9	0.1	1.3	1.5	38,103.0	116.9
Total (million gallons per year)	125,930.6	93,265.9	62,907.4	3,112.5	13,651.3	301,867.7	
Total (thousand acre-feet per year	386.5	286.2	193.1	18.8	41.9		926.4

a Differences may occur due to rounding procedures.

Counties, supplied water from the Edwards aquifer for the irrigation of approximately 73,400 acres. The remaining discharge was for industrial use and was primarily from wells in Comal and Bexar Counties.

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. Changes in ground-water storage occur when there are differences between the amounts of recharge and discharge. 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 last 5 years, discharge was greater than recharge for 1984 and 1988 and was reflected in decreasing water levels. However, recharge was greater than discharge during 1985-87 and was reflected in increasing water levels for those years. The annual difference between recharge and discharge for 1934-88 is shown in figure 4. The accumulated difference between recharge and discharge and the annual average water level for the Bexar County observation well are shown in figure 5.

Although record high water levels were established for five selected observation wells in the artesian part of the aquifer in 1987, the general trend for 1988 was downward reflecting below normal recharge for the year. The annual and period of record high and low water levels recorded for these five selected observation wells during 1934-88 are given in table 5. Water levels from these wells during 1988 fluctuated above the midpoint between the recorded historical high and low measurements.

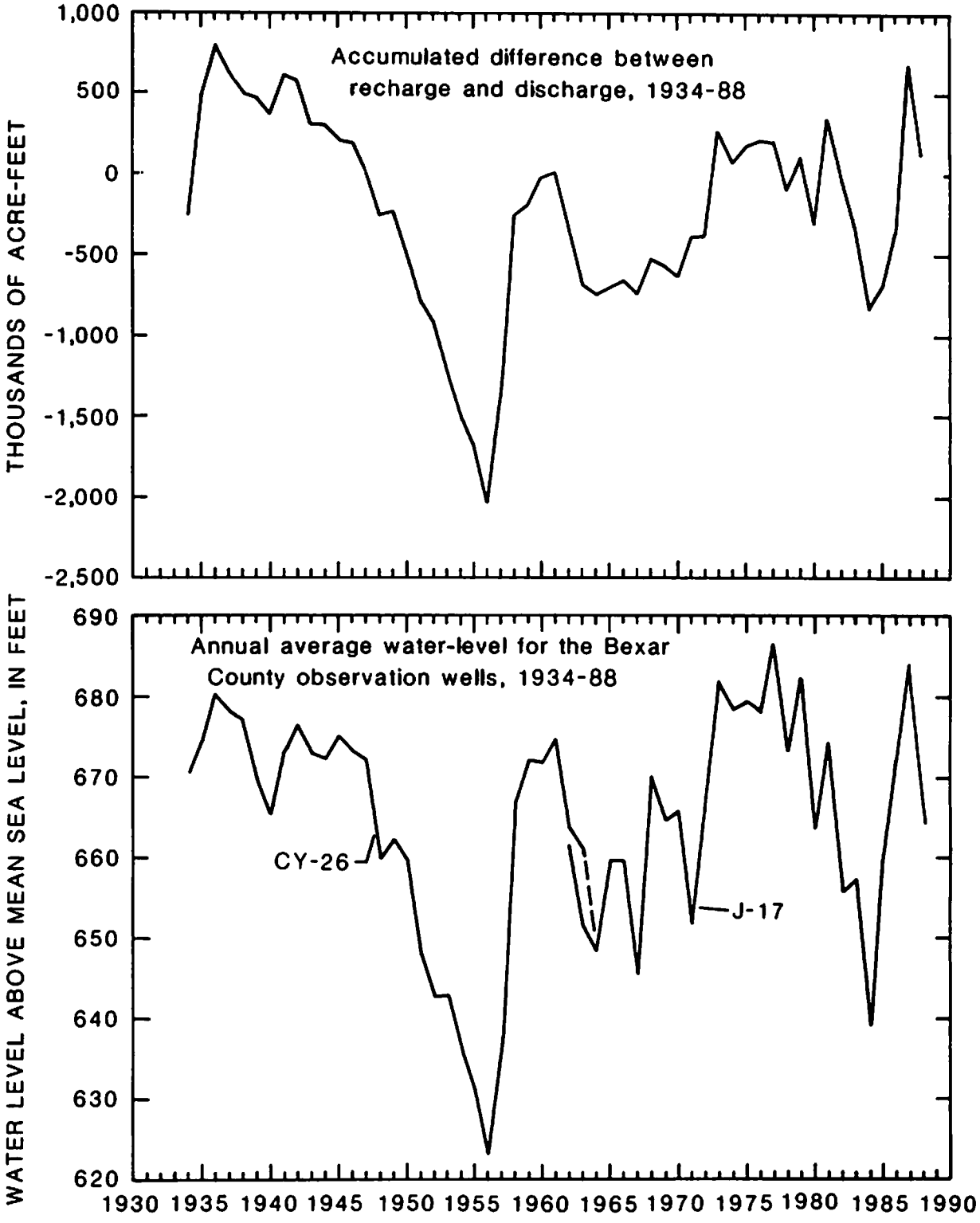

Figure 5.--Accumulated difference between recharge and discharge and annual average water-level for the Bexar County observation well, 1934-88.

[lsd, land-surface datum; ft, feet. Measurements in feet above National Geodetic Vertical Datum of 1929.]

Year	YP-69-50-302 a H-5-1 (Uvalde Co.) lsd 904.85 ft		TD-68-41-301 a J-1-82 (Medina Co.) lsd 756.84 ft		AY-68-37-203 a,b J-17 (Bexar Co.) lsd 730.81 ft		DX-68-23-302 a G-49 (Comal Co.) lsd 642.7 ft		LR-67-01-3041 a H-23 (Hays Co.) lsd 718.0 ft	
	High	Low	High	Low	High	Low	High	Low	High	Low
1934	866.61	--	--	--	675.20	666.81	--	--	--	--
1935	872.12	--	--	--	681.31	666.80	--	--	--	--
1936	876.63	876.51	--	--	683.02	676.62	--	--	--	--
1937	878.11	877.08	--	--	682.08	674.92	--	--	583.4	581.6
1938	875.79	873.95	--	--	681.39	673.58	--	--	590.6	581.5
1939	873.35	869.58	--	--	674.10	665.69	--	--	580.6	569.6
1940	872.33	868.53	--	--	671.43	660.96	--	--	572.2	568.7
1941	875.70	867.74	--	--	682.46	668.26	--	--	587.7	578.6
1942	875.75	871.87	--	--	685.36	669.74	--	--	580.8	573.7
1943	874.53	867.98	--	--	679.58	668.51	--	--	578.2	574.6
1944	869.30	866.80	--	--	677.62	667.13	--	--	580.5	579.3
1945	870.08	865.17	--	--	681.91	668.81	--	--	581.8	--
1946	867.06	862.87	--	--	681.15	663.61	--	--	580.3	--
1947	870.73	867.08	--	--	680.70	665.81	--	--	577.3	577.0
1948	868.37	860.49	--	--	667.74	653.68	624.4	624.3	560.5	559.4
1949	871.15	859.09	--	--	671.59	655.55	626.7	624.1	562.3	561.8
1950	871.24	861.79	686.97	674.86	665.38	653.76	625.2	624.0	575.8	575.2
1951	861.78	846.84	675.17	659.91	656.01	640.63	624.2	622.5	575.3	569.4
1952	846.80	834.87	663.77	649.92	650.49	633.44	623.0	621.5	573.0	569.1
1953	835.21	817.79	665.12	647.69	651.52	630.53	623.6	621.1	584.5	573.2
1954	836.71	823.14	660.34	642.44	646.34	628.09	623.1	620.5	581.8	562.8
1955	834.30	824.05	649.13	635.59	638.49	624.24	621.9	619.8	575.7	558.4
1956	834.20	814.20	641.58	622.31	632.22	612.51	621.0	613.3	569.8	542.2
1957	840.85	810.95	666.11	632.99	653.77	624.36	624.7	620.1	584.9	568.3
1958	866.09	840.82	704.35	665.74	679.56	653.26	626.6	624.6	593.6	580.8
1959	876.06	866.20	703.82	688.95	677.66	661.47	627.1	625.1	591.4	580.5
1960	876.92	873.09	706.29	686.00	679.39	657.86	627.1	624.9	589.4	584.3
1961	878.48	875.60	710.31	693.38	681.16	663.90	627.3	625.7	591.6	573.2
1962	878.26	869.72	703.59	676.34	675.51	646.94	626.3	623.2	584.1	565.0
1963	869.69	860.93	689.12	659.19	665.80	635.02	625.0	621.7	581.6	560.0
1964	860.93	848.97	676.28	654.78	657.04	632.83	624.1	621.6	578.2	562.8
1965	865.82	860.33	689.63	666.77	674.99	645.64	626.6	623.5	590.1	573.4
1966	867.23	860.16	686.06	665.00	668.79	642.74	625.9	623.1	589.0	566.6
1967	867.38	856.44	679.44	645.19	659.69	624.91	624.6	620.0	582.8	556.6
1968	873.31	864.83	701.95	679.19	678.33	655.87	627.2	624.6	593.8	574.4
1969	874.98	866.51	694.76	670.49	676.10	642.77	626.3	623.4	588.7	567.7
1970	876.11	871.32	700.74	678.83	677.08	650.41	627.2	624.3	593.2	575.0
1971	877.65	863.95	701.30	646.43	674.58	627.89	626.2	621.0	577.1	551.5
1972	877.78	874.56	704.59	676.71	678.99	651.17	626.7	624.1	579.7	567.3
1973	881.63	874.50	731.23	690.06	696.52	665.92	629.8	626.1	589.9	572.3
1974	881.35	875.97	723.84	695.96	689.22	660.88	629.1	625.8	593.6	558.5
1975	882.10	879.41	720.99	708.15	686.92	671.99	629.3	626.5	589.8	571.4
1976	884.93	875.97	732.34	694.88	693.11	663.76	629.4	625.8	584.6	571.2
1977	886.21	881.31	737.82	715.27	695.95	675.63	630.2	627.6	587.4	562.1
1978	882.56	875.62	722.40	681.66	684.11	650.13	628.1	624.5	572.0	540.4
1979	881.95	876.06	728.22	710.29	690.52	676.40	629.0	627.3	584.9	572.0
1980	879.07	868.00	716.09	666.76	680.29	640.76	627.5	623.0	572.0	551.8
1981	881.80	867.90	723.17	698.77	685.99	668.57	628.0	625.5	586.2	565.5
1982	881.83	876.35	717.12	682.77	680.45	645.33	627.3	623.6	584.7	644.7
1983	877.05	871.25	698.16	667.69	669.92	642.11	625.6	623.0	588.7	560.4
1984	873.26	856.91	684.52	642.03	656.97	623.29	624.4	619.6	582.5	544.3
1985	876.85	862.24	698.98	670.68	674.50	644.05	626.8	623.3	591.4	561.8
1986	877.82	872.20	704.64	674.19	685.59	649.81	627.7	624.1	595.0	576.3
1987	889.03	877.86	743.48	711.12	699.23	676.88	630.4	627.2	595.9	583.5
1988	887.03	877.99	725.34	679.89	684.87	647.74	627.9	623.9	593.2	585.9
Record	High	Low	High	Low	High	Low	High	Low	High	Low
	889.08	811.11	743.48	622.31	699.23	c 612.51	630.4	613.3	595.9	540.4
Month	June	Apr.	June	Aug.	June	Aug.	June	Aug.	Sept.	July
Year	1987	1957	1987	1956	1987	1956	1987	1956	1987	1978
Period of record	1929-32, 1934-88		1950-88		1932-88		1948-88		1937-88	

a New state well number replaces old well number.
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.

1989

663.90 626.98

In 1988, 18 wells were measured periodically, and 14 additional wells were measured with recorders on a continuous basis (fig. 3). The data from these wells showed a general downward trend, reflecting below normal recharge for the year. The data also show that decreases in storage occurred throughout the year, which is reflective of the below average precipitation. As indicated by the water levels, the volume of water in storage in the Edwards aquifer for the latter part of 1987 was at a record maximum. The volume of water in storage in the Edwards aquifer then remained above to near average during 1988. The water levels in observation wells for 1988 are given in Appendix A. Water Levels.

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 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 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 QUALITY FOR WELLS AND SPRINGS

Water-quality samples were collected at 56 selected wells and 3 springs during 1988. 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 the San Antonio area is shown in figure 8. Although

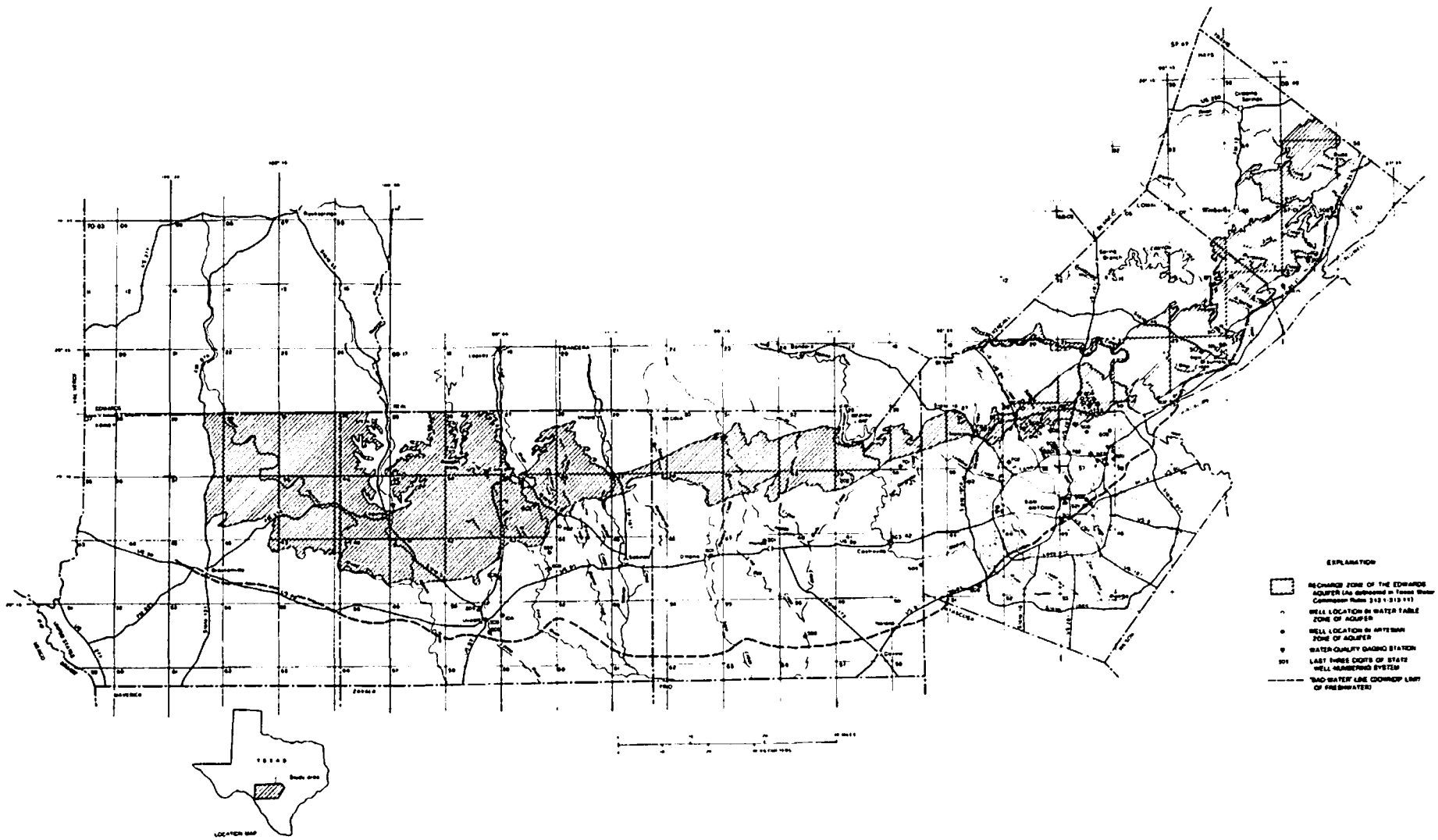

Figure 6.--Location of water-quality data-collection sites for wells, springs, and streams sampled in 1988.

See Plate 4 in back cover.

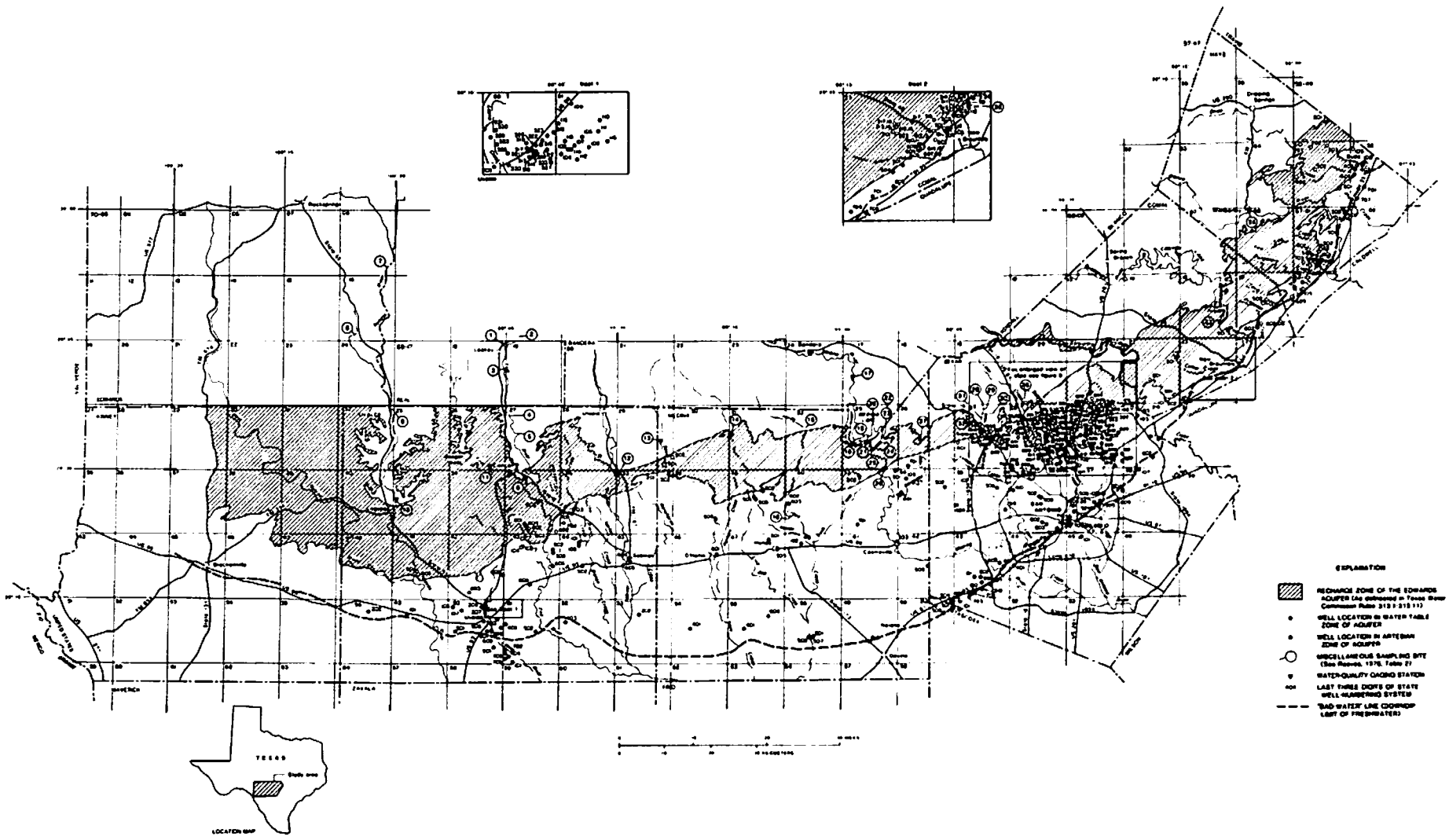

Figure 7.--Location of water-quality data-collection sites for wells, springs, and streams sampled within the period 1972-

See Plate 5 in back cover.

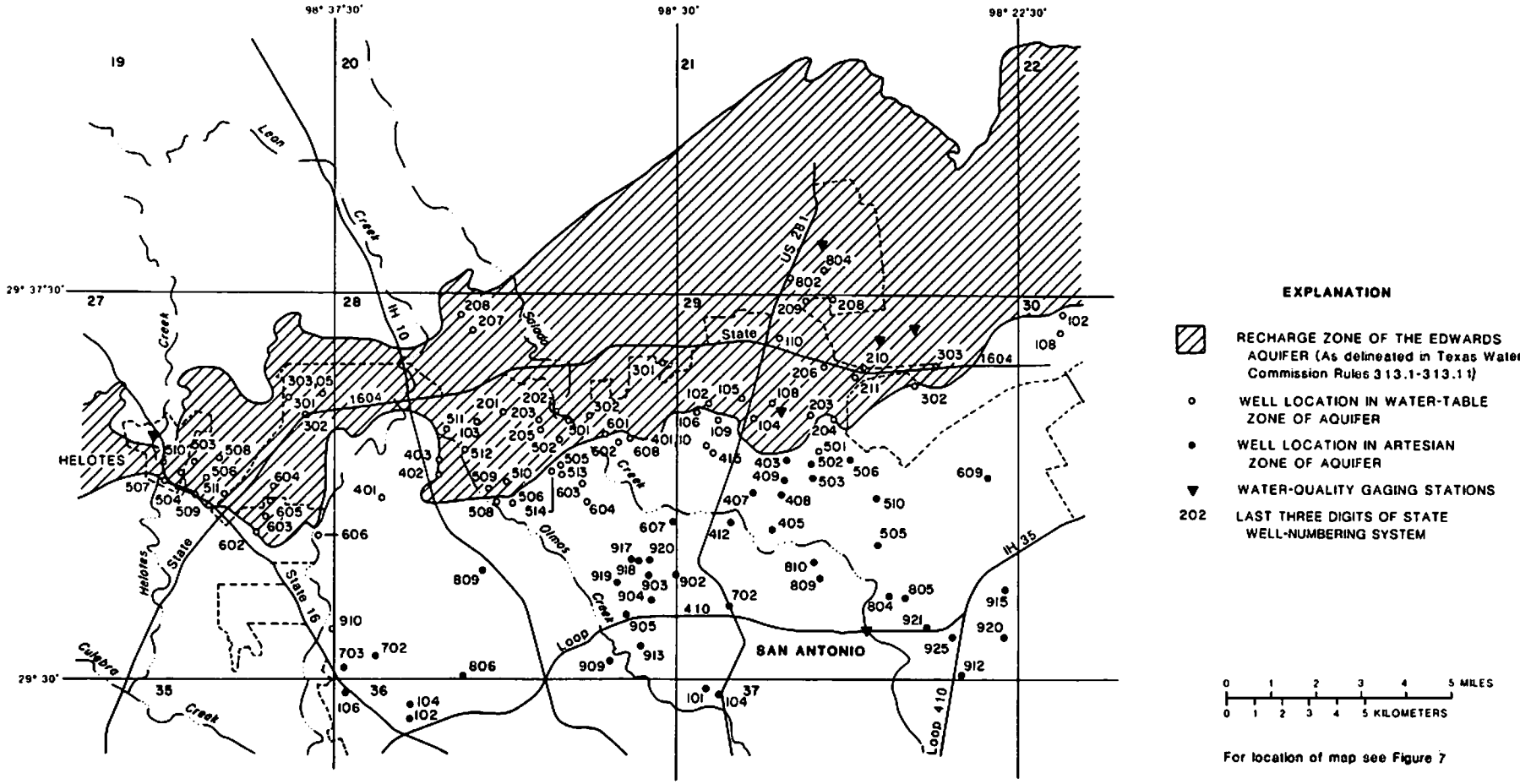

Figure 8.--Location of water-quality data-collection sites for wells, springs, and streams in the vicinity of San Antonio sampled within the period 1972-88.

See Plate 6 in back cover.

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.

The results of the analyses of water samples that were collected from the Edwards aquifer during 1988 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 better quality than the level established for public water systems (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 interface exists between the freshwater zone and the downdip, saline-water zone. 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.

A sampling 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. This program was started in response to the concern that increased withdrawals from the aquifer may result in the encroachment of saline water into the freshwater zone of the aquifer. As part of the water-quality program, monthly samples are collected and analyzed along with continuous water-level monitoring 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 1988 with

previous analyses indicates no environmentally significant change in the quality of water in the freshwater or transition zones.

Samples from wells in the Edwards aquifer were analyzed for several different water-quality constituents, including common inorganics, nutrients, dissolved organic carbon, minor elements, pesticides, volatile organic compounds, and isotopes. The purgeable volatile organic samples taken in 1988 (Appendix B) 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-Dichloropropene
Bromoform	Cis-1,3-Dichloropropene
Carbon tetrachloride	Trans-1,3-Dichloropropene
Chlorobenzene	Ethylbenzene
Chlorodibromomethane	Methylbromide
Chloroethane	Methylene chloride
2-Chloroethyl vinyl ether	1,1,2,2-Tetrachlorethane
Chloroform	Tetrachloroethylene
Chloromethane	Toluene
Dichlorobromomethane	1,1,1-Trichloroethane
1,1-Dichloroethane	1,1,2-Trichloroethane
1,2-Dichloroethane	Trichloroethylene
1,1-Dichloroethylene	Trichlorofluoromethane
1,2-trans-Dichloroethylene	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 level 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)
Benzene	0
Carbon tetrachloride	0
p-Dichlorobenzene	75
1,1-Dichloroethylene	7
1,2-Dichloroethane	0
1,1,1-Trichloroethane	200
Trichloroethylene	0
Vinyl chloride	0

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 1988 was concentrated and conducted in areas where possible or suspected degradation of water quality may occur such as the water-table part of the aquifer. Sampling in other areas of the aquifer was conducted on a rotational monitoring basis.

In 1988, 29 wells were sampled and analyzed for volatile organic compounds. The results of the analyses showed that 16 of the wells contained no detectable amounts of volatile organic compounds. However, samples from 13 wells contained one or more measurable volatile organic compounds. The results ranged from the detection limit of 0.20 to 6.3 µg/L (micrograms per liter). Samples from eight wells contained one or more volatile organic compounds with concentrations equal to or greater than 1 µg/L, and samples from four of the wells contained concentrations equal or greater than 5 µg/L.

Trihalomethanes, which include bromoform, chloroform, chlorodibromomethane, and dichlorobromomethane, were detected in samples from five wells. These wells were AY-68-28-502, AY-68-28-903, LR-67-01-806, TD-68-42-503, and TD-69-46-601. The results ranged from the detection limit of 0.20 µg/L in two wells to 6.1 µg/L in one well. The principal source of trihalomethanes in drinking water is the chemical interaction of 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 six of the wells sampled. These wells were AY-68-28-903, AY-68-28-920, AY-68-29-920, LR-67-01-806, LR-67-09-105, and TD-69-46-601. The results ranged from the detection limit of 0.20 to 6.3 µg/L. Tetrachloroethylene was detected in one sample from Bexar County at 6.3 µg/L.

In 1988, 21 wells and 2 springs were sampled and analyzed for one or more of the following isotopes--tritium, hydrogen, oxygen, and sulfur. The results of the analyses are given in Appendix B. Water Quality. Most ground water contains these isotopes in varying concentrations primarily from contact with various types of rock material and from man's activities.

Radioactive isotopes, such as tritium, are used primarily to measure the age of a water. Tritium occurs in the environment as a result of both natural and man-made processes. It is produced naturally by interaction of cosmic radiation with nitrogen and oxygen of the upper atmosphere and enters the hydrologic cycle as part of the water molecules in precipitation. Large amounts of man-made tritium were released to the atmosphere by thermonuclear test explosions during 1953-62.

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 at 6 to 8 TU (tritium units) by Thatcher (1962). Tritium levels of water from the Edwards aquifer have been determined periodically. Past records and information can be found in studies by Pearson and others (1975) and Maclay, Rettman, and Small (1980).

Stable isotopes like deuterium (^{2}H), oxygen (^{18}O), and sulfur (^{34}S) are used to understand the probable source of a water and the processes that have affected it. Processes that can affect a water include dissolutioning of the aquifer material, mixing of different waters, and the origin of solutions from which sulfite or sulfate minerals were formed in the past (Drever, 1982). 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, 1988
(Water levels furnished by Edwards Underground Water District)

[diam., diameter; in., inches; ft, feet; lsd, land surface datum; msl, mean sea level]

291342098475401. AL-68-50-201. Public supply artesian well in Edwards aquifer, diam. 10 to 8 in., depth 2,379 ft, casec 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 1957-88.

Date	Water level
Mar. 29, 1988	28.90

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 1957-88.

Highest 1988 water level 230.96 ft below lsd on Jan. 6; lowest 1988 water level 256.74 ft on Dec. 28.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	231.26	232.99	234.41	236.27	238.72	240.70	243.33	245.54	249.38	251.87	253.72	255.85
10	231.48	232.90	234.39	236.69	239.08	241.26	243.72	246.20	250.11	252.17	254.25	255.80
15	231.39	233.40	235.04	236.95	239.38	241.88	244.26	246.95	250.56	252.49	254.43	255.89
20	231.55	233.67	235.33	237.23	239.88	242.41	244.94	247.43	250.56	252.91	254.95	256.02
25	232.19	234.08	235.43	237.65	240.42	242.85	244.92	248.03	251.11	253.25	254.79	256.45
Eom	232.32	234.11	235.66	238.08	240.85	242.71	245.35	248.80	251.49	253.65	255.41	256.55

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 1952-88.

Highest 1988 water level 90.91 ft below lsd on Jan 3; lowest 1988 water level 129.65 ft below lsd on June 25.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	91.48	93.91	96.63	101.42	.....	113.30	a123.85	117.01	.....	120.97	119.64	120.37
10	91.62	94.44	97.78	100.95	.....	118.75	124.50	120.24	126.66	121.52	120.39	118.63
15	92.29	95.65	99.68	103.57	.....	122.40	122.72	122.81	126.50	121.50	120.79	118.11
20	92.31	95.21	97.80	102.77	.....	126.49	124.68	.....	120.80	122.64	119.57	117.83
25	93.11	95.94	99.29	106.10	.....	129.65	118.69	.....	121.04	122.29	119.16	117.66
Eom	93.69	96.67	99.66	.....	.....	121.99	118.04	.....	120.83	120.58	119.83	117.11

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 1988.

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 ftc/ below lsd, Aug. 17, 1956. Records available 1932-88d/.

Highest 1988 water level 45.94 ft below lsd on Jan 3; lowest 1988 water level 83.07 ft below lsd on June 25.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	46.38	48.69	50.81	54.83	63.29	67.07	76.95	69.88	77.05	73.85	72.44	73.02
10	46.65	49.04	51.79	54.51	a67.17	72.05	78.00	73.30	79.44	74.11	73.18	71.36
15	47.08	50.38	53.34	56.91	68.14	75.75	75.86	75.56	79.45	74.24	73.43	70.74
20	47.25	50.15	51.74	56.15	72.41	79.60	a78.20	75.35	73.50	75.68	72.10	70.44
25	47.64	50.52	52.99	59.25	70.31	83.07	71.73	78.10	73.39	74.91	71.72	70.24
Eom	47.98	50.85	53.13	61.06	71.71	75.72	71.40	78.63	73.82	73.56	72.70	69.59

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 1936-88.

Date	Water level
Apr. 5, 1988	148.94
Oct. 4	147.10

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 1948-88.

Highest 1988 water level 14.83 ft below lsd on Jan 3, 4, 6, 7; lowest 1988 water level 18.81 ft below lsd on Sept. 12-14.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	14.85	15.03	15.34	15.70	16.40	17.31	18.14	17.82	18.54	18.35	18.29	18.34
10	14.87	15.06	15.41	15.76	16.70	17.46	18.34	17.99	18.76	18.39	18.32	18.33
15	14.87	15.11	15.52	15.87	16.92	17.74	18.19	18.24	18.77	18.36	18.37	18.22
20	14.88	15.20	15.46	15.92	17.10	18.10	18.34	18.26	18.57	18.44	18.34	18.18
25	14.91	a15.24	15.54	16.07	17.23	18.48	17.98	18.48	18.38	18.44	18.26	18.13
Eom	14.99	15.27	15.57	16.29	17.45	18.15	17.91	18.61	18.38	18.36	18.35	18.13

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, 1937-88.

Date	Water level
Apr. 5, 1988	32.26
Oct. 4	44.40

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, 1955-88.

Highest 1988 water level 125.06 ft below lsd on Jan 3; lowest 1988 water level 152.84 ft below lsd on Sept. 12.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	125.25	126.93	128.68	131.56	137.12	.....	.....	.....	151.22	148.62	148.20	148.32
10	125.45	127.09	129.31	131.81	139.61	.....	150.22	.....	152.58	.....	148.54	147.45
15	125.70	127.80	130.34	132.88	141.04	.....	.....	148.78	152.25	.....	148.72	147.04
20	125.90	128.10	129.86	132.84	143.92	.....	.....	148.93	.....	.....	148.11	146.79
25	126.15	128.28	130.38	134.60	143.01	.....	.....	150.50	148.59	.....	147.76	146.66
Eom	126.52	128.57	130.61	136.25	144.51	.....	.....	151.20	148.87	148.75	148.15	146.55

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, 1971-88.

Date	Water level
Apr. 5, 1988	199.65
Oct. 4	239.50

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 1937-88.

Date	Water level
Jan. 5, 1988	101.47
Jan. 29	111.03
Feb. 29	107.92
Apr. 5, 1988	126.57
Oct. 10	138.70

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 1937-88.

Date	Water level
Jan. 5, 1988	124.84
Jan. 29	126.60
Feb. 29, 1988	132.08
Apr. 5	130.15

295443097554201. LR-67-01-809 (H-49). Domestic water-table well in Edwards aquifer, diam. 34 in., depth 32.5 ft, casing information not available. Lsd 601.7 ft above msl. 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, 1980-88.

Highest 1988 water level 24.43 ft below lsd on Jan 1; lowest 1988 water level 26.95 ft below lsd on Dec 10.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	24.53	25.21	25.70	25.93	26.20	25.53	26.20	26.45	26.69	26.76	26.83	26.91
10	24.68	25.25	25.71	25.95	26.27	25.68	26.25	26.50	26.72	26.78	26.84	26.95
15	24.75	25.38	25.88	26.01	26.27	25.80	26.24	26.52	26.74	26.80	26.85	26.92
20	24.84	25.46	25.80	26.05	26.29	25.90	26.36	26.55	26.72	26.82	26.90	26.90
25	25.05	25.50	25.85	26.13	26.20	26.05	26.37	26.60	26.77	26.86	26.87	26.91
Eom	25.14	25.62	25.86	26.15	25.69	26.10	26.43	26.65	26.75	26.86	26.90	26.90

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, 1974-88.

Date	Water level
Apr. 15, 1988	118.86

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 678.5 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 1973-88.

Highest 1988 water level 98.20 ft below lsd on Jan 1; lowest 1988 water level 101.34 ft below lsd on Dec. 28.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	98.29	99.06	99.56	99.85	100.16	98.90	100.24	100.68	101.05	101.15	101.18	101.31
10	98.40	99.12	99.64	99.90	100.30	99.30	100.29	100.74	101.10	101.17	101.20	101.31
15	98.53	99.20	99.73	99.95	100.34	99.58	100.30	100.81	101.14	101.19	101.20	101.30
20	98.62	99.30	99.72	100.00	100.36	99.80	100.43	100.85	101.13	101.20	101.24	101.30
25	98.78	99.37	99.76	100.12	100.36	99.99	100.50	100.95	101.14	101.18	101.24	101.33
Eom	98.92	99.45	99.80	100.15	98.83	100.10	100.63	100.99	101.15	101.22	101.26	101.29

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, 1954-88.

Date	Water level
Mar. 29, 1988	121.31
Oct. 7	146.42

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 756.84 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 1950-88.

Highest 1988 water level 31.50 ft below lsd on Jan 3; lowest 1988 water level 76.95 ft below lsd on July 7.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	31.76	.....	38.37	42.92	.....	.....	76.44	62.88	67.41	64.30	63.53	64.19
10	32.04	37.25	39.21	44.02	61.44	.....	75.55	63.91	68.72	64.64	63.66	63.44
15	32.31	39.25	41.53	45.60	64.07	.....	a71.20	65.97	68.67	64.76	63.54	62.80
20	32.52	39.01	.....	46.35	68.65	.....	71.11	66.31	65.18	65.29	63.55	62.66
25	33.21	38.09	.....	49.70	66.23	.....	66.22	67.58	64.39	65.66	63.04	62.92
Eom	.....	38.07	41.59	.....	70.45	.....	64.50	67.71	64.63	64.89	63.81	62.56

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 1957-88.

Highest 1988 water level 76.19 ft below lsd on Jan. 6; lowest 1988 water level 113.46 ft below lsd on Dec. 31.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	76.35	77.44	79.10	81.57	84.74	88.86	93.65	96.15	99.46	103.03	106.55	110.43
10	76.46	77.48	79.33	82.06	85.81	89.54	94.33	96.57	100.05	103.63	107.25	111.00
15	76.46	77.79	79.94	82.48	85.95	90.48	94.28	97.13	100.67	104.17	107.71	111.55
20	76.55	78.10	80.40	82.89	86.54	91.30	94.78	97.60	101.13	104.68	108.59	112.11
25	76.96	78.61	80.64	83.42	87.26	92.00	95.22	98.21	101.80	105.37	108.88	112.88
Eom	76.95	78.74	81.05	84.00	88.09	92.86	95.76	98.85	102.40	106.13	109.79	113.46

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, 1940-88.

Date	Water level
Mar. 29, 1988	153.93

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 1960-88.

Date	Water level
May 5, 1988	228.68
Oct. 10	234.91

292045099081801. TD-69-47-306 (I-3-134). Unused artesian well in Edwards aquifer, diam. 12 in., depth 1,600 ft, casing to 1485 ft. Lsd 887.5 ft above msl. Highest water level 113.51 ft below lsd, June 22, 1987; lowest water level 193.14 ft below lsd, June 25, 1988. Record available 1986-88.

Highest 1988 water level 128.22 ft below lsd on Jan 3; lowest 1988 water level 193.14 ft below lsd on June 25.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	128.53	133.68	137.19	144.24	163.77	165.35	181.23	165.20	171.06	168.64	167.77	170.16
10	128.88	136.28	138.86	145.40	167.95	171.53	179.00	167.10	173.63	169.25	168.19	169.14
15	129.11	139.38	142.03	148.61	169.51	180.59	173.13	169.49	172.17	170.00	168.49	168.84
20	129.51	.....	141.43	149.49	175.26	184.64	173.11	170.12	168.57	170.49	168.53	169.06
25	130.37	.....	141.64	154.33	171.76	193.14	168.01	171.13	168.09	171.04	168.43	169.08
Eom	131.40	.....	142.29	158.65	.....	180.90	166.94	171.40	168.73	169.09	169.85	168.63

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 1958-88.

Date	Water level
Mar. 29, 1988	122.80
Oct. 7	149.32

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 1957-88.

Date	Water level
Apr. 8, 1988	64.78
Oct. 6	63.66

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 1974-88.

Highest 1988 water level 263.77 ft below lsd on Jan. 6; lowest 1988 water level 319.93 ft below lsd on Dec. 31.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	264.05	266.33	269.72	274.12	279.69	286.73	294.21	298.20	303.01	307.72	312.03	316.37
10	264.32	266.46	269.98	275.14	280.65	287.85	295.20	298.83	303.75	308.31	312.79	316.94
15	264.26	267.07	271.19	275.80	281.69	289.25	295.83	299.67	304.50	308.85	313.14	317.57
20	264.55	267.75	271.90	276.62	282.78	290.41	296.15	300.36	305.35	309.62	314.31	318.17
25	265.27	268.66	272.37	277.48	284.36	291.72	296.76	301.20	306.14	310.50	314.50	319.13
Eom	265.35	268.92	273.21	278.40	285.44	292.86	297.58	302.18	306.88	311.45	315.71	319.93

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 1971-88.

Date	Water level
Apr. 7, 1988	100.90

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 1956-88.

Highest 1988 water level 127.19 ft below lsd on Jan. 1; lowest 1988 water level 189.40 ft below lsd on June 25.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	127.50	134.31	138.88	e145.94	162.35	170.80	182.27	170.62	174.03	174.46	175.00	179.12
10	127.80	136.45	e140.25	e148.30	164.90	174.22	180.80	171.55	175.88	175.34	175.03	179.22
15	128.13	139.20	e143.94	e150.55	168.95	181.28	175.26	171.99	176.30	176.41	175.25	179.19
20	128.88	138.58	e145.18	152.40	.....	184.84	175.08	172.85	174.43	177.25	176.40	179.16
25	129.19	138.03	e144.59	156.57	.....	189.40	171.18	173.97	174.01	177.27	176.68	179.62
Eom	131.20	138.10	e144.82	160.24	.....	183.71	170.77	173.82	174.23	176.25	178.01	179.71

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, 1944-88.

Date	Water level
Apr. 8, 1988	e54.18
Oct. 6	e58.36

291414099475301. YP-69-50-202 (H-5-209). Unused artesian well in Edwards aquifer, diam. 6 in., depth 137 ft, cased to 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 1956-88.

Date	Water level
Apr. 8, 1988	39.73
Oct. 7	43.83

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 904.85 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, 1934-88.

Highest 1988 water level 17.83 ft below lsd on Jan. 3; lowest 1988 water level 26.86 ft below lsd on June 25.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	17.90	18.57	21.03	21.30	23.48	24.70	26.34	25.93	25.90	25.43	25.56	25.70
10	17.98	18.95	20.90	21.64	23.84	25.13	26.42	26.08	25.99	25.39	25.55	25.63
15	17.99	19.38	20.97	21.90	24.02	25.75	26.40	26.17	26.10	25.44	25.43	25.67
20	18.10	19.70	20.94	22.12	24.13	26.26	26.59	26.01	25.62	25.55	25.49	25.84
25	18.20	20.10	21.20	22.50	24.35	26.86	26.30	26.05	25.45	25.63	25.51	25.84
Eom	18.30	20.50	21.14	22.88	24.52	26.47	25.95	26.07	25.36	25.50	25.61	25.83

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, 1984-88.

Date	Water level
Apr. 8, 1988	44.76

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, 1966-88.

Highest 1988 water level 27.21 ft below lsd on Jan 18; lowest 1988 water level 34.58 ft below lsd on June 17.

Highest water level for the day, from recorder graph, 1988

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	27.36	29.64	31.86	30.05	31.50	31.68	32.43	32.60	30.82	29.21	29.54	29.57
10	27.35	30.52	31.44	30.01	31.84	32.81	33.12	32.92	30.85	29.85	29.39	29.35
15	27.28	31.10	31.23	30.52	32.63	34.15	33.45	32.32	30.39	29.93	29.33	29.33
20	27.52	30.96	30.34	30.87	32.97	34.23	32.57	31.51	29.88	30.42	29.53	29.36
25	28.56	32.35	30.10	30.97	32.22	34.40	31.87	30.99	29.48	30.23	29.51	29.21
Eom	29.37	32.41	30.11	31.47	30.93	31.80	33.13	31.00	29.40	29.89	29.86	29.04

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 37.03 ft below lsd, Apr. 7, 1988; lowest 42.95 ft below lsd, Sept. 19, 1964. Records available 1957-88.

Date	Water level
Apr. 7, 1988	37.03
Oct. 6	37.17

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 1937-88.

Date	Water level
Apr. 8, 1988	39.14

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 Pumping (nearby)

APPENDIX B. WATER QUALITY

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988

[MIN, minutes; G/M, gallons per minute; US/CM, microsiemens per centimeter at 25° Celsius; DEG C, degrees Celsius; MG/L, milligrams per liter; --, not determined]

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)	HARD-NESS TOTAL (MG/L AS CACO3)
AY-68-21-804	06-02-88	1000	279.00	60	10	512	6.8	24.0	265	280
AY-68-27-303	06-02-88	1345	354.00	60	20	528	6.5	23.0	255	280
AY-68-27-503	06-02-88	1530	375.00	60	20	545	6.8	22.5	263	290
AY-68-28-207	08-09-88	0945	265.00	30	6.0	517	7.0	22.5	279	290
AY-68-28-502	05-26-88	1000	506.00	30	135	566	6.8	24.0	274	290
AY-68-28-512	06-02-88	1200	400.00	60	10	502	6.6	24.0	249	270
AY-68-28-514	05-26-88	1100	510.00	15	1350	578	6.9	23.0	274	290
AY-68-28-608	04-12-88	1145	500.00	60	9.0	577	6.9	22.0	277	300
AY-68-28-702	06-24-88	0900	450.00	1440	1200	537	6.7	22.5	257	280
AY-68-28-903	06-27-88	1330	762.00	60	3700	830	6.8	23.0	389	390
AY-68-28-920	04-12-88	0945	360.00	60	13	907	6.4	22.5	419	370
AY-68-29-208	04-12-88	1430	266.00	60	8.0	553	6.7	24.0	267	290
AY-68-29-210	06-01-88	0945	329.00	60	15	556	6.7	23.0	281	290
AY-68-29-211	06-24-88	1100	260.00	20	200	480	6.7	24.0	258	270
AY-68-29-506	04-11-88	1330	694.00	210	9.0	620	6.7	23.0	305	320
AY-68-29-609	04-11-88	1445	823.00	720	5000	561	6.9	23.0	269	290
AY-68-29-702	05-24-88	0800	872.00	30	3000	590	6.7	22.0	267	300
AY-68-29-912	04-19-88	1115	630.00	60	1150	479	6.8	24.5	205	230
AY-68-29-915	07-18-88	1000	824.00	240	6000	488	7.0	23.0	214	250
AY-68-29-920	04-19-88	1045	655.00	240	1160	490	6.7	25.5	208	230
AY-68-29-925	04-19-88	1400	525.00	60	13	496	6.6	25.0	204	240
AY-68-35-913	04-13-88	0845	1040.00	720	8000	461	6.8	24.0	208	240
AY-68-37-404	04-07-88	0900	1326.00	240	10000	482	7.1	24.0	204	240
AY-68-37-508	04-05-88	1000	1311.00	60	6000	491	6.9	26.5	200	240
AY-68-37-521	01-20-88	1115	1275.00	60	45	5650	6.7	32.0	249	2100
	02-19-88	1045	1275.00	60	45	5650	6.6	32.0	248	2100
	03-17-88	1030	1275.00	60	45	5710	6.7	31.5	254	2000
	04-20-88	0915	1275.00	60	45	5670	6.6	29.0	259	2000
	05-19-88	0930	1275.00	60	40	5660	6.6	32.0	260	2100
	06-20-88	1110	1275.00	100	30	5480	6.8	32.5	253	2100
	07-20-88	1020	1275.00	80	30	5540	6.7	32.0	260	2300
	08-24-88	1200	1275.00	60	30	5510	6.6	32.0	278	2200
	09-21-88	0830	1275.00	60	30	5620	6.7	32.0	248	2200
	10-21-88	1400	1275.00	75	30	5570	6.6	32.0	247	2300
	11-21-88	1130	1275.00	60	30	5550	6.8	31.0	248	2100
	12-22-88	1415	1275.00	60	30	5490	6.8	32.0	257	2200
AY-68-37-522	01-20-88	1130	1075.00	60	45	4490	6.8	30.5	226	1800
	02-19-88	1100	1075.00	60	45	4510	6.7	30.5	224	1600
	03-17-88	1045	1075.00	60	45	4530	6.8	30.0	227	1600
	04-20-88	0930	1075.00	60	45	4520	6.8	31.0	227	1900
	05-19-88	1015	1075.00	90	40	4540	6.7	31.0	233	1700
	06-20-88	1030	1075.00	60	30	4500	6.8	31.0	230	1600
	07-20-88	1140	1075.00	160	30	4420	6.8	31.0	230	1700
	08-24-88	1215	1075.00	60	30	4430	6.7	31.5	228	1800
	09-21-88	0900	1075.00	90	30	4480	6.7	31.0	227	1800
	10-21-88	1435	1075.00	110	30	4430	6.8	31.0	223	1700
	11-21-88	1145	1075.00	60	30	4420	6.8	31.0	224	1900
	12-22-88	1445	1075.00	90	30	4380	6.8	30.0	232	1700
AY-68-37-523	01-20-88	1145	1175.00	60	30	5900	6.7	30.0	249	2400
	02-19-88	1115	1175.00	60	30	5900	6.7	31.0	249	2300

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
AY-68-21-804	19	110	2.1	4.4	0.70	3.3	0.001	0.042	7.6	0.30
AY-68-27-303	26	96	9.9	5.9	0.80	11	0.001	0.056	9.1	0.30
AY-68-27-503	29	87	18	8.7	1.0	20	0.001	0.078	15	0.30
AY-68-28-207	14	81	22	4.6	1.4	21	--	--	5.9	0.20
AY-68-28-502	13	100	9.0	6.7	1.0	11	0.001	0.036	14	0.20
AY-68-28-512	22	99	5.7	5.7	0.80	9.8	0.001	0.068	9.1	0.30
AY-68-28-514	15	100	9.4	7.3	1.0	15	--	--	12	0.30
AY-68-28-608	25	110	6.5	7.0	1.2	12	--	--	11	0.10
AY-68-28-702	26	85	17	9.4	1.3	24	--	--	13	0.30
AY-68-28-903	7	140	11	38	2.1	34	--	--	34	0.30
AY-68-28-920	0	140	6.0	46	1.8	27	--	--	37	0.20
AY-68-29-208	22	110	3.3	5.3	0.60	3.6	--	--	11	0.10
AY-68-29-210	14	100	7.9	5.0	0.70	10	0.001	0.049	8.3	0.20
AY-68-29-211	15	91	11	4.3	0.80	12	--	--	7.2	0.30
AY-68-29-506	11	110	10	7.2	1.0	8.8	--	--	13	0.20
AY-68-29-609	21	93	14	9.6	1.2	18	--	--	11	0.20
AY-68-29-702	38	99	14	9.3	1.1	26	--	--	13	0.30
AY-68-29-912	29	67	16	9.2	0.90	19	--	--	17	0.30
AY-68-29-915	35	73	16	9.9	1.2	25	--	--	14	0.20
AY-68-29-920	26	67	16	9.6	1.0	18	--	--	18	0.30
AY-68-29-925	36	53	26	11	1.4	37	--	--	16	0.90
AY-68-35-913	28	68	16	9.0	1.2	15	--	--	16	0.20
AY-68-37-404	32	68	16	9.6	1.1	18	--	--	18	0.30
AY-68-37-508	40	68	17	10	1.3	24	--	--	19	0.40
AY-68-37-521	1900	540	190	490	32	1900	--	--	810	2.8
	1900	540	190	--	--	1900	--	--	950	--
	1800	520	180	--	--	1800	--	--	820	--
	1800	500	190	520	21	1800	0.140	4.4	540	2.9
	1900	520	200	--	--	1900	--	--	840	--
	1900	530	190	--	--	1900	--	--	960	--
	2000	550	220	510	17	1900	--	--	960	2.6
	1900	540	200	530	24	1800	--	--	940	2.6
	2000	560	200	460	30	1900	--	--	970	2.6
	2100	580	210	580	20	2000	--	4.4	890	2.7
	1900	530	190	--	--	1900	--	--	1000	--
	2000	560	200	490	20	1900	--	--	960	2.6
AY-68-37-522	1600	480	150	360	25	1400	--	--	700	2.8
	1400	400	140	--	--	1400	--	--	740	--
	1400	420	140	--	--	1400	--	--	720	--
	1700	480	170	380	22	1500	0.100	3.1	740	2.7
	1500	440	150	--	--	1400	--	--	720	--
	1400	420	140	--	--	1400	--	--	720	--
	1500	420	160	360	17	1400	--	--	690	2.4
	1500	440	160	370	20	1500	--	--	720	2.5
	1600	440	170	350	20	1400	--	--	730	0.30
	1500	430	160	350	15	1400	--	3.3	670	2.5
	1700	470	170	--	--	1400	--	--	710	--
	1400	420	150	350	12	1400	--	--	680	2.4
AY-68-37-523	2100	610	210	480	32	1900	--	--	980	2.9
	2000	560	210	--	--	1900	--	--	980	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-21-804	12	300	--	0.020	--	<0.010	<0.20	1.70	<0.010	0.9
AY-68-27-303	11	297	2.7	0.020	--	<0.010	0.30	2.40	0.010	0.7
AY-68-27-503	12	320	--	0.010	--	<0.010	<0.20	2.00	0.010	0.9
AY-68-28-207	11	319	1.3	0.050	--	<0.010	0.40	0.900	0.020	--
AY-68-28-502	13	319	--	<0.010	--	<0.010	<0.20	1.10	0.020	1.2
AY-68-28-512	12	292	--	0.020	--	<0.010	<0.20	1.60	0.020	0.9
AY-68-28-514	13	322	1.8	<0.010	--	<0.010	0.60	1.20	0.020	--
AY-68-28-608	13	327	1.5	0.030	--	<0.010	0.20	1.30	0.010	--
AY-68-28-702	12	316	2.1	0.020	--	<0.010	0.30	1.80	<0.010	--
AY-68-28-903	19	512	1.3	0.290	--	<0.010	0.50	0.800	<0.010	--
AY-68-28-920	20	531	--	0.060	--	<0.010	<0.20	<0.100	<0.010	1.2
AY-68-29-208	13	308	1.7	0.030	--	<0.010	0.20	1.50	0.010	--
AY-68-29-210	12	318	--	0.020	--	<0.010	<0.20	1.30	0.010	0.9
AY-68-29-211	10	291	2.0	0.020	--	<0.010	0.40	1.60	<0.010	--
AY-68-29-506	14	347	--	0.030	--	0.010	<0.20	1.70	0.020	0.6
AY-68-29-609	12	320	--	0.020	--	<0.010	<0.20	1.40	0.010	--
AY-68-29-702	12	335	3.0	<0.010	--	<0.010	1.5	1.50	0.030	--
AY-68-29-912	12	264	--	<0.010	--	<0.010	<0.20	1.80	<0.010	0.9
AY-68-29-915	13	281	--	<0.010	--	<0.010	<0.20	1.80	0.010	--
AY-68-29-920	12	267	2.2	<0.010	--	<0.010	0.30	1.90	<0.010	0.5
AY-68-29-925	12	281	--	0.030	--	<0.010	<0.20	<0.100	<0.010	0.4
AY-68-35-913	12	262	--	<0.010	--	<0.010	<0.20	1.90	<0.010	--
AY-68-37-404	12	265	2.1	0.010	--	<0.010	0.20	1.90	<0.010	--
AY-68-37-508	12	272	1.8	0.010	--	<0.010	0.20	1.60	<0.010	--
AY-68-37-521	20	4130	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	20	3750	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	20	4340	--	--	--	--	--	--	--	--
	20	4220	--	--	--	--	--	--	--	--
	20	4290	--	--	--	--	--	--	--	--
	20	4460	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	20	4300	--	--	--	--	--	--	--	--
AY-68-37-522	19	3270	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	18	3450	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	18	3210	--	--	--	--	--	--	--	--
	18	3370	--	--	--	--	--	--	--	--
	52	3300	--	--	--	--	--	--	--	--
	18	3180	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	18	3170	--	--	--	--	--	--	--	--
AY-68-37-523	20	4380	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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)	HARD-NESS TOTAL (MG/L AS CACO3)
AY-68-37-523	03-17-88	1100	1175.00	60	30	5900	6.8	30.0	253	2200
	04-20-88	0945	1175.00	60	30	5890	6.6	31.0	249	2400
	05-19-88	1100	1175.00	120	20	5900	6.7	30.5	194	2100
	06-20-88	1145	1175.00	135	15	5860	6.8	31.0	253	2100
	07-20-88	1200	1175.00	180	15	5740	6.8	30.5	257	2300
	08-24-88	1230	1175.00	60	20	5780	6.9	30.5	250	2300
	09-21-88	0930	1175.00	120	15	5850	6.8	31.0	252	2300
	10-21-88	1500	1175.00	135	15	5780	6.5	31.0	248	2300
	11-21-88	1200	1175.00	70	15	5760	6.6	30.5	246	2200
	12-22-88	1515	1175.00	115	15	5700	6.7	30.5	253	2200
AY-68-37-524	01-20-88	1000	881.00	60	45	652	7.1	28.0	202	290
	02-19-88	0930	881.00	60	45	642	7.0	28.0	202	300
	03-17-88	0915	881.00	60	45	657	6.9	28.0	203	310
	04-20-88	1140	881.00	60	45	665	6.8	28.0	199	290
	05-19-88	1400	881.00	60	40	676	6.7	28.5	204	290
	06-20-88	1425	881.00	115	30	686	6.7	28.5	204	300
	07-20-88	1435	881.00	80	30	698	6.6	28.0	198	300
	08-24-88	1020	881.00	60	35	694	6.8	29.0	202	300
	09-21-88	1200	881.00	90	30	699	7.0	28.0	204	290
	10-21-88	1015	881.00	60	30	710	7.1	28.5	208	310
	11-21-88	1010	881.00	60	30	710	6.9	28.0	202	290
	12-22-88	1050	881.00	60	30	718	7.0	28.5	206	300
AY-68-37-525	01-20-88	1015	1150.00	60	30	6150	6.7	29.0	244	2300
	02-19-88	0945	1150.00	60	30	6170	6.7	29.0	244	2300
	03-17-88	0930	1150.00	60	30	6150	6.8	29.0	246	2300
	04-20-88	1150	1150.00	60	30	6210	6.9	30.0	247	2300
	05-19-88	1330	1150.00	60	20	6180	6.7	30.5	253	2200
	06-20-88	1345	1150.00	70	15	6020	6.8	30.0	251	2400
	07-20-88	1415	1150.00	60	20	6020	6.7	29.0	246	2700
	08-24-88	1030	1150.00	60	20	6070	6.6	29.5	239	2300
	09-21-88	1130	1150.00	60	25	6180	6.9	30.0	241	2400
	10-21-88	1045	1150.00	90	15	6080	6.9	29.0	264	2500
	11-21-88	1030	1150.00	60	15	6100	6.8	29.0	238	2400
	12-22-88	1230	1150.00	160	20	6050	6.9	29.5	264	2300
AY-68-37-526	01-20-88	0815	1223.00	60	35	969	7.3	26.0	211	400
	02-19-88	0800	1223.00	60	35	977	7.3	25.5	207	400
	03-17-88	0800	1223.00	60	35	974	7.3	26.0	210	430
	04-20-88	1330	1223.00	60	35	994	7.2	26.0	208	400
	05-19-88	1440	1223.00	60	30	1070	7.3	26.0	205	440
	06-20-88	1645	1223.00	95	25	884	7.4	27.5	193	350
	07-21-88	1500	1223.00	108	11	891	6.5	26.0	205	370
	08-24-88	1020	1223.00	150	8.1	926	6.9	26.5	206	380
	09-21-88	1300	1223.00	112	11	868	7.2	29.0	210	360
	10-21-88	1120	1223.00	136	8.8	908	7.4	27.0	209	370
	11-21-88	0848	1223.00	95	13	914	7.3	26.0	205	380
	12-22-88	1110	1223.00	105	12	925	7.4	26.0	218	380
AY-68-37-527	01-20-88	0830	926.00	60	200	499	6.9	26.0	199	240
	02-19-88	0815	926.00	60	200	497	7.0	26.5	199	240
	03-17-88	0815	926.00	60	200	499	6.8	26.5	200	250
	04-20-88	1400	926.00	60	200	502	6.9	27.0	199	230

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	SULFATE, DIS-SOLVED (MG/L AS SO4)	IODIDE, DIS-SOLVED (MG/L AS I)	BROMIDE, DIS-SOLVED (MG/L AS BR)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
AY-68-37-523	2000	540	210	--	--	1900	--	--	850	--
	2100	590	220	530	22	2000	--	--	900	7.8
	1900	510	210	--	--	1900	--	--	890	--
	1900	530	200	--	--	1900	--	--	1000	--
	2000	540	220	520	24	1900	--	--	1000	2.5
	2000	540	220	510	24	2000	--	--	1000	2.7
	2100	560	230	500	24	1900	--	--	990	2.7
	2000	550	220	500	17	1900	--	4.6	1000	2.7
	1900	520	210	--	--	1900	--	--	1000	--
	1900	530	210	540	25	1900	--	--	950	2.6
AY-68-37-524	91	81	22	23	2.5	81	--	--	37	0.60
	94	82	22	--	--	81	--	--	38	--
	100	86	22	--	--	87	--	--	39	--
	88	77	23	25	2.3	89	0.021	0.22	41	0.60
	89	81	22	--	--	90	--	--	42	--
	92	82	22	--	--	88	--	--	43	--
	99	81	23	26	2.7	93	--	--	43	0.60
	97	80	24	27	2.5	92	--	--	45	0.70
	83	77	23	26	2.7	93	--	--	46	0.70
	98	81	25	29	3.0	95	--	0.24	46	0.70
	92	78	24	--	--	93	--	--	47	--
	91	79	24	29	3.0	100	--	--	48	0.70
AY-68-37-525	2100	550	230	520	34	1900	--	--	950	2.9
	2000	550	220	--	--	1900	--	--	960	--
	2100	550	230	--	--	2000	--	--	960	--
	2100	590	210	590	22	2100	0.150	4.6	1100	2.8
	2000	510	230	--	--	2000	--	--	930	--
	2100	570	230	--	--	2000	--	--	1100	--
	2400	600	280	560	24	2000	--	--	1100	2.5
	2100	530	240	550	28	2100	--	--	1000	2.7
	2200	580	230	550	26	2000	--	--	1100	2.5
	2200	580	250	540	20	2000	--	4.8	1100	2.7
	2100	550	240	--	--	2000	--	--	1100	--
	2100	550	230	560	26	2100	--	--	1000	2.5
AY-68-37-526	190	100	36	47	3.4	170	--	--	87	0.80
	200	100	37	--	--	180	--	--	92	--
	220	110	37	--	--	170	--	--	88	--
	190	99	37	53	3.2	180	0.007	0.49	93	0.80
	230	110	39	--	--	210	--	--	110	--
	160	85	33	--	--	150	--	--	82	--
	160	92	33	42	3.0	140	--	--	79	0.70
	170	94	35	45	1.0	150	--	--	83	0.60
	150	89	34	40	2.8	140	--	--	71	0.60
	160	93	34	43	3.2	150	--	0.39	78	0.70
	180	96	35	--	--	150	--	--	81	--
	160	97	34	43	3.1	160	--	--	79	0.70
AY-68-37-527	39	67	17	11	1.3	26	--	--	20	0.30
	46	70	17	--	--	26	--	--	20	--
	50	72	17	--	--	29	--	--	20	--
	31	64	17	11	1.1	35	0.001	0.095	21	0.30

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--Continued

BEXAR COUNTY--Continued

LOCAL IDENT-I-FIER	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)
AY-68-37-523	--	--	--	--	--	--	--	--	--	--
	19	4440	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	19	4380	--	--	--	--	--	--	--	--
	20	4470	--	--	--	--	--	--	--	--
	19	4380	--	--	--	--	--	--	--	--
	19	4360	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	19	4330	--	--	--	--	--	--	--	--
AY-68-37-524	13	382	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	13	390	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	13	401	--	--	--	--	--	--	--	--
	13	405	--	--	--	--	--	--	--	--
	13	404	--	--	--	--	--	--	--	--
	13	418	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	13	420	--	--	--	--	--	--	--	--
AY-68-37-525	20	4350	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	18	4790	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	19	4730	--	--	--	--	--	--	--	--
	19	4610	--	--	--	--	--	--	--	--
	18	4650	--	--	--	--	--	--	--	--
	19	4670	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	19	4650	--	--	--	--	--	--	--	--
AY-68-37-526	13	586	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	13	604	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	12	525	--	--	--	--	--	--	--	--
	12	544	--	--	--	--	--	--	--	--
	12	515	--	--	--	--	--	--	--	--
	12	540	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	12	559	--	--	--	--	--	--	--	--
AY-68-37-527	13	275	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	12	281	--	--	--	--	--	--	--	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3	HARDNESS TOTAL (MG/L AS CACO3)
AY-68-37-527	05-19-88	1415	926.00	45	175	500	6.9	27.0	204	230
	06-20-88	1555	926.00	50	140	507	7.1	27.0	201	620
	07-21-88	1410	926.00	60	--	494	6.7	26.5	198	230
	08-24-88	0900	926.00	60	100	502	7.1	26.5	198	230
	09-21-88	1330	926.00	140	--	505	7.1	26.5	200	230
	10-21-88	1300	926.00	75	140	499	7.2	26.5	199	240
	11-21-88	0830	926.00	60	140	496	7.0	26.0	201	230
	12-22-88	1150	926.00	125	140	507	7.1	26.5	202	240
AY-68-37-701	04-08-88	1300	1582.00	60	6000	498	6.9	27.0	200	240
AY-68-43-809	06-09-88	1030	1903.00	150	500	1280	6.8	34.0	200	510

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
AY-68-37-527	27	66	16	--	--	30	--	--	20	--
	420	160	53	--	--	33	--	--	19	--
	37	66	17	11	1.2	23	--	--	19	0.30
	37	66	17	10	1.9	26	--	--	19	0.30
	34	64	18	10	1.1	25	--	--	18	0.30
	43	67	18	12	1.2	23	--	0.095	19	0.30
	34	66	17	--	--	34	--	--	19	--
	42	68	18	11	1.3	30	--	--	21	0.30
AY-68-37-701	40	68	17	10	1.2	26	--	--	19	0.30
AY-68-43-809	320	140	40	62	4.4	300	--	--	130	1.2

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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
AY-68-37-527	--	--	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	12	268	--	--	--	--	--	--	--	--
	12	271	--	--	--	--	--	--	--	--
	12	268	--	--	--	--	--	--	--	--
	12	272	--	--	--	--	--	--	--	--
	--	--	--	--	--	--	--	--	--	--
	12	283	--	--	--	--	--	--	--	--
AY-68-37-701	12	274	--	0.020	--	<0.010	<0.20	1.50	<0.010	--
AY-68-43-809	16	814	--	--	--	--	--	--	--	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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)	HARDNESS TOTAL (MG/L AS CACO3)
DX-68-15-901	05-02-88	1030	--	--	--	571	6.7	21.5	275	300
DX-68-22-902	06-14-88	0900	240.00	60	800	498	6.7	22.5	245	270
DX-68-23-301	06-13-88	1230	--	--	--	540	6.9	24.0	237	270
DX-68-23-316	06-13-88	1145	350.00	60	10	522	7.0	23.0	276	290
DX-68-23-317	05-02-88	0900	360.00	60	50	555	6.7	23.0	276	290

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
DX-68-15-901	24	93	16	8.1	1.5	17	--	--	12	0.30
DX-68-22-902	25	88	12	6.3	0.90	12	--	--	9.9	0.30
DX-68-23-301	32	81	16	10	1.4	26	0.002	0.10	15	0.40
DX-68-23-316	17	94	14	5.6	1.0	9.8	--	--	9.5	0.30
DX-68-23-317	13	86	18	6.1	1.0	11	--	--	9.9	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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
DX-68-15-901	11	324	--	<0.010	--	<0.010	<0.20	1.40	<0.010	0.8
DX-68-22-902	11	287	2.3	0.030	--	<0.010	0.50	1.80	0.040	--
DX-68-23-301	12	304	2.1	<0.010	--	<0.010	0.20	1.90	<0.010	0.8
DX-68-23-316	12	312	1.8	<0.010	--	<0.010	0.30	1.50	0.010	--
DX-68-23-317	12	310	--	<0.010	--	<0.010	<0.20	1.80	0.010	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--Continued

HAYS COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	ALKALINITY WAT WH TOT FET FIELD (MG/L AS CACO3)	HARDNESS TOTAL (MG/L AS CACO3)
LR-67-01-308	04-04-88	1440	765.00	30	400	705	7.3	24.5	228	330
LR-67-01-801	05-17-88	1300	--	--	--	592	7.0	22.0	264	300
LR-67-01-806	05-17-88	1100	115.00	30	4600	612	6.9	23.0	269	300
LR-67-09-105	05-17-88	1448	330.00	1440	1200	620	6.9	23.5	264	300

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
LR-67-01-308	100	64	41	7.6	1.5	130	--	--	9.3	3.2
LR-67-01-801	32	87	19	11	1.3	27	<0.001	0.12	18	0.30
LR-67-01-806	36	94	17	13	1.3	30	--	--	20	0.30
LR-67-09-105	39	93	17	15	0.90	32	--	--	24	0.30

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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
LR-67-01-308	13	406	--	0.010	--	<0.010	<0.20	<0.100	<0.010	--
LR-67-01-801	11	333	--	<0.010	--	<0.010	<0.20	1.30	0.020	1.5
LR-67-01-806	12	349	--	<0.010	--	<0.010	<0.20	1.70	0.010	1.0
LR-67-09-105	12	353	--	<0.010	--	<0.010	<0.20	1.60	0.020	0.7

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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)	HARDNESS TOTAL (MG/L AS CACO3)
TD-68-26-701	05-31-88	0945	750.00	1440	500	509	6.6	24.0	207	260
TD-68-33-202	05-31-88	1200	279.00	60	15	440	6.9	23.0	196	230
TD-68-41-303	04-18-88	1000	717.00	60	420	490	6.8	24.0	205	240
TD-68-42-503	06-27-88	0830	1373.00	120	800	481	6.9	26.0	199	230
TD-69-46-601	04-18-88	1315	1289.00	30	370	458	7.1	24.0	208	240
TD-69-47-301	04-18-88	1130	1510.00	240	1000	447	7.0	24.5	210	240
TD-69-56-508	04-13-88	1115	2715.00	1440	300	481	6.9	32.0	200	230

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
TD-68-26-701	58	73	20	7.7	1.3	52	0.001	0.097	12	0.40
TD-68-33-202	33	75	10	6.6	1.0	32	0.001	0.073	10	0.20
TD-68-41-303	36	70	16	9.5	0.90	18	--	--	20	0.20
TD-68-42-503	32	66	16	9.0	1.0	15	--	--	19	0.30
TD-69-46-601	29	70	15	7.4	0.90	19	--	--	14	0.20
TD-69-47-301	29	69	16	7.8	1.0	22	--	--	13	0.20
TD-69-56-508	28	55	22	12	1.4	26	--	--	18	1.0

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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
TD-68-26-701	12	303	--	0.010	--	<0.010	<0.20	1.30	0.010	0.8
TD-68-33-202	12	265	--	<0.010	--	<0.010	<0.20	0.900	0.020	0.8
TD-68-41-303	12	270	2.5	<0.010	--	<0.010	0.30	2.20	<0.010	0.5
TD-68-42-503	12	258	--	--	--	--	--	--	--	--
TD-69-46-601	13	264	1.8	<0.010	--	<0.010	0.20	1.60	<0.010	0.5
TD-69-47-301	13	268	1.9	0.010	--	<0.010	0.30	1.60	<0.010	0.5
TD-69-56-508	14	270	--	<0.010	--	0.010	<0.20	1.00	<0.010	--

Analyses for common inorganics, nutrients, and dissolved organic carbon for wells and springs in the Edwards aquifer, 1988--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)	HARDNESS TOTAL (MG/L AS CACO3)
YP-69-35-602	06-07-88	1115	237.00	60	9.8	432	6.4	22.5	210	230
YP-69-36-702	05-27-88	1130	538.00	1440	1000	470	6.9	22.5	188	230
YP-69-42-606	06-07-88	1300	525.00	1440	1000	635	6.9	24.0	210	270
YP-69-43-302	05-27-88	0900	630.00	1440	2300	540	6.6	23.0	200	260
YP-69-43-606	05-27-88	1030	698.00	60	200	515	6.9	24.0	205	250
YP-69-50-203	06-08-88	0830	525.00	1440	1370	589	6.5	23.0	213	280
YP-69-50-609	06-07-88	1330	640.00	1440	600	731	6.8	24.0	230	320
YP-69-51-104	06-08-88	0930	430.00	1440	610	1120	6.6	24.0	261	440

LOCAL IDENT-I-FIER	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	IODIDE, DISSOLVED (MG/L AS I)	BROMIDE, DISSOLVED (MG/L AS BR)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
YP-69-35-602	21	61	19	6.6	1.3	12	0.005	0.11	11	0.30
YP-69-36-702	41	65	16	10	1.0	14	0.001	0.11	29	0.20
YP-69-42-606	64	93	10	22	1.1	18	--	--	52	0.30
YP-69-43-302	56	81	13	16	1.0	15	0.001	0.16	40	0.20
YP-69-43-606	43	81	11	13	1.0	19	--	--	28	0.30
YP-69-50-203	62	92	11	17	1.1	20	--	--	46	0.30
YP-69-50-609	91	110	11	29	1.1	45	--	--	58	0.30
YP-69-51-104	180	150	17	55	1.3	59	--	--	150	0.50

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 DISSOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	CARBON, ORGANIC DISSOLVED (MG/L AS C)
YP-69-35-602	13	250	--	0.010	--	<0.010	<0.20	1.80	<0.010	0.9
YP-69-36-702	12	260	2.8	<0.010	--	<0.010	0.50	2.30	0.020	0.8
YP-69-42-606	13	335	5.4	0.010	--	<0.010	0.20	5.20	<0.010	1.1
YP-69-43-302	12	298	4.2	<0.010	--	<0.010	0.90	3.30	0.020	--
YP-69-43-606	13	289	3.9	<0.010	--	<0.010	0.60	3.30	0.020	1.1
YP-69-50-203	13	328	4.1	<0.010	--	<0.010	0.90	3.20	<0.010	0.8
YP-69-50-609	16	408	5.4	0.010	--	<0.010	0.40	5.00	<0.010	--
YP-69-51-104	16	605	8.7	0.020	--	<0.010	1.3	7.40	<0.010	1.2

Analyses for minor elements for wells and springs in the Edwards aquifer, 1988

[MIN, minutes; G/M, gallons per minute; UG/L, micrograms per liter; --, not determined]

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)	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	06-02-88	1000	279.00	60	10	<1	27	<1	1
AY-68-27-303	06-02-88	1345	354.00	60	20	<1	31	<1	<1
AY-68-27-503	06-02-88	1530	375.00	60	20	<1	36	<1	1
AY-68-28-207	08-09-88	0945	265.00	30	6.0	<1	52	<1	<1
AY-68-28-502	05-26-88	1000	506.00	30	135	<1	40	<1	<1
AY-68-28-512	06-02-88	1200	400.00	60	10	<1	30	<1	<1
AY-68-28-514	05-26-88	1100	510.00	15	1350	<1	41	<1	<1
AY-68-28-608	04-12-88	1145	500.00	60	9.0	<1	37	<1	<1
AY-68-28-702	06-24-88	0900	450.00	1440	1200	<1	33	<1	<1
AY-68-28-903	06-27-88	1330	762.00	60	3700	<1	71	<1	<1
AY-68-28-920	04-12-88	0945	360.00	60	13	<1	85	<1	<1
AY-68-29-208	04-12-88	1430	266.00	60	8.0	<1	35	<1	<1
AY-68-29-210	06-01-88	0945	329.00	60	15	<1	32	<1	<1
AY-68-29-211	06-24-88	1100	260.00	20	200	<1	<100	1	<1
AY-68-29-506	04-11-88	1330	694.00	210	9.0	<1	34	<1	<1
AY-68-29-609	04-11-88	1445	823.00	720	5000	2	33	<1	<1
AY-68-29-702	05-24-88	0800	872.00	30	3000	<1	40	<1	1
AY-68-29-912	04-19-88	1115	630.00	60	1150	<1	75	<1	<1
AY-68-29-915	07-18-88	1000	824.00	240	6000	<1	46	<1	1
AY-68-29-920	04-19-88	1045	655.00	240	1160	<1	91	<1	<1

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
AY-68-21-804	11	5	<5	<1	<0.1	--	<1	2.0	670
AY-68-27-303	3	5	<5	5	<0.1	--	<1	1.0	200
AY-68-27-503	8	6	9	3	<0.1	--	<1	<1.0	450
AY-68-28-207	16	56	<5	17	0.1	--	<1	<1.0	4000
AY-68-28-502	8	5	<5	<1	<0.1	--	<1	<1.0	11
AY-68-28-512	11	11	<5	1	<0.1	--	<1	<1.0	410
AY-68-28-514	5	7	<5	<1	0.2	--	<1	<1.0	21
AY-68-28-608	3	11	<5	1	<0.1	--	<1	<1.0	360
AY-68-28-702	3	<3	<5	1	<0.1	--	<1	<1.0	<3
AY-68-28-903	12	12	<5	5	0.9	--	<1	2.0	44
AY-68-28-920	2	130	<5	370	0.7	--	<1	<1.0	1100
AY-68-29-208	1	5	<5	<1	<0.1	--	<1	<1.0	500
AY-68-29-210	1	11	5	<1	<0.1	--	<1	<1.0	510
AY-68-29-211	3	10	<5	<10	<0.1	--	<1	<1.0	30
AY-68-29-506	3	64	<5	31	<0.1	--	<1	<1.0	4
AY-68-29-609	9	<3	<5	<1	<0.1	--	<1	<1.0	10
AY-68-29-702	10	4	<5	<1	<0.1	--	<1	<1.0	8
AY-68-29-912	4	3	7	<1	<0.1	--	<1	<1.0	9
AY-68-29-915	4	<3	<5	<1	<0.1	--	<1	<1.0	5
AY-68-29-920	2	3	6	<1	<0.1	--	<1	<1.0	7

Analyses for minor elements for wells and springs in the Edwards aquifer, 1988--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)	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)
AY-68-29-925	04-19-88	1400	525.00	60	13	<1	54	<1	<1
AY-68-35-913	04-13-88	0845	1040.00	720	8000	<1	46	<1	<1
AY-68-37-404	04-07-88	0900	1326.00	240	10000	<1	54	<1	<1
AY-68-37-508	04-05-88	1000	1311.00	60	6000	<1	110	<1	<1
AY-68-37-521	01-20-88	1115	1275.00	60	45	<1	<100	1	2
AY-68-37-522	01-20-88	1130	1075.00	60	45	<1	<100	1	2
AY-68-37-523	01-20-88	1145	1175.00	60	30	<1	100	<1	2
AY-68-37-524	01-20-88	1000	881.00	60	45	2	81	<1	<1
AY-68-37-525	01-20-88	1015	1150.00	60	30	<1	100	<1	2
AY-68-37-526	01-20-88	0815	1223.00	60	35	1	110	<1	<1
AY-68-37-527	01-20-88	0830	926.00	60	200	1	110	1	<1
AY-68-37-701	04-08-88	1300	1582.00	60	6000	<1	110	<1	<1

LOCAL IDENT-I-FIER	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
AY-68-29-925	<1	1400	6	21	<0.1	--	<1	<1.0	180
AY-68-35-913	5	<3	<5	<1	<0.1	--	<1	<1.0	<3
AY-68-37-404	5	12	<5	2	0.2	--	<1	1.0	7
AY-68-37-508	4	7	<5	<1	<0.1	--	<1	<1.0	11
AY-68-37-521	1	210	<5	60	--	--	<1	<1.0	20
AY-68-37-522	<1	150	<5	60	--	--	1	<1.0	20
AY-68-37-523	<1	140	<5	60	--	--	<1	<1.0	20
AY-68-37-524	2	720	<5	8	--	--	2	<1.0	10
AY-68-37-525	<1	150	<5	50	--	--	<1	<1.0	20
AY-68-37-526	2	2100	<5	33	--	--	<1	<1.0	8
AY-68-37-527	1	10	<5	4	--	--	<1	<1.0	9
AY-68-37-701	4	13	<5	2	<0.1	--	<1	<1.0	23

Analyses for minor elements for wells and springs in the Edwards aquifer, 1988--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)	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	05-02-88	1030	--	--	--	<1	32	<1	<1
DX-68-22-902	06-14-88	0900	240.00	60	800	<1	28	1	1
DX-68-23-301	06-13-88	1230	--	--	--	<1	47	<1	<1
DX-68-23-316	06-13-88	1145	350.00	60	10	<1	31	1	<1
DX-68-23-317	05-02-88	0900	360.00	60	50	<1	33	<1	<1

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
DX-68-15-901	1	<3	<5	<1	<0.1	--	1	<1.0	<3
DX-68-22-902	7	11	<5	1	<0.1	--	<1	<1.0	15
DX-68-23-301	2	<3	<5	<1	0.2	--	<1	<1.0	<3
DX-68-23-316	3	12	6	1	<0.1	--	<1	<1.0	360
DX-68-23-317	5	7	<5	<1	<0.1	--	<1	<1.0	8

HAYS 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)	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-67-01-308	04-04-88	1440	765.00	30	400	<1	61	<1	<1
LR-67-01-801	05-17-88	1300	--	--	--	<1	40	<1	<1
LR-67-01-806	05-17-88	1100	115.00	30	4600	<1	45	<1	<1
LR-67-09-105	05-17-88	1448	330.00	1440	1200	<1	42	<1	<1

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
LR-67-01-308	3	14	<5	3	<0.1	--	<1	<1.0	28
LR-67-01-801	6	8	<5	<1	<0.1	--	<1	<1.0	<3
LR-67-01-806	19	5	<5	1	0.2	--	<1	<1.0	5
LR-67-09-105	17	4	<5	<1	0.2	--	<1	<1.0	16

Analyses for minor elements for wells and springs in the Edwards aquifer, 1988--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)	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	05-31-88	0945	750.00	1440	500	<1	31	<1	<1
TD-68-33-202	05-31-88	1200	279.00	60	15	<1	32	<1	<1
TD-68-41-303	04-18-88	1000	717.00	60	420	<1	46	<1	<1
TD-69-46-601	04-18-88	1315	1289.00	30	370	<1	41	<1	<1
TD-69-47-301	04-18-88	1130	1510.00	240	1000	<1	45	<1	<1
TD-69-56-508	04-13-88	1115	2715.00	1440	300	<1	210	<1	<1

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
TD-68-26-701	7	<3	<5	<1	<0.1	--	<1	<1.0	9
TD-68-33-202	16	<3	7	<1	<0.1	--	<1	1.0	190
TD-68-41-303	12	5	7	<1	<0.1	--	<1	<1.0	6
TD-69-46-601	10	<3	6	<1	0.3	--	<1	<1.0	9
TD-69-47-301	6	6	<5	<1	<0.1	--	<1	<1.0	19
TD-69-56-508	4	16	5	<1	0.2	--	<1	<1.0	10

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)	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-69-35-602	06-07-88	1115	237.00	60	9.8	<1	36	<1	<1
YP-69-36-702	05-27-88	1130	538.00	1440	1000	<1	36	<1	<1
YP-69-42-606	06-07-88	1300	525.00	1440	1000	1	58	<1	<1
YP-69-43-302	05-27-88	0900	630.00	1440	2300	<1	48	<1	<1
YP-69-43-606	05-27-88	1030	698.00	60	200	<1	50	<1	<1
YP-69-50-203	06-08-88	0830	525.00	1440	1370	<1	53	<1	1
YP-69-50-609	06-07-88	1330	640.00	1440	600	1	94	<1	1
YP-69-51-104	06-08-88	0930	430.00	1440	610	<1	120	<1	2

LOCAL IDENT-I-FIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY, DISSOLVED (UG/L AS HG)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)
YP-69-35-602	5	4	<5	<1	<0.1	--	<1	<1.0	8
YP-69-36-702	2	7	<5	<1	0.6	--	1	<1.0	<3
YP-69-42-606	7	<3	<5	<1	<0.1	--	1	1.0	8
YP-69-43-302	3	3	<5	<1	<0.1	--	1	<1.0	8
YP-69-43-606	9	9	<5	<1	0.1	--	1	<1.0	5
YP-69-50-203	9	<3	<5	<1	<0.1	--	<1	<1.0	6
YP-69-50-609	6	4	<5	<1	<0.1	--	1	<1.0	8
YP-69-51-104	6	5	<5	<1	<0.1	--	2	<1.0	8

Analyses for pesticides for wells and springs in the Edwards aquifer, 1988

[MIN, minutes; G/M, gallons per minute; UG/L, micrograms per liter; --, not determined]

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)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
AY-68-28-502	05-26-88	1000	506.00	30	135	<0.1	<0.10	<0.010
AY-68-28-702	06-24-88	0900	450.00	1440	1200	<0.1	<0.10	<0.010
AY-68-28-903	06-27-88	1330	762.00	60	3700	<0.1	<0.10	<0.010
AY-68-29-210	06-01-88	0945	329.00	60	15	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
AY-68-28-502	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
AY-68-28-702	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
AY-68-28-903	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
AY-68-29-210	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENT-I-FIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
AY-68-28-502	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
AY-68-28-702	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
AY-68-28-903	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
AY-68-29-210	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENT-I-FIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
AY-68-28-502	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-28-702	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-28-903	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
AY-68-29-210	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Analyses for pesticides for wells and springs in the Edwards aquifer, 1988--Continued

COMAL COUNTY

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	05-02-88	1030	--	--	--	<0.1	<0.10	<0.010
DX-68-22-902	06-14-88	0900	240.00	60	800	<0.1	<0.10	<0.010
DX-68-23-301	06-13-88	1230	--	--	--	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
DX-68-15-901	--	<0.1	<0.010	<0.010	<0.010	0.01	<0.010	<0.010
DX-68-22-902	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
DX-68-23-301	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENTIFIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
DX-68-15-901	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
DX-68-22-902	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
DX-68-23-301	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DX-68-15-901	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
DX-68-22-902	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Analyses for pesticides for wells and springs in the Edwards aquifer, 1988--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)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
LR-67-01-801	05-17-88	1300	--	--	--	<0.1	<0.10	<0.010
LR-67-09-105	05-17-88	1448	330.00	1440	1200	<0.1	<0.10	<0.010

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

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

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

Analyses for pesticides for wells and springs in the Edwards aquifer, 1988--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)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
TD-68-26-701	05-31-88	0945	750.00	1440	500	<0.1	<0.10	<0.010
TD-68-33-202	05-31-88	1200	279.00	60	15	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
TD-68-26-701	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
TD-68-33-202	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENTIFIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
TD-68-26-701	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
TD-68-33-202	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
TD-68-26-701	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
TD-68-33-202	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01

Analyses for pesticides for wells and springs in the Edwards aquifer, 1988--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)	PCB, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
YP-69-35-602	06-07-88	1115	237.00	60	9.8	<0.1	<0.10	<0.010
YP-69-42-606	06-07-88	1300	525.00	1440	1000	<0.1	<0.10	<0.010
YP-69-43-302	05-27-88	0900	630.00	1440	2300	<0.1	<0.10	<0.010
YP-69-51-104	06-08-88	0930	430.00	1440	610	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	ATRAZINE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)
YP-69-35-602	--	<0.1	<0.010	<0.010	<0.010	0.01	<0.010	<0.010
YP-69-42-606	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
YP-69-43-302	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010
YP-69-51-104	--	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010

LOCAL IDENT-I-FIER	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	LINDANE, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)
YP-69-35-602	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
YP-69-42-606	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
YP-69-43-302	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
YP-69-51-104	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

LOCAL IDENT-I-FIER	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
YP-69-35-602	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
YP-69-42-606	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
YP-69-43-302	<0.01	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01
YP-69-51-104	<0.01	<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, 1988

[MIN, minutes; G/M, gallons per minute; UG/L, micrograms per liter; --, not determined]

BEXAR 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)
AY-68-21-804	06-02-88	1000	279.00	60	10	<0.20	<0.20	<0.20
AY-68-27-303	06-02-88	1345	354.00	60	20	<0.20	<0.20	<0.20
AY-68-27-503	06-02-88	1530	375.00	60	20	<0.20	<0.20	<0.20
AY-68-28-207	08-09-88	0945	265.00	30	6.0	<0.20	<0.20	0.60
AY-68-28-502	05-26-88	1000	506.00	30	135	0.70	<0.20	<0.20
AY-68-28-512	06-02-88	1200	400.00	60	10	<0.20	<0.20	<0.20
AY-68-28-903	06-27-88	1330	762.00	60	3700	<0.20	<0.20	<0.20
AY-68-28-920	04-12-88	0945	360.00	60	13	<0.20	<0.20	0.40
AY-68-29-210	06-01-88	0945	329.00	60	15	<0.20	<0.20	<0.20
AY-68-29-506	04-11-88	1330	694.00	210	9.0	<0.20	<0.20	<0.20
AY-68-29-912	04-19-88	1115	630.00	60	1150	<0.20	<0.20	<0.20
AY-68-29-920	04-19-88	1045	655.00	240	1160	<0.20	<0.20	<0.20
AY-68-29-925	04-19-88	1400	525.00	60	13	<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)
AY-68-21-804	<0.20	<0.20	<0.20	0.40	<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-68-28-207	<0.20	<0.20	<0.20	0.50	0.20	<0.20	<0.20	<0.20
AY-68-28-502	5.1	1.9	0.50	<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-68-28-903	<0.20	<0.20	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-920	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-210	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-506	<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-68-29-925	<0.20	<0.20	<0.20	1.8	<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-68-28-207	<0.20	<6.0	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-502	<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-68-28-903	<0.20	1.3	2.0	0.40	0.40	<0.20	<0.20	<0.20
AY-68-28-920	<0.20	<0.20	6.3	<0.20	0.50	<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-68-29-506	<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	2.2	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-925	<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, 1988--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-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-27-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-207	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-28-502	<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-68-28-903	<0.20	<0.20	0.70	<0.20	<0.20	4.0	<0.20	0.8
AY-68-28-920	<0.20	0.30	<0.20	<0.20	<0.20	2.4	<0.20	3.9
AY-68-29-210	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
AY-68-29-506	<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-68-29-925	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

COMAL 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)
DX-68-15-901	05-02-88	1030	--	--	--	<0.20	<0.20	<0.20
DX-68-23-301	06-13-88	1230	--	--	--	<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)
DX-68-15-901	<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

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)
DX-68-15-901	<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

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)
DX-68-15-901	<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

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1988--Continued

HAYS COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
LR-67-01-801	05-17-88	1300	--	--	--	<0.20	<0.20	<0.20
LR-67-01-806	05-17-88	1100	115.00	30	4600	<0.20	<0.20	<0.20
	10-19-88	1000	115.00	180	4400	<0.20	<0.20	<0.20
LR-67-09-105	05-17-88	1448	330.00	1440	1200	<0.20	<0.20	<0.20
	10-19-88	1130	330.00	1440	1200	<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)
LR-67-01-801	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-806	6.1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
	1.4	0.50	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-105	<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

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)
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	0.50	<0.20	<0.20	<0.20	<0.20	<0.20
	<0.20	<0.20	<0.60	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-105	<0.20	<0.20	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

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)
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
	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
LR-67-09-105	<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

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1988--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)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	CARBON-TETRA-CHLO-RIDE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)
TD-68-26-701	05-31-88	0945	750.00	1440	500	<0.20	<0.20	<0.20
TD-68-33-202	05-31-88	1200	279.00	60	15	<0.20	<0.20	<0.20
TD-68-41-303	04-18-88	1000	717.00	60	420	<0.20	<0.20	<0.20
TD-68-42-503	06-27-88	0830	1373.00	120	800	<0.20	<0.20	<0.20
TD-69-46-601	04-18-88	1315	1289.00	30	370	0.50	<0.20	<0.20
TD-69-47-301	04-18-88	1130	1510.00	240	1000	<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)
TD-68-26-701	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
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-69-46-601	<0.20	1.3	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-301	<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)
TD-68-26-701	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
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
TD-68-42-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-46-601	<0.20	<0.20	2.5	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<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)
TD-68-26-701	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
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-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
TD-69-47-301	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for volatile organic compounds for wells and springs in the Edwards aquifer, 1988--Continued

UVALDE 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)
YP-69-35-602	06-07-88	1115	237.00	60	9.8	<0.20	<0.20	<0.20
YP-69-36-702	05-27-88	1130	538.00	1440	1000	<0.20	<0.20	<0.20
YP-69-43-606	05-27-88	1030	698.00	60	200	<0.20	<0.20	<0.20
YP-69-50-203	06-08-88	0830	525.00	1440	1370	<0.20	<0.20	<0.20
YP-69-51-104	06-08-88	0930	430.00	1440	610	<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)
YP-69-35-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
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	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	<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)
YP-69-35-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
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	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-104	<0.20	5.7	<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)
YP-69-35-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
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
YP-69-51-104	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2

Analyses for isotopes for wells and springs in the Edwards aquifer, 1988--Continued

UVALDE 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)	H-2/ H-1 STABLE ISOTOPE RATIO PER MIL	O-18/ O-16 STABLE ISOTOPE RATIO PER MIL	S-34/ S-32 STABLE ISOTOPE RATIO PER MIL	TRITIUM TOTAL (PCI/L)
YP-69-35-602	06-07-88	1115	237.00	60	9.8	-24.0	-4.20	--	--
YP-69-36-702	05-27-88	1130	538.00	1440	1000	-24.5	-4.30	--	--
YP-69-43-302	05-27-88	0900	630.00	1440	2300	-25.0	-4.40	--	--
YP-69-50-308	07-13-88	1215	602.00	--	--	-25.5	-4.35	--	21

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

[µg/L, micrograms per liter; mg/L, milligrams 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 (SO_4)	--	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	--
Toxaphene	5 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		
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 contaminants 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 1987 to September 1988

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.--Records good. Many small diversions above station for irrigation. Several observations of water temperature were made during the year. Satellite telemeter at station.

AVERAGE DISCHARGE.--49 years (water years 1940-88), 205 ft³/s (148,500 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)
May 21	0700	3,530	8.93	Aug. 3	1000	4,240	9.62
July 11	1700	*54,000	a*23.26				

a From floodmark.

Minimum daily discharge, 73 ft³/s June 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	303	236	236	237	209	192	161	143	206	149	327	145
2	294	236	248	234	208	186	161	136	195	136	321	145
3	292	236	252	233	210	194	156	135	313	129	1500	145
4	285	233	247	232	211	184	156	123	277	123	587	143
5	282	236	245	231	208	178	158	119	216	115	428	131
6	280	e233	242	235	206	183	162	89	193	108	369	132
7	277	e233	233	239	206	186	155	81	178	104	330	127
8	270	e450	222	234	206	187	147	96	168	99	295	127
9	261	e350	218	231	204	191	156	102	158	97	285	123
10	261	e300	224	227	203	184	156	104	144	97	286	125
11	256	e260	233	225	201	178	154	98	134	16500	264	124
12	261	250	225	226	189	150	152	238	132	4870	247	120
13	259	240	216	221	190	156	148	195	128	1350	239	118
14	256	239	218	217	188	158	142	166	130	876	228	120
15	253	240	213	216	178	173	142	140	158	661	220	121
16	254	330	206	222	176	167	138	132	118	527	211	120
17	253	324	208	224	186	232	136	126	111	468	206	302
18	253	278	212	218	200	238	138	120	73	419	185	596
19	253	261	292	222	204	191	133	114	75	382	198	357
20	265	248	346	216	194	183	130	228	95	624	191	272
21	279	242	307	209	193	180	128	2050	96	1650	186	223
22	e261	242	286	206	188	183	125	717	91	995	180	200
23	256	240	267	210	186	181	126	431	88	679	175	184
24	258	240	264	206	179	181	125	332	89	544	175	173
25	261	241	262	203	178	181	131	285	84	473	179	170
26	256	235	296	205	193	173	127	209	290	442	168	165
27	253	240	265	203	216	168	119	227	406	394	163	161
28	e242	237	253	203	201	167	117	214	284	364	155	152
29	239	235	247	203	196	169	118	196	211	373	154	151
30	242	237	240	205	---	165	154	202	169	346	149	189
31	242	---	239	206	---	161	---	213	---	334	145	---
TOTAL	8157	7802	7662	6799	5707	5600	4251	7761	5010	34428	8746	5361
MEAN	263	260	247	219	197	181	142	250	167	1111	282	179
MAX	303	450	346	239	216	238	162	2050	406	16500	1500	596
MIN	239	233	206	203	176	150	117	81	73	97	145	118
AC-FT	16180	15480	15200	13490	11320	11110	8430	15390	9940	68290	17350	10630

CAL YR 1987 TOTAL 276819 MEAN 758 MAX 36700 MIN 206 AC-FT 549100
WTR YR 1988 TOTAL 107284 MEAN 293 MAX 16500 MIN 73 AC-FT 212800

e Estimated.

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. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--66 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)
July 12	1300	*35,100	a*27.25	No other peak greater than base discharge.			

a From floodmark.

Minimum daily discharge, 103 ft³/s June 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	388	282	283	294	253	232	204	167	236	191	378	171
2	372	276	276	290	252	231	201	177	233	171	375	171
3	363	275	287	288	252	223	198	169	285	157	445	169
4	352	275	294	280	249	223	193	162	380	148	1590	167
5	349	276	292	279	246	222	194	155	302	143	613	166
6	343	273	287	281	246	215	194	151	253	136	471	157
7	335	270	282	289	246	213	194	137	225	133	412	157
8	330	297	273	288	246	218	193	123	205	127	375	149
9	323	549	259	283	246	214	193	123	196	124	345	151
10	317	427	256	276	246	216	196	128	187	126	328	148
11	312	350	259	276	237	215	195	134	174	127	323	146
12	306	316	264	276	236	211	192	140	166	17000	303	146
13	310	310	261	273	232	195	189	209	158	2860	287	145
14	308	301	252	270	233	184	187	216	158	1310	278	142
15	308	302	246	267	227	190	184	201	154	865	263	138
16	305	308	247	268	220	193	183	169	175	663	254	140
17	305	378	243	273	217	237	182	160	150	547	247	160
18	305	378	249	272	230	308	175	151	141	487	252	272
19	303	334	288	269	238	302	174	146	130	438	234	514
20	301	312	374	264	243	245	170	149	103	398	234	359
21	304	302	404	259	234	230	167	657	117	845	226	289
22	324	295	365	253	231	223	168	1740	121	1750	218	244
23	315	295	343	257	225	223	164	637	118	941	210	223
24	307	292	325	259	218	223	157	443	115	658	206	209
25	311	321	313	250	218	222	158	354	115	546	203	193
26	311	294	388	248	215	219	158	308	122	487	203	184
27	299	291	409	247	223	215	160	247	242	457	192	181
28	293	288	340	249	247	211	150	249	371	427	188	174
29	286	287	316	249	241	207	152	239	289	393	184	169
30	285	283	303	250	---	202	159	228	231	396	180	190
31	281	---	302	252	---	207	---	221	---	391	175	---
TOTAL	9851	9437	9280	8329	6847	6869	5384	8490	5852	33442	10192	5824
MEAN	318	315	299	269	236	222	179	274	195	1079	329	194
MAX	388	549	409	294	253	308	204	1740	380	17000	1590	514
MIN	281	270	243	247	215	184	150	123	103	124	175	138
AC-FT	19540	18720	18410	16520	13580	13620	10680	16840	11610	66330	20220	11550

CAL YR 1987 TOTAL 481560 MEAN 1319 MAX 32000 MIN 243 AC-FT 955200
WTR YR 1988 TOTAL 119797 MEAN 327 MAX 17000 MIN 103 AC-FT 237600

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 daily contents, 414,000 acre-ft July 14, 15 (elevation, 912.78 ft); minimum daily, 319,100 acre-ft Nov. 7 (elevation, 900.94 ft).

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

900.0	312,300	906.0	357,800	911.0	398,700
902.0	327,000	908.0	373,800	912.0	407,300
904.0	342,200	910.0	390,300	913.0	415,900

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	335700	319400	330700	346900	359100	368200	377800	381800	387900	382600	404700	382700
2	334400	319400	331300	347200	359300	368800	377900	381800	387700	382500	404700	382600
3	334000	319400	331700	347700	359600	369000	378100	381800	388400	382200	404400	382400
4	333800	319300	332200	348100	360000	369100	378400	381600	388400	382000	405300	381900
5	333700	319300	332700	348400	360200	369400	378600	381400	388100	381800	404900	381500
6	333500	319200	333200	349200	360400	369600	378900	381200	387800	381600	404100	381300
7	333500	319100	333700	349500	360700	369900	378900	381100	387500	381400	403300	381200
8	333200	320200	334100	349900	361100	370300	379200	381000	387000	381100	402400	380900
9	333100	320500	334400	350200	361500	370400	379600	380800	386600	380800	401400	380800
10	333100	320700	334800	350600	361500	370600	379800	380700	386100	380700	400300	380600
11	333000	320700	335200	351000	362100	371000	379800	381200	385500	380500	399500	380400
12	332900	320700	335600	351500	362200	371100	379900	381100	384800	408800	398600	380200
13	332800	320500	336000	351700	362600	371300	380100	380900	384100	413300	397500	380200
14	332800	320500	336200	352200	363000	371300	380200	380900	383800	414000	396400	380200
15	332500	320800	336400	352600	363200	371300	380400	380800	383700	414000	395200	380000
16	332300	321400	336900	353100	363400	371500	380700	380800	383500	413600	394300	380000
17	331700	321400	337400	353500	363800	373300	381000	380600	383300	413000	393300	380900
18	330800	322000	337900	353700	364600	373400	381200	380400	383100	412200	392500	381200
19	330200	322300	339200	354400	364900	373800	381200	380200	382800	411300	391600	381800
20	329100	322700	339900	354700	365000	374100	381300	381700	382500	410500	390600	382200
21	327600	323100	340700	355000	365400	374200	381500	382500	382200	410200	389800	382500
22	326400	323500	341300	355400	365700	374600	381800	385600	381800	411700	388900	382500
23	325600	324100	341900	355700	366000	375100	381900	386400	381700	411800	388100	382400
24	324400	324700	342800	356000	366100	375500	382000	387000	381400	411300	387500	382200
25	323200	327900	343500	356200	366400	375900	382100	387100	382200	410700	386700	382100
26	322000	328300	344200	356600	366800	376100	382000	387400	382500	409900	386100	381800
27	320500	329100	344400	356900	367000	376300	381800	387100	382500	409200	385400	381500
28	319400	329400	345000	357200	367600	376800	381600	387100	382700	408200	384800	381300
29	319500	329900	345400	357600	367900	377200	382300	388000	382800	407300	384200	381000
30	319500	330400	346000	358000	---	377200	382100	388400	382700	406500	383600	381700
31	319400	---	346400	358500	---	377500	---	388100	---	405600	383200	---
MAX	335700	330400	346400	358500	367900	377500	382300	388400	388400	414000	405300	382700
MIN	319400	319100	330700	346900	359100	368200	377800	380200	381400	380500	383200	380000
(†)	900.98	902.45	904.55	906.09	907.27	908.45	909.01	909.73	909.09	911.81	909.14	908.96
(ϕ)	-19380	+10940	+16080	+12090	+9414	+9560	+4592	+5969	-5310	+22910	-22500	-1483

CAL YR 1987 MAX 731300 MIN 319100 (ϕ) -79600
WTR YR 1988 MAX 414000 MIN 319100 (ϕ) +42900

(†) 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.

PERIOD OF RECORD.--March 1960 to current year.
Water-quality records.--Water temperature: June 1984 to September 1987.

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.--26 years (water years 1962-88) since regulation began at Canyon Lake, 435 ft³/s (315,200 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, 1,860 ft³/s Oct. 1 at 1300 hours (gage height, 6.78 ft); minimum daily, 3.5 ft³/s Dec. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1850	275	72	70	73	71	70	181	432	209	763	318
2	1110	275	72	71	71	73	72	181	427	212	772	314
3	415	275	71	69	72	71	71	180	428	215	774	313
4	415	275	73	67	72	66	72	162	426	215	772	313
5	415	275	71	70	73	67	71	184	426	210	772	235
6	347	275	73	70	71	69	71	182	426	208	772	166
7	364	276	73	71	72	71	65	181	426	209	772	166
8	318	281	71	75	72	72	66	181	426	209	772	166
9	318	275	72	72	71	70	71	181	426	209	772	166
10	318	277	72	72	73	64	67	181	426	209	772	166
11	318	275	73	73	74	69	67	182	426	209	775	166
12	318	275	73	71	72	77	68	181	426	218	781	166
13	318	281	72	72	75	74	65	181	426	400	781	140
14	318	286	55	74	74	69	67	181	315	791	777	116
15	318	275	5.5	73	74	71	65	181	209	791	763	116
16	490	280	4.2	71	74	74	69	179	208	791	694	116
17	727	279	3.5	68	73	77	66	179	209	791	607	115
18	621	156	45	66	74	74	62	180	209	774	607	113
19	621	73	75	68	71	74	67	181	209	772	607	112
20	790	74	74	63	73	75	68	183	209	772	607	112
21	906	74	73	69	61	76	68	185	209	772	607	100
22	910	73	37	71	62	75	67	181	209	772	601	168
23	906	73	69	71	70	70	65	181	209	765	563	216
24	906	84	69	70	69	73	70	181	209	763	518	228
25	906	93	67	72	69	70	63	181	209	763	518	228
26	906	75	67	72	72	73	104	181	213	763	446	228
27	906	76	69	72	71	73	182	319	212	763	416	228
28	646	75	68	72	71	71	181	416	209	763	416	198
29	275	72	70	71	69	70	183	394	209	763	416	203
30	275	71	67	72	---	71	180	257	209	763	416	203
31	275	---	65	73	---	72	---	432	---	763	346	---
TOTAL	18526	5779	1921.2	2191	2068	2222	2523	6510	9212	16827	19975	5595
MEAN	598	193	62.0	70.7	71.3	71.7	84.1	210	307	543	644	186
MAX	1850	286	75	75	75	77	183	432	432	791	781	318
MIN	275	71	3.5	63	61	64	62	162	208	208	346	100
AC-FT	36750	11460	3810	4350	4100	4410	5000	12910	18270	33380	39620	11100

CAL YR 1987 TOTAL 526567.2 MEAN 1443 MAX 5480 MIN 3.5 AC-FT 1044000
WTR YR 1988 TOTAL 93349.2 MEAN 255 MAX 1850 MIN 3.5 AC-FT 185200

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 ft³/s Jan. 21, 1968; no flow at times in 1948-49, 1951-57, 1963-64, 1967, and 1984.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Discharge (ft³/s)	Date	Discharge (ft³/s)	Date	Discharge (ft³/s)
Oct. 13, 1987	70.1	Feb. 9, 1988	27.2	June 7, 1988	24.0
Dec. 10	38.8	Apr. 11,	21.1	Aug. 4	16.6

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); 26 years (water years 1963-88) regulated, 526 ft³/s (381,100 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, 5,330 ft³/s May 29 at 2400 hours (gage height, 6.51 ft); minimum daily, 82 ft³/s Dec. 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2080	362	155	141	134	124	123	200	503	230	789	305
2	1630	363	153	143	133	131	121	200	488	229	789	306
3	530	363	152	144	131	128	119	200	519	231	806	306
4	521	359	151	141	131	126	119	196	511	236	797	302
5	519	356	152	139	134	124	118	186	495	231	793	301
6	459	356	151	144	131	124	120	200	480	232	792	188
7	494	356	149	142	130	120	118	205	471	229	789	179
8	428	380	148	143	130	123	114	205	469	226	789	178
9	427	366	145	142	131	119	117	205	460	227	788	178
10	427	355	145	141	131	120	121	205	453	230	787	178
11	425	356	141	142	129	110	112	215	453	239	786	178
12	419	351	142	142	128	117	114	210	450	249	792	178
13	419	352	142	138	129	120	111	210	444	246	785	180
14	417	354	141	139	133	116	106	205	416	775	781	142
15	417	363	124	139	130	113	106	205	240	789	781	134
16	425	362	90	141	129	117	106	202	235	789	771	135
17	873	349	82	140	130	151	109	201	235	789	610	158
18	709	326	82	133	142	198	106	197	234	789	602	143
19	702	157	124	132	132	149	100	191	230	789	600	139
20	794	150	161	129	128	139	103	194	230	789	597	139
21	991	151	154	129	127	134	103	238	230	791	593	136
22	1000	151	147	134	113	133	106	208	230	789	588	128
23	1010	151	118	134	120	131	103	201	229	787	582	228
24	1000	151	145	133	124	127	100	196	230	787	510	234
25	1000	383	147	132	125	129	100	196	230	788	509	240
26	1000	197	144	133	127	122	96	196	274	788	482	240
27	1000	184	144	132	130	124	167	237	239	789	403	238
28	946	167	142	133	128	121	191	417	236	789	403	229
29	381	162	145	133	127	122	221	599	231	789	403	208
30	363	159	143	132	---	120	210	701	230	792	405	231
31	362	---	141	134	---	121	---	519	---	789	380	---
TOTAL	22168	8592	4300	4254	3747	3953	3660	7740	10375	17222	20282	6059
MEAN	715	286	139	137	129	128	122	250	346	556	654	202
MAX	2080	383	161	144	142	198	221	701	519	792	806	306
MIN	362	150	82	129	113	110	96	186	229	226	380	128
AC-FT	43970	17040	8530	8440	7430	7840	7260	15350	20580	34160	40230	12020

CAL YR 1987 TOTAL 588942 MEAN 1614 MAX 5680 MIN 82 AC-FT 1168000
WTR YR 1988 TOTAL 112352 MEAN 307 MAX 2080 MIN 82 AC-FT 222900

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.--56 years (water years 1933-88), 296 ft³/s (214,500 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. 19	1130	*566	*4.77				

Minimum daily discharge, 209 ft³/s Sept. 10, 12, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	352	370	369	355	342	337	314	273	236	245	214
2	356	355	368	369	354	347	329	312	276	241	244	220
3	354	354	369	369	357	342	334	311	285	239	243	221
4	355	355	370	369	354	341	327	309	284	269	246	224
5	358	351	370	366	354	339	328	308	282	252	242	220
6	352	353	370	369	355	338	327	301	282	240	246	216
7	350	351	371	366	355	338	330	300	278	239	244	216
8	351	369	370	366	353	338	326	303	275	234	247	213
9	356	359	369	367	354	340	328	299	277	234	243	212
10	355	353	370	366	352	337	329	294	265	234	245	209
11	350	356	370	364	349	336	330	296	265	256	245	210
12	355	358	369	363	352	334	332	298	266	259	241	209
13	355	361	370	363	351	335	326	292	265	239	244	211
14	354	363	370	365	353	333	323	294	258	234	243	215
15	354	364	367	362	350	333	321	291	246	237	244	209
16	355	368	367	364	349	332	317	286	246	243	240	220
17	355	367	370	365	350	367	326	284	245	239	238	241
18	354	362	373	362	368	341	326	282	248	234	246	221
19	354	363	401	362	353	334	323	278	248	228	241	227
20	354	365	380	360	349	338	322	283	243	227	246	227
21	352	365	374	359	348	336	312	306	234	264	241	228
22	354	370	369	360	343	335	312	283	233	241	240	228
23	356	368	368	360	348	336	317	286	230	244	233	229
24	354	374	371	361	337	336	319	280	221	242	232	230
25	359	369	370	363	346	333	318	281	225	240	235	226
26	359	369	371	363	345	330	312	273	264	234	229	225
27	355	379	369	371	345	334	312	273	236	235	231	221
28	356	370	368	365	345	334	311	273	234	240	227	225
29	354	370	367	365	341	332	317	275	240	236	222	227
30	355	369	367	365	---	330	310	284	243	238	215	236
31	355	---	367	358	---	338	---	272	---	244	221	---
TOTAL	10991	10882	11495	11296	10165	10459	9681	9021	7667	7472	7399	6630
MEAN	355	363	371	364	351	337	323	291	256	241	239	221
MAX	359	379	401	371	368	367	337	314	285	269	247	241
MIN	350	351	367	358	337	330	310	272	221	227	215	209
AC-FT	21800	21580	22800	22410	20160	20750	19200	17890	15210	14820	14680	13150

CAL YR 1987 TOTAL 136909 MEAN 375 MAX 1070 MIN 317 AC-FT 271600
WTR YR 1988 TOTAL 113158 MEAN 309 MAX 401 MIN 209 AC-FT 224400

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 above 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.--61 years (water years 1928-88), 287 ft^3/s, 208,089 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, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	352	370	369	355	342	337	314	273	236	245	214
2	356	355	368	369	354	347	329	312	276	241	244	220
3	354	354	369	369	357	342	334	311	285	239	243	221
4	355	355	370	369	354	341	327	309	284	242	246	224
5	358	351	370	366	354	339	328	308	282	252	242	220
6	352	353	370	369	355	338	327	301	282	240	246	216
7	350	351	371	366	355	338	330	300	278	239	244	216
8	351	364	370	366	353	338	326	303	275	234	247	213
9	356	359	369	367	354	340	328	299	277	234	243	212
10	355	353	370	366	352	337	329	294	265	234	245	209
11	350	356	370	364	349	336	330	296	265	226	245	210
12	355	358	369	363	352	334	332	298	266	259	241	209
13	355	361	370	363	351	335	326	292	265	239	244	211
14	354	363	370	365	353	333	323	294	258	234	243	215
15	354	364	367	362	350	333	321	291	246	237	244	209
16	355	368	367	364	349	332	317	286	246	243	240	220
17	355	367	370	365	350	346	322	284	245	239	238	234
18	354	362	370	362	355	341	326	282	248	234	246	221
19	354	363	389	362	353	334	323	278	248	228	241	227
20	354	365	380	360	349	338	322	274	243	227	246	227
21	352	365	374	359	348	336	312	294	234	230	241	228
22	354	370	369	360	343	335	312	283	233	241	240	228
23	356	368	368	360	348	336	317	286	230	244	233	229
24	354	370	371	361	337	336	319	280	221	242	232	230
25	359	369	370	363	346	333	318	281	225	240	235	226
26	359	369	371	363	345	330	312	273	238	234	229	225
27	355	375	369	371	345	334	312	273	236	235	231	221
28	356	370	368	365	345	334	311	273	234	240	227	225
29	354	370	367	365	341	332	308	275	240	236	222	227
30	355	369	367	365	---	330	310	274	243	238	215	230
31	355	---	367	358	---	338	---	272	---	244	221	---
TOTAL	10991	10869	11480	11296	10152	10438	9668	8990	7641	7381	7399	6617
MEAN	355	362	370	364	350	337	322	290	255	238	239	221
MAX	359	375	389	371	357	347	337	314	285	259	247	234
MIN	350	351	367	358	337	330	308	272	221	226	215	209
AC-FT	21800	21560	22770	22410	20140	20700	19180	17830	15160	14640	14680	13120

CAL YR 1987 TOTAL 132,355 MEAN 363 MAX 484 MIN 317 AC-FT 262,500
WTR YR 1988 TOTAL 112,922 MEAN 309 MAX 389 MIN 209 AC-FT 224,000

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.--No estimated daily discharges. Records good. 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.--32 years (water years 1957-88), 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 (backwater from Blanco River), from floodmark, present datum.

EXTREMES FOR CURRENT YEAR.--Maximum daily spring discharge 244 ft³/s Oct. 1; maximum gage height, 11.92 ft Nov. 25 at 0400 hours (flood runoff); minimum daily spring discharge, 114 ft³/s Sept. 21-22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	199	219	189	167	164	155	153	176	146	132	120
2	243	199	216	188	168	167	153	152	170	145	130	121
3	240	196	212	187	167	163	153	151	170	147	129	120
4	239	196	211	186	167	162	153	151	170	145	130	121
5	238	194	212	188	172	160	151	150	166	142	128	120
6	234	194	215	190	166	161	151	151	163	143	127	118
7	231	195	211	188	164	160	149	151	162	143	122	119
8	230	196	205	185	164	160	150	152	160	143	123	117
9	227	197	201	183	163	159	152	150	159	143	124	115
10	223	193	210	182	162	159	156	147	157	144	124	118
11	222	191	209	177	162	162	155	145	156	143	123	118
12	221	198	206	176	162	163	153	147	157	143	123	118
13	223	197	206	173	167	161	153	150	155	138	124	117
14	221	197	205	172	167	160	152	150	152	138	123	115
15	222	196	202	172	166	157	152	152	152	139	121	118
16	218	195	203	172	165	154	153	151	151	135	120	118
17	216	196	202	172	165	157	156	152	150	137	123	118
18	215	196	206	172	170	167	154	150	150	134	121	115
19	216	193	207	172	168	163	152	151	151	133	124	116
20	209	189	208	172	165	162	150	148	149	131	123	115
21	206	188	207	172	164	160	151	148	147	134	123	114
22	204	190	203	172	163	159	152	149	147	132	123	114
23	206	189	203	171	162	158	151	149	145	132	123	117
24	204	188	203	170	162	156	151	145	147	132	122	118
25	201	196	200	168	162	155	150	145	145	130	125	116
26	203	206	198	168	163	155	146	148	151	129	124	115
27	199	213	194	168	167	154	147	147	151	130	124	116
28	199	218	194	168	167	152	149	147	149	130	123	117
29	199	220	192	168	165	153	148	149	147	131	124	120
30	199	220	191	167	---	152	151	148	148	131	123	122
31	199	---	191	167	---	154	---	171	---	132	118	---
TOTAL	6751	5935	6342	5455	4792	4929	4549	4650	4653	4255	3846	3526
MEAN	218	198	205	176	165	159	152	150	155	137	124	118
MAX	244	220	219	190	172	167	156	171	176	147	132	122
MIN	199	188	191	167	162	152	146	145	145	129	118	114
AC-FT	13390	11770	12580	10820	9500	9780	9020	9220	9230	8440	7630	6990

CAL YR 1987 TOTAL 92531 MEAN 254 MAX 427 MIN 182 AC-FT 183500
WTR YR 1988 TOTAL 59683 MEAN 163 MAX 244 MIN 114 AC-FT 118400

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.

WATER-DISCHARGE RECORDS

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 discharge, 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.--62 years (water years 1925-26, 1929-88), 129 ft³/s (4.93 in/yr), 93,460 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)
Nov. 25	0500	7,320	10.50	May 29	2030	*21,900	*16.66

Minimum daily discharge, 27 ft³/s Sept. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	72	81	91	71	59	58	39	157	70	55	39
2	73	70	78	89	70	64	56	39	134	69	64	39
3	71	66	76	91	68	57	56	39	311	67	287	37
4	71	66	75	86	67	57	58	38	205	66	166	34
5	73	66	75	84	66	57	58	37	142	65	113	35
6	72	65	74	87	66	54	56	36	123	71	91	34
7	68	62	75	86	66	54	53	36	112	69	82	33
8	68	79	72	84	66	55	54	38	103	63	76	33
9	68	73	70	84	66	55	55	38	98	62	75	32
10	68	80	71	83	66	55	56	37	94	61	66	32
11	68	81	70	83	63	56	52	43	89	62	63	31
12	66	71	69	86	62	56	51	44	86	78	190	32
13	66	70	68	82	63	54	53	43	e81	114	88	34
14	66	68	67	80	63	52	54	49	78	147	74	31
15	69	68	63	81	63	51	54	49	72	112	68	32
16	70	77	67	81	62	51	54	47	68	92	65	36
17	70	72	66	81	63	63	54	45	66	84	62	43
18	69	71	70	81	66	60	53	42	66	65	58	36
19	71	69	95	80	61	65	51	41	65	61	56	42
20	64	69	91	78	62	70	48	53	65	60	53	49
21	63	67	100	78	62	67	49	165	63	57	51	44
22	65	68	96	76	62	66	49	156	61	55	51	41
23	67	68	92	75	61	64	49	99	60	56	49	38
24	67	68	91	75	58	61	45	80	60	60	47	37
25	66	1020	89	73	58	61	43	73	58	60	49	33
26	68	123	86	73	57	62	43	66	88	55	45	32
27	68	103	143	71	57	59	41	64	64	53	44	31
28	68	92	108	72	57	60	39	58	63	52	42	29
29	68	89	97	74	58	61	41	1600	61	51	40	27
30	68	86	93	73	---	58	43	382	66	58	39	42
31	68	---	94	73	---	57	---	169	---	63	39	---
TOTAL	2120	3199	2562	2491	1830	1821	1526	3745	2859	2158	2348	1068
MEAN	68.4	107	82.6	80.4	63.1	58.7	50.9	121	95.3	69.6	75.7	35.6
MAX	73	1020	143	91	71	70	58	1600	311	147	287	49
MIN	63	62	63	71	57	51	39	36	58	51	39	27
AC-FT	4210	6350	5080	4940	3630	3610	3030	7430	5670	4280	4660	2120
CFSM	.19	.30	.23	.23	.18	.17	.14	.34	.27	.20	.21	.10
IN.	.22	.34	.27	.26	.19	.19	.16	.39	.30	.23	.25	.11

CAL YR 1987 TOTAL 125899 MEAN 345 MAX 6760 MIN 62 AC-FT 249700 CFSM .97 IN. 13.19
WTR YR 1988 TOTAL 27727 MEAN 75.8 MAX 1600 MIN 27 AC-FT 55000 CFSM .21 IN. 2.91

e Estimated.

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1962 to December 1973. Chemical, biochemical, and pesticide analyses: January 1974 to September 1979, February 1988 to current year. Sediment analyses: November 1965 to April 1966.

PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: December 1976 to September 1978.

INSTRUMENTATION.--From December 1976 to September 1978 water temperature was recorded continuously at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
WATER TEMPERATURES: Maximum daily, 36.0°C July 16, 1978, minimum daily, 2.5°C Jan. 20, 1978.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 (FTU)	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 18...	1300	70	493	8.10	15.0	3	0.40	9.9	101	1.0	54
MAY 25...	1140	100	422	7.70	25.5	2	2.8	8.5	106	0.6	84
SEP 01...	1105	37	456	7.70	27.0	1	1.8	8.0	103	1.7	34

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 18...	160	250	42	71	18	8.3	0.2	1.3	210	31	12
MAY 25...	100	220	32	62	15	7.5	0.2	1.4	185	25	11
SEP 01...	32	210	32	54	18	7.7	0.2	1.3	177	30	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)
FEB 18...	0.30	7.8	276	5	<1	0.490	0.010	0.500	0.020	0.28	0.30
MAY 25...	0.30	10	243	6	6	--	<0.010	0.400	0.020	--	<0.20
SEP 01...	0.20	10	238	3	1	--	<0.010	0.200	<0.010	--	0.60

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 18...	<0.010	0.9	<1	31	<1	<1	<1	44	<5	2	<0.1
MAY 25...	0.010	2.4	6	28	<1	<1	1	46	<5	7	<0.1
SEP 01...	0.010	1.3	<1	31	<1	<1	2	8	<5	1	<0.1

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
FEB 18...	<1	<1.0	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 25...	<1	<1.0	<3	--	--	--	--	--	--	--	--
SEP 01...	<1	<1.0	7	--	--	--	--	--	--	--	--

DATE	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 18...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 25...	--	--	--	--	--	--	--	--	--	--
SEP 01...	--	--	--	--	--	--	--	--	--	--

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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										
18...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
25...	--	--	--	--	--	--	--	--	--	--
SEP										
01...	--	--	--	--	--	--	--	--	--	--

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). Recording rain gage at this site.

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.--32 years, 155 ft³/s (5.11 in/yr), 112,300 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)
Nov. 25	0500	*28,000	*24.22	May 29	2400	19,500	21.57

Minimum daily discharge, 6.3 ft³/s Sept. 28-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	45	99	85	59	49	43	30	180	40	28	9.7
2	54	44	90	82	57	48	42	28	143	38	28	9.5
3	54	44	84	81	56	49	40	30	219	37	195	10
4	53	44	79	76	56	47	40	28	262	35	111	9.6
5	52	43	76	74	55	46	40	26	142	35	83	8.3
6	51	43	73	74	55	45	39	25	114	34	53	8.2
7	51	42	70	80	55	45	37	24	101	43	41	8.1
8	49	52	69	79	54	45	36	25	90	34	35	8.0
9	49	72	68	78	54	44	36	25	83	32	38	7.8
10	49	57	67	76	54	43	38	24	77	30	33	7.3
11	48	63	66	74	54	42	38	23	72	32	31	7.0
12	47	59	65	73	53	42	37	34	69	62	116	7.0
13	47	55	64	72	53	41	36	29	65	40	63	7.8
14	47	53	62	72	53	39	36	29	64	96	37	8.7
15	47	56	61	71	52	39	36	31	61	71	31	7.2
16	47	63	58	71	52	39	35	29	57	53	29	7.0
17	47	62	58	70	52	50	35	28	54	42	25	16
18	47	53	58	69	53	64	34	25	52	38	22	19
19	47	51	79	67	55	47	33	23	50	35	21	10
20	47	49	101	66	54	52	33	25	47	33	20	13
21	44	48	86	64	53	53	32	140	46	32	18	15
22	45	48	97	63	52	51	32	139	44	30	17	13
23	50	48	93	62	52	50	32	81	43	28	16	11
24	52	48	88	62	52	49	30	55	42	28	15	9.6
25	48	5540	85	61	51	47	29	46	41	28	15	8.2
26	48	251	83	60	51	46	29	42	59	27	15	7.1
27	45	179	113	60	50	45	28	37	60	26	13	6.6
28	44	139	117	59	50	43	27	34	45	28	12	6.3
29	44	119	92	59	50	43	30	819	42	25	11	6.3
30	45	110	86	59	---	43	36	1540	40	27	12	9.7
31	45	---	86	59	---	42	---	234	---	34	10	---
TOTAL	1498	7580	2473	2158	1547	1428	1049	3708	2464	1173	1194	282.0
MEAN	48.3	253	79.8	69.6	53.3	46.1	35.0	120	82.1	37.8	38.5	9.40
MAX	55	5540	117	85	59	64	43	1540	262	96	195	19
MIN	44	42	58	59	50	39	27	23	40	25	10	6.3
AC-FT	2970	15030	4910	4280	3070	2830	2080	7350	4890	2330	2370	559
CFSM	.12	.61	.19	.17	.13	.11	.08	.29	.20	.09	.09	.02
IN.	.14	.68	.22	.19	.14	.13	.09	.33	.22	.11	.11	.03

CAL YR 1987 TOTAL 137888 MEAN 378 MAX 6550 MIN 42 AC-FT 273500 CFSM .92 IN. 12.45
WTR YR 1988 TOTAL 26554.0 MEAN 72.6 MAX 5540 MIN 6.3 AC-FT 52670 CFSM .18 IN. 2.40

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.--Records good except those for estimated daily discharges, which are fair. 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.--29 years, 48.3 ft³/s (34,990 acre-ft/yr).

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

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Nov. 25	1700	*317	*7.77				

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	5.0	3.1	1.2	1.3	.41	.08	.43	.07	.00	.00
2	.00	.00	4.0	3.1	1.2	1.3	.43	.28	.39	.00	.00	.00
3	.00	.00	2.9	2.7	1.3	1.5	.43	2.5	.38	.00	.00	.00
4	.00	.00	2.5	3.4	1.3	1.5	.35	2.0	.30	.00	.00	.00
5	.00	.00	2.8	4.3	1.4	1.5	.28	1.5	.36	.00	.00	.00
6	.00	.00	3.2	4.1	1.4	1.2	.18	.88	.18	.00	.00	.00
7	.00	.00	3.2	4.7	1.4	1.1	.19	.31	.11	.36	.00	.00
8	.00	.00	3.0	5.5	1.4	.97	.12	.20	.08	.09	.00	e.00
9	.00	.00	2.5	4.9	1.4	.86	.14	.10	.03	.03	.00	e.00
10	.00	.00	2.1	4.4	1.3	.81	.25	.05	.00	.00	.00	e.00
11	.00	.00	2.0	3.6	1.2	.79	.35	.03	.00	.00	.00	e.00
12	.00	.00	1.7	3.5	1.1	.82	.39	.04	.00	.00	.00	e.00
13	.00	.00	1.7	3.1	1.1	.76	.58	.02	.00	.00	.00	e.00
14	.00	.00	1.9	2.9	1.1	.64	.58	.00	.00	.00	.00	e.00
15	.00	.00	2.4	2.8	1.1	.44	.72	.00	.00	.00	.00	e.00
16	.00	.00	2.4	2.7	1.1	.43	.84	.00	.00	.00	.00	e.00
17	.00	.00	2.9	2.6	1.0	1.2	1.1	.00	.00	.00	.00	e.00
18	.00	.00	3.2	2.8	2.2	38	1.1	.00	.00	.00	.00	e.00
19	.00	.00	5.1	2.6	3.7	7.1	.58	.00	.00	.00	.00	e.00
20	.00	.00	23	2.3	3.3	3.7	.34	.00	.00	.00	.00	e.00
21	.00	.00	14	2.1	2.7	2.2	.24	57	.00	.00	.00	e.00
22	.00	.00	9.0	2.2	2.4	1.4	.74	24	.00	.00	.00	e.00
23	.00	.00	6.9	2.2	2.2	1.0	.54	15	.07	.00	.00	e.00
24	.00	.00	5.9	3.7	1.8	.90	.22	6.5	2.3	.00	.00	e.00
25	.00	62	5.6	4.3	1.5	.73	.09	2.9	3.7	.00	.00	e.00
26	.00	33	5.2	2.0	1.5	.63	.04	1.6	3.4	.00	.00	e.00
27	.00	24	4.9	1.4	1.5	.51	.01	.98	2.7	.00	.00	e.00
28	.00	16	4.5	1.2	1.4	.49	.00	.68	1.9	.00	.00	e.00
29	.00	8.8	3.7	1.1	1.3	.50	.04	4.8	1.1	.00	.00	e.00
30	.00	6.1	3.2	1.1	---	.30	.10	2.8	.40	.00	.00	e.00
31	.00	---	3.0	1.2	---	.37	---	.73	---	.00	.00	---
TOTAL	0.00	149.90	143.4	91.6	46.5	74.95	11.38	124.98	17.83	0.55	0.00	0.00
MEAN	.00	5.00	4.63	2.95	1.60	2.42	.38	4.03	.59	.018	.00	.00
MAX	.00	62	23	5.5	3.7	38	1.1	57	3.7	.36	.00	.00
MIN	.00	.00	1.7	1.1	1.0	.30	.00	.00	.00	.00	.00	.00
AC-FT	.0	297	284	182	92	149	23	248	35	1.1	.0	.0

CAL YR 1987 TOTAL 31546.22 MEAN 86.4 MAX 3510 MIN .00 AC-FT 62570
WTR YR 1988 TOTAL 661.09 MEAN 1.81 MAX 62 MIN .00 AC-FT 1310

e Estimated.

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 123100301, at downstream side of culvert on Shadow Cliff Drive and 3.4 mi upstream from mouth.

DRAINAGE AREA.--4.57 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1980 to October 1985 (published as "at Thousand Oaks Boulevard"), October 1985 to September 1988 (discontinued).

GAGE.--Digital recorders (stage and rainfall). Gage is not referenced to National Geodetic Vertical Datum of 1929. Gage removed Sept. 5, 1984, to Apr. 27, 1987. Prior to Oct. 21, 1985, at site 0.8 mi upstream at Thousand Oaks Boulevard.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft³/s May 31, 1987 (gage height, 6.21 ft), at present site and datum, from rating curve extended above 230 ft³/s; no flow most of time.

EXTREMES FOR WATER YEAR 1987.--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)
Dec. 22	0800	221	4.44	May 31	1545	b*1,450	*6.21
May 29	0815	404	a4.74	June 2	0500	269	4.43

a From floodmark.
b From rating curve extended above 230 ft³/s.

Minimum discharge, no flow most of time.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 26	0015	163	4.13	July 21	0930	*318	*4.55

Minimum discharge, no flow most of time.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: January 1980 to July 1988 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 (FTU)	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)
NOV 16...	1345	<1.0	147	8.00	17.0	48	22	--	--	--	27000
DEC 19...	1350	<1.0	105	8.00	17.5	65	56	8.2	89	4.1	K12000
JUN 25...	2343	58	89	7.40	--	95	5.1	--	--	--	--
26...	0016	123	99	7.70	--	110	840	--	--	--	--
26...	0802	2.2	152	7.90	24.0	50	1.5	5.6	68	5.8	--
JUL 21...	0700	68	140	6.00	--	45	16	--	--	3.8	K8500
21...	0730	92	110	5.70	--	55	26	--	--	3.9	16000
21...	0830	252	103	6.40	24.0	--	--	8.0	97	4.9	14000

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
NOV 16...	--	63	14	23	1.3	1.9	0.1	3.8	49	12	4.1
DEC 19...	37000	--	--	--	--	--	--	--	21	--	--
JUN 25...	--	33	10	12	0.69	1.2	0.1	3.5	23	8.8	4.4
26...	--	48	--	18	0.68	1.6	0.1	3.2	--	12	2.4
26...	K8000	72	1	27	1.2	1.7	0.1	4.4	71	9.5	2.5
JUL 21...	22000	65	5	24	1.3	1.6	0.1	2.9	60	9.0	1.5
21...	28000	49	1	18	1.1	1.4	0.1	2.8	49	8.2	1.7
21...	17000	48	8	18	0.72	1.4	0.1	2.6	40	10	1.8

08178622 LORENCE CREEK AT SHADOW CLIFF DRIVE, SAN ANTONIO, TX--Continued
(Flood-hydrograph partial-record station)

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	RESIDUE 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)
NOV											
16...	0.10	5.3	81	20	4	0.380	0.020	0.400	0.040	0.36	0.40
DEC											
19...	--	--	--	61	24	0.270	0.030	0.300	0.040	0.26	0.30
JUN											
25...	0.20	2.3	47	370	19	0.460	0.040	0.500	0.130	1.5	1.6
26...	0.30	4.2	42	1670	25	0.770	0.030	0.800	0.030	0.67	0.70
26...	0.30	7.1	96	168	9	0.470	0.030	0.500	0.010	0.39	0.40
JUL											
21...	0.10	6.0	82	25	9	0.380	0.020	0.400	0.040	0.36	0.40
21...	0.20	5.4	68	35	6	0.370	0.030	0.400	0.030	0.87	0.90
21...	0.20	5.6	64	--	--	0.630	0.070	0.700	0.100	0.80	0.90

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)
NOV											
16...	0.090	10	--	--	--	--	--	--	--	--	--
DEC											
19...	0.120	10	--	--	--	1	--	--	--	--	--
JUN											
25...	0.230	15	1	10	<1	<1	7	17	<5	8	0.5
26...	0.310	50	--	--	--	--	--	--	--	--	--
26...	0.050	14	2	20	<1	<1	4	34	<5	4	0.1
JUL											
21...	0.090	9.3	--	--	--	--	--	--	--	--	--
21...	0.110	8.0	<1	13	<1	1	5	25	<5	2	0.2
21...	0.130	20	1	12	1	5	7	73	<5	4	0.2

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)
NOV											
16...	--	--	--	--	--	--	--	--	--	--	--
DEC											
19...	--	--	--	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.12
JUN											
25...	1	1.0	7	<0.1	<0.10	<0.010	0.1	<0.010	<0.010	<0.010	0.98
26...	--	--	--	--	--	--	--	--	--	--	--
26...	<1	2.0	4	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.18
JUL											
21...	--	--	--	--	--	--	--	--	--	--	--
21...	<1	2.0	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.42
21...	<1	<1.0	11	--	--	--	--	--	--	--	--

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)
NOV										
16...	--	--	--	--	--	--	--	--	--	--
DEC										
19...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.020	0.03	<0.01	<0.01
JUN										
25...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.01	<0.01	<0.01
26...	--	--	--	--	--	--	--	--	--	--
26...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.06	<0.01	<0.01
JUL										
21...	--	--	--	--	--	--	--	--	--	--
21...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.01	<0.01	<0.01
21...	--	--	--	--	--	--	--	--	--	--

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)
NOV										
16...	--	--	--	--	--	--	--	--	--	--
DEC										
19...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01
JUN										
25...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.16	<0.01	<0.01
26...	--	--	--	--	--	--	--	--	--	--
26...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
JUL										
21...	--	--	--	--	--	--	--	--	--	--
21...	<0.01	<0.01	<0.01	<0.1	0.47	<1	<0.01	1.3	0.04	<0.01
21...	--	--	--	--	--	--	--	--	--	--

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 September 1988 (discontinued).

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 (revised), 889 ft³/s June 6, 1985 (gage height, 6.92 ft); no flow most of time.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 3	0015	*529	*6.48	No other peak greater than base discharge.			

Minimum discharge, no flow most of time.

REVISIONS.--The peak discharges and annual maximum (*) reported for water years 1978, 1981-83, and 1985 have been revised as shown in the following table. They supersede figures published in the WDR reports for 1978, 1981-83, and 1985.

Water year	Date	Time	Discharge (ft³/s)	Gage height (ft)	Water year	Date	Time	Discharge (ft³/s)	Gage height (ft)
1978	Nov. 1, 1977	0820	523	5.82	1985	Apr. 13, 1985	1805	674	6.11
1981	June 13, 1981	1655	417	5.43		June 6, 1985	1355	889	6.92
1982	May 6, 1982	Unknown	514	6.79		June 18, 1985	1745	214	4.50
1983	May 20, 1983	1455	293	4.90		June 22, 1985	0615	765	6.58
	May 21, 1983	0915	293	4.90		July 3, 1985	1510	607	6.10
1985	Oct. 14, 1984	0150	230	4.30		July 12, 1985	0550	173	4.26
	Oct. 22, 1984	0955	235	4.31		Sept. 29, 1985	0955	354	5.17

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1976 to July 1988 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 (FTU)	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)
NOV											
08...	1530	1.2	96	7.40	--	140	90	--	--	4.9	--
08...	1600	1.7	93	7.70	--	75	65	--	--	5.0	--
16...	0645	1.2	81	7.10	--	80	61	--	--	--	70000
16...	0715	0.67	82	7.00	--	60	72	--	--	--	70000
DEC											
19...	1240	0.63	92	8.20	16.0	140	72	8.8	93	4.1	51000
FEB											
18...	0430	2.0	63	7.50	--	--	--	--	--	6.4	K7200
18...	0500	3.6	88	7.80	--	--	--	--	--	5.9	K8800
18...	0530	2.7	97	7.90	--	--	--	--	--	5.8	K16000
MAY											
20-20	2225	45	74	7.40	--	55	31	--	--	--	--
JUN											
02-03	2350	393	95	7.00	--	--	--	--	--	--	--
JUL											
21...	0652	1.2	74	8.00	--	22	2.6	--	--	3.8	6000
21...	0722	6.0	106	5.90	--	55	11	--	--	4.7	2400
21...	0800	24	73	5.70	24.0	45	7.3	7.8	95	2.9	9600

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV											
08...	--	38	7	14	0.78	2.6	0.2	4.8	31	12	5.0
08...	--	38	8	14	0.65	1.9	0.1	4.8	30	11	3.9
16...	--	33	4	12	0.63	1.7	0.1	3.7	29	8.0	3.1
16...	88000	35	4	13	0.68	1.8	0.1	3.6	31	9.0	3.1
DEC											
19...	300000	40	0	15	0.72	1.8	0.1	4.4	41	8.0	2.8
FEB											
18...	K28000	--	--	--	--	--	--	--	25	--	--
18...	K52000	--	--	--	--	--	--	--	32	--	--
18...	K76000	--	--	--	--	--	--	--	35	--	--
MAY											
20-20	--	25	12	9.2	0.60	1.7	0.2	3.0	13	7.3	3.2
JUN											
02-03	--	37	4	14	0.53	1.6	0.1	2.8	33	6.9	2.6
JUL											
21...	7200	33	2	12	0.64	1.2	0.1	2.0	31	5.8	1.2
21...	13000	43	3	16	0.85	1.5	0.1	3.7	41	6.0	2.1
21...	32000	30	2	11	0.69	1.7	0.1	2.6	28	7.3	2.1

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	RESIDUE 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)
NOV											
08...	0.10	3.8	62	187	40	0.680	0.020	0.700	0.080	1.0	1.1
08...	0.10	3.3	58	207	54	0.680	0.020	0.700	0.070	1.0	1.1
16...	0.10	3.1	50	80	17	0.380	0.020	0.400	0.090	0.41	0.50
16...	0.10	3.7	54	83	16	0.370	0.030	0.400	0.080	1.0	1.1
DEC											
19...	0.20	4.9	62	92	25	0.270	0.030	0.300	0.040	0.66	0.70
FEB											
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
20-20	0.20	2.2	35	55	30	0.380	0.020	0.400	0.190	0.71	0.90
JUN											
02-03	0.30	3.6	52	--	--	0.640	0.060	0.700	0.100	0.80	0.90
JUL											
21...	0.10	2.8	44	5	1	0.390	0.010	0.400	0.020	0.38	0.40
21...	0.10	5.3	60	16	3	0.380	0.020	0.400	0.040	0.76	0.80
21...	0.20	3.7	46	21	7	0.280	0.020	0.300	0.060	0.74	0.80

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)
NOV											
08...	0.160	15	1	7	<1	<1	4	42	<5	3	0.3
08...	0.180	15	2	17	<1	2	3	14	<5	1	0.2
16...	0.200	12	1	17	<1	<1	2	29	<5	<1	0.2
16...	0.130	12	1	6	<1	<1	3	91	<5	3	0.2
DEC											
19...	0.190	11	1	7	<1	<1	3	46	<5	3	<0.1
FEB											
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
20-20	0.250	9.3	1	6	<1	<1	12	47	<5	7	0.1
JUN											
02-03	0.330	--	--	--	--	--	--	--	--	--	--
JUL											
21...	0.110	5.1	--	--	--	--	--	--	--	--	--
21...	0.140	9.3	--	--	--	--	--	--	--	--	--
21...	0.260	5.6	1	14	<1	<1	3	68	<5	4	0.1

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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)
NOV											
08...	1	1.0	7	--	--	--	--	--	--	--	--
08...	<1	1.0	4	--	--	--	--	--	--	--	--
16...	<1	1.0	<3	--	--	--	--	--	--	--	--
16...	<1	1.0	8	--	--	--	--	--	--	--	--
DEC											
19...	<1	<1.0	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.13
FEB											
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
20-20	<1	<1.0	27	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.96
JUN											
02-03	--	--	--	--	--	--	--	--	--	--	--
JUL											
21...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
21...	<1	<1.0	14	--	--	--	--	--	--	--	--

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)
NOV										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
DEC										
19...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
FEB										
18...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
MAY										
20-20	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	0.010	0.07	<0.01	<0.01
JUN										
02-03	--	--	--	--	--	--	--	--	--	--
JUL										
21...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--

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)
NOV										
08...	--	--	--	--	--	--	--	--	--	--
08...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
DEC										
19...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.01	<0.01	<0.01
FEB										
18...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
MAY										
20-20	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.12	0.03	<0.01
JUN										
02-03	--	--	--	--	--	--	--	--	--	--
JUL										
21...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--

08178645 EAST ELM CREEK AT SAN ANTONIO, TX
(Flood-hydrograph partial-record station)

LOCATION (REVISED).--Lat 29°36'30", long 98°25'29", Bexar County, Hydrologic Unit 12100301, at mid-channel, 1.1 mi upstream from West Elm Creek, 1.3 mi upstream from Farm Road 1604, and 6.2 mi north of San Antonio International Airport. Prior to May 19, 1987, at site 1.0 mi upstream.

DRAINAGE AREA.--2.33 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1975 to September 1988 (discontinued).

GAGE.--Digital recorders (stage and rainfall) and crest-stage gages. Gage is not referenced to National Geodetic Vertical. Datum of 1929. Prior to May 19, 1987, at site 1.0 mi upstream.

REMARKS.--Records poor.

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

EXTREMES FOR WATER YEAR 1987.--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	0555	*194	*5.83	May 31	Unknown	Unknown	a4.78

a Maximum stage at new site.

Minimum discharge, no flow most of time.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
June 3	0200	Unknown	*3.99				

Minimum discharge, no flow most of time.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1976 to June 1988 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (FTU)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)
JUN 03...	0955	E0.50	123	100	4.4	3500	K12000	59	8	22	0.94	1.4

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET 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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)
JUN 03...	0.1	4.3	51	9.9	3.4	0.30	11	84	6	3	0.670	0.030

DATE	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)	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)
JUN 03...	0.700	0.060	0.94	1.0	0.050	16	<1	9	<1	<1	2	41

DATE	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)	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)
JUN 03...	<5	3	<0.1	<1	<1.0	14	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010

DATE	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	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)
JUN 03...	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

08178645 EAST ELM CREEK AT SAN ANTONIO, TX--Continued
(Flood-hydrograph partial-record station)

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	METHYL PARA-THION, TOTAL (UG/L)	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)
JUN 03...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08178650 ELM CREEK RESERVOIR SITE 11 AT SAN ANTONIO, TX

Insufficient water in reservoir to collect samples.

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 1988. Sediment analyses: November 1971 to September 1973. Water temperatures: November 1968 to September 1988. Bacteria analyses: May 1976 to September 1988.

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

REMARKS.--Records fair above about 2 ft³/s and poor below. 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 mi² above this station. Recording rain gage at station with four additional recording rain gages in the watershed.

AVERAGE DISCHARGE.--28 years, 9.80 ft³/s (7,100 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.--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)
June 3	0400	*3,780	*8.42	July 21	1330	468	4.72

Minimum daily discharge, 0.10 ft³/s May 19, 20, June 2, Aug. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.30	.30	2.1	e.40	e.60	.22	1.5	1.7	e.20	5.8	2.1	e.13
2	e.20	.35	.54	e.40	e.50	.55	1.5	1.5	e.10	1.4	6.8	e.13
3	.44	.40	.63	e.30	e.40	.24	1.5	1.1	659	2.6	2.2	e.13
4	3.6	.40	.63	e.30	e.30	.18	1.5	.95	22	3.9	8.9	e.11
5	3.6	.38	.31	e.30	2.4	6.7	1.5	1.0	14	1.3	4.6	e.11
6	3.6	1.1	.13	e6.0	6.7	7.1	1.5	1.1	7.9	.28	3.1	e.11
7	3.4	2.6	.89	e2.0	4.0	4.9	1.5	1.2	.75	.24	.25	e.11
8	.32	13	8.0	e1.0	.99	.40	3.1	1.3	.57	.24	.18	e.11
9	e.20	1.6	9.1	e.50	.30	e.30	2.1	1.6	.41	.24	.18	e.11
10	e.20	.52	1.9	e.40	e.30	e.20	1.7	1.3	.41	.47	.18	e.11
11	e.20	.51	2.1	e.40	e.30	2.9	1.5	1.0	3.9	2.5	.18	e.11
12	e.20	.49	2.3	e.40	.40	2.1	1.5	1.1	4.9	7.5	.18	e.11
13	e.20	e.30	2.8	e.40	4.2	1.8	1.5	.25	5.1	.28	.16	e.11
14	e.20	1.9	3.0	e.30	5.1	1.8	1.5	e.20	3.9	.24	.18	e.11
15	1.3	6.0	3.1	e.40	4.3	2.4	1.5	e.18	.47	.24	.19	e.11
16	9.7	6.6	3.3	e.70	.26	6.2	2.9	e.16	.30	.23	.24	.12
17	7.6	.65	e4.0	e.60	e.18	10	2.4	e.14	.24	.20	.22	6.5
18	2.2	.51	e2.0	e.40	4.5	2.8	1.8	e.12	.24	e.18	.20	3.0
19	.19	.45	e30	e.40	1.7	1.8	1.5	e.10	.24	e.16	.20	.30
20	.24	.51	e5.0	e.40	11	1.8	1.5	e.10	.24	6.8	e.18	.20
21	.17	.51	e4.0	e.40	7.6	1.8	1.5	e.80	.24	153	e.16	e.13
22	.29	.51	e1.0	e.40	4.8	1.8	1.5	e.30	.26	25	e.14	e.13
23	.89	.54	e1.0	e.30	.40	1.7	1.5	e.20	.32	2.1	e.12	e.13
24	.53	1.1	e.50	e.30	e.20	1.3	1.3	e.50	.32	.54	.12	e.13
25	.46	4.7	e7.0	e.30	e.15	1.4	1.3	.37	.69	.51	1.3	e.13
26	.69	2.1	e2.0	e.30	1.6	.54	1.2	.40	16	.51	.16	e.13
27	2.3	8.3	e1.0	e.30	12	1.5	1.1	.90	20	.51	e.14	e.13
28	2.2	2.4	e.70	e.30	7.7	3.0	1.2	e.60	58	.55	e.12	e.13
29	.43	2.6	e.50	e.30	1.7	6.7	4.1	e.50	5.4	.32	e.10	e.13
30	.32	2.6	e.40	e.30	---	3.8	3.7	e.40	1.6	1.6	.16	e.13
31	.32	---	e.40	e1.0	---	1.7	---	e.30	---	.44	e.14	---
TOTAL	46.49	63.93	100.33	20.20	84.58	79.63	53.4	21.37	827.70	219.88	33.08	13.13
MEAN	1.50	2.13	3.24	.65	2.92	2.57	1.78	.69	27.6	7.09	1.07	.44
MAX	9.7	13	30	6.0	12	10	4.1	1.7	659	153	8.9	6.5
MIN	.17	.30	.13	.30	.15	.18	1.1	.10	.10	.16	.10	.11
AC-FT	92	127	199	40	168	158	106	42	1640	436	66	26

CAL YR 1987 TOTAL 7647.70 MEAN 21.0 MAX 789 MIN .00 AC-FT 15170
WTR YR 1988 TOTAL 1563.72 MEAN 4.27 MAX 659 MIN .10 AC-FT 3100

e Estimated.

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 17...	1235	0.51	638	7.90	24.5	5	2.5	11.8	144	1.8	<100
FEB 02...	1255	0.31	611	7.90	15.0	2	1.3	10.0	100	4.4	20
APR 06...	1050	1.7	549	7.80	19.5	4	13	7.7	85	3.4	K210
JUN 07...	1330	0.50	628	8.00	26.5	14	8.0	8.3	106	3.0	620

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
DEC 17...	K670	290	35	96	11	22	0.6	12	250	59	26
FEB 02...	200	250	21	84	10	20	0.6	12	230	40	24
APR 06...	280	230	22	74	11	21	0.6	9.6	208	50	24
JUN 07...	480	250	96	90	7.2	23	0.7	14	159	100	24

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 17...	0.50	13	389	2	<1	0.780	0.020	0.800	0.030	0.47	0.50
FEB 02...	0.40	11	339	5	<1	1.68	0.020	1.70	0.040	--	<0.20
APR 06...	0.40	12	327	25	6	0.280	0.020	0.300	0.050	0.35	0.40
JUN 07...	0.70	15	369	13	3	0.440	0.020	0.460	0.030	0.37	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 17...	0.020	2.5	1	60	<1	<1	<1	3	<5	2	<0.1
FEB 02...	0.030	0.4	--	--	--	--	--	--	--	--	--
APR 06...	0.040	3.9	--	--	--	--	--	--	--	--	--
JUN 07...	0.030	6.3	2	64	<1	<1	1	<3	<5	9	<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 17...	<1	<1.0	3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
FEB 02...	--	--	--	--	--	--	--	--	--	--	--
APR 06...	--	--	--	--	--	--	--	--	--	--	--
JUN 07...	2	<1.0	3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.16

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 17...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
FEB 02...	--	--	--	--	--	--	--	--	--	--
APR 06...	--	--	--	--	--	--	--	--	--	--
JUN 07...	<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 17...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
FEB 02...	--	--	--	--	--	--	--	--	--	--
APR 06...	--	--	--	--	--	--	--	--	--	--
JUN 07...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.03	0.01	<0.01

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX

LOCATION.--Lat 29°21'25", long 98°24'45", Bexar County, Hydrologic Unit 12100301, on right bank at upstream side of bridge on Loop 13 at San Antonio, 1.4 mi east of Brooks Air Force Base, and 3.3 mi upstream from Rosillo Creek.

DRAINAGE AREA.--189 mi².

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 526.95 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Small diversions above station. Recording rain gages in watershed above station. Most of low flow comes from artesian wells and springs in the city of San Antonio. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08178700. Satellite telemeter at station.

AVERAGE DISCHARGE.--28 years, 43.3 ft³/s (3.11 in/yr), 31,370 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft³/s Sept. 27, 1973 (gage height, 28.83 ft); no flow Aug. 13, 1967.
Maximum stage since at least 1941, that of Sept. 27, 1973.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of Sept. 27, 1946, and Aug. 15, 1960, were about equal magnitude. Flood of Aug. 15, 1960, reached a stage of 26.8 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,690 ft³/s June 3 at 1400 hours (gage height, 15.11 ft); minimum daily, 11 ft³/s June 21-23, July 18, 19, Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	27	33	26	29	27	27	22	13	14	23	14
2	24	27	32	26	29	28	25	18	12	14	32	14
3	23	26	30	26	26	31	24	16	709	14	26	14
4	23	27	29	26	25	27	24	15	97	18	45	15
5	23	26	29	25	25	26	24	15	36	20	38	14
6	24	26	29	31	34	27	23	15	26	14	21	11
7	24	25	29	39	36	30	22	16	22	15	19	13
8	23	61	27	33	33	30	25	16	17	12	17	12
9	23	133	31	27	29	25	38	17	16	12	15	12
10	23	e69	36	26	26	23	27	16	15	13	14	14
11	23	e40	30	27	25	23	23	16	14	17	14	14
12	23	e30	28	26	24	24	23	17	14	77	14	14
13	24	e28	28	26	24	26	21	17	14	24	16	16
14	23	e26	28	25	27	25	21	16	15	14	17	13
15	24	e50	28	25	30	24	20	16	12	13	17	14
16	23	e90	28	25	29	24	29	17	13	13	15	14
17	28	45	29	32	25	59	42	15	12	12	15	34
18	31	31	102	33	86	85	29	14	12	11	27	52
19	30	27	129	28	51	37	24	13	12	11	19	26
20	24	27	131	26	32	31	21	13	12	15	15	18
21	23	27	48	25	34	29	20	34	11	369	14	17
22	24	27	42	24	32	26	20	21	11	153	14	15
23	36	27	30	23	30	26	20	15	11	36	14	15
24	34	30	28	27	26	26	18	14	13	24	13	14
25	29	104	30	29	25	25	18	13	12	20	17	14
26	29	63	39	29	26	24	16	13	55	18	19	14
27	28	92	32	26	26	24	15	13	31	18	15	13
28	29	62	33	25	33	24	15	13	131	29	15	12
29	30	37	30	25	33	25	15	12	39	32	15	14
30	29	36	25	25	---	29	23	13	19	21	13	14
31	27	---	25	26	---	28	---	13	---	20	13	---
TOTAL	805	1346	1228	842	910	918	692	494	1426	1093	581	490
MEAN	26.0	44.9	39.6	27.2	31.4	29.6	23.1	15.9	47.5	35.3	18.7	16.3
MAX	36	133	131	39	86	85	42	34	709	369	45	52
MIN	23	25	25	23	24	23	15	12	11	11	13	11
AC-FT	1600	2670	2440	1670	1800	1820	1370	980	2830	2170	1150	972
CFSM	.14	.24	.21	.14	.17	.16	.12	.08	.25	.19	.10	.09
IN.	.16	.26	.24	.17	.18	.18	.14	.10	.28	.22	.11	.10

CAL YR 1987 TOTAL 28960 MEAN 79.3 MAX 1360 MIN 23 AC-FT 57440 CFSM .42 IN. 5.70
WTR YR 1988 TOTAL 10825 MEAN 29.6 MAX 709 MIN 11 AC-FT 21470 CFSM .16 IN. 2.13

e Estimated.

08178800 SALADO CREEK (LOWER 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.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: January 1987 to current year.
pH: January 1987 to current year.
WATER TEMPERATURE: January 1987 to current year.
DISSOLVED OXYGEN: January 1987 to current year.

INSTRUMENTATION.--Beginning January 1987, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunction of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 940 microsiemens July 2, 1987; minimum, 177 microsiemens June 3, 1988.
pH: Maximum, 8.4 units on several days during 1987 and 1988; minimum, 7.4 units Feb. 18, 1987, Mar. 18-21, 1988.
WATER TEMPERATURE: Maximum, 31.0°C July 17-20, 1988; minimum, 8.0°C Jan. 11, 1988.
DISSOLVED OXYGEN: Maximum, 16.7 mg/L Jan. 27, 1988; minimum, 3.6 mg/L Aug. 15, 1988.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 873 microsiemens Mar. 30; minimum, 177 microsiemens June 3.
pH: Maximum, 8.4 units Dec. 16; minimum, 7.4 units Mar. 18-21.
WATER TEMPERATURE: Maximum, 31.0°C July 17-20; minimum, 8.0°C Jan. 11.
DISSOLVED OXYGEN: Maximum, 16.7 mg/L Jan. 27; minimum, 3.6 mg/L Aug. 15.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT 29...	1315	15	746	8.10	20.0	--	--	7.0	78	2.8	--
DEC 09...	1410	34	770	8.00	17.0	4	3.5	8.7	91	1.1	280
FEB 19...	1430	44	533	7.70	15.5	8	11	7.8	80	1.6	--
APR 06...	1145	24	741	7.70	20.0	8	19	7.0	78	2.6	K200
JUN 29...	1200	44	356	7.90	26.0	30	170	5.6	71	2.2	2100
AUG 09...	1200	16	622	8.00	27.0	19	10	4.8	62	1.8	480

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT 29...	--	280	30	87	16	43	1	3.6	254	52	54
DEC 09...	210	310	38	96	17	44	1	4.1	272	54	57
FEB 19...	--	210	43	66	12	29	0.9	4.4	172	46	37
APR 06...	290	290	25	88	16	41	1	4.6	261	58	58
JUN 29...	3300	140	41	46	5.0	18	0.7	5.0	95	40	19
AUG 09...	700	230	35	72	11	38	1	4.3	190	47	50

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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT 29...	0.30	14	422	--	--	1.58	0.020	1.60	0.040	0.16	0.20
DEC 09...	0.30	12	447	8	5	1.28	0.020	1.30	0.030	0.37	0.40
FEB 19...	0.30	9.7	308	20	4	0.980	0.020	1.00	0.100	0.50	0.60
APR 06...	0.30	14	436	36	7	1.17	0.030	1.20	0.050	0.25	0.30
JUN 29...	0.40	9.7	200	272	40	0.500	0.100	0.600	0.260	0.14	0.40
AUG 09...	0.20	13	349	18	3	--	<0.010	0.700	0.040	0.26	0.30

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT 29...	0.060	--	--	--	--	--	--	--	--	--	--
DEC 09...	0.160	3.1	--	--	--	--	--	--	--	--	--
FEB 19...	0.080	4.8	2	70	<1	1	<1	78	<5	28	<0.1
APR 06...	0.060	3.6	--	--	--	--	--	--	--	--	--
JUN 29...	2.60	11	2	50	<1	<1	2	11	<5	2	0.9
AUG 09...	0.070	4.4	--	--	--	--	--	--	--	--	--

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
OCT 29...	--	--	--	--	--	--	--	--	--	--	--
DEC 09...	--	--	--	--	--	--	--	--	--	--	--
FEB 19...	<1	<1.0	8	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.01
APR 06...	--	--	--	--	--	--	--	--	--	--	--
JUN 29...	1	<1.0	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.47
AUG 09...	--	--	--	--	--	--	--	--	--	--	--

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)
OCT 29...	--	--	--	--	--	--	--	--	--	--
DEC 09...	--	--	--	--	--	--	--	--	--	--
FEB 19...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	0.010	0.03	<0.01	<0.01
APR 06...	--	--	--	--	--	--	--	--	--	--
JUN 29...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	0.010	0.04	<0.01	<0.01
AUG 09...	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
OCT 29...	--	--	--	--	--	--	--	--	--	--
DEC 09...	--	--	--	--	--	--	--	--	--	--
FEB 19...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.02	<0.01	<0.01
APR 06...	--	--	--	--	--	--	--	--	--	--
JUN 29...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	0.03	<0.01	<0.01
AUG 09...	--	--	--	--	--	--	--	--	--	--

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1987 TO SEPTEMBER 1988

MONTH	YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA,MG) (MG/L)
OCT.	1987	805	767	437	950	63	136	62	134	290
NOV.	1987	1346	605	352	1280	43	155	52	188	240
DEC.	1987	1228	634	367	1220	47	154	53	177	250
JAN.	1988	842	761	434	987	62	141	61	139	290
FEB.	1988	910	712	409	1000	55	136	58	144	270
MAR.	1988	918	722	413	1020	57	141	59	146	280
APR.	1988	692	748	428	799	60	112	61	113	290
MAY	1988	494	744	426	568	60	80	60	81	280
JUNE	1988	1426	429	254	979	27	102	38	148	170
JULY	1988	1093	448	266	786	27	80	40	119	180
AUG.	1988	581	662	383	601	49	77	56	87	260
SEPT	1988	490	680	392	519	51	68	57	75	260
TOTAL		10825	**	**	10700	**	1380	**	1550	**
WTD.AVG.		30	634	367	**	47	**	53	**	250

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER AT 25 DEG. C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	775	753	767	779	757	766	672	581	629	789	747	780
2	775	753	765	779	768	775	702	671	688	800	747	788
3	788	764	776	788	768	779	720	700	708	789	779	787
4	788	776	782	778	768	770	738	718	725	789	779	782
5	788	776	786	779	758	772	747	728	740	790	738	779
6	788	754	772	779	768	773	765	736	751	790	758	771
7	788	754	768	779	769	778	763	743	752	758	727	735
8	766	744	752	779	442	711	772	751	763	790	727	755
9	778	744	762	---	---	400	771	721	748	759	748	753
10	789	767	778	---	---	495	731	702	718	780	759	770
11	778	767	777	---	---	575	732	713	722	770	749	756
12	790	767	780	---	---	620	755	724	736	770	749	764
13	790	779	784	---	---	660	757	745	754	760	748	751
14	790	767	779	---	---	700	768	757	763	770	749	762
15	791	768	780	---	---	615	759	739	750	770	760	769
16	791	769	783	---	---	500	760	741	748	791	770	777
17	791	747	777	---	---	600	752	733	746	781	740	763
18	758	736	750	724	662	703	774	520	620	761	739	748
19	747	736	738	765	713	741	592	316	467	750	739	746
20	770	736	746	764	710	730	389	337	354	771	750	764
21	782	759	772	751	719	734	544	408	488	782	739	774
22	782	770	775	738	718	726	586	554	560	792	739	778
23	827	759	778	757	737	743	660	586	631	782	771	776
24	771	726	750	776	745	759	702	660	683	782	739	764
25	782	726	757	745	413	581	734	702	715	750	729	739
26	772	749	761	659	505	568	715	694	704	739	718	731
27	783	761	774	649	421	509	727	705	715	750	718	734
28	783	761	776	605	452	506	740	707	722	760	739	750
29	761	746	749	605	543	569	750	710	729	771	750	756
30	757	736	746	593	562	573	746	736	737	771	760	767
31	767	747	756	---	---	---	779	737	768	771	750	763
MONTH	827	726	768	788	413	658	779	316	688	800	718	762

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

SPECIFIC CONDUCTANCE, MICROSIEMENS PER CENTIMETER AT 25 DEG. C, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	760	749	756	751	730	740	798	766	783	719	709	715
2	760	739	753	774	752	762	808	776	787	768	718	741
3	781	749	762	765	743	755	818	786	794	758	738	752
4	781	770	779	766	744	753	796	786	789	758	728	745
5	791	779	783	777	757	763	796	774	786	767	757	761
6	790	726	761	768	738	757	795	774	783	837	747	769
7	747	715	731	749	727	742	805	773	779	777	747	758
8	735	704	719	750	729	739	836	762	776	776	756	767
9	766	744	753	763	731	746	762	709	729	766	746	755
10	745	712	730	774	752	768	771	719	738	776	756	764
11	754	733	744	786	764	777	761	729	741	775	755	762
12	764	752	762	787	776	781	760	738	748	775	755	764
13	784	762	772	778	757	767	773	738	761	775	745	759
14	782	740	761	780	768	774	762	751	759	774	754	763
15	750	718	736	792	760	775	773	751	761	784	764	772
16	739	728	733	793	761	772	772	593	738	794	773	781
17	768	737	751	783	382	732	727	627	673	783	773	778
18	778	497	640	572	360	493	694	649	672	793	772	780
19	559	425	519	627	520	557	694	660	682	810	781	789
20	695	548	635	692	608	656	737	694	717	817	789	803
21	684	560	605	705	608	641	771	737	748	797	437	680
22	675	623	658	727	683	714	749	726	739	679	639	656
23	686	664	673	749	727	742	760	749	754	724	648	690
24	738	686	714	771	759	762	760	749	759	723	692	706
25	760	738	747	791	770	784	770	748	761	720	692	707
26	833	749	768	802	780	791	770	759	765	728	709	717
27	782	739	772	801	790	792	781	750	766	762	717	738
28	781	730	756	800	789	799	770	750	762	781	743	760
29	741	719	733	800	788	796	779	759	766	778	748	760
30	---	---	---	873	767	784	769	719	746	776	735	758
31	---	---	---	777	766	774	---	---	---	763	743	749
MONTH	833	425	724	873	360	742	836	593	752	837	437	748

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	770	731	750	540	500	520	640	570	608	770	720	742
2	757	718	745	570	530	548	700	620	666	750	730	739
3	709	177	292	590	550	570	680	660	665	740	720	729
4	352	205	294	640	590	616	700	550	650	750	720	736
5	471	361	404	640	540	601	570	360	453	740	720	725
6	525	452	490	690	510	636	550	520	537	740	710	724
7	630	504	565	710	640	686	560	540	547	740	720	730
8	700	630	656	730	700	717	620	560	583	750	720	738
9	730	700	713	750	710	733	660	620	636	760	730	744
10	760	730	743	750	720	738	670	640	659	760	730	744
11	780	750	767	800	680	727	690	660	676	750	720	734
12	810	780	793	700	350	488	700	680	693	740	730	735
13	810	790	799	530	400	481	700	680	694	750	730	737
14	810	790	801	620	480	542	700	660	689	750	710	726
15	820	790	799	650	590	625	720	590	687	750	730	741
16	820	800	814	610	580	595	720	690	705	750	730	740
17	830	800	812	650	560	608	730	710	726	730	500	658
18	830	820	824	680	620	639	730	660	711	610	520	571
19	820	810	815	680	630	656	700	660	669	570	490	518
20	830	810	818	710	660	687	720	690	708	630	580	607
21	840	820	826	670	200	337	730	710	725	650	630	636
22	830	810	826	320	210	264	730	720	726	670	650	660
23	830	800	820	410	320	367	720	710	715	670	650	660
24	820	710	803	500	400	439	730	710	722	670	660	665
25	810	780	801	520	470	493	740	710	728	670	660	668
26	800	550	674	570	520	543	730	670	692	690	670	679
27	560	510	543	610	560	587	720	690	704	710	680	694
28	620	290	430	640	560	607	780	710	724	720	690	705
29	410	320	369	610	570	595	780	740	746	740	710	723
30	480	410	439	630	480	609	760	740	747	730	710	721
31	---	---	---	660	540	626	770	740	759	---	---	---
MONTH	840	177	674	800	200	577	780	360	676	770	490	698

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	8.2	8.1	8.1	8.1	8.1	8.1	7.9	7.8	7.8	8.2	8.1	8.1
2	8.2	8.1	8.1	8.2	8.1	8.1	7.9	7.9	7.9	8.2	8.2	8.2
3	8.2	8.1	8.1	8.1	8.1	8.1	8.0	7.9	7.9	8.2	8.2	8.2
4	8.2	8.1	8.1	8.1	8.1	8.1	7.9	7.8	7.9	8.3	8.2	8.2
5	8.2	8.0	8.1	8.1	8.1	8.1	7.9	7.8	7.9	8.3	8.2	8.2
6	8.1	8.0	8.1	8.2	8.1	8.1	7.9	7.9	7.9	8.3	8.2	8.2
7	8.2	8.0	8.1	8.2	8.1	8.1	8.0	7.9	7.9	8.3	8.1	8.2
8	8.1	8.0	8.1	8.2	7.8	8.1	8.0	7.9	7.9	8.2	8.1	8.2
9	8.1	8.0	8.1	---	---	---	8.1	7.9	8.0	8.3	8.2	8.3
10	8.1	8.0	8.1	---	---	---	8.1	8.0	8.1	8.3	8.2	8.3
11	8.1	8.0	8.1	---	---	---	8.2	8.1	8.1	8.3	8.2	8.2
12	8.1	8.0	8.1	---	---	---	8.2	8.0	8.1	8.3	8.2	8.2
13	8.2	8.0	8.1	---	---	---	8.1	8.1	8.1	8.3	8.2	8.3
14	8.2	8.0	8.1	---	---	---	8.3	8.1	8.2	8.3	8.2	8.3
15	8.1	8.0	8.1	---	---	---	8.3	8.2	8.3	8.3	8.2	8.2
16	8.2	8.0	8.1	---	---	---	8.4	8.2	8.3	8.2	8.1	8.2
17	8.2	8.0	8.1	---	---	---	8.3	8.2	8.2	8.3	8.1	8.2
18	8.2	8.1	8.1	8.1	8.1	8.1	8.2	8.0	8.1	8.2	8.1	8.2
19	8.1	8.0	8.1	8.2	8.1	8.2	8.1	7.9	8.0	8.3	8.0	8.2
20	8.2	8.1	8.1	8.2	8.1	8.1	7.9	7.9	7.9	8.3	8.1	8.2
21	8.2	8.1	8.1	8.2	8.1	8.2	7.9	7.9	7.9	8.3	8.1	8.2
22	8.2	8.1	8.1	8.2	8.1	8.2	7.9	7.9	7.9	8.3	8.2	8.2
23	8.1	8.0	8.0	8.1	8.0	8.1	7.9	7.9	7.9	8.3	8.2	8.2
24	8.0	7.9	8.0	8.1	8.0	8.1	8.1	7.9	8.0	8.3	8.2	8.3
25	8.0	7.9	8.0	8.0	7.8	7.9	8.1	8.1	8.1	8.3	8.2	8.3
26	8.0	7.9	8.0	7.9	7.8	7.9	8.2	8.1	8.1	8.3	8.2	8.3
27	8.1	8.0	8.0	7.9	7.7	7.8	8.2	8.1	8.2	8.3	8.2	8.3
28	8.1	8.1	8.1	7.8	7.7	7.8	8.2	8.2	8.2	8.3	8.2	8.3
29	8.1	8.0	8.1	7.8	7.7	7.8	8.2	8.1	8.2	8.3	8.2	8.2
30	8.2	8.1	8.1	7.8	7.7	7.8	8.1	8.0	8.1	8.2	8.0	8.1
31	8.2	8.1	8.1	---	---	---	8.1	8.0	8.1	8.1	8.0	8.1
MONTH	8.2	7.9	8.1	8.2	7.7	8.0	8.4	7.8	8.0	8.3	8.0	8.2

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	8.1	8.0	8.1	7.9	7.8	7.9	8.0	7.9	8.0	8.1	8.0	8.0
2	8.0	8.0	8.0	7.9	7.8	7.9	8.0	8.0	8.0	8.0	7.9	8.0
3	8.2	8.0	8.1	7.9	7.8	7.9	8.1	8.0	8.0	8.0	7.9	7.9
4	8.2	8.1	8.2	7.9	7.8	7.9	8.0	8.0	8.0	8.0	8.0	8.0
5	8.3	8.2	8.2	7.9	7.8	7.9	8.0	8.0	8.0	8.0	8.0	8.0
6	8.3	8.2	8.3	8.0	7.9	7.9	8.1	8.0	8.0	8.0	7.9	8.0
7	8.3	8.2	8.3	8.0	7.8	7.9	8.1	8.0	8.1	8.0	7.9	8.0
8	8.3	8.2	8.3	7.9	7.8	7.8	8.1	8.0	8.0	8.1	8.0	8.1
9	8.3	8.2	8.3	7.9	7.8	7.9	8.0	7.9	7.9	8.1	8.1	8.1
10	8.2	8.1	8.2	7.9	7.8	7.8	7.9	7.9	7.9	8.2	8.1	8.1
11	8.3	8.1	8.2	7.9	7.8	7.8	8.0	7.8	7.9	8.2	8.1	8.2
12	8.3	8.1	8.2	7.9	7.8	7.8	8.1	8.0	8.0	8.2	8.1	8.1
13	8.3	8.2	8.2	7.9	7.8	7.8	8.1	8.0	8.1	8.2	8.1	8.1
14	8.3	8.1	8.2	7.9	7.8	7.8	8.1	8.1	8.1	8.2	8.1	8.1
15	8.3	8.1	8.2	7.9	7.8	7.8	8.2	8.1	8.1	8.2	8.1	8.1
16	8.3	8.1	8.2	7.9	7.8	7.8	8.2	8.0	8.1	8.2	8.1	8.1
17	8.2	8.1	8.1	7.8	7.7	7.8	8.0	7.9	8.0	8.2	8.1	8.2
18	8.1	7.9	8.0	7.8	7.4	7.6	8.0	7.8	7.9	8.2	8.1	8.1
19	7.9	7.8	7.9	7.5	7.4	7.4	8.0	7.9	7.9	8.2	8.1	8.1
20	7.9	7.8	7.8	7.6	7.4	7.5	8.0	7.9	7.9	8.1	8.1	8.1
21	7.9	7.7	7.8	7.6	7.4	7.5	8.0	7.9	8.0	8.2	7.9	8.0
22	7.9	7.8	7.9	7.6	7.5	7.6	8.0	7.9	8.0	8.0	7.9	7.9
23	7.9	7.8	7.9	7.9	7.6	7.7	8.1	8.0	8.0	7.9	7.9	7.9
24	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.0	7.9	7.8	7.9
25	8.0	7.8	7.9	7.9	7.9	7.9	8.1	8.0	8.0	8.0	7.9	7.9
26	7.9	7.8	7.8	7.9	7.9	7.9	8.1	8.0	8.0	8.0	7.9	8.0
27	7.9	7.8	7.9	7.9	7.9	7.9	8.1	7.9	8.0	8.1	8.0	8.0
28	7.9	7.8	7.9	7.9	7.9	7.9	8.1	8.0	8.1	8.2	8.0	8.1
29	7.9	7.8	7.9	7.9	7.9	7.9	8.1	8.0	8.1	8.2	8.1	8.2
30	---	---	---	7.9	7.9	7.9	8.1	8.0	8.0	8.2	8.1	8.2
31	---	---	---	8.0	7.8	7.9	---	---	---	8.2	8.1	8.2
MONTH	8.3	7.7	8.1	8.0	7.4	7.8	8.2	7.8	8.0	8.2	7.8	8.1

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	8.2	8.2	8.2	8.0	7.9	8.0	8.0	7.9	8.0	8.1	7.7	8.0
2	8.2	8.1	8.2	8.1	8.0	8.0	8.1	8.0	8.1	8.1	8.0	8.1
3	8.2	7.8	8.2	8.1	8.1	8.1	8.2	8.1	8.1	8.1	8.1	8.1
4	8.0	7.8	7.9	8.2	8.1	8.2	8.2	8.1	8.1	8.1	8.0	8.1
5	7.8	7.7	7.7	8.3	8.2	8.2	8.1	7.7	7.9	8.1	8.0	8.1
6	7.8	7.8	7.8	8.2	8.0	8.2	7.9	7.7	7.8	8.1	8.1	8.1
7	8.0	7.8	7.9	8.2	8.1	8.2	7.9	7.8	7.8	8.2	8.1	8.2
8	8.0	8.0	8.0	8.3	8.2	8.2	7.9	7.8	7.9	8.2	8.2	8.2
9	8.1	8.0	8.0	8.3	8.2	8.2	8.1	7.9	8.0	8.2	8.2	8.2
10	8.1	8.0	8.1	8.3	8.2	8.2	8.0	8.0	8.0	8.2	8.2	8.2
11	8.1	8.1	8.1	8.2	8.2	8.2	8.1	8.0	8.1	8.2	8.2	8.2
12	8.2	8.1	8.1	8.2	7.9	8.0	8.1	8.0	8.1	8.2	8.2	8.2
13	8.2	8.1	8.1	8.0	7.9	8.0	8.2	8.1	8.1	8.2	8.0	8.2
14	8.2	8.1	8.2	8.1	8.0	8.0	8.2	8.1	8.1	8.2	8.1	8.2
15	8.2	8.1	8.1	8.1	8.0	8.1	8.1	8.0	8.1	8.2	8.1	8.2
16	8.2	8.1	8.2	8.1	8.0	8.1	8.1	8.1	8.1	8.2	8.2	8.2
17	8.2	8.2	8.2	8.2	8.1	8.1	8.1	8.1	8.1	8.2	7.9	8.0
18	8.2	8.2	8.2	8.2	8.1	8.2	8.1	8.0	8.1	8.0	7.9	7.9
19	8.3	8.2	8.2	8.2	8.1	8.2	8.1	8.0	8.0	7.9	7.8	7.8
20	8.3	8.2	8.2	8.3	8.2	8.2	8.1	8.1	8.1	8.0	7.9	7.9
21	8.3	8.2	8.3	8.2	8.0	8.1	8.1	8.1	8.1	8.1	8.0	8.0
22	8.3	8.2	8.3	8.1	7.9	8.0	8.1	8.1	8.1	8.1	8.0	8.0
23	8.3	8.3	8.3	7.9	7.8	7.8	8.1	8.1	8.1	8.0	8.0	8.0
24	8.3	8.0	8.2	7.9	7.8	7.9	8.2	8.1	8.1	8.0	8.0	8.0
25	8.3	8.3	8.3	8.0	7.9	7.9	8.1	8.0	8.0	8.0	8.0	8.0
26	8.3	8.0	8.2	8.1	7.8	8.0	8.1	8.0	8.0	8.1	8.0	8.0
27	8.0	7.9	8.0	8.1	8.0	8.1	8.1	8.0	8.1	8.1	8.1	8.1
28	8.1	7.9	8.0	8.1	8.1	8.1	8.1	8.1	8.1	8.3	8.0	8.2
29	8.0	7.9	7.9	8.1	8.0	8.1	8.1	8.0	8.1	8.3	8.3	8.3
30	7.9	7.8	7.9	8.0	7.7	7.9	8.1	8.0	8.1	8.3	8.2	8.3
31	---	---	---	7.9	7.8	7.9	8.1	8.1	8.1	---	---	---
MONTH	8.3	7.7	8.1	8.3	7.7	8.1	8.2	7.7	8.1	8.3	7.7	8.1

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	21.5	21.5	20.5	21.0	14.5	13.5	14.0	13.0	11.0	12.0
2	22.0	20.5	21.0	21.5	21.0	21.0	15.0	13.5	14.0	11.5	11.0	11.0
3	21.5	20.5	21.0	21.0	20.5	21.0	16.0	14.5	15.0	12.0	11.0	11.5
4	21.0	19.0	20.0	21.0	20.0	20.5	16.0	15.0	15.5	11.5	11.0	11.5
5	20.5	19.0	19.5	21.5	20.0	21.0	18.0	16.0	17.0	11.5	11.5	11.5
6	20.5	20.0	20.5	21.0	20.5	20.5	19.0	18.0	18.5	11.5	11.0	11.5
7	20.5	19.0	19.5	20.5	19.5	20.0	18.5	17.5	18.0	11.5	11.0	11.0
8	20.5	19.0	19.5	21.0	19.5	20.5	18.0	17.0	17.5	11.0	9.5	10.0
9	21.5	20.0	21.0	---	---	20.0	17.5	16.5	17.0	9.5	9.0	9.5
10	21.5	20.5	21.0	---	---	---	17.0	16.0	16.5	9.5	8.5	9.0
11	21.5	20.5	21.0	---	---	---	17.0	16.0	17.0	9.0	8.0	8.5
12	21.5	20.0	20.5	---	---	---	17.0	16.0	16.5	11.0	9.5	10.5
13	20.5	19.5	20.0	---	---	---	16.0	15.5	15.5	11.0	10.5	10.5
14	21.0	19.5	20.5	---	---	---	15.5	13.5	15.0	11.0	10.0	10.5
15	21.0	20.0	20.5	---	---	---	13.5	12.0	12.5	12.5	11.0	11.5
16	22.0	20.5	21.0	---	---	---	12.0	11.0	11.5	14.0	12.5	13.5
17	23.0	21.5	22.0	---	---	18.0	12.0	11.5	12.0	15.5	14.0	14.5
18	23.0	22.0	22.5	18.0	17.0	17.5	14.5	11.5	13.0	16.5	15.0	15.5
19	23.0	22.0	22.5	17.5	15.5	16.5	16.5	14.5	15.0	16.5	15.5	16.0
20	22.5	22.0	22.5	15.5	14.0	14.5	16.0	15.5	15.5	15.5	13.5	14.5
21	22.0	20.0	20.5	15.0	13.5	14.5	---	---	15.0	13.5	12.0	12.5
22	20.0	19.0	19.5	16.5	15.0	15.5	---	---	15.0	12.0	11.5	12.0
23	20.5	19.5	20.0	18.5	16.5	17.5	16.0	14.5	15.0	12.0	11.0	11.5
24	21.5	20.5	21.0	19.5	18.5	19.0	18.0	16.0	17.0	12.5	11.0	11.5
25	22.0	21.0	21.5	20.5	19.0	20.0	18.0	15.0	16.5	12.0	11.0	11.5
26	23.0	21.5	22.5	19.5	18.0	18.5	15.0	13.5	14.5	12.0	10.5	11.5
27	22.5	21.0	21.5	17.5	16.0	17.0	13.5	12.5	12.5	12.5	11.5	12.0
28	21.0	19.5	20.0	15.5	14.5	15.5	12.5	11.5	12.0	13.5	12.0	12.5
29	21.0	19.5	20.5	15.0	14.0	14.5	12.0	10.5	11.0	14.5	13.0	13.5
30	21.5	20.5	21.0	15.0	14.0	14.5	11.5	11.0	11.0	16.5	14.5	15.5
31	21.5	20.5	21.0	---	---	---	13.0	11.5	12.0	17.5	16.0	17.0
MONTH	23.0	19.0	21.0	21.5	13.5	18.0	19.0	10.5	15.0	17.5	8.0	12.0

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	18.5	17.5	18.0	21.5	20.5	21.0	21.5	19.5	20.0	---	---	---
2	18.5	16.0	18.0	21.0	20.0	20.5	20.5	18.5	19.5	---	---	---
3	16.0	15.0	15.5	20.0	18.0	19.0	21.0	18.5	20.0	---	---	---
4	15.0	13.0	14.0	18.0	17.0	17.5	21.5	20.0	20.5	---	---	---
5	12.5	11.0	12.0	18.0	15.5	17.0	22.5	21.0	21.5	---	---	---
6	12.0	10.5	11.0	18.5	16.5	17.5	22.0	21.0	21.0	---	---	---
7	11.5	11.0	11.5	18.5	17.5	18.0	21.0	19.0	20.0	---	---	---
8	13.0	11.5	12.0	19.5	18.5	19.0	20.5	19.0	19.5	---	---	---
9	14.0	13.0	13.5	18.5	17.0	18.0	19.5	19.0	19.0	---	---	---
10	14.5	13.5	14.0	18.5	16.0	17.5	19.5	17.5	18.5	---	---	---
11	14.5	12.5	13.5	20.0	17.5	19.0	18.0	16.0	17.5	---	---	---
12	12.5	10.5	11.5	20.0	19.0	19.5	18.5	16.0	17.0	---	---	---
13	14.0	11.5	12.5	19.0	17.0	17.5	18.0	17.0	17.5	---	---	---
14	16.0	14.0	15.0	17.5	15.0	16.0	20.0	17.0	18.0	---	---	---
15	15.5	14.0	14.5	15.5	14.0	15.0	21.0	19.0	20.0	---	---	---
16	16.0	13.5	14.5	15.5	15.0	15.0	21.0	20.0	20.5	---	---	---
17	17.0	16.0	16.5	16.5	15.0	15.5	21.5	19.5	20.5	---	---	---
18	17.0	15.5	16.5	16.0	14.5	15.5	21.5	20.5	21.0	---	---	23.5
19	15.5	15.0	15.5	15.5	13.0	14.5	21.5	19.0	20.0	24.5	23.0	23.5
20	15.5	14.5	15.0	16.0	14.0	15.0	21.5	19.0	20.0	24.0	23.5	24.0
21	15.5	13.5	14.5	17.0	14.5	15.5	21.5	20.0	21.0	24.0	21.5	23.0
22	16.0	14.0	15.0	18.0	16.5	17.0	23.5	21.0	22.0	23.0	22.0	22.5
23	16.0	15.5	16.0	19.5	18.0	18.5	24.0	22.5	23.0	23.5	21.0	22.5
24	16.0	14.5	15.5	21.5	19.0	20.0	23.5	21.0	22.0	24.5	22.5	23.5
25	16.5	14.5	15.5	22.5	21.0	21.5	23.0	21.0	22.0	24.5	23.0	24.0
26	16.5	16.0	16.5	22.0	21.5	21.5	23.0	20.0	21.5	24.5	23.0	23.5
27	18.0	16.5	17.0	22.0	21.0	21.5	23.0	21.0	22.0	24.5	22.5	23.5
28	19.5	17.0	18.0	22.0	21.5	22.0	22.5	20.5	21.5	24.5	23.0	24.0
29	21.0	19.0	20.0	22.0	19.5	21.5	22.5	21.5	22.0	24.5	23.5	24.0
30	---	---	---	19.5	18.0	18.5	---	---	21.5	24.5	24.0	24.5
31	---	---	---	19.5	18.5	18.5	---	---	---	24.5	24.0	24.5
MONTH	21.0	10.5	15.0	22.5	13.0	18.0	24.0	16.0	20.5	24.5	21.0	23.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	25.5	24.0	25.0	28.5	26.5	27.5	27.5	25.5	26.5	---	---	---
2	26.5	25.0	25.5	29.0	27.0	28.0	27.5	26.0	26.5	---	---	---
3	26.0	21.0	22.0	29.0	27.5	28.5	27.0	26.5	26.5	---	---	---
4	23.0	21.5	22.0	29.0	27.5	28.5	27.0	26.0	26.5	---	---	---
5	24.0	22.0	22.5	29.0	27.5	28.5	28.0	26.0	26.5	---	---	---
6	24.0	22.5	23.0	29.0	27.5	28.5	28.0	26.5	27.5	---	---	---
7	25.5	23.0	24.0	29.0	27.5	28.0	28.0	26.5	27.5	---	---	---
8	26.0	24.0	25.0	28.5	27.0	28.0	28.0	26.5	27.5	---	---	---
9	27.0	24.5	25.5	28.0	27.5	27.5	30.0	27.0	28.5	---	---	---
10	27.0	26.0	26.5	28.0	26.5	27.5	30.5	29.0	29.5	---	---	---
11	26.5	25.0	25.5	28.0	26.0	27.0	30.0	29.0	29.5	---	---	---
12	26.0	24.5	25.5	29.0	27.5	28.5	30.0	29.0	29.5	---	---	---
13	26.0	24.5	25.0	29.5	28.0	28.5	30.5	28.5	29.5	---	---	---
14	26.0	24.5	25.5	30.0	28.0	29.5	30.0	28.5	29.0	---	---	---
15	26.5	25.5	26.0	30.0	28.5	29.5	29.5	28.0	28.5	---	---	---
16	26.5	25.0	25.5	30.5	28.5	29.5	29.0	28.0	28.5	---	---	---
17	26.0	25.0	25.5	31.0	29.0	30.0	29.0	28.0	28.5	---	---	---
18	26.5	25.5	26.0	31.0	28.5	30.0	29.0	27.5	28.5	---	---	---
19	26.5	25.0	25.5	31.0	29.5	30.5	28.0	27.0	27.5	---	---	---
20	26.5	25.5	26.0	31.0	30.0	30.0	28.5	27.5	28.0	---	---	---
21	26.5	25.5	26.0	30.5	24.0	26.0	28.5	28.0	28.5	---	---	---
22	26.5	25.5	26.0	26.0	24.5	25.0	28.5	27.5	28.5	---	---	---
23	26.5	25.5	26.0	26.5	24.5	25.5	29.0	27.5	28.5	---	---	---
24	26.5	24.5	26.0	27.5	26.0	26.5	29.0	28.0	28.5	---	---	---
25	27.0	26.0	26.5	28.0	26.5	27.5	29.0	28.0	28.5	---	---	---
26	27.5	25.0	26.5	28.0	26.0	27.5	29.0	27.5	28.0	---	---	---
27	27.0	26.0	26.5	28.0	26.5	27.5	28.5	27.0	27.5	---	---	---
28	27.0	26.5	27.0	28.0	26.5	27.5	28.0	27.0	27.5	25.0	22.0	24.0
29	27.5	26.0	26.5	27.5	27.0	27.0	28.5	26.5	27.0	25.5	25.0	25.0
30	28.0	26.5	27.0	27.5	26.5	26.5	27.0	26.5	26.5	25.5	23.0	24.0
31	---	---	---	26.5	25.5	26.0	26.5	26.0	26.5	---	---	---
MONTH	28.0	21.0	25.5	31.0	24.0	28.0	30.5	25.5	28.0	25.5	22.0	24.5

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

OXYGEN, DISSOLVED (MG/L), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	6.8	5.9	6.3	7.1	6.7	6.9	7.8	7.2	7.5	8.1	7.5	7.8
2	7.1	6.1	6.6	6.9	6.5	6.7	8.0	7.4	7.7	7.6	7.3	7.4
3	7.2	6.3	6.7	6.9	6.5	6.7	7.8	7.3	7.5	7.3	7.0	7.1
4	7.4	6.6	7.0	7.0	6.4	6.7	7.9	7.2	7.5	7.1	6.7	6.9
5	7.4	6.5	7.0	6.8	6.4	6.6	7.6	7.1	7.4	7.0	6.6	6.7
6	7.4	6.5	6.9	6.7	6.2	6.5	7.3	6.6	7.0	6.9	6.4	6.6
7	7.5	6.6	7.0	6.9	6.4	6.6	7.7	6.5	7.1	7.3	6.4	6.6
8	7.5	6.6	7.0	6.9	6.2	6.5	7.9	6.7	7.3	8.3	6.3	6.9
9	7.2	6.5	6.8	---	---	6.5	8.7	6.7	7.7	8.8	7.4	7.7
10	7.2	6.3	6.7	---	---	---	8.7	7.7	8.2	7.6	7.0	7.3
11	7.1	6.3	6.7	---	---	---	8.9	7.7	8.3	7.4	6.8	7.0
12	7.2	6.4	6.8	---	---	---	9.1	7.6	8.4	7.5	6.7	7.1
13	7.5	6.5	7.0	---	---	---	8.5	7.8	8.2	8.6	6.9	7.4
14	7.4	6.6	7.0	---	---	---	9.3	7.8	8.5	7.7	7.1	7.3
15	7.3	6.5	6.9	---	---	---	10.7	8.8	9.8	8.5	7.2	7.7
16	7.2	6.4	6.8	---	---	---	11.0	9.6	10.3	8.8	7.7	8.1
17	7.2	6.3	6.7	---	---	7.5	10.3	9.5	9.8	9.0	8.0	8.4
18	7.2	6.4	6.7	7.4	6.8	7.1	9.8	8.9	9.4	10.2	8.3	9.1
19	7.0	6.4	6.7	7.7	6.8	7.3	8.8	7.7	8.4	12.3	9.1	10.4
20	7.3	6.4	6.8	8.0	7.3	7.6	9.0	7.8	8.7	13.8	10.6	12.2
21	7.8	6.8	7.3	8.2	7.6	7.9	---	---	9.1	14.0	11.4	12.7
22	7.8	7.2	7.4	7.8	7.4	7.6	---	---	9.1	15.8	11.9	13.6
23	7.4	6.4	7.0	7.4	6.9	7.1	8.7	8.4	8.7	13.3	11.6	12.5
24	6.9	6.2	6.6	6.8	6.3	6.5	8.4	8.0	8.2	12.9	11.3	12.1
25	6.7	6.2	6.4	7.0	5.8	6.5	8.6	7.8	8.0	13.3	11.4	12.3
26	6.8	6.0	6.3	6.7	6.2	6.5	9.1	8.6	8.8	15.8	12.1	13.9
27	7.3	6.4	6.8	7.7	6.6	7.3	9.6	9.1	9.3	16.7	13.2	14.7
28	7.6	7.0	7.3	7.7	7.3	7.5	9.9	9.5	9.7	13.2	10.0	10.9
29	7.5	7.0	7.2	7.4	7.0	7.3	9.6	9.2	9.4	10.4	9.5	10.0
30	7.2	6.9	7.1	7.4	7.0	7.2	9.1	8.6	8.8	11.1	9.5	10.2
31	7.3	6.8	7.0	---	---	---	9.7	8.1	8.4	12.0	10.0	11.0
MONTH	7.8	5.9	6.9	8.2	5.8	7.0	11.0	6.5	8.5	16.7	6.3	9.3

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	12.7	10.7	11.6	8.0	7.1	7.5	7.0	6.8	6.9	6.9	6.4	6.6
2	11.2	8.9	10.1	7.4	6.9	7.1	7.4	7.0	7.3	6.9	6.3	6.5
3	9.0	8.3	8.7	8.5	7.4	7.8	7.5	7.2	7.4	6.8	6.3	6.5
4	11.5	8.9	9.3	9.1	7.7	8.3	7.3	6.9	7.0	7.1	6.6	6.8
5	9.7	9.1	9.4	8.7	7.9	8.3	7.0	6.6	6.8	7.1	6.8	6.9
6	10.0	9.4	9.7	8.7	8.1	8.5	7.3	6.6	6.9	7.0	6.6	6.8
7	10.5	9.5	9.9	8.9	8.4	8.6	7.5	7.2	7.3	7.0	6.4	6.6
8	10.3	9.8	10.0	8.4	8.1	8.3	7.3	6.7	7.0	6.6	6.2	6.4
9	10.3	9.7	9.9	8.1	7.9	8.0	7.0	6.1	6.7	6.6	6.3	6.4
10	9.9	9.3	9.6	7.9	7.5	7.7	7.1	6.4	6.8	6.7	6.3	6.5
11	9.4	8.6	9.1	7.8	7.1	7.5	7.8	6.7	7.2	6.8	6.3	6.5
12	8.8	8.3	8.5	7.7	7.1	7.4	7.9	7.4	7.6	7.0	6.3	6.7
13	8.5	7.9	8.2	10.0	7.0	8.0	7.8	7.3	7.6	7.1	6.9	7.0
14	8.4	7.7	8.0	9.7	8.6	9.2	7.7	7.1	7.3	7.1	6.8	6.9
15	8.2	7.5	7.8	9.6	7.8	8.5	7.5	6.8	7.1	6.9	6.6	6.8
16	8.2	7.3	7.8	7.8	7.3	7.6	7.4	6.0	6.7	6.9	6.5	6.6
17	7.7	7.3	7.5	8.6	7.7	8.2	6.7	5.5	6.0	7.0	6.6	6.8
18	8.0	7.3	7.6	8.7	8.0	8.3	5.9	5.3	5.7	7.0	6.7	6.8
19	8.0	7.5	7.7	8.0	7.5	7.7	6.4	5.6	5.9	6.8	6.6	6.7
20	9.7	7.6	8.7	7.7	7.5	7.6	6.6	6.0	6.3	6.8	6.5	6.7
21	10.7	9.0	9.8	7.8	7.5	7.6	6.5	6.0	6.2	7.0	5.8	6.5
22	11.2	9.4	10.2	7.8	7.5	7.6	6.3	5.8	6.0	6.4	5.7	6.2
23	9.6	5.8	8.0	7.7	7.4	7.6	6.4	5.7	6.0	6.8	6.3	6.6
24	5.7	4.2	4.7	7.3	6.9	7.1	6.5	5.7	6.1	6.7	6.2	6.4
25	4.7	4.1	4.3	7.0	6.5	6.7	6.4	5.7	6.0	6.8	6.2	6.5
26	5.0	4.6	4.8	6.7	6.4	6.5	6.5	5.7	6.1	7.0	6.4	6.7
27	5.9	5.0	5.3	6.6	6.4	6.5	6.8	5.8	6.3	7.3	6.7	7.0
28	7.9	5.6	6.2	6.5	6.3	6.4	6.8	6.2	6.5	7.2	6.7	7.0
29	7.4	6.7	7.0	6.7	6.2	6.4	6.8	6.2	6.4	7.1	6.7	6.9
30	---	---	---	7.5	6.7	7.2	6.7	5.5	6.2	7.1	6.7	6.9
31	---	---	---	7.3	7.0	7.1	---	---	---	7.0	6.7	6.8
MONTH	12.7	4.1	8.3	10.0	6.2	7.6	7.9	5.3	6.6	7.3	5.7	6.7

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

OXYGEN, DISSOLVED (MG/L), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	7.0	6.6	6.8	5.7	5.5	5.6	5.9	5.4	5.5	6.8	6.2	6.5
2	7.0	6.5	6.8	5.6	5.3	5.5	6.1	5.4	5.7	6.7	6.2	6.4
3	8.3	4.9	6.3	5.6	5.5	5.6	6.1	5.7	5.9	6.9	6.3	6.5
4	7.8	6.8	7.4	6.0	5.5	5.7	6.3	5.8	6.0	7.0	6.0	6.5
5	7.0	6.7	6.9	6.1	5.8	5.9	6.3	4.6	5.2	7.4	6.5	6.9
6	6.9	6.7	6.8	6.0	4.2	5.3	5.2	4.7	4.9	7.6	6.8	7.1
7	6.7	6.2	6.6	6.1	5.2	5.8	5.2	4.9	5.0	7.6	6.8	7.1
8	6.3	6.0	6.2	6.6	6.1	6.2	5.3	4.8	5.1	7.6	6.7	7.0
9	6.1	5.9	6.1	6.7	6.3	6.5	5.4	4.9	5.1	7.5	6.6	6.9
10	6.1	5.9	5.9	6.7	6.3	6.4	5.4	4.9	5.2	7.5	6.7	7.0
11	6.3	6.1	6.2	6.7	6.2	6.4	5.6	5.1	5.4	7.5	6.7	7.0
12	6.6	6.3	6.4	6.8	5.7	6.3	5.6	5.1	5.4	7.1	6.4	6.8
13	6.6	6.4	6.5	5.9	5.6	5.7	5.8	5.3	5.6	6.7	5.0	6.3
14	6.6	6.5	6.6	5.9	5.5	5.7	5.9	5.3	5.6	6.7	5.8	6.2
15	6.6	6.1	6.3	6.0	5.7	5.8	6.0	3.6	5.2	6.5	5.6	5.9
16	6.5	6.2	6.3	6.2	5.8	6.0	6.0	5.4	5.7	6.1	5.7	5.9
17	6.5	6.2	6.4	6.3	5.8	6.1	6.1	5.6	5.9	6.1	5.1	5.5
18	6.6	6.1	6.4	6.4	5.7	6.1	6.3	5.6	6.0	5.6	5.0	5.3
19	6.7	6.3	6.5	6.4	5.7	6.1	6.2	5.7	5.9	5.0	4.7	4.8
20	6.8	6.3	6.5	6.6	5.8	6.1	6.2	5.6	5.9	5.4	4.9	5.1
21	6.6	6.2	6.5	7.1	5.8	6.3	6.3	5.6	5.9	5.8	5.4	5.6
22	6.7	6.2	6.5	7.4	6.5	7.0	6.3	5.6	5.9	5.9	5.6	5.7
23	6.8	6.3	6.6	6.7	6.2	6.6	6.5	5.8	6.1	5.8	5.4	5.6
24	6.6	3.8	6.0	6.2	6.0	6.1	6.3	5.7	6.0	5.7	5.5	5.6
25	6.7	6.1	6.4	6.2	6.0	6.1	6.4	5.5	6.0	6.0	5.6	5.8
26	6.6	4.8	6.1	6.1	5.9	6.0	6.5	5.8	6.1	6.2	5.8	6.0
27	5.2	5.0	5.2	6.0	5.9	6.0	6.9	5.9	6.3	6.4	6.0	6.2
28	6.4	4.8	5.6	6.4	5.8	6.1	6.7	6.0	6.3	6.5	6.1	6.3
29	6.2	5.3	5.7	6.3	5.3	5.8	7.1	5.8	6.4	6.4	6.0	6.2
30	5.7	5.3	5.5	5.6	4.4	5.3	6.9	6.0	6.4	6.5	6.2	6.3
31	---	---	---	5.5	4.8	5.4	7.0	6.3	6.5	---	---	---
MONTH	8.3	3.8	6.3	7.4	4.2	6.0	7.1	3.6	5.8	7.6	4.7	6.2

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, 252,900 acre-ft Oct. 1-3 (gage height, 1,071.8 ft); minimum, 196,500 acre-ft July 11 (gage height, 1,060.9 ft).

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

1,060.0	192,000	1,070.0	242,400
1,065.0	217,200	1,075.0	271,400

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	252900	246500	244200	242400	239400	236900	232300	224800	212700	201100	217700	209100
2	252900	245900	243600	242400	239400	236900	231800	224300	212700	200600	218200	209100
3	252900	245900	243600	241900	239400	236900	231800	223800	213200	200600	217700	208600
4	252300	245900	243600	241900	238900	236900	231300	223800	212700	200100	217700	208100
5	251700	245300	243600	241900	238900	236900	231300	223300	212700	199100	217700	207600
6	251700	245300	243600	241900	238900	236900	231300	222800	212200	198600	217700	207100
7	251100	244700	243600	241900	238900	236400	230800	222300	211700	198600	217700	206600
8	251100	245900	243000	241400	238400	235900	230300	221800	211700	198100	217200	206100
9	250500	245900	243000	241400	238400	235900	230300	221200	211200	197500	217200	205600
10	250500	245900	242400	241400	238400	235400	230300	221200	211200	197000	216700	205600
11	250500	245900	242400	241400	238400	235400	229800	220700	210700	196500	216700	205100
12	250500	245300	242400	241400	238400	235400	229800	220700	210700	213200	216200	204600
13	250500	245300	242400	240900	238400	234900	229800	219700	209700	217200	216200	204100
14	249400	245300	242400	240900	238400	234900	229800	219200	209100	217700	215700	203600
15	249400	245300	242400	240900	238400	234400	229300	218700	208600	218200	215700	203100
16	249400	245300	241900	240900	237900	234400	229300	218200	208600	218700	215200	203100
17	248800	244700	241400	240900	237400	234400	228800	217700	208100	219200	215200	203600
18	248800	244700	241400	240900	237400	234400	228800	217200	207600	218200	214700	203600
19	248800	244700	241900	240900	238400	233900	228300	216700	206600	218200	214200	203600
20	248200	244700	242400	240400	237900	233900	227800	216200	206100	218200	214200	203600
21	248200	244700	243000	240400	237900	233900	227800	216200	205600	218200	214200	203600
22	248200	244700	242400	240400	237900	233900	227300	216200	205100	218200	213200	203600
23	248200	244200	242400	240400	237400	233400	227300	215700	204600	218700	212700	203100
24	248200	244200	242400	240400	237400	233400	227300	215700	204100	218200	212200	203100
25	247600	244200	242400	240400	236900	233400	227300	215200	204100	218200	212700	203100
26	247600	244200	242400	240400	236900	232800	226300	214700	203600	218200	212200	202600
27	247100	244200	242400	239900	236900	232800	225800	214700	202600	218200	211700	202600
28	247100	244200	242400	239400	236900	232300	225300	214200	202100	218200	210700	202100
29	247100	244200	242400	239400	236900	232300	225300	213700	201600	218200	210700	202100
30	246500	244200	242400	239400	---	232800	225300	213200	201100	218200	209700	202100
31	246500	---	242400	239400	---	232300	---	213200	---	217700	209700	---
MAX	252900	246500	244200	242400	239400	236900	232300	224800	213200	219200	218200	209100
MIN	246500	244200	241400	239400	236900	232300	225300	213200	201100	196500	209700	202100
(†)	1070.7	1070.3	1070.0	1069.4	1068.9	1068.0	1066.6	1064.2	1061.8	1065.1	1063.5	1062.0
(ϕ)	-6400	-2300	-1800	-3000	-2500	-4600	-7000	-12100	+12100	+16600	-8000	-7600

CAL YR 1987 MAX 289900 MIN 241400 (ϕ) -16200
WTR YR 1988 MAX 252900 MIN 196500 (ϕ) -50800

(†) Gage height, 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 La Coste and Natalia. Prior to November 1984, double-barrel flume in canal 54 ft downstream from gage.

AVERAGE DISCHARGE.--42 years (water years 1923-33, 1958-88), 43.3 ft³/s (31,370 acre-ft/yr).

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

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	61	29	13	50	58	64	157	116	119	80	117
2	63	60	30	13	58	58	63	156	125	127	74	119
3	73	57	33	13	63	58	63	158	91	125	68	116
4	72	59	41	26	57	56	63	171	51	124	67	110
5	73	59	40	33	39	56	68	186	64	134	65	106
6	76	58	40	31	34	58	69	194	80	135	64	110
7	77	58	40	27	34	59	79	192	83	124	63	113
8	76	48	52	27	43	67	94	198	108	111	84	115
9	77	29	54	27	48	70	89	201	114	110	101	116
10	78	34	54	26	48	63	87	203	125	114	98	116
11	79	37	54	26	53	64	85	193	121	37	94	116
12	82	37	54	26	55	67	88	185	114	37	91	116
13	90	37	54	26	53	81	95	179	120	57	89	115
14	89	37	55	26	53	95	90	173	131	70	87	112
15	92	37	56	12	57	93	91	167	138	85	98	91
16	91	27	56	.00	70	92	93	168	139	93	111	.01
17	91	19	43	.00	66	65	93	165	136	94	115	.02
18	88	19	26	8.3	51	31	95	166	133	108	117	.00
19	76	19	12	26	43	32	93	164	135	126	116	40
20	69	19	.00	26	43	31	92	166	135	139	109	56
21	69	19	.00	26	43	49	94	93	138	50	95	56
22	66	19	.00	32	52	62	103	65	138	.00	94	63
23	58	31	.00	30	59	62	117	76	142	.00	90	74
24	58	28	.00	30	60	62	129	68	149	.00	82	74
25	58	28	.00	29	59	63	130	83	154	.00	93	72
26	61	32	.00	30	59	62	130	96	152	44	104	72
27	63	27	.00	36	58	63	144	98	149	75	103	82
28	63	21	.00	43	58	64	159	99	115	73	103	90
29	62	21	.00	51	58	64	158	122	107	70	111	90
30	62	26	.00	50	---	64	160	135	115	70	114	89
31	61	---	6.1	50	---	64	---	124	---	69	114	---
TOTAL	2252	1063	829.10	819.30	1524	1933	2978	4601	3618	2520.00	2894	2546.03
MEAN	72.6	35.4	26.7	26.4	52.6	62.4	99.3	148	121	81.3	93.4	84.9
MAX	92	61	56	51	70	95	160	203	154	139	117	119
MIN	58	19	.00	.00	34	31	63	65	51	.00	63	.00
AC-FT	4470	2110	1640	1630	3020	3830	5910	9130	7180	5000	5740	5050

CAL YR 1987 TOTAL 15266.31 MEAN 41.8 MAX 111 MIN .00 AC-FT 30280
WTR YR 1988 TOTAL 27577.43 MEAN 75.3 MAX 203 MIN .00 AC-FT 54700

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.

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

REVISED RECORDS.--WRD 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.--20 years, 4.34 ft³/s (3.93 in/yr), 3,140 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)
July 27	2015	*64	*2.27				

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.35	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.04	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00	.39
18	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.19	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.15	.00	.01	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.00	.00
28	.00	.00	.00	.00	.00	.00	.24	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.09	0.19	0.00	0.09	0.07	0.24	0.15	0.43	1.21	0.00	0.39
MEAN	.00	.003	.006	.00	.003	.002	.008	.005	.014	.039	.00	.013
MAX	.00	.05	.19	.00	.09	.07	.24	.15	.35	1.2	.00	.39
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.2	.4	.0	.2	.1	.5	.3	.9	2.4	.0	.8
CFSM	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
IN.	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1987 TOTAL 4701.13 MEAN 12.9 MAX 932 MIN .00 AC-FT 9320 CFSM .86 IN. 11.66
WTR YR 1988 TOTAL 2.86 MEAN .008 MAX 1.2 MIN .00 AC-FT 5.7 CFSM .00 IN. .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.--WRD 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. 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. Six observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years, 29.1 ft³/s (5.78 in/yr), 21,080 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 (discharge, 25,600 ft³/s), from information by local residents.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Nov. 25	0330	*405	*3.55				

Minimum daily discharge, 0.38 ft³/s Sept. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	1.4	6.3	9.3	6.6	8.6	5.0	8.3	2.2	1.5	1.2	.87
2	3.9	1.4	5.9	8.5	6.6	7.6	4.9	7.8	2.6	1.5	3.0	.93
3	3.6	1.2	6.0	8.6	6.6	7.3	4.6	7.8	35	1.3	3.4	1.0
4	4.5	1.2	5.9	9.1	6.6	6.8	4.6	7.0	4.7	1.3	2.2	1.0
5	4.2	1.1	5.8	8.3	6.8	6.3	4.9	6.2	3.4	1.4	1.8	.82
6	3.9	1.0	6.0	9.1	6.5	5.8	5.3	5.6	2.8	1.4	1.5	1.2
7	3.7	.89	6.2	9.4	6.3	5.9	5.5	5.2	2.4	1.3	1.5	1.1
8	3.5	52	5.9	8.9	6.2	5.6	6.8	6.1	2.0	1.2	1.3	.92
9	3.0	5.5	5.3	8.4	6.4	5.5	7.8	5.9	1.5	1.2	1.5	.79
10	3.1	2.6	5.3	8.0	6.2	5.1	7.9	5.0	1.4	1.5	1.7	.54
11	2.8	2.3	5.5	7.8	6.3	5.0	8.6	5.3	1.4	2.0	1.3	.63
12	2.5	2.2	5.2	7.8	6.0	5.6	7.7	6.5	1.3	2.4	1.2	.73
13	2.3	2.4	5.0	7.8	5.5	5.3	6.8	4.8	1.1	1.8	1.2	.70
14	2.2	2.2	4.7	7.5	5.5	4.9	6.6	4.1	1.0	1.4	.98	.60
15	2.1	2.2	5.8	7.4	5.9	4.8	6.8	3.8	1.1	1.1	1.0	.48
16	2.1	5.4	5.0	8.0	5.5	4.7	6.9	3.7	1.1	.94	1.2	.70
17	2.0	3.0	5.1	8.3	5.5	50	9.4	3.9	1.1	.90	2.2	5.9
18	1.9	2.9	6.1	8.3	7.3	13	8.9	3.6	1.4	.74	1.2	4.2
19	1.8	2.9	27	8.2	8.0	9.9	8.3	3.2	1.5	.71	.85	1.3
20	2.1	2.8	14	7.6	7.2	8.5	7.3	4.3	1.4	.85	.75	.83
21	3.3	2.6	13	7.1	6.7	7.4	6.8	6.4	1.2	1.1	.83	.58
22	4.0	2.6	13	6.7	6.3	6.6	6.8	3.2	1.3	1.1	.81	.38
23	5.4	2.5	12	6.7	6.0	6.3	6.7	2.5	1.3	1.1	.82	.47
24	5.6	2.5	12	6.6	6.0	7.4	6.4	2.2	1.1	.94	.90	.50
25	4.0	55	12	6.6	5.7	6.2	6.7	2.3	1.4	.84	.94	.74
26	2.8	7.7	23	6.3	5.5	6.2	7.5	2.3	18	.71	.70	.92
27	2.8	8.1	22	6.0	5.7	5.6	7.3	2.6	8.3	.77	.56	.94
28	2.5	7.0	17	6.1	6.8	5.8	7.9	3.5	7.5	.71	.76	.88
29	2.3	6.4	14	6.0	7.3	5.8	8.6	3.1	2.3	.62	.66	1.4
30	2.0	6.5	12	6.4	---	5.3	9.5	2.9	1.6	.69	.71	4.6
31	1.7	---	11	6.6	---	5.0	---	2.7	---	.95	.84	---
TOTAL	96.1	197.49	303.0	237.4	183.5	243.8	208.8	141.8	114.4	35.97	39.51	36.65
MEAN	3.10	6.58	9.77	7.66	6.33	7.86	6.96	4.57	3.81	1.16	1.27	1.22
MAX	5.6	55	27	9.4	8.0	50	9.5	8.3	35	2.4	3.4	5.9
MIN	1.7	.89	4.7	6.0	5.5	4.7	4.6	2.2	1.0	.62	.56	.38
AC-FT	191	392	601	471	364	484	414	281	227	71	78	73
CFSM	.05	.10	.14	.11	.09	.11	.10	.07	.06	.02	.02	.02
IN.	.05	.11	.16	.13	.10	.13	.11	.08	.06	.02	.02	.02

CAL YR 1987 TOTAL 24817.39 MEAN 68.0 MAX 2110 MIN .89 AC-FT 49230 CFSM .99 IN. 13.50
WTR YR 1988 TOTAL 1838.42 MEAN 5.02 MAX 55 MIN .38 AC-FT 3650 CFSM .07 IN. 1.00

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, that crosses basin between this station and the station near Boerne (station 08183900).

AVERAGE DISCHARGE.--42 years, 16.1 ft³/s (11,660 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.--No flow during year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CAL YR 1987 TOTAL 31416.94 MEAN 86.1 MAX 9550 MIN .00 AC-FT 62320
WTR YR 1988 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .0

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.--65 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)
June 26	1600	*694	*4.01				

Minimum daily discharge, 64 ft³/s Sept. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	272	174	157	142	122	120	97	76	103	198	141	75
2	267	174	155	141	122	117	97	77	96	184	141	74
3	259	175	154	140	122	115	96	75	100	173	139	74
4	250	174	151	139	122	113	96	74	101	164	137	72
5	247	172	149	137	122	111	96	72	96	156	135	71
6	243	169	149	139	121	109	93	72	91	150	131	70
7	236	168	148	138	121	109	93	71	88	145	126	70
8	230	175	147	137	121	109	92	71	85	141	122	69
9	225	176	145	137	120	109	93	70	83	138	118	68
10	221	173	145	136	119	108	94	69	81	137	116	68
11	219	172	144	135	118	107	93	70	80	140	116	67
12	215	172	143	135	118	106	92	70	79	202	110	66
13	212	172	142	133	118	104	90	71	77	247	106	65
14	208	170	142	131	117	103	88	70	75	208	104	65
15	206	170	140	130	116	103	88	69	74	191	106	65
16	205	170	141	132	115	104	89	69	73	176	102	64
17	204	166	143	131	116	105	90	68	71	166	100	86
18	201	167	144	129	116	105	88	67	70	158	98	83
19	200	167	166	128	116	104	87	68	69	150	97	86
20	199	165	162	127	115	104	85	71	68	148	95	84
21	196	162	160	127	114	101	84	84	67	168	93	81
22	192	162	157	127	113	100	82	78	66	160	90	80
23	194	161	155	126	113	100	81	79	65	154	87	81
24	194	160	154	125	112	100	79	86	65	149	86	82
25	192	161	153	124	112	100	79	89	68	143	85	82
26	192	160	155	124	113	99	77	92	359	139	84	82
27	187	160	153	123	114	99	76	91	502	138	82	81
28	183	158	150	122	113	100	75	89	354	144	80	79
29	182	158	148	121	112	98	75	87	255	132	78	80
30	180	158	145	121	---	98	74	132	217	136	77	86
31	177	---	144	121	---	97	---	125	---	140	76	---
TOTAL	6588	5021	4641	4058	3393	3257	2619	2452	3678	4975	3258	2256
MEAN	213	167	150	131	117	105	87.3	79.1	123	160	105	75.2
MAX	272	176	166	142	122	120	97	132	502	247	141	86
MIN	177	158	140	121	112	97	74	67	65	132	76	64
AC-FT	13070	9960	9210	8050	6730	6460	5190	4860	7300	9870	6460	4470
CFSM	.29	.23	.20	.18	.16	.14	.12	.11	.17	.22	.14	.10
IN.	.33	.25	.23	.20	.17	.16	.13	.12	.19	.25	.16	.11

CAL YR 1987 TOTAL 146386 MEAN 401 MAX 5520 MIN 140 AC-FT 290400 CFSM .54 IN. 7.39
WTR YR 1988 TOTAL 46196 MEAN 126 MAX 502 MIN 64 AC-FT 91630 CFSM .17 IN. 2.33

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1949 to June 1952, September 1964 to current year. Chemical, biochemical, and pesticide analyses: February 1970 to current year. Sediment analyses: January 1966.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 (FTU)	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 05...	0920	138	434	8.20	13.5	3	0.30	9.9	96	0.1	K130
MAY 12...	0912	69	413	8.10	21.0	<1	0.20	8.1	94	0.4	K14
SEP 01...	0915	76	416	7.80	25.0	<1	0.40	7.2	91	0.4	21

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 05...	K16	220	28	63	15	9.9	0.3	0.80	191	16	18
MAY 12...	35	200	20	57	14	9.3	0.3	0.60	180	18	16
SEP 01...	62	200	23	57	15	8.7	0.3	1.1	181	13	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 05...	0.20	10	248	<1	<1	1.49	0.010	1.50	0.020	0.48	0.50
MAY 12...	0.20	11	234	<1	<1	--	<0.010	1.10	<0.010	--	0.20
SEP 01...	0.10	13	229	6	<1	--	<0.010	0.700	<0.010	--	0.30

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BORON, DIS-SOLVED (UG/L AS B)	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)
JAN 05...	<0.010	0.8	0.05	<1	44	50	<1	<5	1	7	<5
MAY 12...	<0.010	1.0	--	--	--	--	--	--	--	--	--
SEP 01...	<0.010	1.0	--	<1	42	--	2	<1	1	3	5

DATE	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)	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)
JAN 05...	<1	<0.1	<1	<1.0	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010
MAY 12...	--	--	--	--	--	--	--	--	--	--	--
SEP 01...	<1	<0.1	<1	<1.0	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010

DATE	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	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)
JAN 05...	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01
MAY 12...	--	--	--	--	--	--	--	--	--	--	--
SEP 01...	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	METHYL PARA-THION, TOTAL (UG/L)	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											
05...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
12...	--	--	--	--	--	--	--	--	--	--	--
SEP											
01...	<0.01	<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 except those for estimated daily discharges, which are fair. 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.--43 years (water years 1940-50, 1957-88), 34.4 ft³/s (24,920 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)
July 12	0700	*1,610	*6.21	No other peak greater than base discharge.			

Minimum daily discharge, 0.06 ft³/s Sept. 1-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e33	e.85	.32	.50	.62	.72	.44	.33	.56	1.6	.76	.06
2	e30	e.80	.36	.53	.60	.69	.44	.33	.49	1.5	.71	.06
3	e28	.75	.36	.56	.56	.53	.50	.28	.55	1.2	.64	.06
4	e26	.76	.36	.56	.48	.52	.50	.28	.40	1.1	.59	.06
5	e24	.71	.36	.56	.45	.55	.50	.28	.39	.96	.47	.07
6	e22	.72	.36	.56	.45	.56	.45	.29	.29	.82	.44	.07
7	e20	.67	.36	.45	.45	.62	.40	.31	.26	.71	.39	.07
8	e18	.67	.39	.40	.48	.55	.40	.30	.22	.54	.36	.07
9	e16	.48	.40	.40	.55	.45	.60	.28	.18	.50	.34	.07
10	e15	.40	.40	.40	.56	.52	.76	.28	.18	.50	.31	.07
11	e13	.43	.40	.40	.44	.62	.43	.30	.18	.50	.29	.07
12	e11	.46	.40	.40	.54	.54	.40	.33	.19	568	.23	.07
13	e10	.50	.45	.40	.62	.53	.43	.31	.21	86	.21	.07
14	e9.0	.50	.34	.40	.54	.56	.45	.28	.21	9.3	.18	.07
15	e8.0	.50	.28	.42	.53	.59	.43	.28	.21	5.9	.18	.07
16	e6.8	.41	.34	.50	.69	.62	.42	.28	.20	4.8	.16	.07
17	e6.0	.40	.51	.45	.76	.59	.42	.28	.18	4.4	.16	.57
18	e5.3	.39	.57	.46	.62	.36	.34	.28	.16	3.8	.16	.85
19	e4.5	.39	.71	.42	.50	.43	.34	.31	.18	3.3	.16	3.6
20	e4.0	.40	.59	.38	.53	.53	.36	.34	.18	3.0	.14	4.9
21	e3.5	.40	.62	.39	.58	.56	.36	.48	.18	3.0	.14	4.5
22	e3.0	.40	.62	.44	.68	.62	.40	.36	.18	2.4	.14	2.9
23	e2.7	.40	.62	.45	.60	.58	.35	.31	.18	2.2	.12	1.8
24	e2.5	.40	.62	.43	.56	.56	.34	.34	.18	2.1	.11	1.3
25	e2.2	.35	.58	.40	.58	.56	.33	.39	.25	1.8	.10	1.3
26	e2.0	.35	.48	.40	.56	.56	.31	.52	.39	1.5	.08	1.2
27	e1.8	.32	.44	.44	.56	.56	.31	.50	.31	1.3	.07	.96
28	e1.5	.31	.46	.58	.56	.61	.31	.45	.56	1.2	.07	.87
29	e1.3	.31	.50	.62	.58	.46	.31	.45	1.2	1.1	.07	.83
30	e1.1	.31	.50	.62	---	.39	.31	.47	1.6	.94	.07	.85
31	e1.0	---	.50	.62	---	.47	---	.54	---	.83	.07	---
TOTAL	332.2	14.74	14.20	14.54	16.23	17.01	12.34	10.76	10.45	716.80	7.92	27.51
MEAN	10.7	.49	.46	.47	.56	.55	.41	.35	.35	23.1	.26	.92
MAX	33	.85	.71	.62	.76	.72	.76	.54	1.6	568	.76	4.9
MIN	1.0	.31	.28	.38	.44	.36	.31	.28	.16	.50	.07	.06
AC-FT	659	29	28	29	32	34	24	21	21	1420	16	55

CAL YR 1987 TOTAL 10634.74 MEAN 29.1 MAX 1000 MIN .28 AC-FT 21090
WTR YR 1988 TOTAL 1194.70 MEAN 3.26 MAX 568 MIN .06 AC-FT 2370

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 are 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.--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.

AVERAGE DISCHARGE.--49 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. 1	1730	a*398	*4.07	June 28	2400	b153	3.57

a Stage falling; peak occurred Sept. 16, 1987.
b Maximum independent peak discharge.

Minimum daily discharge, 33 ft³/s June 23, 24, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	382	220	179	160	125	100	78	e49	40	109	62	40
2	375	220	176	157	124	100	77	49	39	97	63	40
3	365	217	176	157	119	98	75	49	39	88	63	40
4	353	214	173	156	120	96	73	48	38	81	64	40
5	348	213	173	153	119	94	74	48	39	74	62	39
6	342	211	171	154	118	93	72	48	38	69	61	40
7	335	208	169	153	116	93	70	47	38	65	60	39
8	328	216	169	153	116	92	70	46	38	61	58	39
9	320	216	166	150	116	90	69	46	38	59	56	39
10	313	210	166	150	113	91	69	46	38	58	54	39
11	308	207	164	149	111	90	68	46	38	58	52	38
12	305	206	163	146	110	88	68	45	38	57	49	38
13	303	208	160	146	109	88	68	45	37	58	47	38
14	298	208	155	143	106	86	67	45	37	96	46	37
15	289	208	154	143	e105	86	66	44	36	104	45	37
16	285	213	153	143	e104	86	68	44	36	96	45	37
17	283	205	157	143	e104	84	65	44	36	87	44	51
18	279	203	160	142	e103	81	61	43	35	79	44	43
19	278	198	170	139	e103	82	62	43	35	73	44	41
20	270	196	182	136	e102	82	62	44	34	67	43	40
21	259	193	181	134	e101	82	61	44	34	75	43	40
22	256	192	180	134	e101	82	60	42	34	83	42	39
23	257	192	176	134	e100	81	e59	42	33	82	42	39
24	255	192	175	132	e100	81	e58	42	33	76	42	39
25	255	190	174	130	e100	80	e57	41	34	71	43	39
26	250	187	170	128	e100	81	e56	46	33	68	42	39
27	244	184	169	128	e100	81	e55	43	34	65	41	37
28	237	183	168	128	e100	80	e54	42	68	62	41	37
29	234	182	166	127	e100	79	e52	42	148	60	41	37
30	232	180	163	126	---	79	e50	41	127	61	41	35
31	227	---	163	125	---	79	---	41	---	61	40	---
TOTAL	9065	6072	5221	4399	3145	2685	1944	1385	1325	2300	1520	1176
MEAN	292	202	168	142	108	86.6	64.8	44.7	44.2	74.2	49.0	39.2
MAX	382	220	182	160	125	100	78	49	148	109	64	51
MIN	227	180	153	125	100	79	50	41	33	57	40	35
AC-FT	17980	12040	10360	8730	6240	5330	3860	2750	2630	4560	3010	2330

CAL YR 1987 TOTAL 187610 MEAN 514 MAX 15700 MIN 105 AC-FT 372100
WTR YR 1988 TOTAL 40237 MEAN 110 MAX 382 MIN 33 AC-FT 79810

e Estimated.

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.--63 years (water years 1925-29, 1931-88), 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)
June 25	0930	5,610	8.09	July 11	2030	*20,000	*13.33
June 26	0530	3,690	7.09				

Minimum daily discharge, 43 ft³/s June 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	226	147	125	111	96	91	73	72	71	257	185	94
2	221	145	124	111	95	87	75	70	67	229	177	92
3	213	145	123	110	98	84	74	68	75	211	175	91
4	208	144	122	108	98	86	74	67	74	200	173	88
5	204	141	122	108	95	84	74	67	70	194	167	86
6	201	141	120	110	95	84	73	66	65	180	161	84
7	195	138	118	108	95	83	71	64	61	175	153	83
8	192	163	118	108	95	83	72	63	60	169	148	81
9	188	147	118	108	95	82	74	60	59	160	144	80
10	186	141	117	108	92	80	75	59	57	159	140	79
11	185	137	115	105	89	80	74	58	55	3250	140	77
12	181	136	115	105	92	80	74	61	56	1850	137	77
13	180	137	115	105	91	80	73	60	54	643	132	76
14	179	137	110	104	91	79	73	59	53	444	132	75
15	176	139	111	102	89	78	72	57	52	373	130	73
16	176	144	111	105	89	79	73	56	51	330	129	74
17	173	146	113	105	89	85	75	56	50	303	126	90
18	173	140	118	104	91	80	72	56	49	281	121	94
19	170	135	145	102	90	80	71	57	50	265	119	89
20	169	133	143	101	89	79	69	62	48	257	116	86
21	165	130	142	102	89	79	69	74	46	262	112	83
22	163	129	129	101	87	78	69	121	45	242	109	80
23	162	131	126	98	86	78	67	114	43	223	107	80
24	165	130	122	98	87	78	67	90	45	213	106	80
25	162	129	121	98	86	78	67	83	1070	205	106	78
26	160	126	120	98	86	78	66	77	2060	196	104	77
27	157	125	122	98	86	78	64	74	1100	191	101	74
28	154	125	118	98	86	79	62	73	550	188	98	73
29	152	125	115	96	86	76	66	72	367	187	97	73
30	150	126	115	96	---	76	68	72	296	180	96	77
31	149	---	112	95	---	76	---	71	---	194	95	---
TOTAL	5535	4112	3745	3206	2633	2498	2126	2159	6799	12211	4036	2444
MEAN	179	137	121	103	90.8	80.6	70.9	69.6	227	394	130	81.5
MAX	226	163	145	111	98	91	75	121	2060	3250	185	94
MIN	149	125	110	95	86	76	62	56	43	159	95	73
AC-FT	10980	8160	7430	6360	5220	4950	4220	4280	13490	24220	8010	4850
CFSM	.46	.35	.31	.27	.23	.21	.18	.18	.58	1.01	.33	.21
IN.	.53	.39	.36	.31	.25	.24	.20	.21	.65	1.17	.39	.23

CAL YR 1987 TOTAL 143799 MEAN 394 MAX 9460 MIN 110 AC-FT 285200 CFSM 1.01 IN. 13.75
WTR YR 1988 TOTAL 51504 MEAN 141 MAX 3250 MIN 43 AC-FT 102200 CFSM .36 IN. 4.93

WATER-QUALITY RECORDS

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 05...	1450	108	420	8.30	11.5	1	0.20	11.0	103	0	K16
MAY 11...	1329	58	382	8.20	24.5	1	0.20	8.5	106	0.5	K19
AUG 31...	1416	98	398	8.00	27.5	<1	0.20	8.4	111	0.4	58

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 05...	K14	220	24	64	14	7.7	0.2	0.80	194	15	14
MAY 11...	K38	190	23	53	14	7.8	0.3	0.80	167	15	14
AUG 31...	21	200	27	56	15	7.8	0.2	0.90	175	15	12

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
JAN 05...	0.20	10	242	<1	<1	<0.010	1.20	<0.010	0.30	<0.010	0.6
MAY 11...	0.20	12	217	11	7	<0.010	0.600	<0.010	<0.20	0.020	1.5
AUG 31...	0.10	13	225	2	<1	<0.010	0.600	<0.010	<0.20	<0.010	1.0

DATE	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BORON, DIS-SOLVED (UG/L AS B)	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 05...	0.03	<1	32	30	<1	<5	1	4	<5	1	<0.1
MAY 11...	0.03	--	--	50	--	--	--	--	--	--	--
AUG 31...	--	<1	36	--	2	<1	1	10	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 05...	<1	<1.0	4	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--	--
AUG 31...	<1	<1.0	12	<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 05...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08195000 FRIO RIVER AT CONCAN, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

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 05...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<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.--No estimated daily discharges. Records good. There are several small diversions above station.

AVERAGE DISCHARGE.--36 years, 36.1 ft³/s (3.89 in/yr), 26,180 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)
June 26	1700	*575	*3.87	No other peak greater than base discharge.			

Minimum daily discharge, 3.2 ft³/s June 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	27	22	20	16	18	12	7.2	7.4	45	11	5.6
2	40	27	22	20	16	15	11	7.4	6.9	39	11	5.3
3	38	27	21	19	16	15	11	7.1	11	35	10	5.2
4	38	27	21	19	16	14	10	6.8	9.1	32	11	5.0
5	37	27	21	19	16	14	11	6.8	8.3	31	11	4.4
6	37	26	21	19	16	14	10	6.5	7.4	28	10	4.1
7	36	26	21	19	16	14	10	6.5	6.9	25	9.1	4.1
8	35	40	21	19	16	14	10	6.7	6.9	24	8.2	4.1
9	34	38	21	18	15	13	10	6.3	6.4	23	7.5	4.1
10	34	30	21	18	15	13	11	6.2	6.0	22	7.6	4.0
11	32	28	22	18	15	13	10	6.1	5.7	26	7.2	3.9
12	32	28	20	18	14	12	10	6.8	5.3	26	6.2	3.8
13	32	28	19	18	15	12	9.8	6.6	4.8	22	6.0	3.8
14	31	27	19	17	15	11	9.6	6.5	4.7	20	6.5	3.8
15	31	28	19	17	14	11	9.7	6.1	4.6	20	9.0	4.0
16	31	30	19	18	14	12	10	5.9	4.2	19	7.6	4.0
17	31	27	21	18	14	14	10	5.9	4.5	19	6.9	7.9
18	30	26	23	17	15	13	10	5.6	4.4	18	6.6	14
19	30	25	36	17	14	12	9.7	5.9	4.2	18	6.7	14
20	30	24	34	17	14	12	9.4	7.1	3.9	18	6.2	13
21	29	23	32	16	14	12	9.4	14	3.5	20	5.9	11
22	29	23	28	16	14	12	9.6	11	3.3	20	5.9	10
23	29	24	25	16	14	12	9.3	8.6	3.3	17	5.7	9.8
24	29	24	25	16	13	12	8.6	7.6	3.2	15	5.5	9.6
25	30	24	24	16	13	12	8.0	7.1	4.3	14	5.4	8.9
26	30	23	24	16	14	12	7.5	7.0	266	13	5.3	8.5
27	29	23	23	16	14	12	7.4	6.9	165	13	5.1	8.2
28	28	22	22	16	14	12	7.3	6.9	121	13	5.2	7.8
29	28	22	22	16	14	12	7.5	6.7	73	12	5.3	7.9
30	28	22	21	16	---	11	7.4	6.9	55	12	5.5	8.7
31	27	---	21	16	---	11	---	7.3	---	12	5.5	---
TOTAL	996	796	711	541	426	396	286.2	220.0	820.2	671	225.6	208.5
MEAN	32.1	26.5	22.9	17.5	14.7	12.8	9.54	7.10	27.3	21.6	7.28	6.95
MAX	41	40	36	20	16	18	12	14	266	45	11	14
MIN	27	22	19	16	13	11	7.3	5.6	3.2	12	5.1	3.8
AC-FT	1980	1580	1410	1070	845	785	568	436	1630	1330	447	414
CFSM	.25	.21	.18	.14	.12	.10	.08	.06	.22	.17	.06	.06
IN.	.29	.24	.21	.16	.13	.12	.08	.06	.24	.20	.07	.06

CAL YR 1987 TOTAL 39810 MEAN 109 MAX 5100 MIN 19 AC-FT 78960 CFSM .87 IN. 11.75
WTR YR 1988 TOTAL 6297.5 MEAN 17.2 MAX 266 MIN 3.2 AC-FT 12490 CFSM .14 IN. 1.86

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 05...	1300	21	406	8.30	10.5	2	0.30	10.9	100	0	K4
MAY 11...	1542	6.6	363	8.20	23.0	1	0.20	8.4	102	0.5	51
AUG 31...	1818	5.5	358	8.00	29.0	<1	0.50	8.3	113	0.5	140

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 05...	K16	210	24	61	13	6.9	0.2	0.50	182	15	12
MAY 11...	94	180	20	53	12	7.2	0.2	0.70	162	17	13
AUG 31...	96	180	20	51	13	6.9	0.2	0.70	161	13	11

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 05...	0.10	8.5	226	<1	<1	<0.010	1.20	<0.010	--	0.20	<0.010
MAY 11...	0.20	10	210	<1	<1	<0.010	0.400	0.020	0.38	0.40	<0.010
AUG 31...	0.10	12	204	5	<1	<0.010	0.200	<0.010	--	0.30	<0.010

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	METHY-LENE BLUE ACTIVE SUB-STANCE (MG/L)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BORON, DIS-SOLVED (UG/L AS B)	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)
JAN 05...	<0.1	0.03	<1	34	50	<1	<5	1	<3	<5	<1
MAY 11...	1.7	--	--	--	--	--	--	--	--	--	--
AUG 31...	1.5	--	<1	38	--	1	<1	<1	11	5	1

DATE	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)	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)
JAN 05...	<0.1	<1	<1.0	3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 11...	--	--	--	--	--	--	--	--	--	--	--
AUG 31...	<0.1	<1	<1.0	6	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DI-AZINON, TOTAL (UG/L)	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 05...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--	--
AUG 31...	<0.01	<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 1987 TO SEPTEMBER 1988

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										
05...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
11...	--	--	--	--	--	--	--	--	--	--
AUG										
31...	<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 Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

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

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

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

AVERAGE DISCHARGE.--36 years, 34.6 ft³/s (25,070 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)
June 26	2300	2,150	6.69	July 12	0300	*12,900	*11.58

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	.00	.45	.00	.00	.00	.00	.00	.00	8.1	.03	.00
2	2.3	.00	.45	.00	.00	.00	.00	.00	.00	1.8	.03	.00
3	2.2	.00	.45	.00	.00	.00	.00	.00	.00	.77	.03	.00
4	2.2	.00	.24	.00	.00	.00	.00	.00	.00	.09	.03	.00
5	2.1	.00	.00	.00	.00	.00	.00	.00	.00	.03	.03	.00
6	1.9	.00	.00	.00	.00	.00	.00	.00	.00	.03	.01	.00
7	1.8	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
8	1.7	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
9	1.5	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
10	1.3	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
11	1.2	.00	.00	.01	.00	.00	.00	.00	.00	.03	.00	.00
12	.98	.00	.00	.16	.00	.00	.00	.00	.00	3520	.00	.00
13	.93	.00	.00	.25	.00	.00	.00	.00	.00	488	.00	.00
14	.93	.03	.00	.25	.00	.00	.00	.00	.00	188	.00	.00
15	.87	.18	.00	.25	.00	.00	.00	.00	.00	96	.00	.00
16	.69	.29	.00	.27	.00	.00	.00	.00	.00	49	.00	.00
17	.50	.30	.00	.30	.00	.00	.00	.00	.00	19	.00	.00
18	.16	.30	.00	.30	.00	.00	.00	.00	.00	4.7	.00	.00
19	.00	.31	.00	.30	.00	.00	.00	.00	.00	1.5	.00	.00
20	.13	.30	.00	.30	.00	.00	.00	.00	.00	1.0	.00	.00
21	.35	.35	.00	.29	.00	.00	.00	.00	.00	.59	.00	.00
22	.46	.37	.00	.08	.00	.00	.00	.00	.00	.10	.00	.00
23	.53	.37	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00
24	.60	.39	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00
25	.62	.47	.00	.00	.00	.00	.00	.00	23	.07	.00	.00
26	.67	.45	.00	.00	.00	.00	.00	.00	847	.05	.00	.00
27	.72	.40	.00	.00	.00	.00	.00	.00	1210	.05	.00	.00
28	.72	.44	.00	.00	.00	.00	.00	.00	322	.05	.00	.00
29	.72	.45	.00	.00	.00	.00	.00	.00	119	.04	.00	.00
30	.53	.45	.00	.00	---	.00	.00	.00	42	.03	.00	.00
31	.13	---	.00	.00	---	.00	---	.00	---	.03	.00	---
TOTAL	31.84	5.85	1.59	2.76	0.00	0.00	0.00	0.00	2563.00	4379.32	0.16	0.00
MEAN	1.03	.19	.051	.089	.00	.00	.00	.00	85.4	141	.005	.00
MAX	2.4	.47	.45	.30	.00	.00	.00	.00	1210	3520	.03	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
AC-FT	63	12	3.2	5.5	.0	.0	.0	.0	5080	8690	.3	.0

CAL YR 1987 TOTAL 78340.48 MEAN 215 MAX 24100 MIN .00 AC-FT 155400
WTR YR 1988 TOTAL 6984.52 MEAN 19.1 MAX 3520 MIN .00 AC-FT 13850

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.--46 years, 60.4 ft³/s (3.98 in/yr), 43,760 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)
July 11	2000	*10,300	*12.21	No other peak greater than base discharge.			

Minimum daily discharge, 4.1 ft³/s June 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	52	45	42	32	29	22	15	13	21	42	18
2	81	52	44	42	32	29	22	16	12	19	38	17
3	81	51	45	42	30	28	21	16	15	17	37	17
4	79	48	44	40	31	26	20	15	11	15	35	17
5	79	46	44	40	32	26	20	14	11	14	36	15
6	75	46	42	40	32	26	20	13	9.5	13	37	15
7	73	44	39	40	32	26	20	13	8.8	13	34	14
8	73	61	39	39	32	26	20	13	8.1	13	32	14
9	73	58	39	39	32	25	20	12	7.6	12	30	13
10	71	51	39	37	32	25	20	12	7.4	12	28	13
11	69	48	39	35	31	24	19	11	6.8	1490	28	13
12	67	46	39	37	30	24	19	11	6.7	555	27	12
13	67	46	39	37	30	23	19	11	6.7	153	24	12
14	67	48	38	37	30	23	19	11	6.2	90	25	12
15	67	48	35	37	30	23	19	11	6.1	70	26	11
16	66	50	36	37	30	23	19	11	6.1	62	25	11
17	63	55	37	37	30	26	20	11	5.6	55	24	13
18	63	53	39	36	30	29	19	10	5.5	49	24	14
19	63	48	56	35	30	26	18	10	5.2	44	24	16
20	62	46	63	34	30	25	17	12	5.1	43	24	17
21	58	45	58	34	30	24	17	21	5.0	60	23	16
22	58	44	50	34	29	24	17	30	4.5	53	21	14
23	59	45	49	34	29	24	17	23	4.5	45	20	14
24	61	46	50	34	29	24	16	19	4.1	42	19	14
25	62	46	47	34	29	24	15	17	5.1	38	20	13
26	61	44	46	33	29	24	14	16	17	37	20	13
27	58	44	46	32	29	24	13	15	157	36	19	12
28	56	44	46	32	29	23	13	13	55	35	18	11
29	54	44	44	32	29	22	13	13	36	33	18	11
30	54	44	44	32	---	22	14	13	26	32	18	11
31	53	---	44	32	---	22	---	13	---	39	18	---
TOTAL	2058	1443	1365	1126	880	769	542	441	477.6	3210	814	413
MEAN	66.4	48.1	44.0	36.3	30.3	24.8	18.1	14.2	15.9	104	26.3	13.8
MAX	85	61	63	42	32	29	22	30	157	1490	42	18
MIN	53	44	35	32	29	22	13	10	4.1	12	18	11
AC-FT	4080	2860	2710	2230	1750	1530	1080	875	947	6370	1610	819
CFSM	.32	.23	.21	.18	.15	.12	.09	.07	.08	.50	.13	.07
IN.	.37	.26	.25	.20	.16	.14	.10	.08	.09	.58	.15	.07

CAL YR 1987 TOTAL 95775 MEAN 262 MAX 7130 MIN 35 AC-FT 190000 CFSM 1.27 IN. 17.30
WTR YR 1988 TOTAL 13538.6 MEAN 37.0 MAX 1490 MIN 4.1 AC-FT 26850 CFSM .18 IN. 2.44

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 06...	1020	40	476	8.20	10.5	3	0.10	10.4	96	0.2	88
MAY 11...	0926	11	443	7.90	24.0	2	0.40	7.4	91	0.9	150
AUG 31...	0905	18	435	7.80	26.0	1	0.40	7.0	90	0.7	K350

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 06...	58	240	29	74	14	9.0	0.3	0.90	214	27	14
MAY 11...	99	220	32	65	13	9.2	0.3	0.90	184	29	15
AUG 31...	260	220	33	63	14	8.8	0.3	2.4	182	26	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 06...	0.20	11	278	<1	<1	<0.010	0.900	0.020	--	<0.20	<0.010
MAY 11...	0.30	13	256	<1	<1	<0.010	0.300	0.010	0.39	0.40	0.010
AUG 31...	0.20	14	251	2	<1	<0.010	0.200	<0.010	--	0.80	<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 06...	0.8	--	--	--	--	--	--	--	--	--	--
MAY 11...	2.1	--	--	--	--	--	--	--	--	--	--
AUG 31...	1.1	<1	35	2	<1	1	11	5	2	0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
JAN 06...	--	--	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<1.0	8	<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 06...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<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 1987 TO SEPTEMBER 1988

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 06...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY 11...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<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.--No estimated daily discharges. 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.--36 years, 34.5 ft³/s (25,000 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)
July 12	0100	*7,010	*14.95	No other peak greater than base discharge.			

Minimum daily discharge, 1.5 ft³/s Sept. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	6.8	5.8	5.1	4.1	3.0	4.3	2.3	2.1	1.9	3.3	3.3
2	10	6.6	5.8	5.0	3.8	3.0	4.2	2.3	1.9	2.0	2.9	3.1
3	9.6	6.4	5.7	5.0	3.7	3.0	4.2	2.0	2.6	2.0	2.9	2.8
4	9.1	6.4	5.5	4.8	3.7	3.0	4.4	2.2	2.1	1.9	3.0	2.9
5	8.7	6.4	5.4	4.8	3.9	2.8	4.3	2.1	2.4	1.7	3.0	2.6
6	8.6	6.6	5.1	4.6	3.9	2.6	4.1	2.2	2.5	1.8	2.8	2.7
7	8.5	6.5	5.1	4.6	3.9	2.6	3.6	2.2	2.5	1.9	2.7	2.3
8	8.4	7.8	5.3	4.5	3.9	2.4	3.5	2.2	2.5	1.9	2.6	2.4
9	8.2	8.2	5.4	4.5	3.8	2.4	3.4	2.2	2.4	2.0	2.7	2.8
10	8.1	7.9	5.5	4.3	3.7	2.4	3.2	2.2	2.2	2.4	2.7	2.8
11	8.1	7.7	5.3	4.3	3.6	2.3	2.8	2.1	2.3	8.6	2.8	3.2
12	8.2	7.5	5.1	4.3	3.6	2.2	2.8	2.3	2.4	1290	2.8	2.8
13	8.1	7.3	5.2	4.3	3.6	2.2	3.2	2.2	2.3	79	2.7	2.8
14	8.1	7.1	5.3	4.2	3.5	2.1	3.4	2.2	2.4	22	2.7	2.6
15	8.0	6.9	6.5	4.2	3.4	2.3	3.4	2.0	2.2	8.1	2.7	1.9
16	7.9	7.3	6.9	4.2	3.3	2.5	3.6	1.8	2.2	3.8	2.8	1.5
17	7.7	7.4	7.1	4.2	3.2	2.7	3.2	2.0	2.1	2.5	2.8	2.2
18	8.2	7.3	7.1	4.2	3.9	2.6	2.9	2.1	2.2	2.0	2.9	2.2
19	8.5	7.1	7.6	4.2	3.6	3.2	3.1	2.1	2.0	1.9	2.9	3.3
20	9.0	7.1	7.7	4.4	3.6	4.1	3.2	2.5	2.0	2.1	2.9	2.7
21	9.4	6.9	7.7	4.6	3.5	4.2	3.1	3.0	1.8	3.2	2.9	2.7
22	8.9	6.8	7.5	4.1	3.2	4.2	2.9	2.5	2.0	2.5	2.9	2.7
23	8.8	6.8	7.1	4.0	2.8	4.2	2.8	2.9	1.7	2.7	2.9	2.8
24	8.2	6.6	7.1	4.0	2.6	4.0	2.9	3.2	1.8	2.6	2.9	3.0
25	8.1	6.7	7.0	4.2	2.6	4.0	2.6	3.2	1.8	2.8	2.8	2.7
26	7.9	6.6	14	4.2	2.6	3.6	2.6	2.9	2.0	2.9	2.6	2.6
27	7.8	6.5	13	4.2	2.7	2.9	2.4	2.7	2.0	3.0	2.2	2.9
28	7.7	6.3	11	4.2	2.8	2.7	2.4	3.0	2.0	3.3	2.1	3.6
29	7.3	6.0	9.0	4.2	3.0	2.8	2.3	2.8	2.1	3.3	2.9	3.6
30	7.2	6.0	7.4	4.2	---	3.3	2.4	1.7	1.8	3.3	3.3	3.5
31	7.1	---	5.8	4.2	---	3.6	---	1.9	---	3.8	3.3	---
TOTAL	259.4	207.5	215.0	135.8	99.5	92.9	97.2	73.0	64.3	1472.9	87.4	83.0
MEAN	8.37	6.92	6.94	4.38	3.43	3.00	3.24	2.35	2.14	47.5	2.82	2.77
MAX	10	8.2	14	5.1	4.1	4.2	4.4	3.2	2.6	1290	3.3	3.6
MIN	7.1	6.0	5.1	4.0	2.6	2.1	2.3	1.7	1.7	1.7	2.1	1.5
AC-FT	515	412	426	269	197	184	193	145	128	2920	173	165

CAL YR 1987 TOTAL 72859.9 MEAN 200 MAX 9600 MIN 5.1 AC-FT 144500
WTR YR 1988 TOTAL 2887.9 MEAN 7.89 MAX 1290 MIN 1.5 AC-FT 5730

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 Co. datum.

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

AVERAGE DISCHARGE.--36 years, 41.0 ft³/s (5.82 in/yr), 29,700 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)
July 11	1330	*1,960	*5.02	No other peak greater than base discharge.			

Minimum daily discharge, 0.90 ft³/s June 13-15, 23-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	7.0	9.5	16	11	7.9	6.1	3.3	e1.8	e1.8	14	5.5
2	11	7.0	9.2	16	11	7.5	5.6	3.4	e2.1	e1.8	13	5.6
3	10	6.9	9.1	16	11	6.8	5.9	3.5	e2.5	e1.7	12	5.8
4	10	6.8	8.9	16	11	6.4	5.9	3.0	e2.0	e1.6	12	4.8
5	11	6.4	8.8	15	11	6.3	6.0	2.9	e1.7	e1.6	12	4.8
6	10	6.2	8.6	17	10	6.2	5.6	2.8	e1.6	e1.6	11	4.8
7	9.9	6.4	8.2	18	10	6.1	5.4	2.9	e1.5	e1.6	11	4.7
8	9.4	66	8.0	18	10	6.3	5.9	3.3	e1.4	e1.6	10	4.5
9	9.0	34	7.6	17	10	6.1	6.1	2.8	e1.3	e1.6	10	4.4
10	8.9	15	7.6	16	9.8	5.6	5.6	2.4	e1.1	e2.0	10	4.3
11	8.7	13	7.5	15	9.7	5.7	5.1	2.4	e1.0	469	9.2	4.1
12	8.6	12	7.2	15	8.8	5.2	5.1	2.7	e.95	72	8.6	4.0
13	8.9	12	7.2	14	8.7	5.1	5.1	2.6	e.90	43	8.2	4.2
14	8.1	11	7.2	15	8.7	5.0	5.0	2.3	e.90	33	8.0	3.9
15	8.2	11	6.5	14	8.5	4.9	4.9	2.1	e.90	29	7.8	3.6
16	8.3	16	6.7	14	8.3	5.2	6.0	2.2	e.95	26	7.5	3.6
17	8.4	13	7.4	14	8.3	11	6.3	2.2	e1.0	23	7.5	5.7
18	8.1	12	8.8	15	9.3	8.6	4.9	1.8	e1.0	21	7.6	7.3
19	8.0	11	24	14	9.1	7.6	4.5	1.7	e1.0	19	7.4	38
20	7.9	11	21	14	8.4	7.4	4.7	2.0	e1.0	21	7.1	11
21	7.5	10	17	13	7.8	6.9	5.4	6.4	e1.0	22	6.8	8.6
22	7.6	10	18	13	7.5	6.5	8.1	2.6	e.95	18	6.6	7.9
23	8.5	10	17	12	7.4	6.7	4.6	1.6	e.90	17	6.4	7.8
24	9.7	11	16	12	7.1	6.4	3.8	1.5	e.90	16	6.2	7.5
25	8.4	17	17	12	7.0	6.3	3.7	1.6	e.90	15	6.0	7.1
26	7.9	10	28	11	7.2	6.3	3.7	1.8	e7.0	14	5.8	6.6
27	7.5	11	19	11	7.3	7.0	3.5	1.7	2.5	14	5.8	6.3
28	7.3	9.6	18	11	7.2	7.2	3.6	1.4	e2.3	14	5.9	6.0
29	7.3	9.9	16	11	7.0	6.7	4.2	1.5	e2.2	17	5.7	6.0
30	7.2	9.9	16	11	---	6.0	4.8	1.6	e2.0	14	5.7	7.4
31	7.0	---	16	11	---	6.0	---	1.9	---	15	5.7	---
TOTAL	269.3	392.1	387.0	437	258.1	202.9	155.1	75.9	47.25	948.9	260.5	205.8
MEAN	8.69	13.1	12.5	14.1	8.90	6.55	5.17	2.45	1.57	30.6	8.40	6.86
MAX	11	66	28	18	11	11	8.1	6.4	7.0	469	14	38
MIN	7.0	6.2	6.5	11	7.0	4.9	3.5	1.4	.90	1.6	5.7	3.6
AC-FT	534	778	768	867	512	402	308	151	94	1880	517	408
CFSM	.09	.14	.13	.15	.09	.07	.05	.03	.02	.32	.09	.07
IN.	.10	.15	.15	.17	.10	.08	.06	.03	.02	.37	.10	.08

CAL YR 1987 TOTAL 59008.4 MEAN 162 MAX 7600 MIN 6.2 AC-FT 117000 CFSM 1.69 IN. 22.96
WTR YR 1988 TOTAL 3639.85 MEAN 9.94 MAX 469 MIN .90 AC-FT 7220 CFSM .10 IN. 1.42

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 07...	1110	20	421	8.30	7.0	1	0.20	11.4	96	0.2	K26
MAY 10...	0934	2.7	418	8.00	23.5	2	0.30	6.8	83	1.1	99
AUG 30...	0856	5.3	349	7.80	25.5	1	0.60	6.6	84	0.7	56

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 07...	K2	210	34	69	10	7.5	0.2	1.0	180	34	12
MAY 10...	67	200	53	60	12	9.3	0.3	1.2	147	49	15
AUG 30...	250	160	42	48	10	7.4	0.3	1.3	119	37	10

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 07...	0.20	9.3	251	<1	<1	<0.010	0.400	0.020	--	<0.20	<0.010
MAY 10...	0.30	14	249	<1	<1	<0.010	0.200	0.020	0.68	0.70	0.010
AUG 30...	0.20	13	198	3	<1	<0.010	0.100	<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 07...	0.7	--	--	--	--	--	--	--	--	--	--
MAY 10...	1.9	--	--	--	--	--	--	--	--	--	--
AUG 30...	1.8	<1	32	1	<1	<1	15	<5	2	<0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
JAN 07...	--	--	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 10...	--	--	--	--	--	--	--	--	--	--
AUG 30...	<1.0	33	<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 07...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 10...	--	--	--	--	--	--	--	--	--	--
AUG 30...	<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 1987 TO SEPTEMBER 1988

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										
07...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
10...	--	--	--	--	--	--	--	--	--	--
AUG										
30...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<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.--28 years, 16.4 ft³/s (11,880 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 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)
July 11	2330	*241	*2.70				

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	12	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	62	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.0	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.86	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.90	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.58	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	62	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	.0	.0	158	.0	.0

CAL YR 1987 TOTAL 46360.20 MEAN 127 MAX 10500 MIN .00 AC-FT 91960
WTR YR 1988 TOTAL 79.90 MEAN .22 MAX 62 MIN .00 AC-FT 158

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 Co. datum, adjustment unknown.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station.

AVERAGE DISCHARGE.--27 years, 19.7 ft³/s (5.94 in/yr), 14,270 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 the 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)
Nov. 8	1430	*229	*2.64				

Minimum daily discharge, 0.36 ft³/s June 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	3.1	3.9	5.4	3.6	3.1	2.5	1.6	.91	1.1	2.8	1.1
2	5.3	3.1	3.9	5.3	3.6	2.8	2.4	1.3	1.1	.81	2.8	1.1
3	4.9	3.1	3.9	5.3	3.6	2.8	2.2	1.3	.98	.76	2.8	1.2
4	4.6	3.1	3.9	4.9	3.8	2.8	2.2	1.2	.76	.68	3.1	1.1
5	4.6	3.1	3.6	4.7	3.5	2.8	2.4	1.0	.68	.65	4.3	1.1
6	4.6	2.8	3.6	5.6	3.4	2.6	2.5	.92	.65	.58	2.7	1.2
7	4.6	2.6	3.4	5.6	3.4	2.6	2.4	.92	.58	.58	2.2	1.0
8	4.4	40	3.4	4.9	3.4	2.6	2.4	1.0	.58	.58	2.1	.91
9	4.3	11	3.2	4.4	3.3	2.4	2.5	1.1	.55	.58	2.0	.79
10	4.3	6.7	3.1	4.3	3.1	2.4	2.3	1.0	.50	.74	2.0	.79
11	4.3	5.7	3.1	4.2	2.9	2.4	2.0	.90	.49	29	1.8	.69
12	4.3	5.1	3.1	4.3	2.8	2.2	1.8	.87	.42	20	1.6	.72
13	4.3	4.8	3.1	4.2	2.8	2.3	1.8	.87	.36	11	1.5	1.1
14	4.2	4.6	2.9	3.9	2.9	2.6	1.8	1.0	.36	8.7	1.6	.92
15	3.9	4.6	2.5	3.9	2.8	2.6	1.8	.88	.39	7.3	2.7	.85
16	3.9	8.0	2.6	4.4	2.8	2.7	2.1	.79	.46	6.3	1.8	.68
17	3.9	5.1	2.8	4.4	2.8	4.2	2.5	.79	.50	5.5	1.6	1.3
18	3.9	4.9	3.2	4.3	3.1	4.0	2.0	.79	.50	4.9	1.8	1.6
19	3.9	4.4	11	4.1	3.1	3.6	1.7	.76	.50	4.3	1.6	2.9
20	3.9	4.4	7.6	3.9	3.1	3.6	1.7	1.1	.48	5.5	1.4	2.0
21	3.6	4.6	7.7	3.7	2.9	3.4	1.7	3.0	.50	7.1	1.4	1.4
22	3.6	4.6	6.6	3.5	2.7	3.1	1.8	1.8	.49	4.8	1.3	1.4
23	3.6	4.6	6.4	3.6	2.6	3.1	1.7	1.4	.42	4.2	1.3	1.3
24	3.6	4.6	6.5	3.7	2.6	3.1	1.5	1.2	.42	3.9	1.3	1.2
25	3.6	5.3	6.6	3.8	2.6	2.6	1.5	.89	1.6	3.6	1.2	1.1
26	3.6	4.3	7.6	3.6	2.6	2.0	1.4	.68	5.9	3.4	1.2	.92
27	3.6	4.3	7.0	3.5	2.6	1.8	1.3	.68	4.5	3.1	1.2	.87
28	3.5	4.3	6.6	3.4	2.6	2.6	1.3	.68	2.2	3.6	1.2	.79
29	3.4	4.3	6.2	3.4	2.7	2.7	1.4	.68	1.6	3.4	1.2	.79
30	3.4	4.1	5.9	3.5	---	2.5	1.6	.68	1.5	3.1	1.2	1.2
31	3.2	---	5.7	3.6	---	2.4	---	.74	---	2.9	1.2	---
TOTAL	126.1	175.2	150.6	131.3	87.7	86.4	58.2	32.52	30.88	152.66	57.9	34.02
MEAN	4.07	5.84	4.86	4.24	3.02	2.79	1.94	1.05	1.03	4.92	1.87	1.13
MAX	5.3	40	11	5.6	3.8	4.2	2.5	3.0	5.9	29	4.3	2.9
MIN	3.2	2.6	2.5	3.4	2.6	1.8	1.3	.68	.36	.58	1.2	.68
AC-FT	250	348	299	260	174	171	115	65	61	303	115	67
CFSM	.09	.13	.11	.09	.07	.06	.04	.02	.02	.11	.04	.03
IN.	.10	.14	.12	.11	.07	.07	.05	.03	.03	.13	.05	.03

CAL YR 1987	TOTAL 24447.8	MEAN 67.0	MAX 2870	MIN 2.5	AC-FT 48490	CFSM 1.49	IN. 20.21			
WTR YR 1988	TOTAL 1123.48	MEAN 3.07	MAX 40	MIN .36	AC-FT 2230	CFSM .07	IN. .93			

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 1987 TO SEPTEMBER 1988

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 (FTU)	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 06...	1500	5.3	431	8.40	9.5	2	0.20	11.1	100	0.3	31
MAY 10...	1434	0.50	397	8.30	33.0	2	0.60	7.9	114	1.0	400
AUG 30...	1424	1.1	388	8.20	33.0	1	0.60	10.3	150	0.5	200

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	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)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT WH TOT FET FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
JAN 06...	K15	210	47	67	11	7.7	0.2	0.90	166	49	13
MAY 10...	34	180	69	53	12	11	0.4	1.2	113	64	16
AUG 30...	K8	180	70	51	12	8.5	0.3	1.1	107	61	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)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE 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 06...	0.20	9.7	258	<1	<1	<0.010	0.500	0.020	--	<0.20	<0.010
MAY 10...	0.30	14	239	<1	<1	<0.010	<0.100	0.010	0.59	0.60	0.010
AUG 30...	0.20	14	226	6	<1	<0.010	<0.100	<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 06...	0.7	--	--	--	--	--	--	--	--	--	--
MAY 10...	2.5	--	--	--	--	--	--	--	--	--	--
AUG 30...	1.9	<1	32	<1	<1	1	6	5	<1	<0.1	<1

DATE	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)
JAN 06...	--	--	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01
MAY 10...	--	--	--	--	--	--	--	--	--	--
AUG 30...	<1.0	7	<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 06...	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 10...	--	--	--	--	--	--	--	--	--	--
AUG 30...	<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 1987 TO SEPTEMBER 1988

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										
06...	<0.01	<0.01	<0.01	<0.1	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
10...	--	--	--	--	--	--	--	--	--	--
AUG										
30...	<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.--27 years (water years 1962-88), 9.10 ft³/s (6,590 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.--No flow during year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

CAL YR 1987	TOTAL	18952.41	MEAN	51.9	MAX	8310	MIN	.00	AC-FT 37590
WTR YR 1988	TOTAL	0.00	MEAN	.00	MAX	.00	MIN	.00	AC-FT .0

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. Miscellaneous discharge measurements 1925-39 in connection with seepage investigations. Operated as continuous record station from January 1939 to September 1965. Miscellaneous discharge measurements since September 1965.

GAGE.--Nonrecording. Datum of gage is 838.39 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Discharge represents flow from several springs that enter river above station and below Uvalde. Surface runoff from precipitation is excluded. No known diversion above station.

AVERAGE DISCHARGE.--26 years (during period of continuous record, water years 1940-65), 9.72 ft^3/s, 7,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--(1939 to current year.) Maximum measured spring discharge, 82 ft^3/s May 25, 1977; no flow at times in 1948-49, 1951-59, 1964-68, and 1984-85.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Nov. 3, 1988	85.7	Mar. 3, 1988	61.0	July 1, 1988	29.5
Jan. 6	91.1	May 5	39.2	Aug. 25	28.3

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 (FT³/S, ft³/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 picocuries per liter and is equal to 3.7×10^{-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),

for January 1986 to December 1986 were reported by Ozuna, Nalley, and Stein (1988), and for January 1987 to December 1987 were reported by Nalley and Rettman (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.

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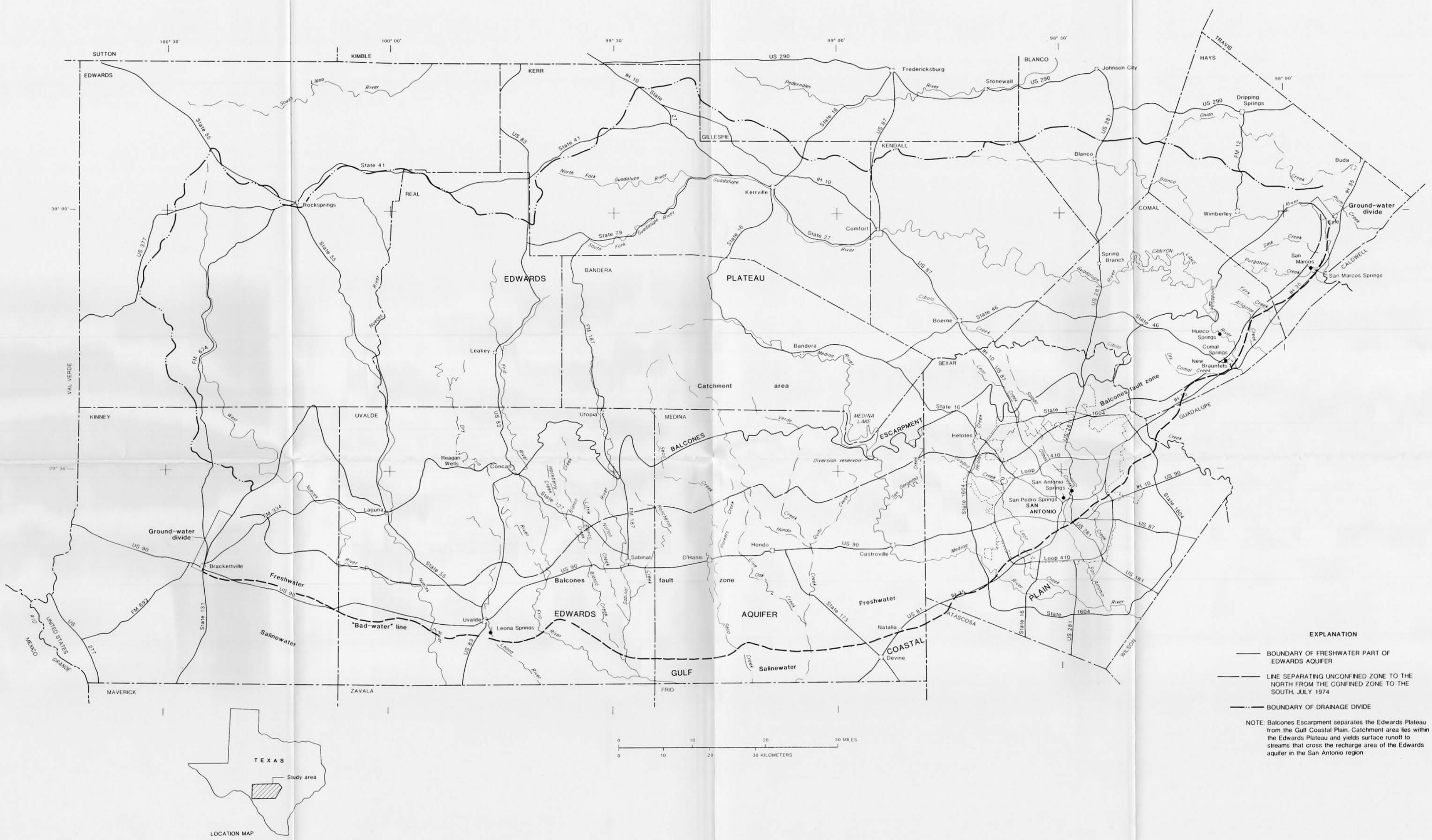


Plate 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio region.

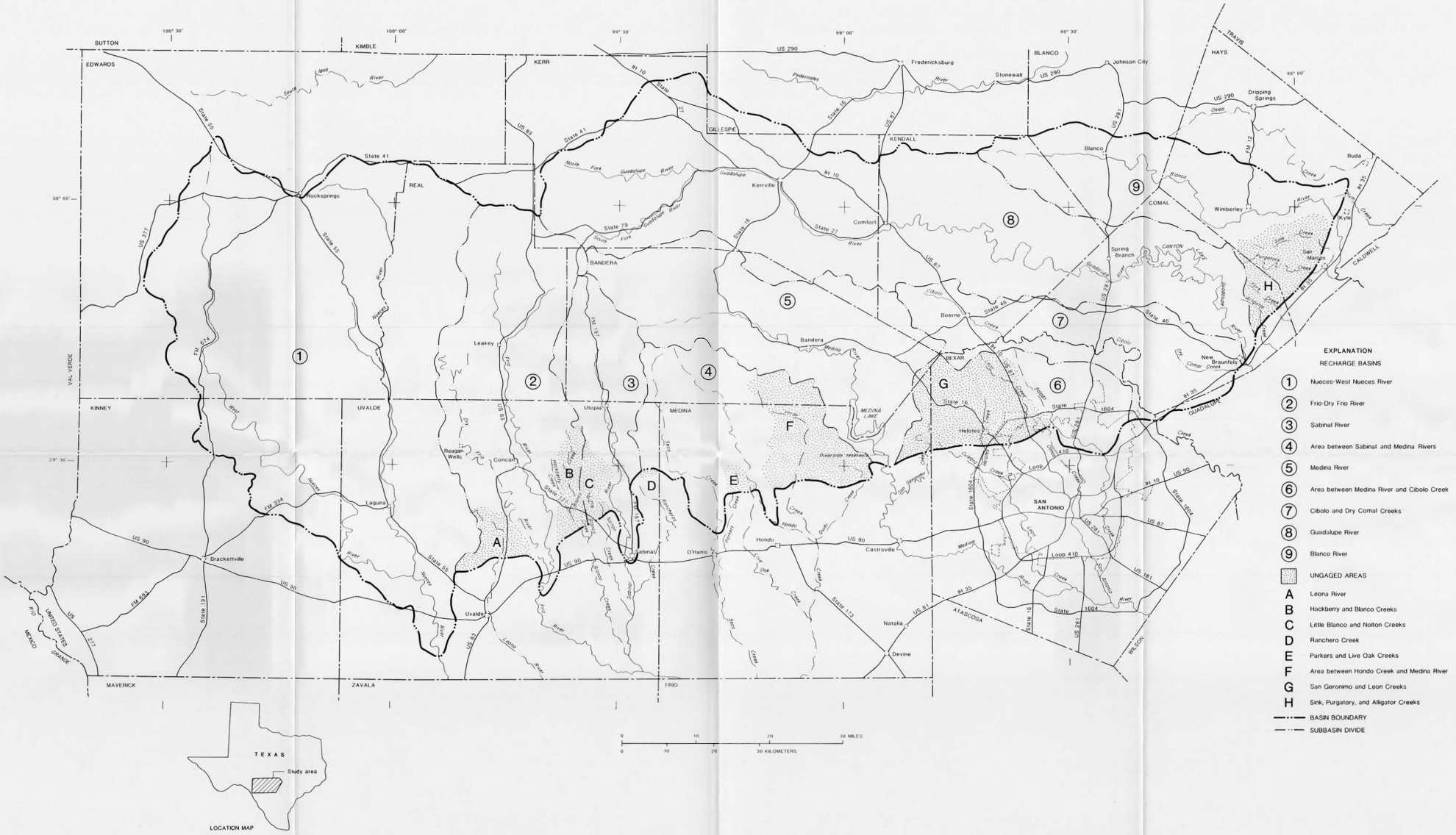
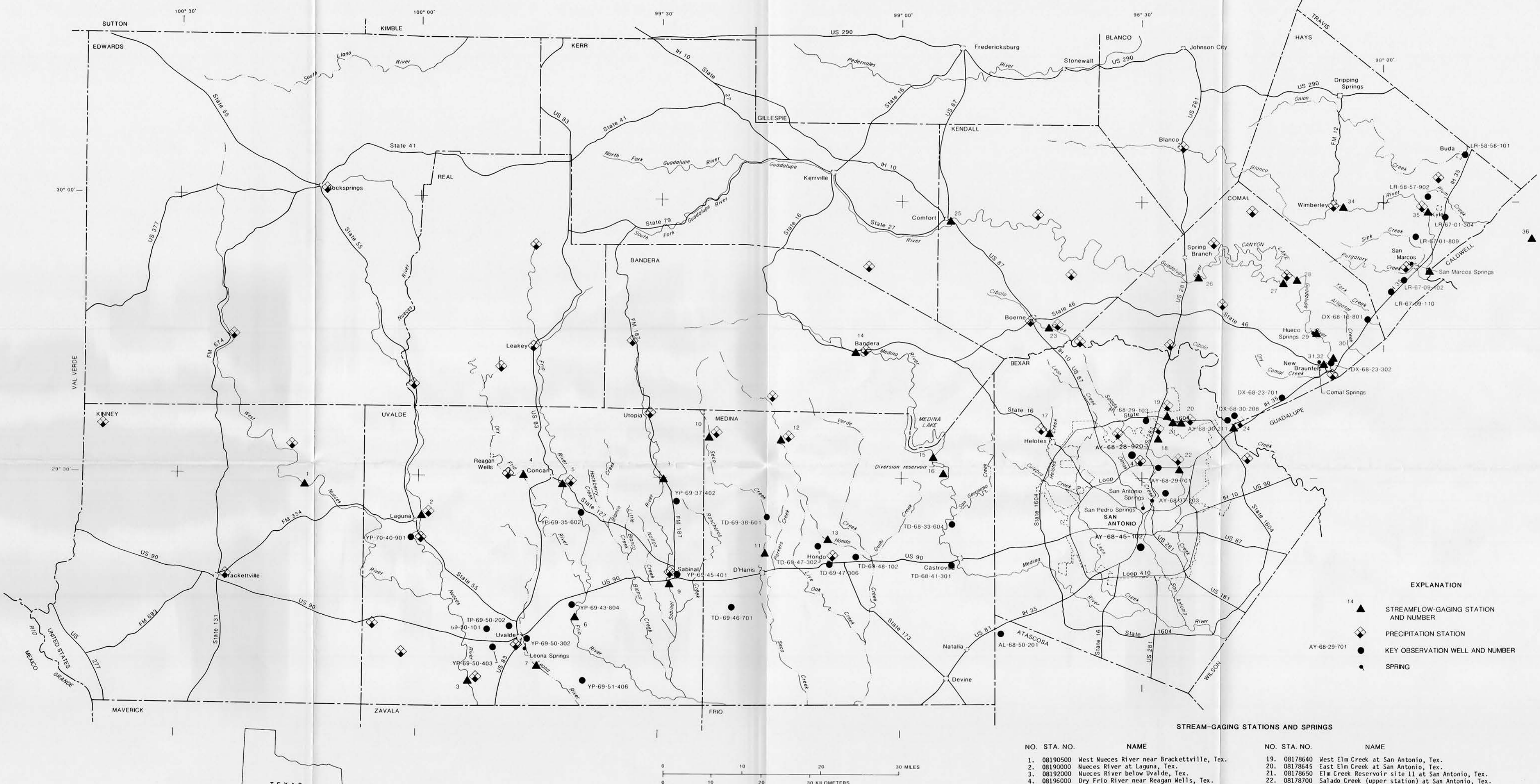
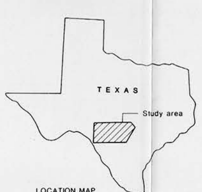


Plate 2.--Location of drainage basins and ungaged areas.





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, 1988.

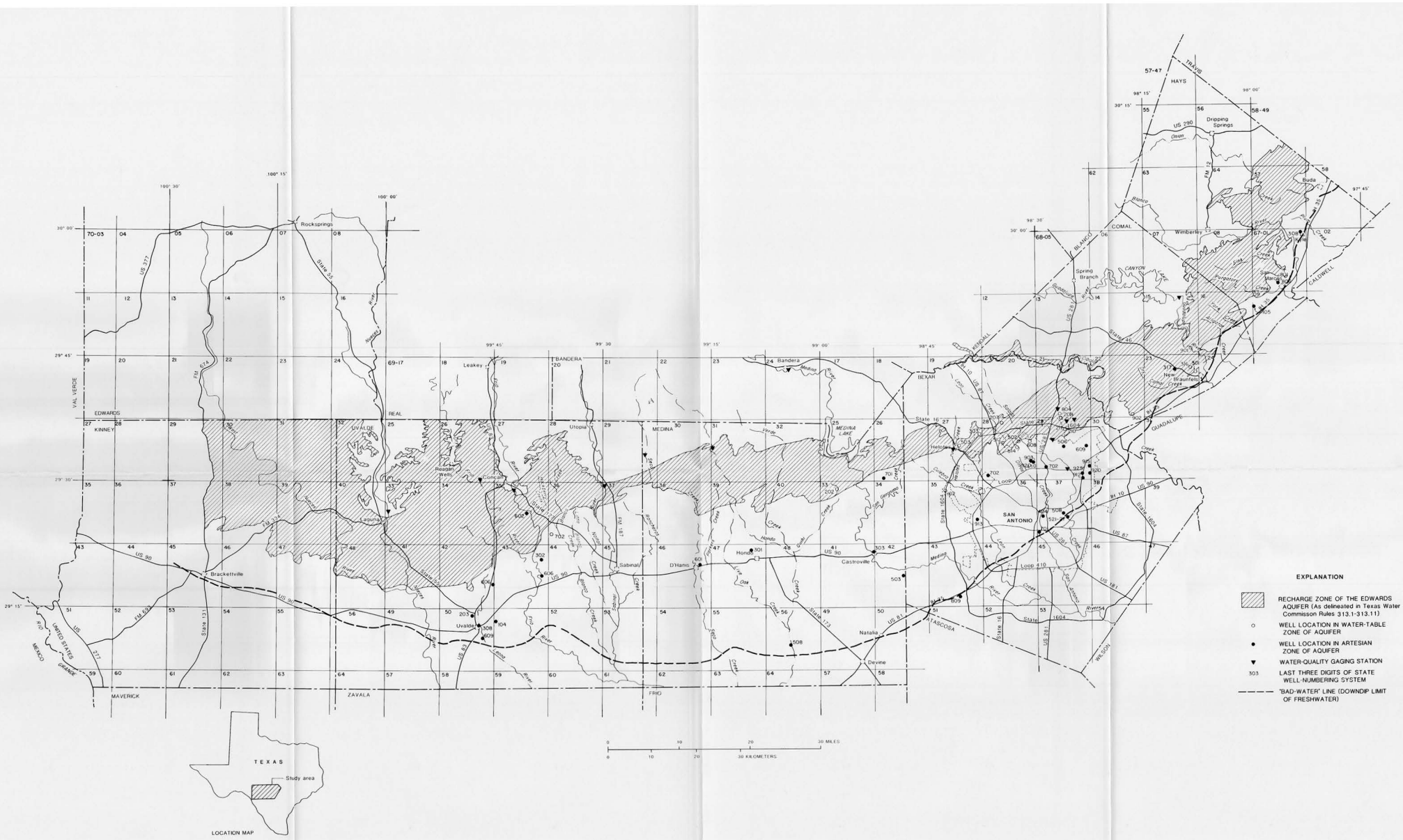


Plate 4.--Location of water-quality data-collection sites for wells, springs, and streams sampled in 1988.

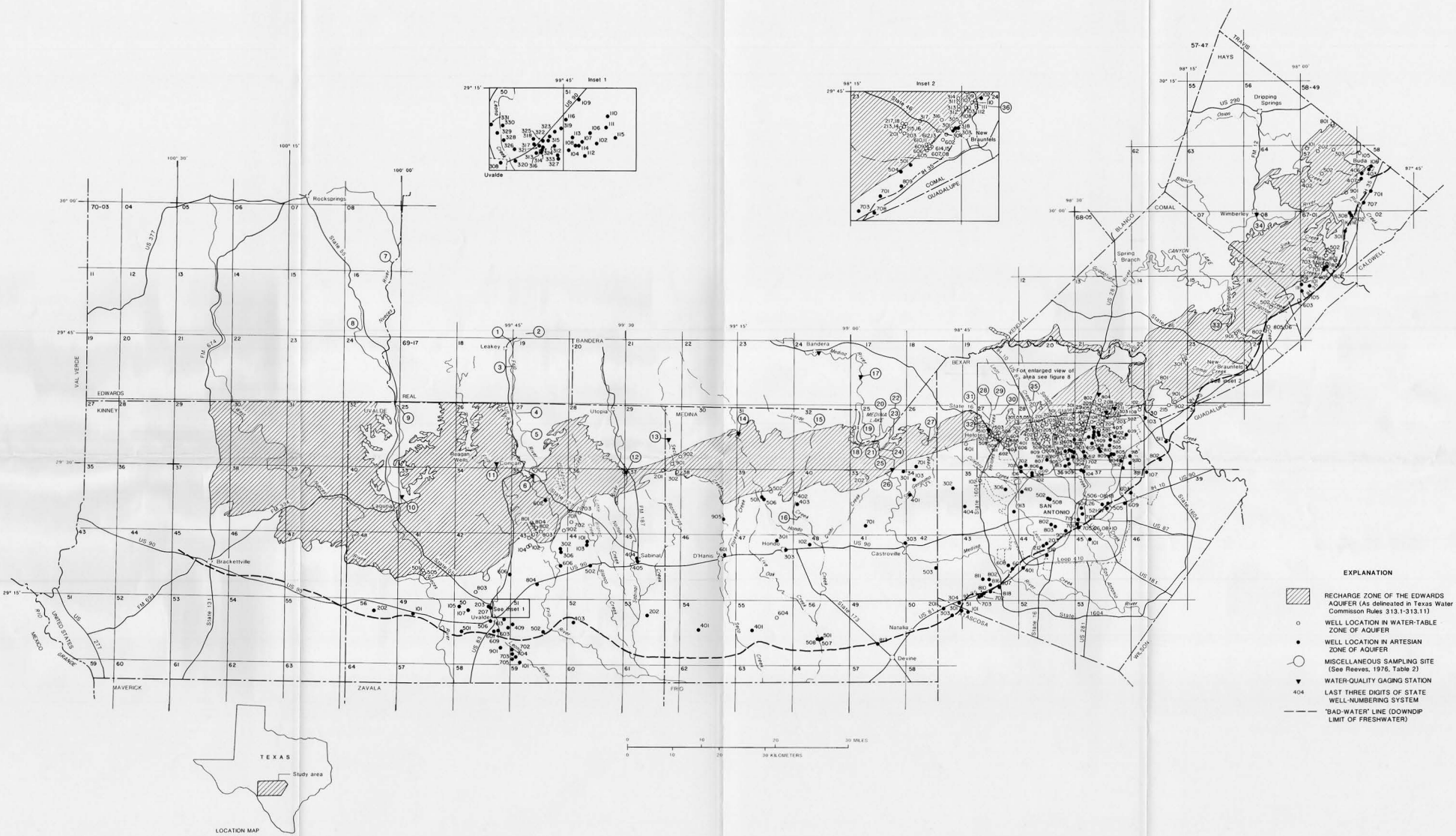
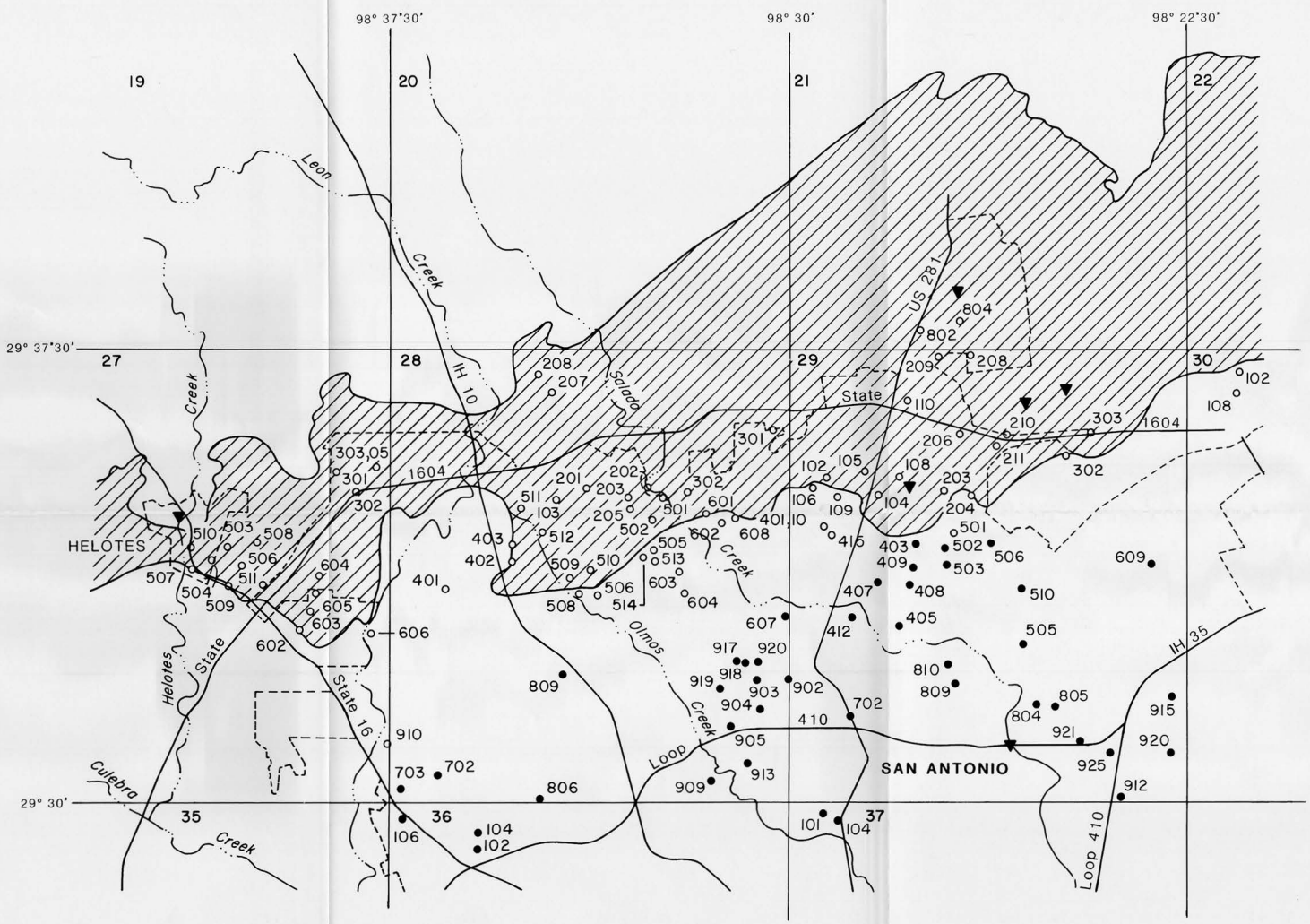


Plate 5.--Location of water-quality data -collection sites for wells, springs, and streams sampled within the period 1972-88.



EXPLANATION

- RECHARGE ZONE OF THE EDWARDS AQUIFER (As delineated in Texas Water Commission Rules 313.1-313.11)
- 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 vicinity of San Antonio sampled within the period 1972-88.

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

http://www.edwardsaquifer.org/documents/1989_Nalley_1988HydrologicData-Plates.pdf