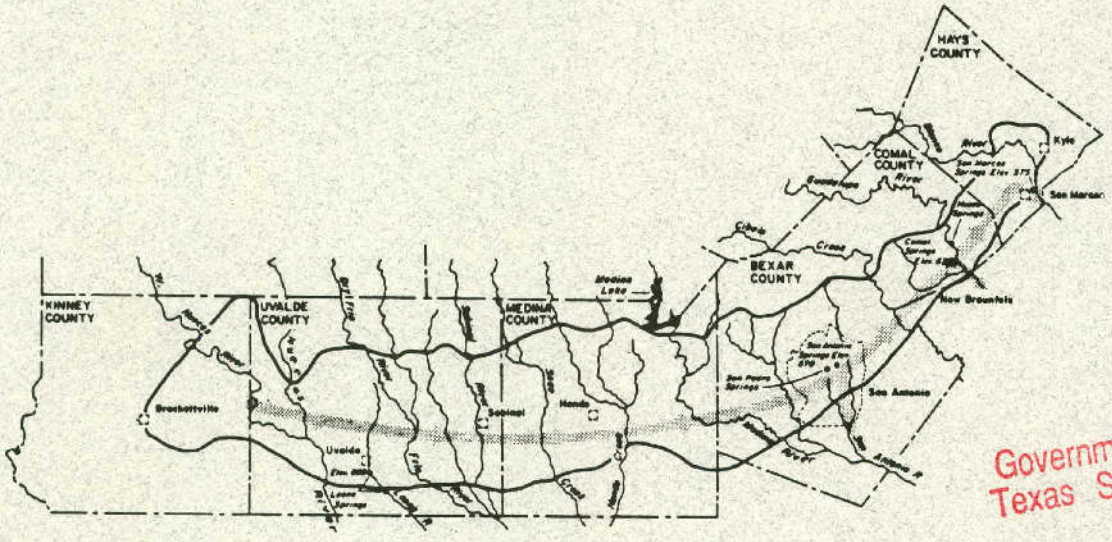
COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1990, WITH 1934-90 SUMMARY

Bulletin 50
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

1615 North St. Mary's
San Antonio, Texas 78212

BULLETIN 50

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Compiled by

D.S. Brown, J.R. Gilhousen, and G.M. Nalley
U.S. Geological Survey

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COMPILATION OF HYDROLOGIC DATA FOR THE EDWARDS AQUIFER, SAN ANTONIO AREA, TEXAS, 1990, WITH 1934-90 SUMMARY

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ABSTRACT

The average estimated annual ground-water recharge to the Edwards aquifer in the San Antonio area, Texas, from 1934 through 1990 was 636,700 acre-feet. Recharge in 1990 was 1,123,200 acre-feet, which is the eighth largest 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 estimated annual discharge from the Edwards aquifer by wells and springs in 1990 was 730,000 acre-feet, which is the seventeenth 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 1990 fluctuated near the midpoint between record high and low levels, reflecting a greater-than- to about-average volume of ground water in storage in the aquifer during most of the year. In 1990, water levels rose during the early winter and early spring, after which water levels generally remained about average in most of the area.

Water samples from 87 wells (including wells drilled in 1985 that transect the freshwater/saline-water interface) and 3 springs in the Edwards aquifer were analyzed for more than 90 properties or constituents, most of which affect the suitability of the water for domestic use. Concentrations of

constituents in water from the freshwater zone did not exceed the maximum contaminant levels established for public water systems. Trace concentrations of volatile organic compounds, however, were detected in samples from 14 wells.

Surface-water data for the San Antonio area, which were used to calculate annual recharge to and annual discharge from the Edwards aquifer, consisted of discharge data for streams and springs and contents-data for reservoirs. These data are stored in the National Water Information System, a computerized data base operated by the U.S. Geological Survey.

INTRODUCTION

This annual compilation of records of ground-water recharge and discharge, water levels, and water quality for the Edwards aquifer and of 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 ground-water 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 upstream and downstream from the area used for calculating recharge plus the estimated runoff within this area. The Edwards aquifer and physiographic regions are shown in figure 1, recharge basins and ungaged areas are shown in figure 2, and data-collection sites are shown in figure 3.

Annual ground-water discharge is compiled from: (1) Pumpage data for municipal, military, and industrial uses collected by the Texas Water Development Board; (2) pumpage data for irrigation estimated by the U.S. Geological Survey using irrigated-acreage data supplied by the U.S. Soil Conservation Service; and (3) springflow data collected by the U.S. Geological Survey.

Periodic water-level measurements have been made in observation wells completed in the Edwards aquifer since 1929 to determine changes in ground-water storage in the aquifer. The first continuous water-level recorders were installed during the early 1930's. During 1990, periodic water-level measurements were made in 13 wells, and continuous water-level recorders were operated in 20 other wells.

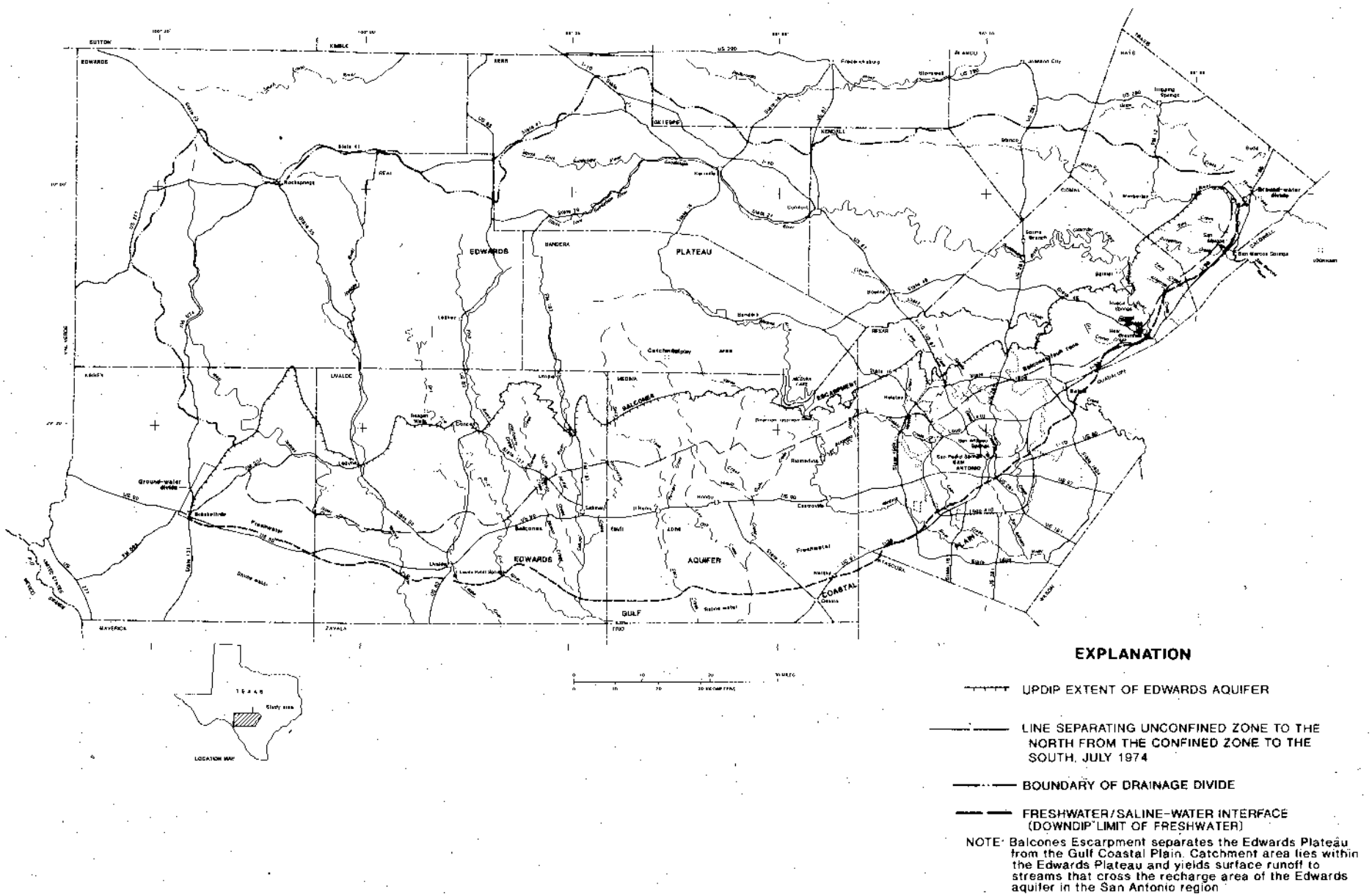


Figure 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio area.

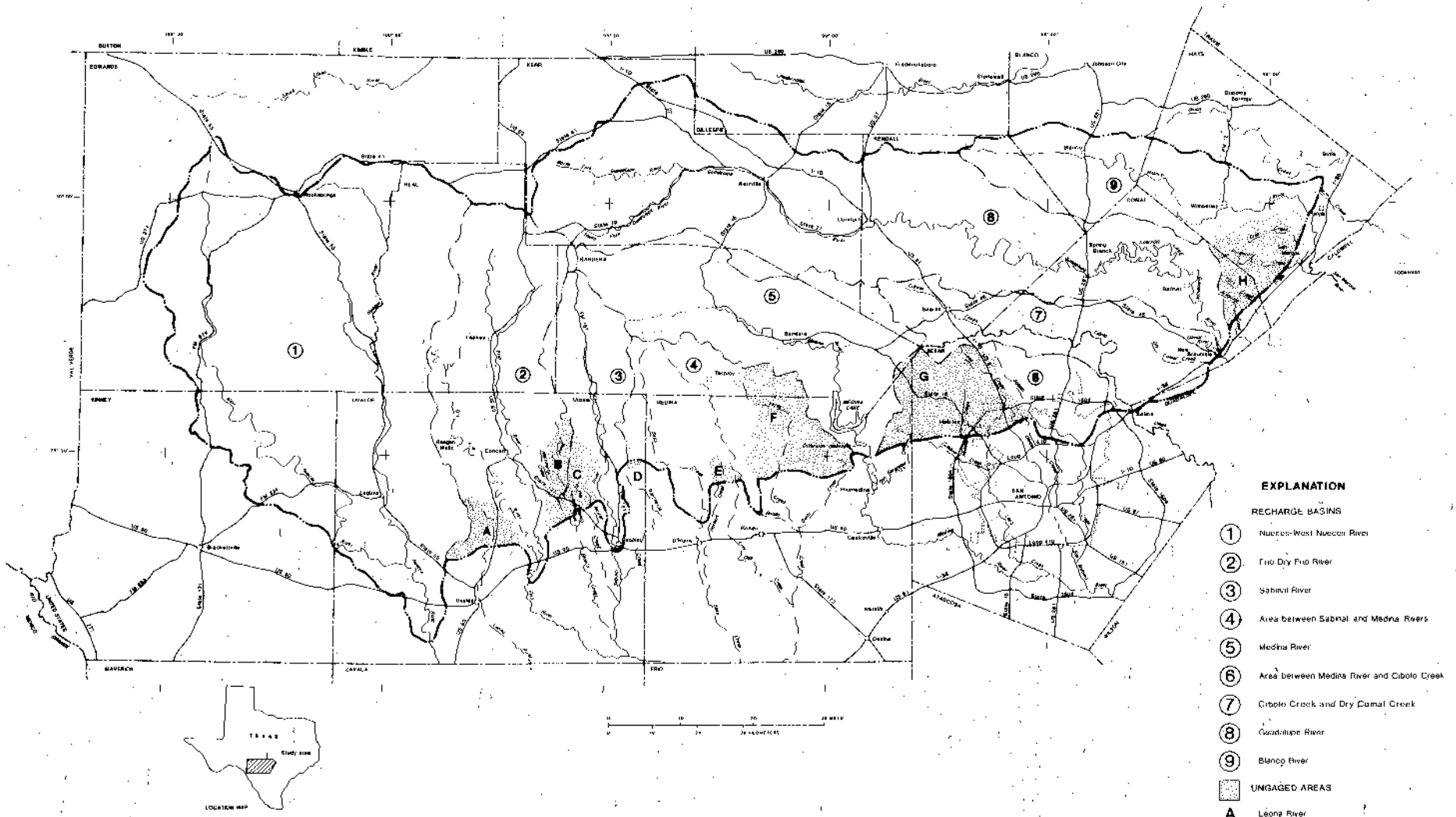
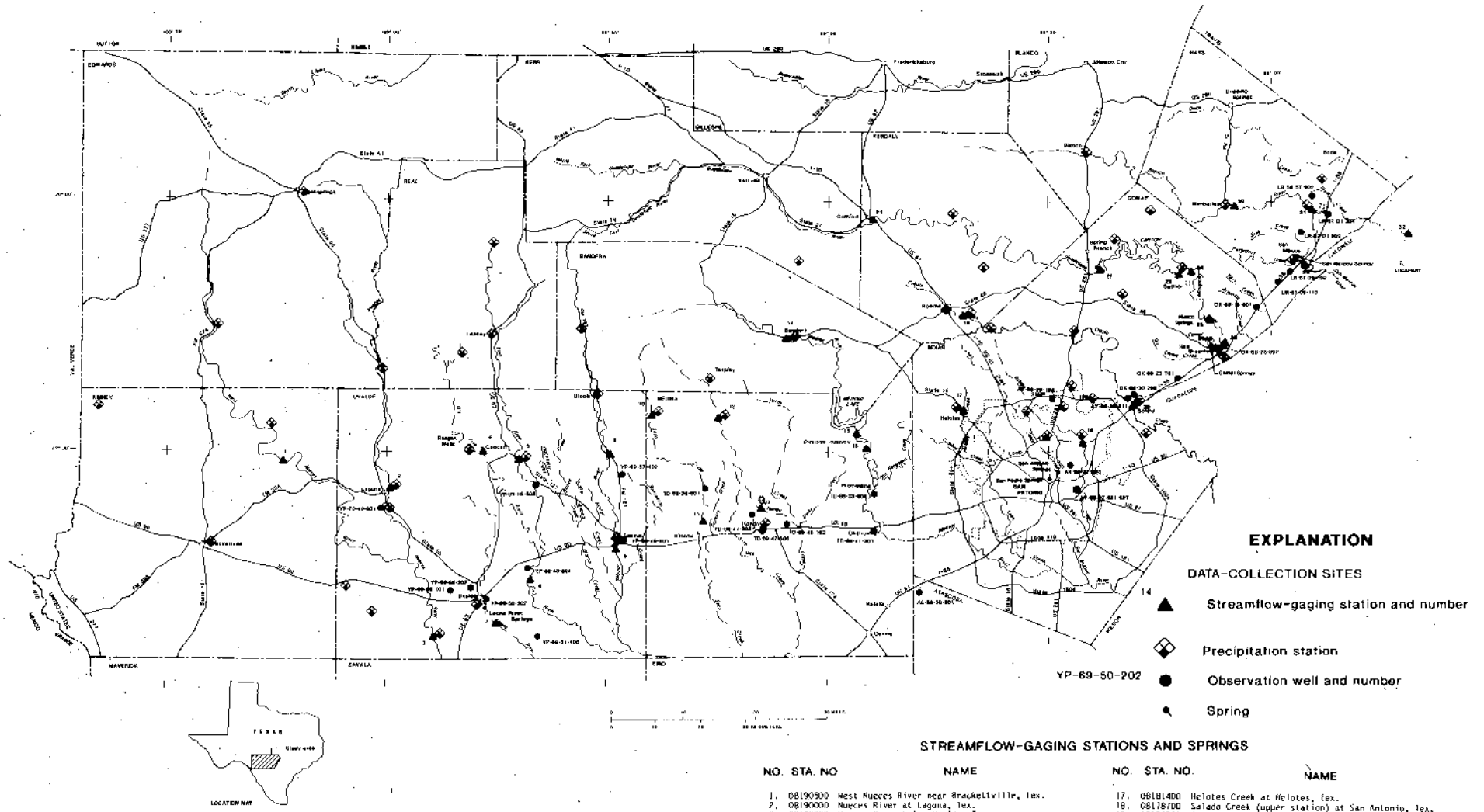


Figure 2.--Location of recharge basins and ungaged areas.



STREAMFLOW-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 springflow 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.	08210000	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 Rionedina, Tex.
17.	08181400	Helotes Creek at Helotes, Tex.
18.	08178700	Salado Creek (upper station) at San Antonio, Tex.
19.	08183900	Cibolo Creek near Boerne, Tex.
20.	08186000	Cibolo Creek at Selma, Tex.
21.	08167000	Guadalupe River at Comfort, Tex.
22.	08167500	Guadalupe River near Spring Branch, Tex.
23.	08167700	Canyon Lake near New Braunfels, Tex.
24.	08167800	Guadalupe River at Sattler, Tex.
25.	08168000	Hueco Springs near New Braunfels, Tex.
26.	08168500	Guadalupe River above Comal River at New Braunfels, Tex.
27.	08169000	Comal River at New Braunfels, Tex.
28.		Comal Springs at New Braunfels, Tex.
29.	08170000	San Marcos River springflow at San Marcos, Tex.
30.	08171000	Blanco River at Wimberley, Tex.
31.	08171300	Blanco River near Kyle, Tex.
32.	08172400	Plum Creek at Lockhart, Tex.

Figure 3.--Location of data-collection sites--streamflow-gaging and precipitation stations, observation wells, and springs, 1990.

Water-quality samples were collected during 1990 from selected wells completed in and springs discharging from the Edwards aquifer. Samples were analyzed for properties and constituents that affect the domestic use of the water. Monthly samples were collected from wells transecting the freshwater/saline-water interface in order to detect changes in water quality.

Surface-water data for the San Antonio area for the 1990 water year are presented in "Water Resources Data for Texas, Water Year 1990," volume 3 (U.S. Geological Survey, 1991) and are identified by river basins. Provisional data for October-December 1990 were used to calculate ground-water recharge for 1990. Data 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. These data are stored in the National Water Information System, a computerized data base operated by the U.S. Geological Survey in cooperation with Federal, State, and local agencies.

PRECIPITATION

The annual precipitation for 1934-90 and the long-term average, based on the period of record, at selected stations in the San Antonio area are given in table 1. Annual precipitation for 1990 at five stations with complete records ranged from about 30 percent greater than the long-term average at Boerne to about 4 percent less than the long-term average at Hondo.

During 1986-90, precipitation fluctuations at selected stations with complete records ranged from about 61 percent less than the long-term average for 1988, to about 37 percent more than the long-term average for 1986. The annual precipitation at all selected stations during 1988-89 was less than average. During 1986-87, the annual precipitation was near average to substantially greater than average at most stations. Fluctuations of reported annual-precipitation totals for San Antonio for 1934-90 are shown in figure 4.

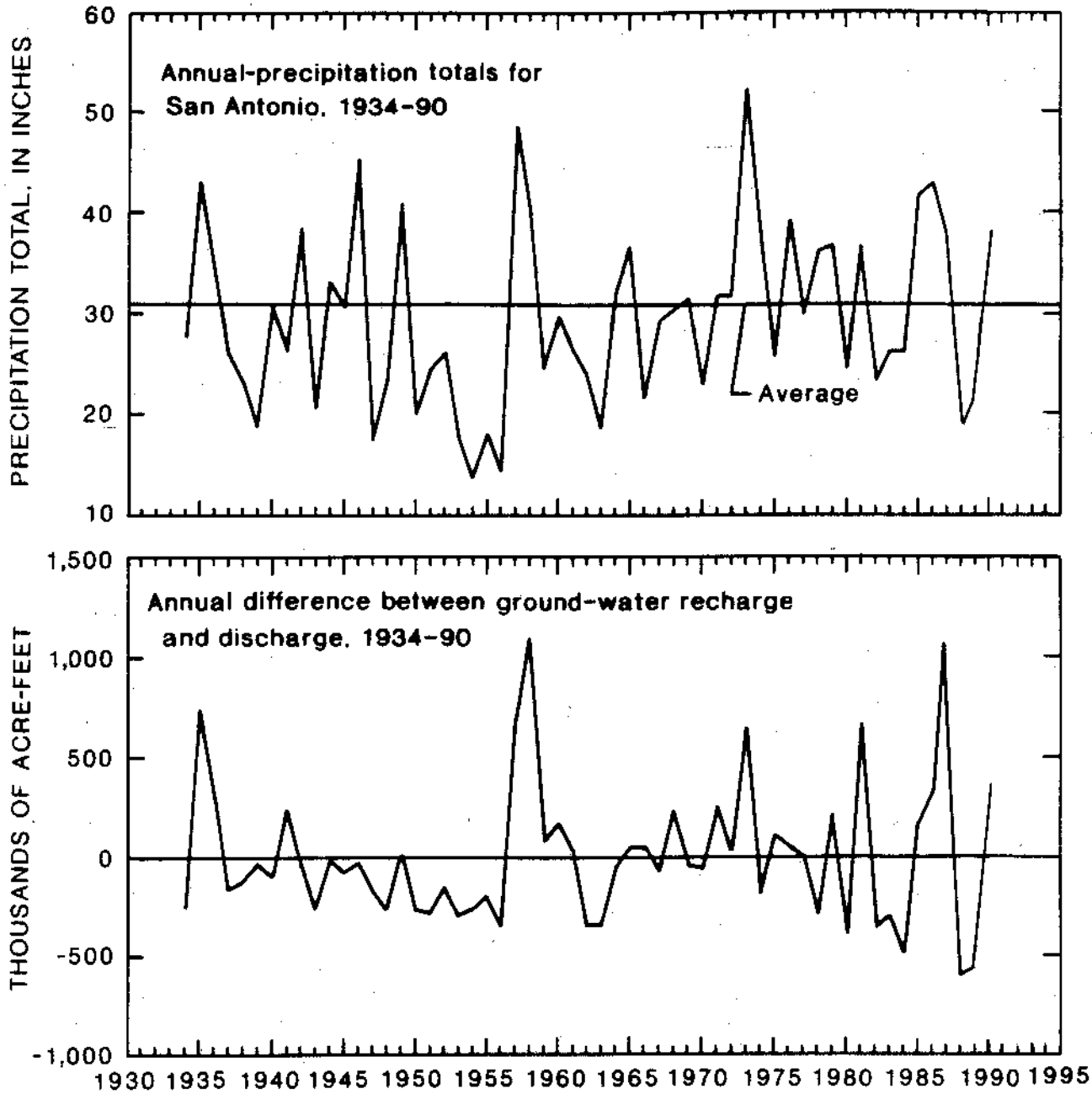


Figure 4.--Annual-precipitation totals for San Antonio, 1934-90, and annual difference between ground-water recharge and discharge, 1934-90.

Table 1.--Annual precipitation for 1934-90 and long-term average precipitation 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
1989	16.98	18.65	17.26	16.10	22.14	25.14	20.99	25.46
1990	c/38.24	24.73	30.06	27.01	38.31	42.51	b/24.58	c/35.14
Years of record available	92	90	73	88	107	88	95	90
Long-term average	21.16	24.15	25.14	28.27	31.16	32.82	32.07	33.60

a/ Precipitation data from the U.S. Department of Agriculture (1934-40) and U.S. Department of Commerce (1941-90).
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.

GROUND-WATER RECHARGE

The area used for estimating recharge to the Edwards aquifer in the San Antonio area has been modified slightly from the area described by Puente (1978) to reflect existing data-collection sites. The 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. Collectively, basins 1-5 in the western part of the recharge zone (fig. 2) have a catchment area of about 2,950 mi^2, which is about 60 percent of the total catchment area for the Edwards aquifer. These basins supply 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 might contribute recharge to the Edwards aquifer are, from oldest to youngest, the Glen Rose Limestone, the Buda Limestone, and the Austin Group. Only recharge derived from the land surface is included in this compilation.

The estimated annual recharge by basin and the average annual recharge for 1934-90 are given in table 2. Recharge in the Guadalupe River basin is not included because the net recharge to the aquifer in this basin is negligible (Puente, 1978).

The annual recharge for 1934-90 ranged from 43,700 acre-ft in 1956 to 2,003,600 acre-ft in 1987. The average annual recharge for 1934-90 was 636,700 acre-ft. The annual recharge for 1990 was 1,123,200 acre-ft, which is 76 percent greater than the average annual recharge and is the eighth largest estimated annual recharge since 1934.

Table 2.--Estimated annual recharge to the Edwards aquifer by basin, 1934-90 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 River basin c/	Area between Medina River basin and Cibolo Creek basin b/	Cibolo Creek and Dry Comal Creek basins	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	44.8	23.5	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
1989	52.6	52.6	8.4	13.5	46.9	4.6	12.3	23.6	214.4
1990	479.3	255.0	54.6	131.2	54.0	35.9	71.8	41.3	1,123.2
AVERAGE	111.1	119.9	38.6	98.0	60.7	67.2	103.5	37.8	636.7

a/ Differences may occur due to rounding procedures.
b/ Includes recharge from gaged and ungaged areas within the basin.
c/ Recharge to Edwards aquifer from the Medina River basin consists entirely of losses from Medina Lake (Puente, 1978, p. 23).

GROUND-WATER DISCHARGE

The estimated total discharge from wells and springs in 1990 was 730,000 acre-ft, which is a decrease of about 5 percent from 1989. In 1990, most of the estimated discharge was from wells and constituted about 67 percent of the total discharge. Spring discharge comprised about 33 percent of the total discharge for the year. The estimated annual discharge, by county, from the Edwards aquifer during 1934-90 is given in table 3. The annual difference between ground-water recharge and discharge for 1934-90 is shown in figure 4. The calculated average daily and total annual discharge by county and by water use for 1990 is given in table 4.

The total estimated spring discharge (table 3) was 240,600 acre-ft for 1990, an increase of about 7 percent from 1989. The major springs from which discharge was estimated 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 discharge in Comal and Hays Counties was 229,200 acre-ft, which is about 95 percent of the total spring discharge for the year. The estimated discharge from Leona River Springs includes underflow into the alluvial gravels along the stream.

The total estimated discharge from wells (table 3) was 489,400 acre-ft, a decrease of 53,000 acre-ft, which is about a 10-percent decrease from 1989. Well discharge in Bexar County was 276,800 acre-ft, which is a decrease of 28,800 acre-ft, or about a 9-percent decrease from 1989. In 1990, about 57 percent of the total well discharge was from wells in Bexar County (table 4). Most of this well discharge was for municipal, military, and domestic uses. Other wells in Bexar County, along with most of the large wells in Uvalde and Medina Counties, supplied water from the Edwards aquifer for the irrigation of about 92,400 acres. The number of acres of each crop type irrigated

Table 3.--Estimated annual discharge from the Edwards aquifer by county, 1934-90 a/
[thousands of acre-feet]

Year	Kinney-Uvalde Counties	Medina County	Bexar County	Comal County	Hays County	Total	Total well discharge	Total spring discharge
1934	12.6	1.3	109.3	229.1	85.6	437.9	101.9	336.0
1935	12.2	1.5	171.8	237.2	96.9	519.6	103.7	415.9
1936	26.6	1.5	215.2	261.7	93.2	598.2	112.7	485.5
1937	28.3	1.5	201.8	252.5	87.1	571.2	120.2	451.0
1938	25.2	1.6	187.6	250.0	93.4	557.8	120.1	437.7
1939	18.2	1.6	122.5	219.4	71.1	432.8	118.9	313.9
1940	16.1	1.6	116.7	203.8	78.4	416.6	120.1	296.5
1941	17.9	1.6	197.4	250.0	134.3	601.2	136.8	464.4
1942	22.5	1.7	203.2	255.1	112.2	594.7	144.6	450.1
1943	19.2	1.7	172.0	249.2	97.2	539.3	149.1	390.2
1944	11.6	1.7	166.3	252.5	135.3	567.4	147.3	420.1
1945	12.4	1.7	199.8	263.1	137.8	614.8	153.3	461.5
1946	6.2	1.7	180.1	261.9	134.0	583.9	155.0	428.9
1947	13.8	2.0	193.3	256.8	127.6	593.5	167.0	426.5
1948	9.2	1.9	159.2	203.0	77.3	450.6	168.7	281.9
1949	13.2	2.0	165.3	209.5	89.8	479.8	179.4	300.4
1950	17.8	2.2	177.3	191.1	78.3	466.7	193.8	272.9
1951	16.9	2.2	186.9	150.5	69.1	425.6	209.7	215.9
1952	22.7	3.1	187.1	133.2	78.8	424.9	215.4	209.5
1953	27.5	4.0	193.7	141.7	101.4	468.3	229.8	238.5
1954	26.6	6.3	208.9	101.0	81.5	424.3	246.2	178.1
1955	28.3	11.1	215.2	70.1	64.1	388.8	261.0	127.8
1956	59.6	17.7	229.6	33.6	50.4	390.9	321.1	69.8
1957	29.0	11.9	189.4	113.2	113.0	456.5	237.3	219.2
1958	23.7	6.6	199.5	231.8	155.9	617.5	219.3	398.2
1959	43.0	8.3	217.5	231.7	118.5	619.0	234.5	384.5
1960	53.7	7.6	215.4	235.2	143.5	655.4	227.1	428.3
1961	56.5	6.4	230.3	249.5	140.8	683.5	228.2	455.3
1962	64.6	8.1	220.0	197.5	98.8	589.0	267.9	321.1
1963	51.4	9.7	217.3	155.7	81.9	516.0	276.4	239.6
1964	49.3	8.6	201.0	141.8	73.3	474.0	260.2	213.8
1965	46.8	10.0	201.1	194.7	126.3	578.9	256.1	322.8
1966	48.5	10.4	198.0	198.9	15.4	571.2	255.9	315.3
1967	81.1	15.2	239.7	139.1	82.3	557.4	341.3	216.1
1968	58.0	9.9	207.1	238.2	146.8	660.0	251.7	408.3
1969	88.5	13.6	216.3	218.2	122.1	658.7	307.5	351.2
1970	100.9	16.5	230.6	229.2	149.9	727.1	329.4	397.7
1971	117.0	32.4	262.8	168.2	99.1	679.5	406.8	272.7
1972	112.6	28.8	247.7	234.3	123.7	747.1	371.3	375.8
1973	96.5	14.9	273.0	289.3	164.3	838.0	310.4	527.6
1974	133.3	28.6	272.1	286.1	141.1	861.2	377.4	483.8
1975	112.0	22.6	259.0	296.0	178.6	868.2	327.8	540.4
1976	136.4	19.4	253.2	279.7	164.7	853.4	349.5	503.9
1977	156.5	19.9	317.5	295.0	172.0	960.9	380.6	580.3
1978	154.3	38.7	269.5	245.7	99.1	807.3	431.8	375.5
1979	130.1	32.9	294.5	300.0	157.0	914.5	391.5	523.0
1980	151.0	39.9	300.3	220.3	107.9	819.4	491.1	328.3
1981	104.2	26.1	280.7	241.8	141.6	794.4	387.1	407.3
1982	129.2	33.4	305.1	213.2	105.5	786.4	453.1	333.3
1983	107.7	29.7	271.6	186.6	118.5	720.1	418.5	301.6
1984	151.1	46.9	309.7	108.9	85.7	702.3	529.8	172.5
1985	156.9	59.2	295.5	200.0	144.9	856.5	522.5	334.0
1986	b/91.7	41.9	294.0	229.3	160.4	b/817.3	429.3	b/388.1
1987	b/94.9	15.9	326.6	286.2	198.4	b/922.0	364.1	b/558.0
1988	b/156.7	82.2	317.4	236.5	116.9	b/909.7	540.0	b/369.8
1989	155.6	70.5	305.6	147.9	85.6	766.6	542.4	224.1
1990	118.1	69.7	276.8	171.3	94.1	730.0	489.4	240.6

a/ Differences may occur due to rounding procedures.
b/ Differs from Bulletins 46-48 due to correcting an error found in the method of calculating the Leona Gravel underflow.

Table 4.--Calculated average daily and total annual discharge from the Edwards aquifer by county and by water use, 1990 a/

[--, data not available]

County	Springs	Municipal supply and military use	Irrigation	Industrial use	Domestic supply, stock, and miscellaneous use b/	Total (million gallons per year)	Total (thousand acre-feet per year)
	Million gallons per day						
Kinney	--	--	0.5	--	0.2	255.5	0.8
Uvalde	10.2	4.1	87.1	0.8	2.4	38,205.8	117.3
Medina	--	5.2	56.5	--	0.6	22,726.0	69.7
Bexar	0.0	200.5	10.0	7.8	28.8	90,185.6	276.8
Comal	130.8	8.9	0.2	12.3	0.6	55,826.8	171.3
Hays	73.7	8.8	0.1	0.2	1.2	30,666.7	94.1
Total (million gallons per year)	78,397.3	83,066.0	56,340.5	7,717.1	12,345.5	237,866.4	
Total (thousand acre-feet per year)	240.6	254.9	172.9	23.7	37.9		730.0

a/ Differences may occur due to rounding procedures.

b/ Includes pumpage from private schools, country clubs, parks, flowing wells, and cemeteries.

was estimated using data obtained from the U.S. Soil Conservation Service. The quantity of irrigation water withdrawn from the Edwards aquifer is calculated by multiplying the duty value for each crop type by the estimated number of acres in that crop type. 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 completed 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 the change in ground-water storage in the aquifer. Changes in ground-water storage occur when there are differences between the quantities of recharge and discharge. When recharge is greater than discharge, water levels rise and spring discharge increases; when discharge is greater than recharge, water levels decline and spring discharge decreases. During 1986-90, recharge was greater than discharge in 1986, 1987, and 1990, and was reflected in rising water levels. Discharge was greater than recharge during 1988-89 and was reflected in declining water levels for those years. The annual difference between ground-water recharge and discharge for 1934-90 is shown in figure 4. The accumulated difference between ground-water recharge and discharge and the annual average water level for an observation well in Bexar County are shown in figure 5. The observation well is a composite record of wells CY-26 and AY-68-37-203 (J-17).

In 1990, the general trend of water levels for five selected observation wells in the artesian part of the aquifer was slightly upward, reflecting

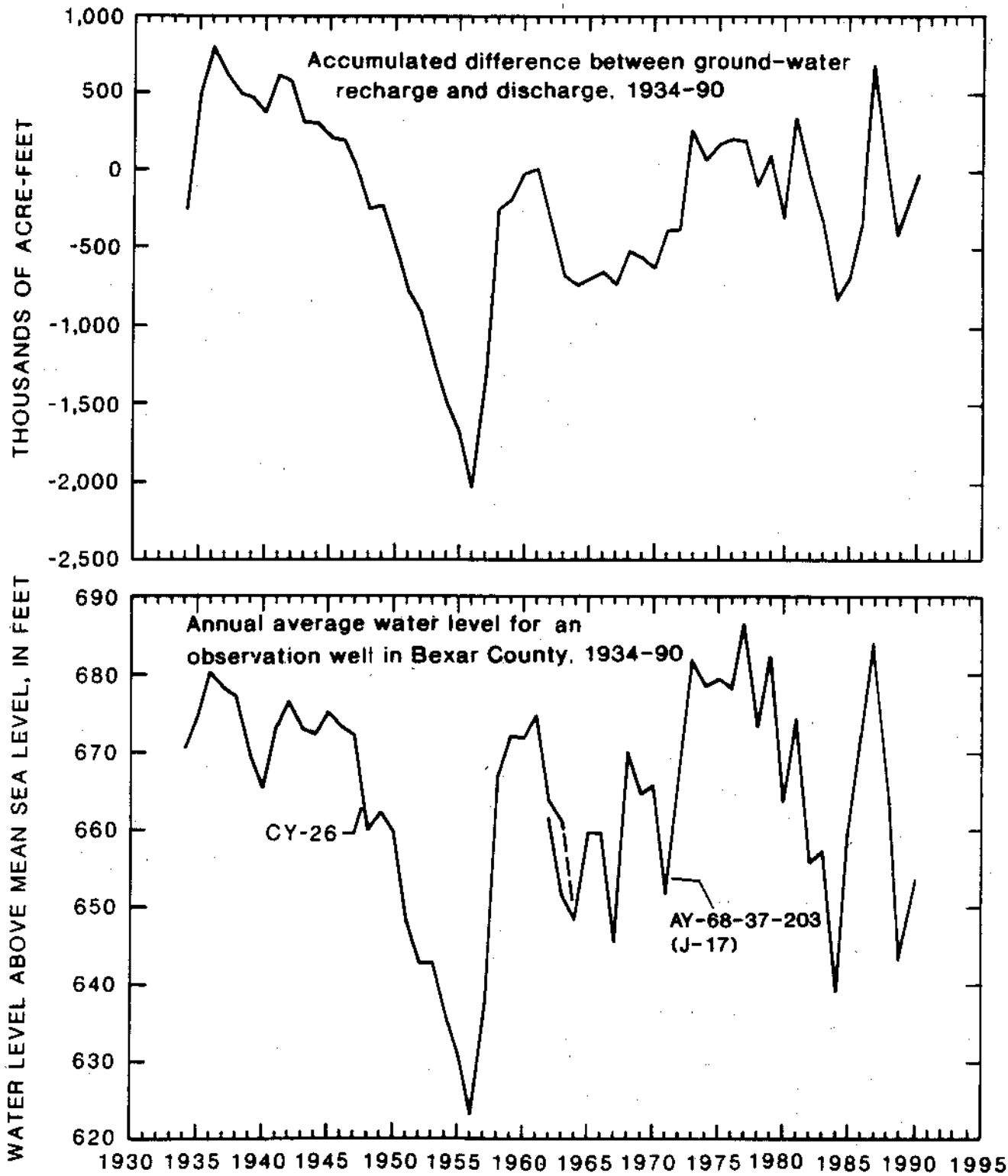


Figure 5.--Accumulated difference between ground-water recharge and discharge, and annual average water level for an observation well in Bexar County, 1934-90.

greater-than-normal recharge or less-than-normal discharge or both for the year. The annual and period of record high and low water levels recorded for these five selected observation wells during 1934-90 are given in table 5. Water levels from these wells during 1990 fluctuated near the midpoint between the recorded historical high and low measurements.

In 1990, water levels in 13 wells were measured periodically and water levels in 20 additional wells were measured with recorders on a continuous basis (fig. 3). Two additional wells shown in figure 3 had no water-level data for 1990. The water-level data from the wells with 1990 measurements showed a general upward trend, reflecting greater recharge than discharge for the year. The water-level data also show that increases in storage occurred throughout the year, which is reflective of the greater-than-average precipitation. As indicated by the water levels, the volume of water in storage in the Edwards aquifer for 1990 was greater than to about average.

The water levels in observation wells for 1990 are given in Appendix A, Water Levels. Some water-level measurements are reported in feet below land-surface datum, others are actual elevation above mean sea level. Water levels in wells equipped with recorders are reported every fifth day and at the end of the month. If known, the altitude of the land surface above mean sea level is given in the well description.

Tabulations of current and historical water-level measurements are available from the Edwards Underground Water District in San Antonio, Texas. Water levels in about 80 additional wells are measured annually in the San Antonio area by personnel of the Texas Water Development Board. Data for these wells are available from the Texas Water Development Board in Austin, Texas. Records also are on file in the office of the U.S. Geological Survey in San Antonio, Texas.

Table 5.--Annual and period of record high and low water levels measured in selected observation wells completed in the Edwards aquifer, 1934-90

[lsd, land-surface datum; ft, feet. Measurements in feet above mean sea level]

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-67-01-304 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	544.7
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	889.08	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
1989	879.02	866.64	695.30	650.52	663.90	626.98	624.9	620.5	581.7	571.5
1990	872.91	861.58	679.47	640.79	658.11	622.66	624.3	620.3	577.6	561.2
Record	High	Low	High	Low	High	Low	High	Low	High	Low
	889.08	810.95	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, 1934-90		1950-90		1932-90		1948-90		1937-90	

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 (J-17).
c/ Record low for well CY-26.

WATER QUALITY FOR WELLS AND SPRINGS

Water-quality samples were collected at 87 selected wells and 3 springs during 1990 (fig. 6). The water-quality data-collection sites previously sampled in 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 some of the wells previously sampled are no longer in use, additional samples can be collected at most of the wells in order to detect changes in water quality.

The general classification of water based on dissolved-solids concentration (Winslow and Kister, 1956, p. 5) presented below is used for classifying ground water in Texas:

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-dissolved-solids-concentration line defines an arbitrary boundary between the freshwater zone and the saline-water zone. Locally, this line is referred to as the freshwater/saline-water interface, which defines the farthest downdip extent of potable water (Pavlicek and others, 1987). This transitional interface also has been referred to as the transition zone (Garza, 1962, p. 38).

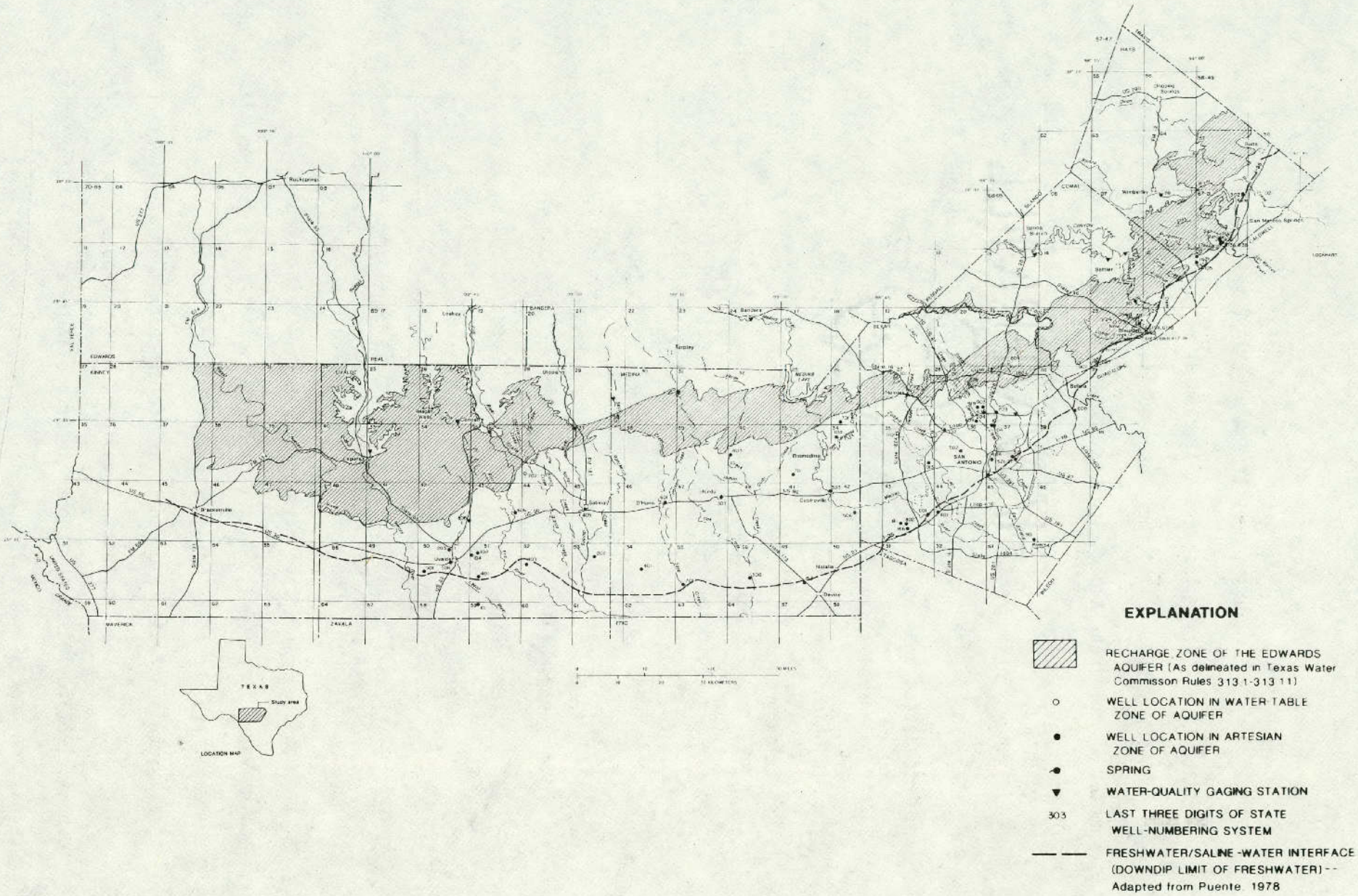


Figure 6.--Location of water-quality data-collection sites--wells, springs, and streams--sampled in 1990.

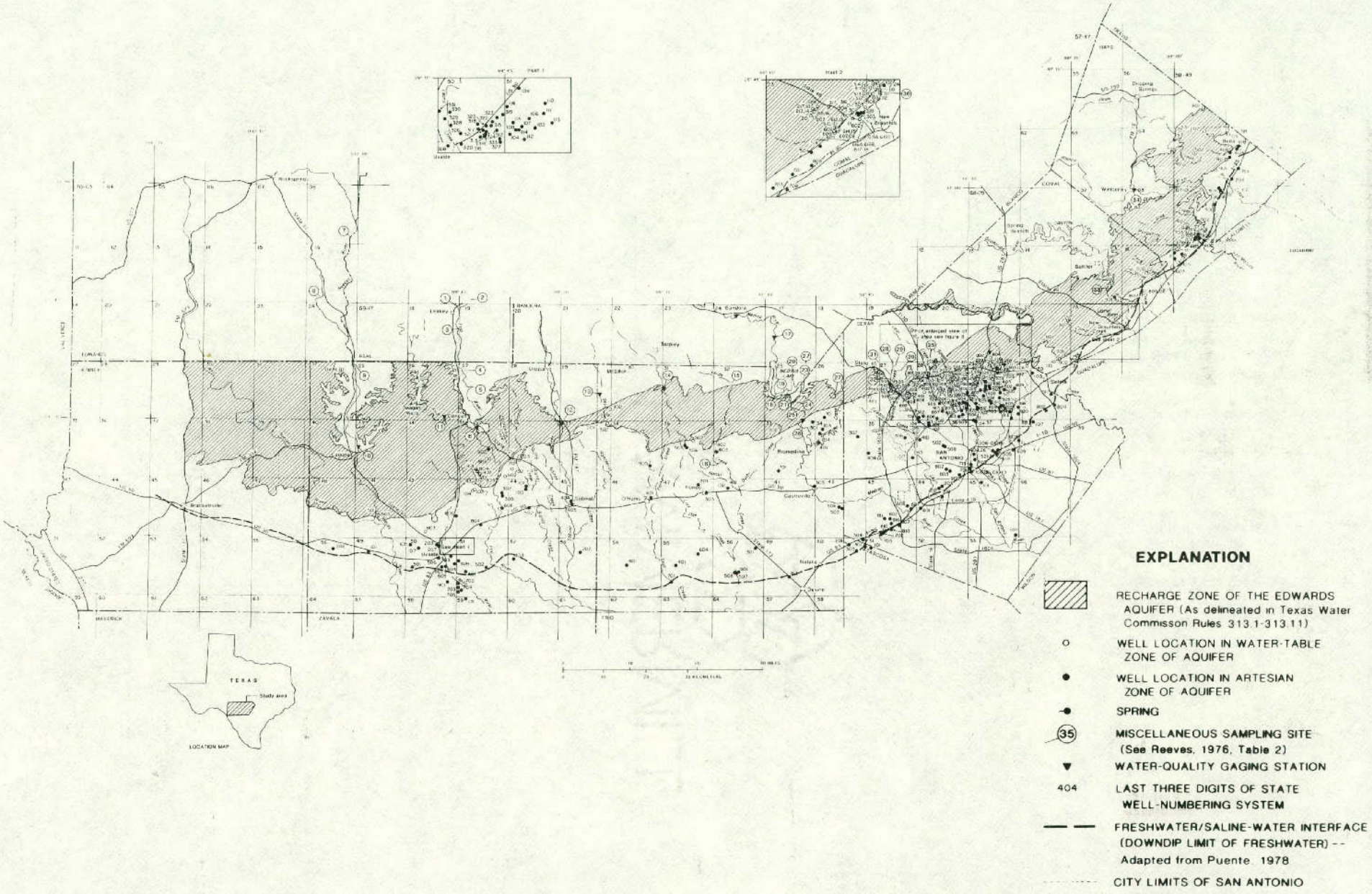
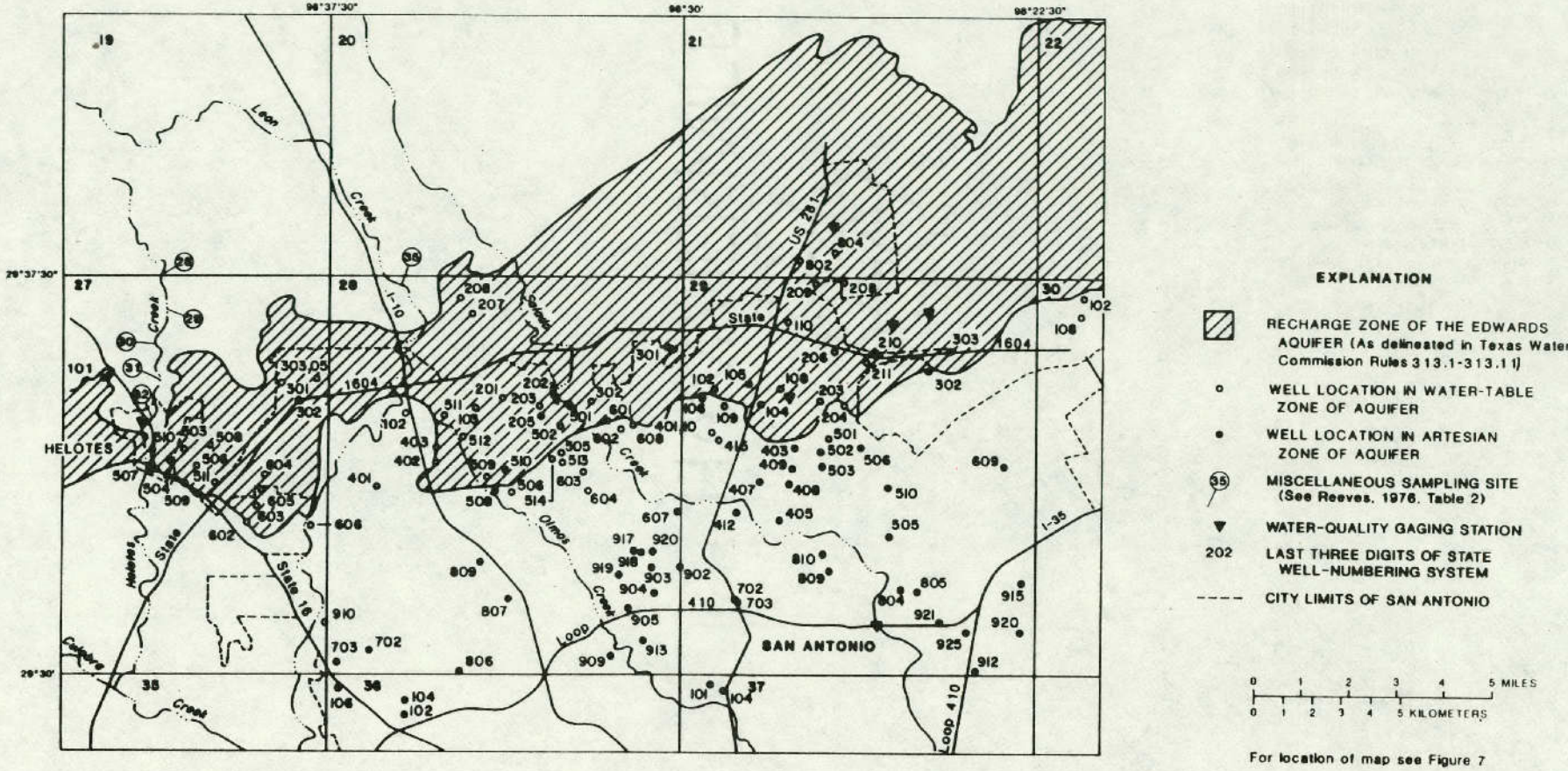


Figure 7.--Location of water-quality data-collection sites--wells, springs, and streams--sampled during 1972-90.



For location of map see Figure 7

Figure 8.--Location of water-quality data-collection sites--wells, springs, and streams--in the northern San Antonio area sampled during 1972-90.

The freshwater/saline-water interface 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 large concentrations of sulfate and chloride. Water from some wells north of the line and from all wells south of the line contains hydrogen sulfide gas. Wells completed in the freshwater zone near the interface can yield freshwater from the upper part of the aquifer and slightly saline water from 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 freshwater/saline-water interface in order to detect changes in water quality as the hydraulic head in the aquifer changes. This program was started in response to the concern that increased withdrawals from the aquifer might 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. Other samples are collected and analyzed when certain water-level and spring-discharge criteria are met.

The results of the analyses of water samples that were collected from the Edwards aquifer during 1990 are given in Appendix B, Water Quality. Many of the samples were analyzed for more than 90 properties or constituents, most of which affect the suitability of the water for domestic use. The analyses included determinations of the concentrations of selected properties, common inorganic constituents, nutrients, and dissolved organic carbon; minor elements, including heavy metals; pesticides; volatile organic compounds; and isotopes. Analyses of samples from the wells and springs in the freshwater zone of the aquifer showed that no properties or constituents exceeded the maximum contaminant levels established for public water systems (Appendix B).

In 1990, samples from 18 wells and 3 springs were collected and analyzed for pesticides. The results of the analyses showed that water from 13 wells

and 3 springs contained no detectable concentrations of pesticides. Samples from five wells (AY-68-28-205, AY-68-28-903, DX-68-22-902, LR-67-01-806, and YP-69-50-506), however, contained pesticides in concentrations ranging from 0.01 to 0.20 µg/L.

The samples collected in 1990 for analysis of volatile organic compounds were analyzed for, but the analyses were not limited to, the following compounds on the U.S. Environmental Protection Agency Priority Pollutant list:

Volatile Organic Compounds

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

Analytical methods used for the determination of the volatile 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 chloroform, toluene, benzene, and methylene chloride are given in Appendix B, Water Quality, these compounds are common solvents used

in the laboratory, and their presence in a sample often can be traced to contamination of the sample by laboratory atmosphere.

The volatile organic compounds are determined by purge and trap followed by gas chromatography/mass spectrometry. A water sample is purged with helium and the purgeable volatile 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 Institute of Standards and Technology computer library reference spectra of about 35,000 compounds. Although most common volatile organic compounds can be identified by this method, many of the samples contain compounds that cannot be identified because the concentrations were too small or because reliable library matches could not be obtained.

The U.S. Environmental Protection Agency's (1990a) proposed maximum contaminant level (MCL) for nine volatile organic compounds are given at the end of Appendix B, Water Quality. The MCL's were promulgated in the Federal Register on July 25, 1990 (v. 55, no. 143, p. 30,370-30,448) as revisions to the National Interim Primary Drinking-Water Regulations. 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 on 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 nonenforceable health goals that 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 carcino-

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

Compound	MCLG (µg/L)
Benzene	0
Carbon tetrachloride	0
p-Dichlorobenzene	75
1,2-Dichloroethane	0
1,1-Dichloroethylene	7
Tetrachloroethylene	1/0
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 January 1986, no final proposal has been received.

Sampling for volatile organic compounds in 1990 was concentrated in areas, such as the water-table part of the aquifer, where possible or suspected degradation of water quality might occur. Sampling in other areas of the aquifer was conducted on a rotational, monitoring basis.

In 1990, 41 wells were sampled and analyzed for volatile organic compounds. The results of the analyses showed that samples from 27 of the wells contained no detectable concentrations of volatile organic compounds. Samples from 14 wells, however, contained one or more than one measurable volatile organic compound. The concentrations ranged from 0.20 to 4.9 µg/L. Samples from six wells contained one or more than one volatile organic compound at concentrations equal to or greater than 1 µg/L.

Trihalomethanes, which include dichlorobromomethane, bromoform, chlorodibromomethane, and chloroform, were detected in samples from six wells. These wells were AY-68-27-303, AY-68-28-514, AY-68-35-102, DX-68-22-902, LR-67-01-302, and LR-67-01-806. Concentrations ranged from 0.20 to 4.9 µg/L. The principal source of trihalomethanes in drinking water is the chemical interaction of chlorine (added for disinfection) with natural humic substances in untreated water.

Tetrachloroethylene or trichloroethylene or both were detected in 10 of the wells sampled. These wells were AY-68-27-503, AY-68-28-514, AY-68-28-903, AY-68-28-909, AY-68-28-919, AY-68-29-703, AY-68-36-102, DX-68-23-602, LR-67-01-806, and YP-69-51-102. Concentrations ranged from 0.20 to 1.0 µg/L.

In 1990, samples from six wells were analyzed for one or more of the following isotopes--tritium, hydrogen-2/hydrogen-1, and oxygen-18/oxygen-16. 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 human activity.

Radioactive isotopes, such as tritium, are used primarily to measure the age of water. Tritium exists in the environment as a result of natural and human processes. Tritium is produced naturally by the 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 quantities of tritium were released to the atmosphere by thermonuclear testing in the atmosphere 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 large concentrations of tritium (Drever,

1982). Pre-1953 tritium concentrations in precipitation in the San Antonio area have been estimated at 6 to 8 TU (19 to 26 pCi/L) by Thatcher (1962). Tritium concentrations in precipitation have been steadily decreasing from a maximum, in 1963, of 2,000 TU (6,400 pCi/L) around Waco, Texas (P.M. Buszka, U.S. Geological Survey, written commun., 1989). Tritium concentrations in water from the Edwards aquifer have been determined periodically. Past records and information are included in reports by Pearson and others (1975) and Maclay, Rettman, and Small (1980).

Stable isotopes like hydrogen-2 and oxygen-18 are used to understand the probable source of water and the processes that have affected it. Processes that can affect water include dissolution of the aquifer material and mixing of water from different sources (Drever, 1982). The results from recent analyses of samples from wells that have historical data are given in Appendix B, Water Quality. Repeat sampling of the same wells allows comparison of results for detecting changes in time.

SURFACE-WATER DATA

Discharge (or stage) data for streams, contents (or stage) data for lakes and reservoirs, and 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 examined 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.

Discharge data for streams and springs, contents data for reservoirs, and water-quality data for streams and a reservoir collected at 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 and the annual discharge from the aquifer.

Water-quality data collected at stations upstream from the recharge zone are used to evaluate the quality of water recharging the aquifer. Data collected at gaging stations throughout the area provide streamflow and water-quality information for areas of different types of land 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 measured in observation wells completed in the Edwards aquifer, 1990
(Water levels furnished by Edwards Underground Water District)

[diam., diameter; in., inches; ft, feet; lsd, land surface datum; msl, mean sea level; Eom, end of month; ....., data missing]

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 1957-90

Highest 1990 water level 271.63 ft below lsd on May 7; lowest 1990 water level 278.10 ft on July 14 and Dec. 24.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	272.82	275.07	275.37	273.75	273.20	274.49	277.45	276.06	277.55	277.95	277.51	277.55
10	272.83	273.83	275.43	273.80	273.18	275.28	277.76	276.30	277.54	277.66	277.56	277.67
15	272.75	274.77	272.78	274.03	272.17	275.75	277.93	276.65	277.30	277.73	277.38	277.68
20	273.88	275.60	274.17	274.13	272.64	276.30	273.98	276.99	277.30	277.67	277.35	277.76
25	274.80	275.60	274.83	274.33	273.60	276.96	275.27	277.45	277.48	277.70	277.40	277.98
Eom	274.95	275.68	274.07	274.00	274.06	277.00	276.04	277.77	277.82	277.70	277.57	.....

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, 1989-90.

Date	Water level
Mar. 3, 1990	136.07
Sept. 5	138.83

292845098255401. AY-68-37-203 (J-17)a/. 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 ftb/ below lsd, Aug. 17, 1956. Records available 1932-90c/.

Highest 1990 water level 72.27 ft below lsd on Nov. 30; lowest 1990 water level 108.15 ft below lsd on June 29.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	86.44	86.35	83.54	77.95	73.07	93.05	105.71	83.59	87.78	86.01	80.20	78.53
10	85.64	88.33	83.06	78.23	74.20	97.77	104.11	85.39	87.55	83.35	78.03	78.44
15	85.31	88.93	79.97	78.65	77.07	.....	101.11	87.77	84.49	82.40	78.17	78.30
20	85.24	88.46	79.08	79.31	80.88	104.60	87.24	88.52	84.41	82.35	78.14	78.61
25	86.14	86.90	78.30	80.57	84.15	106.16	84.30	90.15	83.85	81.12	77.40	80.08
Eom	87.23	86.63	78.20	76.13	88.14	107.78	84.57	91.90	85.96	81.44	72.27	78.60

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 1936-90.

Date	Water level
Mar. 3, 1990	148.90
Sept. 5	148.00

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 1948-90.

Highest 1990 water level 18.36 ft below lsd on May 8; lowest 1990 water level 22.43 ft below lsd on June 30.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	19.86	19.81	19.54	18.96	18.44	19.80	22.05	19.55	19.96	19.68	.....	18.98
10	19.79	19.88	19.57	18.93	18.39	20.39	21.88	19.68	19.73	19.51	18.96	18.96
15	19.71	19.70	19.32	18.92	18.52	20.98	21.43	19.79	19.64	19.37	18.92	18.99
20	19.76	19.95	19.19	19.03	18.71	21.59	20.20	19.85	19.57	19.39	18.90	18.98
25	19.82	19.86	19.13	19.09	19.01	21.84	19.83	20.03	19.54	19.28	18.84	19.10
Eom	19.87	19.82	19.06	18.71	19.38	22.43	19.72	20.22	19.58	19.31	18.95	.....

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, 1937-90.

Date	Water level
Mar. 3, 1990	50.75

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 184.4 ft below lsd, Aug. 18, 1956. Records available 1945, 1955-90.

Highest 1990 water level 149.26 ft below lsd on May 8; lowest 1990 water level 172.66 ftd/ below lsd on June 26.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	159.36	158.86	157.33	153.03	149.70	161.10	.....	157.44	160.01	158.16	154.67	152.85
10	158.83	159.89	157.00	153.07	149.67	164.83	171.61	158.28	159.30	156.90	153.31	152.85
15	158.48	160.41	155.25	153.25	150.85	167.78	170.67	159.23	157.75	156.15	152.87	152.92
20	158.85	160.21	154.28	153.69	152.81	170.43	161.56	159.83	157.57	156.15	152.87	152.98
25	158.90	159.44	154.96	154.43	.....	d172.20	158.70	161.00	157.08	155.26	152.41	153.82
Eom	159.28	159.21	d153.16	151.73	157.83	.....	158.28	162.18	157.65	155.28	152.80	.....

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, 1971-90.

Date	Water level
Mar. 3, 1990	232.00
Sept. 5	224.88

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 1937-90.

Date	Water level
Mar. 3, 1990	140.45
July 7	156.83

Date	Water level
Sept. 5, 1990	151.21

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 27.42 ft below lsd, Dec. 25, 31, 1989. Records available 1937, 1950, 1954-55, 1980-90.

Highest 1990 water level 25.95 ft below lsd on May 11; lowest 1990 water level 27.41 ft below lsd on Jan. 1.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	27.35	27.37	27.37	26.74	26.06	26.25	26.43	26.07	26.42	26.69	26.62	26.45
10	27.37	27.37	27.36	26.71	25.97	26.31	26.47	26.11	26.38	26.59	26.39	26.51
15	27.39	27.37	27.26	26.69	26.02	26.37	26.47	26.17	26.41	26.52	26.36	26.53
20	27.40	27.40	27.11	26.69	26.04	26.36	26.10	26.22	26.41	26.52	26.37	26.56
25	27.40	27.39	27.07	26.69	26.07	26.43	25.97	26.30	26.48	26.56	26.36	26.63
Eom	27.40	27.39	26.96	26.43	26.20	26.47	26.02	26.39	26.60	26.58	26.38	.....

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, 1974-90.

Date	Water level
Mar. 3, 1990	121.05
Sept. 5	122.24

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 1973-90.

Highest 1990 water level 99.98 ft below lsd on Aug. 15; lowest 1990 water level 102.01 ft below lsd on Jan. 1, Feb. 28.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	101.97	101.98	101.93	101.63	100.83	100.98	101.24	100.55	101.10	101.24	101.28	101.19
10	101.96	101.99	101.93	101.59	100.80	101.00	101.25	100.71	101.08	101.25	101.12	101.22
15	101.98	102.00	101.87	101.56	100.80	101.09	101.26	99.98	101.06	101.21	101.10	101.23
20	101.98	102.01	101.83	101.56	100.79	101.16	100.67	100.82	101.09	101.22	101.11	101.23
25	101.99	101.97	101.80	101.56	100.80	101.21	100.57	100.96	101.13	101.23	101.12	101.28
Eom	101.99	102.01	101.68	101.28	100.90	101.22	100.56	101.05	.....	101.26	101.15	101.34

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, 1954-90.

Date	Water level
Mar. 7, 1990	170.33

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 1950-90.

Highest 1990 water level 77.37 ft below lsd on Dec. 17; lowest 1990 water level 116.05 ft below lsd on June 30.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	86.85	89.13	86.98	80.87	77.80	97.80	114.62	87.17	88.97	85.05	81.08	78.25
10	86.41	91.55	86.03	80.96	76.55	104.17	111.60	87.36	88.55	84.67	79.95	77.88
15	86.23	92.54	84.73	80.97	77.65	107.58	107.58	87.88	86.37	83.04	78.92	77.75
20	86.54	92.95	83.37	81.00	84.57	111.01	95.37	89.06	85.43	82.88	78.47	77.55
25	87.40	90.58	83.62	81.52	88.39	113.86	89.77	90.15	84.42	82.10	77.75	78.23
Eom	89.13	89.67	82.23	79.41	92.77	116.05	87.87	90.73	84.55	81.62	77.86	.....

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 1957-90.

Highest 1990 water level 157.82 ft below lsd on July 20; lowest 1990 water level 166.72 ft below lsd on Apr. 16.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	161.07	164.52	166.27	166.25	161.60	160.80	163.90	159.03	158.85	159.75	159.72	161.16
10	161.76	165.10	166.48	166.52	161.05	161.27	164.48	158.93	158.87	159.09	159.94	162.04
15	162.30	165.62	165.80	166.65	160.61	161.64	165.05	158.82	158.76	159.13	160.14	161.95
20	162.72	166.49	166.09	165.00	160.45	162.12	157.82	158.77	158.77	159.18	160.32	162.35
25	163.40	166.29	166.29	165.21	160.45	162.70	159.05	158.79	158.65	159.46	160.58	162.82
Eom	164.18	166.54	166.21	161.75	160.55	163.32	159.25	158.80	158.78	159.61	160.90	.....

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 1960-90.

Date	Water level
Mar. 10, 1990	264.58

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 236.99 ft below lsd, June 30, 1990. Record available 1986-90.

Highest 1990 water level 188.03 ft below lsd on Nov. 26; lowest 1990 water level 236.99 ft below lsd on June 30.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	199.27	207.52	199.93	194.21	189.77	218.83	234.18	199.94	199.87	196.50	191.56	188.91
10	.....	206.84	198.95	194.37	188.74	224.75	229.60	200.30	199.11	195.00	190.10	189.07
15	198.58	208.13	197.72	194.74	191.55	229.30	223.17	200.78	196.67	193.45	189.18	189.23
20	199.48	208.87	196.69	194.04	202.20	231.37	207.56	201.20	195.83	193.54	188.78	189.15
25	201.62	204.12	197.15	194.81	206.09	234.30	201.80	201.94	194.05	192.45	188.20	189.53
Eom	204.43	202.98	195.57	191.75	210.70	236.99	199.47	202.31	195.37	192.28	188.56	.....

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 1958-90.

Date	Water level
Mar. 10, 1990	177.90

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 1957-90.

Date	Water level
Mar. 23, 1990	50.05
Sept. 24	49.43

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 1974-90.

Highest 1990 water level 352.90 ft below lsd on Nov. 3; lowest 1990 water level 378.72 ft below lsd on Apr. 18.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	373.30	375.74	.....	378.37	375.61	371.44	376.35	366.80	358.53	355.26	.....	353.68
10	373.84	.....	.....	378.54	373.35	372.20	377.20	364.68	358.14	354.85	353.73	353.87
15	374.00	.....	378.50	378.55	372.00	372.33	377.85	362.79	357.57	354.35	353.59	353.97
20	374.57	.....	378.45	d378.60	371.27	373.60	.....	361.14	d357.20	353.86	353.43	354.09
25	375.03	.....	378.54	378.24	371.05	374.50	.....	359.85	356.60	353.99	353.41	354.48
Eom	375.32	.....	378.53	377.21	371.12	375.52	.....	358.90	355.89	353.14	353.70	.....

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 1956-90.

Highest 1990 water level 205.50 ft below lsd on Nov. 26-27; lowest 1990 water level 248.03 ft below lsd on July 6.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	220.53	224.73	223.92	219.06	213.90	.....	247.96	220.09	216.05	212.79	208.85	206.14
10	220.01	228.42	222.67	219.05	212.10	.....	246.70	217.81	215.51	212.17	207.87	206.46
15	222.01	229.99	222.00	218.82	212.92	.....	244.15	216.30	214.08	210.67	206.80	206.69
20	220.72	231.10	221.65	218.42	219.05	.....	231.27	216.93	212.95	210.40	206.32	206.44
25	222.35	227.05	221.13	218.30	223.87	.....	224.65	216.94	212.10	209.42	205.70	206.00
Eom	225.32	226.39	220.15	216.13	227.81	.....	220.94	217.15	212.30	208.98	206.10	.....

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, 1944-90.

Date	Water level
Mar. 10, 1990	73.54
Sept. 9	65.53

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 1956-90. Casing collapsed at 59.0 ft (1990).

Date	Water level
Mar. 10, 1990	e
Sept. 19	57.07

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, 1934-90.

Highest 1990 water level 31.94 ft below lsd on Dec. 28; lowest 1990 water level 43.27 ft below lsd on July 14.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	38.28	38.87	40.38	39.23	37.80	38.17	42.68	93.32	36.67	34.42	33.18	32.24
10	38.32	39.33	40.28	39.09	37.51	38.97	43.02	38.70	36.30	34.10	32.87	32.16
15	38.37	39.90	40.11	38.86	37.41	39.85	43.24	38.18	35.74	33.92	32.69	32.08
20	38.41	40.45	39.94	38.57	37.83	40.72	41.92	37.84	35.20	33.80	32.55	32.03
25	38.48	40.37	39.75	38.40	37.67	41.35	40.92	37.60	34.85	33.51	32.37	32.04
Eom	38.65	40.42	39.45	38.14	37.66	42.20	40.00	37.29	34.63	33.32	32.27	.....

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, 1966-90.

Highest 1990 water level 29.76 ft below lsd on Nov. 26; lowest 1990 water level 39.65 ft below lsd on July 6.

Highest water level for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	31.12	32.61	31.55	30.51	29.94	33.92	39.55	31.63	32.10	31.26	30.55	30.09
10	31.21	34.18	31.09	30.29	30.14	35.73	39.31	31.38	31.46	31.48	30.35	30.25
15	31.05	34.93	30.85	30.28	31.50	37.36	39.31	31.30	31.41	31.65	29.97	30.44
20	31.82	34.07	30.64	30.22	33.13	37.98	34.06	31.61	30.85	31.67	29.77	30.06
25	32.40	32.42	30.90	30.21	31.76	38.45	32.74	32.65	30.44	30.97	29.77	29.94
Eom	33.11	32.61	30.77	30.01	32.75	39.17	32.12	32.18	30.44	30.70	30.14	29.97

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 43.75 ft below lsd, Aug. 30, 1989. Records available 1957-90.

Date	Water level
Sept. 9, 1990	43.27

a/ Replaces well CY-26 and reflects the same water level; composite record of wells CY-26 and AY-68-37-203 (J-17).
b/ Record low for well CY-26. Equivalent water level for AY-68-37-203 (J-17) would be 118.30 ft below lsd.
c/ Composite record of wells CY-26 and AY-68-37-203 (J-17).
d/ Estimated.
e/ Dry, water level below collapsed casing.

Water-level elevations in transect wells completed in the Edwards aquifer, Bexar County, 1990
(Data collected by U.S. Geological Survey)

[diam., diameter; in., inches; ft, feet; lsd, land surface datum; msl, mean sea level; Eom, end of month; ....., data missing]

292505098254001. AY-68-37-521 (A-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,489 ft, cased to 1,275 ft. Lsd 621.17 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 654.65 ft above msl on June 28; lowest 1990 water-level elevation 620.07 ft above msl on May 8.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	640.88	.....	.....	649.51	653.89	635.30	621.62	644.06	640.67	642.07	647.92	649.68
10	641.94	639.08	644.28	648.94	653.63	630.05	623.83	642.14	640.39	644.61	649.94	650.11
15	642.70	638.66	647.08	648.82	651.39	626.63	625.54	640.68	643.48	645.93	650.23	649.88
20	642.43	.....	648.50	648.34	647.43	.....	.....	640.12	643.62	645.78	650.36	.....
25	641.30	640.58	646.63	646.52	643.87	621.84	643.15	638.02	643.93	646.68	650.50	647.80
Eom	640.53	.....	648.89	650.97	639.99	620.82	643.38	636.52	643.02	.....	649.79	.....

292505098254002. AY-68-37-522 (A-2). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,075 ft, cased to 1,075 ft. Lsd 621.17 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 655.84 ft above msl on July 3; lowest 1990 water-level elevation 622.23 ft above msl on May 8.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	642.16	.....	.....	650.77	655.11	636.26	622.38	645.54	641.92	643.73	649.27	651.01
10	643.11	640.22	645.43	650.30	654.78	631.10	623.74	643.49	641.94	646.20	651.28	651.43
15	643.85	639.74	648.16	650.09	652.44	627.71	627.30	641.94	645.12	647.54	651.60	651.26
20	643.56	.....	649.55	649.56	648.45	.....	.....	641.36	645.27	647.36	651.68	.....
25	642.51	641.71	647.71	647.87	645.02	623.12	644.56	639.39	645.71	648.41	651.93	649.08
Eom	641.68	.....	649.99	652.26	641.01	623.86	644.69	637.80	644.73	.....	651.21	.....

292505098254003. AY-68-37-523 (A-3). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,175 ft, cased to 1,175 ft. Lsd 621.17 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 654.79 ft above msl on June 28; lowest 1990 water-level elevation 619.59 ft above msl on May 8.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	641.47	.....	.....	649.96	654.03	635.01	621.50	644.02	640.50	642.22	648.19	649.95
10	642.52	639.58	644.63	649.41	653.74	629.76	.....	641.98	640.49	644.74	650.28	650.43
15	643.26	639.12	647.41	649.23	651.34	626.27	625.69	640.45	643.64	646.10	650.58	650.23
20	642.93	.....	648.83	648.70	647.33	.....	.....	639.87	643.74	645.89	650.61	.....
25	641.81	641.11	646.73	646.88	643.82	621.42	643.06	637.80	644.11	646.95	650.79	647.98
Eom	641.06	641.40	649.14	651.36	639.86	620.38	642.95	636.27	643.19	.....	650.07	.....

292546098260001. AY-68-37-524 (C-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,396 ft, cased to 881 ft. Lsd 625.84 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 658.40 ft above msl on July 6; lowest 1990 water-level elevation 624.74 ft above msl on May 6.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	644.65	.....	.....	653.52	657.97	638.02	624.77	647.60	643.33	645.49	651.43	653.01
10	645.45	642.59	648.37	653.26	657.07	633.19	626.59	645.10	.....	648.04	653.55	653.35
15	646.15	642.13	651.16	652.83	654.30	629.42	629.22	643.26	647.10	649.28	653.61	653.28
20	645.86	.....	652.27	652.29	650.42	.....	.....	642.60	647.26	649.16	653.71	.....
25	644.77	.....	650.60	650.84	646.86	625.59	646.56	640.92	647.71	650.33	654.20	651.14
Eom	643.92	.....	653.16	655.10	643.03	625.52	646.66	639.14	646.65	.....	653.29	.....

Water-level elevations in transect wells completed in the Edwards aquifer, Bexar County, 1990--Continued

292546098260002. AY-68-37-525 (C-2). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,150 ft, cased to 1,150 ft. Lsd 624.82 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 653.84 ft above msl on June 29, lowest 1990 water-level elevation 619.83 ft above msl on May 8.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	641.50	.....	.....	650.21	652.98	634.38	620.55	643.61	639.65	641.29	647.01	648.94
10	642.82	639.43	644.53	649.66	652.89	629.10	622.67	641.21	.....	643.43	649.05	649.35
15	642.99	638.95	647.92	649.41	650.57	625.82	624.53	639.70	642.56	644.99	649.49	649.16
20	642.74	.....	648.66	648.83	646.58	.....	.....	639.12	642.65	644.84	649.56	.....
25	641.50	.....	646.79	647.16	643.29	620.60	642.21	637.17	643.09	645.86	649.82	647.04
Eom	640.92	.....	649.13	651.51	639.16	619.93	642.41	635.59	642.11	.....	648.99	.....

292556098260701. AY-68-37-526 (D-1). A transect well in the artesian part of the Edwards aquifer, diam. 9 to 2 in., depth 1,384 ft, cased to 1,223 ft. Lsd 643.26 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 658.21 ft above msl on June 29; lowest 1990 water-level elevation 622.67 ft above msl on May 6.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	644.91	.....	.....	653.76	657.83	637.56	.....	648.01	643.24	645.29	651.24	652.77
10	645.86	643.32	647.87	653.39	656.98	.....	.....	645.36	643.50	647.96	653.35	653.13
15	646.52	643.06	651.43	653.00	654.20	.....	629.65	646.30	646.63	649.17	653.35	653.06
20	646.31	.....	652.46	652.46	650.29	.....	.....	642.26	646.81	649.07	653.47	.....
25	645.71	642.71	650.74	650.93	646.72	624.41	646.96	640.66	647.45	650.15	653.91	650.82
Eom	644.89	642.22	653.49	655.30	644.33	623.90	647.03	639.04	646.48	650.05	653.01	.....

292556098260702. AY-68-37-527 (D-2). A transect well in the artesian part of the Edwards aquifer, diam. 4 to 7 in., depth 926 ft, cased to 926 ft. Lsd 642.59 ft above msl. Records available 1986-90.

Highest 1990 water-level elevation 658.53 ft above msl on June 29; lowest 1990 water-level elevation 622.17 ft above msl on May 6.

Highest water-level elevation for the day, from recorder graph, 1990

Day	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
5	644.87	.....	.....	653.43	658.21	637.85	627.24	647.36	643.34	645.20	651.20	652.70
10	645.66	642.64	.....	653.23	657.19	.....	627.90	645.37	643.50	647.88	653.28	653.01
15	646.24	642.09	651.23	652.70	654.27	.....	629.36	643.89	646.77	649.04	653.24	652.92
20	646.01	.....	652.12	652.08	650.33	.....	.....	642.46	646.93	648.95	653.36	.....
25	644.80	644.37	650.58	650.76	646.82	624.38	646.53	640.96	647.48	650.26	654.02	650.91
Eom	643.77	643.99	653.23	655.02	.....	623.41	646.47	639.26	646.43	650.02	653.00	.....

APPENDIX B. WATER QUALITY

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990

BEXAR COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE, WATER (DEG C)	ALKALINITY, WAT DIS, FIX END FIELD, CACO3 (MG/L)
AY-68-21-804	04-30-90	1015	279.00	40	5.0	561	6.9	23.5	260
AY-68-27-101	04-30-90	1440	100.00	40	3.0	498	7.3	21.0	260
AY-68-27-303	04-30-90	1200	354.00	60	14	537	6.9	23.5	250
AY-68-27-503	04-30-90	1330	375.00	15	20	542	7.0	22.5	250
AY-68-28-102	06-05-90	0945	440.00	60	7.0	602	6.8	22.5	250
AY-68-28-205	05-15-90	1500	485.00	100	350	559	7.1	24.5	270
AY-68-28-207	06-13-90	1030	265.00	60	2.5	492	6.9	22.5	250
AY-68-28-501	05-15-90	1400	468.00	100	125	556	6.8	23.5	260
AY-68-28-514	05-15-90	1230	510.00	30	1250	580	7.0	23.5	260
AY-68-28-903	05-16-90	1200	762.00	90	2000	630	7.0	22.5	300
AY-68-28-904	05-16-90	1040	640.00	100	800	582	7.1	22.5	280
AY-68-28-909	06-25-90	0935	867.00	95	2430	567	7.0	22.0	220
AY-68-28-919	05-16-90	1120	550.00	100	2500	607	6.8	22.5	270
AY-68-29-210	06-06-90	1055	329.00	30	15	537	6.9	23.5	270
AY-68-29-703	08-14-90	0950	824.00	110	5000	566	6.9	22.0	250
AY-68-30-808	07-02-90	1035	544.00	35	1100	516	7.3	27.5	200
AY-68-35-102	05-22-90	1530	796.00	1440	3000	548	7.1	23.0	230
AY-68-35-913	05-09-90	0730	1040	60	8000	480	6.8	24.0	210
AY-68-36-102	05-09-90	1000	786.00	60	4000	552	7.0	22.5	240
AY-68-37-101	08-14-90	1030	1005	150	5000	519	7.1	23.5	220
AY-68-37-104	05-22-90	1515	995.00	1440	5000	506	7.2	24.0	220
AY-68-37-404	08-14-90	1115	1326	25	10000	486	7.2	24.5	210
AY-68-37-519	07-05-90	1115	1340	195	5000	484	7.2	26.5	200
AY-68-37-521	01-22-90	1200	1275	60	35	5530	6.7	30.5	260
AY-68-37-521	02-20-90	1200	1275	60	25	5560	6.6	30.0	260
AY-68-37-521	03-23-90	1245	1275	70	30	5540	6.7	31.0	260
AY-68-37-521	04-23-90	1230	1275	60	30	5540	6.7	31.0	250
AY-68-37-521	05-21-90	1245	1275	60	20	5540	6.7	31.0	260
AY-68-37-521	06-20-90	1330	1275	60	22	5530	6.7	31.5	250
AY-68-37-521	07-20-90	1250	1275	60	20	5350	6.7	31.0	250
AY-68-37-521	08-23-90	1440	1275	115	15	5550	6.9	37.0	250
AY-68-37-521	09-21-90	1140	1275	50	25	5540	6.7	31.0	250
AY-68-37-521	10-22-90	1030	1275	80	35	5530	6.8	31.5	250
AY-68-37-521	11-23-90	1330	1275	90	25	5560	6.7	31.0	240
AY-68-37-521	12-20-90	1130	1275	60	30	5510	6.7	30.5	250
AY-68-37-522	01-22-90	1215	1075	60	35	4410	6.8	30.0	230
AY-68-37-522	02-20-90	1215	1075	70	25	4440	6.6	29.5	240
AY-68-37-522	03-23-90	1300	1075	80	30	4420	6.8	30.5	240
AY-68-37-522	04-23-90	1245	1075	80	30	4420	6.9	30.5	240
AY-68-37-522	05-21-90	1230	1075	40	20	4410	6.8	30.0	240
AY-68-37-522	06-20-90	1500	1075	0	0	4410	6.8	31.0	230
AY-68-37-522	07-20-90	1230	1075	60	20	4250	6.8	23.0	240
AY-68-37-522	08-23-90	1530	1075	205	20	4360	6.9	31.0	230
AY-68-37-522	09-21-90	1150	1075	60	25	4400	6.8	30.5	230
AY-68-37-522	10-22-90	1045	1075	95	35	4380	6.8	30.5	240
AY-68-37-522	11-23-90	1400	1075	120	25	4400	7.0	30.5	230
AY-68-37-522	12-20-90	1140	1075	70	30	4370	6.8	30.0	230
AY-68-37-523	01-22-90	1230	1175	70	25	5750	6.7	30.0	260
AY-68-37-523	02-20-90	1230	1175	80	15	5770	6.7	28.5	260
AY-68-37-523	03-23-90	1315	1175	100	25	5770	6.8	30.0	250
AY-68-37-523	04-23-90	1300	1175	90	20	5770	6.8	29.5	260
AY-68-37-523	05-21-90	1315	1175	90	12	5780	6.8	30.0	260
AY-68-37-523	06-20-90	1430	1175	60	15	5740	6.7	29.5	250
AY-68-37-523	07-20-90	1320	1175	90	9.4	5620	6.8	30.0	250
AY-68-37-523	07-30-90	1700	1175	380	<20	5800	6.9	27.0	250

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
AY-68-21-804	290	110	2.5	3.3	0.60	1.4	16	<0.10	14
AY-68-27-101	270	75	19	4.5	0.60	15	8.9	0.40	11
AY-68-27-303	270	92	9.8	5.7	0.80	18	12	<0.10	12
AY-68-27-503	270	77	18	7.9	1.0	24	16	0.20	12
AY-68-28-102	300	100	12	9.4	1.1	28	20	0.10	9.6
AY-68-28-205	280	90	13	6.0	1.0	14	13	<0.10	12
AY-68-28-207	250	69	20	4.2	1.4	16	8.2	0.20	9.7
AY-68-28-501	270	100	5.7	7.1	1.1	8.5	18	0.10	13
AY-68-28-514	290	100	10	7.7	1.0	31	14	0.20	12
AY-68-28-903	300	100	13	13	1.4	15	17	0.30	13
AY-68-28-904	300	96	15	8.1	1.1	12	13	0.20	11
AY-68-28-909	280	88	15	10	1.2	30	22	0.20	12
AY-68-28-919	300	96	15	10	1.3	20	16	0.20	13
AY-68-29-210	280	100	7.5	4.8	0.60	6.2	4.7	0.10	11
AY-68-29-703	290	92	15	9.7	1.2	33	17	0.30	12
AY-68-30-808	240	66	19	14	1.3	33	29	0.30	12
AY-68-35-102	280	79	21	8.0	1.3	49	14	<0.10	12
AY-68-35-913	230	68	15	8.9	0.80	18	16	0.40	13
AY-68-36-102	280	86	16	9.8	1.3	29	16	0.50	13
AY-68-37-101	260	77	17	9.7	1.2	31	17	0.30	13
AY-68-37-104	250	74	17	9.4	1.2	25	19	<0.10	13
AY-68-37-404	240	69	16	9.6	1.0	19	23	0.40	12
AY-68-37-519	230	64	17	11	1.1	18	21	0.60	12
AY-68-37-521	2200	550	190	470	29	1900	880	2.7	21
AY-68-37-521	2200	550	190	460	29	1900	900	2.8	20
AY-68-37-521	2200	550	190	460	27	1800	880	2.2	22
AY-68-37-521	2200	560	200	460	28	1600	880	2.1	22
AY-68-37-521	2200	540	200	450	30	1800	970	2.6	21
AY-68-37-521	2200	540	200	470	26	2200	920	1.2	20
AY-68-37-521	2300	590	200	450	28	1800	920	2.3	19
AY-68-37-521	2100	540	190	420	29	1600	820	2.8	18
AY-68-37-521	2000	520	180	430	28	1600	860	2.9	20
AY-68-37-521	2100	530	190	460	28	1700	990	1.7	20
AY-68-37-521	2200	540	200	460	27	1900	860	2.1	19
AY-68-37-521	2100	530	200	450	28	1700	850	2.1	19
AY-68-37-522	1700	430	150	350	24	1400	650	2.5	18
AY-68-37-522	1600	410	150	360	24	1400	660	2.6	18
AY-68-37-522	1600	420	140	350	2.3	1400	660	2.1	20
AY-68-37-522	1700	440	150	360	12	1300	670	2.0	20
AY-68-37-522	1800	440	160	360	24	1300	630	1.8	19
AY-68-37-522	1800	470	160	350	22	1300	680	1.5	18
AY-68-37-522	1900	480	160	360	24	1400	680	1.7	18
AY-68-37-522	1700	420	150	360	24	1400	660	2.3	16
AY-68-37-522	1700	420	150	350	23	1200	670	2.4	18
AY-68-37-522	1700	420	150	350	24	1300	700	1.5	18
AY-68-37-522	1700	420	150	360	23	1400	670	2.3	18
AY-68-37-522	1700	420	150	350	22	1200	660	2.4	17
AY-68-37-523	2300	550	210	490	31	1900	950	2.7	19
AY-68-37-523	2100	530	200	470	30	1900	940	2.7	19
AY-68-37-523	2200	540	200	500	29	1800	940	2.3	21
AY-68-37-523	2300	560	210	490	29	1700	940	2.3	20
AY-68-37-523	2200	550	210	470	30	1900	1000	2.3	19
AY-68-37-523	2200	540	210	490	28	1900	960	1.0	19
AY-68-37-523	2400	590	220	450	30	1900	990	2.4	18
AY-68-37-523	2300	550	210	470	25	1800	970	2.7	19

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, 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	307	4.0	<0.010	<0.010	--	0.20	3.80	0.020	0.5
AY-68-27-101	294	0.70	<0.010	<0.010	--	0.20	0.500	0.030	1.3
AY-68-27-303	302	2.7	<0.010	0.020	2.28	0.40	2.30	0.020	0.6
AY-68-27-503	306	1.8	<0.010	<0.010	--	0.20	1.60	<0.010	0.4
AY-68-28-102	329	3.8	0.030	0.020	2.78	1.0	2.80	0.030	1.6
AY-68-28-205	312	--	<0.010	<0.010	--	<0.20	0.700	<0.010	0.3
AY-68-28-207	284	1.9	0.050	0.020	0.880	1.0	0.900	0.040	--
AY-68-28-501	310	--	<0.010	<0.010	--	<0.20	1.00	<0.010	--
AY-68-28-514	331	1.6	<0.010	<0.010	--	0.30	1.30	<0.010	0.4
AY-68-28-903	350	--	<0.010	<0.010	--	<0.20	1.20	0.020	0.6
AY-68-28-904	325	--	<0.010	<0.010	--	<0.20	1.40	<0.010	--
AY-68-28-909	310	2.3	<0.010	0.040	1.86	0.40	1.90	0.020	--
AY-68-28-919	335	--	<0.010	<0.010	--	<0.20	1.80	<0.010	--
AY-68-29-210	296	--	<0.010	<0.010	--	<0.20	1.30	<0.010	0.8
AY-68-29-703	330	--	--	--	--	--	--	--	--
AY-68-30-808	295	--	--	--	--	--	--	--	--
AY-68-35-102	319	--	<0.010	<0.010	--	<0.20	1.20	<0.010	--
AY-68-35-913	264	--	<0.010	<0.010	--	<0.20	1.70	<0.010	--
AY-68-36-102	318	--	<0.010	<0.010	--	<0.20	1.70	0.010	--
AY-68-37-101	299	--	--	--	--	--	--	--	--
AY-68-37-104	289	--	<0.010	0.020	1.68	<0.20	1.70	<0.010	--
AY-68-37-404	274	--	--	--	--	--	--	--	--
AY-68-37-519	263	--	--	--	--	--	--	--	--
AY-68-37-521	4210	--	--	--	--	--	--	--	--
AY-68-37-521	4200	--	--	--	--	--	--	--	--
AY-68-37-521	4080	--	--	--	--	--	--	--	--
AY-68-37-521	3900	--	--	--	--	--	--	--	--
AY-68-37-521	4170	--	--	--	--	--	--	--	--
AY-68-37-521	4530	--	--	--	--	--	--	--	--
AY-68-37-521	4160	--	--	--	--	--	--	--	--
AY-68-37-521	3770	--	--	--	--	--	--	--	--
AY-68-37-521	3790	--	--	--	--	--	--	--	--
AY-68-37-521	4070	--	--	--	--	--	--	--	--
AY-68-37-521	4150	--	--	--	--	--	--	--	--
AY-68-37-521	3930	--	--	--	--	--	--	--	--
AY-68-37-522	3180	--	--	--	--	--	--	--	--
AY-68-37-522	3170	--	--	--	--	--	--	--	--
AY-68-37-522	3140	--	--	--	--	--	--	--	--
AY-68-37-522	3100	--	--	--	--	--	--	--	--
AY-68-37-522	3080	--	--	--	--	--	--	--	--
AY-68-37-522	3140	--	--	--	--	--	--	--	--
AY-68-37-522	3270	--	--	--	--	--	--	--	--
AY-68-37-522	3170	--	--	--	--	--	--	--	--
AY-68-37-522	2970	--	--	--	--	--	--	--	--
AY-68-37-522	3100	--	--	--	--	--	--	--	--
AY-68-37-522	3180	--	--	--	--	--	--	--	--
AY-68-37-522	2960	--	--	--	--	--	--	--	--
AY-68-37-523	4320	--	--	--	--	--	--	--	--
AY-68-37-523	4250	--	--	--	--	--	--	--	--
AY-68-37-523	4180	--	--	--	--	--	--	--	--
AY-68-37-523	4100	--	--	--	--	--	--	--	--
AY-68-37-523	4330	--	--	--	--	--	--	--	--
AY-68-37-523	4300	--	--	--	--	--	--	--	--
AY-68-37-523	4350	--	--	--	--	--	--	--	--
AY-68-37-523	4210	--	--	--	--	--	--	--	2.6

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE, WATER (DEG C)	ALKALINITY, WAT DIS, FIX END FIELD, CACO3 (MG/L)
AY-68-37-523	08-23-90	1500	1175	135	10	5730	6.8	30.0	250
AY-68-37-523	09-21-90	1210	1175	75	12	5750	6.7	29.5	250
AY-68-37-523	10-22-90	1100	1175	110	25	5740	6.8	30.0	250
AY-68-37-523	11-23-90	1420	1175	140	15	5750	6.8	30.0	250
AY-68-37-523	12-20-90	1150	1175	80	25	5730	6.7	29.5	250
AY-68-37-524	01-22-90	1015	881.00	60	35	834	6.9	28.0	210
AY-68-37-524	02-20-90	1015	881.00	E60	35	821	6.6	27.5	200
AY-68-37-524	03-23-90	1045	881.00	60	35	861	6.8	28.0	210
AY-68-37-524	04-23-90	1100	881.00	80	35	911	7.0	28.0	210
AY-68-37-524	05-21-90	1100	881.00	60	30	942	7.1	28.5	210
AY-68-37-524	07-20-90	1120	881.00	100	35	940	6.5	28.5	210
AY-68-37-524	08-23-90	1330	881.00	75	25	915	7.3	28.5	210
AY-68-37-524	09-21-90	1010	881.00	50	33	944	7.0	28.5	200
AY-68-37-524	10-22-90	1000	881.00	50	40	945	7.0	28.0	210
AY-68-37-524	11-23-90	1500	881.00	120	35	948	7.2	28.5	210
AY-68-37-524	12-20-90	0940	881.00	70	40	946	6.8	28.0	240
AY-68-37-525	01-22-90	1030	1150	80	25	6210	6.8	28.0	250
AY-68-37-525	02-20-90	1030	1150	60	--	6180	6.7	27.0	240
AY-68-37-525	03-23-90	1100	1150	75	25	6240	6.7	29.0	250
AY-68-37-525	04-23-90	1115	1150	90	25	6220	6.8	29.0	250
AY-68-37-525	05-21-90	1115	1150	70	20	6180	6.8	29.0	250
AY-68-37-525	06-20-90	1020	1150	60	22	6150	6.8	27.0	250
AY-68-37-525	07-20-90	1100	1150	120	25	6080	6.9	28.5	250
AY-68-37-525	08-23-90	1400	1150	105	12	6260	6.9	28.5	250
AY-68-37-525	09-21-90	1030	1150	70	18	6250	6.8	28.5	240
AY-68-37-525	10-22-90	1015	1150	60	25	6240	6.9	28.5	210
AY-68-37-525	11-23-90	1530	1150	150	20	6230	7.2	29.0	260
AY-68-37-525	12-20-90	0950	1150	70	35	6220	6.7	28.5	200
AY-68-37-526	01-22-90	0835	1223	85	14	939	7.1	26.0	210
AY-68-37-526	02-20-90	0900	1223	92	13	924	6.8	25.0	210
AY-68-37-526	03-23-90	0910	1223	120	10	832	7.3	26.0	210
AY-68-37-526	04-23-90	1030	1223	120	10	832	7.6	25.5	210
AY-68-37-526	05-21-90	1030	1223	160	7.5	803	7.9	26.0	200
AY-68-37-526	06-20-90	1010	1223	--	13	1070	7.2	26.5	210
AY-68-37-526	07-20-90	0915	1223	90	14	830	7.6	26.0	210
AY-68-37-526	08-23-90	1130	1223	60	20	973	7.6	26.5	200
AY-68-37-526	09-21-90	0845	1223	90	13	921	7.3	26.0	210
AY-68-37-526	10-22-90	0835	1223	85	14	922	7.4	26.0	210
AY-68-37-526	11-23-90	1120	1223	120	10	873	7.3	26.0	210
AY-68-37-526	12-20-90	0820	1223	90	13	934	7.0	25.5	220
AY-68-37-527	01-22-90	0850	926.00	100	65	525	7.1	25.5	200
AY-68-37-527	02-20-90	0830	926.00	80	60	516	7.1	25.5	200
AY-68-37-527	03-23-90	0845	926.00	60	100	519	7.1	26.5	200
AY-68-37-527	04-23-90	1020	926.00	--	80	523	7.1	26.5	200
AY-68-37-527	05-21-90	0930	926.00	60	80	519	7.1	26.5	200
AY-68-37-527	06-20-90	1545	926.00	360	12	517	7.0	29.0	200
AY-68-37-527	07-20-90	0940	926.00	100	50	508	7.0	26.0	200
AY-68-37-527	08-23-90	1600	926.00	240	--	518	7.3	26.0	200
AY-68-37-527	09-21-90	0815	926.00	60	73	511	6.9	26.0	210
AY-68-37-527	10-22-90	0820	926.00	60	120	507	7.1	25.5	200
AY-68-37-527	11-23-90	1030	926.00	75	60	515	7.1	26.0	190
AY-68-37-527	12-20-90	0810	926.00	50	135	516	7.2	26.5	200
AY-68-37-705	07-01-90	1410	1798	370	3000	486	7.2	27.5	200
AY-68-43-601	07-01-90	1135	1911	--	20	488	7.3	26.5	200
AY-68-43-802	07-01-90	1400	1987	360	200	503	7.2	27.5	200

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
AY-68-37-523	2200	540	210	470	29	1400	860	2.7	17
AY-68-37-523	2100	520	200	460	28	1600	910	2.7	19
AY-68-37-523	2200	530	210	440	29	1800	1000	1.5	19
AY-68-37-523	2200	530	210	490	29	1800	920	2.7	18
AY-68-37-523	2200	520	210	480	29	1900	960	3.3	18
AY-68-37-524	330	88	26	38	3.7	140	66	1.0	14
AY-68-37-524	330	88	27	39	4.0	140	66	1.0	14
AY-68-37-524	350	91	29	41	4.0	140	70	0.90	14
AY-68-37-524	350	92	30	44	3.7	160	75	1.0	16
AY-68-37-524	370	94	32	50	4.2	170	77	0.90	15
AY-68-37-524	370	97	32	48	4.3	120	84	0.80	14
AY-68-37-524	360	95	31	48	4.3	170	77	1.1	13
AY-68-37-524	380	97	33	48	4.2	170	79	1.1	15
AY-68-37-524	370	96	31	47	4.3	180	80	1.1	15
AY-68-37-524	370	97	32	48	4.1	180	76	1.1	14
AY-68-37-524	370	94	32	47	4.2	200	80	1.4	14
AY-68-37-525	2400	550	240	570	12	2100	1100	2.8	19
AY-68-37-525	2200	520	220	540	34	2100	920	2.8	18
AY-68-37-525	2300	560	230	550	31	2000	1000	2.1	20
AY-68-37-525	2500	590	240	550	30	1800	1000	2.1	20
AY-68-37-525	2500	570	250	530	34	2200	1100	2.0	19
AY-68-37-525	2400	560	240	540	30	2000	1100	1.0	18
AY-68-37-525	2500	600	250	520	32	1900	1000	1.4	18
AY-68-37-525	2300	540	230	510	33	2100	1100	2.4	16
AY-68-37-525	2200	530	220	530	33	1700	1000	2.7	0.10
AY-68-37-525	2400	550	240	510	32	2000	1100	1.4	19
AY-68-37-525	2400	560	240	540	31	2100	1000	2.5	18
AY-68-37-525	2400	550	240	540	32	2100	1100	3.0	18
AY-68-37-526	380	95	33	44	3.3	160	81	0.70	12
AY-68-37-526	370	95	33	44	3.4	160	81	0.70	12
AY-68-37-526	340	87	30	38	2.9	130	70	0.40	12
AY-68-37-526	330	82	30	37	2.7	120	69	0.50	13
AY-68-37-526	310	78	29	39	2.6	120	66	<0.10	11
AY-68-37-526	410	100	39	57	4.0	220	100	0.20	12
AY-68-37-526	340	88	30	37	2.9	130	82	0.30	11
AY-68-37-526	380	93	35	51	3.5	170	90	0.70	10
AY-68-37-526	370	93	34	44	3.1	150	79	0.70	12
AY-68-37-526	370	95	33	44	3.3	160	83	0.60	12
AY-68-37-526	360	90	32	41	2.9	140	72	0.60	11
AY-68-37-526	370	93	34	45	3.2	180	82	0.60	12
AY-68-37-527	240	67	17	12	1.4	30	24	0.30	12
AY-68-37-527	240	67	17	12	1.4	31	25	0.30	12
AY-68-37-527	240	67	18	13	1.4	29	25	0.30	12
AY-68-37-527	230	65	17	12	1.3	28	23	0.30	14
AY-68-37-527	240	65	18	13	1.2	28	25	<0.10	13
AY-68-37-527	240	66	18	12	1.2	26	22	0.40	12
AY-68-37-527	240	68	17	13	1.3	19	27	0.10	12
AY-68-37-527	240	67	17	12	1.3	30	27	0.40	11
AY-68-37-527	240	67	18	12	1.2	28	23	<0.10	12
AY-68-37-527	240	67	17	11	1.2	26	23	0.10	12
AY-68-37-527	240	67	17	12	1.2	28	24	0.50	12
AY-68-37-527	230	66	17	12	1.3	34	26	0.60	12
AY-68-37-705	230	66	17	9.3	1.1	20	21	0.40	12
AY-68-43-601	230	67	16	9.2	1.1	19	22	0.40	12
AY-68-43-802	240	68	18	11	1.1	29	26	0.40	12

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC, TOTAL (MG/L AS N)	NITROGEN, NO2+NO3, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC, DISSOLVED (MG/L AS C)
AY-68-37-523	3680	--	--	--	--	--	--	--	--
AY-68-37-523	3890	--	--	--	--	--	--	--	--
AY-68-37-523	4180	--	--	--	--	--	--	--	--
AY-68-37-523	4150	--	--	--	--	--	--	--	--
AY-68-37-523	4270	--	--	--	--	--	--	--	--
AY-68-37-524	506	--	--	--	--	--	--	--	--
AY-68-37-524	501	--	--	--	--	--	--	--	--
AY-68-37-524	515	--	--	--	--	--	--	--	--
AY-68-37-524	545	--	--	--	--	--	--	--	--
AY-68-37-524	567	--	--	--	--	--	--	--	--
AY-68-37-524	524	--	--	--	--	--	--	--	--
AY-68-37-524	562	--	--	--	--	--	--	--	--
AY-68-37-524	570	--	--	--	--	--	--	--	--
AY-68-37-524	577	--	--	--	--	--	--	--	--
AY-68-37-524	578	--	--	--	--	--	--	--	--
AY-68-37-524	617	--	--	--	--	--	--	--	--
AY-68-37-525	4760	--	--	--	--	--	--	--	--
AY-68-37-525	4500	--	--	--	--	--	--	--	--
AY-68-37-525	4540	--	--	--	--	--	--	--	--
AY-68-37-525	4380	--	--	--	--	--	--	--	--
AY-68-37-525	4860	--	--	--	--	--	--	--	--
AY-68-37-525	4640	--	--	--	--	--	--	--	--
AY-68-37-525	4470	--	--	--	--	--	--	--	--
AY-68-37-525	4680	--	--	--	--	--	--	--	--
AY-68-37-525	4160	--	--	--	--	--	--	--	--
AY-68-37-525	4580	--	--	--	--	--	--	--	--
AY-68-37-525	4650	--	--	--	--	--	--	--	--
AY-68-37-525	4700	--	--	--	--	--	--	--	--
AY-68-37-526	565	--	--	--	--	--	--	--	--
AY-68-37-526	557	--	--	--	--	--	--	--	--
AY-68-37-526	498	--	--	--	--	--	--	--	--
AY-68-37-526	479	--	--	--	--	--	--	--	--
AY-68-37-526	466	--	--	--	--	--	--	--	--
AY-68-37-526	659	--	--	--	--	--	--	--	--
AY-68-37-526	510	--	--	--	--	--	--	--	--
AY-68-37-526	576	--	--	--	--	--	--	--	--
AY-68-37-526	542	--	--	--	--	--	--	--	--
AY-68-37-526	555	--	--	--	--	--	--	--	--
AY-68-37-526	513	--	--	--	--	--	--	--	--
AY-68-37-526	580	--	--	--	--	--	--	--	--
AY-68-37-527	288	--	--	--	--	--	--	--	--
AY-68-37-527	284	--	--	--	--	--	--	--	--
AY-68-37-527	287	--	--	--	--	--	--	--	--
AY-68-37-527	282	--	--	--	--	--	--	--	--
AY-68-37-527	286	--	--	--	--	--	--	--	--
AY-68-37-527	279	--	--	--	--	--	--	--	--
AY-68-37-527	279	--	--	--	--	--	--	--	--
AY-68-37-527	287	--	--	--	--	--	--	--	--
AY-68-37-527	285	--	--	--	--	--	--	--	--
AY-68-37-527	280	--	--	--	--	--	--	--	--
AY-68-37-527	276	--	--	--	--	--	--	--	--
AY-68-37-527	289	--	--	--	--	--	--	--	--
AY-68-37-705	266	--	--	--	--	--	--	--	--
AY-68-43-601	266	--	--	--	--	--	--	--	--
AY-68-43-802	283	--	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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 DIS, FIX END FIELD, CACO3 (MG/L)
AY-68-43-811	07-09-90	1405	2292	1440	1600	621	7.2	27.5	210
AY-68-43-816	07-01-90	1315	1993	315	900	1050	7.4	35.0	190
AY-68-44-401	07-01-90	1055	1532	1440	750	500	7.3	27.0	190
AY-68-45-901	09-10-90	1200	2920	4380	12	4390	6.7	36.0	240

LOCAL IDENT-I-FIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
AY-68-43-811	260	68	22	10	1.1	83	20	1.9	12
AY-68-43-816	440	120	34	51	3.7	230	100	0.80	15
AY-68-44-401	240	68	17	9.9	1.1	23	22	0.30	12
AY-68-45-901	2400	610	210	400	20	2000	790	2.6	26

LOCAL IDENT-I-FIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, 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-68-43-811	346	--	--	--	--	--	--	--	--
AY-68-43-816	669	--	--	--	--	--	--	--	--
AY-68-44-401	268	--	--	--	--	--	--	--	--
AY-68-45-901	4220	--	--	--	--	--	--	--	1.4

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

COMAL 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 DIS, FIX END FIELD, CACO3 (MG/L)
DX-68-15-901	05-22-90	1345	a/--	--	--	568	7.0	20.0	260
DX-68-22-902	06-27-90	1025	240.00	40	800	536	6.9	22.5	250
DX-68-23-224	07-10-90	1145	420.00	45	100	562	7.2	23.5	250
DX-68-23-301	06-21-90	1445	a/--	--	--	551	7.3	24.5	230
DX-68-23-303	06-26-90	1100	1045	180	4200	512	7.3	25.5	230
DX-68-23-316	06-13-90	1300	350.00	60	10	532	6.9	23.5	260
DX-68-23-317	07-10-90	1030	360.00	40	50	577	7.1	23.0	280
DX-68-23-501	07-03-90	1050	210.00	32	500	479	7.2	23.0	220
DX-68-23-602	06-26-90	1230	790.00	300	2570	520	7.2	23.0	230
DX-68-23-616A	05-29-90	1530	576.00	60	13	2660	7.3	25.5	240
DX-68-23-616A	08-29-90	1100	576.00	200	20	2820	7.1	26.0	250
DX-68-23-616A	09-04-90	1200	576.00	60	11	2870	7.1	26.0	250
DX-68-23-616A	10-10-90	1150	576.00	60	--	2880	7.0	25.0	250
DX-68-23-616A	11-19-90	1315	576.00	60	10	2880	7.1	25.5	250
DX-68-23-616A	12-13-90	1635	576.00	60	14	2880	6.8	25.0	250
DX-68-23-616B	05-29-90	1415	738.00	75	12	1700	7.1	26.5	120
DX-68-23-616B	08-02-90	1100	738.00	60	12	1680	7.0	26.5	230
DX-68-23-616B	09-04-90	1100	738.00	70	11	1680	7.0	26.0	230
DX-68-23-616B	10-10-90	1020	738.00	60	10	1680	7.2	26.0	230
DX-68-23-616B	11-19-90	1210	738.00	60	9.9	1680	6.8	26.0	240
DX-68-23-616B	12-13-90	1515	738.00	40	13	1710	6.9	26.0	240
DX-68-23-617	05-22-90	0900	743.00	60	14	552	7.1	26.0	220
DX-68-23-617	07-23-90	1045	743.00	65	12	541	7.3	27.0	200
DX-68-23-617	09-04-90	1345	743.00	--	12	546	7.4	26.5	200
DX-68-23-617	10-10-90	1400	743.00	65	11	540	7.0	25.5	200
DX-68-23-617	11-19-90	1020	743.00	65	11	538	7.3	26.0	200
DX-68-23-617	12-13-90	1415	743.00	60	13	553	6.9	26.0	210
DX-68-23-618	01-11-90	0835	660.10	60	54	556	7.3	24.5	210
DX-68-23-618	01-12-90	1125	660.10	60	65	752	7.5	25.0	210
DX-68-23-618	05-22-90	1100	660.10	100	9.0	625	7.8	25.5	200
DX-68-23-618	07-23-90	1130	660.10	70	8.3	605	7.6	25.5	190
DX-68-23-618	09-04-90	1415	660.10	--	7.3	605	6.9	25.5	180
DX-68-23-618	10-10-90	1440	660.10	100	10	617	6.9	25.5	200
DX-68-23-618	11-19-90	1040	660.10	85	10	616	6.9	25.0	200
DX-68-23-618	12-13-90	1225	660.10	60	13	627	7.0	25.5	210
DX-68-23-619A	06-14-90	0915	652.00	70	12	558	6.9	26.0	200
DX-68-23-619A	07-23-90	1330	652.00	70	11	556	7.1	26.0	210
DX-68-23-619A	09-04-90	1550	652.00	60	11	565	7.3	26.0	210
DX-68-23-619A	10-10-90	1600	652.00	50	10	555	7.1	25.0	200
DX-68-23-619A	11-19-90	1520	652.00	60	10	562	7.1	25.5	210
DX-68-23-619A	12-13-90	0915	652.00	60	12	567	6.8	25.5	210
DX-68-23-619B	06-14-90	1040	787.00	60	12	542	7.1	26.5	210
DX-68-23-619B	07-23-90	1430	787.00	45	12	528	6.9	27.0	200
DX-68-23-619B	09-04-90	1640	787.00	50	11	536	6.7	26.5	210
DX-68-23-619B	10-10-90	1650	787.00	50	10	546	6.8	26.0	220
DX-68-23-619B	11-19-90	1420	787.00	60	11	550	7.2	26.0	220
DX-68-23-619B	12-13-90	0805	787.00	40	13	554	7.1	25.5	220
DX-68-23-703	07-06-90	1415	380.00	30	15	555	7.6	24.0	220
DX-68-23-809	07-10-90	1740	720.00	28	10	684	7.7	24.0	250

a/ Spring.

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

COMAL COUNTY--Continued

LOCAL IDENTIFIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
DX-68-15-901	290	98	12	7.4	1.3	18	16	<0.10	11
DX-68-22-902	270	89	12	5.9	0.80	8.8	11	0.20	11
DX-68-23-224	270	91	11	8.2	0.70	11	17	0.40	12
DX-68-23-301	260	79	16	10	1.2	22	16	<0.10	12
DX-68-23-303	270	81	17	10	1.2	26	16	0.20	13
DX-68-23-316	280	90	13	5.5	0.80	11	12	0.20	11
DX-68-23-317	290	87	18	6.3	0.90	9.7	33	0.30	12
DX-68-23-501	260	80	14	8.6	1.1	19	21	0.40	11
DX-68-23-602	250	79	14	8.7	1.2	20	14	<0.10	12
DX-68-23-616A	720	150	85	260	17	490	460	2.1	13
DX-68-23-616A	800	150	100	300	21	520	510	2.5	13
DX-68-23-616A	810	160	100	300	19	540	540	2.6	13
DX-68-23-616A	820	170	97	300	21	510	480	2.2	13
DX-68-23-616A	790	160	94	310	18	520	500	2.5	13
DX-68-23-616A	750	150	91	320	20	560	480	2.1	14
DX-68-23-616B	480	98	56	140	10	280	260	2.7	13
DX-68-23-616B	490	100	58	140	11	280	250	2.8	13
DX-68-23-616B	490	99	58	150	11	270	260	2.4	14
DX-68-23-616B	490	100	59	150	11	280	250	2.5	13
DX-68-23-616B	490	98	59	150	11	280	250	2.8	13
DX-68-23-616B	490	100	59	150	11	280	220	2.9	14
DX-68-23-617	230	56	23	11	6.4	51	18	1.3	13
DX-68-23-617	230	53	23	12	10	48	25	<0.10	13
DX-68-23-617	220	52	23	12	9.3	47	23	1.0	13
DX-68-23-617	230	52	24	12	8.0	49	24	1.0	12
DX-68-23-617	240	54	25	12	7.0	49	21	1.5	12
DX-68-23-617	240	56	25	11	5.2	44	17	1.1	13
DX-68-23-618	240	50	29	21	2.2	47	30	2.0	13
DX-68-23-618	290	59	35	41	3.5	85	67	2.3	13
DX-68-23-618	260	51	31	26	3.1	64	40	2.7	14
DX-68-23-618	250	48	32	26	3.1	61	42	<0.10	14
DX-68-23-618	260	50	32	26	3.1	61	41	2.2	14
DX-68-23-618	250	50	31	25	3.0	61	45	2.4	13
DX-68-23-618	270	53	33	27	2.7	63	42	3.1	13
DX-68-23-618	260	53	32	26	2.8	49	34	2.3	14
DX-68-23-619A	240	56	25	16	3.8	54	22	1.5	12
DX-68-23-619A	250	57	26	15	4.1	54	22	1.8	13
DX-68-23-619A	240	56	25	15	4.0	54	19	1.6	13
DX-68-23-619A	230	54	24	15	4.6	56	24	1.6	13
DX-68-23-619A	250	57	27	16	4.3	57	21	2.1	13
DX-68-23-619A	250	57	26	15	4.0	46	17	1.5	13
DX-68-23-619B	240	58	24	13	2.5	45	19	1.3	13
DX-68-23-619B	230	56	22	12	2.7	46	19	0.40	13
DX-68-23-619B	240	59	23	12	2.6	48	17	1.1	13
DX-68-23-619B	240	58	24	11	2.2	46	19	1.3	13
DX-68-23-619B	260	60	26	12	1.9	49	18	2.0	12
DX-68-23-619B	250	59	25	11	1.8	44	16	1.1	13
DX-68-23-703	250	50	31	18	2.2	36	28	2.2	12
DX-68-23-809	260	49	34	36	3.1	43	56	2.0	12

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

COMAL COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, 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	322	--	--	--	--	--	--	--	--
DX-68-22-902	290	--	<0.010	<0.010	--	<0.20	1.60	<0.010	0.5
DX-68-23-224	298	2.9	<0.010	<0.010	--	0.40	2.50	0.010	--
DX-68-23-301	294	1.2	<0.010	0.030	0.970	0.20	1.00	<0.010	0.7
DX-68-23-303	302	--	<0.010	<0.010	--	<0.20	1.70	0.010	0.6
DX-68-23-316	302	2.0	<0.010	<0.010	--	0.50	1.50	<0.010	0.8
DX-68-23-317	333	--	<0.010	<0.010	--	<0.20	1.90	0.030	--
DX-68-23-501	288	2.4	<0.010	<0.010	--	0.50	1.90	<0.010	--
DX-68-23-602	284	--	<0.010	<0.010	--	<0.20	2.00	0.010	0.6
DX-68-23-616A	1620	--	--	--	--	--	--	--	--
DX-68-23-616A	1790	--	--	--	--	--	--	--	1.8
DX-68-23-616A	1820	--	--	--	--	--	--	--	--
DX-68-23-616A	1740	--	--	--	--	--	--	--	--
DX-68-23-616A	1770	--	--	--	--	--	--	--	--
DX-68-23-616A	1790	--	--	--	--	--	--	--	--
DX-68-23-616B	930	--	--	--	--	--	--	--	--
DX-68-23-616B	995	--	--	--	--	--	--	--	--
DX-68-23-616B	1000	--	--	--	--	--	--	--	--
DX-68-23-616B	1000	--	--	--	--	--	--	--	--
DX-68-23-616B	1010	--	--	--	--	--	--	--	--
DX-68-23-616B	979	--	--	--	--	--	--	--	--
DX-68-23-617	310	--	--	--	--	--	--	--	--
DX-68-23-617	302	--	--	--	--	--	--	--	--
DX-68-23-617	298	--	--	--	--	--	--	--	--
DX-68-23-617	301	--	--	--	--	--	--	--	--
DX-68-23-617	302	--	--	--	--	--	--	--	--
DX-68-23-617	298	--	--	--	--	--	--	--	--
DX-68-23-618	320	--	--	--	--	--	--	--	--
DX-68-23-618	433	--	--	--	--	--	--	--	--
DX-68-23-618	351	--	--	--	--	--	--	--	--
DX-68-23-618	342	--	--	--	--	--	--	--	--
DX-68-23-618	339	--	--	--	--	--	--	--	--
DX-68-23-618	349	--	--	--	--	--	--	--	--
DX-68-23-618	357	--	--	--	--	--	--	--	--
DX-68-23-618	336	--	--	--	--	--	--	--	--
DX-68-23-619A	313	--	--	--	--	--	--	--	--
DX-68-23-619A	320	--	--	--	--	--	--	--	--
DX-68-23-619A	312	--	--	--	--	--	--	--	--
DX-68-23-619A	311	--	--	--	--	--	--	--	--
DX-68-23-619A	322	--	--	--	--	--	--	--	--
DX-68-23-619A	305	--	--	--	--	--	--	--	--
DX-68-23-619B	301	--	--	--	--	--	--	--	--
DX-68-23-619B	290	--	--	--	--	--	--	--	--
DX-68-23-619B	302	--	--	--	--	--	--	--	--
DX-68-23-619B	304	--	--	--	--	--	--	--	--
DX-68-23-619B	313	--	--	--	--	--	--	--	--
DX-68-23-619B	302	--	--	--	--	--	--	--	--
DX-68-23-703	310	--	--	--	--	--	--	--	--
DX-68-23-809	387	--	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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 DIS, FIX END FIELD, CACO3 (MG/L)
LR-67-01-302	07-03-90	1540	360.00	40	500	683	7.2	26.0	230
LR-67-01-801	06-21-90	1100	a/--	--	--	593	7.2	21.5	250
LR-67-01-806	07-03-90	1330	715.00	60	4500	638	7.0	23.0	270
LR-67-01-812	06-23-90	1739	543.00	60	33	13600	7.9	27.0	360
LR-67-01-812	06-25-90	1730	543.00	120	21	14200	6.6	26.5	390
LR-67-01-812	06-28-90	1150	543.00	180	20	14400	6.6	26.0	390
LR-67-01-812	07-01-90	1118	543.00	120	30	14300	6.7	27.0	410
LR-67-01-812	07-02-90	1055	543.00	180	20	14400	6.6	27.0	390
LR-67-01-812	08-13-90	1500	543.00	390	13	13500	6.4	25.5	--
LR-67-01-812	11-14-90	1100	543.00	60	6.0	14800	6.6	24.0	380
LR-67-01-813A	07-20-90	0630	564.00	90	21	13600	7.5	24.5	380
LR-67-01-813A	07-21-90	0725	564.00	180	10	14200	6.5	26.5	390
LR-67-01-813A	07-24-90	1618	564.00	180	21	14600	6.5	26.5	400
LR-67-01-813A	07-26-90	2035	564.00	420	70	14400	6.6	26.5	390
LR-67-01-813A	08-10-90	1255	564.00	225	11	13900	6.6	25.0	390
LR-67-01-813A	11-14-90	1400	564.00	60	7.0	14800	6.6	24.0	400
LR-67-01-813B	08-10-90	1705	699.00	240	12	14100	6.6	25.5	390
LR-67-01-813B	11-14-90	1500	699.00	50	9.5	14900	6.5	25.0	390
LR-67-09-105	06-29-90	1300	330.00	1440	1100	628	7.1	23.5	250
LR-67-09-111	06-29-90	1100	264.00	87	400	595	7.1	23.5	260

LOCAL IDENT-I-FIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
LR-67-01-302	320	64	39	8.3	1.6	130	14	0.70	13
LR-67-01-801	290	83	19	12	1.5	26	21	0.20	11
LR-67-01-806	300	94	17	13	1.3	27	27	0.50	12
LR-67-01-812	3700	780	420	1800	80	2500	3000	0.90	13
LR-67-01-812	4000	870	450	1900	83	2700	3800	6.8	14
LR-67-01-812	4000	870	450	1900	84	2800	4000	2.1	14
LR-67-01-812	4000	860	440	1900	83	2700	3500	2.3	14
LR-67-01-812	4000	860	450	2000	85	3000	4000	2.3	14
LR-67-01-812	4200	930	440	1800	80	2300	3600	1.3	15
LR-67-01-812	3700	820	410	1800	87	2600	3900	2.5	16
LR-67-01-813A	3900	860	420	1800	83	2300	3200	1.4	14
LR-67-01-813A	4000	920	420	2000	86	2700	3800	2.1	14
LR-67-01-813A	4000	900	430	1800	79	2600	3800	2.4	14
LR-67-01-813A	4200	950	450	1800	84	2600	3900	2.3	14
LR-67-01-813A	3600	790	390	1800	85	2300	3700	0.80	14
LR-67-01-813A	3800	810	420	1800	82	2700	4000	<0.10	17
LR-67-01-813B	3900	850	440	1900	88	2400	3800	2.7	16
LR-67-01-813B	3800	830	420	1800	85	2500	3900	2.4	15
LR-67-09-105	310	93	18	15	1.4	30	26	0.20	12
LR-67-09-111	300	94	17	12	1.2	22	19	<0.10	12

a/ Spring.

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--Continued

HAYS COUNTY--Continued

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC, TOTAL (MG/L AS N)	NITROGEN, NO2+NO3, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	CARBON, ORGANIC, DISSOLVED (MG/L AS C)
LR-67-01-302	409	--	0.020	<0.010	--	<0.20	<0.100	0.010	--
LR-67-01-801	322	2.2	<0.010	0.030	1.77	0.40	1.80	0.010	0.6
LR-67-01-806	352	1.9	<0.010	<0.010	--	0.30	1.60	0.010	0.6
LR-67-01-812	8810	--	--	--	--	--	--	--	--
LR-67-01-812	10100	--	--	--	--	--	--	--	--
LR-67-01-812	10400	--	--	--	--	--	--	--	--
LR-67-01-812	9740	--	--	--	--	--	--	--	--
LR-67-01-812	10600	--	--	--	--	--	--	--	--
LR-67-01-812	--	--	--	--	--	--	--	--	5.7
LR-67-01-812	9860	--	--	--	--	--	--	--	--
LR-67-01-813A	8900	--	--	--	--	--	--	--	--
LR-67-01-813A	10200	--	--	--	--	--	--	--	--
LR-67-01-813A	9870	--	--	--	--	--	--	--	--
LR-67-01-813A	10000	--	--	--	--	--	--	--	--
LR-67-01-813A	9310	--	--	--	--	--	--	--	--
LR-67-01-813A	10100	--	--	--	--	--	--	--	--
LR-67-01-813B	9730	--	--	--	--	--	--	--	--
LR-67-01-813B	9780	--	--	--	--	--	--	--	--
LR-67-09-105	347	2.1	0.020	<0.010	--	0.50	1.60	<0.010	0.6
LR-67-09-111	335	--	0.020	<0.010	--	<0.20	1.60	<0.010	0.7

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE, WATER (DEG C)	ALKALINITY, WAT DIS, FIX END FIELD, CACO3 (MG/L)
TD-68-26-701	06-19-90	1235	750.00	1440	400	526	7.2	23.5	200
TD-68-33-202	06-13-90	1145	279.00	30	20	456	7.1	22.5	190
TD-68-33-701	06-04-90	1535	1348	1440	1950	473	7.7	24.5	220
TD-68-41-303	06-19-90	1445	717.00	480	340	488	7.2	24.0	210
TD-68-42-506	06-04-90	1130	1445	30	1000	480	7.1	26.5	200
TD-68-49-813	07-02-90	1315	3194	80	170	1190	7.2	38.0	290
TD-69-29-901	05-29-90	1225	276.00	60	20	450	7.0	23.5	220
TD-69-40-403	06-04-90	1345	518.00	1440	1000	461	7.5	23.5	220
TD-69-47-303	05-30-90	1250	1803	50	1000	469	7.2	24.0	210
TD-69-54-401	07-05-90	1540	2000	220	20	500	7.2	24.5	200
TD-69-55-701	09-05-90	1000	--	840	950	491	7.2	30.5	200
TD-69-56-508	07-06-90	1050	2715	1440	300	624	7.3	32.0	200

LOCAL IDENTIFIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE, DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
TD-68-26-701	270	74	20	7.6	1.3	50	14	0.60	12
TD-68-33-202	220	73	10	6.5	0.90	25	6.5	0.20	12
TD-68-33-701	240	75	13	7.9	1.0	9.8	8.3	0.20	12
TD-68-41-303	240	71	15	9.8	1.0	17	22	0.40	12
TD-68-42-506	240	69	16	9.3	1.0	13	25	0.10	12
TD-68-49-813	220	54	21	140	7.0	47	170	4.4	23
TD-69-29-901	230	83	5.7	4.7	0.70	7.2	7.7	<0.10	12
TD-69-40-403	240	79	10	5.7	0.90	4.0	12	0.20	12
TD-69-47-303	230	66	<15	7.1	1.0	15	14	0.20	12
TD-69-54-401	230	66	16	12	1.0	9.5	18	0.30	12
TD-69-55-701	230	61	18	9.1	1.0	24	19	0.30	13
TD-69-56-508	220	55	21	11	1.2	25	21	0.90	13

LOCAL IDENTIFIER	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, 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	302	1.4	0.020	<0.010	--	0.40	1.00	0.050	0.5
TD-68-33-202	250	1.5	<0.010	<0.010	--	0.70	0.800	<0.010	0.8
TD-68-33-701	258	2.1	<0.010	0.010	1.69	0.40	1.70	<0.010	--
TD-68-41-303	272	2.5	0.020	<0.010	--	0.60	1.90	<0.010	0.5
TD-68-42-506	266	2.2	<0.010	<0.010	--	0.20	2.00	0.010	--
TD-68-49-813	640	--	--	--	--	--	--	--	--
TD-69-29-901	257	--	<0.010	<0.010	--	<0.20	0.800	<0.010	--
TD-69-40-403	256	2.1	0.010	<0.010	--	0.40	1.70	<0.010	--
TD-69-47-303	--	--	<0.010	<0.010	--	<0.20	1.50	<0.010	--
TD-69-54-401	255	--	--	--	--	--	--	--	--
TD-69-55-701	274	--	--	--	--	--	--	--	--
TD-69-56-508	270	--	--	--	--	--	--	--	--

Analytical data for selected properties, common inorganic constituents, nutrients, and dissolved organic carbon in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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 DIS, FIX END FIELD, CACO3 (MG/L)
YP-69-36-702	02-13-90	0900	538.00	200	1000	485	6.6	22.0	190
YP-69-42-606	02-12-90	1130	525.00	1440	1000	550	6.5	23.5	210
YP-69-43-606	06-11-90	1730	698.00	30	400	505	6.7	23.5	200
YP-69-45-405	06-11-90	1000	1211	40	500	486	7.2	23.0	210
YP-69-50-203	02-12-90	1330	525.00	200	1280	598	6.4	23.5	210
YP-69-50-501	07-05-90	1000	600.00	45	1300	1370	6.8	23.5	220
YP-69-50-506	06-11-90	1345	525.00	40	460	604	6.8	23.0	230
YP-69-51-102	06-12-90	0930	391.00	45	50	669	6.9	25.0	240
YP-69-51-104	06-11-90	1430	430.00	1440	710	858	7.0	25.0	260
YP-69-51-401	07-05-90	1100	400.00	1440	1000	775	6.8	25.0	250
YP-69-52-403	07-05-90	1230	1400	1440	800	2940	6.8	33.0	290
YP-69-53-202	06-11-90	1600	1230	1440	1000	658	7.0	25.0	220
YP-69-59-101	08-22-90	1530	1647	5220	3000	2920	6.7	36.0	180

LOCAL IDENT-I-FIER	HARDNESS, TOTAL (MG/L AS CACO3)	CALCIUM, DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	POTASSIUM, DIS-SOLVED (MG/L AS K)	SULFATE, DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
YP-69-36-702	230	66	17	10	1.0	14	31	0.10	13
YP-69-42-606	240	81	8.6	15	1.0	13	38	0.20	12
YP-69-43-606	240	79	10	12	1.0	11	28	0.20	12
YP-69-45-405	240	72	14	9.1	1.0	17	14	0.20	13
YP-69-50-203	260	88	10	16	<0.10	17	43	0.20	13
YP-69-50-501	510	170	20	52	1.4	96	210	0.20	16
YP-69-50-506	270	93	8.8	17	1.0	20	39	<0.10	13
YP-69-51-102	300	100	13	16	1.7	70	30	0.80	17
YP-69-51-104	350	120	13	32	1.2	44	87	0.50	16
YP-69-51-401	330	110	14	35	1.4	79	66	1.0	14
YP-69-52-403	800	200	74	360	17	800	380	2.8	18
YP-69-53-202	270	81	16	27	1.2	27	58	0.20	13
YP-69-59-101	1900	640	66	170	14	1800	240	1.8	16

LOCAL IDENT-I-FIER	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA, TOTAL (MG/L AS N)	NITROGEN, NITRITE, TOTAL (MG/L AS N)	NITROGEN, NITRATE, 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, DIS-SOLVED (MG/L AS C)
YP-69-36-702	265	--	0.030	<0.010	--	<0.20	2.20	0.010	0.5
YP-69-42-606	294	--	<0.010	<0.010	--	<0.20	3.50	0.010	0.4
YP-69-43-606	274	3.5	<0.010	<0.010	--	0.70	2.80	0.010	1.5
YP-69-45-405	267	2.4	<0.010	<0.010	--	0.90	1.50	<0.010	--
YP-69-50-203	--	3.4	<0.010	<0.010	--	0.30	3.10	0.020	0.4
YP-69-50-501	699	--	--	--	--	--	--	--	--
YP-69-50-506	328	--	--	--	--	--	--	--	--
YP-69-51-102	392	--	<0.010	<0.010	--	<0.20	0.600	0.020	0.6
YP-69-51-104	467	--	--	--	--	--	--	--	0.6
YP-69-51-401	470	--	--	--	--	--	--	--	--
YP-69-52-403	2030	--	--	--	--	--	--	--	--
YP-69-53-202	354	4.6	<0.010	<0.010	--	1.0	3.60	<0.010	--
YP-69-59-101	3070	--	--	--	--	--	--	--	1.9

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1990

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	04-30-90	1015	279.00	40	5.0	<1	24	1.0	10
AY-68-27-101	04-30-90	1440	100.00	40	3.0	<1	31	2.0	<1
AY-68-27-303	04-30-90	1200	354.00	60	14	<1	30	1.0	2
AY-68-27-503	04-30-90	1330	375.00	15	20	<1	26	1.0	1
AY-68-28-102	06-05-90	0945	440.00	60	7.0	<1	37	<1.0	<1
AY-68-28-205	05-15-90	1500	485.00	100	350	<1	30	2.0	<1
AY-68-28-207	06-13-90	1030	265.00	60	2.5	<1	41	3.0	<1
AY-68-28-501	05-15-90	1400	468.00	100	125	<1	37	3.0	<1
AY-68-28-514	05-15-90	1230	510.00	30	1250	<1	33	1.0	<1
AY-68-28-903	05-16-90	1200	762.00	90	2000	<1	39	<1.0	<1
AY-68-28-904	05-16-90	1040	640.00	100	800	<1	30	<1.0	<1
AY-68-28-909	06-25-90	0935	867.00	95	2430	<1	34	<1.0	<1
AY-68-28-919	05-16-90	1120	550.00	100	2500	<1	34	<1.0	<1
AY-68-29-210	06-06-90	1055	329.00	30	15	<1	31	<1.0	<1
AY-68-35-102	05-22-90	1530	796.00	1440	3000	<1	32	<1.0	1
AY-68-35-913	05-09-90	0730	1040	60	8000	<1	46	<1.0	<1
AY-68-36-102	05-09-90	1000	786.00	60	4000	<1	35	<1.0	<1
AY-68-37-104	05-22-90	1515	995.00	1440	5000	<1	38	<1.0	<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)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	SELENIUM, DISSOLVED (UG/L AS SE)	MERCURY, DISSOLVED (UG/L AS HG)
AY-68-21-804	10	12	15	2	2.0	580	<1	<0.1
AY-68-27-101	4	42	2	28	<1.0	1700	<1	<0.1
AY-68-27-303	2	8	1	<1	3.0	270	<1	0.1
AY-68-27-503	10	4	9	<1	2.0	380	<1	0.4
AY-68-28-102	4	<3	1	1	<1.0	40	<1	<0.1
AY-68-28-205	2	<3	<1	<1	<1.0	12	<1	<0.1
AY-68-28-207	27	21	5	65	<1.0	4500	<1	--
AY-68-28-501	7	7	1	<1	<1.0	25	<1	<0.1
AY-68-28-514	10	6	1	<1	<1.0	9	<1	0.1
AY-68-28-903	12	4	<1	<1	<1.0	9	<1	0.1
AY-68-28-904	13	3	1	<1	<1.0	4	<1	<0.1
AY-68-28-909	4	<3	1	<1	<1.0	10	<1	<0.1
AY-68-28-919	15	4	1	<1	<1.0	4	<1	<0.1
AY-68-29-210	15	19	2	<1	1.0	600	<1	0.4
AY-68-35-102	<1	<3	1	<1	<1.0	13	<1	0.2
AY-68-35-913	6	10	<1	<1	<1.0	23	<1	<0.1
AY-68-36-102	10	4	1	<1	<1.0	15	<1	0.2
AY-68-37-104	7	<3	<1	<1	<1.0	8	<1	0.1

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	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	05-22-90	1345	a/--	--	--	<1	32	<1.0	<1
DX-68-22-902	06-27-90	1025	240.00	40	800	<1	29	<1.0	<1
DX-68-23-224	07-10-90	1145	420.00	45	100	<1	36	<1.0	2
DX-68-23-301	06-21-90	1445	a/--	--	--	<1	51	<1.0	<1
DX-68-23-303	06-26-90	1100	1045	180	4200	<1	53	<1.0	<1
DX-68-23-316	06-13-90	1300	350.00	60	10	<1	31	<1.0	<1
DX-68-23-317	07-10-90	1030	360.00	40	50	<1	34	<1.0	<1
DX-68-23-501	07-03-90	1050	210.00	32	500	<1	35	1.0	2
DX-68-23-602	06-26-90	1230	790.00	300	2570	<1	35	<1.0	1

LOCAL IDENTIFIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	SELENIUM, DISSOLVED (UG/L AS SE)	MERCURY, DISSOLVED (UG/L AS HG)
DX-68-15-901	<1	<3	<1	<1	<1.0	5	<1	<0.1
DX-68-22-902	8	<3	<1	<1	<1.0	10	<1	<0.1
DX-68-23-224	2	3	1	<1	<1.0	6	<1	<0.1
DX-68-23-301	1	3	<1	<1	<1.0	8	<1	<0.1
DX-68-23-303	7	5	1	<1	<1.0	71	<1	0.2
DX-68-23-316	4	8	4	<1	<1.0	420	<1	<0.1
DX-68-23-317	3	<3	<1	<1	<1.0	8	<1	<0.1
DX-68-23-501	3	<3	3	<1	<1.0	18	<1	<0.1
DX-68-23-602	4	<3	<1	<1	<1.0	13	<1	<0.1

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	ARSENIC, DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM, DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)
LR-67-01-302	07-03-90	1540	360.00	40	500	<1	61	<1.0	<1
LR-67-01-801	06-21-90	1100	a/--	--	--	<1	34	<1.0	<1
LR-67-01-806	07-03-90	1330	715.00	60	4500	<1	39	<1.0	1
LR-67-09-105	06-29-90	1300	330.00	1440	1100	<1	41	<1.0	<1
LR-67-09-111	06-29-90	1100	264.00	87	400	<1	42	<1.0	2

LOCAL IDENTIFIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	SELENIUM, DISSOLVED (UG/L AS SE)	MERCURY, DISSOLVED (UG/L AS HG)
LR-67-01-302	4	14	1	<1	<1.0	37	<1	<0.1
LR-67-01-801	3	<3	1	<1	<1.0	24	<1	0.2
LR-67-01-806	6	<3	1	<1	<1.0	9	<1	<0.1
LR-67-09-105	3	30	<1	<1	1.0	10	<1	<0.1
LR-67-09-111	7	9	2	<1	<1.0	9	<1	<0.1

a/ Spring.

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	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	06-19-90	1235	750.00	1440	400	<1	32	<1.0	<1
TD-68-33-202	06-13-90	1145	279.00	30	20	<1	33	<1.0	<1
TD-68-33-701	06-04-90	1535	1348	1440	1950	<1	38	<1.0	<1
TD-68-41-303	06-19-90	1445	717.00	480	340	<1	48	<1.0	<1
TD-68-42-506	06-04-90	1130	1445	30	1000	<1	70	<1.0	<1
TD-69-29-901	05-29-90	1225	276.00	60	20	<1	28	<1.0	<1
TD-69-40-403	06-04-90	1345	518.00	1440	1000	<1	32	<1.0	<1
TD-69-47-303	05-30-90	1250	1803	50	1000	<1	42	<1.0	<1

LOCAL IDENTIFIER	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	SELENIUM, DISSOLVED (UG/L AS SE)	MERCURY, DISSOLVED (UG/L AS HG)
TD-68-26-701	1	<3	2	<1	<1.0	20	<1	<0.1
TD-68-33-202	3	<3	3	<1	<1.0	200	<1	0.2
TD-68-33-701	1	<3	2	<1	<1.0	6	<1	<0.1
TD-68-41-303	3	<3	1	<1	<1.0	6	<1	<0.1
TD-68-42-506	1	<3	3	<1	<1.0	11	<1	<0.1
TD-69-29-901	3	3	5	5	<1.0	1200	<1	<0.1
TD-69-40-403	5	6	2	<1	<1.0	13	<1	<0.1
TD-69-47-303	1	<3	1	<1	<1.0	<14	<1	<0.1

Analytical data for minor elements in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	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-69-36-702	02-13-90	0900	538.00	200	1000	<1	37	<1.0	5
YP-69-42-606	02-12-90	1130	525.00	1440	1000	1	53	<1.0	<5
YP-69-43-606	06-11-90	1730	698.00	30	400	<1	49	<1.0	<1
YP-69-45-405	06-11-90	1000	1211	40	500	<1	36	<1.0	<1
YP-69-50-203	02-12-90	1330	525.00	200	1280	<1	65	<1.0	<5
YP-69-50-501	07-05-90	1000	600.00	45	1300	<1	110	<1.0	3
YP-69-50-506	06-11-90	1345	525.00	40	460	<1	64	<1.0	<1
YP-69-51-102	06-12-90	0930	391.00	45	50	<1	80	<1.0	1
YP-69-51-104	06-11-90	1430	430.00	1440	710	<1	110	<1.0	<1
YP-69-53-202	06-11-90	1600	1230	1440	1000	<1	67	<1.0	<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)	SILVER, DISSOLVED (UG/L AS AG)	ZINC, DISSOLVED (UG/L AS ZN)	SELENIUM, DISSOLVED (UG/L AS SE)	MERCURY, DISSOLVED (UG/L AS HG)
YP-69-36-702	<10	10	10	<1	1.0	23	<1	<0.1
YP-69-42-606	<10	6	<10	<1	<1.0	17	<1	<0.1
YP-69-43-606	13	7	1	<1	<1.0	10	<1	<0.1
YP-69-45-405	12	<3	<1	<1	<1.0	4	<1	<0.1
YP-69-50-203	<10	5	<10	<1	<1.0	22	<1	<0.1
YP-69-50-501	4	8	2	<1	<1.0	38	2	<0.1
YP-69-50-506	6	<3	<1	<1	<1.0	7	<1	<0.1
YP-69-51-102	7	8	<1	<1	1.0	32	<1	<0.1
YP-69-51-104	11	<3	1	<1	<1.0	10	<1	0.6
YP-69-53-202	1	15	<1	1	2.0	12	<1	<0.1

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1990

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)	PERTHANE, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
AY-68-21-804	04-30-90	1015	279.00	40	5.0	<0.1	<0.10	<0.010
AY-68-27-101	04-30-90	1440	100.00	40	3.0	<0.1	<0.10	<0.010
AY-68-27-503	04-30-90	1330	375.00	15	20	<0.1	<0.10	<0.010
AY-68-28-102	06-05-90	0945	440.00	60	7.0	<0.1	<0.10	<0.010
AY-68-28-205	05-15-90	1500	485.00	100	350	<0.1	<0.10	<0.010
AY-68-28-903	05-16-90	1200	762.00	90	2000	<0.1	<0.10	<0.010
AY-68-36-102	05-09-90	1000	786.00	60	4000	<0.1	<0.10	<0.010

LOCAL IDENT-I-FIER	LINDANE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
AY-68-21-804	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-27-101	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-27-503	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-28-102	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-28-205	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-28-903	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AY-68-36-102	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

LOCAL IDENT-I-FIER	ETHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	PCB, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
AY-68-21-804	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-27-101	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-27-503	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-28-102	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
AY-68-28-205	<0.01	<1	<0.010	<0.010	0.2	0.01	<0.01	<0.01
AY-68-28-903	<0.01	<1	<0.010	<0.010	0.2	<0.01	<0.01	<0.01
AY-68-36-102	--	<1	<0.010	<0.010	<0.1	--	--	--

LOCAL IDENT-I-FIER	METHYL PARATHION, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	METHYL TRITHION, TOTAL (UG/L)
AY-68-21-804	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-27-101	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-27-503	<0.01	<0.01	<0.01	<0.10	<0.01	<0.01	<0.01
AY-68-28-102	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-28-205	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-28-903	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AY-68-36-102	--	<0.01	<0.01	<0.01	<0.01	--	--

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	PERTHANE, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
DX-68-15-901	05-22-90	1345	a/--	--	--	<0.1	<0.10	<0.010
DX-68-22-902	06-27-90	1025	240.00	40	800	<0.1	<0.10	<0.010
DX-68-23-301	06-21-90	1445	a/--	--	--	<0.1	<0.10	<0.010
DX-68-23-602	06-26-90	1230	790.00	300	2570	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	LINDANE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
DX-68-15-901	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DX-68-22-902	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DX-68-23-301	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DX-68-23-602	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	ETHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	PCB, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
DX-68-15-901	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
DX-68-22-902	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
DX-68-23-602	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	METHYL PARATHION, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	METHYL TRITHION, TOTAL (UG/L)
DX-68-15-901	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DX-68-22-902	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DX-68-23-301	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
DX-68-23-602	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

a/ Spring.

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	PERTHANE, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
LR-67-01-302	07-03-90	1540	360.00	40	500	<0.1	<0.10	<0.010
LR-67-01-801	06-21-90	1100	a/--	--	--	<0.1	<0.10	<0.010
LR-67-01-806	07-03-90	1330	T15.00	60	4500	<0.1	<0.10	<0.010
LR-67-09-105	06-29-90	1300	330.00	1440	1100	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	LINDANE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
LR-67-01-302	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
LR-67-01-801	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
LR-67-01-806	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
LR-67-09-105	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	ETHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	PCB, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
LR-67-01-302	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
LR-67-01-801	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
LR-67-01-806	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
LR-67-09-105	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	METHYL PARATHION, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	METHYL TRITHION, TOTAL (UG/L)
LR-67-01-302	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LR-67-01-801	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
LR-67-01-806	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
LR-67-09-105	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

a/ Spring.

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	PERTHANE, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
TD-68-26-701	06-19-90	1235	750.00	1440	400	<0.1	<0.10	<0.010
TD-69-29-901	05-29-90	1225	276.00	60	20	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	LINDANE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
TD-68-26-701	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TD-69-29-901	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	ETHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	PCB, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
TD-68-26-701	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
TD-69-29-901	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	METHYL PARATHION, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	METHYL TRITHION, TOTAL (UG/L)
TD-68-26-701	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TD-69-29-901	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer, 1990--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)	PERTHANE, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR., TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)
YP-69-36-702	02-13-90	0900	538.00	200	1000	<0.1	<0.10	<0.010
YP-69-42-606	02-12-90	1130	525.00	1440	1000	<0.1	<0.10	<0.010
YP-69-50-203	02-12-90	1330	525.00	200	1280	<0.1	<0.10	<0.010
YP-69-50-506	06-11-90	1345	525.00	40	460	<0.1	<0.10	<0.010

LOCAL IDENTIFIER	LINDANE, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIELDRIN, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
YP-69-36-702	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
YP-69-42-606	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
YP-69-50-203	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
YP-69-50-506	<0.010	<0.1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

LOCAL IDENTIFIER	ETHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE, TOTAL (UG/L)	PCB, TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)
YP-69-36-702	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
YP-69-42-606	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
YP-69-50-203	<0.01	<1	<0.010	<0.010	<0.1	<0.01	<0.01	<0.01
YP-69-50-506	<0.01	<1	<0.010	<0.010	0.1	<0.01	<0.01	<0.01

LOCAL IDENTIFIER	METHYL PARATHION, TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	METHYL TRITHION, TOTAL (UG/L)
YP-69-36-702	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-42-606	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-50-203	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
YP-69-50-506	<0.01	0.10	<0.01	<0.01	<0.01	<0.01	<0.01

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990

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)	BROMOFORM, TOTAL (UG/L)	CHLORODIBROMOMETHANE, TOTAL (UG/L)
AY-68-21-804	04-30-90	1015	279.00	40	5.0	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-21-804	06-06-90	1000	279.00	35	10	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-303	04-30-90	1200	354.00	60	14	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-27-503	04-30-90	1330	375.00	15	20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-102	06-05-90	0945	440.00	60	7.0	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-205	05-15-90	1500	485.00	100	350	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-514	05-15-90	1230	510.00	30	1250	1.0	<0.20	<0.20	4.2	1.5
AY-68-28-903	05-16-90	1200	762.00	90	2000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-909	06-25-90	0935	867.00	95	2430	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-919	05-16-90	1120	550.00	100	2500	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-29-703	08-14-90	0950	824.00	110	5000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-102	05-22-90	1530	796.00	1440	3000	0.20	<0.20	<0.20	3.7	0.80
AY-68-35-913	06-25-90	1325	1040	325	8000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-102	06-25-90	1030	786.00	150	2000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-502	06-25-90	1425	1224	385	4000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-101	08-14-90	1030	1005	150	5000	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-404	08-14-90	1115	1326	25	10000	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	CHLOROFORM, TOTAL (UG/L)	TOLUENE, TOTAL (UG/L)	BENZENE, TOTAL (UG/L)	CHLOROBENZENE, TOTAL (UG/L)	CHLOROETHANE, TOTAL (UG/L)	ETHYLBENZENE, TOTAL (UG/L)	METHYLBROMIDE, TOTAL (UG/L)	METHYLCHLORIDE, TOTAL (UG/L)	METHYLENE CHLORIDE, TOTAL (UG/L)	TETRACHLOROETHYLENE, TOTAL (UG/L)
AY-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-21-804	<0.20	<0.20	<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	<0.20	<0.20
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.30
AY-68-28-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-205	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-514	0.20	<0.20	<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	<0.20	1.0
AY-68-28-909	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
AY-68-28-919	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
AY-68-29-703	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
AY-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-35-913	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-36-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20
AY-68-36-502	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-101	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-37-404	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--Continued

BEXAR COUNTY--Continued

LOCAL IDENTIFIER	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)	1,1,2,2 TETRACHLOROETHANE, TOTAL (UG/L)	1,2-DICHLOROBENZENE, TOTAL (UG/L)	1,2-DICHLOROPROPANE, TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE, TOTAL (UG/L)	1,3-DICHLOROPROPENE, TOTAL (UG/L)
AY-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
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	<0.20	<0.20
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-28-205	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
AY-68-28-514	<0.20	<0.20	<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	0.20	<0.20
AY-68-28-909	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-28-919	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-29-703	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-35-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-35-913	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-36-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-36-502	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-37-101	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
AY-68-37-404	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--

LOCAL IDENTIFIER	1,3-DICHLOROBENZENE, TOTAL (UG/L)	1,4-DICHLOROBENZENE, TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER, TOTAL (UG/L)	DICHLORODIFLUOROMETHANE, TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE, TOTAL (UG/L)	VINYL CHLORIDE, TOTAL (UG/L)	TRICHLOROETHYLENE, TOTAL (UG/L)	STYRENE, TOTAL (UG/L)	XYLENE, TOTAL, WATER WHOLE, TOT REC (UG/L)
AY-68-21-804	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-21-804	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-27-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-27-503	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-28-102	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-28-205	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-28-514	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-28-903	<0.20	0.20	<0.20	0.80	<0.20	<0.20	0.3	<0.2	<0.2
AY-68-28-909	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-28-919	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-29-703	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-35-102	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-35-913	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-36-102	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-36-502	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-37-101	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
AY-68-37-404	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--Continued

COMAL COUNTY

LOCAL IDENT-I-FIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DI-CHLORO-BROMO-METHANE, TOTAL (UG/L)	CARBON-TETRA-CHLORIDE, TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE, TOTAL (UG/L)	BROMO-FORM, TOTAL (UG/L)	CHLORO-DI-BROMO-METHANE, TOTAL (UG/L)
DX-68-22-902	06-27-90	1025	240.00	40	800	<0.20	<0.20	<0.20	0.30	<0.20
DX-68-23-303	06-26-90	1100	1045	180	4200	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-316	06-13-90	1300	350.00	60	10	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-317	07-10-90	1030	360.00	40	50	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-602	06-26-90	1230	790.00	300	2570	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENT-I-FIER	CHLORO-FORM, TOTAL (UG/L)	TOLU-ENE, TOTAL (UG/L)	BEN-ZENE, TOTAL (UG/L)	CHLORO-BEN-ZENE, TOTAL (UG/L)	CHLORO-ETHANE, TOTAL (UG/L)	ETHYL-BEN-ZENE, TOTAL (UG/L)	METHYL-BRO-MIDE, TOTAL (UG/L)	METHYL-CHLO-RIDE, TOTAL (UG/L)	METHYL-ENE CHLO-RIDE, TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE, TOTAL (UG/L)
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-317	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.50

LOCAL IDENT-I-FIER	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)	1,1,2,2 TETRA-CHLORO-ETHANE, TOTAL (UG/L)	1,2-DI-CHLORO-BEN-ZENE, TOTAL (UG/L)	1,2-DI-CHLORO-PRO-PANE, TOTAL (UG/L)	1,2-TRANSDI-CHLORO-ETHENE, TOTAL (UG/L)	1,3-DI-CHLORO-PRO-PENE, TOTAL (UG/L)
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-317	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
DX-68-23-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENT-I-FIER	1,3-DI-CHLORO-BEN-ZENE, TOTAL (UG/L)	1,4-DI-CHLORO-BEN-ZENE, TOTAL (UG/L)	2-CHLORO-ETHYL-VINYL-ETHER, TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE, TOTAL (UG/L)	CIS 1,3-DI-CHLORO-PRO-PENE, TOTAL (UG/L)	VINYL CHLO-RIDE, TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE, TOTAL (UG/L)	STY-RENE, TOTAL (UG/L)	XYLENE, TOTAL, WATER WHOLE, TOT REC (UG/L)
DX-68-22-902	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
DX-68-23-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
DX-68-23-316	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
DX-68-23-317	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
DX-68-23-602	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	1.0	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--Continued

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DICHLOROBROMOMETHANE, TOTAL (UG/L)	CARBON TETRACHLORIDE, TOTAL (UG/L)	1,2-DICHLOROETHANE, TOTAL (UG/L)	BROMOFORM, TOTAL (UG/L)	CHLORODIBROMOMETHANE, TOTAL (UG/L)
LR-67-01-302	07-03-90	1540	360.00	40	500	2.5	<0.20	<0.20	0.50	1.7
LR-67-01-806	07-03-90	1330	115.00	60	4500	0.30	<0.20	<0.20	4.9	0.90
LR-67-09-105	06-29-90	1300	330.00	1440	1100	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-111	06-29-90	1100	264.00	87	400	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	CHLOROFORM, TOTAL (UG/L)	TOLUENE, TOTAL (UG/L)	BENZENE, TOTAL (UG/L)	CHLOROBENZENE, TOTAL (UG/L)	CHLOROETHANE, TOTAL (UG/L)	ETHYLBENZENE, TOTAL (UG/L)	METHYLBROMIDE, TOTAL (UG/L)	METHYLCHLORIDE, TOTAL (UG/L)	METHYLENE CHLORIDE, TOTAL (UG/L)	TETRACHLOROETHYLENE, TOTAL (UG/L)
LR-67-01-302	4.7	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-806	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.50
LR-67-09-105	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	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)	1,1,2,2 TETRACHLOROETHANE, TOTAL (UG/L)	1,2-DICHLOROBENZENE, TOTAL (UG/L)	1,2-DICHLOROPROPANE, TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE, TOTAL (UG/L)	1,3-DICHLOROPROPENE, TOTAL (UG/L)
LR-67-01-302	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
LR-67-01-806	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<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
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	1,3-DICHLOROBENZENE, TOTAL (UG/L)	1,4-DICHLOROBENZENE, TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER, TOTAL (UG/L)	DICHLORODIFLUOROMETHANE, TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE, TOTAL (UG/L)	VINYL CHLORIDE, TOTAL (UG/L)	TRICHLOROETHYLENE, TOTAL (UG/L)	STYRENE, TOTAL (UG/L)	XYLENE, TOTAL, WATER WHOLE, TOT REC (UG/L)
LR-67-01-302	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
LR-67-01-806	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
LR-67-09-105	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
LR-67-09-111	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--Continued

MEDINA COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	PUMP OR FLOW PERIOD PRIOR TO SAMPLING (MIN)	FLOW RATE, INSTANTANEOUS (G/M)	DICHLOROBROMOMETHANE, TOTAL (UG/L)	CARBON TETRACHLORIDE, TOTAL (UG/L)	1,2-DICHLOROETHANE, TOTAL (UG/L)	BROMOFORM, TOTAL (UG/L)	CHLORODIBROMOMETHANE, TOTAL (UG/L)
TD-68-26-701	06-19-90	1235	750.00	1440	400	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-33-202	06-13-90	1145	279.00	30	20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-33-701	06-04-90	1535	1348	1440	1950	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-34-104	05-21-90	1150	1155	1440	2400	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-41-303	06-19-90	1445	717.00	480	340	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-42-506	06-04-90	1130	1445	30	1000	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-29-901	05-29-90	1225	276.00	60	20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-46-601	05-29-90	1505	1289	25	240	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-303	05-30-90	1250	1803	50	1000	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	CHLOROFORM, TOTAL (UG/L)	TOLUENE, TOTAL (UG/L)	BENZENE, TOTAL (UG/L)	CHLOROBENZENE, TOTAL (UG/L)	CHLOROETHANE, TOTAL (UG/L)	ETHYLBENZENE, TOTAL (UG/L)	METHYLBROMIDE, TOTAL (UG/L)	METHYLCHLORIDE, TOTAL (UG/L)	METHYLENE CHLORIDE, TOTAL (UG/L)	TETRACHLOROETHYLENE, TOTAL (UG/L)
TD-68-26-701	<0.20	<0.20	<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	<0.20	<0.20
TD-68-33-701	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-68-34-104	<0.20	<0.20	<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	<0.20	<0.20
TD-68-42-506	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-29-901	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-47-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	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)	1,1,2,2 TETRACHLOROETHANE, TOTAL (UG/L)	1,2-DICHLOROBENZENE, TOTAL (UG/L)	1,2-DICHLOROPROPANE, TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE, TOTAL (UG/L)	1,3-DICHLOROPROPENE, 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-68-33-701	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
TD-68-34-104	<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-68-42-506	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
TD-69-29-901	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
TD-69-46-601	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--
TD-69-47-303	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--Continued

MEDINA COUNTY--Continued

LOCAL IDENTIFIER	1,3-DICHLOROBENZENE, TOTAL (UG/L)	1,4-DICHLOROBENZENE, TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER, TOTAL (UG/L)	DICHLORODIFLUOROMETHANE, TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE, TOTAL (UG/L)	VINYL CHLORIDE, TOTAL (UG/L)	TRICHLOROETHYLENE, TOTAL (UG/L)	STYRENE, TOTAL (UG/L)	XYLENE, TOTAL, WATER WHOLE, TOT REC (UG/L)
TD-68-26-701	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-68-33-202	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-68-33-701	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-68-34-104	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-68-41-303	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-68-42-506	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-69-29-901	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-69-46-601	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
TD-69-47-303	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2

Analytical data for volatile organic compounds in water from wells completed in the Edwards aquifer, 1990--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)	BROMOFORM, TOTAL (UG/L)	CHLORODIBROMOMETHANE, TOTAL (UG/L)
YP-69-36-702	02-13-90	0900	538.00	200	1000	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-36-702	06-11-90	1115	538.00	1440	1000	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-42-606	02-12-90	1130	525.00	1440	1000	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-43-606	06-11-90	1730	698.00	30	400	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-45-405	06-11-90	1000	1211	40	500	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-50-203	02-12-90	1330	525.00	200	1280	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-51-102	06-12-90	0930	391.00	45	50	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-53-202	06-11-90	1600	1230	1440	1000	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	CHLOROFORM, TOTAL (UG/L)	TOLUENE, TOTAL (UG/L)	BENZENE, TOTAL (UG/L)	CHLOROBENZENE, TOTAL (UG/L)	CHLOROETHANE, TOTAL (UG/L)	ETHYLBENZENE, TOTAL (UG/L)	METHYLBROMIDE, TOTAL (UG/L)	METHYLCHLORIDE, TOTAL (UG/L)	METHYLENE CHLORIDE, TOTAL (UG/L)	TETRACHLOROETHYLENE, TOTAL (UG/L)
YP-69-36-702	<0.20	<0.20	<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	<0.20	<0.20
YP-69-42-606	<0.20	<0.20	<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	<0.20	<0.20
YP-69-45-405	<0.20	<0.20	<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	<0.20	<0.20
YP-69-51-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.80
YP-69-53-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

LOCAL IDENTIFIER	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)	1,1,2,2 TETRACHLOROETHANE, TOTAL (UG/L)	1,2-DICHLOROBENZENE, TOTAL (UG/L)	1,2-DICHLOROPROPANE, TOTAL (UG/L)	1,2-TRANSDICHLOROETHENE, TOTAL (UG/L)	1,3-DICHLOROPROPENE, TOTAL (UG/L)
YP-69-36-702	<0.20	<0.20	<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-69-42-606	<0.20	<0.20	<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-69-45-405	<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	<0.20	<0.20
YP-69-51-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
YP-69-53-202	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	--	--

LOCAL IDENTIFIER	1,3-DICHLOROBENZENE, TOTAL (UG/L)	1,4-DICHLOROBENZENE, TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER, TOTAL (UG/L)	DICHLORODIFLUOROMETHANE, TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE, TOTAL (UG/L)	VINYL CHLORIDE, TOTAL (UG/L)	TRICHLOROETHYLENE, TOTAL (UG/L)	STYRENE, TOTAL (UG/L)	XYLENE, TOTAL, WATER WHOLE, TOT REC (UG/L)
YP-69-36-702	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-36-702	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-42-606	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-43-606	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-45-405	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-50-203	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-51-102	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2
YP-69-53-202	<0.20	<0.20	--	<0.20	<0.20	<0.20	<0.2	<0.2	<0.2

Analytical data for isotopes in water from wells completed in the Edwards aquifer, 1990

BEXAR COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	TRITIUM TOTAL (PCI/L)	H-2/H-1 STABLE ISOTOPE RATIO PER MIL	O-18/O-16 STABLE ISOTOPE RATIO PER MIL
AY-68-37-523	07-30-90	1700	1175	--	-26.5	-4.60
AY-68-45-901	09-10-90	1200	2920	--	-25.0	-4.60

COMAL COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	TRITIUM TOTAL (PCI/L)	H-2/H-1 STABLE ISOTOPE RATIO PER MIL	O-18/O-16 STABLE ISOTOPE RATIO PER MIL
DX-68-23-616A	08-29-90	1100	576.00	--	-23.0	-4.45

HAYS COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	TRITIUM TOTAL (PCI/L)	H-2/H-1 STABLE ISOTOPE RATIO PER MIL	O-18/O-16 STABLE ISOTOPE RATIO PER MIL
LR-67-01-812	08-13-90	1500	543.00	--	-26.4	-4.55

MEDINA COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	TRITIUM TOTAL (PCI/L)	H-2/H-1 STABLE ISOTOPE RATIO PER MIL	O-18/O-16 STABLE ISOTOPE RATIO PER MIL
TD-69-55-701	09-05-90	1000	--	8.0	--	--

UVALDE COUNTY

LOCAL IDENTIFIER	DATE	TIME	DEPTH OF WELL, TOTAL (FEET)	TRITIUM TOTAL (PCI/L)	H-2/H-1 STABLE ISOTOPE RATIO PER MIL	O-18/O-16 STABLE ISOTOPE RATIO PER MIL
YP-69-59-101	08-22-90	1530	1647	--	-29.5	-5.15

Summary of maximum contaminant levels for pH and selected constituents in water distributed by public water systems 1/

[--, not applicable; mg/L, milligram per liter; µg/L, microgram 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
Dissolved solids	--	500 mg/L
Sulfate (SO_4)	--	250 mg/L
Chloride (Cl)	--	250 mg/L
Fluoride	4 mg/L	2 mg/L
Nitrate (as N)	10 mg/L	--
Arsenic (As)	50 µg/L	--
Barium (Ba)	1,000 µg/L	--
Cadmium (Cd)	5 µg/L	--
Chromium (Cr)	100 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	--
Selenium (Se)	50 µg/L	--
Silver (Ag)	50 µg/L	--
Zinc (Zn)	--	5,000 µg/L
	Organic chemicals	
Chlorinated hydrocarbons		
Endrin	0.2 µg/L	--
Lindane	0.2 µg/L	--
Methoxychlor	40 µg/L	--
Toxaphene	3 µg/L	--
Chlorophenoxys		
2,4-D	70 µg/L	--
Silvex	50 µg/L	--

Summary of maximum contaminant levels for pH and selected constituents in water distributed by public water systems--Continued 1/

Constituent 2/	Maximum contaminant level 3/	Secondary maximum contaminant level 4/
	Volatile organic compounds 5/	
Benzene	5 µg/L	--
Carbon tetrachloride	5 µg/L	--
p-Dichlorobenzene	75 µg/L	--
1,2-Dichloroethane	5 µg/L	--
1,1-Dichloroethylene	7 µg/L	--
Tetrachloroethylene	5 µg/L	--
1,1,1-Trichloroethane	200 µg/L	--
Trichloroethylene	5 µg/L	--
Vinyl chloride	2 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 (1990b) 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 U.S. Environmental Protection Agency (1990c) 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/ Proposed maximum contaminant levels (U.S. Environmental Protection Agency, 1990a).

APPENDIX C. SURFACE WATER

Streamflow, springflow, reservoir contents, and water-quality data for streams and a reservoir, October 1989 to September 1990

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.--No estimated daily discharges. Records good. Many small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--51 years (water years 1940-90), 203 ft³/s (147,100 acre-ft/yr).

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

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 1869 reached a stage of 42.3 ft, present datum, from report by U.S. Army Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft, from floodmark, and from information by State Department of Highways and Public Transportation. Flood of July 16, 1900, reached about the same stage as that of July 1, 1932, from information by local residents. All stages are at site and datum then in use.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 2	0700	9,210	12.89	Aug. 3	2000	8,590	12.58
May 3	0700	*27,900	*18.59				

Minimum daily discharge, 35 ft³/s Mar. 28, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	142	126	77	88	162	102	146	175	64	399	104
2	39	121	123	77	97	161	157	2850	167	63	303	108
3	39	106	122	83	97	157	156	13600	155	60	2040	113
4	39	101	109	82	95	154	141	1930	151	58	1630	113
5	40	98	105	78	94	147	129	1000	145	56	522	111
6	49	95	102	78	92	141	124	736	136	54	371	110
7	76	94	92	79	89	141	121	580	128	53	302	105
8	93	93	86	82	88	139	111	501	121	54	266	99
9	81	89	83	82	88	140	108	449	118	56	235	114
10	77	83	82	79	84	134	108	391	113	57	224	234
11	67	82	78	77	82	134	109	358	111	55	210	257
12	58	83	76	75	79	142	104	358	110	54	195	174
13	52	90	77	72	77	141	100	318	108	56	184	149
14	49	93	78	72	77	192	106	301	107	54	176	137
15	50	93	78	73	76	154	106	293	112	62	167	134
16	48	87	75	74	72	137	103	281	108	163	158	132
17	45	82	75	74	71	129	102	269	103	178	152	206
18	46	90	75	76	71	127	108	259	100	424	148	166
19	45	89	75	78	71	126	114	251	93	492	143	144
20	44	89	75	77	71	122	118	248	91	323	136	149
21	47	92	75	75	103	121	117	233	87	234	131	145
22	47	96	75	75	121	120	112	229	84	196	127	146
23	49	101	75	75	116	117	105	272	80	184	130	143
24	52	93	75	73	112	108	102	233	80	234	160	156
25	52	94	75	70	110	102	102	215	75	200	135	142
26	52	95	74	67	115	102	543	200	68	181	127	134
27	52	93	72	67	132	68	317	185	67	156	123	130
28	110	119	72	66	141	35	226	191	67	143	117	125
29	275	121	74	66	---	36	189	192	67	135	112	123
30	189	130	75	70	---	35	163	179	65	134	110	119
31	176	---	76	71	---	82	---	176	---	195	108	---
TOTAL	2175	2934	2610	2320	2609	3806	4303	27424	3192	4428	9341	4222
MEAN	70.2	97.8	84.2	74.8	93.2	123	143	885	106	143	301	141
MAX	275	142	126	83	141	192	543	13600	175	492	2040	257
MIN	37	82	72	66	71	35	100	146	65	53	108	99
AC-FT	4310	5820	5180	4600	5170	7550	8530	54400	6330	8780	18530	8370

CAL YR 1989	TOTAL	40792	MEAN	112	MAX	680	MIN	22	AC-FT	80910
WTR YR 1990	TOTAL	69364	MEAN	190	MAX	13600	MIN	35	AC-FT	137600

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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1922 to current year.

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

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

REMARKS.--Estimated daily discharges: Mar. 29 to Apr. 2. Records good. Several small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--68 years, 329 ft³/s (238,400 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)
Apr. 26	1900	4,800	9.18	July 24	0800	4,340	8.71
May 2	2400	7,410	11.65	Aug. 4	1500	6,080	10.42
May 4	0300	*18,800	*20.23				

Minimum daily discharge, 36 ft³/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	167	117	84	90	159	119	306	279	94	429	151
2	37	142	131	84	102	179	158	1570	267	88	496	148
3	37	125	129	88	104	175	282	8610	252	86	495	148
4	37	114	130	89	103	165	219	10900	261	84	2760	153
5	37	105	128	89	103	159	194	2190	260	82	1170	153
6	38	101	118	92	103	156	181	1410	224	79	670	149
7	56	99	117	93	103	153	165	1110	209	82	515	146
8	80	97	108	89	103	151	165	943	196	78	438	142
9	70	92	101	89	102	147	160	846	185	76	398	147
10	75	89	97	91	99	146	157	751	179	76	360	434
11	69	88	96	91	95	147	149	673	175	77	340	319
12	67	84	91	88	92	148	145	639	171	83	319	318
13	61	86	89	83	91	150	143	601	167	101	298	249
14	56	90	89	82	91	645	143	546	160	85	284	212
15	52	91	91	83	87	583	142	514	152	83	268	192
16	50	91	90	84	83	263	143	492	149	338	258	184
17	48	89	89	86	80	201	140	469	147	428	245	200
18	45	88	89	86	81	176	138	828	142	1280	234	224
19	43	85	89	86	82	163	138	529	135	1220	227	213
20	46	87	88	86	81	153	148	470	127	742	220	195
21	46	87	87	85	94	149	150	444	121	504	210	189
22	46	95	84	83	96	147	148	414	119	384	204	186
23	47	97	81	83	114	144	144	391	114	496	201	175
24	49	90	83	84	121	140	137	417	107	1850	193	183
25	50	92	84	83	120	133	133	379	106	581	208	189
26	51	89	78	80	116	128	1580	352	102	425	195	183
27	53	89	87	79	116	127	1330	331	96	370	178	171
28	64	87	84	79	140	130	563	309	91	325	174	166
29	78	84	84	79	---	116	420	303	87	296	167	159
30	197	109	85	78	---	119	354	307	88	274	160	155
31	188	---	84	78	---	119	---	290	---	318	156	---
TOTAL	1909	2929	2998	2634	2792	5671	8188	38334	4868	11085	12470	5833
MEAN	61.6	97.6	96.7	85.0	99.7	183	273	1237	162	358	402	194
MAX	197	167	131	93	140	645	1580	10900	279	1850	2760	434
MIN	36	84	78	78	80	116	119	290	87	76	156	142
AC-FT	3790	5810	5950	5220	5540	11250	16240	76040	9660	21990	24730	11570

CAL YR 1989	TOTAL	43124	MEAN	118	MAX	679	MIN	26	AC-FT	85540
WTR YR 1990	TOTAL	99711	MEAN	273	MAX	10900	MIN	36	AC-FT	197800

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to September 1990.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CACO3)
OCT 19...	1015	43	479	8.1	15.0	5	8.0	8.3	84	1.0	200
DEC 28...	1325	80	506	8.1	5.0	5	1.0	11.8	95	2.7	230
FEB 26...	1325	117	468	8.2	16.0	2	10	9.9	103	1.8	220
MAY 02...	1130	282	485	8.0	24.0	13	17	7.8	97	1.8	260
JUN 28...	0740	97	464	8.0	28.5	2	6.9	6.6	87	1.1	210
SEP 06...	1111	153	465	8.1	26.5	4	7.0	7.5	96	1.4	230

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
OCT 19...	20	49	20	17	0.5	2.1	180	19	24	0.30	11
DEC 28...	14	57	21	15	0.4	1.3	220	21	23	0.20	9.0
FEB 26...	29	53	21	15	0.4	1.7	190	23	23	0.20	9.5
MAY 02...	47	70	20	37	1	2.7	210	27	21	0.30	13
JUN 28...	20	51	20	14	0.4	1.8	190	21	24	0.30	11
SEP 06...	31	59	19	12	0.3	1.7	200	21	20	0.30	11

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
OCT 19...	253	8	7	1	--	<0.010	0.200	0.020	0.28	0.30	0.090
DEC 28...	277	<1	<1	--	--	<0.010	0.400	<0.010	--	0.20	0.010
FEB 26...	260	18	18	0	--	<0.010	0.300	<0.010	--	0.20	0.010
MAY 02...	317	52	28	24	--	<0.010	0.500	0.010	0.39	0.40	0.030
JUN 28...	258	19	5	14	--	<0.010	0.100	0.010	0.99	1.0	0.020
SEP 06...	262	16	13	3	0.350	0.050	0.400	0.040	1.3	1.3	0.040

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT 19...	2.1	--	--	--	--	--	--	--	--	--
DEC 28...	1.4	<1	34	<0.5	<1.0	<5	<3	<10	<3	<10
FEB 26...	2.0	--	--	--	--	--	--	--	--	--
MAY 02...	3.2	--	--	--	--	--	--	--	--	--
JUN 28...	1.7	1	31	<0.5	<1.0	<5	<3	<10	3	<10
SEP 06...	2.3	1	44	<0.5	1.0	9	<3	<10	18	<10

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
19...	--	--	--	--	--	--	--	--	--	--
DEC										
28...	6	<1	<0.1	<10	<10	<1	<1.0	470	<6	<3
FEB										
26...	--	--	--	--	--	--	--	--	--	--
MAY										
02...	--	--	--	--	--	--	--	--	--	--
JUN										
28...	11	1	<0.1	<10	<10	<1	<1.0	540	<6	12
SEP										
06...	7	2	<0.1	<10	<10	<1	<1.0	510	<6	28

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.

WATER-DISCHGARGE RECORDS

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

REVISED RECORDS.--WSP 2123: Drainage area.

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

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

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

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 732,600 acre-ft June 19, 1987 (elevation, 942.68 ft); minimum observed since conservation pool first reached in April 1968, 311,200 acre-ft Nov. 24, 1984 (elevation, 899.85 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 390,000 acre-ft May 18 at 1600 hours (elevation, 909.96 ft); minimum, 330,200 acre-ft Jan. 14 (elevation, 902.43 ft).

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

902.0	327,000	905.0	349,900	908.0	373,800
903.0	334,500	906.0	357,800	909.0	382,000
904.0	342,200	907.0	365,800	910.0	390,200

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	348700	345300	338700	331000	331000	331600	335700	341500	383700	368300	376000	370400
2	348500	345100	338600	330800	331000	331600	335700	343500	382800	367800	376000	370000
3	348400	344900	338300	330800	331000	331600	335800	358800	382000	367400	376100	369900
4	348500	344800	338100	330800	330900	331600	335900	380100	383300	367000	380000	369300
5	348400	344700	337900	330700	330900	331500	336000	383600	382500	366600	381400	369000
6	348400	344600	337800	330800	330900	331600	335800	385400	381800	366500	381700	368700
7	349500	344500	337800	330700	330800	331900	335600	386600	380900	366100	381500	368200
8	349300	344200	337200	330700	330900	331900	335500	387600	380000	365600	381300	367800
9	349200	343900	336900	330600	331000	331900	335600	388200	379300	365300	380900	367700
10	349200	343600	336600	330500	331100	331900	335500	388300	378400	365000	380500	368000
11	349000	343300	336400	330500	331000	332100	335400	388500	377800	364800	380000	368100
12	348800	343100	335900	330400	330900	332200	335100	388700	377200	365300	379400	368200
13	348500	343000	335600	330300	330900	332600	335000	388800	376600	365000	378900	368100
14	348400	342900	335300	330300	330900	335900	335000	388600	375900	364600	378100	367800
15	348200	342600	335000	330300	331000	337000	334900	388600	375300	365400	377400	367700
16	348000	342100	334600	330500	330700	337300	334700	388500	374600	366700	376600	367400
17	347600	341800	334300	330600	330700	337300	334700	389100	374100	367700	375900	367100
18	347000	341600	334000	330800	330700	337100	334400	389800	373500	370600	375100	367000
19	346600	341400	333800	331000	330700	337000	334300	389700	372900	373300	374400	367000
20	346000	341200	333700	330900	330600	336700	334100	389600	372400	374300	373800	366800
21	345700	340900	333500	330800	331200	336600	334100	389400	372000	374900	373500	366500
22	345400	341200	333100	330700	331000	336400	333900	389100	371600	375000	373500	366200
23	345300	340900	332700	330700	330900	336200	333700	388600	371200	375200	373300	365600
24	345000	340500	332200	330700	330900	336100	333500	388300	370600	378500	372900	365200
25	344900	340300	331700	330600	330700	335700	333300	387700	370000	378600	372600	365000
26	344700	340100	331600	330500	330700	335400	337300	387100	369700	378400	372300	364900
27	344600	339900	331500	330400	330700	335300	340000	386600	369400	378100	372000	365000
28	344700	339400	331400	330500	331400	335400	340700	386100	368900	377700	371600	364900
29	344900	339000	331300	330400	---	335900	341200	385500	368600	377100	371200	364800
30	345400	338900	331300	330400	---	335900	341600	385000	368500	376700	371000	364600
31	345300	---	331200	330300	---	335800	---	384100	---	376300	370600	---
MAX	349500	345300	338700	331000	331400	337300	341600	389800	383700	378600	381700	370400
MIN	344600	338900	331200	330300	330600	331500	333300	341500	368500	364600	370600	364600
(†)	904.41	903.57	902.56	902.44	902.59	903.17	903.92	909.25	907.34	908.31	907.60	906.86
(ϕ)	-3500	-6400	-7700	-900	+1100	+4400	+5800	+42500	-15600	+7800	-5700	-6000

CAL YR 1989 MAX 381500 MIN 331200 (ϕ) -44400
WTR YR 1990 MAX 389800 MIN 330300 (ϕ) +15800

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

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1969 to September 1982, February to September 1990.

295148098115201 - CANYON LAKE SITE AR

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB							
05...	1105	1.00	383	8.4	12.0	8.5	81
05...	1107	10.0	383	8.4	12.0	8.4	80
05...	1109	20.0	383	8.4	12.0	8.4	80
05...	1111	30.0	383	8.4	12.0	8.4	80
05...	1113	40.0	383	8.4	12.0	8.3	79
05...	1115	50.0	383	8.4	12.0	8.3	79
05...	1117	60.0	390	8.3	11.5	7.8	73
05...	1119	70.0	390	8.2	10.5	6.9	63
05...	1121	80.0	409	8.1	10.0	6.4	58
05...	1123	90.0	409	8.0	10.0	6.3	57
05...	1125	100	409	8.0	10.5	6.5	60
05...	1127	110	409	7.9	9.5	5.6	50
05...	1129	124	417	7.9	9.5	4.7	42
APR							
24...	0840	1.00	388	8.3	19.0	7.3	82
24...	0842	10.0	388	8.3	18.5	7.3	81
24...	0844	20.0	388	8.3	18.0	7.3	80
24...	0846	30.0	388	8.2	17.0	6.9	74
24...	0848	40.0	388	8.2	17.0	6.9	74
24...	0850	50.0	388	8.2	16.5	6.8	72
24...	0852	60.0	388	8.2	16.5	6.6	70
24...	0854	70.0	388	8.1	16.0	6.4	67

295206098115501 - CANYON LAKE SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB											
05...	1000	1.00	383	8.5	12.0	3.50	8.2	78	--	<1	<1
05...	1002	10.0	383	8.5	12.0	--	8.3	79	--	--	--
05...	1004	20.0	383	8.5	12.0	--	8.3	79	--	--	--
05...	1006	30.0	383	8.4	12.0	--	8.2	78	--	--	--
05...	1008	40.0	383	8.4	12.0	--	8.2	78	--	--	--
05...	1010	50.0	383	8.4	12.0	--	8.2	78	--	--	--
05...	1012	60.0	383	8.4	11.5	--	8.5	80	--	--	--
05...	1014	70.0	390	8.2	10.5	--	7.2	66	--	--	--
05...	1016	80.0	390	8.1	9.5	--	7.0	63	--	--	--
05...	1018	90.0	390	8.1	9.5	--	7.0	63	--	--	--
05...	1020	100	408	8.1	9.5	--	6.6	59	--	--	--
05...	1022	110	411	8.0	9.0	--	6.3	56	--	--	--
05...	1024	120	417	7.9	9.0	--	5.7	50	--	--	--
05...	1026	130	417	7.9	9.0	--	5.7	50	--	--	--
05...	1028	144	417	7.9	9.0	--	5.7	50	--	--	--
APR											
24...	1010	1.00	388	8.4	20.0	3.00	7.4	84	--	<1	<1
24...	1012	10.0	388	8.4	19.5	--	7.4	84	--	--	--
24...	1014	20.0	388	8.3	18.5	--	7.4	82	--	--	--
24...	1016	30.0	388	8.3	18.0	--	7.3	80	--	--	--
24...	1018	40.0	388	8.2	17.0	--	6.9	74	--	--	--
24...	1020	50.0	388	8.2	16.5	--	6.8	72	--	--	--
24...	1022	60.0	388	8.2	16.0	--	6.6	69	--	--	--
24...	1024	70.0	389	8.1	16.0	--	6.5	68	--	--	--
24...	1026	80.0	389	8.0	15.0	--	6.2	64	--	--	--
24...	1028	90.0	393	7.9	13.5	--	5.3	53	--	--	--
24...	1030	100	393	7.8	13.0	--	4.8	47	--	--	--
24...	1032	110	400	7.7	13.0	--	4.0	39	--	--	--
24...	1034	120	400	7.7	12.5	--	3.3	32	--	--	--
24...	1036	130	400	7.6	12.0	--	3.0	29	--	--	--
24...	1038	143	400	7.6	12.0	--	3.0	29	--	--	--
AUG											
13...	0908	1.00	351	8.4	28.5	4.10	6.6	88	0.5	K1	<1
13...	0910	10.0	352	8.3	28.5	--	6.6	88	--	--	--
13...	0912	20.0	357	8.2	27.5	--	5.9	77	--	--	--
13...	0914	30.0	362	8.0	27.0	--	4.4	57	--	--	--
13...	0916	40.0	367	7.8	26.5	--	2.9	37	--	--	--
13...	0918	50.0	376	7.5	25.5	--	0.7	9	--	--	--
13...	0920	60.0	379	7.5	21.5	--	0	0	--	--	--
13...	0922	70.0	374	7.5	21.0	--	0	0	--	--	--
13...	0924	80.0	374	7.5	19.5	--	0.3	3	--	--	--
13...	0926	90.0	382	7.6	18.5	--	0.5	5	--	--	--
13...	0928	100	387	7.6	18.0	--	0.5	5	--	--	--
13...	0930	110	390	7.5	17.5	--	0	0	--	--	--
13...	0932	120	393	7.6	17.0	--	0	0	--	--	--
13...	0934	130	401	7.5	15.5	--	0	0	--	--	--
13...	0936	140	406	7.5	14.5	--	0	0	--	--	--
13...	0938	146	408	7.5	14.5	--	0	0	0.8	--	--

GUADALUPE RIVER MAIN STEM

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295206098115501 - CANYON LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
FEB											
05...	170	18	39	18	11	0.4	2.2	150	19	18	0.20
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	190	20	43	19	12	0.4	2.1	170	21	20	0.20
APR											
24...	170	17	38	19	12	0.4	2.0	160	20	19	0.20
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	180	20	40	19	12	0.4	2.0	160	20	20	0.30
AUG											
13...	160	21	35	17	10	0.3	2.0	140	18	17	0.20
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	190	19	44	19	11	0.3	2.1	170	13	19	0.20

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295206098115501 - CANYON LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB											
05...	10	210	--	<0.010	<0.100	<0.010	--	0.40	0.020	4	<1
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	<0.010	<0.100	0.020	0.18	0.20	<0.010	10	<10
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	11	228	--	<0.010	0.100	0.060	0.44	0.50	0.040	8	11
APR											
24...	11	215	--	<0.010	<0.100	<0.010	--	0.30	0.080	7	<1
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	<0.010	<0.100	<0.010	--	0.30	<0.010	10	<10
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	12	220	0.180	0.020	0.200	<0.010	--	0.30	0.020	11	44
AUG											
13...	7.5	188	--	<0.010	<0.100	<0.010	--	0.60	0.020	<3	<1
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	<0.010	<0.100	0.020	0.28	0.30	0.010	<10	<10
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	<0.010	0.100	<0.010	--	0.40	<0.010	20	30
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	14	224	--	<0.010	<0.100	0.360	0.54	0.90	0.030	350	310

295224098115901 - CANYON LAKE SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
FEB							
05...	0930	1.00	360	8.4	12.0	7.7	73
05...	0932	10.0	360	8.4	12.0	7.7	73
05...	0934	20.0	360	8.4	12.0	7.6	72
05...	0936	30.0	360	8.4	11.5	7.6	71
05...	0938	40.0	360	8.4	11.5	7.6	71
05...	0940	50.0	360	8.4	11.5	7.5	70
05...	0942	60.0	360	8.4	11.5	7.4	69
05...	0944	70.0	363	8.1	10.0	6.6	60

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295241098132101 - CANYON LAKE SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
APR							
24...	1100	1.00	387	8.4	20.0	7.3	83
24...	1102	10.0	387	8.4	20.0	7.3	83
24...	1104	20.0	390	8.3	19.5	7.3	82
24...	1106	30.0	390	8.3	18.5	7.2	80
24...	1108	40.0	390	8.2	17.5	6.8	74
24...	1110	50.0	390	8.1	16.5	6.4	68
24...	1112	60.0	390	8.0	16.0	6.0	63
24...	1114	70.0	393	7.9	15.0	5.3	54
24...	1116	80.0	393	7.8	14.0	4.3	43
24...	1118	90.0	400	7.6	13.5	3.2	32
24...	1120	100	400	7.6	13.0	2.4	24
24...	1122	110	400	7.6	13.0	2.1	21
24...	1124	124	400	7.6	12.5	2.1	20
AUG							
13...	1025	1.00	352	8.3	29.0	6.4	86
13...	1027	10.0	351	8.3	28.5	6.5	86
13...	1029	20.0	354	8.2	28.0	6.2	82
13...	1031	30.0	360	8.0	27.5	4.9	64
13...	1033	40.0	367	7.7	26.5	2.7	35
13...	1034	50.0	382	7.5	25.0	0	0
13...	1035	60.0	382	7.5	22.0	0	0
13...	1037	70.0	379	7.5	20.0	0	0
13...	1039	80.0	383	7.5	19.5	0	0
13...	1041	90.0	385	7.5	18.5	0	0
13...	1043	100	390	7.5	18.0	0	0
13...	1045	110	395	7.5	17.5	0	0
13...	1047	120	401	7.5	17.0	0	0
13...	1049	126	409	7.5	16.5	0	0

295240098152001 - CANYON LAKE SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
FEB							
05...	1200	1.00	386	8.5	12.5	8.6	83
05...	1202	10.0	386	8.5	12.5	8.5	82
05...	1204	20.0	386	8.5	12.0	8.5	81
05...	1206	30.0	386	8.4	12.0	8.4	80
05...	1208	40.0	386	8.4	12.0	8.0	76
05...	1210	50.0	386	8.2	11.5	7.2	68
05...	1212	60.0	386	8.2	11.0	6.6	61
05...	1214	70.0	395	8.0	10.5	4.9	45
05...	1216	78.0	409	8.0	10.5	4.3	39
APR							
24...	1140	1.00	388	8.4	20.0	7.4	84
24...	1142	10.0	388	8.4	20.0	7.4	84
24...	1144	20.0	388	8.4	19.5	7.4	84
24...	1146	30.0	388	8.3	19.5	7.3	82
24...	1148	40.0	391	8.2	18.5	6.3	70
24...	1150	50.0	391	8.1	16.5	5.9	63
24...	1152	62.0	393	8.0	16.0	4.9	51
AUG							
13...	1120	1.00	351	8.3	29.0	6.9	92
13...	1122	10.0	351	8.3	28.5	6.9	92
13...	1124	20.0	353	8.3	28.5	6.7	89
13...	1126	30.0	362	8.0	27.5	4.4	57
13...	1128	40.0	371	7.6	26.5	1.4	18
13...	1130	50.0	388	7.4	24.0	0	0
13...	1132	60.0	389	7.4	21.0	0	0
13...	1134	74.0	390	7.4	20.0	0	0

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295349098143101 - CANYON LAKE SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
FEB											
05...	1245	1.00	386	8.4	12.5	2.10	8.3	80	<1	<1	170
05...	1247	10.0	386	8.4	12.0	--	8.3	79	--	--	--
05...	1249	20.0	386	8.4	12.0	--	8.2	78	--	--	--
05...	1251	30.0	386	8.4	12.0	--	8.0	76	--	--	--
05...	1253	40.0	386	8.3	11.5	--	7.7	72	--	--	--
05...	1255	50.0	386	8.3	11.5	--	7.5	71	--	--	--
05...	1257	60.0	390	8.2	11.0	--	6.7	62	--	--	--
05...	1259	70.0	409	8.0	10.5	--	5.1	47	--	--	--
05...	1301	84.0	409	7.9	10.5	--	4.6	42	--	--	180
APR											
24...	1205	1.00	388	8.4	21.5	1.30	7.2	85	<1	<1	180
24...	1207	10.0	388	8.4	21.0	--	7.2	84	--	--	--
24...	1209	20.0	388	8.4	20.5	--	7.2	83	--	--	--
24...	1211	30.0	388	8.3	20.5	--	7.2	83	--	--	--
24...	1213	40.0	391	8.2	19.5	--	6.7	76	--	--	--
24...	1215	50.0	397	8.0	17.0	--	5.7	61	--	--	--
24...	1217	60.0	397	7.9	16.0	--	4.5	47	--	--	--
24...	1219	70.0	400	7.8	15.5	--	3.1	32	--	--	--
24...	1221	83.0	400	7.6	14.5	--	2.1	21	--	--	180
AUG											
13...	1200	1.00	353	8.2	29.5	1.90	6.9	93	2	<1	160
13...	1202	10.0	353	8.3	29.0	--	7.1	95	--	--	--
13...	1204	20.0	354	8.2	29.0	--	7.0	94	--	--	--
13...	1206	30.0	362	8.0	28.0	--	5.1	67	--	--	--
13...	1208	40.0	381	7.5	26.5	--	1.0	13	--	--	--
13...	1210	50.0	389	7.4	24.0	--	0	0	--	--	--
13...	1212	60.0	394	7.4	21.5	--	0	0	--	--	--
13...	1214	70.0	400	7.3	20.0	--	0	0	--	--	--
13...	1216	80.0	400	7.3	19.0	--	0	0	--	--	--
13...	1218	88.0	401	7.3	19.0	--	0	0	--	--	190

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
FEB										
05...	19	39	18	11	0.4	2.0	150	19	18	0.20
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	19	42	19	12	0.4	2.1	160	20	19	0.30
APR										
24...	25	41	19	11	0.4	2.0	160	19	18	0.20
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	23	42	19	11	0.4	2.0	160	19	19	0.20
AUG										
13...	21	35	17	10	0.3	1.8	140	17	17	0.20
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	13	47	17	9.4	0.3	1.7	170	8.5	16	0.20

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295349098143101 - CANYON LAKE SITE DC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (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)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB										
05...	10	209	<0.010	<0.100	<0.010	--	0.20	<0.010	6	<1
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	<0.010	<0.100	0.020	0.18	0.20	<0.010	20	<10
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	11	224	<0.010	<0.100	0.090	0.31	0.40	0.030	11	22
APR										
24...	10	214	<0.010	<0.100	<0.010	--	0.20	<0.010	16	<1
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	0.010	<0.100	<0.010	--	0.20	0.020	10	<10
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	12	220	<0.010	0.200	0.020	0.28	0.30	0.010	15	97
AUG										
13...	7.7	187	<0.010	<0.100	<0.010	--	0.30	<0.010	<3	<1
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	<0.010	<0.100	<0.010	--	0.40	0.020	<10	<10
13...	--	--	<0.010	0.300	0.010	0.49	0.50	0.020	30	<10
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
13...	14	219	<0.010	<0.100	0.540	0.56	1.1	0.030	250	220

295329098151001 - CANYON LAKE SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
FEB							
05...	1320	1.00	386	8.4	12.5	8.3	80
05...	1322	10.0	386	8.4	12.5	8.3	80
05...	1324	20.0	386	8.4	12.0	8.2	78
05...	1326	30.0	386	8.4	12.0	8.2	78
05...	1328	40.0	386	8.4	12.0	7.9	75
05...	1330	50.0	386	8.3	11.5	7.6	72
05...	1332	60.0	386	8.2	11.0	7.2	67
05...	1334	70.0	390	8.1	10.5	6.4	59
05...	1336	80.0	400	8.0	10.0	5.2	47
05...	1338	95.0	409	7.9	10.0	4.3	39
APR							
24...	1240	1.00	391	8.3	20.5	7.2	83
24...	1242	10.0	391	8.3	20.5	7.2	83
24...	1244	20.0	391	8.3	20.0	7.1	81
24...	1246	30.0	394	8.3	20.0	6.9	79
24...	1248	40.0	402	8.1	19.0	6.3	70
24...	1250	50.0	406	7.9	17.0	5.0	54
24...	1252	60.0	397	7.9	16.5	5.0	53
24...	1254	70.0	400	7.8	15.5	4.0	42
24...	1256	80.0	400	7.7	14.5	2.6	26
24...	1258	94.0	408	7.6	14.0	1.8	18
AUG							
13...	1250	1.00	352	8.3	29.5	7.0	95
13...	1252	10.0	354	8.3	29.0	7.0	94
13...	1254	20.0	354	8.2	29.0	6.8	91
13...	1256	30.0	380	7.7	28.0	3.2	42
13...	1258	40.0	374	7.4	26.5	0.5	6
13...	1300	50.0	386	7.4	24.5	0	0
13...	1302	60.0	409	7.3	21.5	0	0
13...	1304	70.0	396	7.4	20.5	0	0
13...	1306	80.0	398	7.4	19.5	0	0
13...	1308	90.0	410	7.4	18.5	0	0
13...	1310	101	410	7.4	18.0	0	0

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295349098173701 - CANYON LAKE SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
FEB											
05...	1400	1.00	406	8.3	13.0	1.20	7.9	77	<1	<1	190
05...	1402	10.0	406	8.3	13.0	--	7.6	74	--	--	--
05...	1404	20.0	400	8.2	12.0	--	7.1	68	--	--	--
05...	1406	30.0	400	8.1	12.0	--	6.8	65	--	--	--
05...	1408	40.0	400	8.1	11.5	--	6.5	61	--	--	--
05...	1410	50.0	407	8.0	11.5	--	5.6	53	--	--	--
05...	1412	58.0	407	8.0	11.5	--	5.4	51	--	--	180
APR											
24...	1315	1.00	405	8.3	22.0	0.80	6.9	82	K1	K2	190
24...	1317	10.0	405	8.3	22.0	--	6.8	81	--	--	--
24...	1319	20.0	405	8.2	21.5	--	6.6	78	--	--	--
24...	1321	30.0	410	8.1	21.0	--	6.2	72	--	--	--
24...	1323	40.0	444	7.8	20.0	--	4.6	53	--	--	--
24...	1325	50.0	458	7.6	18.0	--	1.9	21	--	--	--
24...	1327	59.0	445	7.6	17.5	--	1.9	21	--	--	210
AUG											
13...	1335	1.00	355	8.2	30.0	1.60	7.6	104	<1	<1	160
13...	1337	10.0	355	8.2	29.5	--	7.6	103	--	--	--
13...	1339	20.0	371	8.0	28.5	--	5.4	72	--	--	--
13...	1341	30.0	381	7.6	28.0	--	2.7	36	--	--	--
13...	1343	40.0	394	7.5	27.0	--	2.0	26	--	--	--
13...	1345	50.0	372	7.3	26.0	--	0	0	--	--	--
13...	1347	62.0	466	7.1	22.0	--	0	0	--	--	230

DATE	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
FEB											
05...	22	43	19	12	0.4	2.1	160	20	19	0.20	9.9
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	21	42	19	12	0.4	2.1	160	20	19	0.20	11
APR											
24...	23	45	18	11	0.4	2.0	160	20	19	0.30	11
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	29	54	19	11	0.3	1.8	180	19	19	0.20	12
AUG											
13...	22	36	17	10	0.3	2.0	140	18	17	0.20	8.7
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	17	71	13	7.4	0.2	1.5	210	9.3	12	0.20	13

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX--Continued

295349098173701 - CANYON LAKE SITE FC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB										
05...	224	--	<0.010	<0.100	0.010	0.29	0.30	0.020	10	<1
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	<0.010	<0.100	0.040	0.26	0.30	<0.010	10	<10
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	222	--	<0.010	<0.100	0.090	0.51	0.60	0.200	7	10
APR										
24...	225	--	<0.010	0.100	<0.010	--	<0.20	0.020	9	<1
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	--	0.180	0.020	0.200	<0.010	--	0.20	0.090	<10	<10
24...	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
24...	246	0.290	0.010	0.300	0.010	0.29	0.30	<0.010	20	36
AUG										
13...	192	--	<0.010	<0.100	0.020	0.68	0.70	0.010	8	2
13...	--	--	--	--	--	--	--	--	--	--
13...	--	--	<0.010	<0.100	<0.010	--	0.40	0.020	<10	<10
13...	--	--	--	--	--	--	--	--	--	--
13...	--	0.740	0.060	0.800	0.070	0.73	0.80	0.040	20	10
13...	--	--	--	--	--	--	--	--	--	--
13...	256	--	<0.010	<0.100	0.570	0.33	0.90	0.030	140	380

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. Since July 21, 1962, flow completely regulated by Canyon Lake (station 08167700) 1.8 mi upstream. Small diversions above station for irrigation. Satellite telemeter at station.

AVERAGE DISCHARGE.--28 years (water years 1963-90) since regulation began at Canyon Lake, 418 ft³/s (302,800 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, 621 ft³/s May 15 at 1200 hours (gage height, 5.74 ft); minimum daily, 53 ft³/s Oct. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	120	171	130	99	134	241	364	581	203	561	292
2	53	122	171	130	97	146	240	336	581	203	561	311
3	54	131	171	130	97	164	238	380	580	203	558	305
4	57	119	171	130	97	166	241	533	551	203	555	302
5	58	118	171	130	97	166	241	578	561	201	555	292
6	57	146	171	130	95	166	239	581	561	200	561	293
7	60	187	179	130	95	166	237	581	561	200	548	296
8	58	185	171	131	95	166	237	581	558	200	529	296
9	56	184	173	113	95	166	237	581	547	169	539	296
10	74	180	171	95	95	168	237	573	561	114	563	296
11	75	173	171	95	95	169	237	568	472	121	574	291
12	116	172	173	95	96	169	237	568	395	135	574	294
13	118	171	174	95	97	169	240	568	410	128	578	296
14	116	169	174	95	97	173	243	561	393	128	581	296
15	116	175	175	96	97	169	244	576	407	127	581	296
16	116	179	175	97	97	201	244	562	408	133	580	296
17	116	166	174	97	97	228	242	565	410	135	569	296
18	116	168	168	97	97	229	237	569	408	196	575	296
19	117	169	127	97	97	233	237	574	331	279	559	296
20	118	178	128	97	96	230	237	574	287	283	471	296
21	118	174	122	97	97	230	237	574	276	283	326	296
22	118	173	128	97	94	237	237	569	267	283	309	296
23	118	171	202	97	102	241	242	568	270	283	309	296
24	118	171	281	96	116	241	214	568	273	445	309	294
25	118	171	263	95	116	241	238	564	275	538	311	244
26	118	171	126	93	125	241	248	574	238	545	316	167
27	118	171	131	92	132	241	241	581	204	561	290	133
28	118	171	130	92	134	241	241	581	196	560	296	142
29	118	171	130	92	---	243	244	569	194	568	297	148
30	121	171	130	95	---	242	315	581	198	561	288	148
31	121	---	130	97	---	241	---	581	---	562	296	---
TOTAL	3008	4927	5130	3253	2844	6217	7243	17083	11954	8750	14519	8096
MEAN	97.0	164	165	105	102	201	241	551	398	282	468	270
MAX	121	187	281	131	134	243	315	581	581	568	581	311
MIN	53	118	122	92	94	134	214	336	194	114	288	133
AC-FT	5970	9770	10180	6450	5640	12330	14370	33880	23710	17360	28800	16060

CAL YR 1989	TOTAL	53850	MEAN	148	MAX	320	MIN	53	AC-FT	106800
WTR YR 1990	TOTAL	93024	MEAN	255	MAX	581	MIN	53	AC-FT	184500

08167800 GUADALUPE RIVER AT SATTLER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: September 1962 to August 1982, January to September 1990.

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

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

EXTREMES FOR PERIOD OF RECORD.--
WATER TEMPERATURE: Maximum, 25.5°C on several days during September 1987; minimum, 9.5°C Mar. 8-10, 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CACO3)
FEB 05...	1700	30	395	8.2	9.5	5	1.3	11.1	100	0.9	180
APR 24...	1445	230	391	7.7	12.5	6	5.0	10.7	104	0.2	180
AUG 13...	1430	578	386	7.4	18.0	5	3.5	5.8	63	0	180

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB 05...	24	42	19	12	0.4	2.2	160	20	19	0.20	10
APR 24...	23	41	19	12	0.4	2.0	160	19	19	0.20	10
AUG 13...	18	42	17	11	0.4	1.9	160	15	17	0.20	11

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (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)
FEB 05...	221	6	1	5	<0.010	<0.100	0.030	0.17	0.20	0.020
APR 24...	217	6	6	0	<0.010	0.100	<0.010	--	<0.20	0.010
AUG 13...	210	1	1	0	<0.010	0.100	0.050	0.35	0.40	<0.010

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
FEB 05...	2.5	<1	31	<0.5	<1.0	<5	<3	<10	5	<10
APR 24...	2.1	1	31	<0.5	<1.0	<5	<3	<10	6	<10
AUG 13...	2.5	1	31	<0.5	1.0	<5	<3	<10	5	<10

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
FEB 05...	6	8	<0.1	<10	<10	<1	<1.0	410	<6	6
APR 24...	5	6	<0.1	<10	<10	<1	<1.0	400	<6	<3
AUG 13...	8	62	<0.1	<10	<10	<1	<1.0	370	<6	5

08168000 HUECO SPRINGS NEAR NEW BRAUNFELS, TX

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

DRAINAGE AREA.--Not applicable.

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

GAGE.--None.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum spring discharge measured 131 ft^3/s Jan. 21, 1968; no flow at times in 1948-49, 1951-57, 1963-64, 1967, 1984, and 1989.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Oct. 18, 1989	0.9	Feb. 22, 1990	2.7	June 28, 1990	14.8
Dec. 20	0.0	Apr. 30	83.3	Sept. 14	23.6

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 largely regulated by Canyon Lake (station 08167700) 21.9 mi upstream. 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); 28 years (water years 1963-90) regulated, 505 ft³/s (365,900 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, 927 ft³/s May 3 at 1300 hours (gage height, 3.09 ft); minimum daily, 52 ft³/s Oct. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	133	182	136	114	169	327	484	645	212	651	320
2	52	133	182	136	106	182	327	453	643	209	653	321
3	52	127	182	140	104	195	318	641	643	205	653	320
4	58	134	182	139	101	193	313	704	681	206	655	313
5	60	124	182	139	100	191	313	773	650	205	652	304
6	56	124	182	144	100	191	311	757	642	206	653	301
7	81	175	188	139	98	191	304	744	648	211	652	302
8	73	181	184	139	98	188	300	736	652	209	615	301
9	60	180	181	138	99	187	301	728	623	206	619	304
10	58	182	185	105	100	186	293	721	642	137	628	318
11	74	172	184	100	98	190	288	721	585	126	650	304
12	88	174	185	100	98	189	286	718	448	138	645	307
13	116	178	187	102	100	192	288	709	463	143	645	313
14	115	177	182	104	101	248	290	701	437	134	638	314
15	114	169	182	105	108	283	282	701	450	152	630	314
16	114	186	183	111	98	279	279	691	448	198	628	322
17	116	171	178	109	98	321	276	703	439	264	625	324
18	115	168	189	106	103	320	267	718	428	286	624	317
19	114	169	139	111	100	314	264	698	365	439	624	318
20	114	173	129	106	99	308	264	692	296	452	565	316
21	114	182	128	106	108	306	260	688	285	433	375	313
22	116	195	127	106	102	300	257	683	274	417	334	313
23	117	179	138	105	100	298	259	683	282	403	337	308
24	117	179	267	103	114	291	250	679	284	469	332	307
25	118	182	270	101	121	287	249	673	282	682	328	294
26	119	182	178	99	121	282	439	670	268	629	347	210
27	121	182	134	99	138	282	435	663	212	669	307	154
28	128	179	135	104	154	283	394	658	204	664	311	151
29	129	178	136	101	---	297	373	644	200	665	314	160
30	133	184	137	99	---	319	375	653	206	650	308	161
31	138	---	136	108	---	327	---	651	---	647	312	---
TOTAL	3032	5052	5354	3540	2981	7789	9182	21138	13325	10666	16310	8624
MEAN	97.8	168	173	114	106	251	306	682	444	344	526	287
MAX	138	195	270	144	154	327	439	773	681	682	655	324
MIN	52	124	127	99	98	169	249	453	200	126	307	151
AC-FT	6010	10020	10620	7020	5910	15450	18210	41930	26430	21160	32350	17110

CAL YR 1989	TOTAL	58040	MEAN	159	MAX	320	MIN	51	AC-FT	115100
WTR YR 1990	TOTAL	106993	MEAN	293	MAX	773	MIN	52	AC-FT	212200

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. Satellite telemeter at station.

AVERAGE DISCHARGE.--58 years (water years 1933-90), 292 ft³/s (211,600 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)
Apr. 26	1000	*688	*4.95				

Minimum daily discharge, 46 ft³/s June 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	123	160	166	181	203	212	220	172	56	169	144
2	81	125	163	168	180	201	219	224	173	60	169	155
3	77	132	164	167	176	193	216	399	169	58	173	156
4	81	133	167	166	177	187	215	263	199	57	177	160
5	80	134	173	169	177	192	213	239	165	60	178	158
6	81	137	171	175	175	191	212	239	158	54	177	158
7	133	136	169	174	174	191	214	242	153	62	169	157
8	97	135	169	174	171	191	218	243	138	62	172	159
9	100	134	170	175	171	189	222	236	140	68	173	162
10	101	135	172	175	171	189	221	232	134	61	170	185
11	100	134	171	174	171	189	217	233	131	61	172	172
12	99	134	166	173	169	189	214	232	124	77	171	165
13	99	147	173	174	168	188	215	234	123	67	171	168
14	104	140	171	176	167	203	217	234	117	70	166	170
15	101	142	172	176	207	201	216	223	103	93	165	171
16	100	143	171	177	171	203	219	223	102	142	164	174
17	98	144	171	177	169	203	211	225	100	142	163	174
18	100	145	172	177	171	204	211	234	95	139	165	173
19	102	146	171	178	172	210	213	221	89	150	164	184
20	102	150	170	177	169	205	208	219	83	166	164	175
21	103	149	169	177	176	200	204	221	76	154	158	178
22	103	163	166	175	172	198	204	210	68	157	156	176
23	98	155	166	177	173	197	202	209	69	161	161	176
24	103	158	160	178	174	198	206	205	67	161	153	177
25	101	161	156	176	175	199	203	204	63	164	153	177
26	101	160	157	175	172	200	420	199	58	165	156	177
27	105	161	157	174	176	201	260	203	47	160	151	176
28	111	158	158	176	194	204	224	195	50	164	149	176
29	118	158	159	176	---	217	224	186	46	168	149	176
30	127	161	160	176	---	213	222	187	47	170	150	176
31	120	---	165	175	---	207	---	185	---	166	145	---
TOTAL	3107	4333	5159	5403	4899	6156	6672	7019	3259	3495	5073	5085
MEAN	100	144	166	174	175	199	222	226	109	113	164	169
MAX	133	163	173	178	207	217	420	399	199	170	178	185
MIN	77	123	156	166	167	187	202	185	46	54	145	144
AC-FT	6160	8590	10230	10720	9720	12210	13230	13920	6460	6930	10060	10090

CAL YR 1989 TOTAL 59649 MEAN 163 MAX 330 MIN 62 AC-FT 118300
WTR YR 1990 TOTAL 59660 MEAN 163 MAX 420 MIN 46 AC-FT 118300

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.--62 years (water years 1928-89), 286 ft^3/s, 206,928 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 1988 TO SEPTEMBER 1989
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	232	232	233	247	251	257	244	235	127	117	82	67
2	235	233	234	248	257	258	246	231	115	115	87	62
3	229	234	234	246	256	258	242	235	116	106	83	66
4	232	234	235	245	255	258	239	233	117	107	77	66
5	228	233	234	244	256	258	236	225	117	111	77	62
6	230	233	235	243	251	258	234	222	107	107	75	66
7	233	233	236	242	253	260	233	222	103	102	75	72
8	233	231	236	246	252	257	225	222	99	100	77	75
9	231	232	239	243	252	258	226	215	91	99	83	77
10	230	231	238	246	253	256	226	321	93	95	87	78
11	231	233	241	245	253	251	227	219	99	93	82	83
12	232	233	239	248	255	246	229	211	110	90	83	78
13	230	232	239	246	256	250	252	211	108	90	83	82
14	230	232	239	247	254	243	251	208	164	86	84	87
15	229	231	239	245	254	240	238	204	129	89	79	88
16	229	232	241	245	253	238	237	208	133	86	80	88
17	226	233	242	247	255	234	239	219	131	86	80	90
18	227	236	244	247	256	236	234	204	133	80	75	89
19	225	236	243	251	258	237	330	201	135	72	79	86
20	224	236	245	247	261	244	248	194	127	71	79	85
21	225	236	245	245	258	238	240	191	125	67	78	84
22	225	236	243	249	255	248	239	177	124	69	70	84
23	226	234	245	249	259	239	241	159	117	75	70	84
24	226	234	246	253	259	239	238	166	124	80	72	86
25	226	236	248	250	261	241	238	156	127	85	72	87
26	224	235	248	248	260	243	242	150	128	88	75	85
27	224	234	249	250	260	247	230	142	126	91	73	85
28	225	237	246	250	260	261	229	146	126	91	71	83
29	226	233	245	253	---	252	234	143	120	92	67	83
30	227	231	245	259	---	248	237	130	115	91	65	82
31	234	---	243	254	---	245	---	128	---	86	66	---
TOTAL	7084	7006	7469	7678	7163	7698	7204	6128	3586	2817	2386	2390
MEAN	229	234	241	248	256	248	240	198	120	90.9	77.0	79.7
MAX	235	237	249	259	261	261	330	321	164	117	87	90
MIN	224	231	233	242	251	234	225	128	91	67	65	62
AC-FT	14050	13900	14810	15230	14210	15270	14290	12150	7110	5590	4730	4740

CAL YR 1988 TOTAL 101349 MEAN 277 MAX 371 MIN 209 AC-FT 201000
WTR YR 1989 TOTAL 68609 MEAN 188 MAX 330 MIN 62 AC-FT 136100

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.--63 years (water years 1928-90), 284 ft^3/s, 205,521 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 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	81	123	160	166	181	203	212	220	172	56	169	144
2	81	125	163	168	180	201	219	224	173	60	169	155
3	77	132	164	167	176	193	216	399	169	58	173	156
4	81	133	167	166	177	187	215	263	199	57	177	160
5	80	134	173	169	177	192	213	239	165	60	178	158
6	81	137	171	175	175	191	212	239	158	54	177	158
7	133	136	169	174	174	191	214	242	153	62	169	157
8	97	135	169	174	171	191	218	243	138	62	172	159
9	100	134	170	175	171	189	222	236	140	68	173	162
10	101	135	172	175	171	189	221	232	134	61	170	185
11	100	134	171	174	171	189	217	233	131	61	172	172
12	99	134	166	173	169	189	214	232	124	77	171	165
13	99	147	173	174	168	188	215	234	123	67	171	168
14	104	140	171	176	167	203	217	234	117	70	166	170
15	101	142	172	176	207	201	216	223	103	93	165	171
16	100	143	171	177	171	203	219	223	102	142	164	174
17	98	144	171	177	169	203	211	225	100	142	163	174
18	100	145	172	177	171	204	211	234	95	139	165	173
19	102	146	171	178	172	210	213	221	89	150	164	184
20	102	150	170	177	169	205	208	219	83	166	164	175
21	103	149	169	177	176	200	204	221	76	154	158	178
22	103	163	166	175	172	198	204	210	68	157	156	176
23	98	155	166	177	173	197	202	209	69	161	161	176
24	103	158	160	178	174	198	206	205	67	161	153	177
25	101	161	156	176	175	199	203	204	63	164	153	177
26	101	160	157	175	172	200	420	199	58	165	156	177
27	105	161	157	174	176	201	260	203	47	160	151	176
28	111	158	158	176	194	204	224	195	50	164	149	176
29	118	158	159	176	---	217	224	186	46	168	149	176
30	127	161	160	176	---	213	222	187	47	170	150	176
31	120	---	165	175	---	207	---	185	---	166	145	---
TOTAL	3107	4333	5159	5403	4899	6156	6672	7019	3259	3495	5073	5085
MEAN	100	144	166	174	175	199	222	226	109	113	164	169
MAX	133	163	173	178	207	217	420	399	199	170	178	185
MIN	77	123	156	166	167	187	202	185	46	54	145	144
AC-FT	6160	8590	10230	10720	9720	12210	13230	13920	6460	6930	10060	10090

CAL YR 1989 TOTAL 59649 MEAN 163 MAX 330 MIN 62 AC-FT 118300
WTR YR 1990 TOTAL 59660 MEAN 163 MAX 420 MIN 46 AC-FT 118300

08170000 SAN MARCOS RIVER SPRINGFLOW AT SAN MARCOS, TX

LOCATION (REVISED).--Lat 29°50'35", long 97°58'55", Hays County, Hydrologic Unit 12100203, at ground-water well No. LR-67-09-110, 1250 ft southwest of the intersection of FM 2439 and McCarty Lane, and 3.7 mi south of San Marcos.

DRAINAGE AREA.--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. October 1956 to September 1988, at site 0.7 mi downstream from bridge on Interstate Highway 35, and 2.1 mi upstream from Blanco River.

REVISED RECORDS.--WSP 1923: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 678.50 ft, which is mean land surface, above National Geodetic Vertical Datum of 1929. June 10, 1915, to Jan. 19, 1916, nonrecording gage at site 0.5 mi upstream from Interstate Highway 35, and Mar. 13, 1916, to Sept. 7, 1921, water-stage recorder about 0.7 mi downstream from Interstate Highway 35, datum relations unknown. May 1956 to September 1988, water-stage recorder, 0.7 mi downstream from Interstate Highway 35, and 2.1 mi upstream from Blanco River, datum 536.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Estimated daily discharges: Sept 28-30. Records fair. Springflow is computed from a regression equation developed using water-level data from a water well LR-67-09-110, and many measurements of springflow. The entire flow of river is from San Marcos Springs, located about 1.1 mi upstream from Interstate Highway 35, except during periods of local runoff. San Marcos Springs emerge from the Edwards and associated limestones in the Balcones Fault Zone. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--34 years (water years 1957-90), 164 ft^3/s (118,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily spring discharge (estimated), 427 ft^3/s June 14, 1987; minimum daily, 46 ft^3/s Aug. 15, 16, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum daily spring discharge, 141 ft^3/s July 22 to Aug. 6; minimum daily spring, 80 ft^3/s Oct. 3-8, Nov. 14-19, and Dec. 24-31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	81	84	81	83	87	103	116	129	118	141	124
2	82	81	85	82	82	90	104	117	129	118	141	123
3	80	81	85	82	83	90	104	120	129	118	141	123
4	80	82	86	83	83	91	104	129	127	118	141	123
5	80	82	86	85	84	91	104	132	127	118	141	123
6	80	82	87	85	83	91	104	133	127	118	141	123
7	80	82	87	86	83	92	105	133	127	117	140	123
8	80	82	86	86	83	92	105	134	127	117	138	123
9	81	81	86	86	83	92	105	134	126	117	137	122
10	83	81	86	86	83	92	105	133	126	117	136	123
11	83	81	87	86	84	92	106	134	125	117	136	124
12	83	81	86	85	84	92	106	133	125	117	136	124
13	83	81	87	84	85	93	107	133	124	117	135	125
14	83	80	88	84	85	94	107	133	123	117	135	125
15	83	80	88	84	84	94	107	133	123	117	134	125
16	83	80	87	84	83	94	107	133	122	122	134	124
17	83	80	86	84	84	94	107	133	121	129	133	124
18	83	80	85	84	84	96	107	133	121	131	133	124
19	83	80	82	85	84	96	107	134	121	131	133	124
20	83	81	81	84	84	96	106	134	120	136	133	123
21	83	82	81	84	86	97	106	134	119	139	132	123
22	83	82	81	84	88	97	106	133	119	141	130	123
23	83	82	81	84	88	98	106	133	119	141	129	123
24	84	84	80	84	88	98	106	133	118	141	128	122
25	84	84	80	83	88	98	106	133	118	141	128	122
26	83	85	80	84	87	99	108	133	119	141	128	122
27	83	85	80	84	86	100	114	133	119	141	127	122
28	84	85	80	84	85	100	116	132	119	141	127	e122
29	84	84	80	84	---	101	117	131	119	141	126	e122
30	83	84	80	84	---	102	117	130	118	141	125	e122
31	82	---	80	84	---	103	---	130	---	141	125	---
TOTAL	2555	2456	2598	2609	2367	2942	3212	4069	3686	3959	4144	3695
MEAN	82.4	81.9	83.8	84.2	84.5	94.9	107	131	123	128	134	123
MAX	84	85	88	86	88	103	117	134	129	141	141	125
MIN	80	80	80	81	82	87	103	116	118	117	125	122
AC-FT	5070	4870	5150	5170	4690	5840	6370	8070	7310	7850	8220	7330

CAL YR 1989 TOTAL 36567 MEAN 100 MAX 115 MIN 80 AC-FT 72530
WTR YR 1990 TOTAL 38292 MEAN 105 MAX 141 MIN 80 AC-FT 75950

e Estimated

08171000 BLANCO RIVER AT WIMBERLEY, TX

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

DRAINAGE AREA.--355 mi².

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.--No estimated daily discharges. Records good. There are many small diversions above station. Satellite telemeter at station.

AVERAGE DISCHARGE.--64 years (water years 1925-26, 1929-90), 126 ft³/s (4.82 in/yr), 91,290 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)
Mar. 14	1400	1,900	6.60	May 3	1300	*10,300	*12.09
Apr. 26	1730	1,910	6.61				

Minimum daily discharge, 13 ft³/s Oct. 18-20, Nov. 2-3, Dec. 21-24, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	15	17	15	25	26	54	129	83	43	59	30
2	17	13	16	15	24	25	60	122	82	41	56	30
3	17	13	16	17	21	24	62	2880	80	38	56	30
4	17	15	16	17	19	23	68	927	207	39	56	30
5	18	16	16	16	18	23	66	609	102	38	54	29
6	18	16	18	19	19	24	67	473	97	38	52	28
7	34	15	17	19	19	25	62	385	91	37	53	28
8	23	16	15	17	19	25	62	331	87	35	52	27
9	17	14	16	16	20	25	64	293	84	35	50	28
10	16	14	16	16	22	25	63	247	77	35	49	33
11	15	16	16	17	20	25	60	219	75	34	48	33
12	15	15	15	16	19	25	60	211	73	33	46	32
13	15	18	15	15	19	25	61	201	68	33	44	32
14	16	18	16	16	19	719	60	177	66	32	43	31
15	15	16	15	16	20	394	56	164	65	48	43	30
16	15	14	14	19	19	154	56	156	63	53	42	31
17	15	14	14	19	18	101	56	147	60	46	41	28
18	13	16	14	18	20	84	55	154	60	48	41	27
19	13	17	14	19	20	76	54	181	60	56	40	26
20	13	17	14	18	20	67	56	153	58	58	38	27
21	14	18	13	18	26	62	55	140	55	56	38	27
22	14	23	13	18	23	57	54	128	54	55	40	26
23	14	20	13	18	20	54	54	118	51	49	38	25
24	15	17	13	18	19	51	53	114	49	148	36	24
25	15	16	14	17	19	45	53	108	47	113	36	23
26	15	17	13	17	17	44	553	104	45	84	35	23
27	15	17	14	16	17	43	583	100	44	78	33	24
28	18	16	15	19	22	51	256	97	43	72	33	23
29	20	15	15	18	---	50	179	91	43	69	33	23
30	22	16	17	17	---	52	147	92	43	64	33	22
31	20	---	16	18	---	52	---	88	---	61	32	---
TOTAL	522	483	466	534	563	2476	3189	9339	2112	1669	1350	830
MEAN	16.8	16.1	15.0	17.2	20.1	79.9	106	301	70.4	53.8	43.5	27.7
MAX	34	23	18	19	26	719	583	2880	207	148	59	33
MIN	13	13	13	15	17	23	53	88	43	32	32	22
AC-FT	1040	958	924	1060	1120	4910	6330	18520	4190	3310	2680	1650
CFSM	.05	.05	.04	.05	.06	.22	.30	.85	.20	.15	.12	.08
IN.	.05	.05	.05	.06	.06	.26	.33	.98	.22	.17	.14	.09

CAL YR 1989	TOTAL	16804	MEAN	46.0	MAX	2190	MIN	13	AC-FT	33330	CFSM	.13	IN.	1.76
WTR YR 1990	TOTAL	23533	MEAN	64.5	MAX	2880	MIN	13	AC-FT	46680	CFSM	.18	IN.	2.47

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 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 02...	1540	17	452	8.3	18.0	7	1.0	10.1	108	0.9	17	22
MAY 17...	1010	144	452	8.2	24.5	4	3.0	8.9	109	0.4	64	130
AUG 24...	0925	38	427	8.2	27.5	3	3.6	7.0	91	0.2	120	28

DATE	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLVED AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
NOV 02...	220	32	58	18	8.4	0.2	1.7	190	37	12	0.20	8.3
MAY 17...	240	39	67	17	7.1	0.2	1.5	200	22	15	0.10	9.3
AUG 24...	210	42	55	17	7.8	0.2	1.5	170	30	12	0.20	11

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	RESIDUE VOLATILE, SUSPENDED (MG/L)	RESIDUE FIXED NON FILTERABLE (MG/L)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DISSOLVED (UG/L AS AS)
NOV 02...	257	<1	<1	--	<0.010	0.100	0.010	0.19	0.20	0.020	1.9	<1
MAY 17...	258	13	13	0	<0.010	<0.100	0.020	1.4	1.4	0.010	1.5	<1
AUG 24...	233	1	1	0	<0.010	0.100	0.030	--	<0.20	<0.010	1.9	--

DATE	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
NOV 02...	29	<0.5	<1.0	<5	<3	<10	8	<10	8	1	<0.1	<10
MAY 17...	31	<0.5	<1.0	<5	<3	<10	4	<10	9	1	<0.1	<10
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	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)
NOV 02...	<10	<1	1.0	610	<6	9	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010
MAY 17...	<10	<1	<1.0	320	<6	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)
NOV 02...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	0.010	<0.01	<0.01
MAY 17...	<0.010	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01
AUG 24...	--	--	--	--	--	--	--	--	--	--	--	--

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

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)	PHORATE OTAL (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)
NOV												
02...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.01	<0.01	<0.01
MAY												
17...	<0.01	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
AUG												
24...	--	--	--	--	--	--	--	--	--	--	--	--

08171300 BLANCO RIVER NEAR KYLE, TX

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

DRAINAGE AREA.--412 mi².

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

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

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

REMARKS.--Records good except those for estimated daily discharges, which are fair. 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. Recording rain gage at this station.

AVERAGE DISCHARGE.--34 years, 148 ft³/s (4.88 in/yr), 107,200 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)
May 3	1630	*8,800	*16.28	No other peak greater than base discharge.			

Minimum daily discharge, no flow Oct. 1 to Mar. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	33	104	68	19	36	4.7
2	.00	.00	.00	.00	.00	.00	36	95	65	18	33	5.7
3	.00	.00	.00	.00	.00	.00	37	2180	64	16	31	6.3
4	.00	.00	.00	.00	.00	.00	42	1050	156	14	31	5.9
5	.00	.00	.00	.00	.00	.00	42	541	95	13	30	5.2
6	.00	.00	.00	.00	.00	.00	44	410	77	12	30	4.2
7	.00	.00	.00	.00	.00	.00	40	340	70	12	25	3.3
8	.00	.00	.00	.00	.00	.00	37	294	66	12	24	3.1
9	.00	.00	.00	.00	.00	.00	43	265	61	11	24	17
10	.00	.00	.00	.00	.00	.00	42	231	56	9.8	23	46
11	.00	.00	.00	.00	.00	.00	38	206	51	9.4	22	20
12	.00	.00	.00	.00	.00	.00	36	196	48	8.6	20	11
13	.00	.00	.00	.00	.00	.00	37	186	45	8.5	18	9.8
14	.00	.00	.00	.00	.00	311	38	167	45	7.9	17	9.8
15	.00	.00	.00	.00	.00	441	35	151	42	11	17	8.3
16	.00	.00	.00	.00	.00	144	34	141	40	69	15	13
17	.00	.00	.00	.00	.00	83	35	133	37	37	14	13
18	.00	.00	.00	.00	.00	59	33	133	35	29	16	8.1
19	.00	.00	.00	.00	.00	49	32	163	33	37	13	6.1
20	.00	.00	.00	.00	.00	43	31	141	31	47	12	5.8
21	.00	.00	.00	.00	.00	37	29	127	30	40	10	6.4
22	.00	.00	.00	.00	.00	34	28	116	28	35	11	5.2
23	.00	.00	.00	.00	.00	31	26	108	27	31	14	4.1
24	.00	.00	.00	.00	.00	28	26	100	26	33	11	3.1
25	.00	.00	.00	.00	.00	25	26	94	25	136	8.4	2.7
26	.00	.00	.00	.00	.00	24	286	88	23	65	7.3	2.7
27	.00	.00	.00	.00	.00	24	600	83	22	56	6.4	e2.6
28	.00	.00	.00	.00	.00	31	230	80	20	49	5.9	e2.5
29	.00	.00	.00	.00	---	36	157	76	18	45	5.4	e2.4
30	.00	.00	.00	.00	---	36	121	74	18	40	5.2	e2.3
31	.00	---	.00	.00	---	33	---	72	---	39	4.8	---
TOTAL	0.00	0.00	0.00	0.00	0.00	1469.00	2274	8145	1422	970.2	540.4	240.3
MEAN	.000	.000	.000	.000	.000	47.4	75.8	263	47.4	31.3	17.4	8.01
MAX	.00	.00	.00	.00	.00	441	600	2180	156	136	36	46
MIN	.00	.00	.00	.00	.00	.00	26	72	18	7.9	4.8	2.3
AC-FT	.00	.00	.00	.00	.00	2910	4510	16160	2820	1920	1070	477
CFSM	.00	.00	.00	.00	.00	.12	.18	.64	.12	.08	.04	.02
IN.	.00	.00	.00	.00	.00	.13	.21	.74	.13	.09	.05	.02

CAL YR 1989 TOTAL 10471.75 MEAN 28.7 MAX 1530 MIN .00 AC-FT 20770 CFSM .07 IN. .95
WTR YR 1990 TOTAL 15060.90 MEAN 41.3 MAX 2180 MIN .00 AC-FT 29870 CFSM .10 IN. 1.36

e Estimated

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.--Estimated daily discharges: Sept. 28-30. Records good. No known diversion above station. Flow is affected at times by discharge from the flood-detention pools of 17 floodwater-retarding structures with a combined capacity of 24,850 acre-ft. These structures control runoff from 67.8 mi² above this station. One observation of water temperature was made during the year.

AVERAGE DISCHARGE.--31 years, 45.4 ft³/s (32,890 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)
May 3	1800	*146	*5.66				

Minimum daily discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
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	33	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	11	.45	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	2.8	.06	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	1.5	.01	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.83	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.63	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.32	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.05	.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	.04	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.6	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.7	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.41	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.24	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.31	.00	.00
26	.00	.00	.00	.00	.00	.00	.12	.00	.00	.18	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00	e.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.03	.00	e.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	e.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.12	50.13	0.52	9.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.004	1.62	.017	.29	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.12	33	.45	3.7	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.2	99	1.0	18	.00	.00

CAL YR 1989	TOTAL	2111.07	MEAN	5.78	MAX	364	MIN	.00	AC-FT 4190
WTR YR 1990	TOTAL	59.77	MEAN	.16	MAX	33	MIN	.00	AC-FT 119

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.

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

REMARKS.--Estimated daily discharges: Oct. 7-10. Records fair. There are 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 two additional recording rain gages in the watershed.

AVERAGE DISCHARGE.--30 years, 9.39 ft³/s (6,800 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,500 ft³/s Apr. 26 at 0930 hours (gage height, 7.46 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.87	.46	.00	1.1	36	1.0	4.9	.00	.51	.04	12
2	.00	.13	2.9	.00	1.6	14	1.1	1.4	.00	.08	.20	6.6
3	.00	.08	.51	.05	.17	.71	.96	224	.00	.00	.39	.85
4	.00	.05	.13	.00	.14	.26	.54	21	.01	.00	.25	.16
5	.00	.01	.06	.00	.10	.18	.37	7.9	.00	.00	.12	.08
6	.00	.00	.05	2.1	.07	.16	.19	6.5	.00	.00	.03	.02
7	e70	.00	.01	1.0	.01	.18	.13	4.9	.00	.00	.01	.10
8	e10	.00	.00	.15	.00	.58	.09	1.6	.00	.01	.00	.09
9	e2.0	.00	.00	.11	.02	.26	.84	1.3	.00	.00	.00	.49
10	e.50	.00	.00	.07	.01	.16	.27	1.1	.00	.00	.00	13
11	.00	.00	2.1	.05	.06	.14	.11	1.1	.00	.00	.00	12
12	.00	.00	.26	.01	.09	.14	.08	1.1	.00	.00	.00	19
13	.00	6.0	.06	.00	.08	1.6	.08	1.1	.00	.00	.00	61
14	.00	.89	.02	.00	.41	181	.05	.92	.00	.00	.00	5.1
15	.00	.16	.01	.00	7.4	16	.05	.84	.00	8.6	.00	1.9
16	.00	.05	.00	.04	.25	.30	.05	.26	.00	314	.00	1.5
17	.00	.02	.00	.02	.16	.10	.05	4.9	.04	185	.00	1.5
18	.00	.00	.00	.10	1.3	.05	.01	5.1	.11	32	.00	1.5
19	.00	.01	.00	.11	.46	.02	.00	.61	.09	19	.00	2.2
20	.00	.00	.00	.08	.20	.11	.00	.16	.05	13	.03	2.8
21	.00	.00	.00	.09	21	.32	.00	.13	.00	11	.00	.33
22	.00	25	.00	.05	4.8	.40	.00	3.3	.00	12	.00	.13
23	.00	9.1	.00	.02	.35	.40	.00	.75	.00	4.4	.00	.10
24	.00	.40	.00	.01	.17	.51	.00	.16	.00	.98	.01	.05
25	.00	.12	.00	.00	.13	.63	.17	.12	.00	1.3	.01	.03
26	.01	.05	.00	.00	.11	.77	664	.11	.00	.35	.01	.07
27	.00	.02	.00	.01	.11	.21	32	.08	.00	.17	.02	.09
28	13	.00	.00	.03	3.8	2.1	8.6	.01	.00	.16	.01	.09
29	20	.00	.03	.01	---	9.3	7.3	.00	.00	.14	.02	.09
30	29	1.0	.01	.00	---	37	6.5	.00	.02	.10	.01	.09
31	14	---	.00	.04	---	3.8	---	.00	---	.07	.02	---
TOTAL	158.51	43.96	6.61	4.15	44.10	307.39	724.54	295.35	0.32	602.87	1.18	142.96
MEAN	5.11	1.47	.21	.13	1.57	9.92	24.2	9.53	.011	19.4	.038	4.77
MAX	70	25	2.9	2.1	21	181	664	224	.11	314	.39	61
MIN	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00	.02
AC-FT	314	87	13	8.2	87	610	1440	586	.6	1200	2.3	284

CAL YR 1989 TOTAL 499.14 MEAN 1.37 MAX 123 MIN .00 AC-FT 990
WTR YR 1990 TOTAL 2331.94 MEAN 6.39 MAX 664 MIN .00 AC-FT 4630

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: November 1971 to September 1973. Water temperatures: November 1968 to current year. Bacteria analyses: May 1976 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV 13...	1520	28	259	7.8	19.5	18	17	7.2	81	4.7	--
FEB 28...	1052	1.8	290	7.9	17.0	25	16	7.0	74	2.9	2600
APR 26...	1048	2420	122	8.4	18.0	170	420	7.8	85	8.6	10000
MAY 16...	1035	0.50	768	7.9	26.0	10	1.2	6.2	78	2.6	--
JUL 16...	1100	241	142	7.6	23.0	55	3.5	7.9	95	2.9	4800

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV 13...	K800	130	7	45	3.1	4.8	0.2	5.1	120	14	5.7
FEB 28...	1700	130	25	46	3.9	8.6	0.3	5.4	110	25	--
APR 26...	360000	39	4	14	0.94	3.1	0.2	5.8	35	8.3	4.7
MAY 16...	--	260	82	91	8.5	33	0.9	30	180	160	32
JUL 16...	K28000	61	4	22	1.4	2.5	0.1	4.2	57	6.0	3.8

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)	RESIDUE FIXED NON FILTERABLE (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)
NOV 13...	0.20	7.7	156	22	1	21	--	0.010	<0.100	0.010	0.49
FEB 28...	0.20	4.0	--	45	10	35	0.090	0.010	0.100	0.030	0.57
APR 26...	0.20	5.2	64	823	98	725	0.580	0.120	0.700	0.140	1.8
MAY 16...	0.80	12	475	19	18	1	--	0.010	<0.100	0.040	0.56
JUL 16...	<0.10	5.9	80	72	22	50	0.450	0.050	0.500	0.030	0.37

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)
NOV 13...	0.50	0.070	5.4	--	--	--	--	--	--	--	--
FEB 28...	0.60	0.080	6.1	1	44	<0.5	<1.0	<5	<3	<10	12
APR 26...	1.9	0.450	13	2	12	<0.5	<1.0	<5	<3	<10	61
MAY 16...	0.60	0.050	5.1	--	--	--	--	--	--	--	--
JUL 16...	0.40	0.190	8.0	--	--	--	--	--	--	--	--

DATE	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
NOV 13...	--	--	--	--	--	--	--	--	--	--	--
FEB 28...	10	80	4	<0.1	<10	<10	<1	2.0	190	<6	4
APR 26...	<10	190	5	<0.1	<10	<10	<1	1.0	50	<6	4
MAY 16...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	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)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)
NOV 13...	--	--	--	--	--	--	--	--	--	--
FEB 28...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.64	<0.010	<0.01
APR 26...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.91	<0.010	<0.01
MAY 16...	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--

DATE	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)	METHYL TRITHION, TOTAL (UG/L)
NOV 13...	--	--	--	--	--	--	--	--	--	--
FEB 28...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.01	<0.01	<0.01	<0.01
APR 26...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.02	<0.01	<0.01	<0.01
MAY 16...	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE OTAL (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 13...	--	--	--	--	--	--	--	--	--	--
FEB 28...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.01	<0.01	<0.01
APR 26...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.31	0.08	<0.01
MAY 16...	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--

08178880 MEDINA RIVER AT BANDERA, TX

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

DRAINAGE AREA.--427 mi².

WATER-DISCHARGE RECORDS

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

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

REMARKS.--No estimated daily discharges. Records good, except those below 10 ft³/s, which are poor. Several small diversions upstream from station.

AVERAGE DISCHARGE.--8 years, 144 ft³/s (104,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,800 ft³/s June 3, 1987 (gage height, 24.90 ft), from rating curve extended above 27,000 ft³/s; minimum daily, 2.2 ft³/s Aug. 7, 11, 13, 14, 1984.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft³/s and maximum (*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
May 3	1000	*5,770	*12.83	No other peak greater than base discharge.			

Minimum daily discharge, 4.0 ft³/s Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	63	30	26	42	71	72	141	121	49	139	68
2	4.9	50	30	26	39	76	73	515	113	48	148	70
3	4.5	41	32	28	39	77	73	2900	109	47	185	69
4	4.5	36	32	28	41	75	74	969	102	46	354	66
5	5.0	34	32	27	40	70	73	593	97	45	247	66
6	4.0	32	34	29	38	68	71	478	91	44	217	65
7	5.5	32	32	29	36	67	69	397	88	46	196	64
8	7.8	31	30	28	35	68	67	343	86	46	175	62
9	10	29	30	28	34	68	68	311	82	44	166	64
10	7.8	28	30	28	33	67	69	276	79	45	155	101
11	6.7	28	30	27	32	71	66	257	77	44	144	104
12	6.9	27	29	26	32	80	64	244	75	43	138	88
13	5.8	32	30	26	31	83	64	222	74	43	131	78
14	6.3	34	30	26	31	105	65	208	72	41	126	73
15	5.7	38	30	26	32	84	63	196	70	51	118	70
16	6.7	36	29	26	31	80	63	185	68	71	111	75
17	6.6	34	27	27	30	77	64	178	66	126	106	74
18	7.0	34	27	27	31	75	101	175	64	689	107	73
19	6.4	32	27	29	31	73	110	180	63	667	99	69
20	7.1	31	27	29	31	71	96	173	61	366	96	73
21	8.2	31	27	30	48	69	89	164	59	264	91	72
22	8.6	36	27	31	64	68	83	163	57	219	87	74
23	8.9	30	27	32	76	67	79	184	56	203	85	73
24	9.0	29	27	32	67	67	77	163	55	213	83	70
25	8.8	30	28	30	60	64	73	148	53	212	81	70
26	8.8	31	28	30	57	64	339	142	52	178	79	67
27	8.8	30	27	30	54	65	298	135	51	159	76	66
28	248	30	27	30	58	68	221	128	51	147	74	64
29	132	28	27	30	---	71	183	127	50	134	71	63
30	222	29	27	30	---	75	158	124	49	121	69	62
31	76	---	27	29	---	74	---	127	---	118	67	---
TOTAL	863.7	1006	897	880	1173	2258	3065	10546	2191	4569	4021	2153
MEAN	27.9	33.5	28.9	28.4	41.9	72.8	102	340	73.0	147	130	71.8
MAX	248	63	34	32	76	105	339	2900	121	689	354	104
MIN	4.0	27	27	26	30	64	63	124	49	41	67	62
AC-FT	1710	2000	1780	1750	2330	4480	6080	20920	4350	9060	7980	4270

CAL YR 1989 TOTAL 13334.1 MEAN 36.5 MAX 248 MIN 3.5 AC-FT 26450
WTR YR 1990 TOTAL 33622.7 MEAN 92.1 MAX 2900 MIN 4.0 AC-FT 66690

08178880 MEDINA RIVER AT BANDERA, TX--Continued

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 09...	1202	34	573	8.1	17.5	2	1.6	8.6	95	0.4	95	62
MAY 21...	1802	164	534	8.3	25.0	5	1.0	8.2	104	0.9	98	28
AUG 27...	1437	400	524	8.0	27.0	2	0.70	7.7	101	0.7	170	26

DATE	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)
FEB 09...	290	110	84	19	7.0	0.2	1.2	180	110	11	0.30	9.0
MAY 21...	270	70	79	17	6.5	0.2	1.0	200	68	7.9	0.20	11
AUG 27...	260	88	75	18	6.7	0.2	1.4	170	77	9.9	0.60	12

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	RESIDUE VOLATILE, SUSPENDED (MG/L)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)
FEB 09...	351	<1	<1	<0.010	0.200	0.020	0.48	0.50	0.200	0.7	<1	33
MAY 21...	309	--	--	<0.010	0.500	<0.010	--	<0.20	<0.010	1.1	--	--
AUG 27...	306	1	<1	<0.010	0.200	0.020	--	<0.20	<0.010	1.4	<1	31

DATE	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)
FEB 09...	<0.5	<1.0	<5	<3	<10	4	<10	6	2	<0.1	<10	<10
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 27...	<0.5	1.0	<5	<3	<10	<3	<10	12	1	<0.1	<10	<10

DATE	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	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)
FEB 09...	<1	<1.0	920	<6	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 27...	<1	<1.0	790	<6	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 09...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 27...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08178880 MEDINA RIVER AT BANDERA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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											
09...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
21...	--	--	--	--	--	--	--	--	--	--	--
AUG											
27...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01

08179500 MEDINA LAKE NEAR SAN ANTONIO, TX

LOCATION.--Lat 29°32'24", long 98°56'01", Medina County, Hydrologic Unit 12100302, at gate-operating platform, 576 ft from left end of Medina Dam on Medina River, 4.2 mi upstream from Medina diversion dam, 13 mi north of Castroville, 26 mi west of San Antonio, and 70.4 mi upstream from mouth.

DRAINAGE AREA.--634 mi².

PERIOD OF RECORD.--May 1913 to current year. Prior to October 1965, monthend contents only.
Water-quality records.--Chemical analyses: October 1969 to September 1984.

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, 110,200 acre-ft May 27 (gage height, 1,038.5 ft); minimum, 78,640 acre-ft Feb. 19, 20 (gage height, 1,026.9 ft).

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

1,026.0	76,550	1,032.0	91,590	1,037.0	105,900
1,028.0	81,200	1,034.0	97,320	1,038.0	108,800
1,030.0	85,860	1,036.0	103,100	1,039.0	111,700

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97900	91020	91590	87580	81670	79340	83300	88440	109400	97900	105300	106200
2	97320	91020	91590	87580	81670	79810	83070	88730	109100	97320	105600	105900
3	97040	91310	91590	87290	81670	80040	82830	91590	109100	97040	105900	105900
4	96750	91310	91590	87290	81440	80270	82830	100500	108500	96460	107100	105300
5	96180	91310	91310	87010	81200	80510	82830	101900	108200	95890	107600	105300
6	95600	91310	91310	86720	81200	80270	82830	103300	107900	95320	107900	105300
7	95320	91310	91310	86720	80970	80270	82830	104200	107600	95030	108200	104800
8	95320	91310	91590	86430	80740	80270	82600	105300	107400	94460	108200	104800
9	95030	91310	91590	86150	80740	80270	82600	105900	107100	93880	108200	104800
10	94740	91310	91590	85860	80510	80510	82830	106500	107100	93600	108500	104800
11	94170	91310	91590	85630	80510	80270	82830	107100	106500	93020	109100	104800
12	93600	91310	91310	85630	80270	80510	82600	107600	105900	92450	109100	104800
13	93020	91310	90730	85390	80040	80740	82830	108200	105900	92740	109100	104800
14	92740	91310	90730	85390	79810	80970	83070	108200	105600	92170	109100	104800
15	92170	91310	90450	85160	79570	81440	83070	108800	105100	91880	109100	104500
16	91880	91590	90160	84930	79340	81670	82830	108800	104800	92170	109100	104500
17	91590	91590	89590	84930	79110	82140	82600	109400	104800	92740	109100	104200
18	91020	91590	89300	84700	78880	82140	82600	109400	104200	93880	109100	104200
19	90730	91310	89300	84700	78640	82600	82600	109100	103300	97320	108800	104200
20	90160	91310	89300	84460	78640	82140	82830	109600	103100	99040	108800	104200
21	89870	91310	88730	84230	78880	82140	82830	109400	102500	100500	108500	104200
22	89300	91590	88730	84000	78880	82370	83070	109900	102200	101000	108500	104200
23	89010	91590	88440	83760	78880	82370	82830	109900	101900	101300	108200	105100
24	88730	91590	88440	83530	79110	82600	82830	109900	101600	101900	108200	104500
25	88440	91590	88440	83530	79110	82600	82830	109900	100800	103100	107900	104200
26	88150	91590	88440	83070	78880	82830	84230	109900	100200	103300	107900	104200
27	88150	91590	88440	83070	79110	82370	86150	110200	99900	103900	106600	103900
28	89010	91590	88150	82830	79340	82370	87010	109900	99330	104500	107400	103900
29	89590	91310	88150	82370	---	82370	87580	109900	98760	104800	107100	103900
30	91310	91590	88150	82370	---	82830	88150	109600	98470	104800	106800	103900
31	91310	---	87580	81900	---	83530	---	109400	---	105100	106500	---
MAX	97900	91590	91590	87580	81670	83530	88150	110200	109400	105100	109100	106200
MIN	88150	91020	87580	81900	78640	79340	82600	88440	98470	91880	105300	103900
(†)	1031.9	1032.0	1030.6	1028.3	1027.2	1029.0	1030.8	1038.2	1034.4	1036.7	1037.2	1036.3
(ϕ)	-6870	+280	-4010	-5680	-2560	+4190	+4620	+21250	-10930	+6630	+1400	-2600

CAL YR 1989 MAX 178100 MIN 87580 (ϕ) -90520
WTR YR 1990 MAX 110200 MIN 78640 (ϕ) +5720

(†) 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. Satellite telemeter at station.

AVERAGE DISCHARGE.--44 years (water years 1923-33, 1958-90), 44.8 ft³/s (32,460 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 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	118	.00	.00	47	49	.00	.00	23	122	180	61	153
2	124	.00	.00	54	39	.00	.00	9.6	129	190	47	121
3	127	.00	.00	72	44	.00	.00	.05	134	190	46	105
4	131	.00	.00	75	49	.00	.00	.00	134	187	46	99
5	136	.00	.00	76	67	.00	.00	.00	136	185	45	80
6	138	.00	.00	51	59	.00	.00	.00	141	181	42	89
7	137	.00	.00	36	55	.00	13	7.1	145	183	43	100
8	136	.00	.00	39	58	.00	25	32	142	185	63	94
9	135	.00	.00	50	64	.00	25	52	146	185	65	92
10	138	.00	.00	62	61	.00	25	62	149	180	63	64
11	136	.00	.00	63	59	.00	24	54	152	178	60	47
12	137	.00	.00	59	61	.00	22	47	152	167	57	39
13	126	.00	.00	54	63	.00	21	50	154	154	68	40
14	123	.00	1.6	50	64	.00	20	57	160	155	77	48
15	126	.00	12	53	65	.00	18	63	172	140	79	51
16	122	.00	29	72	65	.00	18	78	175	.11	100	50
17	112	.00	52	69	65	.00	18	88	177	.07	104	54
18	110	.00	59	67	65	.00	20	83	180	.00	103	68
19	113	.00	52	65	59	13	20	85	180	.00	103	52
20	115	.00	43	63	53	30	20	87	181	.00	104	45
21	108	.00	18	61	15	28	23	92	181	.00	104	51
22	102	.00	.04	62	.04	26	24	88	178	.00	115	51
23	98	.00	.04	67	.02	24	28	83	175	.00	122	52
24	94	.00	.04	71	.00	25	44	91	174	.00	124	53
25	91	.00	.02	73	.00	25	45	92	175	.00	126	62
26	90	.00	.00	74	.00	26	15	92	180	.00	127	66
27	94	.00	13	75	.00	34	.00	92	181	.00	129	69
28	43	.00	49	77	.00	39	.00	99	190	.00	138	70
29	.01	.00	48	75	---	21	.00	93	193	.00	151	69
30	.02	.00	48	73	---	11	17	100	190	.00	154	68
31	.00	---	48	69	---	.00	---	122	---	30	152	---
TOTAL	3260.03	0.00	472.74	1954	1179.06	302.00	485.00	1921.75	4878	2670.18	2818	2102
MEAN	105	.000	15.2	63.0	42.1	9.74	16.2	62.0	163	86.1	90.9	70.1
MAX	138	.00	59	77	67	39	45	122	193	190	154	153
MIN	.00	.00	.00	36	.00	.00	.00	.00	122	.00	42	39
AC-FT	6470	.00	938	3880	2340	599	962	3810	9680	5300	5590	4170

CAL YR 1989	TOTAL	31432.06	MEAN	86.1	MAX	199	MIN	.00	AC-FT	62350
WTR YR 1990	TOTAL	22042.76	MEAN	60.4	MAX	193	MIN	.00	AC-FT	43720

GUADALUPE RIVER BASIN

08181400 HELOTES CREEK AT HELOTES, TX

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

DRAINAGE AREA.--15.0 mi².

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--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 fair. 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.--22 years, 4.00 ft³/s (3.62 in/yr), 2,900 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 31	1700	*116	*2.65				

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.15	.00	.00	.00	.00	12	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	18	.00
3	.00	.00	.00	.00	.00	.00	.00	17	.00	.00	23	.00
4	.00	.00	.00	.00	.00	.00	.00	20	.00	.00	19	.00
5	.00	.00	.00	.00	.00	.00	.00	9.1	.00	.00	16	.00
6	.00	.00	.00	.00	.00	.00	.00	3.1	.00	.00	12	.00
7	.00	.00	.00	.00	.00	.00	.00	.71	.00	.00	9.2	.00
8	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00	7.4	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.0	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.8	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.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	.28	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.1	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	16	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	33	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	40	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	40	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	28	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.01	.00	17	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	12	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	9.5	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	7.2	.00	.00
26	.00	.00	.00	.00	.00	.00	1.3	.00	.00	4.4	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.1	.00	.00
28	.81	.00	.00	.00	.07	.00	.00	.00	.00	.03	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.39	.00	.00	.00	---	.70	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	12	.00	---
TOTAL	1.20	0.00	0.00	0.00	0.07	1.13	1.30	50.06	0.00	225.63	125.60	0.00
MEAN	.039	.000	.000	.000	.002	.036	.043	1.61	.000	7.28	4.05	.000
MAX	.81	.00	.00	.00	.07	.70	1.3	20	.00	40	23	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2.4	.00	.00	.00	.1	2.2	2.6	99	.00	448	249	.00
CFSM	.00	.00	.00	.00	.00	.00	.00	.11	.00	.49	.27	.00
IN.	.00	.00	.00	.00	.00	.00	.00	.12	.00	.56	.31	.00

CAL YR 1989 TOTAL 11.26 MEAN .031 MAX 5.7 MIN .00 AC-FT 22 CFSM .00 IN. .03
WTR YR 1990 TOTAL 404.99 MEAN 1.11 MAX 40 MIN .00 AC-FT 803 CFSM .07 IN. 1.00

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
MAR											
01...	1055	0.79	84	7.2	7.0	50	40	11.4	96	3.6	K1600
APR											
26...	0810	7.1	82	7.6	18.0	80	15	8.2	89	4.6	K6400
MAY											
03...	1240	35	450	7.9	20.0	45	30	8.5	98	2.9	5000
03...	1455	23	477	8.0	22.0	31	21	8.4	100	3.2	4900
JUL											
17...	0850	14	481	7.7	22.0	40	2.1	7.8	92	1.6	230

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
MAR											
01...	28000	42	4	15	1.0	0.80	0.0	1.1	38	1.2	1.2
APR											
26...	K230000	40	2	15	0.66	0.80	0.0	2.1	38	1.9	1.7
MAY											
03...	74000	200	35	61	11	11	0.3	2.9	160	26	17
03...	2800	210	34	64	11	10	0.3	2.5	170	20	20
JUL											
17...	6100	220	51	65	13	16	0.5	1.9	170	39	32

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)	RESIDUE FIXED NON FILTER-ABLE (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)
MAR											
01...	<0.10	3.1	46	50	50	0	0.160	0.040	0.200	0.050	0.85
APR											
26...	0.10	4.3	49	36	15	21	0.260	0.040	0.300	0.070	0.73
MAY											
03...	0.30	8.3	235	29	18	11	0.580	0.020	0.600	0.020	0.28
03...	0.10	9.1	239	18	8	10	0.680	0.020	0.700	0.030	0.17
JUL											
17...	<0.10	9.7	276	29	9	20	1.16	0.040	1.20	0.020	0.68

DATE	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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
MAR											
01...	0.90	0.020	5.8	<1	9	<0.5	<1.0	<5	<3	<10	32
APR											
26...	0.80	0.080	--	--	--	--	--	--	--	--	--
MAY											
03...	0.30	0.050	5.3	<1	24	<0.5	1.0	<5	<3	<10	18
03...	0.20	0.020	5.1	--	--	--	--	--	--	--	--
JUL											
17...	0.70	0.020	9.2	--	--	--	--	--	--	--	--

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAR											
01...	<10	<4	2	<0.1	<10	<10	<1	2.0	42	<6	9
APR											
26...	--	--	--	--	--	--	--	--	--	--	--
MAY											
03...	<10	<4	2	0.2	<10	<10	<1	<1.0	120	<6	4
03...	--	--	--	--	--	--	--	--	--	--	--
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--

08181400 HELOTES CREEK AT HELOTES, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	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)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)
MAR										
01...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.01	<0.010	<0.01
APR										
26...	--	--	--	--	--	--	--	--	--	--
MAY										
03...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	0.01	<0.010	<0.01
03...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	--	--	--	--	--	--	--	--	--	--

DATE	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)	METHYL TRITHION, TOTAL (UG/L)
MAR										
01...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
APR										
26...	--	--	--	--	--	--	--	--	--	--
MAY										
03...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
03...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	--	--	--	--	--	--	--	--	--	--

DATE	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE OTAL (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)
MAR										
01...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.05	<0.01	<0.01
APR										
26...	--	--	--	--	--	--	--	--	--	--
MAY										
03...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	0.02	<0.01	<0.01
03...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	--	--	--	--	--	--	--	--	--	--

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

AVERAGE DISCHARGE.--28 years, 27.5 ft³/s (5.46 in/yr), 19,920 acre-ft/yr.

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

EXTREMES OUTSIDE PERIOD OF RECORD.--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)
Apr. 26	0715	1,650	5.09	July 18	1015	*2,840	*6.08
May 3	0600	1,380	4.84				

Minimum daily discharge, 0.16 ft³/s Nov. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	.74	.76	.38	2.4	5.3	6.8	21	10	2.5	32	5.9
2	.95	.49	.73	.37	1.7	1.6	8.2	20	9.6	2.6	43	6.2
3	.86	.39	.77	.57	1.2	1.3	7.3	365	9.4	2.4	39	6.2
4	.81	.35	.70	.58	1.2	1.4	6.7	87	9.0	2.3	35	5.9
5	1.2	.19	.67	.49	1.2	9.1	6.0	53	8.5	2.3	25	5.4
6	1.0	.54	.62	.73	1.2	1.6	5.6	42	7.7	2.3	22	5.4
7	9.0	.64	.64	.69	1.1	1.5	5.2	36	6.8	2.2	20	5.1
8	1.7	.75	.59	.61	1.1	1.6	5.0	32	6.5	2.4	17	5.3
9	.58	.69	.55	.56	1.1	4.9	6.0	28	5.8	2.1	17	28
10	.42	.72	.68	.56	1.2	1.3	6.4	24	5.5	2.0	16	57
11	.27	.72	.64	.59	1.4	2.2	5.7	21	4.4	1.7	15	21
12	.34	.74	.59	.53	1.2	1.4	5.3	21	4.2	2.0	14	14
13	.37	2.0	.56	.55	1.2	9.1	5.5	21	3.9	2.1	13	10
14	.35	1.2	.62	.64	1.3	32	5.8	18	3.6	2.2	12	9.1
15	.44	1.0	.77	.80	1.2	7.7	5.8	16	3.4	46	12	7.9
16	.51	1.1	.71	.97	1.0	1.9	5.6	15	3.2	39	11	8.6
17	.53	.98	.67	.81	.96	1.8	5.5	14	2.9	28	10	9.3
18	.61	1.1	.61	.90	1.0	5.3	5.6	14	2.9	449	9.7	7.9
19	.63	1.5	.58	.89	1.0	5.7	6.0	13	2.7	82	9.2	7.4
20	.67	1.4	.49	.72	1.1	5.2	6.3	11	2.4	61	8.8	8.4
21	.74	1.2	.60	.90	2.8	5.1	5.9	11	2.3	41	8.0	8.2
22	.73	3.3	.52	.93	1.3	5.2	5.6	10	2.0	32	10	7.9
23	.67	.39	.88	.93	.92	5.1	5.3	12	2.0	31	8.8	7.8
24	.80	.17	.59	1.1	.85	4.9	5.4	12	1.9	66	7.2	7.7
25	.83	.16	.48	.96	.97	4.4	5.6	11	1.7	53	7.0	7.4
26	.98	.32	.41	1.0	1.0	4.7	417	11	1.7	39	7.0	7.4
27	.97	.54	.35	1.1	1.3	5.1	78	12	1.6	34	7.0	7.6
28	17	.58	.30	1.3	7.0	6.0	36	13	1.9	31	6.4	7.8
29	3.6	.54	.34	1.2	---	50	28	13	2.1	27	5.9	7.9
30	2.7	.86	.45	1.0	---	12	24	12	2.6	26	5.8	8.2
31	1.7	---	.41	1.0	---	7.6	---	11	---	43	6.0	---
TOTAL	53.06	25.30	18.28	24.36	40.90	212.0	731.1	1000	132.2	1159.1	459.8	311.9
MEAN	1.71	.84	.59	.79	1.46	6.84	24.4	32.3	4.41	37.4	14.8	10.4
MAX	17	3.3	.88	1.3	7.0	50	417	365	10	449	43	57
MIN	.27	.16	.30	.37	.85	1.3	5.0	10	1.6	1.7	5.8	5.1
AC-FT	105	50	36	48	81	421	1450	1980	262	2300	912	619
CFSM	.03	.01	.01	.01	.02	.10	.36	.47	.06	.55	.22	.15
IN.	.03	.01	.01	.01	.02	.12	.40	.54	.07	.63	.25	.17

CAL YR 1989	TOTAL	497.43	MEAN	1.36	MAX	17	MIN	.07	AC-FT	987	CFSM	.02	IN.	.27
WTR YR 1990	TOTAL	4168.00	MEAN	11.4	MAX	449	MIN	.16	AC-FT	8270	CFSM	.17	IN.	2.27

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.--44 years, 15.4 ft³/s (11,160 acre-ft/yr).

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

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
July 17	1700	*0.48	*2.74				

Minimum daily discharge, no flow for most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
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	.04	.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
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	0.04	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00

CAL YR 1989 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .00
WTR YR 1990 TOTAL 0.04 MEAN .00 MAX .04 MIN .00 AC-FT .08

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. There are many small diversions above station for irrigation.

AVERAGE DISCHARGE.--67 years, 151 ft³/s (2.78 in/yr), 109,400 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)
Apr. 26	0730	5,000	7.38	July 18	2400	5,510	7.68
May 2	2200	*11,300	*10.00	July 23	1430	3,480	6.58
May 3	1400	10,700	9.78	Aug. 3	1800	3,570	6.64
July 16	0500	956	4.53				

Minimum daily discharge, 16 ft³/s Oct. 1-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	37	67	56	54	145	108	412	173	72	494	196
2	16	39	69	56	52	150	118	1830	170	72	513	192
3	16	39	68	57	52	143	129	6240	164	70	1440	198
4	16	41	67	56	53	136	116	2050	155	69	1420	223
5	17	42	66	56	53	133	111	1120	147	67	864	208
6	17	43	66	59	53	132	108	862	139	66	703	196
7	28	43	64	55	52	132	105	718	133	67	605	191
8	20	44	62	56	52	130	103	624	128	68	540	184
9	18	46	64	56	51	127	103	559	125	68	505	179
10	18	48	63	56	51	124	102	499	122	67	472	187
11	18	51	61	55	50	124	100	457	120	65	442	216
12	18	53	62	54	50	125	98	429	116	66	416	222
13	18	133	64	54	50	125	100	394	113	66	385	211
14	18	133	63	54	50	127	98	364	113	68	361	201
15	18	92	62	53	50	125	97	340	111	71	349	194
16	18	79	62	54	49	124	96	322	108	337	335	199
17	17	72	62	54	50	123	96	302	104	474	332	199
18	17	71	62	54	50	122	237	310	102	901	317	190
19	18	69	62	54	50	120	410	292	99	2440	303	195
20	18	67	62	54	53	117	283	276	96	862	288	190
21	18	67	59	54	246	115	226	262	93	654	275	185
22	19	69	58	54	193	114	195	248	89	545	263	184
23	19	67	58	54	140	111	176	239	86	1820	251	203
24	20	69	58	51	115	110	162	242	82	1540	238	188
25	20	69	58	50	106	109	154	238	81	849	227	178
26	21	68	58	50	103	108	2570	226	80	661	219	171
27	21	67	58	51	103	110	1450	215	78	567	212	166
28	42	63	58	51	116	112	776	204	76	511	207	162
29	33	63	57	51	---	109	584	193	74	472	202	157
30	36	70	57	50	---	120	481	185	72	441	208	154
31	35	---	56	51	---	111	---	180	---	416	196	---
TOTAL	644	1914	1913	1670	2147	3813	9492	20832	3349	14512	13582	5719
MEAN	20.8	63.8	61.7	53.9	76.7	123	316	672	112	468	438	191
MAX	42	133	69	59	246	150	2570	6240	173	2440	1440	223
MIN	16	37	56	50	49	108	96	180	72	65	196	154
AC-FT	1280	3800	3790	3310	4260	7560	18830	41320	6640	28780	26940	11340
CFSM	.03	.09	.08	.07	.10	.17	.43	.91	.15	.64	.59	.26
IN.	.03	.10	.10	.08	.11	.19	.48	1.05	.17	.73	.69	.29

CAL YR 1989 TOTAL 19500 MEAN 53.4 MAX 133 MIN 16 AC-FT 38680 CFSM .07 IN. .98
WTR YR 1990 TOTAL 79587 MEAN 218 MAX 6240 MIN 16 AC-FT 157900 CFSM .30 IN. 4.02

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB												
01...	1410	54	398	8.2	17.0	3	1.0	9.4	102	1.1	K16	21
MAY												
17...	1608	308	419	7.7	25.0	7	4.1	7.7	97	0.8	K18	32
AUG												
22...	1435	268	419	8.0	29.0	3	0.70	7.9	107	1.0	K13	K8

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB												
01...	200	24	57	14	7.5	0.2	0.80	180	13	12	0.10	11
MAY												
17...	210	15	59	14	7.4	0.2	0.80	190	7.5	13	0.30	12
AUG												
22...	210	14	59	14	6.8	0.2	1.1	190	15	11	0.50	13

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
FEB												
01...	221	17	1	16	<0.010	0.600	<0.010	0.60	<0.010	0.6	<1	36
MAY												
17...	228	13	13	0	<0.010	1.60	<0.010	<0.20	<0.010	1.9	--	--
AUG												
22...	235	<1	<1	--	<0.010	1.00	0.020	<0.20	<0.010	1.4	<1	42

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
FEB												
01...	<0.5	<1.0	<5	<3	<10	<3	<10	5	1	<0.1	<10	<10
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
22...	<0.5	2.0	<5	<3	<10	<3	<10	9	<1	<0.1	<10	<10

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	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)
FEB												
01...	<1	<1.0	240	<6	17	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
22...	<1	<1.0	230	<6	<3	<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)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB												
01...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY												
17...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
22...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

08190000 NUECES RIVER AT LAGUNA, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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											
01...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
17...	--	--	--	--	--	--	--	--	--	--	--
AUG											
22...	<0.01	<0.01	<0.01	<0.1	<0.01	<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.--No estimated daily discharges. Records good. In ordinary years, a large part of streamflow is lost by seepage into the Balcones Fault Zone of the Edwards and associated limestones above station. No known diversion above station.

AVERAGE DISCHARGE.--45 years (water years 1940-50, 1957-90), 34.7 ft³/s (25,140 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)
Apr. 26	0530	16,200	a13.74	July 20	1100	1,560	6.15
May 3	0430	4,130	a7.84	July 24	0200	4,120	8.39
July 18	2030	*25,700	*16.56				

a From floodmark.

Minimum daily discharge, no flow Oct. 1-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.94	.46	.19	.14	1.5	1.5	136	9.7	1.9	86	6.9
2	.00	.90	.43	.19	.13	3.1	1.9	125	9.0	1.8	80	6.7
3	.00	.80	.40	.19	.12	4.9	3.9	1640	8.6	1.7	73	6.5
4	.00	.69	.40	.19	.08	5.3	6.2	407	8.3	1.5	66	6.4
5	.00	.64	.40	.25	.13	4.7	7.0	233	8.0	1.4	59	6.2
6	.00	.57	.39	.26	.15	3.8	6.7	193	7.6	1.3	53	5.8
7	.59	.57	.34	.21	.17	2.8	6.5	171	7.4	1.3	46	5.7
8	.96	.50	.30	.19	.19	2.3	5.7	149	7.2	1.2	43	5.6
9	3.5	.45	.30	.19	.17	2.0	5.2	135	6.9	1.2	40	5.1
10	4.0	.45	.30	.19	.13	1.7	4.1	121	6.6	1.1	36	5.5
11	3.3	.44	.30	.19	.10	1.7	3.3	111	6.0	1.0	33	5.6
12	2.0	.40	.26	.20	.14	2.5	2.9	98	5.9	1.0	30	5.0
13	1.6	.71	.27	.22	.15	4.4	2.5	84	5.5	.93	29	4.9
14	1.2	.88	.30	.22	.15	3.8	2.1	74	5.2	.81	27	4.7
15	1.1	2.6	.30	.22	.15	3.7	1.9	63	5.0	.78	25	4.5
16	.98	2.8	.30	.24	.14	3.8	1.7	54	4.7	.78	22	4.7
17	.77	2.5	.28	.20	.15	3.6	1.5	48	4.3	.95	20	6.0
18	.67	1.7	.26	.19	.15	2.9	1.5	49	4.1	5280	19	8.0
19	.59	1.3	.24	.21	.15	2.3	1.7	43	4.0	8060	17	8.7
20	.51	1.1	.22	.13	.23	1.9	1.7	37	3.8	892	16	9.0
21	.51	.95	.22	.13	.83	1.8	2.5	32	3.8	350	14	8.7
22	.49	.87	.19	.13	1.3	1.8	2.8	30	3.5	215	12	8.3
23	.36	.78	.19	.13	3.8	1.8	2.5	26	3.2	223	11	7.9
24	.35	.78	.19	.13	4.2	1.5	2.1	22	3.0	1760	10	8.4
25	.32	.71	.17	.13	3.8	1.3	5.5	19	2.9	325	9.4	8.9
26	.30	.64	.15	.11	3.2	1.3	5940	16	2.8	182	8.7	9.1
27	.31	.53	.14	.10	2.3	1.3	495	15	2.7	145	8.1	8.5
28	.89	.51	.15	.10	1.7	1.3	249	13	2.4	127	7.8	7.9
29	.70	.51	.19	.10	---	.95	196	12	2.2	113	7.5	7.0
30	.90	.51	.19	.10	---	1.3	161	11	2.1	102	7.3	6.3
31	.94	---	.19	.10	---	1.1	---	10	---	94	7.2	---
TOTAL	27.84	27.73	8.42	5.33	24.05	78.15	7125.9	4177	156.4	17888.65	923.0	202.4
MEAN	.90	.92	.27	.17	.86	2.52	238	135	5.21	577	29.8	6.75
MAX	4.0	2.8	.46	.26	4.2	5.3	5940	1640	9.7	8060	86	9.1
MIN	.00	.40	.14	.10	.08	.95	1.5	10	2.1	.78	7.2	4.5
AC-FT	55	55	17	11	48	155	14130	8290	310	35480	1830	401

CAL YR 1989 TOTAL 137.01 MEAN .38 MAX 4.0 MIN .00 AC-FT 272
WTR YR 1990 TOTAL 30644.87 MEAN 84.0 MAX 8060 MIN .00 AC-FT 60780

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

AVERAGE DISCHARGE.--51 years, 126 ft³/s (91,290 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)
Apr. 26	1730	*22,000	*13.02	July 21	0030	3,630	6.79
May 3	0800	6,320	8.62	July 24	0600	2,720	6.27
May 3	2130	8,090	9.70	July 24	2300	3,130	6.50
July 19	1600	20,300	12.83	Aug. 4	0600	2,360	6.04

Minimum daily discharge, 8.0 ft³/s Oct. 19-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	10	11	10	11	13	9.5	274	71	22	335	128
2	9.0	9.8	11	10	10	11	9.6	219	63	22	410	132
3	9.0	9.5	10	10	9.2	10	9.1	4380	57	21	410	127
4	9.0	9.5	10	10	9.4	10	9.0	3840	52	21	1730	128
5	9.0	9.5	10	10	9.5	10	9.0	1590	48	20	1050	133
6	9.1	9.5	10	11	9.3	11	8.8	1030	46	20	753	129
7	14	9.5	10	10	9.2	10	8.5	778	43	20	609	121
8	9.9	9.4	9.6	10	9.5	10	8.7	636	41	21	513	112
9	9.5	9.4	10	10	9.2	10	9.3	535	39	20	451	105
10	9.5	9.5	10	10	8.9	10	9.1	448	37	19	411	100
11	9.5	9.5	9.8	10	9.0	10	8.6	395	36	19	382	106
12	9.5	9.5	9.6	9.8	9.0	10	8.7	352	36	19	355	117
13	9.3	9.5	10	9.5	9.1	10	10	316	35	19	331	124
14	9.3	9.5	10	9.6	9.1	9.5	9.8	286	33	19	306	124
15	9.0	9.3	10	9.8	8.7	9.0	9.5	255	33	19	282	136
16	9.0	9.0	9.8	10	8.2	9.0	9.5	229	32	73	269	135
17	8.8	9.2	10	9.5	8.4	9.0	9.5	209	31	57	259	136
18	8.2	9.5	10	9.7	8.4	9.0	9.3	198	30	111	247	127
19	8.0	9.5	10	9.4	8.5	9.0	14	194	29	8630	234	125
20	8.0	9.5	10	9.3	8.9	9.0	11	177	28	4370	205	131
21	8.0	9.5	10	9.2	17	9.0	10	162	28	2350	200	124
22	8.0	11	10	9.0	12	9.0	10	178	27	941	191	125
23	8.0	10	10	9.3	10	9.0	10	152	26	607	179	170
24	8.0	10	10	9.6	10	9.0	10	133	25	2390	169	160
25	8.2	10	10	9.2	10	9.0	10	127	25	2090	159	138
26	8.4	10	10	9.2	9.8	9.1	6350	124	24	962	149	126
27	8.4	10	10	9.5	9.7	9.9	4750	115	24	621	141	117
28	13	9.8	10	9.5	10	10	1160	104	23	504	135	109
29	13	9.6	10	9.5	---	9.4	527	92	23	432	129	104
30	11	12	10	9.2	---	11	359	84	22	391	125	99
31	10	---	10	9.4	---	9.5	---	78	---	355	123	---
TOTAL	289.6	291.5	310.8	300.2	271.0	302.4	13386.5	17690	1067	25185	11242	3748
MEAN	9.34	9.72	10.0	9.68	9.68	9.75	446	571	35.6	812	363	125
MAX	14	12	11	11	17	13	6350	4380	71	8630	1730	170
MIN	8.0	9.0	9.6	9.0	8.2	9.0	8.5	78	22	19	123	99
AC-FT	574	578	616	595	538	600	26550	35090	2120	49950	22300	7430

CAL YR 1989 TOTAL 6154.4 MEAN 16.9 MAX 34 MIN 8.0 AC-FT 12210
WTR YR 1990 TOTAL 74084.0 MEAN 203 MAX 8630 MIN 8.0 AC-FT 146900

NUECES RIVER BASIN

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.--65 years (water years 1925-29, 1931-90), 117 ft³/s (4.08 in/yr), 84,770 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)
Apr. 26	1400	1,490	5.67	July 17	2100	949	5.20
May 2	2130	1,360	5.56	July 18	1430	3,550	7.01
May 3	1030	*7,920	*9.15	July 18	2030	3,280	6.86
July 16	1130	980	5.23	Aug. 3	1430	5,310	7.94

Minimum daily discharge, 16 ft³/s Oct. 3-6, 14, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	68	57	46	52	102	85	152	120	59	241	146
2	17	62	57	48	52	105	96	339	114	58	238	145
3	16	60	55	48	51	105	88	2370	110	56	1600	152
4	16	58	53	47	51	105	86	729	105	55	831	145
5	16	56	53	46	51	103	85	464	101	53	493	142
6	16	56	53	50	51	102	81	374	98	52	408	136
7	21	55	52	48	52	102	81	325	95	53	360	132
8	22	53	51	48	53	101	80	298	93	52	330	129
9	19	52	51	48	52	99	82	273	91	52	311	128
10	20	52	51	47	52	96	79	252	88	51	295	163
11	19	52	50	47	52	95	78	241	88	50	279	166
12	17	52	50	46	52	95	77	231	85	54	265	156
13	17	61	50	46	52	99	79	213	84	54	255	146
14	16	67	50	47	52	97	78	201	82	53	246	139
15	17	61	50	48	50	95	77	193	81	56	242	137
16	19	58	49	48	49	91	77	185	79	412	229	158
17	18	58	50	47	48	89	77	178	78	411	222	170
18	18	59	50	48	49	88	77	175	77	1460	214	162
19	17	59	49	47	49	86	89	171	75	1120	207	158
20	16	58	46	47	48	85	99	164	73	529	199	155
21	17	58	46	46	93	83	98	156	72	394	190	153
22	19	61	47	46	193	83	93	210	70	329	184	144
23	20	57	48	46	144	83	90	196	69	304	182	164
24	19	56	48	46	118	81	89	161	67	341	180	147
25	19	56	47	46	104	80	88	149	64	308	172	141
26	18	56	47	46	97	80	551	139	63	278	166	140
27	20	55	47	46	93	82	387	135	62	258	161	137
28	43	54	47	46	97	85	228	129	60	244	158	135
29	142	54	47	46	---	83	182	128	59	236	157	132
30	93	59	48	46	---	92	161	126	59	232	157	129
31	81	---	47	46	---	86	---	124	---	266	152	---
TOTAL	845	1723	1546	1453	1957	2858	3618	9181	2462	7930	9324	4387
MEAN	27.3	57.4	49.9	46.9	69.9	92.2	121	296	82.1	256	301	146
MAX	142	68	57	50	193	105	551	2370	120	1460	1600	170
MIN	16	52	46	46	48	80	77	124	59	50	152	128
AC-FT	1680	3420	3070	2880	3880	5670	7180	18210	4880	15730	18490	8700
CFSM	.07	.15	.13	.12	.18	.24	.31	.76	.21	.66	.77	.38
IN.	.08	.16	.15	.14	.19	.27	.35	.88	.24	.76	.89	.42

CAL YR 1989 TOTAL 18472 MEAN 50.6 MAX 142 MIN 16 AC-FT 36640 CFSM .13 IN. 1.77
WTR YR 1990 TOTAL 47284 MEAN 130 MAX 2370 MIN 16 AC-FT 93790 CFSM .33 IN. 4.52

08195000 FRIO RIVER AT CONCAN, TX--Continued

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 06...	1304	52	397	8.3	13.5	1	0.40	10.0	100	0.8	K9	23
MAY 23...	1353	199	392	7.8	26.0	<1	0.30	8.0	103	0.7	K15	K19
AUG 28...	1512	156	396	8.0	30.0	2	0.40	7.8	108	1.2	46	K13

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB 06...	200	16	55	14	7.1	0.2	0.90	180	15	12	0.20	9.8
MAY 23...	190	17	55	13	6.1	0.2	0.80	170	9.7	7.9	0.20	11
AUG 28...	200	24	58	14	6.9	0.2	0.90	180	11	10	0.10	13

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (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)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
FEB 06...	222	<1	<1	--	<0.010	0.500	<0.010	<0.20	0.090	0.6	<1	31
MAY 23...	208	2	2	0	<0.010	0.900	<0.010	0.30	<0.010	1.1	--	--
AUG 28...	222	<1	<1	--	<0.010	0.700	<0.010	0.20	<0.010	1.5	<1	34

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
FEB 06...	<0.5	<1.0	<5	<3	<10	<3	<10	<4	<1	<0.1	<10	<10
MAY 23...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 28...	<0.5	<1.0	<5	<3	<10	4	<10	7	<1	<0.1	<10	<10

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	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)
FEB 06...	<1	<1.0	260	<6	5	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 23...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 28...	<1	<1.0	260	<6	<3	<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)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 06...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 23...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 28...	<0.01	<0.010	<0.01	<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 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
FEB											
06...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
23...	--	--	--	--	--	--	--	--	--	--	--
AUG											
28...	<0.01	<0.01	<0.01	<0.1	<0.01	<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.--38 years, 35.0 ft³/s (3.77 in/yr), 25,360 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)
Apr. 26	1045	1,330	4.93	July 18	1000	459	3.80
May 3	1415	275	3.31	July 18	1915	*2,160	*6.33
July 17	2100	1,000	4.48	Aug. 3	1530	211	3.15

Minimum daily discharge, 0.11 ft³/s Oct. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	5.6	8.2	5.8	8.7	27	19	53	21	3.8	53	22
2	.14	5.0	8.2	5.9	8.4	29	22	59	20	3.7	54	23
3	.11	4.5	7.8	5.9	7.9	28	26	144	18	3.5	117	23
4	.14	3.8	7.2	6.0	8.2	26	25	118	17	3.4	115	22
5	.14	3.5	6.9	6.0	8.2	25	23	90	16	3.3	84	21
6	.17	3.3	6.9	6.4	7.9	24	21	78	15	3.0	73	20
7	.58	3.1	6.8	6.9	7.9	24	20	71	14	3.2	66	19
8	.39	3.1	6.8	6.7	7.8	24	19	66	13	3.3	62	19
9	.33	3.4	6.6	6.6	7.5	23	19	61	12	3.2	59	20
10	.39	3.4	6.4	6.4	7.2	22	19	57	11	3.0	56	24
11	.44	3.4	6.5	6.3	6.8	21	18	54	11	2.9	53	24
12	.44	3.4	6.6	6.3	6.5	22	17	52	11	3.1	51	23
13	.57	4.2	6.6	6.3	6.3	22	18	48	10	3.4	48	22
14	.64	9.0	6.3	6.5	6.3	22	17	45	9.0	4.6	46	21
15	.72	13	6.3	6.6	6.3	20	16	43	8.6	4.3	44	20
16	.80	9.7	6.3	6.6	6.1	19	16	41	8.0	10	42	21
17	.80	8.0	6.0	6.6	5.7	18	16	39	7.3	153	40	22
18	.89	7.3	6.0	6.4	5.7	17	15	42	6.8	599	39	22
19	.95	7.0	6.0	6.4	5.7	17	17	42	6.5	423	37	21
20	.98	6.7	6.3	6.4	6.1	17	17	38	6.2	171	36	21
21	.95	6.3	6.3	6.2	36	17	16	34	5.7	122	34	21
22	.95	7.1	6.1	6.0	63	17	15	34	5.4	101	32	20
23	.89	7.3	6.0	6.0	45	17	15	33	5.3	90	31	21
24	.89	6.7	5.9	6.0	35	16	15	32	5.1	85	30	22
25	.89	6.4	6.0	6.2	29	16	14	29	4.6	79	28	21
26	.95	6.3	6.0	6.1	25	16	334	27	4.4	71	25	19
27	.93	6.0	6.0	6.3	23	16	136	26	4.2	66	24	18
28	1.6	6.3	6.0	6.4	23	17	82	24	4.1	61	23	18
29	2.0	6.2	6.0	6.6	---	17	65	23	3.9	58	23	17
30	3.8	7.8	6.0	6.5	---	21	57	23	3.8	54	23	17
31	6.3	---	5.9	6.3	---	20	---	23	---	54	23	---
TOTAL	29.98	176.8	200.9	195.6	420.2	637	1129	1549	287.9	2248.7	1471	624
MEAN	.97	5.89	6.48	6.31	15.0	20.5	37.6	50.0	9.60	72.5	47.5	20.8
MAX	6.3	13	8.2	6.9	63	29	334	144	21	599	117	24
MIN	.11	3.1	5.9	5.8	5.7	16	14	23	3.8	2.9	23	17
AC-FT	59	351	398	388	833	1260	2240	3070	571	4460	2920	1240
CFSM	.01	.05	.05	.05	.12	.16	.30	.40	.08	.58	.38	.17
IN.	.01	.05	.06	.06	.12	.19	.33	.46	.08	.66	.43	.18

CAL YR 1989 TOTAL 1994.86 MEAN 5.47 MAX 29 MIN .11 AC-FT 3960 CFSM .04 IN. .59
WTR YR 1990 TOTAL 8970.08 MEAN 24.6 MAX 599 MIN .11 AC-FT 17790 CFSM .20 IN. 2.65

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

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 02...	1356	8.4	378	8.1	15.0	3	0.50	10.0	105	1.2	K10	K17
MAY 18...	1426	40	399	8.0	26.0	3	0.40	7.4	96	1.0	--	K4
AUG 24...	1301	30	377	7.9	29.5	1	5.3	7.5	104	1.4	K10	K5

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB 02...	190	31	55	13	7.0	0.2	0.50	160	20	11	0.10	8.2
MAY 18...	190	14	55	13	6.5	0.2	0.60	180	10	12	0.20	11
AUG 24...	180	18	53	12	6.1	0.2	0.80	160	15	9.8	0.50	12

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (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)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
FEB 02...	211	9	1	8	<0.010	0.500	<0.010	0.40	<0.010	0.8	<1	34
MAY 18...	214	4	4	0	<0.010	0.800	<0.010	0.30	<0.010	1.6	--	--
AUG 24...	208	2	2	0	<0.010	0.600	0.020	<0.20	0.010	1.8	<1	37

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
FEB 02...	<0.5	<1.0	<5	<3	<10	<3	<10	<4	<1	<0.1	<10	<10
MAY 18...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	<0.5	2.0	<5	<3	<10	<3	<10	8	1	<0.1	<10	<10

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	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)
FEB 02...	<1	<1.0	370	<6	9	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 18...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	<1	<1.0	360	<6	3	<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)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 02...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 18...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	<0.01	<0.010	<0.01	<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 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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											
02...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
18...	--	--	--	--	--	--	--	--	--	--	--
AUG											
24...	<0.01	<0.01	<0.01	<0.1	<0.01	--	<1	<0.01	--	--	--

08197500 FRIO RIVER BELOW DRY FRIO RIVER NEAR UVALDE, TX

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

DRAINAGE AREA.--631 mi².

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

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

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

REMARKS.--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.--38 years, 33.2 ft³/s (24,050 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)
May 3	1730	*4,690	*8.31	Aug. 3	2230	2,690	7.09
July 19	0330	2,250	6.77				

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
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	938	.00	.00	261	.00
4	.00	.00	.00	.00	.00	.00	.00	698	.00	.00	781	.00
5	.00	.00	.00	.00	.00	.00	.00	178	.00	.00	160	.00
6	.00	.00	.00	.00	.00	.00	.00	74	.00	.00	69	.00
7	.00	.00	.00	.00	.00	.00	.00	23	.00	.00	27	.00
8	.00	.00	.00	.00	.00	.00	.00	3.2	.00	.00	6.2	.00
9	.00	.00	.00	.00	.00	.00	.00	.78	.00	.00	.52	.00
10	.00	.00	.00	.00	.00	.00	.00	.04	.00	.00	.03	.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	2.0	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	336	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	1240	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	274	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	99	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	35	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	6.4	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.36	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1915.02	0.00	1992.92	1304.75	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	61.8	.000	64.3	42.1	.000
MAX	.00	.00	.00	.00	.00	.00	.00	938	.00	1240	781	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	3800	.00	3950	2590	.00

CAL YR 1989 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .00
WTR YR 1990 TOTAL 5212.69 MEAN 14.3 MAX 1240 MIN .00 AC-FT 10340

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

AVERAGE DISCHARGE.--48 years, 59.1 ft³/s (3.90 in/yr), 42,820 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 17	2030	1,160	6.80	July 18	1630	*10,300	*12.20

Minimum daily discharge, 0.01 ft³/s Oct. 3-6, 12-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	7.0	10	8.8	e12	19	26	42	45	14	123	58
2	.02	5.3	10	8.8	e11	21	30	133	42	14	117	58
3	.01	4.2	10	8.8	e10	23	27	354	40	14	322	60
4	.01	3.7	8.9	8.8	e9.4	23	26	206	38	13	221	58
5	.01	3.4	8.8	8.8	9.0	23	26	145	37	12	171	58
6	.01	3.4	8.8	8.8	8.8	23	25	123	35	11	150	55
7	.02	3.3	8.8	9.1	8.8	23	23	106	33	11	139	54
8	.02	2.9	8.4	9.0	8.8	23	23	99	32	12	133	52
9	.02	3.4	8.8	8.6	8.8	23	23	94	30	13	131	50
10	.02	3.4	8.5	e8.3	8.8	22	23	87	30	11	122	64
11	.02	3.4	8.8	e8.1	8.8	22	23	81	29	11	116	71
12	.01	3.5	7.9	e8.0	9.1	22	23	81	29	11	112	70
13	.01	6.9	8.6	e8.0	10	22	23	77	27	12	107	65
14	.01	8.8	9.2	e8.2	10	26	23	73	27	11	105	60
15	.01	8.8	8.8	e8.4	10	27	23	71	26	14	104	58
16	.01	8.1	8.8	e8.5	9.6	26	23	69	26	288	98	56
17	.01	6.9	8.8	e8.5	9.6	24	27	67	24	420	97	57
18	.01	6.7	8.8	e8.4	9.6	24	36	65	23	2640	94	56
19	.01	6.7	8.8	e8.6	9.6	24	37	65	22	979	89	56
20	.01	7.4	8.8	e8.3	9.6	23	36	63	22	421	87	60
21	.01	8.1	8.8	e8.1	23	23	33	60	21	288	81	56
22	.01	9.3	8.8	e7.9	19	23	31	59	20	228	79	54
23	.01	8.8	8.3	e7.8	22	23	30	58	19	207	77	78
24	.01	8.8	8.6	e7.8	20	23	28	54	18	204	75	70
25	.01	8.8	9.2	e8.0	18	23	27	54	18	187	71	63
26	.01	9.1	9.6	e8.0	17	23	58	51	17	165	69	61
27	.01	9.9	9.6	e8.2	17	23	60	49	17	153	67	58
28	.02	9.9	9.6	e8.4	17	23	53	48	16	144	65	56
29	23	9.6	8.8	e8.5	---	24	48	46	16	135	63	54
30	20	10	8.8	e8.2	---	27	44	46	15	126	62	52
31	14	---	8.8	e8.0	---	27	---	46	---	123	60	---
TOTAL	57.36	199.5	277.2	259.7	344.3	725	938	2672	794	6892	3407	1778
MEAN	1.85	6.65	8.94	8.38	12.3	23.4	31.3	86.2	26.5	222	110	59.3
MAX	23	10	10	9.1	23	27	60	354	45	2640	322	78
MIN	.01	2.9	7.9	7.8	8.8	19	23	42	15	11	60	50
AC-FT	114	396	550	515	683	1440	1860	5300	1570	13670	6760	3530
CFSM	.01	.03	.04	.04	.06	.11	.15	.42	.13	1.08	.53	.29
IN.	.01	.04	.05	.05	.06	.13	.17	.48	.14	1.24	.62	.32

CAL YR 1989 TOTAL 3930.86 MEAN 10.8 MAX 77 MIN .01 AC-FT 7800 CFSM .05 IN. .71
WTR YR 1990 TOTAL 18344.06 MEAN 50.3 MAX 2640 MIN .01 AC-FT 36390 CFSM .24 IN. 3.31

e Estimated

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 07...	0937	8.8	482	7.9	13.0	2	0.50	9.6	95	0.7	22	56
MAY 22...	1748	59	466	7.9	26.5	<1	0.20	7.7	100	0.9	K5	39
AUG 29...	1509	64	450	7.9	27.5	3	0.30	7.3	97	0.6	51	23

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB 07...	240	36	73	14	9.1	0.3	1.1	200	40	14	0.20	11
MAY 22...	240	35	72	14	8.1	0.2	0.90	200	31	10	0.20	13
AUG 29...	230	19	69	13	8.2	0.2	1.0	210	27	10	0.20	14

DATE	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, AMMONIA + 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)
FEB 07...	285	<1	<1	--	<0.010	0.200	0.010	<0.20	0.500	0.6	<1	35
MAY 22...	270	<1	<1	0.390	0.010	0.400	<0.010	<0.20	<0.010	0.9	--	--
AUG 29...	267	<1	<1	--	<0.010	0.400	0.010	<0.20	<0.010	1.2	<1	35

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
FEB 07...	<0.5	<1.0	<5	<3	<10	4	<10	5	1	<0.1	<10	<10
MAY 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	<0.5	<1.0	<5	<3	<10	<3	<10	9	<1	<0.1	<10	<10

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	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)
FEB 07...	<1	<1.0	370	<6	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	<1	<1.0	330	<6	4	<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)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 07...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 22...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	<0.01	<0.010	<0.01	<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 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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											
07...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
22...	--	--	--	--	--	--	--	--	--	--	--
AUG											
29...	<0.01	<0.01	<0.01	<0.1	<0.01	<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 fair. 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.--38 years, 33.2 ft³/s (24,050 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 16	0130	196	5.83	July 18	0400	764	7.57
July 16	0700	1,730	9.40	July 18	2130	*8,830	*16.24
July 17	1000	200	5.85	Aug. 3	2330	229	5.99
July 17	1830	168	5.68				

Minimum daily discharge, 0.78 ft³/s Oct. 1-6, 11-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.78	1.1	1.4	1.0	1.3	1.4	1.1	1.5	1.4	.93	10	4.4
2	.78	1.1	1.5	1.0	1.2	1.1	1.2	1.5	1.3	.93	8.8	4.3
3	.78	1.1	1.5	1.0	1.1	1.1	1.1	1.8	1.3	.93	28	4.2
4	.78	1.1	1.4	1.0	1.1	1.1	1.1	1.6	1.3	.93	120	4.0
5	.78	1.1	1.4	1.0	1.2	1.1	1.1	1.5	1.3	.93	58	4.0
6	.78	1.1	1.4	1.1	1.3	1.1	1.1	1.5	1.3	.93	39	4.0
7	1.3	1.1	1.3	1.1	1.3	1.1	1.1	1.5	1.3	.93	28	3.9
8	1.0	1.2	1.3	1.1	1.3	1.1	1.1	1.5	1.3	.93	22	3.8
9	.86	1.2	1.3	1.1	1.1	1.1	1.1	1.4	1.2	.93	22	3.7
10	.81	1.2	1.3	1.1	1.0	1.1	1.1	1.4	1.2	.93	18	4.0
11	.78	1.2	1.2	1.1	1.0	1.1	1.1	1.4	1.2	.92	13	3.9
12	.78	1.2	1.1	1.0	1.0	1.1	1.1	1.3	1.3	.85	10	3.7
13	.78	1.1	1.1	1.0	1.1	1.1	1.1	1.3	1.2	.85	8.6	3.7
14	.78	1.1	1.1	1.0	1.1	1.3	1.1	1.3	1.2	.85	7.4	3.7
15	.78	1.1	1.1	1.0	1.1	1.2	1.1	1.3	1.2	1.3	6.6	3.7
16	.78	1.1	1.0	1.0	1.0	1.2	1.1	1.3	1.2	435	6.1	4.1
17	.78	1.1	1.0	1.0	1.0	1.2	1.1	1.3	1.2	96	5.8	4.1
18	.78	1.1	1.0	1.1	1.0	1.2	1.1	1.3	1.1	1650	5.7	3.9
19	.78	1.1	1.0	1.1	1.0	1.1	1.6	1.3	1.0	1550	5.6	4.0
20	.78	1.1	1.0	1.1	1.0	1.1	1.2	1.3	1.0	388	5.5	4.1
21	.78	1.1	.99	1.1	3.4	1.1	1.1	1.3	1.0	195	5.3	4.0
22	.78	1.4	.93	1.1	1.1	1.1	1.1	2.1	1.0	115	5.3	3.9
23	.78	1.3	.93	1.1	1.0	1.1	1.0	1.6	1.0	82	5.1	3.9
24	.78	1.3	.99	1.1	.95	1.1	1.0	1.6	.98	76	4.9	3.9
25	.78	1.3	1.0	1.1	.93	1.1	1.0	1.6	.93	63	4.6	3.9
26	.78	1.3	1.0	1.1	.93	1.1	5.5	1.5	.93	51	4.6	3.8
27	.78	1.3	1.0	1.1	.96	1.1	2.2	1.5	.93	38	4.6	3.6
28	2.5	1.3	1.0	1.1	1.0	1.1	1.7	1.5	.93	29	4.4	3.6
29	3.9	1.3	1.0	1.1	---	1.2	1.6	1.5	.93	22	4.3	3.6
30	1.8	1.6	1.0	1.2	---	2.0	1.5	1.5	.93	16	4.3	3.6
31	1.2	---	1.0	1.1	---	1.1	---	1.5	---	12	4.3	---
TOTAL	31.31	35.7	35.24	33.1	32.47	36.0	40.4	45.5	34.06	4832.07	479.8	117.0
MEAN	1.01	1.19	1.14	1.07	1.16	1.16	1.35	1.47	1.14	156	15.5	3.90
MAX	3.9	1.6	1.5	1.2	3.4	2.0	5.5	2.1	1.4	1650	120	4.4
MIN	.78	1.1	.93	1.0	.93	1.1	1.0	1.3	.93	.85	4.3	3.6
AC-FT	62	71	70	66	64	71	80	90	68	9580	952	232

CAL YR 1989 TOTAL 389.75 MEAN 1.07 MAX 3.9 MIN .12 AC-FT 773
WTR YR 1990 TOTAL 5752.65 MEAN 15.8 MAX 1650 MIN .78 AC-FT 11410

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 poor. There are several small diversions for irrigation above station.

AVERAGE DISCHARGE.--38 years, 39.7 ft³/s (5.64 in/yr), 28,760 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.
Maximum stage since at least 1907, that of June 17, 1958.

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

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
Oct. 28	0245	937	3.90	May 3	0515	2,780	5.68
Oct. 30	1145	1,180	4.23	July 17	1100	1,160	4.20
Apr. 17	2115	3,170	5.99	July 18	0945	*3,320	*6.11
Apr. 26	0700	1,390	4.48				

Minimum daily discharge, no flow Oct. 1-6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	17	6.0	3.8	6.8	15	22	58	36	9.5	45	20
2	.00	12	6.3	3.8	5.9	15	24	88	34	9.1	47	26
3	.00	9.7	5.6	4.6	3.9	15	23	638	32	8.5	61	20
4	.00	8.9	5.4	4.1	3.5	16	22	199	30	7.9	57	23
5	.00	8.7	5.3	3.8	3.5	15	22	154	29	7.5	49	23
6	.00	8.1	5.2	5.1	3.5	16	21	129	27	7.5	46	19
7	e.03	7.9	5.0	4.4	3.4	17	20	110	26	7.7	43	18
8	e.03	7.3	4.6	3.9	3.5	17	20	99	24	9.5	42	17
9	e.03	6.4	4.5	3.8	3.5	16	23	90	24	7.3	41	19
10	e.03	6.2	4.7	3.8	3.2	15	22	81	23	6.7	39	22
11	e.03	6.0	4.6	3.7	3.1	19	20	78	22	6.4	37	18
12	e.03	5.9	4.1	3.3	3.3	19	19	73	21	6.1	36	17
13	e.03	12	4.2	3.1	3.5	21	21	68	20	5.9	35	16
14	e.03	11	4.3	3.3	3.6	32	20	65	20	5.3	34	16
15	e.03	8.2	4.3	3.3	3.6	27	20	62	19	13	32	16
16	e.03	7.0	3.7	3.5	3.2	27	19	59	18	66	31	16
17	e.03	7.0	4.2	3.8	3.3	26	168	58	17	295	30	15
18	e.03	7.0	4.1	3.6	3.8	25	50	57	16	474	30	14
19	e.03	6.9	4.2	3.9	3.8	24	41	55	16	196	29	15
20	.03	6.7	4.1	3.4	3.8	23	38	53	15	129	28	16
21	e.03	6.6	4.1	3.3	18	23	33	52	14	101	27	15
22	e.02	8.9	2.5	3.2	12	24	31	51	14	84	26	14
23	e.02	6.6	3.8	3.3	9.5	23	30	49	13	76	27	26
24	e.02	6.4	4.0	3.3	9.1	23	29	47	13	74	25	24
25	e.02	6.1	4.1	3.1	9.2	22	29	46	12	66	24	20
26	e.02	6.0	4.0	2.8	9.0	22	281	44	12	59	23	19
27	e.02	5.8	3.9	3.0	9.1	22	85	42	11	55	22	18
28	B1	5.4	3.9	3.2	11	23	71	42	11	53	22	18
29	25	5.2	4.1	3.2	---	25	65	40	10	50	21	17
30	175	6.8	4.2	2.9	---	26	60	40	9.8	48	21	17
31	26	---	4.0	3.0	---	23	---	39	---	46	20	---
TOTAL	307.57	233.7	137.0	110.3	162.6	656	1349	2766	588.8	1989.9	1050	554
MEAN	9.92	7.79	4.42	3.56	5.81	21.2	45.0	89.2	19.6	64.2	33.9	18.5
MAX	175	17	6.3	5.1	18	32	281	638	36	474	61	26
MIN	.00	5.2	2.5	2.8	3.1	15	19	39	9.8	5.3	20	14
AC-FT	610	464	272	219	323	1300	2680	5490	1170	3950	2080	1100
CFSM	.10	.08	.05	.04	.06	.22	.47	.93	.21	.67	.35	.19
IN.	.12	.09	.05	.04	.06	.26	.52	1.08	.23	.77	.41	.22

CAL YR 1989	TOTAL	1672.84	MEAN	4.58	MAX	175	MIN	.00	AC-FT	3320	CFSM	.05	IN.	.65
WTR YR 1990	TOTAL	9904.87	MEAN	27.1	MAX	638	MIN	.00	AC-FT	19650	CFSM	.28	IN.	3.85

e Estimated

08200000 HONDO CREEK NEAR TARPLEY, TX--Continued

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 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
FEB 08...	1452	3.5	439	8.1	20.5	2	0.50	9.8	114	1.1	K1
MAY 25...	1517	46	416	8.1	30.5	<1	0.50	7.4	104	1.0	K5
AUG 31...	1500	20	380	8.1	32.5	3	0.70	7.7	112	1.1	K13

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 08...	K5	210	68	64	12	7.2	0.2	1.5	140	69	10
MAY 25...	31	210	35	66	10	6.8	0.2	0.90	170	32	8.8
AUG 31...	120	190	39	58	10	7.0	0.2	1.1	150	35	8.8

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)	RESIDUE FIXED NON FILTER-ABLE (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)
FEB 08...	0.20	6.5	256	<1	<1	--	--	<0.010	<0.100	0.020	0.28
MAY 25...	0.20	7.4	235	2	2	0	0.290	0.010	0.300	<0.010	--
AUG 31...	0.30	13	222	1	1	0	--	<0.010	<0.100	0.010	0.39

DATE	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)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
FEB 08...	0.30	<0.010	1.0	<1	30	<0.5	<1.0	<5	<3	<10	6
MAY 25...	<0.20	<0.010	1.1	--	--	--	--	--	--	--	--
AUG 31...	0.40	<0.010	2.0	<1	26	<0.5	<1.0	<5	<3	<10	8

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
FEB 08...	<10	5	1	<0.1	<10	<10	<1	<1.0	470	<6	<3
MAY 25...	--	--	--	--	--	--	--	--	--	--	--
AUG 31...	<10	9	3	<0.1	<10	<10	<1	<1.0	350	<6	<3

DATE	PCB, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)
FEB 08...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01
MAY 25...	--	--	--	--	--	--	--	--	--	--
AUG 31...	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010	<0.01

08200000 HONDO CREEK NEAR TARPLEY, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	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)	METHYL TRI-THION, TOTAL (UG/L)
FEB										
08...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
MAY										
25...	--	--	--	--	--	--	--	--	--	--
AUG										
31...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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										
08...	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY										
25...	--	--	--	--	--	--	--	--	--	--
AUG										
31...	<0.01	<0.01	<0.1	<0.01	<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.--No estimated daily discharges. 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.--30 years, 15.4 ft³/s (11,160 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)
Apr. 18	0200	*1,190	*4.09	May 3	1100	704	3.52
Apr. 26	1330	546	3.28	July 18	1600	669	3.47

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.05	.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	174	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	93	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	56	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	32	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	17	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	6.5	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	2.6	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.64	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.05	.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	178	.00	.00	149	.00	.00
19	.00	.00	.00	.00	.00	.00	7.0	.00	.00	125	.00	.00
20	.00	.00	.00	.00	.00	.00	2.3	.00	.00	63	.00	.00
21	.00	.00	.00	.00	.00	.00	.56	.00	.00	29	.00	.00
22	.00	.00	.00	.00	.00	.00	.06	.00	.00	8.1	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.8	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.64	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
26	.00	.00	.00	.00	.00	.00	113	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	28	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	6.0	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	2.1	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.61	.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	337.63	381.84	0.00	377.56	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	11.3	12.3	.000	12.2	.000	.000
MAX	.00	.00	.00	.00	.00	.00	178	174	.00	149	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	670	757	.00	749	.00	.00

CAL YR 1989	TOTAL	.00	MEAN	.00	MAX	.00	MIN	.00	AC-FT .00
WTR YR 1990	TOTAL	1097.03	MEAN	3.01	MAX	178	MIN	.00	AC-FT 2180

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

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

DRAINAGE AREA.--45.0 mi².

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Records good, except those for estimated daily discharges, which are fair. No known diversions above station.

AVERAGE DISCHARGE.--29 years, 18.9 ft³/s (5.70 in/yr), 13,690 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, 1964, 1989, and 1990.

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)
July 16	0130	2,500	4.82	Sept. 23	0530	694	3.36
July 17	1000	*2,880	*5.03				

Minimum daily discharge, no flow on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	6.5	2.8	1.8	2.9	7.1	8.5	19	9.5	1.8	40	24
2	.00	4.9	2.8	1.7	3.9	6.8	9.9	28	8.7	1.8	39	22
3	.00	3.9	2.6	1.8	1.8	6.3	8.5	147	8.4	1.8	117	14
4	.00	3.1	2.4	2.1	1.5	6.3	7.5	68	7.9	1.6	73	14
5	.00	2.8	2.4	1.8	1.3	6.3	7.5	55	7.4	1.5	60	13
6	.00	2.6	2.4	2.0	1.3	6.5	7.3	48	6.9	1.4	55	11
7	.02	2.4	2.2	2.4	1.3	8.7	6.5	44	6.3	1.5	49	11
8	.01	2.2	2.2	1.9	1.3	8.8	6.5	40	6.0	2.4	47	11
9	.00	2.0	2.2	1.7	1.2	8.4	6.7	38	5.7	2.1	45	16
10	.00	2.0	2.0	1.7	1.2	8.2	6.9	33	5.3	1.6	41	20
11	.01	2.0	2.2	1.7	1.2	9.4	6.2	32	5.3	1.4	38	19
12	.02	2.2	2.2	1.6	1.2	9.0	5.9	30	4.9	2.1	35	18
13	.02	8.8	2.0	1.3	1.2	9.0	6.4	27	4.6	3.2	33	14
14	.02	5.7	2.0	1.3	1.2	14	6.5	25	4.3	1.7	31	12
15	.02	3.6	e2.0	1.3	1.2	12	5.9	24	4.3	12	29	12
16	.02	2.8	e2.0	1.3	1.1	12	5.9	22	4.2	346	27	13
17	.02	2.8	e2.0	1.4	1.1	12	6.4	21	3.6	467	32	13
18	.01	2.8	2.0	1.5	1.1	12	7.9	20	3.4	202	27	11
19	.01	2.8	2.0	1.5	1.1	11	8.0	20	3.4	163	26	12
20	.01	2.8	2.0	1.5	1.1	9.9	7.2	18	3.1	116	24	13
21	.01	2.8	2.0	1.4	19	9.4	6.5	17	3.1	93	22	11
22	.01	2.8	3.0	1.3	5.3	9.4	6.2	16	2.9	78	21	10
23	.01	2.6	1.6	1.3	3.9	8.7	5.9	15	2.8	68	20	135
24	.01	2.6	1.5	1.3	3.5	8.2	5.9	14	2.8	71	19	43
25	.00	2.6	2.1	1.1	3.2	7.8	5.9	14	2.3	65	18	38
26	.00	2.6	2.1	1.1	2.8	7.8	70	13	2.2	55	17	36
27	.01	2.6	2.0	1.1	2.8	7.8	25	13	2.2	51	16	33
28	37	2.4	2.0	1.1	5.4	8.3	22	11	2.1	47	16	31
29	21	2.4	2.0	1.2	---	8.4	21	11	2.0	45	15	31
30	50	2.6	2.0	1.2	---	12	20	11	1.8	42	14	29
31	12	---	2.0	1.2	---	9.0	---	11	---	40	13	---
TOTAL	120.24	94.7	66.7	46.6	75.1	280.5	330.5	905	137.4	1986.9	1059	690
MEAN	3.88	3.16	2.15	1.50	2.68	9.05	11.0	29.2	4.58	64.1	34.2	23.0
MAX	50	8.8	3.0	2.4	19	14	70	147	9.5	467	117	135
MIN	.00	2.0	1.5	1.1	1.1	6.3	5.9	11	1.8	1.4	13	10
AC-FT	238	188	132	92	149	556	656	1800	273	3940	2100	1370
CFSM	.09	.07	.05	.03	.06	.20	.24	.65	.10	1.42	.76	.51
IN.	.10	.08	.06	.04	.06	.23	.27	.75	.11	1.64	.88	.57

CAL YR 1989	TOTAL	572.62	MEAN	1.57	MAX	50	MIN	.00	AC-FT	1140	CFSM	.03	IN.	.47
WTR YR 1990	TOTAL	5792.64	MEAN	15.9	MAX	467	MIN	.00	AC-FT	11490	CFSM	.35	IN.	4.79

e Estimated

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

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
FEB 07...	1708	1.3	439	8.4	17.5	2	0.60	10.6	116	0.9	20	20
MAY 24...	1537	15	408	8.1	33.0	3	0.40	7.7	113	0.8	K1	K9
AUG 30...	1458	14	392	8.1	33.5	2	0.40	8.1	120	0.7	K1	34

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	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 DIS FIX END FIELD CACO3 (MG/L)	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)
FEB 07...	210	78	65	12	7.0	0.2	1.3	130	79	11	0.20	7.3
MAY 24...	190	50	59	11	7.0	0.2	0.90	140	45	11	0.20	12
AUG 30...	190	37	59	10	7.5	0.2	0.90	150	31	10	0.30	15

DATE	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)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
FEB 07...	264	<1	<1	--	<0.010	0.100	0.010	<0.20	<0.010	0.8	<1	28
MAY 24...	232	3	3	0	<0.010	0.300	<0.010	<0.20	<0.010	1.2	--	--
AUG 30...	225	1	1	0	<0.010	0.300	<0.010	0.30	<0.010	1.8	<1	28

DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
FEB 07...	<0.5	<1.0	<5	<3	<10	<3	<10	5	<1	<0.1	<10	<10
MAY 24...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 30...	<0.5	<1.0	<5	<3	<10	5	<10	7	1	<0.1	<10	<10

DATE	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	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)
FEB 07...	<1	<1.0	440	<6	<3	<0.1	<0.10	<0.010	<0.1	<0.010	<0.010	<0.010
MAY 24...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 30...	<1	1.0	380	<6	5	<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)	DI-SYSTON TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 07...	<0.01	<0.010	<0.01	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
MAY 24...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 30...	<0.01	<0.010	<0.01	<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 1989 TO SEPTEMBER 1990

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE OTAL (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											
07...	<0.01	<0.01	<0.01	<0.1	<0.01	<0.01	<1	<0.01	<0.01	<0.01	<0.01
MAY											
24...	--	--	--	--	--	--	--	--	--	--	--
AUG											
30...	<0.01	<0.01	<0.01	<0.1	<0.01	<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.--29 years (water years 1962-90), 8.55 ft³/s (6,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,800 ft³/s May 29, 1987 (gage height, 28.20 ft), from rating curve extended above 25,100 ft³/s on basis of slope-area measurement of 35,800 ft³/s; no flow most of time each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, 35.7 ft May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft; September 1919, 28 ft; July 2, 1932, 28.2 ft (discharge, 35,800 ft³/s), by slope-area measurement; and June 17, 1958, 32.4 ft.

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

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
July 16	1000	886	10.25	July 17	1530	*3,730	*12.88

Minimum daily discharge, no flow most of year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
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	181	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	589	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	86	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.1	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.5	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.38	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.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
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	862.01	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	27.8	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	589	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	1710	.00	.00

CAL YR 1989 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .00
WTR YR 1990 TOTAL 862.01 MEAN 2.36 MAX 589 MIN .00 AC-FT 1710

NUECES RIVER BASIN

08204000 LEONA RIVER SPRINGFLOW 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, 1984-85, and 1990.

DISCHARGE MEASUREMENTS, CUBIC FEET PER SECOND
WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990

Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)	Date	Discharge (ft^3/s)
Oct. 16, 1989	4.5	Jan. 31, 1990	1.9	May 15, 1990	3.4
Dec. 14,	6.5	Mar. 30	3.3	July 9	0.0
				Aug. 23	3.1

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 ft and is equivalent to 43,560 ft^3 (cubic feet), about 326,000 gal (gallons), or 1,233 m^3.

bacteria (COLS./100 ML) are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped in colonies. Some bacteria cause disease, while 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 that ferment lactose with gas formation within 24 hours at 35 °C. In the laboratory these bacteria are defined as all organisms that 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 that 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 also in the 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 organisms that produce red or pink colonies within 48 hours at 35 °C ±1.0 °C on KF-streptococcus 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.

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 mg/L 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. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

control designates a feature downstream from the 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 (ft^3/s) is the rate of discharge representing a volume of 1 ft^3 passing a given point during 1 second and is equivalent to 7.48 gal/s (gallons per second), or 448.8 gal/min, or 0.02832 m^3/s.

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.

DEG C is an abbreviation for degrees Celsius.

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 that 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 specified.

drainage basin is a part of the surface of the earth that is occupied by a drainage system, that consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

duty is that amount of water applied to a particular crop in a year when the seasonal precipitation occurrences and crop needs are taken into account, usually measured in acre-inches.

G/M is an abbreviation for gallon per minute.

gage height 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 µg/L is equivalent to 1 mg/L.

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 dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (mean sea level) 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. 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.

nephelometric turbidity unit (NTU) is the reporting unit for turbidity.

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.

PCI/L, pCi/L is the notation for picocuries per liter and is equal to 3.7×10^{-2} radioactive nuclide disintegrations per second per liter.

pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides and herbicides, which control insects and plants, respectively, and are the two categories reported.

polychlorinated biphenyls (PCB's) 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 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 is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those that can be used for irrigation on almost all soils to those that are generally unsatisfactory for irrigation.

solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

specific conductance (US/CM) 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 of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance. 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 volume 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 is 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 are 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 is 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 a water-suspended sediment mixture and that the analytical method determined 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 are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

tritium unit (TU) 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 hydrologic-data reports (WRD was used as an abbreviation for "Water Resources Data" in reports published prior to 1976).

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-foot (acre-ft)	1,233	cubic meter (m^3)
	0.001233	cubic hectometer (hm^3)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
foot (ft)	0.3048	meter (m)
gallon per minute (gal/min)	0.06308	liter per second (L/s)
inch (in.)	25.4	millimeter (mm)
mile (mi)	1.609	kilometer (km)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)
million gallons per year (Mgal/yr)	3,785	cubic meter per year (m^3/yr)
square mile (mi^2)	2.590	square kilometer (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 Livingston and others (1936); George (1952); Lang (1954); Petitt and George (1956); Arnow (1959); Holt (1959); Bennett and Sayre (1962); Garza (1962, 1966); Welder and Reeves (1962); DeCook (1963); and Maclay and Small (1976). 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-December 1980 were reported by Reeves, Maclay, and Davis (1982); for January-December 1981 were reported by Reeves, Maclay, and Ozuna (1984); for January-December 1982 and January 1983 to December 1984 were reported by Reeves and Ozuna (1985, 1986); for January-December 1985 were reported by Ozuna, Nalley, and Bowman (1987); for January-December 1986 were reported by Ozuna, Nalley, and Stein (1988); for January-December 1987 were reported by Nalley and Rettman (1988);

for January-December 1988 were reported by Nalley (1989); and for January-December 1989 were reported by Nalley and Thomas (1990).

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. A number inside parentheses is a number assigned to the well in some publication prior to 1978.

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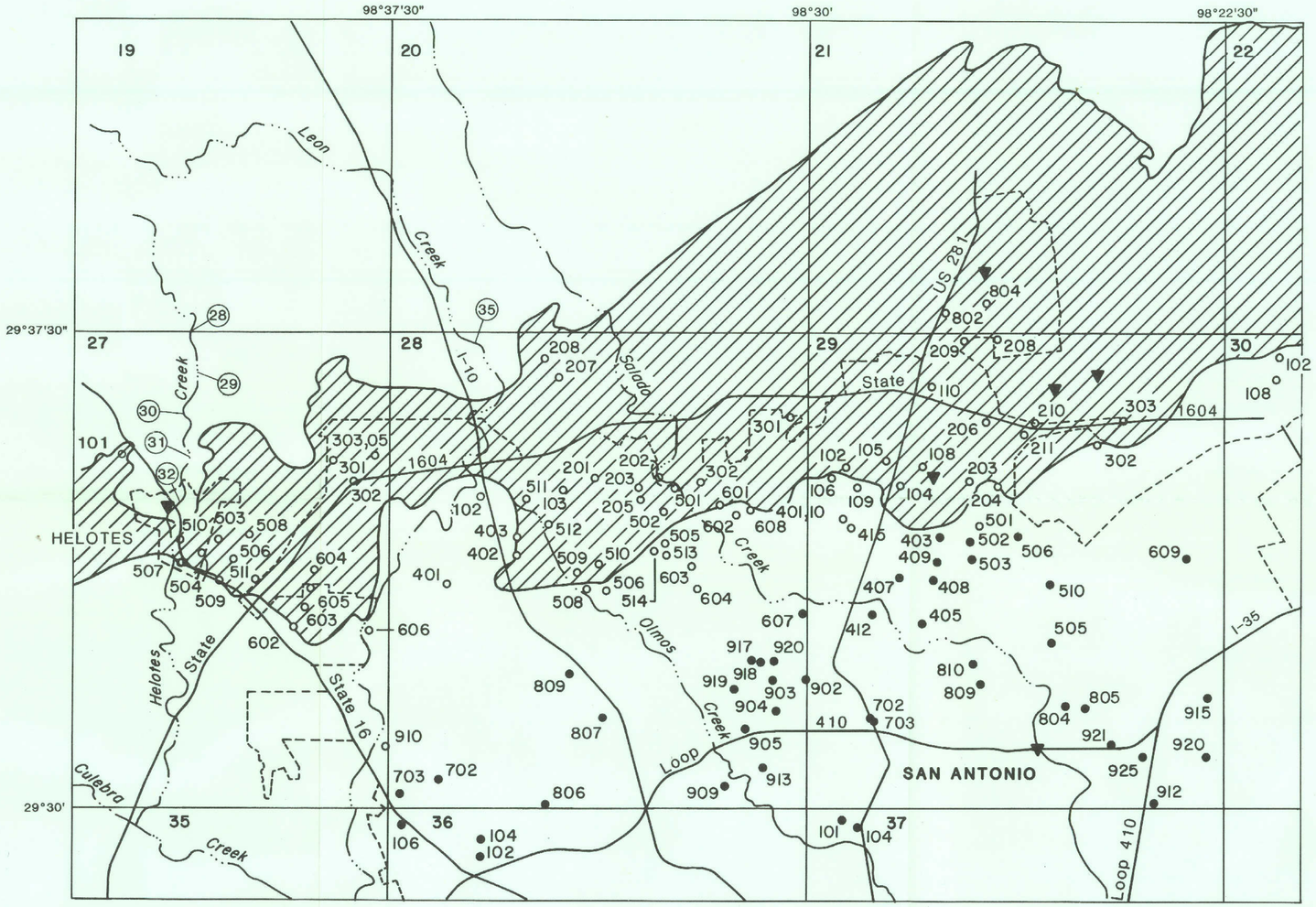


EXPLANATION

- RECHARGE ZONE OF THE EDWARDS AQUIFER (As delineated in Texas Water Commission Rules 313.1-313.11)
- ○ WELL LOCATION IN WATER-TABLE ZONE OF AQUIFER
- ● WELL LOCATION IN ARTESIAN ZONE OF AQUIFER
- (35) MISCELLANEOUS SAMPLING SITE (See Reeves, 1976, Table 2)
- ▼ WATER-QUALITY GAGING STATION
- 202 LAST THREE DIGITS OF STATE WELL-NUMBERING SYSTEM
- ---- CITY LIMITS OF SAN ANTONIO

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--wells, springs, and streams--in the northern San Antonio area sampled during 1972-90.

SAN ANTONIO

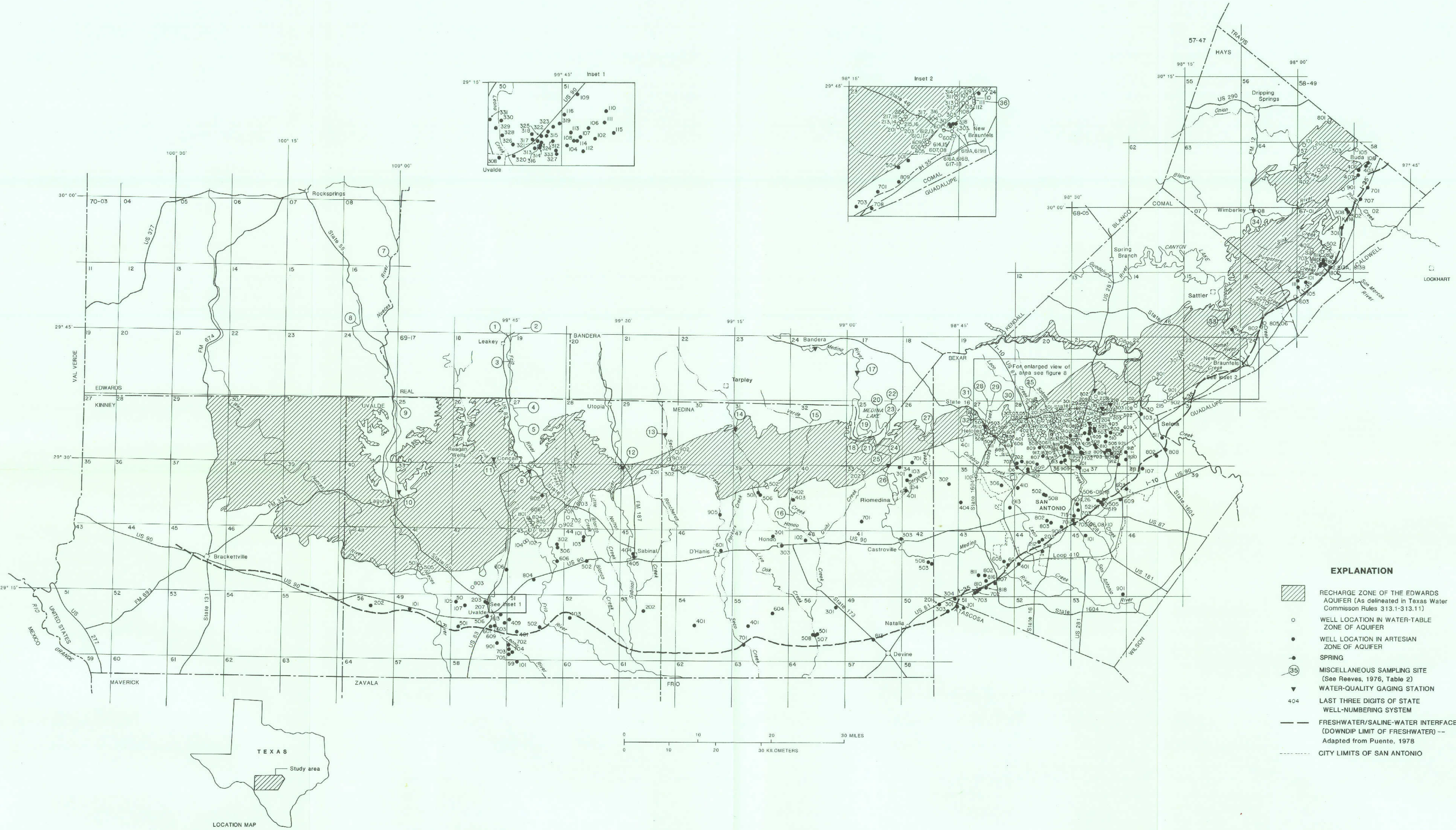
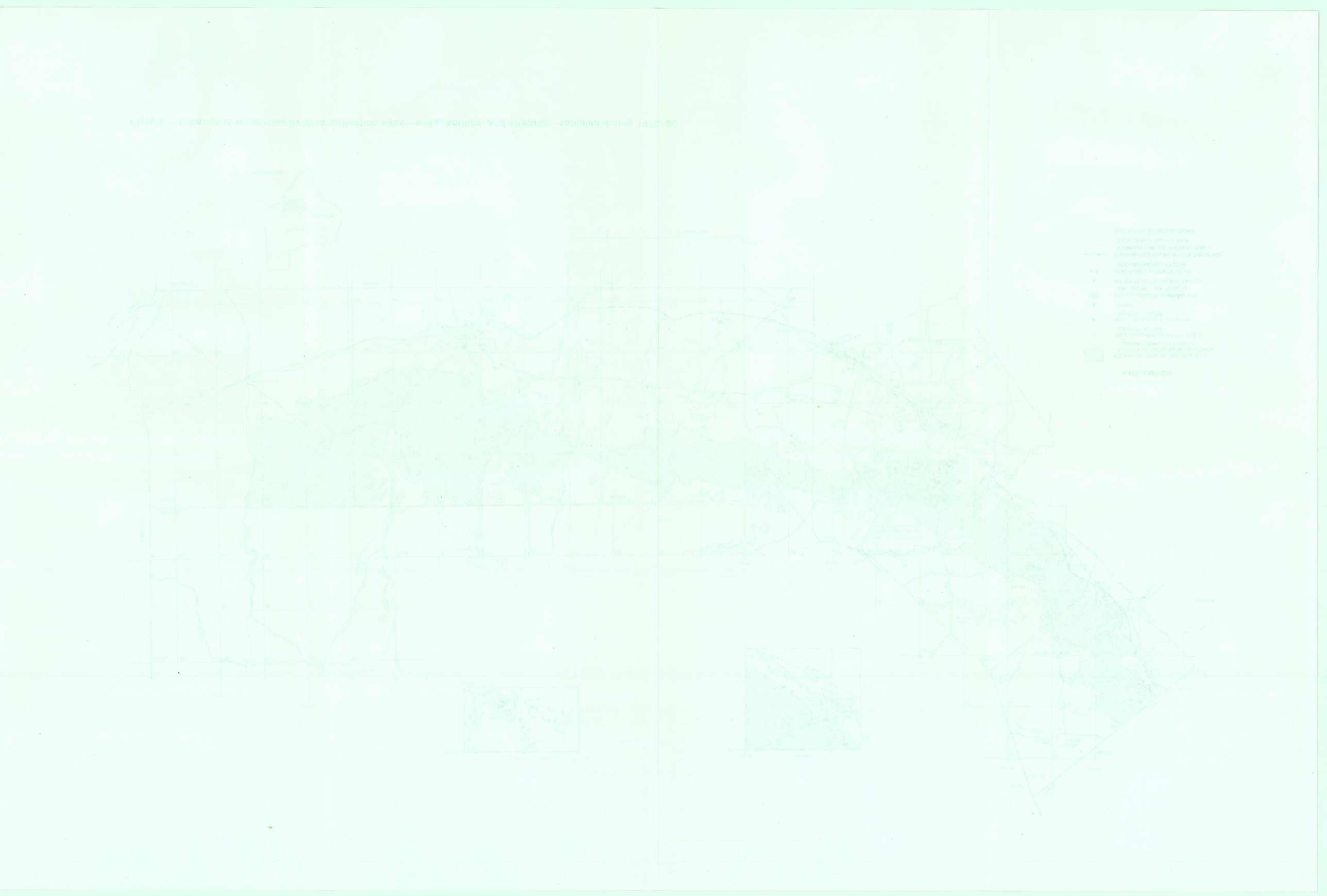


Plate 5.--Location of water-quality data-collection sites--wells, springs, and streams--sampled during 1972-90.



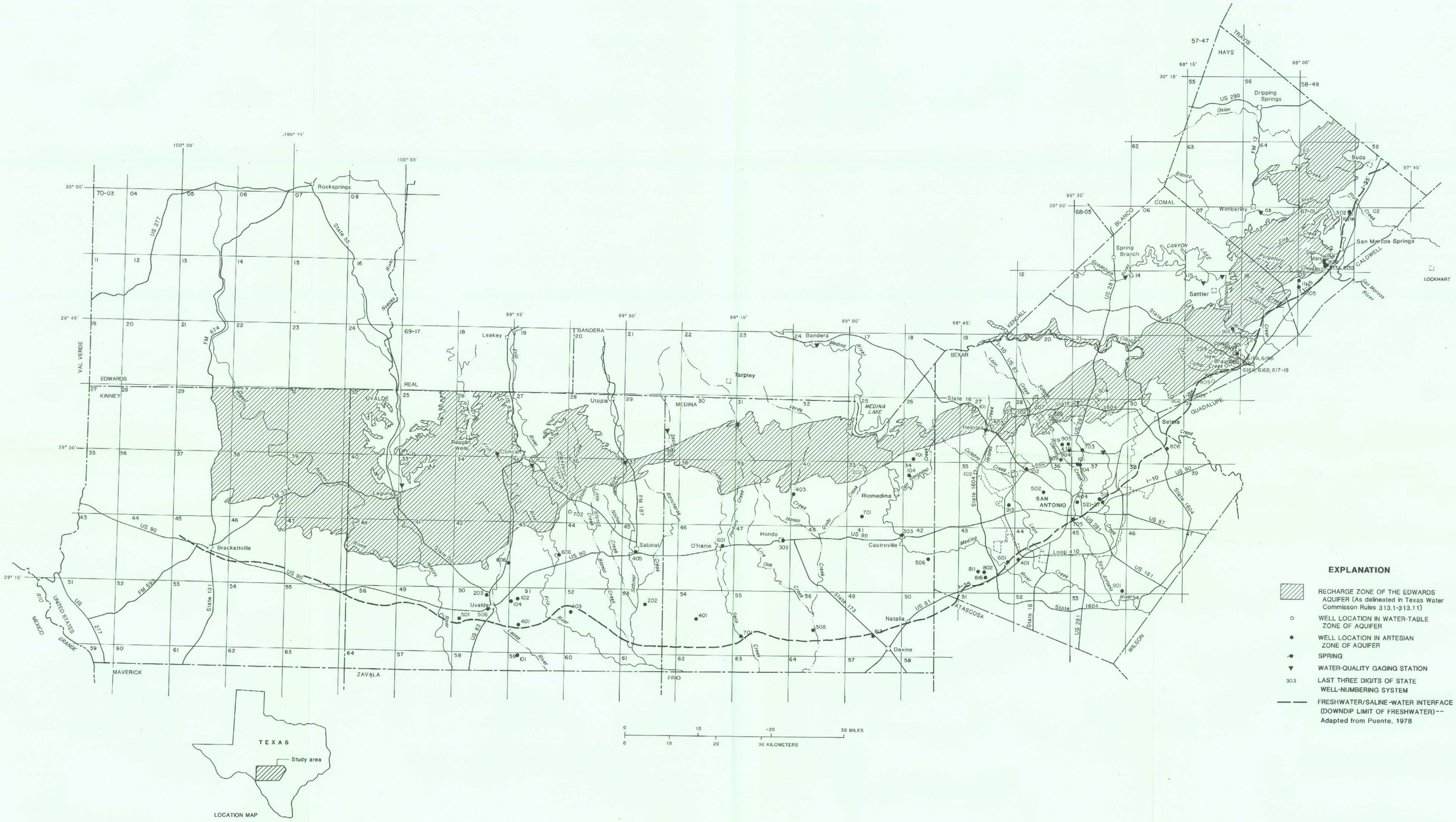
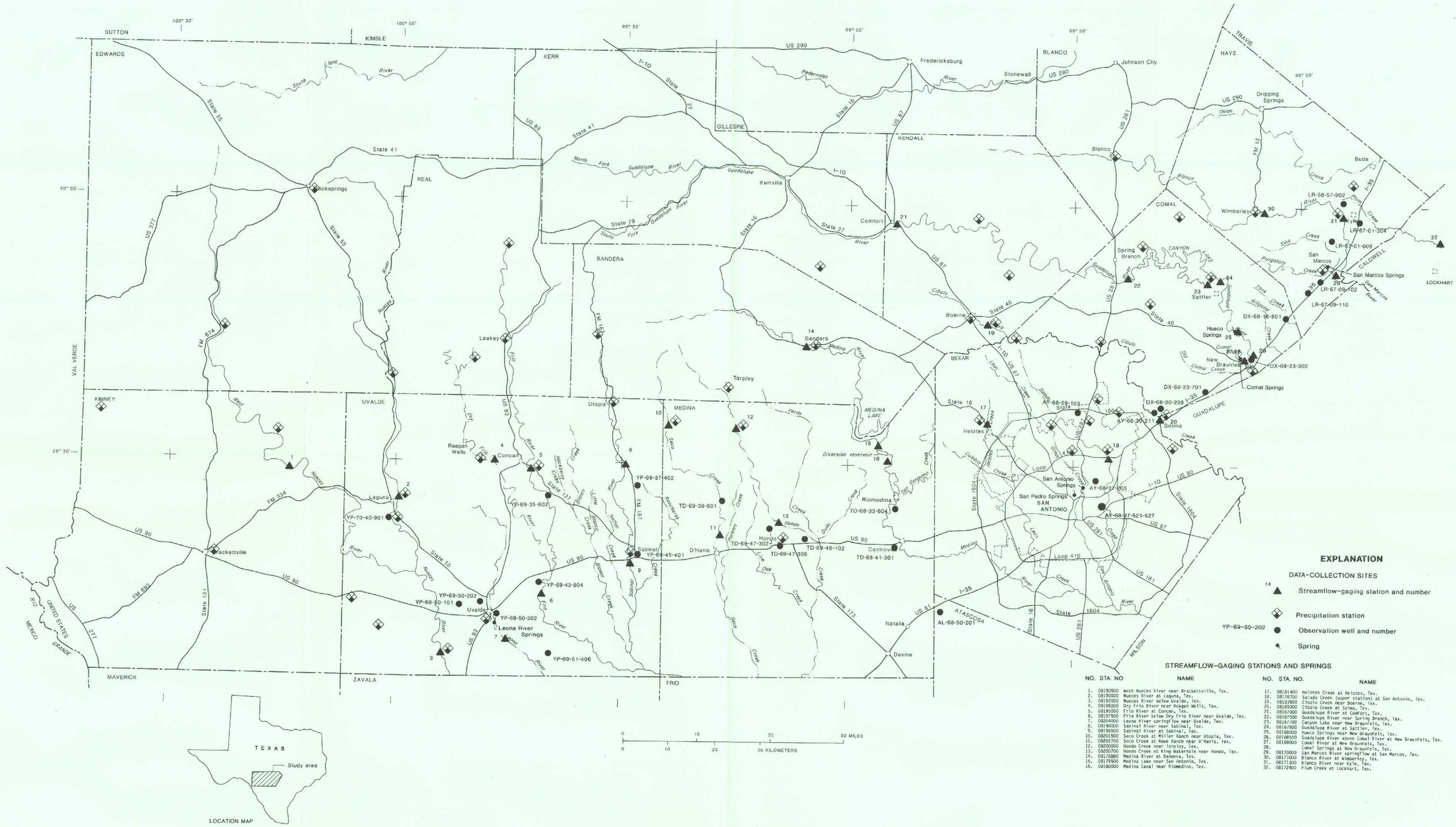


Plate 4.--Location of water-quality data-collection sites--wells, springs, and streams--sampled in 1990.

Plate 4.—Location of water-quality data-collection sites—wells, springs, and streams—sampled in 1980.



EXPLANATION

DATA-COLLECTION SITES

14 ▲ Streamflow-gaging station and number

◈ Precipitation station

YP-69-50-202 ● Observation well and number

• Spring

STREAMFLOW-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 springflow 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.	08178700	Salado Creek (upper station) at San Antonio, Tex.
19.	08183900	Cibolo Creek near Boerne, Tex.
20.	08185000	Cibolo Creek at Selma, Tex.
21.	08167000	Guadalupe River at Comfort, Tex.
22.	08167500	Guadalupe River near Spring Branch, Tex.
23.	08167700	Canyon Lake near New Braunfels, Tex.
24.	08167800	Guadalupe River at Sattler, Tex.
25.	08168000	Hueco Springs near New Braunfels, Tex.
26.	08168500	Guadalupe River above Comal River at New Braunfels, Tex.
27.	08169000	Comal River at New Braunfels, Tex.
28.		Comal Springs at New Braunfels, Tex.
29.	08170000	San Marcos River springflow at San Marcos, Tex.
30.	08171000	Blanco River at Wimberley, Tex.
31.	08171300	Blanco River near Kyle, Tex.
32.	08172400	Plum Creek at Lockhart, Tex.

Plate 3.--Location of data-collection sites--streamflow-gaging and precipitation stations, observation wells, and springs, 1990.

Plate 3.--Location of data-collection sites--streamflow-gaging and precipitation stations, observation wells, and springs, 1980.

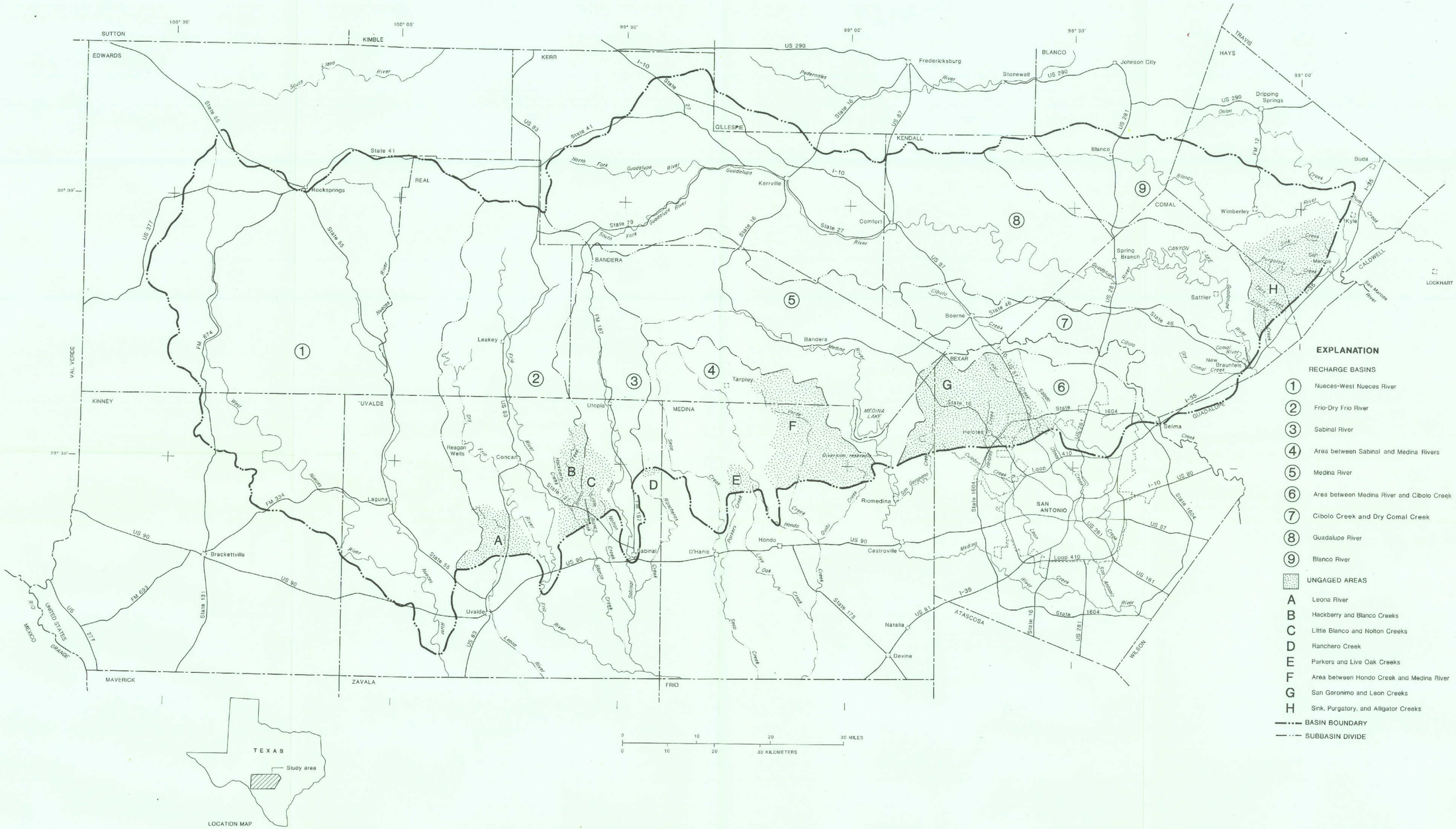


Plate 2.--Location of recharge basins and ungaged areas.

Plate 2.—Location of recharge basins and ungaged areas.

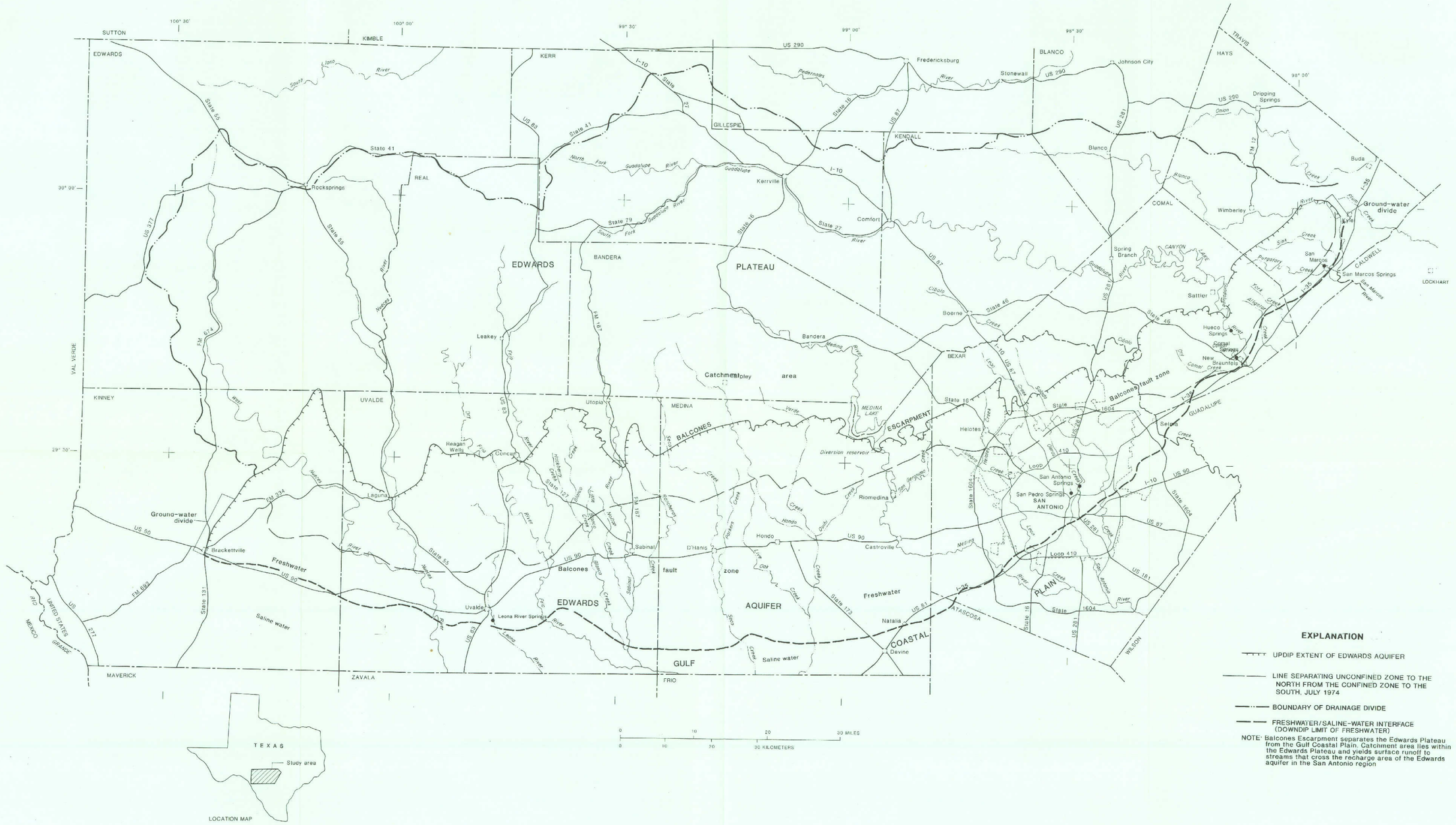


Plate 1.--Location of the Edwards aquifer and physiographic regions in the San Antonio area.