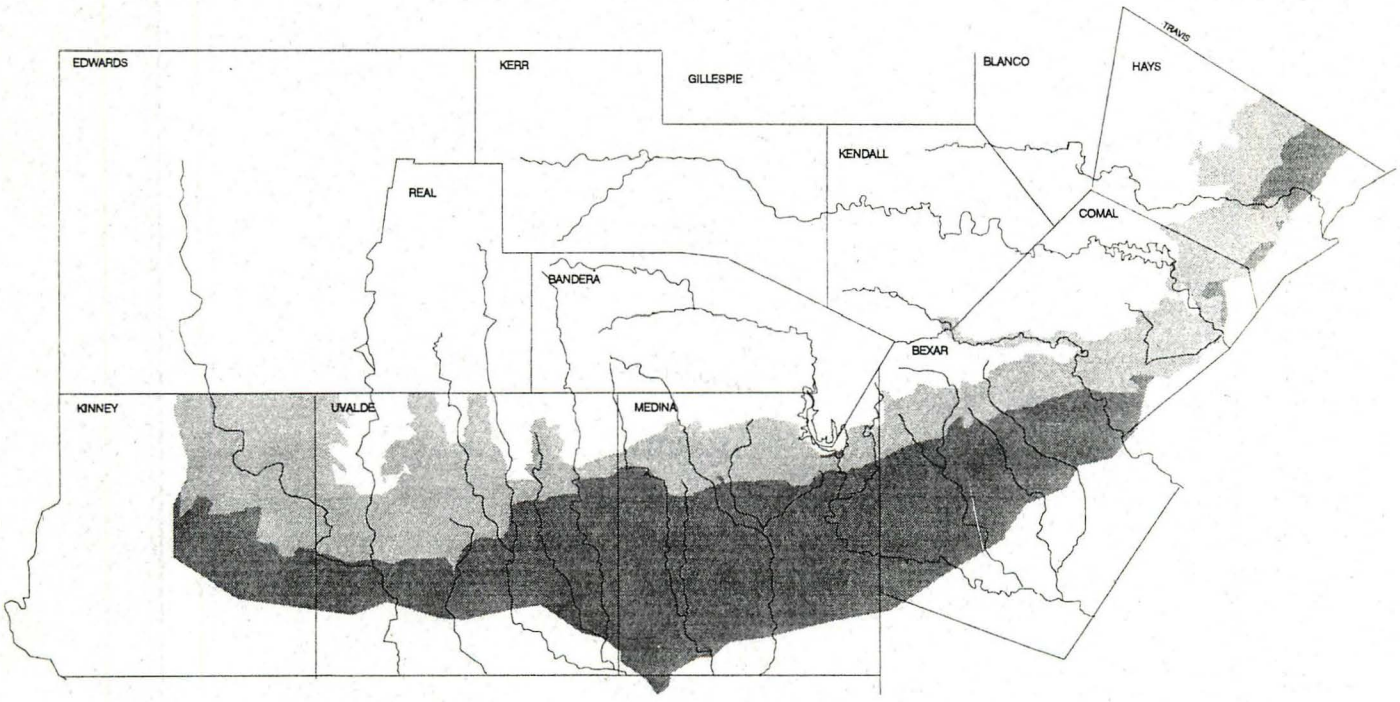
EDWARDS UNDERGROUND
WATER DISTRICT

Report 95-07

EDWARDS AQUIFER HYDROGEOLOGIC REPORT FOR 1994



Prepared by: Division of Field Operations

EDWARDS UNDERGROUND WATER DISTRICT

1615 N. St. Marys
San Antonio, Texas 78215

EDWARDS AQUIFER HYDROGEOLOGIC REPORT FOR 1994

Compiled by:

Steven D. Walthour, Hydrologist III
John R. Waugh, Hydrologist II
Jim O'Connor, Hydrologist I

Robert W Bader, Division Manager
Field Operations Division

Edwards Underground Water District

June 1995

TABLE OF CONTENTS

1.0	INTRODUCTION	5
2.0	WATER LEVELS	7
3.0	PRECIPITATION	13
4.0	GROUNDWATER RECHARGE	19
5.0	GROUNDWATER DISCHARGE AND USAGE	25
6.0	WATER QUALITY	33
7.0	SUMMARY	53
8.0	DEFINITIONS	55
9.0	REFERENCES	59
10.0	APPENDICES	61
	Appendix 10.1	63
	Appendix 10.2	93

LIST OF TABLES

Table 2.1	Annual water level highs and lows for selected index wells in the San Antonio area of the Edwards aquifer, 1934-1994.	9
Table 3.1	Annual precipitation for selected rain gauges in the Edwards aquifer region, 1934-1994.	16
Table 3.2	Monthly precipitation data from Edwards Underground Water District rain gauge network and National Oceanic and Atmospheric Administration precipitation gauging stations, 1994.	17
Table 4.1	Drainage basins which cross the Edwards aquifer recharge zone.	19
Table 4.2	Estimated annual groundwater recharge to the Edwards aquifer by river basin, 1934-1994.	21
Table 4.3	Monthly groundwater recharge at Edwards Underground Water District recharge projects, 1994.	23
Table 4.4	Estimated annual Edwards aquifer recharge from Edwards Underground Water District recharge projects.	23
Table 5.1	Annual estimated groundwater discharge data by county for the Edwards aquifer, 1934-1994.	28
Table 5.2	Estimated spring discharge from the Edwards aquifer, 1994.	29
Table 5.3	Groundwater discharge from the Edwards aquifer, 1994.	33
Table 5.4	Annual estimated Edwards aquifer discharge by use, 1955-1994.	33
Table 6.1	Groundwater quality standards.	36
Table 6.2	Volatile organic components.	38
Table 6.3	Classification of groundwater quality based on TDS (total dissolved solids).	39
Table 6.4	Water quality data - flow tests and packer tests, South Medina County Observation Well, 1993.	44
Table 6.5	Water quality data compiled from transect wells in San Antonio and in New Braunfels compared to water level at Bexar County index well (J-17, Dodd Field).	46
Table 6.6	Secondary drinking water standards.	50

LIST OF FIGURES

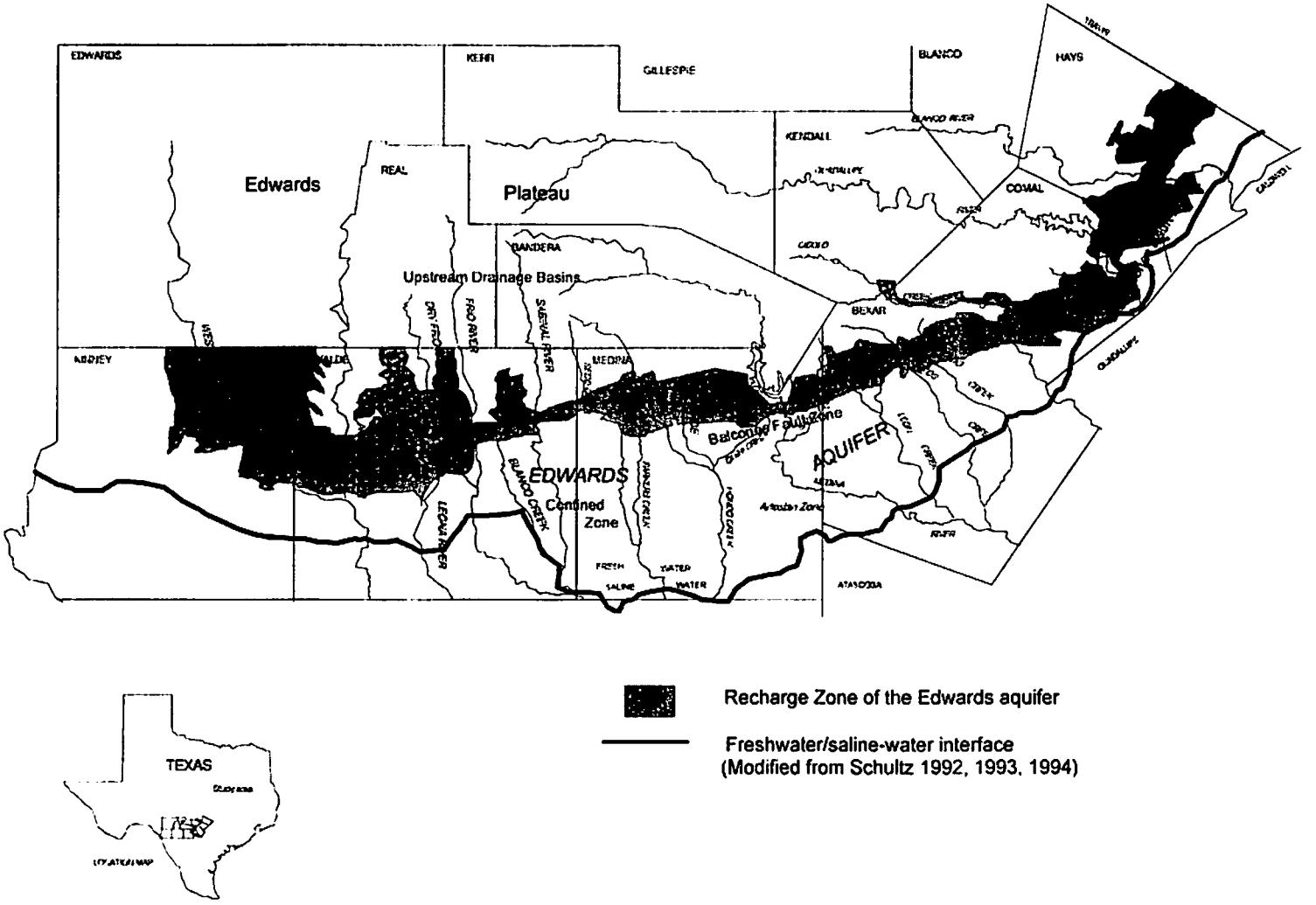
Figure 1.1	Edwards aquifer and other physiographic features in the San Antonio area.	**6**
Figure 2.1	Edwards Underground Water District water level observation network.	**8**
Figure 2.2	Water levels in the Edwards aquifer (Bexar County Index Well, AY 68-37-203) compared to the Lower Glen Rose aquifer (AY 68-19-806), 1994.	**10**
Figure 2.3	Edwards aquifer water levels (Bexar County Index Well, AY 68-37-203) compared to Leona aquifer water levels (Ehler well, Uvalde County YP 69-51-406), 1994.	**11**
Figure 3.1	Regional rain gauge network utilized by the Edwards Underground District to monitor precipitation in 1994.	**14**
Figure 3.2	Precipitation for San Antonio, 1934-1994.	**15**
Figure 4.1	Eight major drainage basins and Edwards Underground Water District recharge structures in the San Antonio area of the Edwards aquifer.	**20**
Figure 4.2	Yearly recharge and ten-year average recharge for San Antonio area of the Edwards aquifer.	**24**
Figure 5.1	Major springs in the San Antonio area of the Edwards aquifer.	**26**
Figure 5.2	Groundwater pumping compared to springflow in the Edwards aquifer, 1934-1994.	**30**
Figure 5.3	Percent Edwards aquifer groundwater discharge by use, 1994.	**31**
Figure 6.1	Edwards Underground Water District water quality monitoring sites, 1994.	**34**
Figure 6.2	Edwards aquifer freshwater/saline - water interface, 1994.	**41**
Figure 6.3	South Medina County water quality monitoring wells.	**43**
Figure 6.4	Water quality changes in San Antonio and New Braunfels transect wells compared to water levels in J-17.	**45**
Figure 6.5	Surface water quality monitoring sites, 1994.	**52**

1.0 INTRODUCTION

The Edwards Underground Water District (District) was created by the Texas Legislature in 1959, and is charged with conserving, protecting, recharging and preventing pollution of the groundwater in the Edwards aquifer. To accomplish this mandate, the District conducts groundwater resource investigations, develops demand management plans, as well as informs and educates the public about the aquifer. In keeping with the District's statutory charge, the District has prepared this technical data report for calendar year 1994. This report provides a historical perspective by providing annual data for the period of record (1934-1994).

The following report addresses the portion of the Edwards aquifer that extends through six counties in south central Texas, from the groundwater divide near Brackettville in Kinney County to the groundwater divide near Kyle in central Hays County. **Figure 1.1** is a regional map showing primary physiographic features of the Edwards aquifer within the report area.

Figure 1.1 Edwards aquifer and other physiographic features in the San Antonio area.



2.0 WATER LEVELS

Over 850,000 water level measurements from 27 digital recorder-equipped observation wells, as well as monthly measurements from 23 periodic observation wells were recorded in 1994 as part of the District's water level data collection program. **Figure 2.1** shows the locations of the District's observation well network within the Edwards aquifer region

Periodic water level measurements from a variety of wells have been compiled in the San Antonio area of the Edwards aquifer region since 1929. These periodic measurements were enhanced with the introduction of continuous water level recorders in some of the observation wells in the 1930s by the United States Geological Survey (USGS). The District has further enhanced the data with the introduction of continuous digital recorders, developing a groundwater network from eastern Kinney County to central Hays County.

The digital recorders measure water levels across the aquifer every 15 minutes, 365 days a year. These wells are equipped with a float device or a pressure transducer for water level readings. Data is recorded on digital storage cards and then downloaded during site inspection, or by modem, to the District's office in San Antonio. **Table 2.1** shows the annual and period of record high and low water levels measured in five selected Edwards aquifer observation wells.

Figure 2.1 Edwards Underground Water District water level observation network.

County	Well I.D. Number	Name (Location)
Hays	LR 67-01-503	City of Kyle (Continuous)
	LR 67-01-508	Kirkpatrick (Index)
	LR 67-09-102	Nicholson
	LR 67-09-111	Southwest Texas
	LR 67-57-502	Gregg
	LR 67-01-504	City of Kyle (Index)
	LR 67-01-512	San Marcos SWL
Comal	DX 69-18-701	State Hwy 306
	DX 69-22-600	Deason
	DX 69-29-103	Landa Park, New Braunfels (Index)
	DX 69-22-701	Schaefer
	DX 69-30-208	Bracken
	DX 69-18-601	Jentsch
Atascosa	AL 69-50-201	City of Lytle

County	Well I.D. Number	Name (Location)
Bexar	AY 69-30-211	Cibolo Creek
	AY 69-29-309	Judson Road
	AY 69-29-701	Airport
	AY 69-30-602	Blanco Road (Glen Rose, Cow Creek)
	AY 69-29-620	West Avenue
	AY 69-29-009	Chulen Pass (Glen Rose)
	AY 69-29-103	Hill Country
	AY 69-37-203	Dodd Field-J 17 (Index)
	AY 69-37-309	Cedar Creek (Glen Rose)
	AY 69-29-208	Encino Park
	AY 69-43-501	Schirmer
	AY 69-43-606	Verstraten
	AY 69-43-N29	Quinn
	AY 69-43-607	Grothues
	AY 69-19-606	La Escondida (Glen Rose)
	AY 69-19-618	Boerne Stage Road (Glen Rose)

County	Well I.D. Number	Name (Location)
Medina	TD 69-33-604	Stinson
	TD 69-48-102	Mueninink
	TD 69-47-302	Hondo Pool
	TD 69-56-004	Tarply Road
	TD 69-47-306	City of Hondo (Index)
	TD 69-56-501	Seco Creek
	TD 69-41-501	City of Castroville (Index)
Uvalde	YP 69-50-202	Hulme
	YP 69-50-101	U.V. Cattle Co.
	YP 69-33-403	Livingston
	YP 70-40-501	Nueces River
	YP 69-53-501	Frio River
	YP 69-37-402	State Hwy. 187
	YP 69-43-401	City of Bobtail
	YP 69-43-607	Knippa
	YP 69-50-302	City of Uvalde (Index)
	YP 69-43-409	North Uvalde
	YP 69-51-406	Ehler
	YP 69-42-709	Seven Mile Hill

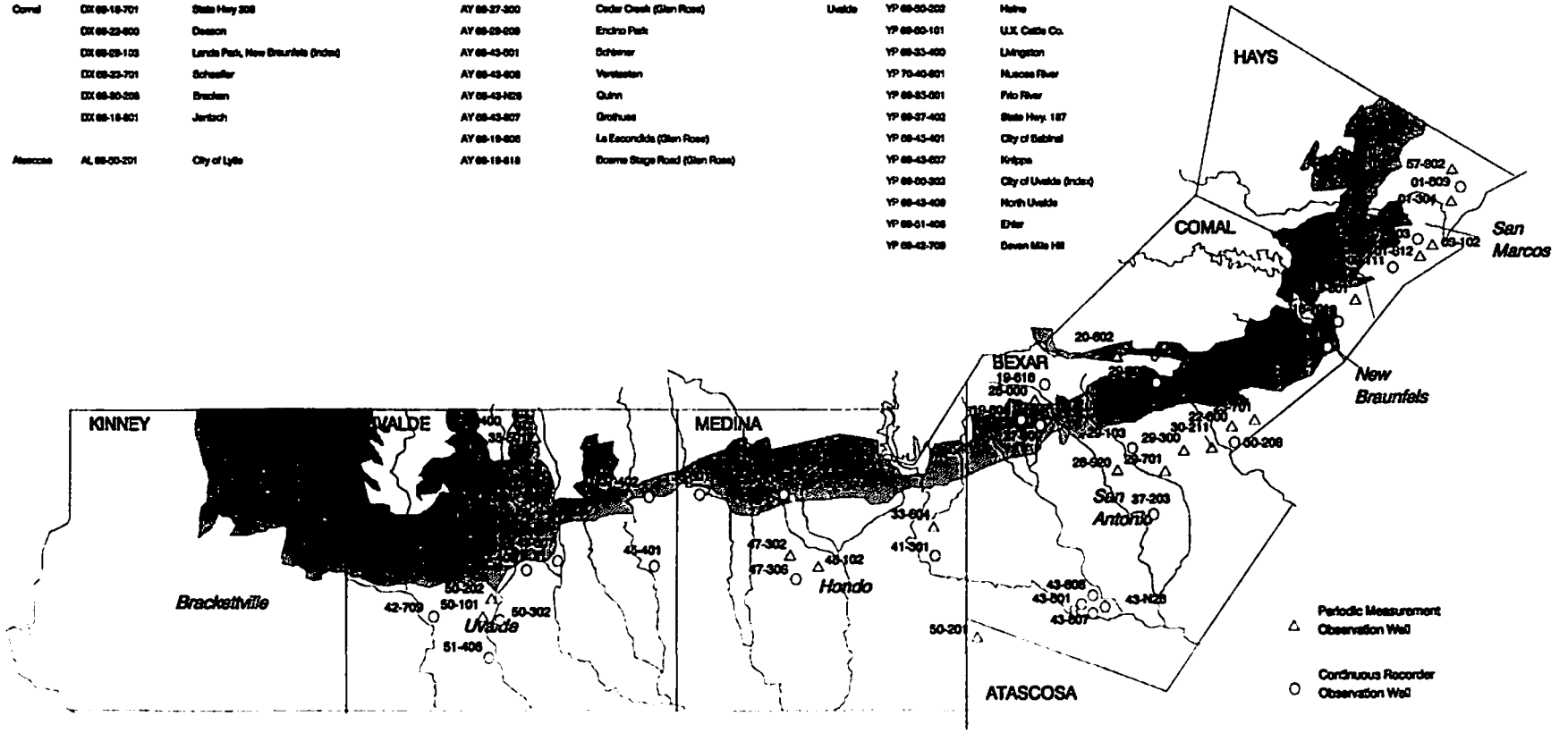


Table 2.1 Annual water level highs and lows for selected index wells in the San Antonio area of the Edwards aquifer, 1934-1994 (Measured in feet above mean sea level).

YEAR	City of Uvalde Uvalde County YP-69-50-302		Castroville Medina County TD-68-41-301		San Antonio Bexar County AY-68-37-203		New Braunfels Comal County DX-68-23-302		San Marcos Hays County LR-61-01-304	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
1934	866.6	---	---	---	675.2	666.8	---	---	---	---
1935	872.1	---	---	---	681.3	666.8	---	---	---	---
1936	876.6	876.5	---	---	683.0	676.6	---	---	---	---
1937	878.1	877.1	---	---	682.1	674.9	---	---	583.4	581.6
1938	875.8	874.0	---	---	681.4	673.6	---	---	590.6	581.5
1939	873.4	869.6	---	---	674.1	665.7	---	---	580.6	569.6
1940	872.3	868.5	---	---	671.4	661.0	---	---	572.2	568.7
1941	875.7	867.7	---	---	682.5	668.3	---	---	587.7	578.6
1942	875.8	871.9	---	---	685.4	669.7	---	---	580.8	573.7
1943	874.5	868.0	---	---	679.6	668.5	---	---	578.2	574.6
1944	869.3	866.8	---	---	677.6	667.1	---	---	580.5	579.3
1945	870.1	865.2	---	---	681.9	668.8	---	---	581.8	---
1946	867.1	862.9	---	---	681.2	663.6	---	---	580.3	---
1947	870.7	867.1	---	---	680.7	665.8	---	---	577.3	577.0
1948	868.4	860.5	---	---	667.7	653.7	624.4	624.3	560.5	559.4
1949	871.2	859.1	---	---	671.6	655.6	626.7	624.1	562.3	561.8
1950	871.2	861.8	687.0	674.9	665.4	653.8	625.2	624.0	575.8	575.2
1951	861.8	846.8	675.2	659.9	656.0	640.6	624.2	622.5	575.3	569.4
1952	846.8	834.9	663.8	649.9	650.5	633.4	623.0	621.5	573.0	569.1
1953	835.2	817.8	665.1	647.7	651.5	630.5	623.6	621.1	584.5	573.2
1954	836.7	823.1	660.3	642.4	646.3	628.9	623.1	620.5	581.8	562.8
1955	834.3	824.1	649.1	635.6	638.5	624.2	621.9	619.8	575.7	558.4
1956	834.2	814.2	641.6	622.3	632.2	612.5	621.0	613.3	569.8	542.2
1957	840.9	811.0	666.1	633.0	653.8	624.4	624.7	620.1	584.9	568.3
1958	866.1	840.8	704.4	665.7	679.6	653.3	626.6	624.6	593.6	580.8
1959	876.1	866.2	703.8	689.0	677.7	661.5	627.1	625.1	591.4	580.5
1960	876.9	873.1	706.3	686.0	679.4	657.9	627.1	624.9	589.4	584.3
1961	878.5	875.6	710.3	693.4	681.2	663.9	627.3	625.7	591.6	573.2
1962	878.3	867.7	703.6	676.3	675.5	646.9	626.3	623.2	584.1	565.0
1963	869.7	860.9	689.1	659.2	665.8	635.0	625.0	621.7	581.6	560.0
1964	860.9	849.0	676.3	654.8	657.1	632.8	624.1	621.6	578.2	562.8
1965	865.8	860.3	689.6	666.8	675.0	645.6	626.6	623.5	590.1	573.4
1966	867.2	860.2	686.1	665.0	668.8	642.7	625.9	623.1	589.0	566.6
1967	867.4	856.4	679.4	645.2	659.7	624.9	624.6	620.0	582.8	556.6
1968	873.3	864.8	702.0	679.2	678.3	655.9	627.2	624.6	593.8	574.4
1969	875.0	866.5	694.8	670.5	676.1	642.8	626.3	623.4	588.7	567.7
1970	876.1	871.3	700.7	678.8	677.1	650.4	627.2	624.3	593.2	575.0
1971	877.7	864.0	701.3	646.4	674.6	627.9	626.2	621.0	577.1	551.3
1972	877.8	874.6	704.6	676.7	679.0	651.2	626.7	624.1	579.7	576.3
1973	881.6	874.5	731.2	690.1	696.5	665.9	629.8	626.1	589.9	572.3
1974	881.4	876.0	723.8	696.0	689.2	660.9	629.1	625.8	593.6	558.5
1975	882.1	879.4	721.0	708.2	686.9	672.0	629.3	626.5	589.8	571.4
1976	884.9	876.0	732.4	694.9	693.1	663.8	629.4	625.8	584.6	571.2
1977	886.2	881.3	737.8	715.3	696.0	675.6	630.2	627.6	587.4	562.1
1978	882.6	875.6	722.4	681.7	684.1	650.1	628.1	624.5	572.0	540.4
1979	882.0	876.1	728.2	710.3	690.5	676.4	629.0	627.3	584.9	572.0
1980	879.1	868.0	716.1	666.8	680.3	640.8	627.5	623.0	572.0	551.8
1981	881.8	867.9	723.2	698.8	686.0	668.6	628.0	625.5	586.2	565.5
1982	881.8	876.4	717.1	682.8	680.5	645.3	627.3	623.6	584.7	544.7
1983	877.1	871.3	698.2	667.7	670.0	642.1	625.6	623.0	588.7	560.4
1984	873.3	856.9	684.5	642.0	657.0	623.3	624.4	619.6	582.5	544.3
1985	876.9	862.2	699.0	670.7	674.5	644.1	626.8	623.3	591.4	561.8
1986	877.8	872.2	704.6	674.2	685.6	649.8	627.7	624.1	595.0	576.3
1987	889.1	877.9	743.5	711.1	699.2	676.9	630.4	627.2	595.9	583.5
1988	887.0	878.0	725.3	679.9	684.9	647.7	627.9	623.9	593.2	585.9
1989	879.0	866.6	695.3	650.5	663.9	626.4	624.9	620.5	571.7	571.5
1990	872.9	861.6	679.5	640.8	658.1	622.7	624.3	620.3	577.6	561.2
1991	873.8	865.4	703.8	666.1	680.3	640.5	627.0	623.3	593.8	575.1
1992	885.2	872.9	743.6	704.3	703.3	680.7	630.9	627.0	595.4	586.2
1993	884.9	877.3	730.2	706.6	692.8	672.0	629.4	626.9	593.7	575.9
1994	---	---	718.6	684.1	679.2	652.1	627.2	629.7	575.0	545.3
Average	High	Low	High	Low	High	Low	High	Low	High	Low
	871.8	863.0	700.9	672.5	675.2	652.5	626.5	623.5	583.5	568.0
Record	High	Low	High	Low	High	Low	High	Low	High	Low
Level	889.1	811.0	743.6	622.3	703.3	612.5	630.9	613.3	595.9	540.4
Month	June	April	June	Aug.	June	Aug.	June	Aug.	Sept.	July
Year	1987	1957	1992	1956	1992	1956	1992	1956	1987	1978

Data Source - Edwards Underground Water District, 1995.

The water level observation wells that are equipped with digital recorders are located in the water-table (unconfined) and the artesian (confined) portions of the Edwards aquifer. In addition to Edwards aquifer water level information, the District also collects water level data from the aquifers located in the Glen Rose and Leona formations. These aquifers are hydraulically connected and provide pathways for groundwater flow to and from the Edwards aquifer. The District has been collecting water level data in northern Bexar County from the Glen Rose formation since 1991and data in southern Uvalde County from the Leona formation since 1966. **Figure 2.2** compares the water levels in the Edwards and Glen Rose aquifers for 1994. **Figure 2.3** compares water levels in the Edwards and Leona aquifers for 1994. Water level monitoring assists in research and management of these aquifers by providing information on current and historical aquifer conditions.

Figure 2.2 Water levels in the Edwards aquifer (Bexar County Index Well, AY 68-37-203) compared to the Lower Glen Rose aquifer (AY 68-19-806), 1994.

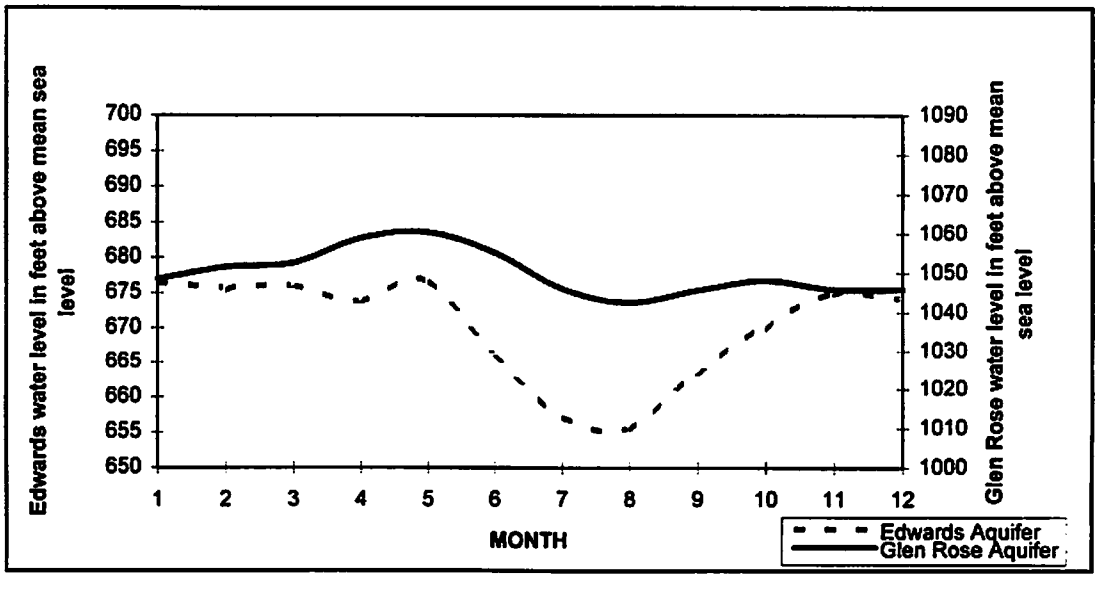
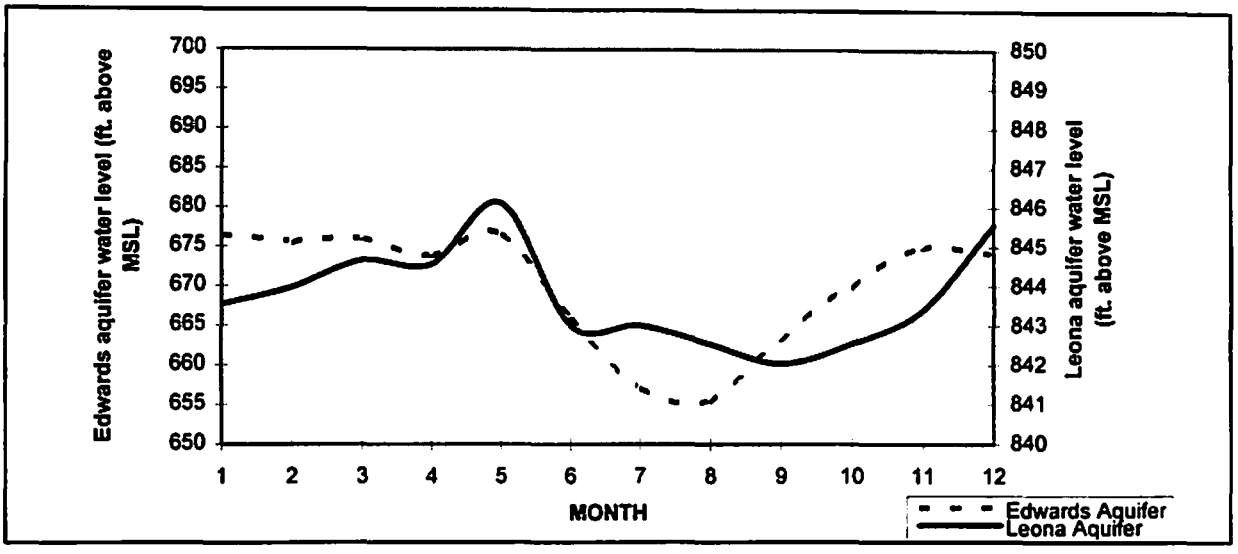


Figure 2.3 Edwards aquifer water levels (Bexar County index well, AY 68-37-203) compared to Leona aquifer water levels (Ehler well, Uvalde County YP69-51-406), 1994.



To augment the digital recorder network, District staff measure water levels at 20 observation wells during normal aquifer conditions, on a monthly basis, and at 50 additional wells during periods of extreme high or low water level conditions. These periodic measurements are performed by "tape and chalk method", and occasionally by conductivity meter. Water level data collected by the District are forwarded to regional and local entities such as the Texas Water Development Board (TWDB) and the USGS.

Historical water level trends in observation wells, along with corresponding precipitation and discharge information, are necessary to determine the quantity of

groundwater stored in the aquifer during any given period. Water level increases generally indicate greater quantities of water are recharging the aquifer than are being discharged. During periods where groundwater recharge is greater than discharge, springflow increases in proportion to increases in groundwater levels. Likewise, during drought or high demand conditions, water levels and springflows generally decline, reflecting greater groundwater discharge than groundwater recharge. In 1994, total discharge was greater than total recharge from May to August as was demonstrated by declining water levels during that period of the year.

Though discharge was calculated to be greater than recharge for the entire year the net change in water levels at the Bexar County Index Well declined less than 1.5 feet from January to December. The reason for the relatively little change in water levels for 1994 may be a result of recovery of higher than normal storage in the aquifer caused by record recharge in 1992.

Water level tables and hydrographs for selected wells depicting water level data collected in 1994 are shown in **Appendix 10.1.**

3.0 PRECIPITATION

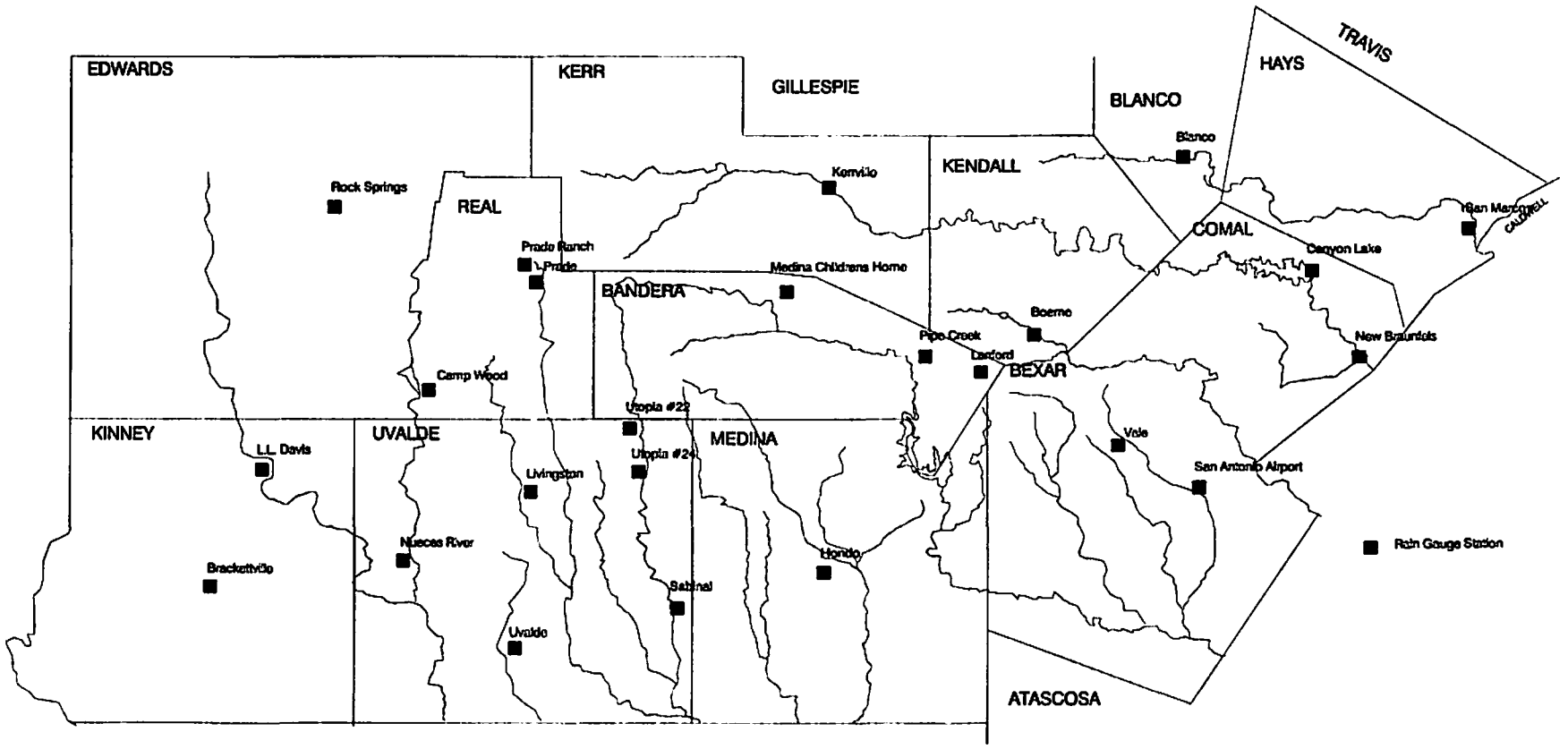
Precipitation is the primary water source of recharge to the Edwards aquifer. Water levels monitored by the District's network of observation wells across the artesian zone have risen within hours of a heavy rainfall event on the recharge zone or associated upstream drainage basin in the central Texas hill country.

Annual precipitation in the Edwards aquifer region is monitored by the District to determine the volume of groundwater recharge to the aquifer. Precipitation data are gathered from District rain gauge stations, National Oceanic and Atmospheric Administration (NOAA) weather stations, and USGS rain gauge stations located across the recharge zone and upstream drainage basins.

A map showing the locations of the precipitation gauging stations utilized by the District to record area rainfall is shown in **Figure 3.1.**

Daily precipitation data are forwarded every month to the District from ten rain gauge observation sites located on the recharge zone. This information is augmented with data from 14 weather and rain gauge stations maintained by NOAA and the USGS. The precipitation information is used to calculate recharge and to monitor any precipitation trends that may affect recharge to the Edwards aquifer.

Figure 3.1 Regional rain gauge network utilized by the Edwards Underground Water District to monitor precipation, 1994.



Precipitation data from San Antonio have been maintained since 1871. Historical aquifer water level trends, recharge and springflow are closely related to precipitation and decrease during periods of low precipitation.

The amount of rainfall during 1994 was recorded near normal levels in the western portion of the Edwards aquifer region, whereas rainfall amounts in San Antonio were well above normal. A hydrograph of precipitation for San Antonio from 1871 to 1994 is shown in **Figure 3.2** . **Table 3.1** shows annual precipitation for selected rain gauges in the region. **Table 3.2** shows monthly measurements for 1994 at selected rain gauge stations across the region.

Figure 3.2 Precipitation for San Antonio, 1934-1994.

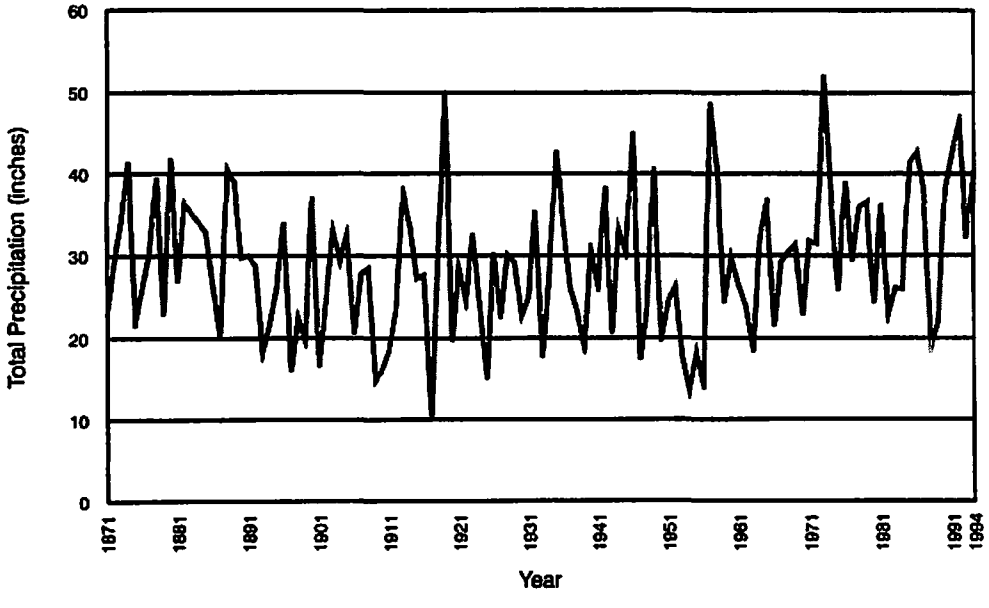


Table 3.1 Annual precipitation for selected rain gauges in the Edwards aquifer region, 1934-1994 (Measured in inches).

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	25.56	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/15.7	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	29.69
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	16.33	23.05	22.67	21.27	24.23	39.02	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
1991	23.11	21.77	31.12	34.55	42.76	48.22	56.55	51.07
1992	22.22	b/27.85	37.73	45.34	46.49	64.17	c/38.84	c/40.33
1993	15.18	c/9.32	13.20	16.60	32.00	24.02	c/19.54	c/24.01
1994	b/22.85	39.61	29.32	c/22.38	40.42	40.98	b/35.76	40.85
Years of Record (complete)	94	92	77	91	111	92	96	92
Yearly Average (period of record)	21.19	24.72	25.27	28.39	28.73	33.33	32.33	33.87

a/ Precipitation data from the US Department of Commerce (1934-1994)
b/ Partial record not included in long-term average; missing one month.
c/ Partial record not included in long-term average; missing more than one month.

Table 3.2 Monthly precipitation data from Edwards Underground Water District rain gauge network and National Oceanic and Atmospheric Administration precipitation gauging stations, 1994 (Measured in inches).

Gauge	County	Jan	Feb	Mar	Apr.	May	Jun	Jul.	Aug	Sep	Oct.	Nov	Dec
Pipe Creek	Bandera	2.45	2.40	3.25	2.95	4.35	4.15	0.10	1.90	2.70	3.95	1.25	4.65
Children's Home	Bandera	1.95	3.50	2.75	1.45	3.55	3.10	1.50	1.20	1.95	3.45	2.05	1.75
Medina	Bandera	3.08	2.60	4.09	1.89	4.49	2.56	2.05	0.57	2.86	4.72	2.72	4.26
Vale	Bexar	1.45	1.00	3.65	2.95	3.65	1.75	0.00	1.05	3.20	6.80	0.70	1.90
Blanco	Blanco	1.65	1.62	4.41	1.85	4.96	0.65	0.00	1.47	3.07	7.66	1.82	4.52
Canyon Dam	Comal	1.32	1.73	2.95	2.22	4.24	1.56	0.10	0.96	3.53	8.22	1.27	4.09
New Braunfels	Comal	—	1.41	2.73	2.62	5.65	2.71	0.00	3.96	2.57	8.24	1.21	4.66
Rock Springs	Edwards	1.32	0.21	1.84	0.90	5.81	2.58	1.36	3.20	3.61	2.81	—	4.07
San Marcos	Hays	1.28	2.13	1.95	2.73	7.08	3.55	trace	2.78	3.77	8.61	0.95	6.02
Boerne	Kendall	2.81	2.98	5.01	2.95	6.34	2.49	0.00	0.75	3.25	8.33	2.23	3.84
Kerrville	Kerr	1.87	2.17	3.01	2.20	3.66	3.25	0.80	2.41	5.64	4.45	3.31	5.99
Bracketville	Kinney	—	0.43	2.18	4.06	3.35	0.50	0.00	0.24	6.00	2.26	0.80	3.03
Hondo	Medina	2.97	0.92	2.82	4.31	3.35	3.39	0.96	0.81	1.77	1.08	—	—
Prade Ranch	Real	1.60	1.00	4.60	1.70	5.45	4.95	1.95	0.90	1.20	1.45	1.25	2.65
Livingston	Uvalde	3.45	1.10	6.15	2.60	3.85	2.05	1.80	2.20	2.00	5.00	4.10	3.40
Utopia 22	Uvalde	3.20	1.00	4.65	2.10	2.85	2.90	1.05	1.80	2.70	3.50	2.10	3.45
Utopia 24	Uvalde	3.30	1.85	4.00	1.65	3.45	2.80	3.00	2.80	1.20	2.15	2.85	—

Note: The symbol "—" indicates no data available at time of publication.
Data Source - Edwards Underground Water District and US Department of Commerce, 1995.

4.0 GROUNDWATER RECHARGE

The segment of the recharge zone that supplies groundwater to the San Antonio area of the Edwards aquifer extends from central Kinney County to central Hays County. **Figure 4.1** identifies the eight drainage basins cross the recharge zone of the aquifer. These basins are listed in the following **Table 4.1.**

Table 4.1 - Drainage basins which cross the Edwards aquifer recharge zone

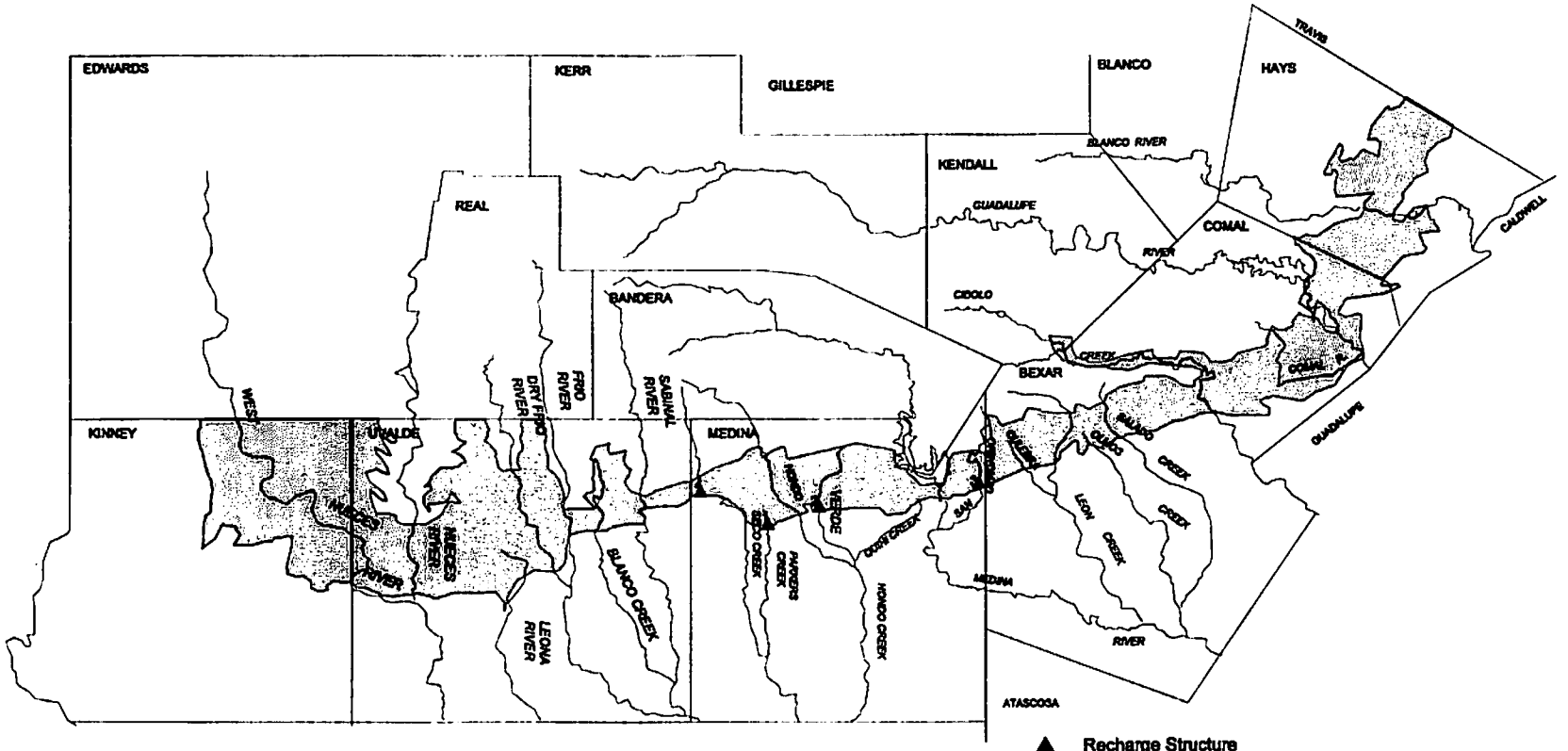
- **Nueces-West Nueces River basin**
- **Frio-Dry Frio River basin**
- **Sabinal River basin**
- **Medina River basin**
- **Comal Creek basin**
- **Cibolo Creek and Dry Comal Creek basin**
- **Guadalupe River basin**
- **Blanco River basin**

Although some recharge to the Edwards aquifer is provided by other hydraulically connected aquifers, this type of recharge has not been quantified. Only surface water data from precipitation and streamflows are utilized to calculate total recharge.

The USGS has been calculating groundwater recharge to the Edwards aquifer since 1934. **Table 4.2** shows annual recharge by river basin from 1934 through 1994, based on the USGS calculations.

The USGS has estimated that annual recharge for the period of record from 1934 to 1994, ranges from 43,700 acre-feet at the height of the drought in

Figure 4.1 Eight major drainage basins and Edwards Underground Water District recharge structures in the San Antonio area of the Edwards aquifer.



Primary Drainage Basins

- Nueces - West Nueces River Basin
- Frio-Dry Frio River Basin
- Sabinal River Basin
- Medina River Basin
- Comal Creek Basin
- Cibolo Creek and Dry Comal Creek Basin
- Guadalupe River Basin
- Blanco River Basin

Edwards Underground Water District Recharge Structures

Site Number	Name (Location)
1	Parker
2	Verde
3	San Geronimo
4	Seco

Table 4.2 Estimated annual groundwater recharge to the Edwards aquifer by river basin, 1934-1994 (Measured in thousands of acre-feet).

Year	Nueces-West Nueces River basin	Frio-Dry Frio River basin	Sabinal River basin	Area between Sabinal River and Medina River basin	Medina River basin	Area between Medina River and Cibolo-Dry Comal Creek basin	Cibolo-Dry Creek basin	Blanco River basin	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	1258.2
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	1142.6
1958	266.7	300.0	223.8	294.9	95.5	190.9	268.7	70.7	1711.2
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	76.8	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	1486.5
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	1117.8
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	1448.3
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	197.7
1985	105.9	186.9	50.7	148.5	64.7	136.7	259.2	50.7	1003.3
1986	188.4	192.8	42.2	173.6	74.7	170.2	267.4	44.5	1153.8
1987	308.5	473.3	110.7	405.5	90.4	229.3	270.9	114.9	2003.5
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	214.5
1990	479.3	255.0	54.6	131.2	54.0	35.9	71.8	41.3	1123.1
1991	325.2	421.0	103.1	315.2	52.8	84.5	109.7	96.9	1508.4
1992	234.1	586.9	201.1	566.1	91.4	290.6	286.6	226.9	2486.0
1993	32.6	78.5	29.6	60.8	78.5	38.9	90.9	37.8	447.6
1994	124.6	151.5	29.5	45.1	61.1	34.1	55.6	36.6	538.1
For the period of record 1934-1994									
Average	115.5	132.3	42.0	107.8	61.3	70.1	105.6	41.9	676.6
Median	89.9	113.8	30.8	78.6	57.3	50.1	77.9	34.6	556.1
For the period of record 1985-1994									
Average	191.0	251.6	64.7	188.4	68.4	103.7	145.3	69.9	1083.4
Median	156.5	189.9	46.5	139.9	67.3	61.7	100.3	42.9	1063.2
Maximum	479.3	586.9	223.8	566.1	104.0	290.6	397.9	226.9	2486.0
Minimum	8.6	4.2	0.6	3.6	6.3	2.0	2.2	8.2	43.7

Data Source: USGS, 1995.

1956, to 2,486,000 acre-feet in 1992. In 1994, estimated recharge was 538,100 acre-feet. The average annual recharge from 1934 to 1994 is 676,600 acre-feet. However, since 1985, the ten-year average annual recharge is estimated to be approximately 1,083,400 acre-feet. **Figure 4.2** is a graph of yearly recharge and the ten-year floating average recharge estimate for the San Antonio area of the Edwards aquifer from 1934 to 1994.

Recharge directly affects groundwater levels in the aquifer. Water levels rise during years of higher than normal recharge, and generally decline during periods of normal to below normal recharge. Since recharge is a direct result of precipitation, water levels in the aquifer are greatly affected by rainfall.

The District operates four recharge dams across the Edwards aquifer recharge zone. The locations of the recharge structures are shown in **Figure 4.1.** These structures contributed approximately 164 acre-feet of recharge to the aquifer in 1994. The average annual recharge is 4765 acre-feet . **Table 4.3** shows the 1994 monthly recharge to the Edwards aquifer by each structure and **Table 4.4** shows the annual historical recharge recorded for each site since construction.

Table 4.3 Monthly groundwater recharge at Edwards Underground Water District recharge projects, 1994 (Measured in acre-feet).

Month	Parker Creek Dam Adjudication No. 3192	Verde Creek Dam Adjudication No. 3444	San Geronimo Creek Dam Adjudication No. 2956	Seco Creek Dam Adjudication No. 3551
January	0	0	0	0
February	0	0	0	0
March	96	0	0	0
April	0	0	0	0
May	54	0	0	0
June	0	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	4	0	0	0
November	0	0	0	0
December	5	0	0	5
Total	159	0	0	5

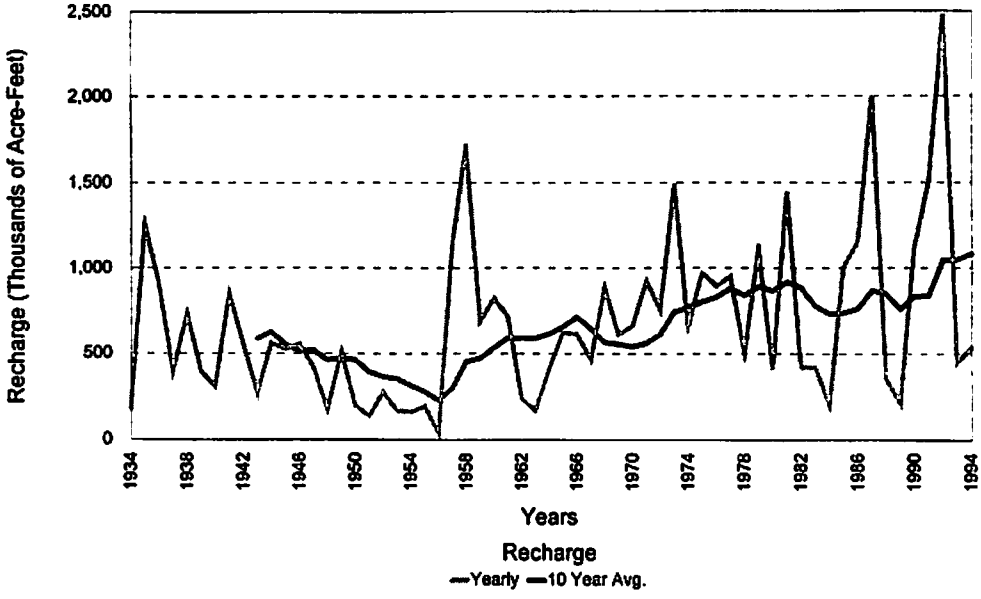
Data Source: USGS and Edwards Underground Water District, 1995

Table 4.4 Estimated annual Edwards aquifer recharge from Edwards Underground Water District recharge projects (Measured in acre-feet).

Year	Parker (4-20-74)	Verde (4-28-78)	San Geronimo (11-13-79)	Seco (10-21-82)	Yearly Total
1974	160	---	---	---	160
1975	620	---	---	---	620
1976	2,018	---	---	---	2,018
1977	6	---	---	---	6
1978	98	150	---	---	248
1979	2,315	1,725	0	---	4,040
1980	0	371	903	---	1,274
1981	772	1,923	1,407	---	4,102
1982	3	112	91	0	206
1983	0	254	0	0	254
1984	251	246	0	143	640
1985	232	440	1,097	643	2,412
1986	217	889	963	1,580	3,649
1987	2,104	4,141	1,176	12,915	20,336
1988	0	0	0	0	0
1989	0	0	0	0	0
1990	49	176	41	479	745
1991	647	966	1,647	2,160	5,420
1992	723	2,775	2,874	14,631	21,003
1993	0	0	334	508	842
1994	159	0	0	5	164
Total	10,374	14,168	10,533	33,064	67,139
Recharge					
Average	502	850	695	2,718	4,765
Median	188	313	254	250	745

Data Source: Edwards Underground Water District, 1995.

Figure 4.2 Yearly recharge and ten-year floating average recharge for San Antonio area of the Edwards aquifer.



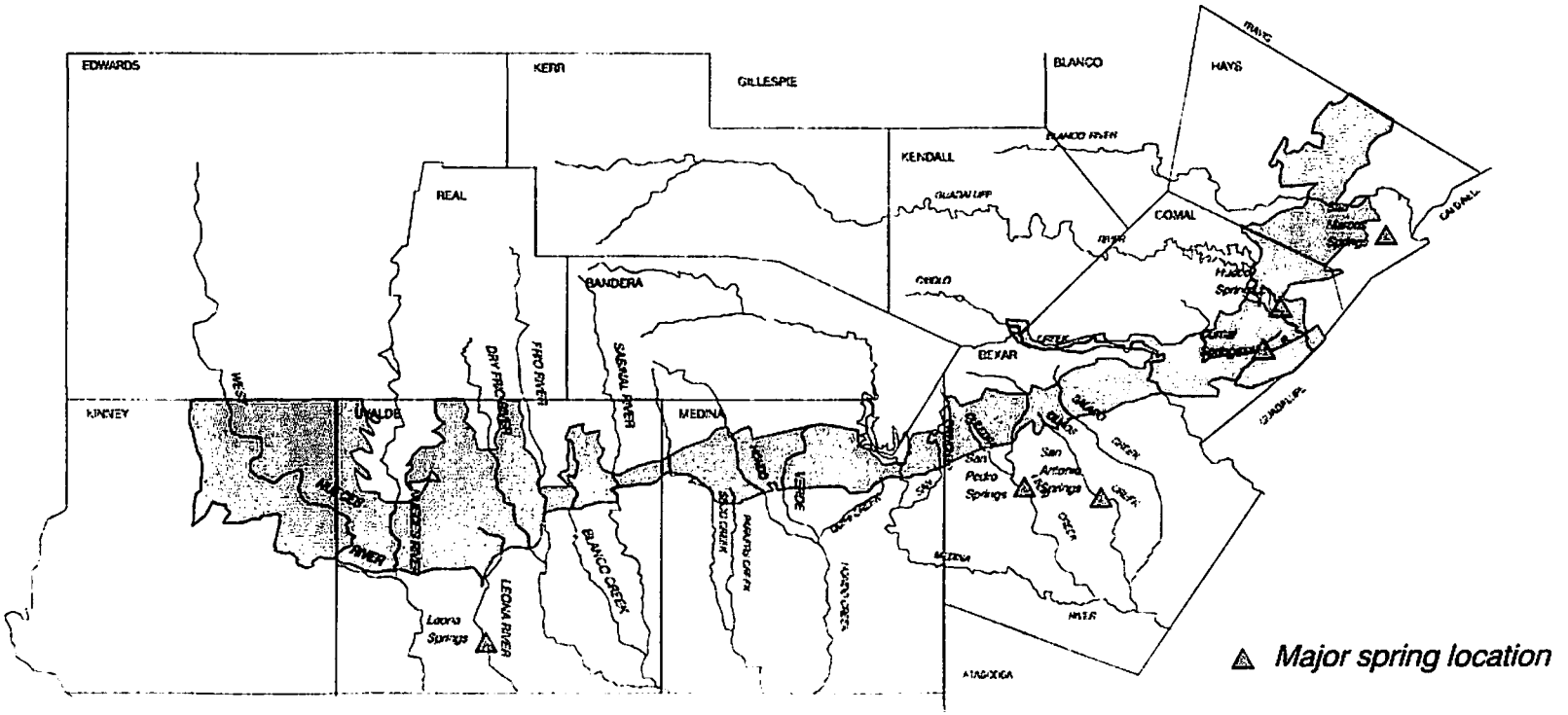
5.0 GROUNDWATER DISCHARGE AND USAGE

The Edwards aquifer provides water for many diverse uses in the south central Texas region, including agricultural, municipal, industrial, domestic and recreational needs. Natural springflow accounts for the majority of groundwater discharge when compared to any of the other above mentioned users. Springflow supports recreational economies in New Braunfels and San Marcos, and provides habitat for threatened and endangered animal and/or plant species.

Groundwater is discharged from the Edwards aquifer through springflow or by pumped or artesian flow from wells. Springflow is calculated by measuring the downstream flow from springs, or by measuring water levels in observation wells near the springs, and making corrections from these values.

Measuring downstream flow provides the most direct method in estimating springflow and is used in this report to determine springflow discharge. Downstream flow from springs is measured on a continuous basis and provides a detailed history of springflow discharge. A location map of the primary springs of the Edwards aquifer is shown in **Figure 5.1.**

Figure 5.1 Major springs in the San Antonio Area of the Edwards aquifer.



Indirectly calculating springflow by measuring groundwater levels in nearby observation wells is an alternative method of determining groundwater discharge. While the method is not as accurate as using downstream flow measurements, this method may be used to fill gaps in incomplete data sets when downstream recorders are not functioning.

Groundwater discharge resulting from pumping is calculated by tabulating reported water use data from public supply, irrigation, agricultural, industrial, commercial and domestic wells.

Estimates for annual groundwater discharge from springflow and pumping for the Edwards aquifer are available from 1934 to 1994 and range from the calculated low of 388,100 acre-feet in 1955, to the calculated high of 1,100,000 acre-feet in 1992. Springflow for the same period has varied from a low of 69,800 acre-feet in 1956 to a high of 802,800 acre-feet in 1992. In 1994, total groundwater discharge from the Edwards aquifer was approximately 814,800 acre-feet. **Table 5.1** contains annual estimated groundwater discharge data for the San Antonio area of the Edwards aquifer from 1934 to 1994.

Springflow from the Edwards aquifer for 1994 was calculated at 390,200 acre-feet. Springflow in the aquifer is directly related to groundwater levels.

Table 5.1 Annual estimated groundwater discharge data by county for the Edwards aquifer, 1934-1994 (Measured in thousands of acre-feet).

Year	Kinney Uvalde	Medina	Bexar	Comal	Hays	Total	Total Wells	Total Springs
1934	12.6	1.3	109.3	229.1	85.6	437.9	101.9	336.0
1935	12.2	1.5	171.9	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	115.4	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	68.5	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	277.6	188.6	118.5	720.1	418.5	301.6
1984	156.9	46.9	309.7	108.9	85.7	708.1	529.8	178.3
1985	156.9	59.2	295.5	200.0	144.9	856.5	522.5	334.0
1986	91.7	41.9	294.0	229.3	160.4	817.3	429.3	388.0
1987	94.9	15.9	326.6	286.2	198.4	922.0	364.1	557.9
1988	156.7	82.2	317.4	236.5	116.9	909.7	540.0	369.7
1989	156.9	70.5	305.6	147.9	85.6	766.5	542.4	224.1
1990	118.1	69.7	276.8	171.3	94.1	730.0	489.4	240.6
1991	76.6	25.6	315.5	221.9	151.0	790.6	436.0	354.6
1992	76.5	9.3	370.5	412.4	261.3	1130.0	327.2	802.8
1993	107.5	17.8	371.0	349.5	151.0	996.7	407.3	589.4
1994	95.5	41.1	297.7	269.8	110.6	814.8	424.6	390.2
For period of record 1934-1994.								
Average	68.7	17.4	233.4	218.7	117.6	655.8	289.8	366.0
Median	56.5	10.0	217.3	229.3	113.0	617.5	261.0	375.5
For period of Record 1985-1994. (Ten years)								
Average	113.1	43.3	317.1	252.5	147.4	873.4	448.3	425.1
Median	101.5	41.5	310.6	232.9	148.0	836.9	432.7	378.9

Differences may occur due to rounding procedures.
Data Source - USGS, 1995.

Generally, the higher the water levels, the greater the springflows. Record-high groundwater levels and greater than normal precipitation in 1992 resulted greater than normal spring discharge during 1994. **Table 5.2** shows the monthly estimated discharge in 1994 for six primary Edwards aquifer springs.

Table 5.2 Estimated spring discharge from the Edwards aquifer, 1994 (Measured in acre-feet).

Month	Comal Springs	San Marcos Springs	Hueco Springs	San Antonio Springs	San Pedro Springs	Leona Springs and Leona Springs Underflow	Total monthly discharge combining all springs
January	21,640	8,920	1,280	1,710	550	2,454	36,554
February	19,300	7,800	1,057	1,734	523	4,229	32,643
March	20,880	8,430	1,227	2,051	586	2,271	35,445
April	19,660	8,000	1,374	2,116	574	2,155	33,879
May	21,260	8,520	2,531	2,159	593	2,237	37,300
June	18,900	8,160	3,421	58	367	2,025	32,931
July	16,960	7,990	2,487	0	77	1,860	29,374
August	15,720	7,670	1,428	0	18	1,817	26,653
September	16,080	7,350	1,211	0	79	1,853	26,573
October	18,050	7,930	1,662	91	149	2,150	30,032
November	18,330	8,410	2,892	379	209	2,475	32,695
December	19,360	8,640	4,331	702	282	2,807	36,122
Total	226,140	97,820	24,901	11,000	4,007	26,332	390,200

Differences may occur due to rounding procedures.
Data Source - USGS, 1995

Springflows accounted for 48% of total discharge from the Edwards aquifer in 1994. Underflow in the Leona formation has been included in total discharge from Leona Springs.

While springflow can vary greatly from year to year and is dependent on precipitation and aquifer water levels, groundwater pumping has progressively increased since records have been maintained. The lowest

estimated annual aquifer pumping level was 101,900 acre-feet which was recorded in 1934. Since 1934, pumping from the Edwards aquifer has increased more than 400 percent. Average annual well production is estimated to be 289,800 acre-feet per year for the period of record from 1934 to 1994, while the estimated floating ten-year average for pumping from 1985 to 1994 is 448,300 acre-feet. Groundwater pumping accounted for 424,600 acre-feet of water discharged from the Edwards aquifer in 1994. **Figure 5.2** is a graph comparing groundwater pumpage to springflow. **Figure 5.3** contains three charts showing the total distribution and percentage of groundwater discharged from the Edwards aquifer.

Table 5.3 shows the 1994 discharge data by use for the six counties in the region. **Table 5.4** shows annual estimated Edwards aquifer groundwater discharge by use from 1955 to 1994.

Figure 5.2 Groundwater pumping compared to springflow in the Edwards aquifer, 1934-1994.

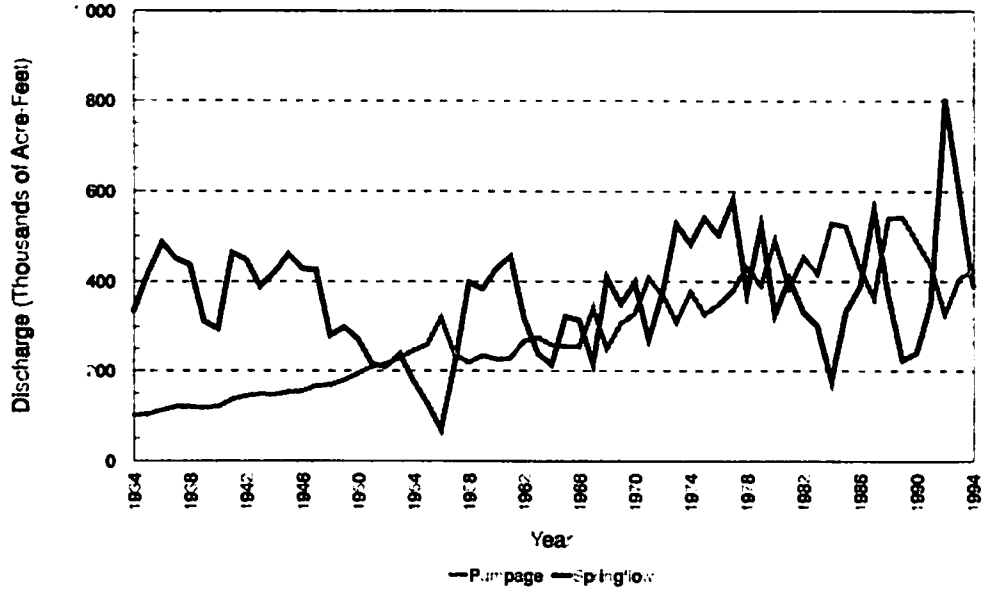
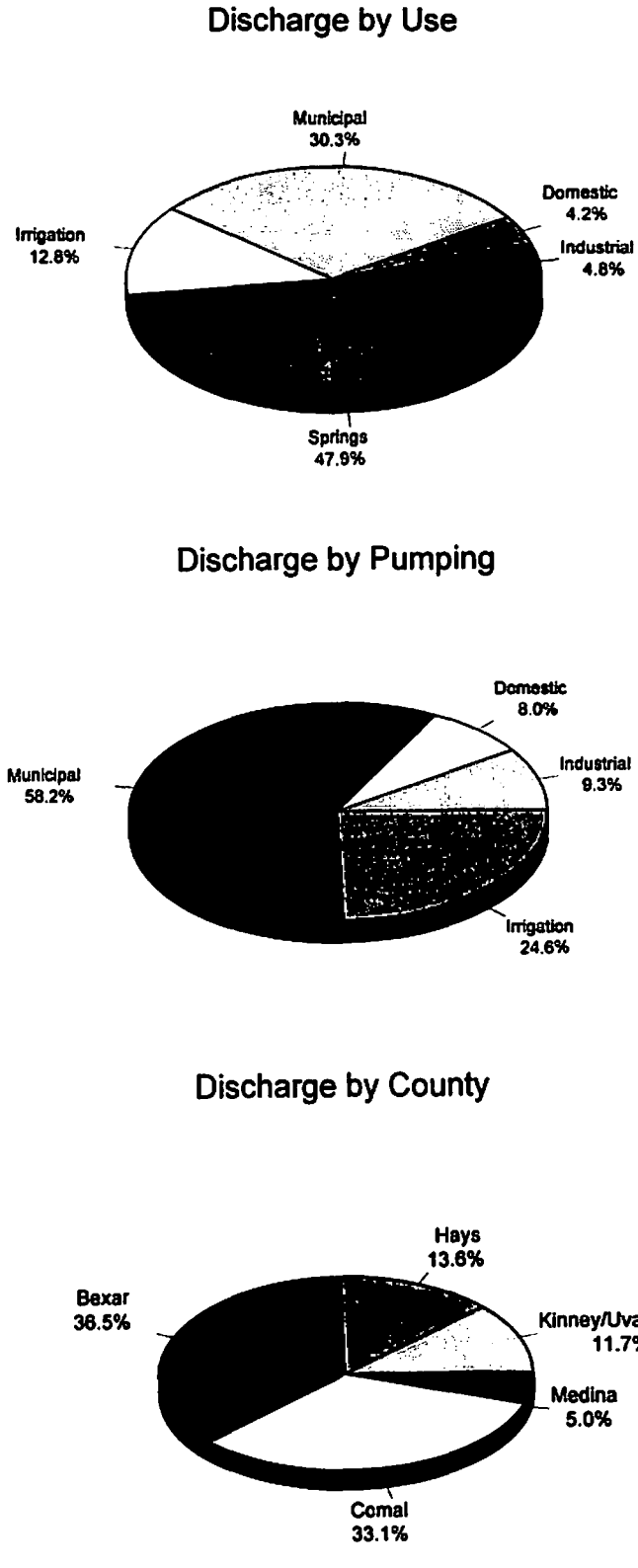


Figure 5.3 Percent Edwards aquifer groundwater discharge by use, 1994.



1994

Table 5.3 Groundwater discharge from the Edwards aquifer, 1994 (Measured in thousands of acre-feet).

County	Irrigation	Municipal /Military	Domestic /Stock	Industrial	Springs	Total
Bexar	9.4	220.9	28.8	23.6	15.0	297.7
Comal	0.2	3.5	0.7	14.3	251.0	269.8
Hays	0.1	11.2	1.0	0.4	97.8	110.6
Medina	34.7	5.7	0.7	0	0	41.1
Uvalde	59.5	4.7	2.5	0.9	26.3	93.9
Kinney	0.6	1.0	0.2	0	0	1.8
Total	**104.5**	**247.0**	**33.9**	**39.3**	**390.2**	**814.8**

Differences may occur due to rounding procedures.
Data Source - USGS, 1995.

Table 5.4 Annual estimated Edwards aquifer groundwater discharge by use, 1955-1994 (Measured in thousands of acre-feet).

Year	Irrigation	Municipal	Domestic & Stock	Industrial Commercial	Springs
1955	76.1	107.6	26.9	22.4	114.1
1956	113.6	123.5	25.8	20.0	66.1
1957	61.4	103.7	26.6	20.7	195.7
1958	42.1	101.5	29.8	22.4	355.5
1959	53.6	106.2	20.1	21.6	343.2
1960	49.0	108.1	26.0	20.8	381.3
1961	48.5	111.2	26.4	19.8	406.4
1962	64.9	128.3	25.7	20.4	286.6
1963	75.4	115.8	27.8	21.8	239.6
1964	72.8	140.6	26.4	21.8	213.8
1965	68.0	138.8	27.0	23.3	322.8
1966	68.2	141.8	23.3	22.6	315.3
1967	79.4	171.0	25.1	25.8	216.1
1968	59.3	146.9	25.5	20.0	408.3
1969	95.2	162.0	29.2	21.1	351.2
1970	110.1	167.5	34.6	22.5	397.7
1971	159.4	196.2	28.6	22.6	272.7
1972	128.8	190.5	30.8	21.1	375.8
1973	82.2	177.1	32.3	18.8	527.6
1974	140.5	174.6	33.5	15.1	483.8
1975	96.4	182.5	33.6	15.3	540.4
1976	118.2	182.1	34.6	14.7	503.9
1977	124.2	205.3	38.1	13.0	580.3
1978	165.8	214.2	40.3	11.5	375.5
1979	126.8	208.9	40.7	15.2	523.0
1980	177.9	256.2	43.3	13.7	328.3
1981	101.8	231.8	40.9	12.6	407.3
1982	130.0	268.6	39.5	15.0	333.3
1983	115.9	249.2	38.8	14.7	301.5
1984	191.2	287.2	36.2	15.2	172.5
1985	203.1	263.7	39.2	16.5	334.0
1986	104.2	266.3	42.0	16.8	405.3
1987	40.9	260.9	43.5	18.7	576.3
1988	193.1	286.2	41.9	18.8	386.5
1989	196.2	285.2	38.2	22.9	224.1
1990	172.9	254.9	37.9	23.7	240.6
1991	88.5	240.5	39.5	67.5	354.3
1992	27.1	236.5	34.8	29.0	602.8
1993	69.3	252.0	49.9	38.1	589.4
1994	104.5	247.0	33.9	39.3	390.2
Average (1955-1994)	104.9	192.3	33.5	21.4	386.1
Median (1955-1994)	99.1	186.5	33.8	20.6	354.9
Average (1985-1994)	120.0	259.3	40.1	28.9	430.3
Median (1985-1994)	104.4	257.9	39.4	23.3	388.3

Differences may occur due to rounding procedures.
Data Source - USGS and Edwards Underground Water District, 1995.

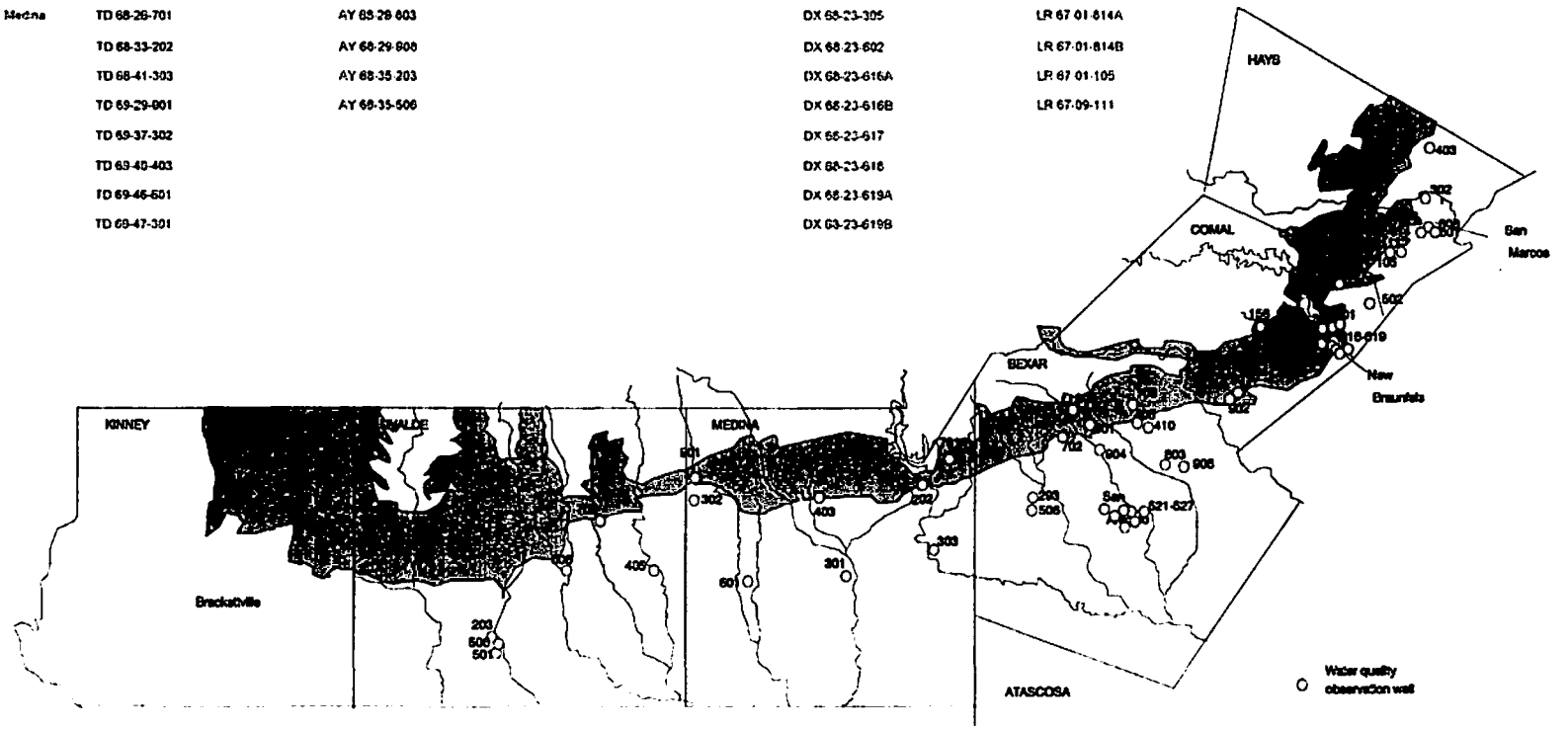
6.0 WATER QUALITY

The District, in cooperation with the USGS and the TWDB, has conducted a systematic program of water quality data collection since 1968. Through this cooperative effort, the District has monitored and maintained a network of wells, springs, and stream sites across the entire area of the Edwards aquifer. Analyses of these data have been used by the District to determine changes in aquifer water quality. A bulletin has been published annually by the District to report the results from the sample analyses obtained from the data collection network.

In 1994, the District collected water quality samples from 55 wells and three springs. The location of these wells and springs are shown in **Figure 6.1.** These samples were analyzed for 74 constituents and parameters. The analyses included common organic constituents, nutrients, dissolved organic carbon, metals, and volatile organic compounds. Typical standards for these parameters are listed in **Table 6.1.** Minor elements (metals) were sampled in 39 wells during 1994 (**Appendix 10.2**). Laboratory analyses indicated that 18 wells contained metal concentrations slightly above the minimum analytical detection levels for the constituents. These data have been documented by the testing laboratory under detection limits set through duplication of analytical methods to obtain reasonable confidence levels. Concentrations slightly above minimum

Figure 6.1 Edwards Underground Water District water quality monitoring sites sampled,1994.

County	Well I.D. Number	County	Well I.D. Number	County	Well I.D. Number	County	Well I.D. Number	County	Well I.D. Number
Uvalde	YP 69-36-702	Bexar	AY 68-28-203	Bexar	AY 68-37-521	Comal	DX 68-15-901	Hays	LR 58-58-403
	YP 69-43-606		AY 68-28-501	(continued)	AY 68-37-522		DX 68-16-502		LR 67-01-302
	YP 69-45-405		AY 68-28-702		AY 68-37-523		DX 68-22-901		LR 67-01-801
	YP 60-50-203		AY 68-28-904		AY 68-37-524		DX 68-22-902		LR 67-01-809
	YP 68-50-501		AY 68-29-109		AY 68-37-525		DX 68-23-156		LR 67-01-812
	YP 69-50-506		AY 68-29-405		AY 68-37-526		DX 68-23-301		LR 67-01-813A
			AY 60-29-410		AY 68-37-527		DX 68-23-303		LR 67-01-813B
Medina	TD 68-26-701		AY 68-29-603				DX 68-23-305		LR 67-01-814A
	TD 68-33-202		AY 68-29-606				DX 68-23-602		LR 67-01-814B
	TD 68-41-303		AY 68-35-203				DX 68-23-616A		LR 67-01-105
	TD 69-29-901		AY 68-35-506				DX 68-23-616B		LR 67-09-111
	TD 69-37-302						DX 68-23-617		
	TD 69-40-403						DX 68-23-618		
	TD 69-46-601						DX 68-23-619A		
	TD 69-47-301						DX 68-23-619B		



detection levels are not considered to be reproducible quantitative values, and must be viewed with a degree of precaution. The American Chemical Society has defined the limit of detection of any analyte concentration to be three times the standard deviation of a mean blank signal, and goes further to define the limit of quantification to be 10 times the standard deviation before the result can be considered as a quantifiable and reproducible value (Analytical Chemistry, vol.52, no.14, 1980). The analytical values in the subject wells are extremely low in magnitude and in no case were any of these parameters more than 20% of the maximum contaminant level (MCL). These analytical values all correspond to typical aquifer results for minor element content, as seen in **Table 6.1**. To verify whether or not these data are reproducible, 11 of the wells that showed minor element concentrations above the minimum analytical detection level have been scheduled for retesting during the 1995 sampling period.

Samples from 18 wells in Comal, Hays, Uvalde and Medina Counties were sampled for pesticides. Each well was tested for up to 20 pesticides at analytical detection levels below those of the MCL's posted by the U.S. Environmental Protection Agency (EPA) in the National Primary Drinking Water Regulations. No pesticides were observed at or above the minimum analytical detection level for any of the wells sampled during the 1994 water quality study.

MCLs for nine volatile organic compounds are given in **Table 6.2**. MCLs are established by the EPA, and are enforceable federal standards. While these

Table 6.1 Groundwater Quality Standards

Parameter	Current Maximum or Secondary Contaminant Levels	"Edwards Aquifer Typical Range of Results"
pH	-	6.5-8.0
Hardness (mg/L)	-	250-300
Non-carbonate hardness	-	20-50
Calcium (Ca) (mg/L)	-	80-120
Magnesium (Mg) (mg/L)	-	10-20
Sodium (Na) (mg/L)	-	3-10
Potassium (K) (mg/L)	-	1-2
Bicarbonate (CO_3)	-	250-400
Carbonate (CO3) (mg/L)	-	0
Sulfate (SO4) (mg/L)	250*	10-30
Chloride (Cl) (mg/L)	250*	10-30
Fluoride (F) (mg/L)	4	0.1-0.5
Dissolved Solids (mg/L)	500*	250-450
Silica (SiO2) (mg/L)	-	10-20
Nutrients		
Total Nitrate Nitrogen (mg/L)	10	0-0.1
Total Nitrite Nitrogen (mg/L)	-	0-0.1
Total Ammonia Nitrogen (mg/L)	0.5	
Total Phosphorus (mg/L)	-	
Bacteria & Biological Parameters		
Biochemical Oxygen Demand	-	0-1
Total Organic Carbon	-	1-5
Detergents (MBAS)	-	0-0.1
Total Coliform (colonies/100ml)	10,000 (Raw water for drinking water supplies)	0-5000
Fecal Coliform (colonies/100ml)	2,000 (Raw water for drinking water supplies)	0-150
Fecal Streptococci	-	
Metals		
Arsenic (As) (µg/L)	50	0-2
Cadmium (Cd) (µg/L)	5	0-1
Chromium (Cr) (µg/L)	100	0-15
Copper (Cu) (µg/L)	1000*	0-40
Iron (Fe) (µg/L)	300*	0-500
Lead (Pb) (µg/L)	50	0-10
Manganese (Mn) (µg/L)	50*	0-50
Mercury (Hg) (µg/L)	2	0-1.5
Zinc (Zn) (µg/L)	5000*	0-2000
Nickel (Ni) (µg/L)	-	0-4

Table 6.1 (Continued)

Parameter	Current Maximum or Secondary Contaminant Levels	"Edwards Aquifer Typical Range of Results"
Pesticides		
Aldrin (µg/L)	1	0
Chlordane (µg/L)	3	0
DDD (µg/L)	-	0
DDE (µg/L)	-	0
DDT (µg/L)	50	0
Heptachlor (µg/L)	0.1	0
Heptachlor epoxide (µg/L)	-	0
Lindane (µg/L)	0.2	0
Mirex (µg/L)	-	0
Toxaphene (µg/L)	3	0
Diazinon (µg/L)	-	0
Ethion (µg/L)	-	0
Malathion (µg/L)	-	0
Methyl Parathion (µg/L)	-	0
Methyl Trithion (µg/L)	-	0
Parathion (µg/L)	-	0
Trithion (µg/L)	-	0
2, 4D (µg/L)	70	0
2, 4-DP (µg/L)	-	0
2, 4, 5-T (µg/L)	2	0
Silvex (µg/L)	50	0
PCB (µg/L)	-	0
Endosulfan (µg/L)	-	0
Ethyl trithion (µg/L)	-	0
Perthane (µg/L)	-	0
Toxaphene (µg/L)	-	0

* - Secondary Maximum Contaminant Level

Data Source - EPA maximum contaminant levels, 1993.

levels are detectable, they are well below the limits set by current EPA drinking water standards. Volatile organic sampling in 1994 consisted of 19 wells distributed in all five counties. The samples taken from wells in Medina, Hays and Uvalde counties showed no detectable levels of any volatile organic

compounds. In Bexar and Comal counties, a total of four wells were found with levels of methylene chloride above the analytical detection level. These wells were AY-68-28-904 (7μg/L), AY-68-36-908 (7μg/L) , and AY-68-36-803 (8μg/L), all in Bexar County, and DX-68-22-901 (4μg/L) in Comal County. These results may be reflections of sampling and/or testing error and are under suspicion for their validity for the following reasons. 1) EPA document 8240, section 3.2 suggests that samples may be contaminated by diffusion of volatile organics (particularly methylene chloride and fluorocarbons) through the container septum seal into the sample during shipment and storage. 2) All four wells were sampled within a 24 hour period and were analyzed by the laboratory within three hours of each other. Wells separated by large distances with no history of methylene chloride contamination should not have produced the observed results. The subject wells are scheduled to be sampled again during the 1995 program, and will be re-evaluated for volatile organics.

Table 6.2 Volatile Organic Compounds.

Parameter	Maximum Contaminant Level	"Edwards Aquifer Typical Result"
Benzene (μg/L)	5	0
Carbon tetrachloride (μg/L)	5	0
1, 4-Dichlorobenzene (μg/L)	75	0
1, 2-Dichloroethane (μg/L)	5	0
1, 1-Dichloroethylene (μg/L)	7	0
Tetrachloroethylene (μg/L)	5	0
1, 1, 1-Trichloroethane (μg/L)	200	0
Trichloroethylene (μg/L)	5	0
Vinyl Chloride (μg/L)	2	0

Source - EPA maximum contaminant levels, 1993.

Overall, results of the 1994 water quality sampling and analysis program illustrate the continued excellent quality of water in the Edwards aquifer. The classification of groundwater quality is based on the concentration of minerals dissolved in water, termed total dissolved solids (TDS), as shown in **Table 6.3.**

Table 6.3 Classification of groundwater quality based on TDS.

Description	TDS Concentration (mg/L)
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

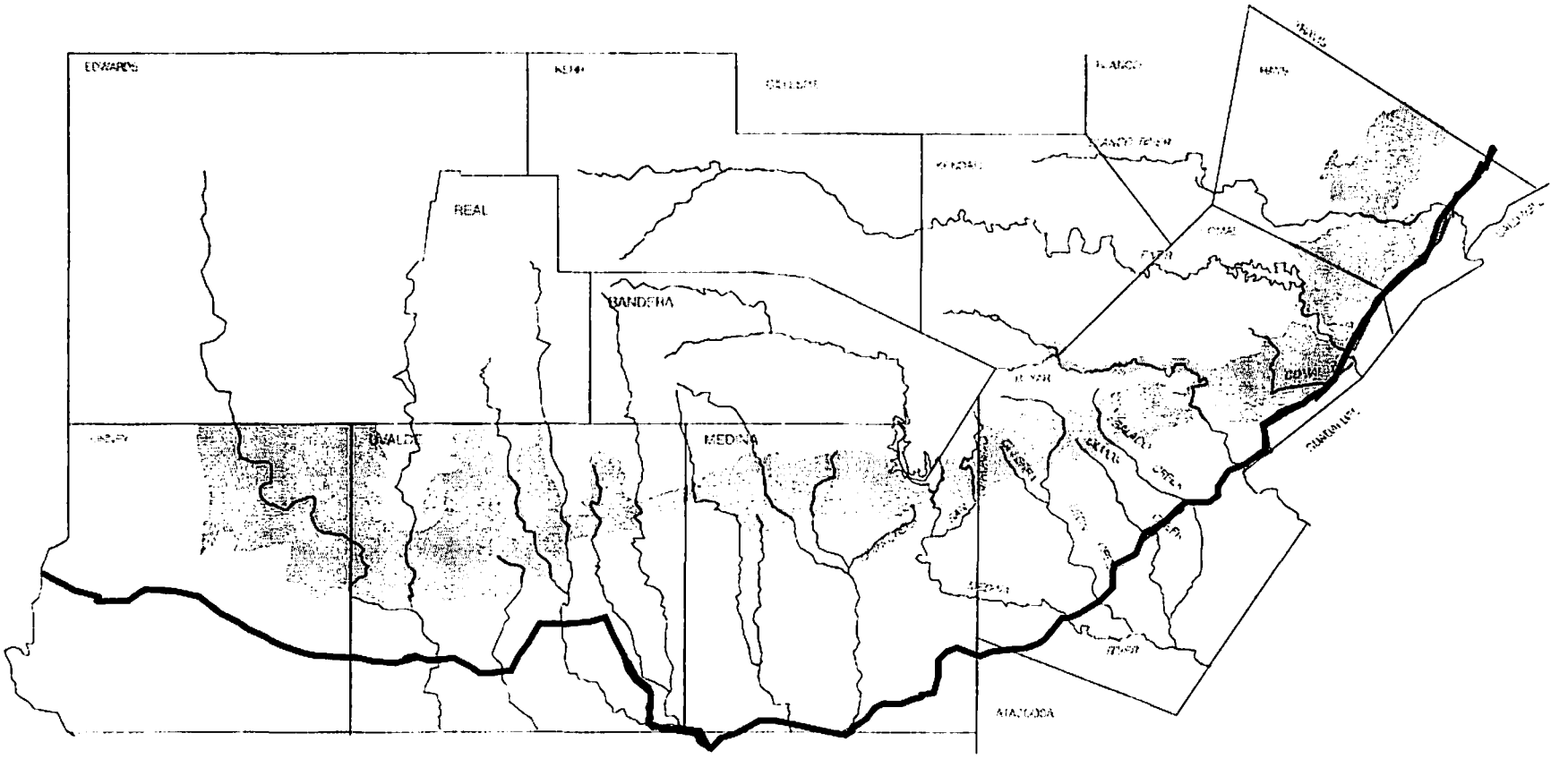
Source - Winslow and Kister, 1956.

A transitional freshwater/saline-water interface (formerly called the bad water line), defined by TDS values greater than 1000 mg/L, represents the downdip hydrologic boundary of the Edwards aquifer. Water updip from this arbitrary boundary is considered to be fresh potable water. South and southeast of the interface, water from the aquifer is slightly to moderately saline, and contains moderate to large concentrations of dissolved chloride and sulfate. The interface varies both laterally and vertically, as determined in several wells near the boundary. In some of these wells, fresh water has been encountered in the upper portion and saline water in the lower portion of the Edwards aquifer. Other

wells along the interface have encountered the opposite vertical distribution with saline-water zones overlying freshwater zones.

One District study, completed in 1994, evaluated the position of the freshwater/saline-water interface. The study by Alvin L. Schultz, "1994 Review and Update of the Position of the Edwards Aquifer Freshwater/Saline-Water Interface from Uvalde to Kyle, Texas", was conducted to update the location of the interface from Uvalde eastward to Kyle, Texas. This study utilized geophysical log data to calculate water quality values for TDS, and revised the work conducted by Schultz in 1992, "Using Geophysical Logs in the Edwards Aquifer to Estimate Water Quality Along the Freshwater/Saline-Water Interface (Uvalde to San Antonio, Texas)" , as well as the 1993 report "Defining the Edwards Aquifer Freshwater/Saline Water Interface with Geophysical Logs and Measured Data (San Antonio to Kyle, Texas)". The position of the interface, as determined by the 1994 study, is shown in **Figure 6.2.** The calculated data from geophysical logs, combined with available measured water quality data from the area, indicates that the freshwater/saline-water interface northeast of San Antonio is controlled predominantly by the Balcones Fault Zone, which downdrops portions of the aquifer to the southeast. While small segments of the interface were located further north than previously mapped, generally the position of the interface was consistent with previous mapping. This conclusion was determined as a result of the 1993 study.

Figure 6.2 Edwards aquifer freshwater/saline-water interface, 1994.

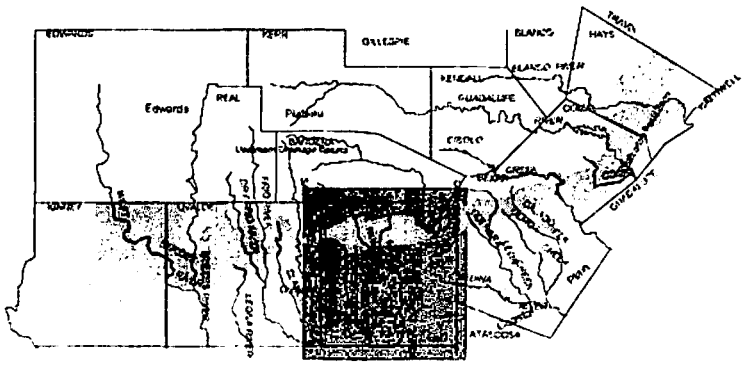


Results of Schultz's 1992 study indicated that the freshwater/saline-water interface was further south in western Medina County than had been previously mapped. An Edwards aquifer observation well was completed in 1993 at a total depth of 3410 feet, in order to evaluate the results of Schultz's 1992 study. The District drilled the well and tested the Edwards aquifer at a location in Medina County approximately 3.5 miles south of the previously mapped interface (**Figure 6.3**). The well encountered fresh water throughout the entire thickness of the aquifer.

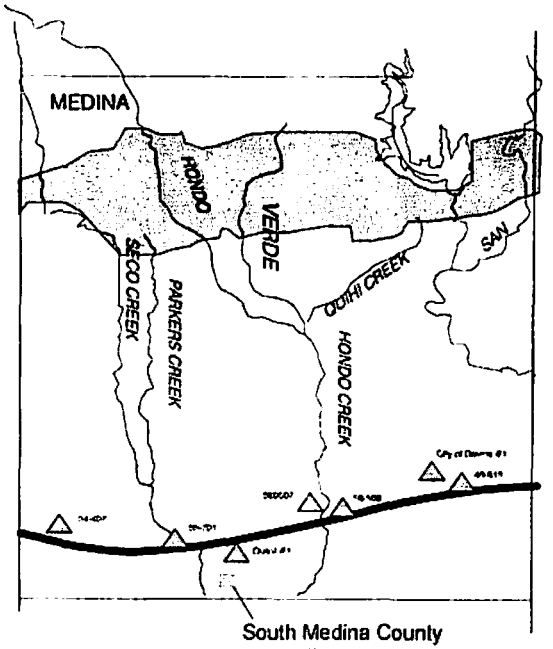
A total of ten flow tests and two packer tests were conducted at the test well site to evaluate hydrogeologic parameters and water quality in various discrete zones of the aquifer (**Table 6.4**). The results of analyses of the test data from this well were used to re-calibrate the calculated water quality data in the western portion of the aquifer area for the 1994 study. The well was subsequently equipped as a long-term monitoring well for water quality and aquifer level evaluation near the freshwater/saline-water interface.

Wells adjacent to the freshwater/saline-water interface have been monitored for possible water quality changes by the District, USGS, San Antonio Water System (SAWS), TWDB and other entities since the early 1960's. Various reports have theorized that during periods of drought and corresponding low aquifer levels, water quality could deteriorate in wells in close proximity to the interface, due to saline water encroachment updip into the

Figure 6.3 South Medina County water quality monitoring wells.



Freshwater/saline-water interface
(Modified from Puente, 1978)



South Medina County
test well.

Table 6.4 Water quality data - flow tests and packer tests, South Medina County monitoring well, 1993.

Test	Test Interval (ft)	shut-in Press (psi)	Temp. (°C)	Cond. (µS/cm)	TDS (mg/L)
Flow Test 1	2623-2822	40.5	39	796	466
Flow Test 2	2623-2932	--	--	575	312
Flow Test 3	2623-2978	42	43	515	313
Flow Test 4	2623-3043	43	43	527	368
Flow Test 5	2623-3104	47	43.5	539	--
Flow Test 6	2623-3168	47	43.5	559	410
Flow Test 7	2623-3231	48.5	43.5	481	359
Flow Test 8	2623-3291	45.5	44.5	448	363
Flow Test 9	2623-3356	46	45	477	349
Flow Test 10	2623-3410	--	44	473	351
PKR1-Upper	2673-3042	51	40	417	226
PKR1-Lower	3042-3231	45.5	40	453	340
PKR2-Upper	2623-3230	51	44	474	374
PKR2-Lower	3230-3410	47.3	42	447	298
Final Flow	2623-3410	51	44	462	354

freshwater portion of the aquifer. The possibility of saline water encroachment and subsequent deterioration of water quality in the aquifer led to the construction of three water quality monitor well transects across the freshwater/saline-water interface. The monitor wells were drilled and tested by the District and the USGS with the cooperation of local entities. These transects are located in San Marcos, New Braunfels and San Antonio.

Table 6.5 consists of water quality data compiled from transect wells in San Antonio and New Braunfels. These wells have been sampled on a monthly basis since the 1980's. Data from the San Antonio transect well, AY-68-37-526, extends back to 1986, and includes the drought period of 1988 to 1989 repre-

sented by lower than normal water levels in well J-17 (the Bexar County index well).

Figure 6.4 illustrates that normal changes in the aquifer water level have little effect on water quality in these wells, which are directly adjacent to the freshwater/saline-water interface. The data suggest, however, that if water levels approach record lows, there may be a slight degradation of water quality in specific wells immediately adjacent to the interface. **Table 6.5** and **Figure 6.4** show that when the water level in well J-17 was below 630 feet, specific conductance values rose slightly in transect well AY-68-37-526.

Figure 6.4 Water quality changes in San Antonio and New Braunfels transect wells compared to water levels in J-17 (Bexar County index well), 1988 - 1994.

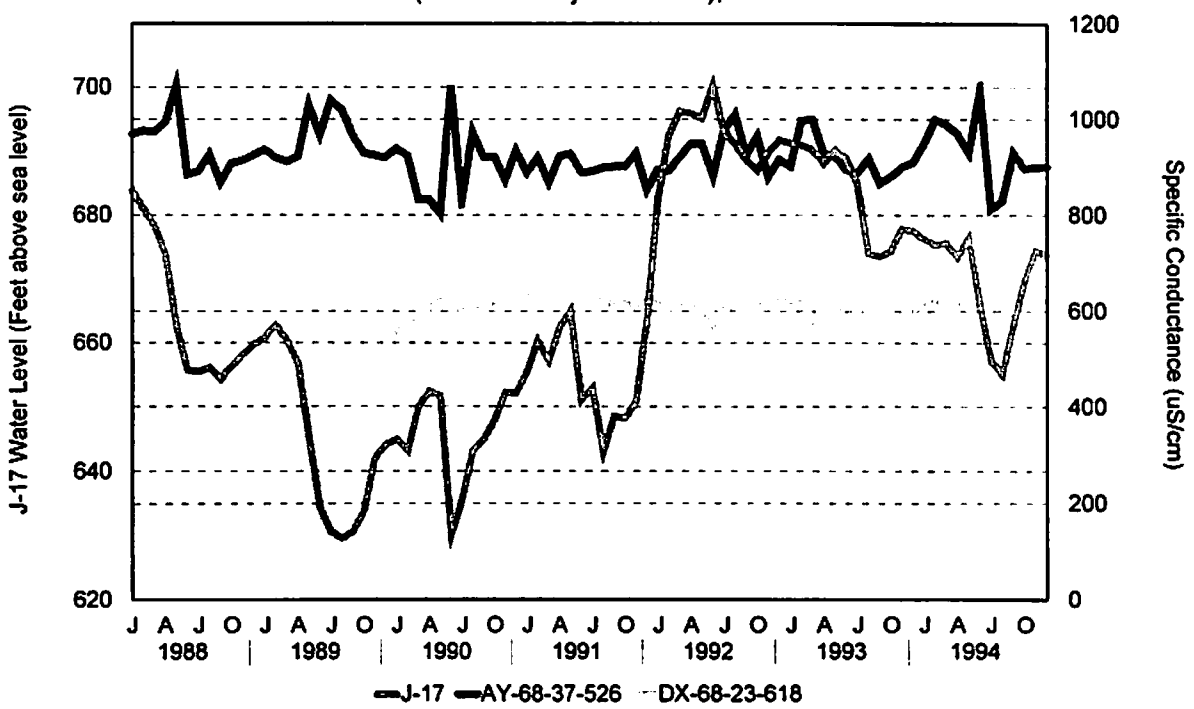


Table 6.5 Water quality data compiled from transect wells in San Antonio and New Braunfels reported as conductivity values as compared to water levels at Bexar County index well (J-17, Dodd Field).

Month	Bexar County index well (feet above sea level)	San Antonio AY-68-37-526 (D-1) (µS/cm)	New Braunfels DX-68-23-618 (µS/cm)
January 1988	683.8	969	—
February	681.1	977	—
March	678.6	974	—
April	674.1	994	—
May	662.9	1070	—
June	655.7	884	—
July	655.5	891	—
August	656.1	926	—
September	654.2	868	—
October	656.4	908	—
November	658.2	914	—
December	659.7	925	—
January 1989	660.8	937	—
February	662.9	920	—
March	660.4	911	—
April	656.8	922	—
May	645.2	1030	—
June	634.3	968	—
July	630.7	1040	—
August	629.6	1020	—
September	630.7	967	—
October	633.8	930	—
November	642.0	—	—
December	644.1	920	—
January 1990	644.9	939	556
February	643.2	924	—
March	650.0	832	—
April	652.4	832	—
May	651.7	803	625
June	630.2	1070	—
July	635.6	830	605
August	643.2	973	—
September	644.9	921	605
October	647.9	922	617
November	652.2	873	616
December	652.1	934	627
January 1991	655.3	888	630
February	660.3	920	615
March	657.2	868	627
April	662.5	923	622
May	665.1	928	619
June	651.0	888	617
July	653.0	891	611
August	643.1	898	626
September	648.5	901	610
October	648.2	—	619
November	650.8	929	612
December	663.3	853	623
January 1992	682.2	895	616
February	692.4	892	604
March	696.3	922	610
April	695.9	949	621
May	695.1	—	606
June	700.3	882	570
July	693.3	978	606
August	691.2	1010	610
September	688.7	925	598
October	686.9	965	—
November	689.7	880	624

Table 6.5 (Continued)

Month	Bexar County Index well (feet above sea level)	San Antonio AY-68-37-526 (D-1) (µS/cm)	New Braunfels DX-68-23-618 (µS/cm)
December	691.8	916	—
January 1993	691.3	902	620
February	691.0	997	618
March	690.2	1000	580
April	688.1	928	612
May	690.2	923	603
June	688.9	894	—
July	684.9	888	577
August	674.0	918	602
September	673.6	866	600
October	674.5	—	—
November	677.9	900	580
December	677.6	910	600
January 1994	676.3	950	611
February	675.4	1000	630
March	675.7	990	605
April	673.5	970	615
May	676.5	930	610
June	666.1	1060	610
July	657.2	813	622
August	655.1	829	608
September	662.9	930	594
October	669.8	897	616
November	674.5	900	621
December	673.8	901	623

Data Source: Edwards Underground Water District, 1995.

Since 1968 the District, in cooperation with the USGS, has monitored water quality in the Edwards aquifer. Water quality data from these monitoring activities have been presented in various bulletins and reports with detectable concentrations of certain contaminants noted. A short background on several of these contaminants and their significance and potential health effects follows.

Lead - Lead is a highly toxic metal. Exposure to lead in high concentrations can cause anemia, kidney damage and mental retardation. High levels of lead in the blood can delay physical and mental development in infants, and can

impair mental abilities in children. It is also classified by the EPA as a probable human carcinogen.

Lead occurs in drinking water primarily as a result of corrosion of pipes and other plumbing materials. Lead levels are monitored in public drinking water systems on a regular basis by the TNRCC. The minimum detection limit for lead in water quality sample analysis is 0.01 μg/L, and the maximum contaminant level (MCL) is 15 μg/L. Detectable concentrations of lead in Edwards wells are predominantly found in or near the saline portion of the aquifer, where corrosion of casing and pumping equipment occurs rapidly. Lead has also been detected in monitor wells adjacent to closed landfills and industrial sites. As of 1994, no significant recurring levels of lead exceeding the MCL have been found in the Edwards aquifer region.

Mercury - Mercury is known to cause damage to the central nervous system, and is a known human carcinogen. It occurs naturally in groundwater associated with highly mineralized fluids in the vicinity of volcanic activity, or due to geothermal heating of deep brines. Mercury is also used in some batteries, paints, pesticides and some electrical components, and therefore can possibly be detected in the vicinity of landfills and manufacturing sites that produced these items. The MCL for mercury is 2 μg/L. The minimum detection limit is 0.01

µg/L. The primary occurrences of detectable concentrations of mercury have been found in saline-water wells and monitor wells used to investigate abandoned landfills and industrial sites in Bexar County. No detectable concentrations of mercury were measured during the 1994 sampling program.

Volatile Organic Chemicals (VOCs) - At least five of the chemicals on this list are known or suspected carcinogens when ingested by humans. These include benzene, carbon tetrachloride, 1,2-dichloroethane, trichloroethylene (TCE), and vinyl chloride. Several other VOCs are regulated based on chronic toxicity.

These chemicals occur as byproducts of industrial activity, primarily used as solvents or cleaning agents in industrial processes. Because of their toxicity, MCLs for these contaminants are very low, ranging from 2 to 5 µg/L for most of the VOCs. Minimum detection levels for VOCs predominantly range from 0.01 to 0.03 µg/L.

Occurrences of significant detectable concentrations of VOCs have been uncommon in the Edwards aquifer. Specific sites of former industrial and landfill activity in Uvalde and Bexar counties have been investigated by the District, as well as other local, state and federal agencies. No new reported instances of VOC contamination were investigated by District staff during 1994.

Secondary Drinking Water Standards - These standards are non-enforceable and are set for contaminants that may affect the aesthetic qualities of drinking water, such as odor or appearance. **Table 6.6** is a list of the current secondary standards. While these contaminants are not considered to affect public health, their presence can result in an adverse effect on public welfare.

Table 6.6 Secondary drinking water standards.

Contaminant	Secondary Maximum Contaminant Level (SMCL) (mg/L)
Aluminum	0.05-0.2
Chloride	250
Color	15 color units
Corrosivity	noncorrosive
Fluoride	2.0
Iron	0.3
Manganese	0.05
pH	6.5-8.5
Silver	0.10
Sulfate	250
Total Dissolved Solids (TDS)	500-1000
Zinc	5

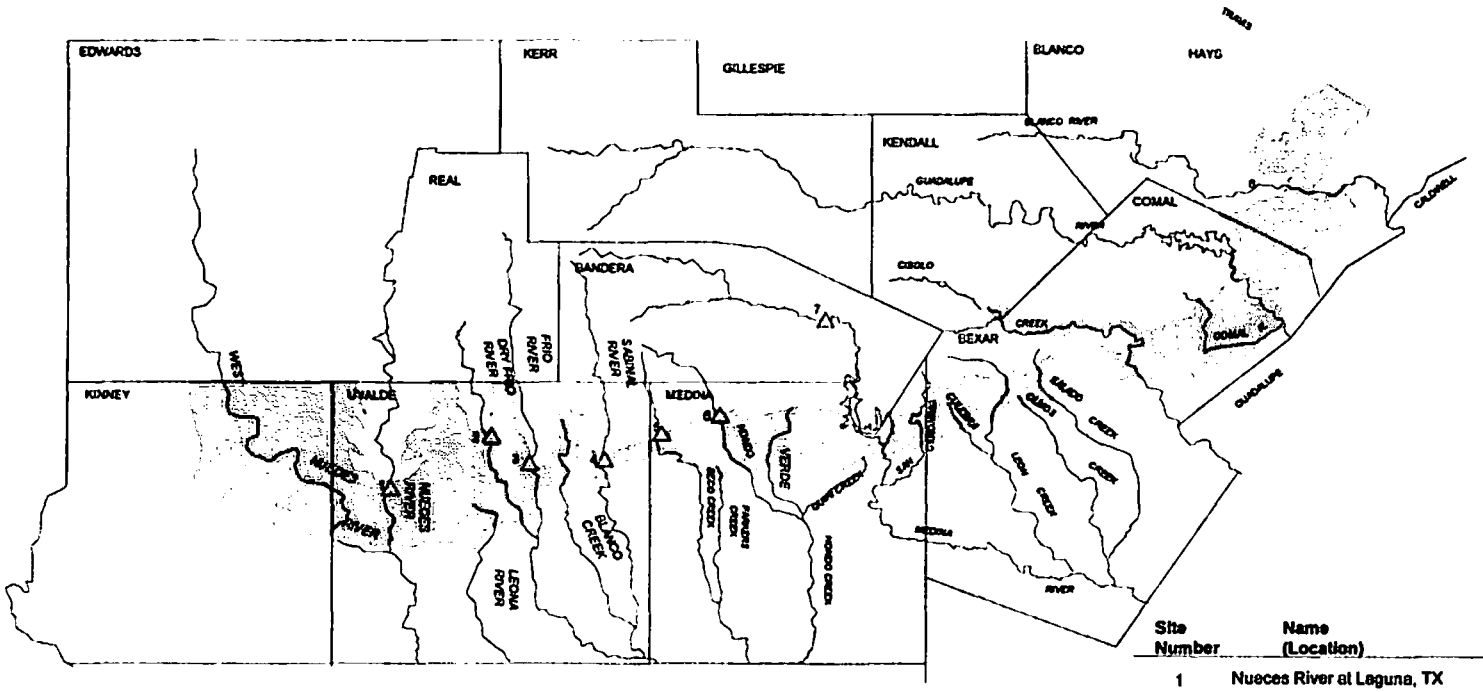
Data Source - EPA, 1993.

The District's water quality monitoring program will continue to monitor for these contaminants as well as many others, in order to detect and investigate any occurrences of possible contamination to the aquifer. The District continues its programs to protect the water quality of the aquifer through investigating groundwater contamination, identifying and analyzing anomalous data from the District's aquifer-wide sampling program, diligently monitoring development

activities over the recharge zone, and locating and causing abandoned wells to be plugged. All of these programs are intended to ensure that the quality of water in the aquifer will remain at its current excellent level.

Surface water data is collected at stations upstream of the recharge zone and at stations located throughout the aquifer area. Data from the network of gauging stations can be used as a base level to evaluate the quality of water recharging the aquifer and the sensitivity of water quality resulting from land use in various areas of the Edwards aquifer region. Locations of data collection sites are illustrated in **Figure 6.5.** Laboratory analyses of the samples collected in 1994, as seen in **Appendix 10.2**, indicate no evidence of detectable concentrations of pesticides, volatile organic compounds, or other constituents or parameters in excess of typical standards.

Figure 6.5 Surface water quality monitoring sites, 1994.



Site Number	Name (Location)
1	Nueces River at Laguna, TX
2	Dry Frio River near Reagan, TX
3	Frio River at Concan, TX
4	Sabinal River near Sabinal, TX
5	Seco Creek at Miller Ranch near Utopia, TX
6	Hondo Creek near Tarpley, TX
7	Medina River at Bandera, Tx

7.0 SUMMARY

The average estimated annual groundwater recharge to the Edwards aquifer in the San Antonio area from 1934 through 1994 was 676,600 acre-feet. Recharge in 1994 was 538,100 acre-feet, which was well below the regional average. The lowest annual recharge of 43,700 acre-feet occurred in 1956 and the highest annual recharge of 2,486,000 acre-feet occurred in 1992.

The estimated annual discharge from the Edwards aquifer through wells and springs in 1994 was 814,800 acre-feet, which was the 14th largest calculated annual discharge for the period of record (1934-1994). The lowest annual discharge through wells and springs for the same time period was 388,800 acre-feet which occurred in 1955.

Water level data for wells during 1994 reflected an above average volume of groundwater in storage in the Edwards aquifer during the year.

In 1994, the District collected water quality samples from 55 wells, three springs, and seven streams and rivers. These samples were analyzed for 74 constituents and parameters which included common organic constituents, nutrients, dissolved organic carbon, metals and VOCs. Laboratory analyses indicated that samples from 18 wells contained detectable metal concentrations. These

concentrations were well below the MCLs for those constituents. No detectable concentrations of pesticides were measured in the wells sampled in 1994. VOCs were detected in four wells at levels well below the limits set by current EPA drinking water standards.

Results of the District's 1994 water quality monitoring program illustrate the continued excellent quality of water in the Edwards aquifer.

8.0 DEFINITIONS

Technical terms and abbreviations used in this report are defined as follows:

Acre-foot (ac-ft)	The quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 ft^3 (cubic feet), about 325,900 gal (gallons), or 1,233 m^3 (cubic meters).
Aquifer	A formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield economical quantities of water to wells and springs.
Artesian well	A well deriving its water from a confined aquifer in which the water level stands above the ground surface.
Artesian zone	An area where the water level from a confined aquifer stands above the top of the strata in which the aquifer is located.
Bacteria	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. (Measured in colonies 100 ml)
Conductivity	A measure of the ease with which a conduction current can be caused to flow through a material under the influence of an applied electric field. Generally, in water the higher the total dissolved solids the higher the electrical conductivity.
Confined aquifer	An artesian aquifer or an aquifer bounded above and below by impermeable strata, or by strata with lower permeability than the aquifer itself.
Discharge	The volume of water that passes a given point within a given period of time.
Drainage basin	A part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.
Freshwater/	The interface or area which separates TDS values less than

saline-water interface	1000 mg/L (freshwater) from TDS values greater than 1000 mg/L (saline-water). Commonly referred to as the "Bad Water Line".
Gauging station	A particular site which systematically collects hydrologic data such as streamflow, springflow or precipitation.
Micrograms per liter (UG/L,µg/L)	A unit expressing the concentration chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. 1000 micrograms per liter is equal to 1 milligram per liter.
Milligrams per liter (Mg/L,mg/L)	A unit for expressing the concentration of chemical constituents in solution as mass (milligram) of solute per unit volume (liter) of water. 1000 milligrams per liter is equal to 1 gram per liter.
Potentiometric surface	An imaginary surface representing the total head of groundwater and defined by the level that water will rise in a well.
Recharge	The process involved in absorption and addition of water to the zone of saturation.
Recharge zone	The area in which water infiltrates into the ground and eventually reaches the zone of saturation in one or more aquifers.
Specific conductance	A measure of the ability of water to conduct an electrical current. Expressed in micro-siemens per centimeter (µS/cm) at 25°C.
Ten-year floating average	The calculated mean of the current year plus the previous nine years in a graph.
Total Dissolved Solids (TDS)	The concentration of dissolved minerals in water.
Transect wells	A group of water quality monitoring wells located at particular a site which are used to measure movement of the freshwater/saline-water interface.
Unconfined aquifer	An aquifer, or a portion of an aquifer, having a water table and containing groundwater that is not under pressure beneath relatively impermeable rocks.

Underflow	The movement of water flowing beneath the bed or alluvial plain of a surface stream.
Water table	The interface between the zone of saturation and the zone of aeration where the surface pressure of unconfined groundwater is equal to the atmospheric pressure
Zone of aeration	The subsurface zone where the voids and pore spaces are filled with water under less pressure than that of the atmosphere and air.
Zone of saturation	The subsurface zone in which all voids and pore spaces are filled with water under pressure greater than that of the atmosphere.

9.0 REFERENCES

Bader, R.W., Walthour, S.D., Waugh, J.R., 1993, Edwards aquifer hydrogeologic status report for 1992: Edwards Underground Water District Report 93-05, 71 p.

Edwards Underground Water District, 1995, Division of Field Operations Open Data Files.

Puente, Celso, 1978, Method of estimating natural recharge to the Edwards aquifer in the San Antonio area, Texas: US Geological Survey Water-Resources Investigations Report 78-10, 38 p.

Schultz, A.L., 1992, Using geophysical logs in the Edwards aquifer to estimate water quality along the freshwater/saline-water interface (Uvalde to San Antonio, Texas): Edwards Underground Water District Report 92-03, 47 p.

Schultz, A.L., 1993, Defining the Edwards aquifer freshwater/saline-water interface with geophysical logs and measured data (San Antonio to Kyle, Texas): Edwards Underground Water District Report 93-06, 81 p.

Schultz, A.L., 1994, 1994 Review and update of the position of the Edwards aquifer freshwater/saline-water interface from Uvalde to Kyle, Texas: Edwards Underground Water District Report 94-05, 31 p.

United States Department of Commerce, 1970-1994, Climatological data, Texas, annual summaries: National Oceanic and Atmospheric Administration, v 75-97, no. 13

United States Environmental Protection Agency, 1993, Maximum contaminant levels (subpart of part 141, National primary drinking water regulations): U.S. Code of Federal Regulations, Title 40, parts 100-149.

United States Environmental Protection Agency, 1993, Secondary maximum contaminant levels (section 141.3 of part 143, National secondary drinking water regulations): U.S. Code of Federal Regulations, Title 40, parts 100-149.

United States Environmental Protection Agency, 1993, National primary and secondary drinking water regulations; synthetic organic compounds and inorganic chemicals (sections 141.11, 141.12, 141.32, 141.50, 141.51, 141.61, and141.62 of part 143): U.S. Code of Federal Regulations, Title 40 parts 100-149.

United States Geological Survey, 1995, Basic data collection cooperative agreement with Edwards Underground Water District for Fiscal Year 1994-1995: District open files.

Walthour, S.D., Waugh, J.R., Sutton, C.M., 1994, Edwards aquifer hydrogeologic report for 1993: Edwards Underground Water District Report 94-04, 178 p.

Waugh, J.R., 1993, South Medina County observation well report: Edwards Underground Water District Report 93-11, 10 p.

Winslow, A.G., and Kister, L.R., 1956, Saline-water resources of Texas: US Geological Survey Water-Supply Paper 1365, 105 p.

10.0 APPENDIX

Appendix 10.1 - Water Level Data

Daily high water levels
in feet above MSL
LSD = 730.81'.

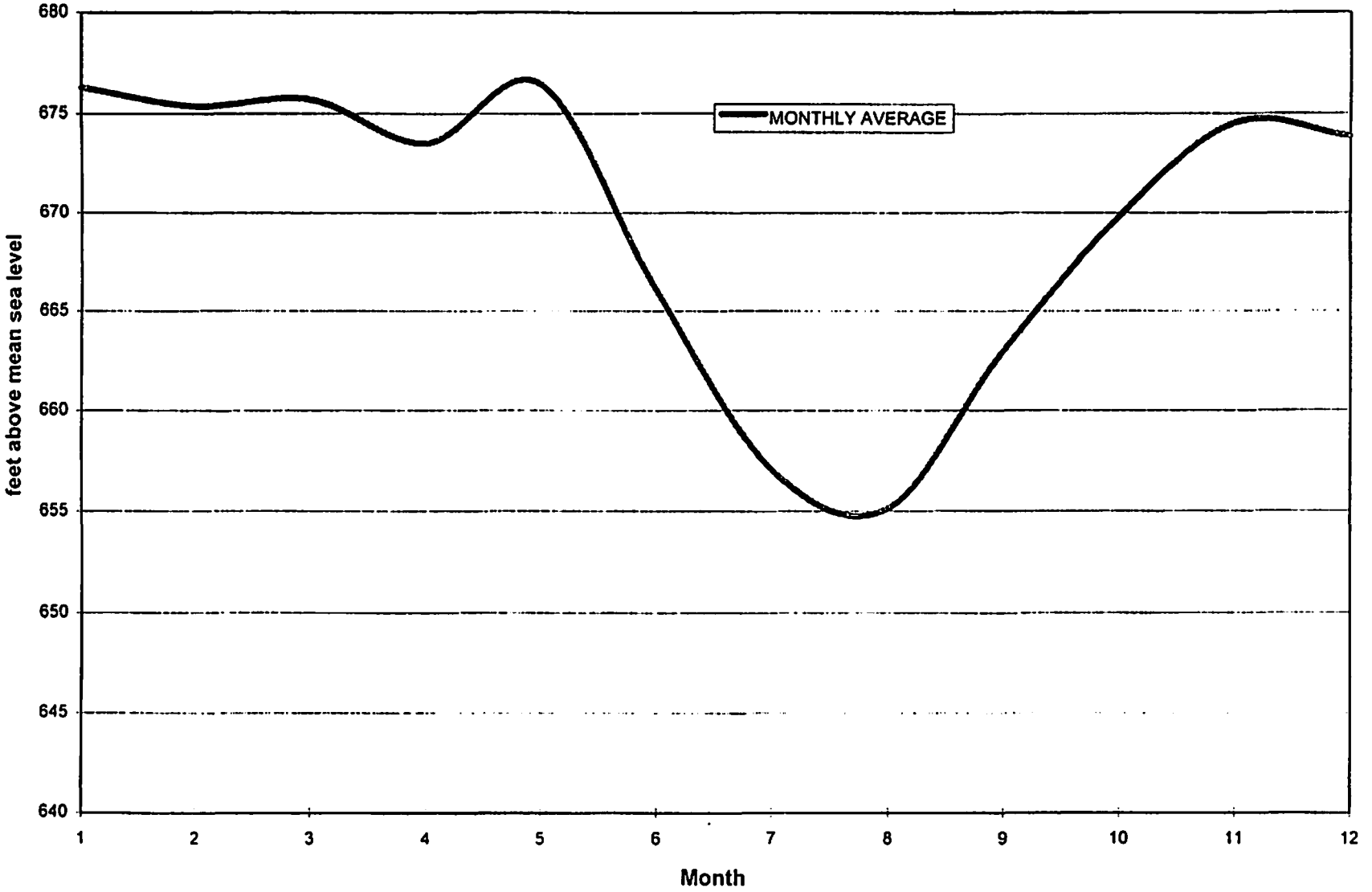
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVEL IN OBSEVATION WELLS
YEAR 1994

BEXAR CO.
AY 68-37-203
J-17

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	677.48	676.55	675.21	676.11	673.96	671.17	661.98	652.83	656.4	663.36	675.35	673.14
2	677.56	676.44	675.36	675.85	675.14	670.21	661.77	652.51	657.13	663.2	675.26	673.1
3	677.19	676.35	675.18	675.6	675.46	668.74	661.56	652.55	657.86	662.69	675.15	673.51
4	677.1	676.25	675.19	675.58	675.69	668.07	661.6	652.08	657.95	661.87	675.09	673.7
5	676.89	676.23	675.19	675.32	675.81	667.33	661.12	652.74	657.7	661.66	675.13	673.51
6	676.82	676.08	674.98	675.1	675.8	666.36	660.46	653.59	656.71	661.72	675.27	673.36
7	676.57	675.81	674.65	674.87	675.9	664.76	659.93	653.48	656.07	661.6	675.17	673.36
8	676.4	675.6	674.43	674.73	676	663.7	659.2	652.59	657.09	666.73	674.92	673.3
9	676.51	675.42	674.51	674.45	676.03	662.23	659.03	652.48	661.16	668.39	675.76	673.3
10	676.48	675.35	674.64	674.26	675.77	661.7	659.59	655.79	662.35	668.87	674.77	673.45
11	676.04	675.4	674.57	673.89	675.65	662.82	659.15	656.82	663.06	669.13	674.72	673.52
12	675.88	675.67	674.69	673.6	675.48	662.95	658.5	656.86	663.68	669.42	674.72	673.47
13	675.9	675.54	674.79	673.56	675.38	662.56	657.74	657.01	664.1	669.51	674.78	673.25
14	675.95	675.45	674.92	673.16	674.88	663.66	657.21	657.06	665.48	669.47	674.55	673.3
15	676.02	675.27	675.06	672.94	677.64	665.24	656.89	656.55	666.01	670.23	674.48	673.37
16	676.04	675.09	675.86	673.23	678.26	665.91	656.91	657.11	666.82	670.74	674.46	673.71
17	675.87	674.93	676.46	673.45	678.74	666.52	656.93	657.29	667.24	670.9	674.52	673.89
18	675.75	674.76	676.89	673.2	679.12	666.8	656.41	656.91	667.46	671.18	674.32	674.06
19	674.96	674.89	676.98	672.97	679.14	666.72	656.05	656.06	667.24	672.31	674.32	674.22
20	675.04	674.81	677.01	672.67	679.13	667.64	655.68	656.14	666.95	672.92	674.55	674.26
21	675.09	674.63	676.77	672.78	678.93	667.74	655.09	656.04	666.53	673.33	674.34	673.97
22	675.62	674.8	676.49	672.52	678.72	668.35	654.59	656.44	666.37	673.65	673.87	673.31
23	675.97	674.78	676.37	672.46	677.8	668.68	654.86	656.04	666.1	673.75	673.68	673.73
24	676.22	674.77	676.2	672.39	677.72	668.56	654.79	655.81	665.94	673.76	673.94	673.87
25	676.43	674.9	676.16	672.04	677.28	667.95	654.16	655.77	665.58	673.68	674.23	674
26	676.54	674.77	675.72	671.62	676.84	667.13	653.56	655.51	665.05	674.88	674.21	674.32
27	676.68	674.95	676.28	671.09	676.38	666.32	653.1	655.48	664.32	674.89	674.28	674.1
28	676.58	675.01	676.63	671.22	675.78	664.68	652.55	655.36	664.26	675.2	673.87	674.46
29	676.74		676.67	672.01	675.12	663.52	652.43	654.82	663.8	675.46	673.52	675.15
30	676.82		676.57	672.63		662.68	652.7	654.29	663.31	675.44	673.2	675.68
31	676.76		676.31				653.15	655.07		675.43		676.12

Artesian well in Edwards Limestone.

Bexar County Index Well (J-17) AY 68-37-203
1994



Land surface datum = 730.81

Daily high water levels
in feet above MSL.
LSD = 1230'.

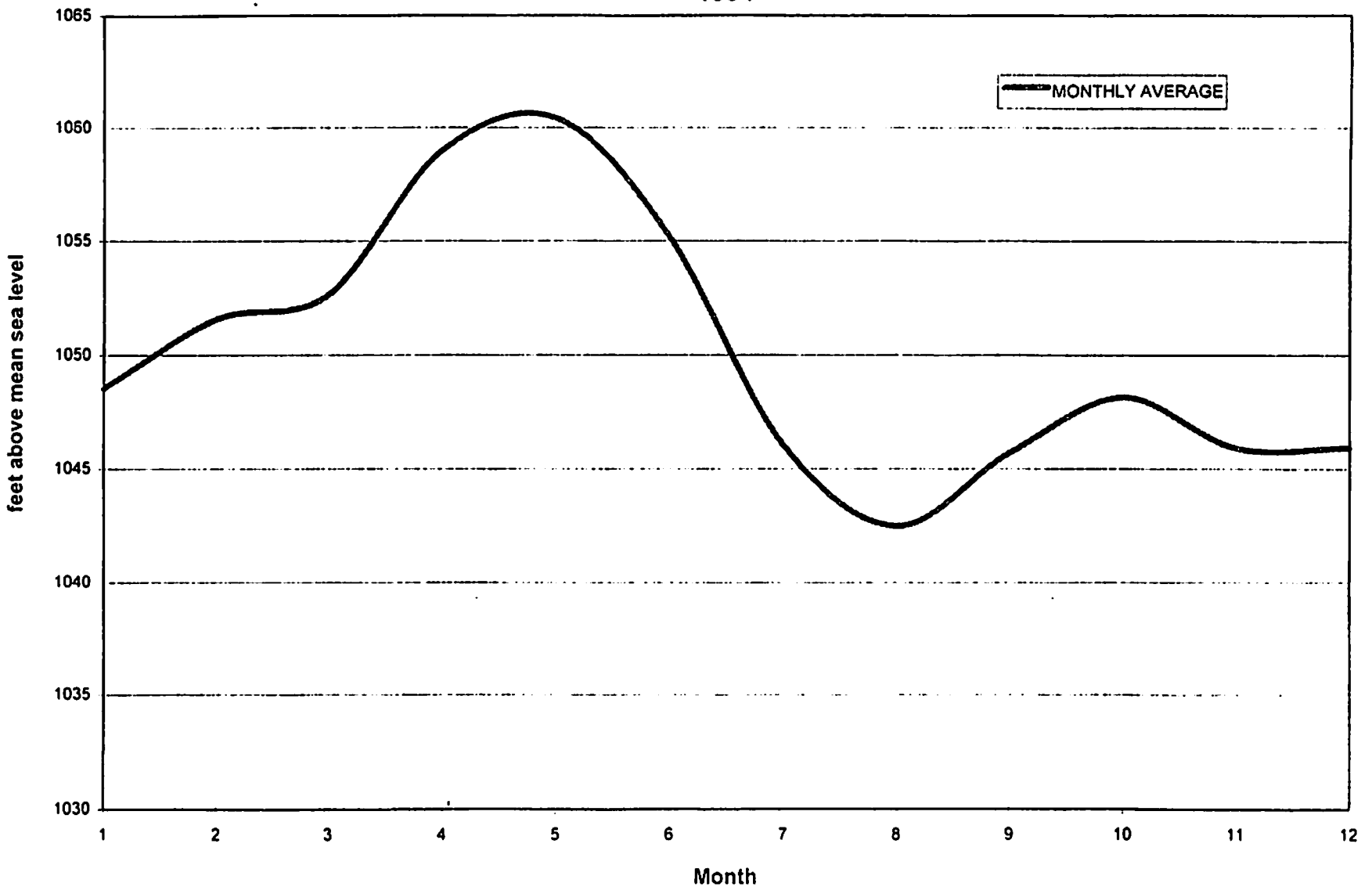
EDWARDS UNDERGROUNG WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

BEXAR CO.
AY 68-19-806
La ESCONDIDA WELL

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	1052.7		1050.96	1053.9	1052.62	1061.37	1059.22	1049.89	1042.64	1041.03	1049.33	1046.36
2	1052.73		1050.83	1053.94	1054.39	1061.31	1059	1049.64	1042.67	1040.77	1049.34	1046.38
3	1052.45	1049.05	1050.41	1053.69	1055.35	1061.11	1058.84	1049.4	1042.33	1040.22	1048.94	1046.21
4	1052.35	1049.1	1050.6	1053.82	1055.63	1061.23	1058.49	1048.93	1041.4	1039.67	1048.86	1046
5	1051.95	1049.05	1050.6	1053.88	1055.82	1061.18	1058.18	1048.16	1041.35	1039.41	1048.7	1045.96
6	1052	1048.87	1050.36	1053.51	1055.65	1061.13	1058.15	1047.86	1041.3	1039.23	1048.51	1045.85
7	1051.86	1048.78	1050.04	1053.44	1055.69	1061.03	1057.79	1048.12	1040.65	1038.91	1048.84	1045.7
8		1048.72	1049.95	1053.49	1056.15	1060.72	1057.35	1047.81	1041.09	1041.35	1048.99	1045.65
9		1048.63	1049.74	1053.47	1056.29	1060.43	1057.01	1047.31	1041.89	1044.85	1048.99	1045.57
10		1048.38	1049.25	1053.37	1056.29	1060.5	1057.03	1047.23	1043.06	1046.17	1048.71	1045.28
11	1050.7	1048.3	1049.07	1053.22	1056.24	1060.35	1056.89	1046.81	1043.35	1046.75	1048.7	1045.05
12	1050.66	1048.35	1048.95	1052.95	1056.38	1060.26	1056.53	1046.9	1043.37	1046.93	1048.55	1045.02
13	1050.61	1047.91	1048.71	1052.96	1057.31	1060.22	1056.43	1046.77	1043.15	1046.63	1048.48	1044.57
14		1047.67	1048.52	1053.05	1059.09	1060.26	1056.17	1046.26	1043.02	1046.09	1048.39	1044.58
15		1047.76	1048.36	1052.99	1060.22	1060.29	1055.95	1046.16	1043.11	1045.5	1048.18	1044.51
16	1050.5	1047.35	1049.71	1052.59	1060.92	1060.2	1055.6	1045.75	1043.24	1045.3	1048.19	1044.57
17	1050.5	1047.14	1051.87	1052.27	1061.2	1060.25	1055.28	1046.12	1043.25	1045.17	1048.32	1045.1
18		1047.25	1052.91	1052.25	1061.36	1060	1055.06	1046.23	1043.42	1045.43	1048.15	1045.38
19		1047.28	1053.32	1052.33	1061.49	1059.97	1054.72	1045.94	1043.58	1047.62	1048.07	1045.91
20		1047.1	1053.38	1052.02	1061.51	1059.95	1054.33	1045.63	1043.03	1048.82	1048.15	1046.2
21		1047	1053.36	1052.16	1061.59	1060.18	1053.95	1045.26	1042.86	1049.24	1047.75	1046.04
22		1047.08	1053.4	1052.13	1061.73	1060.45	1053.63	1045.17	1042.34	1049.29	1047.47	1045.86
23		1048.05	1053.62	1051.91	1061.73	1060.51	1053.08	1044.86	1043.1	1048.98	1047.09	1045.87
24		1049.75	1053.56	1051.5	1061.95	1060.4	1052.79	1044.44	1043.35	1048.43	1047.2	1045.94
25		1050.37	1053.4	1051.3	1061.96	1060.28	1052.45	1043.76	1043.2	1048.15	1047.23	1045.76
26		1050.73	1053.71	1051.14	1061.76	1060.03	1052.15	1043.53	1042.61	1048.38	1047.5	1045.67
27		1051.38	1053.82	1051.04	1061.68	1059.97	1051.85	1043.14	1042.1	1049.39	1047.51	1045.69
28		1051.15	1053.96	1051.25	1061.57	1059.94	1050.98	1042.82	1041.86	1049.77	1047.14	1045.7
29			1054.13	1051.6	1061.53	1059.58	1050.97	1042.87	1041.58	1049.75	1046.82	1048.05
30			1053.99	1051.99	1061.43	1059.38	1050.61	1042.81	1041.29	1049.64	1046.37	1049.34
31			1053.89		1061.39		1050.17	1042.42		1049.62		1049.71

Water table well in Lower Glen Rose Limestone.

Bexar County Index Well (La Escondida Well) AY 68-19-806
1994



Land surface datum = 1230'

Daily high water levels
in feet above MSL.
LSD = 642.7'.

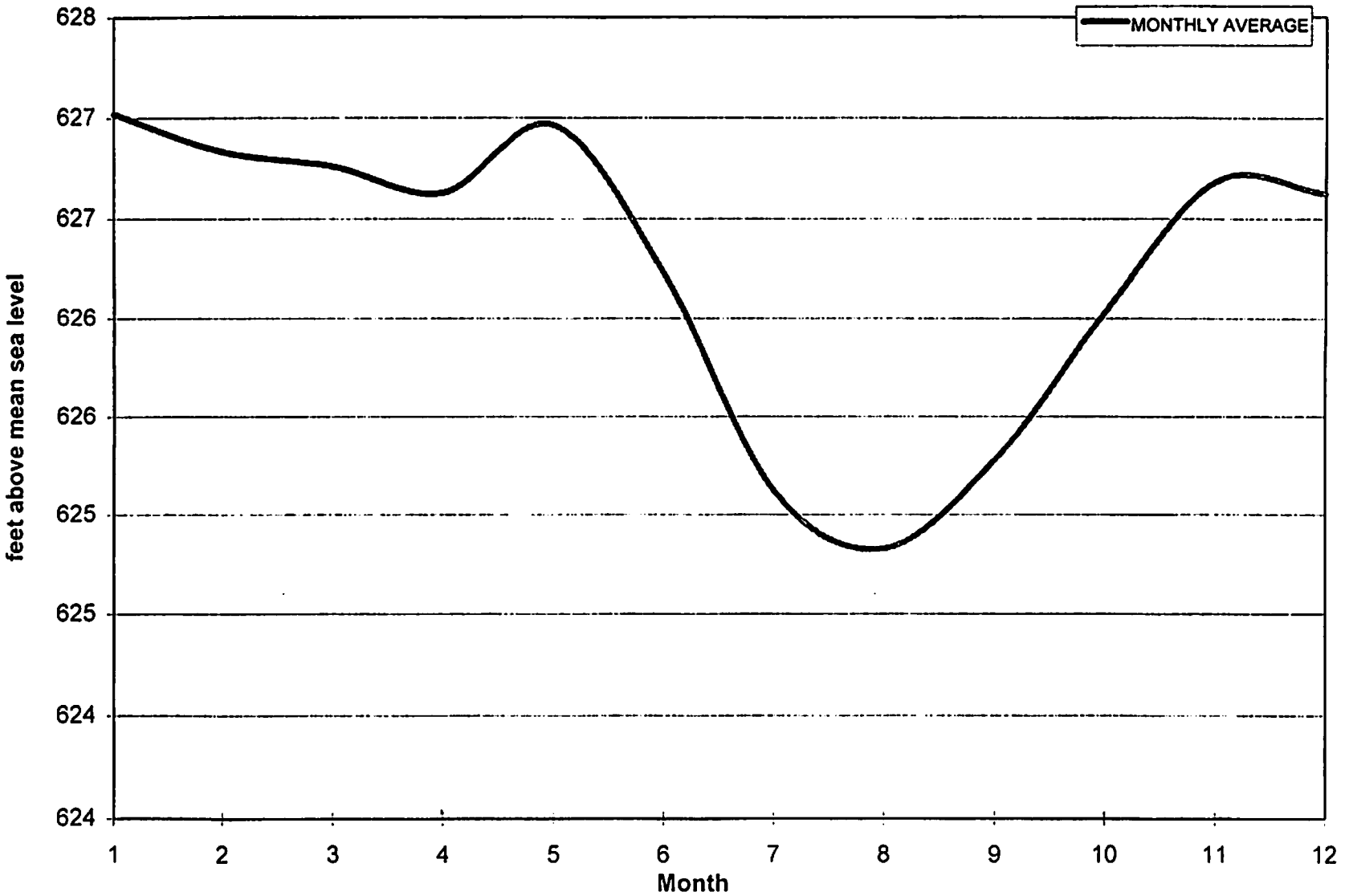
EDWARDS UNDERGROUNG WATER DISTRICT
WATER LEVESL IN OBSERVATION WELLS
YEAR 1994

COMAL CO.
DX 68-23-302
LANDA PARK

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	627.2	626.93	626.74	626.8	626.45	626.96	625.78	624.71	624.78	625.47	626.7	626.61
2	627.2	626.93	626.72	626.79	626.65	626.88	625.7	624.74	624.81	625.46	626.71	626.59
3	627.2	626.93	626.72	626.79	626.64	626.78	625.66	624.72	624.84	625.44	626.7	626.58
4	627.19	626.92	626.73	626.79	626.65	626.72	625.64	624.69	624.87	625.4	626.69	626.58
5	627.12	626.92	626.73	626.79	626.67	626.65	625.6	624.68	624.87	625.37	626.71	626.58
6	627.11	626.92	626.73	626.78	626.67	626.6	625.49	624.68	624.84	625.31	626.71	626.58
7	627.09	626.92	626.74	626.75	626.68	626.48	625.42	624.69	624.81	625.2	626.71	626.59
8	627.07	626.91	626.72	626.71	626.72	626.38	625.35	624.68	624.89	625.65	626.71	626.59
9	627.06	626.89	626.7	626.7	626.73	626.26	625.33	625.09	625.09	625.65	626.7	626.59
10	627.06	626.86	626.69	626.69	626.73	626.15	625.31	624.82	625.08	625.74	626.68	626.58
11	627.04	626.84	626.68	626.66	626.73	626.12	625.31	624.87	625.1	625.75	626.67	626.59
12	627.03	626.83	626.68	626.64	626.72	626.05	625.27	624.91	625.22	625.78	626.68	626.59
13	627.01	626.82	626.69	626.63	627.07	626.04	625.2	624.92	625.28	625.85	626.71	626.59
14	627.01	626.83	626.71	626.62	626.8	626.02	625.11	624.94	625.34	625.86	626.71	626.59
15	627	626.83	626.71	626.6	627.09	626.06	625.05	624.94	625.4	625.94	626.7	626.59
16	627	626.81	626.72	626.59	627.17	626.06	625	624.95	625.45	626.24	626.68	626.59
17	627	626.8	626.77	626.59	627.19	626.07	624.96	624.95	625.49	626.06	626.69	626.6
18	626.96	626.79	626.78	626.58	627.22	626.07	624.94	624.95	625.54	626.08	626.69	626.64
19	626.94	626.78	626.79	626.58	627.22	626.07	624.88	624.91	625.55	626.16	626.68	626.64
20	626.93	626.77	626.82	626.55	627.23	626.08	624.83	624.88	625.56	626.17	626.69	626.63
21	626.93	626.77	626.83	626.55	627.23	626.08	624.82	624.86	625.57	626.17	626.69	626.62
22	626.92	626.83	626.81	626.56	627.23	626.08	624.84	624.88	625.57	626.41	626.67	626.62
23	626.93	626.77	626.79	626.53	627.23	626.08	624.84	624.88	625.57	626.45	626.64	626.61
24	626.96	626.74	626.76	626.52	627.21	626.09	624.84	624.85	625.57	626.47	626.64	626.62
25	626.96	626.73	626.75	626.5	627.19	626.09	624.93	624.83	625.57	626.75	626.66	626.62
26	626.97	626.72	626.75	626.5	627.19	626.09	624.88	624.82	625.57	626.63	626.67	626.63
27	626.97	626.72	626.98	626.47	627.16	626.1	624.83	624.81	625.53	626.63	626.67	626.63
28	626.96	626.74	626.82	626.44	627.14	626.04	624.78	624.76	625.52	626.65	626.67	626.84
29	626.95		626.82	626.65	627.11	625.9	624.76	624.76	625.51	626.67	626.64	626.74
30	626.94		626.81	626.46	627.08	625.84	624.72	624.73	625.49	626.69	626.61	626.71
31	626.93		626.8		627.04		624.69	624.74		626.71		626.76

Water table well in Edwards Limestone.

Comal County Index Well (Landa Park) DX 68-23-302
1994



Land Surface Datum = 642.7'

Daily high water levels
in feet above MSL.
LSD =797.81'.

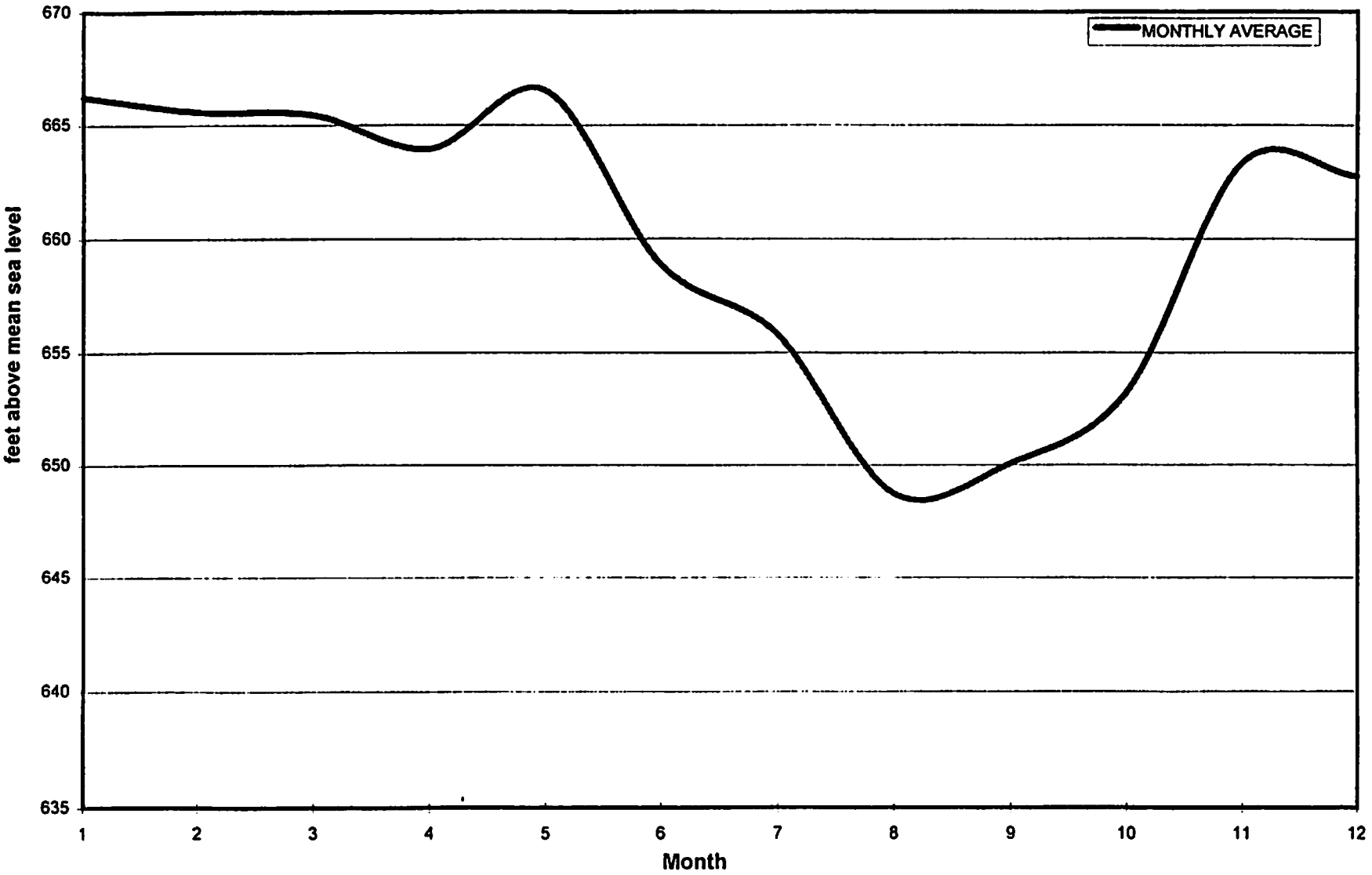
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

COMAL CO.
DX 68-30-208
MPRR (BRACKEN WELL)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	667.06	666.17		665.7			656.61		649.51			662.71
2	667.11	666.16		665.57			656.16	648.14	649.89		663.54	662.71
3	667	666.03		665.44			655.83	648.03	650.19		663.43	662.74
4	666.82	666.02		665.43	665		655.69	647.87	650.36		663.44	662.79
5	666.75	665.96		665.32	665.12		655.37	648.04	650.37	653.72	663.48	662.8
6	666.74	665.86		665.04	665.17		655.05	648.21	649.97		663.54	662.76
7	666.56	665.77		664.94	665.21			648.23	649.71		663.62	662.69
8	666.43	665.69		664.91	665.29			648	650.48		663.61	662.73
9	666.42	665.53		664.75	665.33			647.71			663.6	662.66
10	666.41	665.45	664.46	664.57	665.23					653.56	663.48	662.66
11	666.22	665.45	664.46	664.41	665.18					653.28	663.46	662.77
12	666.14	665.47	664.47	664.1	665.16					652.99	663.48	659.72
13	666.07	665.36	664.62	664.09	665.55					652.61	663.53	662.7
14	666.07	665.42	664.59	663.87	665.77	657.85					663.45	662.69
15	666.04	665.3	665.12	663.65	666.76	658.43					663.25	662.76
16	666.07	665.2	665.51	663.61	667.8	658.81					663.35	662.97
17	666	665.14	665.75	663.7	667.79	658.81					663.3	663
18	665.77	665.03	665.82	663.65	667.92	659.01					663.21	663.1
19	665.6	664.98	665.86	663.51	668.01	658.97					663.28	663.21
20	665.53		665.86	663.35	668.03	659.29					663.26	663.18
21	665.47		665.8	663.36	667.96	659.56					663.22	663.11
22	665.56		665.74	663.2	667.91	659.79		649.71			663.11	662.99
23	665.81		665.65	663.06	667.62	660.01		649.71			662.97	662.96
24	665.99		665.52	662.96	667.42	659.84		649.55			663.1	662.98
25	666.19		665.48	662.95	667.23	659.46		649.44			663.14	662.96
0	666.28		665.45	662.69	667.04	659.09		649.36			663.25	
27	666.27		665.95	662.38	666.78	658.81		649.26			663.24	
28	666.23		665.96	662.28		658.19		649.11			663.08	
29	666.24		665.97	662.63		657.71		649.03			662.95	
30	666.25		665.91	662.88		657.1					662.77	
31	666.23		665.8					649.06				

Artesian well in Edwards Limestone.

Comal County Index Well (Bracken Well) DX 68-30-208
1994



Land surface datum = 797.81

Daily high water levels
in feet above MSL.
LSD = 715'.

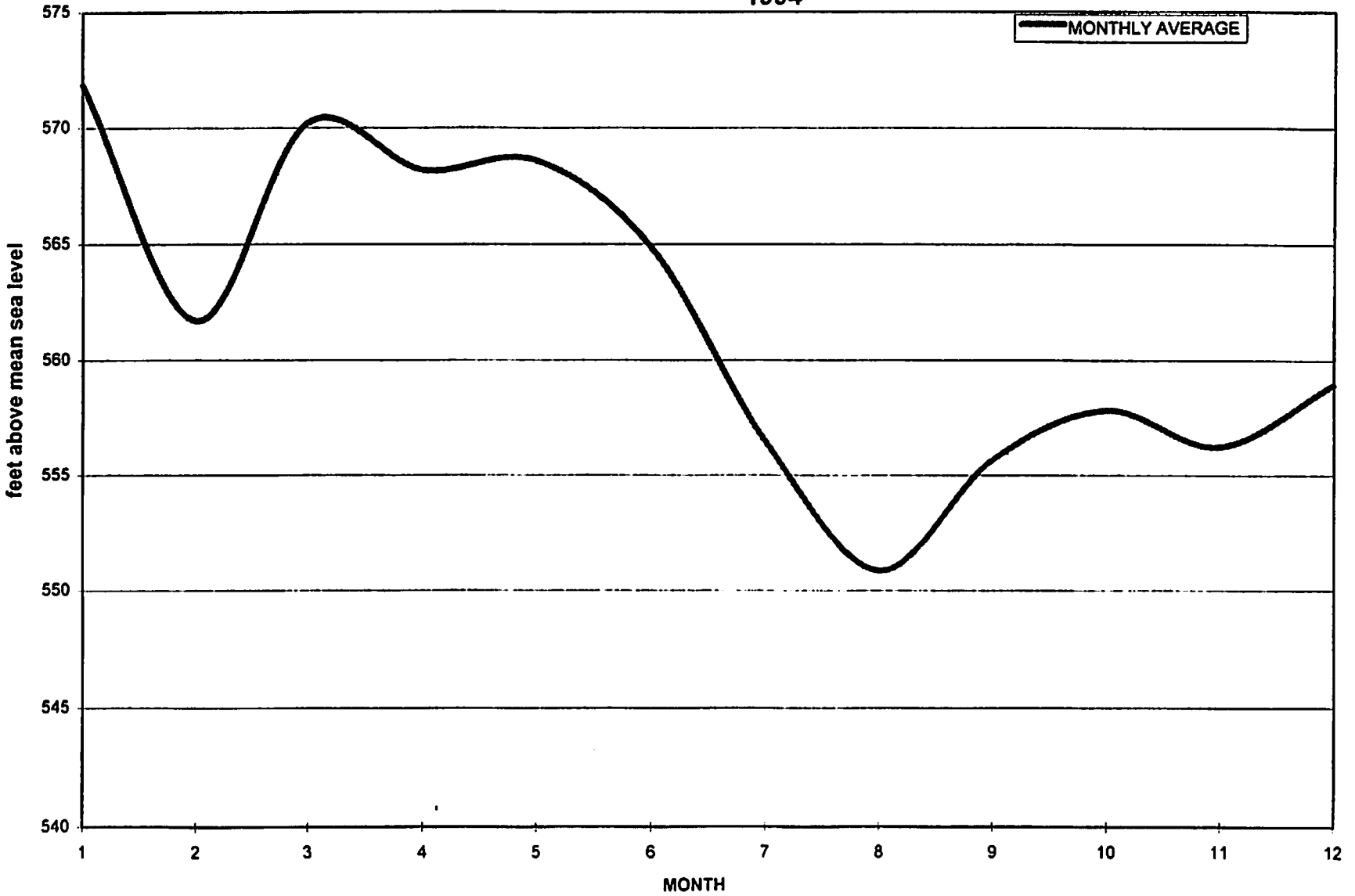
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

HAYS CO.
LR 67-01-303
KYLE NORTH WELL

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	575		570.43		567.65	566.47	559.59		552.96		555.64	556.23
2	575	553.46	570.86		568.1	566.71	558.71	547.6	553.6		555.83	556.37
3	574.2	552.57	571.16		568.25	566.62	555.66	547.73	554.31		555.86	556.83
4	573.8	553.31	571.62		568.57	566.58	553.82	547.06	554.23		555.88	556.83
5	573.98	553.87	571.8		568.77	566.6	555.79	546.29	553.86	560.98	556.32	556.32
6	574.22	553.86	571.47		568.46		559.06	546.06	551.75	560.63	556.08	557.25
7	574.35	553.6	571.09	567.31	568.38		557.85	546.42	551.91	561.22	555.44	558.17
8	574.03	553.62	571.28	567.98	567.92		555.08	545.25	553.44	560.69	555.83	558.95
9	574.06	553.24	571.21	568.48	567.58		558.85	547.32	555.05	561.37	555.95	559.39
10	573.5	553.1	571.29	568.54	567.14		561.74	549.82	555.37	561.9	556.42	559.84
11	572.88	554.53	568.33	568.48	567.85		563.13	551.57	555.27	561.8	556.52	559.33
12	570.2	558.06	566.83	568.79	569.5		559.67	552.49	555.1	562.34	557	558.76
13	566.55	560.39	568	568.83	570.56		555.14	552.88	555.41	562.65	556.99	559.25
14	564.45		568.74	568.82	571.22		554.01	552.82		563.11	556.11	559.8
15	561.6		569.49	568.8	571.7		551.83	550.98	556.19	562.65	556.26	560.09
16		565.48	569.95	568.83	572.13		551.65	551.5	556.47	558.75	556.77	560.18
17		566.57	570.46	569.8	572.45		549.05	552.66	556.68	554.15	556.01	560.1
18		567.48	570.46	570.25	572.77			552.62	556.57	554.13	556.77	559.65
19		567.85	570.6	569.06	573			551.99	556.05	553.96	557.42	559.38
20		568.06	570.27	568.06	570.3			551.36	556.53	554.05	556.97	559.39
21		568.15	569.58	567.27	570.2			550.17	557.8	554.56	555.87	559.46
22		568.38	570	566.65	567.8			551.58	559.4	555.2	555.66	559.61
23		568.53	570.1	569	565.94			552.53	560.87	554.83	555.85	559.68
24		569.15	570.31	568.75	565.54			553.26	561.33	554.12	556.18	559.74
25		569.35	570.02	567.89	565.74			553.91		554.57	556.99	559.7
26		569.8	570.12	567.08	566.55			554.04		555.1	556.65	559.83
27		569.96	569.59	566.07	566.59			554.16		555.66	556.75	558.94
28		570.04		566.45	566.43	561.41		553.75		555.88	555.61	559.37
29				567.35	566.25	559.7		552.75		556.32	555.6	559.38
30				567.5	566.24			552.73		555.64	555.96	559.37
31					566.52			552.3		554.87		559.8

Artesian well in Edwards Limestone

Hays County Index Well (Kyle North Well) LR 67-01-303
1994



Land surface datum = 715'

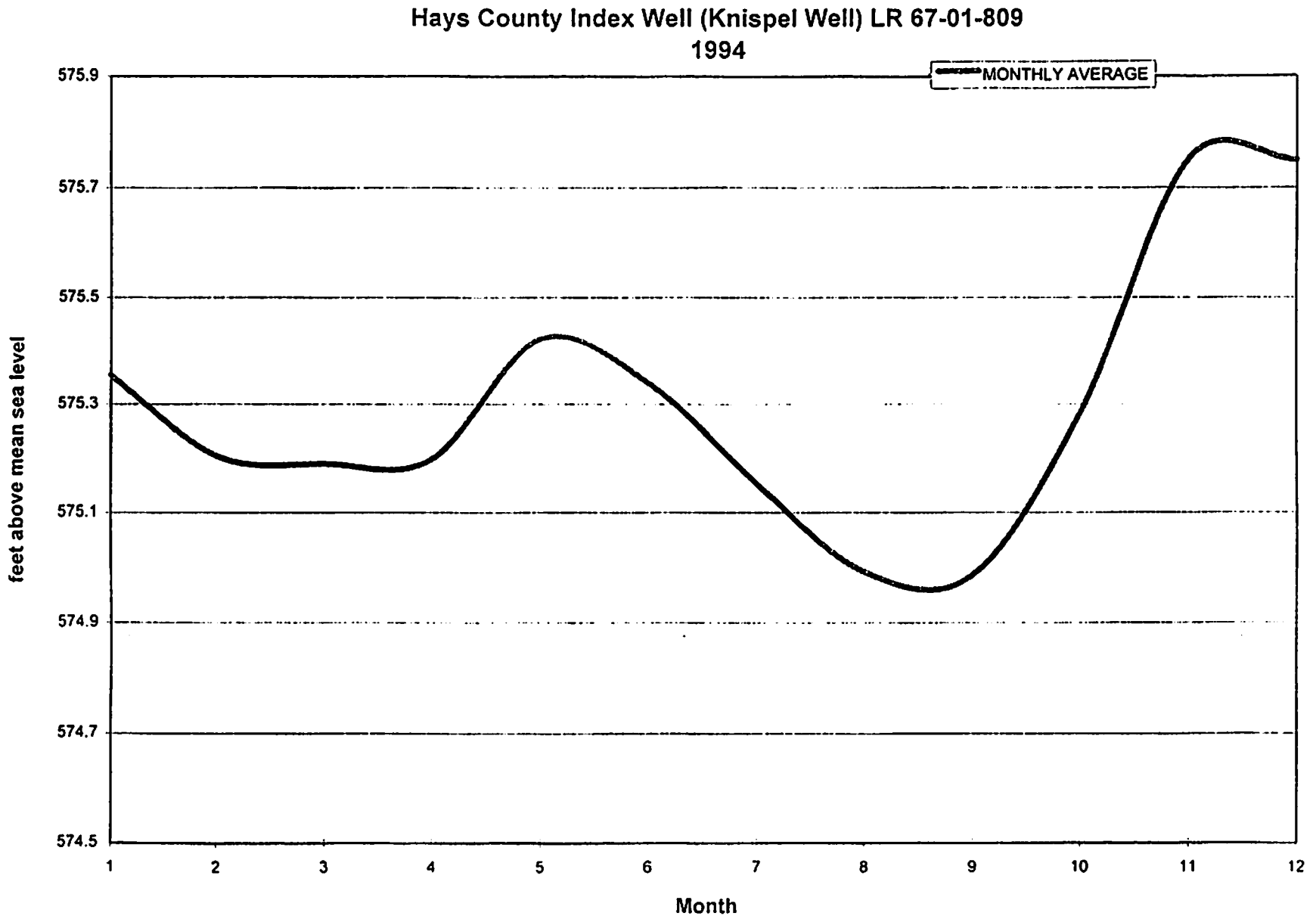
Daily high water levels
in feet above MSL.
LSD = 601.7

EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

HAYS CO.
LR 67-01-809
KNISPEL WELL

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	575.55	575.26	575.18	575.19		575.35	575.27	575.05	574.95	574.94	575.87	575.6
2	575.54	575.24	575.15	575.19		575.36	575.27	575.05	574.94	574.95	575.87	575.6
3	575.52	575.24	575.16	575.2		575.37	575.27	575.04	574.95	574.93	575.86	575.6
4	575.51	575.25	575.17	575.16		575.38	575.25	575.04	574.94	574.9	575.85	575.6
5	575.4	575.25	575.18	575.16		575.37	575.25	575.03	574.93	574.96	575.84	575.6
6	575.4	575.24	575.17	575.16		575.38	575.24	575.03	574.91	574.97	575.8	575.6
7	575.39	575.24	575.16	575.24		575.37	575.23	575	574.91	575.12	575.78	575.59
8	575.36	575.21	575.17	575.25		575.32	575.22	575	574.9	575.18	575.81	575.56
9	575.36	575.22	575.18	575.25		575.33	575.2	575	575.05	575.19	575.81	575.56
10	575.36	575.2	575.15	575.22		575.33	575.2	575.02	575.04	575.19	575.8	575.55
11	575.35	575.2	575.15	575.21		575.33	575.19	575.03	575.03	575.19	575.79	575.55
12	575.35	575.2	575.15	575.19		575.34	575.17	575.03	575.03	575.19	575.78	575.55
13	575.35	575.19	575.15	575.18		575.34	575.17	575.03	575.03	575.17	575.78	575.55
14	575.35	575.19	575.15	575.18		575.34	575.16	575.03	575.03	575.16	575.78	575.55
15	575.35	575.19	575.16	575.2		575.34	575.15	575.03	575.02	575.16	575.77	575.6
16	575.36	575.19	575.19	575.19		575.34	575.14	575.01	575	575.15	575.76	575.75
17	575.35	575.19	575.21	575.19		575.34	575.13	575	575	575.16	575.77	575.8
18	575.33	575.19	575.22	575.19		575.34	575.12	574.97	575.04	575.19	575.75	575.85
19	575.32	575.19	575.22	575.2		575.33	575.11	574.96	575.04	575.2	575.74	575.9
20	575.32	575.19	575.22	575.2		575.33	575.11	574.95	575.04	575.22	575.73	575.91
21	575.29	575.17	575.21	575.2		575.33	575.11	574.94	575	575.22	575.71	575.91
22	575.29	575.19	575.22	575.2		575.35	575.1	574.94	575	575.22	575.7	575.85
23	575.3	575.19	575.22	575.2		575.35	575.1	574.93	575	575.22	575.65	575.85
24	575.3	575.17	575.22	575.2		575.35	575.09	574.95	575	575.63	575.65	575.82
25	575.3	575.18	575.22			575.34	575.09	574.95	574.99	575.77	575.66	575.8
26	575.29	575.18	575.23		575.44	575.33	575.09	574.95	574.99	575.82	575.67	575.8
27	575.29	575.16	575.23		575.44	575.32	575.08	574.96	574.98	575.85	575.67	575.8
28	575.28	575.18	575.22		575.43	575.32	575.05	574.96	574.96	575.86	575.65	575.98
29	575.27		575.21		575.43	575.3	575.05	574.96	574.95	575.86	575.65	576.1
30	575.28		575.2		575.41	575.29	575.05	574.96	574.95	575.86	575.6	576.2
31	575.27		575.19		575.38		575.05	574.97				576.25

Water table well in Edwards Limestone



Land surface datum = 601.7'

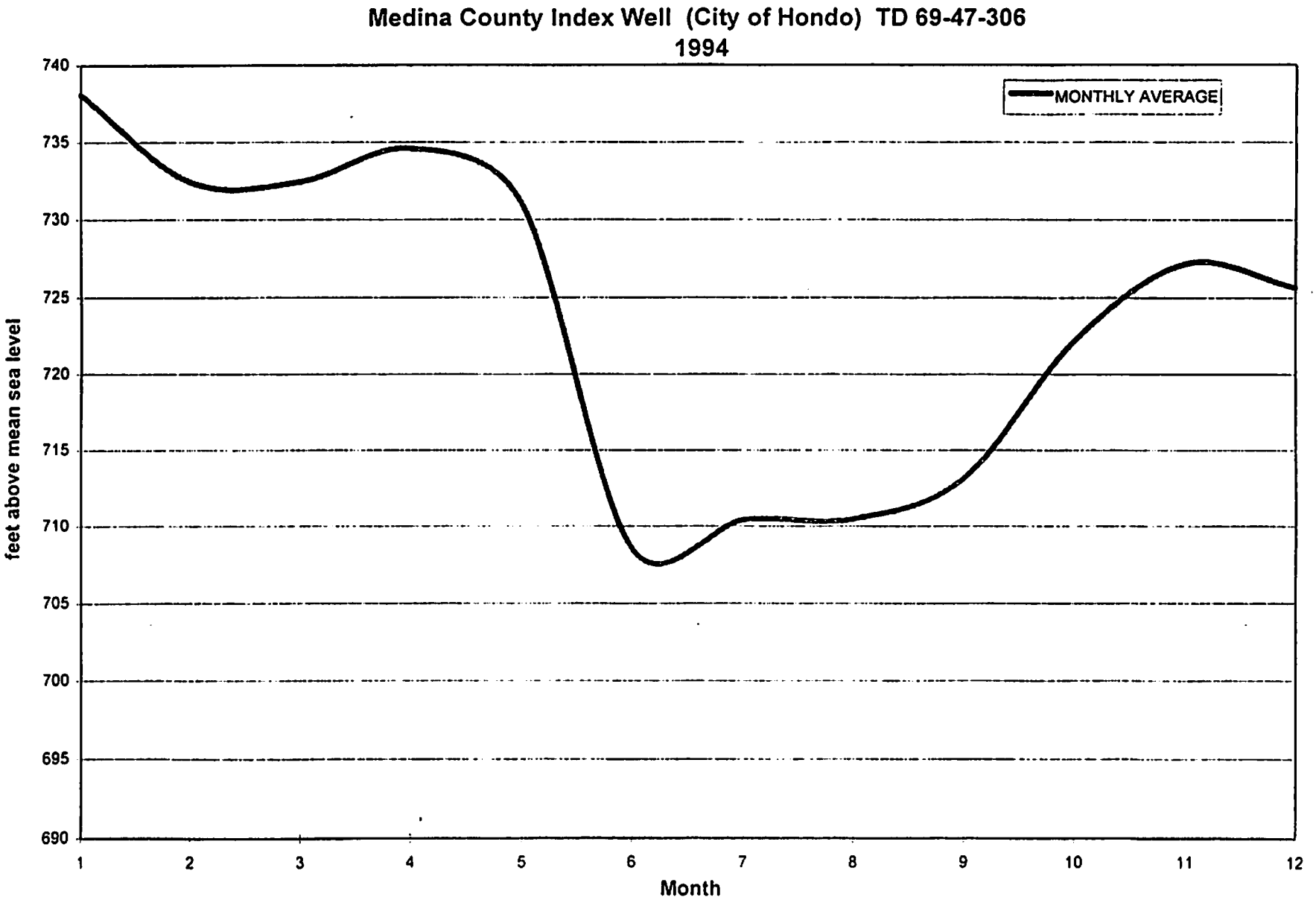
Daily high water levels
in feet above MSL.
LSD = 887.5'.

EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS

MEDINA CO.
TD 69-47-306
CITY OF HONDO WELL

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	736.47	734.98	732.27	733.89	728.51	716.35	711.26	708.44	712.18	717.88	727.24	726.55
2	736.34	734.36	731.95	733.73	729.94	713.03	711.25	708.68	712.69	717.87	727.43	696.57
3	736.13	733.88	732.03	733.51	730.56	710.61	711.82	708.91	712.9	717.68	727.4	726.57
4	735.66	733.32	731.83	733.32	731.02	708.88	711.71	708.87	713.28	715.95	727.43	726.43
5	735.26	732.96	731.66	733.25	731.42	707.89	711.6	708.82	713.5	716.14	727.35	726.41
6	734.94	732.62	731.26	732.86	731.78	707.37	711.17	708.97	713.04	715.94	727.22	726.45
7	733.64	732.41	730.89	732.01	732.09	700.98	710.85	708.81	712.85	716.17	727.31	726.4
8	733.99	731.94	731.2	732.03	732.26	703.58	710.21	707.68	713.36	717.56	727.47	726.4
9	734.47	731.14	731.2	732.14	732.36	705.02	710.01	709.84	714.5	719.15	727.45	726.44
10	734.74	731.46	731.08	872.2	732.35		710.86	710.47		720.29	727.31	726.22
11	733.7	732.08	730.76	732.05	732.29		711.1	711.48		721.05	727.3	726.3
12	732.93	732.21	730.69	731.75	732.05		710.03	711.6		721.51	727.4	726.37
13	732.68	731.84	730.45	731.63	732.3		709.35	711.85		721.72	727.45	726.32
14	731.95	732.03	730.62	731.1	732.9		709.68	712.03		722.1	727.21	726.32
15	871.66	731.81	730.49	730.43	733.9		710.32			722.57	726.97	726.39
16	731.37	731.8	731.33	730.47	734.67		710.74			722.96	727	726.49
17	731.1	731.8	732.25	730.5	735.14		711.65			723.29	727.15	726.47
18	730.16	732.29	732.82	730.58	735.49		712.46			723.45	727.22	726.6
19	729.17	732.33	733.07	729.82	735.52		712.34	712.06		724.01	727.29	726.85
20	729.52	732.24	733.37	729.19	735.53		712.05	711.99		724.47	727.33	726.93
21	730.94	732.2	733.52	728.89	735.32		711.52			724.97	727.09	726.68
2	732.37	732.35	733.62	728.02	735.16		710.11			725.26	727.02	726.45
23	733.32	732.28	733.89	727.21	734.74		710.18			725.32	726.41	726.4
24	733.93	732.3	733.89	726.03	732.7		710.48			725.48	726.72	726.43
25	734.45	732.43	733.88	725.22	730.72		710.36			725.65	727.01	726.55
26	734.77	732.03	734.24	724.48	728.49		708.54			726	727.14	726.7
27	734.98	732.23	734.2	722.35	727.43		708.13	711.96		726.32	727.29	726.83
28	734.9	732.64	734.08	724.8	724.75		707.85	711.97		726.71	727.04	727
29	735.07		734.2	726.42	722.49		708.25	712.03		726.81	726.85	727.28
22	735.14		734.15	727.36	720.95	711.81	708.05	711.91		727	726.52	727.61
31	735.05		734.06		717.97		708.42	711.49		727.04		727.9

Artesian well in Edwards Limestone.



Land surface datum = 887.5

Daily high water levels
in feet above MSL.
LSD = 1008.3'.

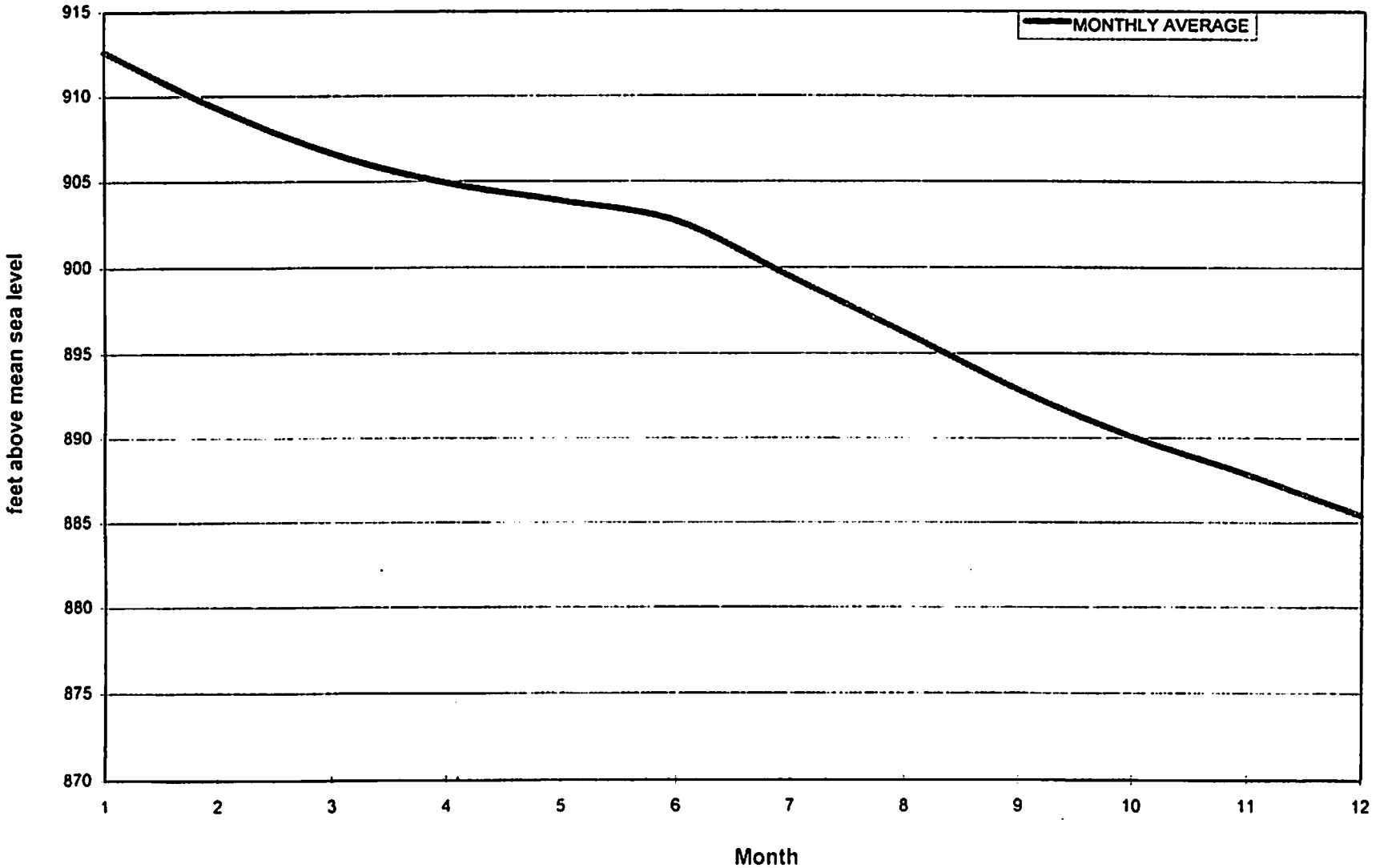
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

MEDINA CO.
TD 69-38-601
SECO CREEK WELL

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	914.19	910.73	907.73	905.96	904.11	903.96	900.76	897.92	894.37	890.96	888.91	886.46
2	914.34	910.65	907.43	905.95	904.18	903.9	901.08	897.8	894.32	890.97	888.88	886.53
3	914.19	910.6	907.3	905.84	904.15	903.8	901.05	897.75	894.27	890.9	888.76	886.47
4	914.16	910.55	907.26	905.94	903.48	903.72	900.97	897.62	894.21	890.71	888.72	
5	914.05	910.49	907.23	905.92	903.35	903.68	900.87	897.45	894.11	890.69	888.7	886.15
6	914.05	910.35	906.6	905.7	903.32	903.63	900.84	896.44	894	890.67	888.59	886.14
7	913.98	910.27	906.73	905.53	903.27	903.56	900.25	897.03	893.28	890.55	888.55	886.05
8	913.56	910.19	906.73	905.52	903.26	903.43	900.38	896.96	893.6	890.72	888.42	885.98
9	913.61	910.16	906.55	905.54	903.19	903.25	900.31	896.87	893.54	890.68	888.46	885.92
10	913.51	909.83	906.23	905.45	903.05	903.18	899.83	896.74	893.51	890.57	888.25	885.77
11	913.39	909.7	906.22	905.35	902.96	903	900.08	896.68	893.47	890.43	888.17	885.67
12	913.27	909.61	906.14	905.15	902.91	902.92	899.43	896.61	893.37	890.34	888.1	885.65
13	913.2	909.26	905.98	905.14	903.57	902.85	899.76	896.54	893.29	890.25	888.07	885.53
14	912.96	909.22	905.92	905.12	903.88	902.75	899.69	896.38	893.23	890.14	887.96	885.48
15	911.52	909.17	906.35	905.05	904.06	902.73	899.62	896.33	893.19	890.14	887.78	885.38
16	912.31	908.98	906.96	904.78	904.17	902.62	899.57	896.26	893.1	890.03	887.81	885.31
17	912.42	908.89	907.09	904.4	904.15	902.55	899.51	896.2	892.94	889.95	887.85	885.17
18	912.15	908.9	907.05	904.48	904.15	902.48	899.34	896.09	892.84	889.89	887.7	885.05
19	912.01	908.85	906.95	904.47	904.21	902.42	899.12	895.98	892.76	890.01	887.64	885.04
20	912	908.68	906.87	904.4	904.22	902.33	899.07	895.62	892.69	889.95	887.63	884.98
21	911.81	908.5	906.75	904.35	904.2	902.27	898.99	895.28	892.64	889.89	887.49	884.81
22	911.74	908.51	906.65	904.31	904.16	902.24	898.95	895.85	892.56	889.83	887.3	884.69
23	911.75	908.35	906.66	904.23	904.21	902.17	897.78	895.78	892.45	889.67	887.3	884.55
24	911.75	908.21	906.56	904.2	904.28	902.09	898.26	895.56	892.38	889.53	887.06	884.54
25	911.73	908.16	906.42	904.14	904.38	902.01	898.44	895.37	892.05	889.46	887.07	884.42
26	911.7	907.87	906.57	903.57	904.35	901.92	898.42	895.3	890.79	889.32	887.1	884.37
27	911.65	907.77	906.48	903.7	904.21	901.85	898.38	895.23	890.4	889.28	887.12	884.31
28	911.4	907.77	906.2	904.22	904.15	901.78	898.28	895.13	891.2	889.25	886.85	885.32
29	911.19		906.15	904.36	904.16	901.65	898.2	895.06	890.23	889.21	886.75	885.51
30	911.05		906.03	904.28	904.15	900.6	898.09	894.55	890.69	889.07	886.55	885.48
31	910.9		905.97		904.02		897.99	894.16		889.04		885.48

Artesian well in Edwards Limestone.

Medina County Index Well (Seco Creek) TD 69-38-601
1994



Land surface datum = 1008.3'

Daily high water levels
in feet above MSL.
LSD = 1056'.

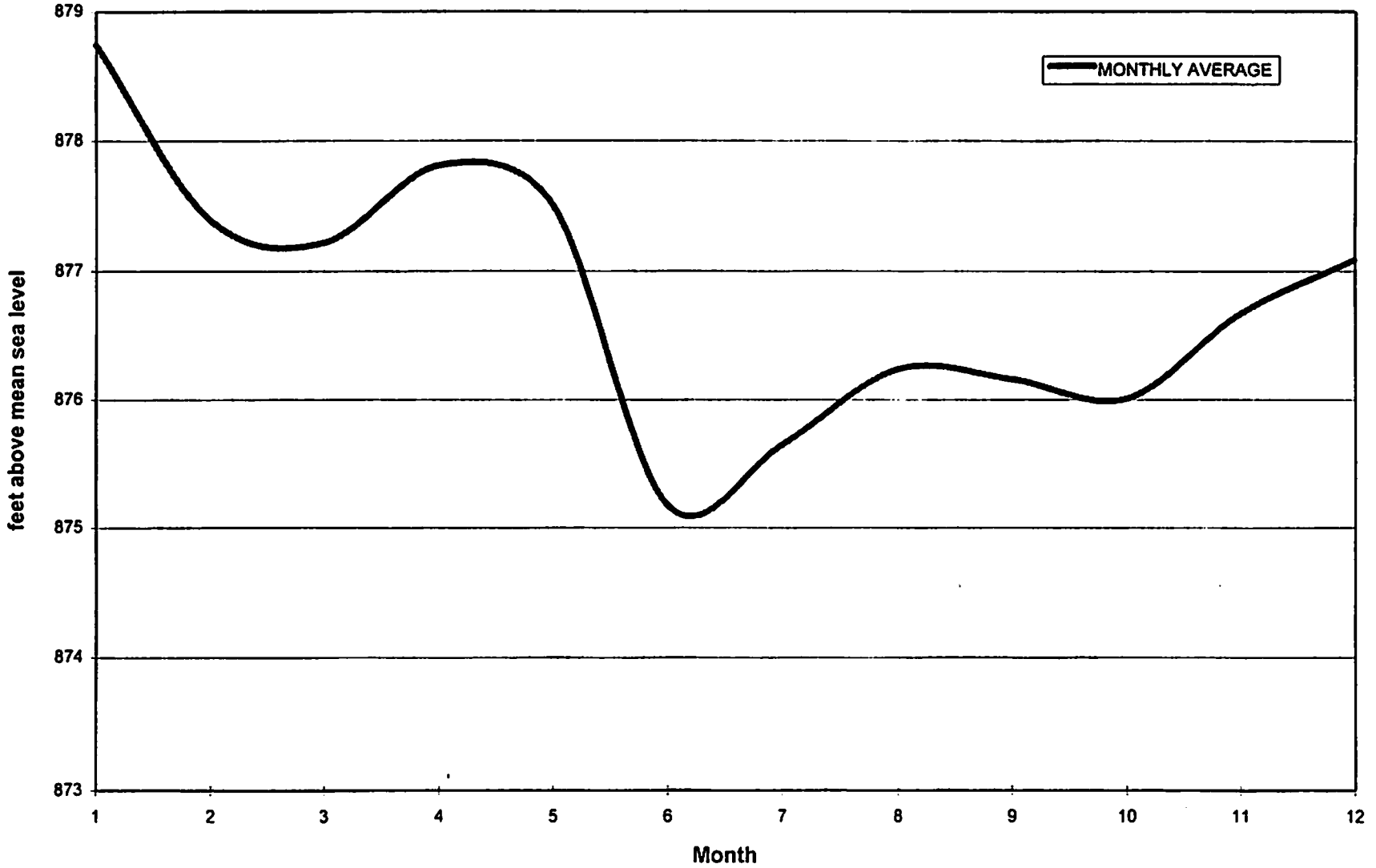
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

UVALDE CO.
YP 69-43-409
NORTH UVALDE

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	879.66	878.1	876.65		876.07	876.45	875.34	876.33	876.15	876.17	876.53	876.93
2	879.69	878.15	876.51		876.25	876.05	875.29	876.26	876.07	876.19	876.53	877.03
3	879.62	878.15	876.55		876.44	875.95	875.26	876.05	876.21	876.09	876.53	877
4	879.6	878.15	876.58	878.82	876.42	875.98	875.27	876.1	876.24	875.83	876.65	876.96
5	879.58	878.06	876.56	878.84	876.53	875.93	875.21	876.22	876.24	875.89	876.5	876.93
6	879.57	877.87	876.49	878.64	876.44	875.93	875.18	876.26	876.22	875.81	876.46	876.96
7	879.3	877.79	876.44	878.63	876.64	875.82	875.03	876.2	876.15	875.85	876.55	876.94
8	879.27	877.74	876.45	878.63	876.77	875.4	874.77	876.12	876.11	875.77	876.59	877.01
9	879.32	877.7	876.25	878.7	876.82	874.72	874.72	876.12	876.08	875.75	876.5	876.98
10	879.21	877.65	876.25	878.69	876.88	874.64	874.68	876.15	876.09	875.8	876.52	876.92
11	879.1	877.65	876.26	878.56	876.92	874.62	874.7	876.21	876.12	875.87	876.52	877.04
12	879.04	877.57	876.18	878.48	876.95	874.6	874.62	876.26	876.17	875.9	876.58	877.01
13	878.9	877.34	876.09	878.58	877.03	874.59	874.53	876.28	876.24	875.84	876.61	877.09
14	878.73	877.42	876.18	878.57	877.28	874.24	874.58	876.28	876.29	875.8	876.57	877.1
15	878.68	877.36	876.4	878.5	877.54	874.31	874.85	876.25	876.24	875.84	876.54	877.12
16	878.68	877.2	877.3	878.32	877.93	874.38	875.38	876.2	876.18	875.88	876.69	877.09
17	878.5	877.19	878.12	878.39	878.23	874.37	875.48	876.21	876.24	875.91	876.73	877.03
18	878.36	877.2	878.39	878.36	878.54	874.31	875.76	876.25	876.34	875.9	876.72	877.05
19	878.3	877.19	878.63	878.35	878.88	874.55	876.03	876.25	876.32	875.95	876.79	877.16
20	878.14	876.99	878.76	878.33	879.06	874.7	876.28	876.24	876.21	876.03	876.8	877.15
21	877.95	877.01	878.87	878.15	879.09	874.95	876.47	876.18	876.19	876.1	876.72	877.07
22	878.02	877	879.09	877.79	879.08	875.16	876.63	876.27	876.22	876.1	876.69	877.03
23	878.12	876.75	879.13	877.58	879.05	875.3	876.61	876.27	876.16	876.09	876.62	877.13
24	878.2	876.84	879.12	877.18	878.94	875.4	876.68	876.25	876.17	876.13	876.75	877.13
25	878.2	876.77		876.8	878.49	875.48	876.7	876.29	876.25	876.13	876.82	877.12
26	878.33	876.66		876.35	878.2	875.56	876.65	876.31	876.21	876.13	876.94	877.17
27	878.26	876.69		875.68	877.86	875.55	876.59	876.3	875.92	876.21	876.96	877.25
28	878.23	876.73		875.1	877.45	875.49	876.52	876.31	875.96	876.29	876.9	877.25
29	878.2			875.17	877.19	875.43	876.48	876.36	875.96	876.3	876.86	877.32
30	878.14			875.75	876.91	875.39	876.41	876.38	875.89	876.37	876.86	877.39
31	878.13				876.76		876.38	876.25		876.36		877.41

Artesian well in Edwards Limestone.

Uvalde County Index Well (North Uvalde)
YP 69-43-409 1994



Land surface datum = 1056'

Daily high water levels
in feet above MSL.
LSD = 874.9'.

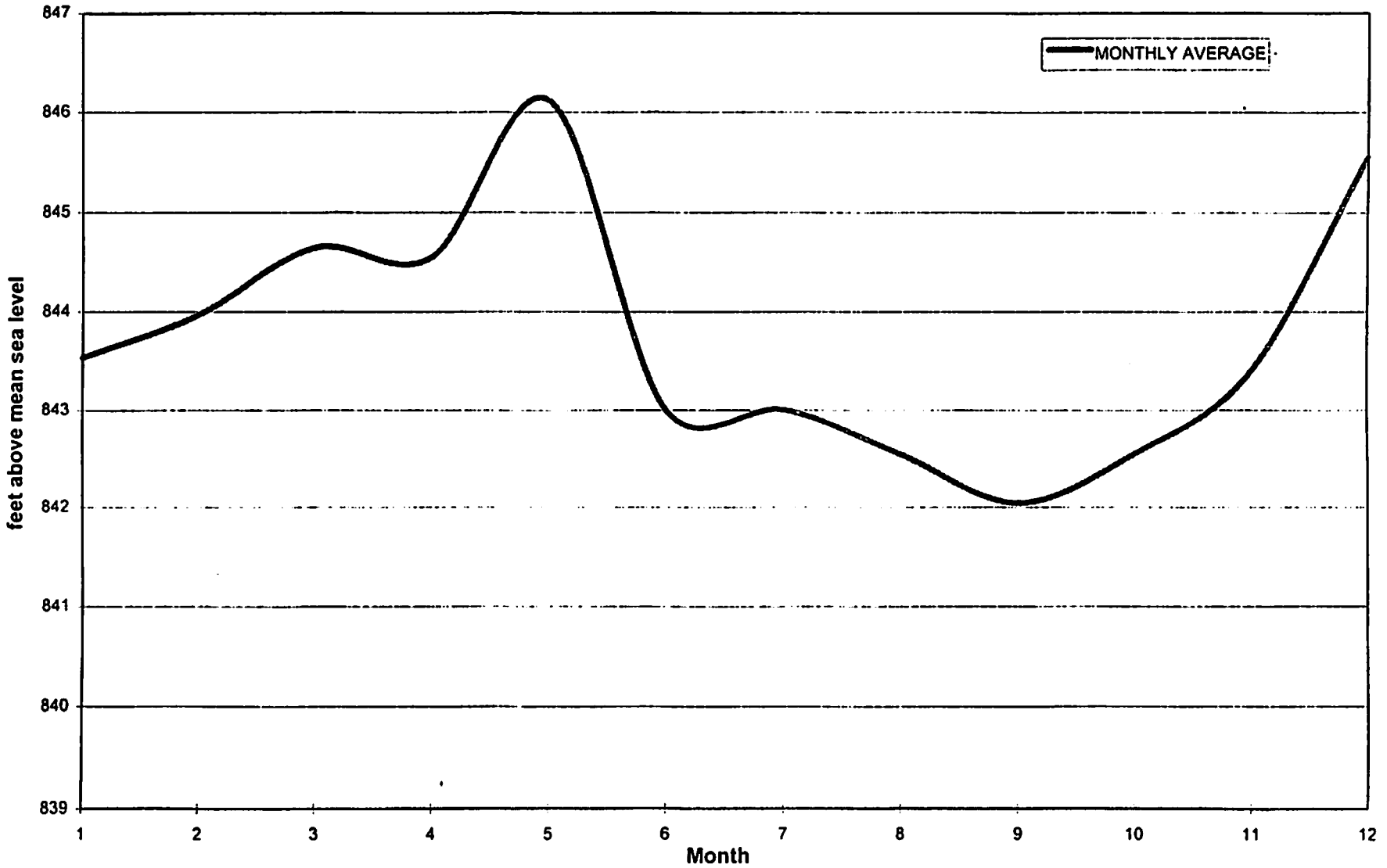
EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

UVALDE CO.
YP 69-51-406
Ehler Well

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1		844.87	843.72	846.1	844.75	844.19	842.98	841.62	841.47	842.53	845.05	845.95
2		844.47	843.32	846.11	845.14	843.95	842.86	841.65	841.43	842.39	845.1	845.96
3		844.31	843.27	846.1	845.27	843.51	842.72	841.66	841.51	842.35	845.13	845.97
4	843.75	844.04	843.4	846.16	845.32	843.12	842.76	841.56	841.69	842.29	845.15	845.98
5	843.99	844.15	843.95	846.03	845.48	843.36	842.55	841.67	841.73	842.23	845.15	845.99
6	844.03	844.1	844.1	846.03	845.6	843.39	842.45	841.8	841.39	842.14	845.16	846
7	843.76	844.14	844.15	845.96	845.7	842.97	842.4	841.88	841.4	842.1	845.22	846.01
8	843.64	844.27	843.35	845.62	846.69	842.84	842.36	841.96	841.42	842.18	845.28	846.02
9	843.78	844.35	843.38	845.57	846.86	842.55	842.4	841.77	841.75	842.36	845.3	845.9
10	843.89	844.48	843.22	845.17	846.83	842.17	842.24	841.92	841.92	842.66	845.33	845.92
11	843.85	844.53	842.88	844.91	846.84	841.9	842.15	841.76	842.21	842.76	845.31	845.93
12	843.35	844.31	843.11	845.13	846.83	842.1	842.05	841.68	842.52	842.81	845.27	845.97
13	842.97	844.1	843.68	845.18	846.82	842.17	841.97	841.69	842.76	842.84	845.25	846.02
14	842.69	843.96	843.97	845.17	846.82	842.02	842.25	841.98	842.95	842.9	845.25	846.05
15	842.41	843.91	844.48	845.08	846.84	842.26	842.54	842.1	843.1	843.01	845.6	846.08
16	842.58	843.45	844.8	844.98	846.74	842.31	842.72	842.25	843.26	843.18	845.69	846.07
17	842.71	843.32	845	845.04	846.78	842.18	842.83	842.34	843.38	843.3	845.73	846.07
18	842.72	843.3	845.57	845.07	846.79	842.39	842.94	842.48	843.33	843.41	845.75	846.09
19	842.66	843.45	845.23	844.52	846.8	842.67	843.03	842.54	843.25	843.87	845.8	846.11
20	842.25	843.8	845.28	844.13	846.81	842.96	843.1	842.52	843.25	844	845.82	846.11
21	842.52	843.88	845.35	843.83	846.87	843.15	843.15	842.53	843.17	844.1	845.82	846.1
22	843.09	843.97	845.47	843.5	846.8	843.47	843.16	842.58	843.21	844.19	845.83	846.1
23	843.49	843.83	845.53	842.67	846.78	843.62	843.09	842.55	843.26	844.28	845.84	846.01
24	843.73	843.91	845.83	842.62	846.65	843.7	842.8	842.28	843.39	844.43	845.9	845.97
25	844.02	843.71	845.86	842.52	846.2	843.76	842.59	842.46	843.36	844.41	845.94	845.9
26	844.23	843.2	846.02	842.38	845.5	843.78	842.44	842.57	843.15	844.59	846	845.95
27	844.35	843.62	846	842.28	845.32	843.79	842.27	842.6	842.94	844.67	846	845.95
28	844.49	843.65	845.98	842.28	845.12	843.5	842.21	841.87	842.75	844.75	845.96	846.04
29	844.6		846.02	842.43	844.96	843.21	842.1	841.68	842.7	844.8	845.94	846.09
30	844.7		846.03	843.98	844.97	843.09	841.99	841.74	842.65	844.87	845.95	846.14
31	844.8		846.07		844.72		841.67	841.63		844.9		846.15

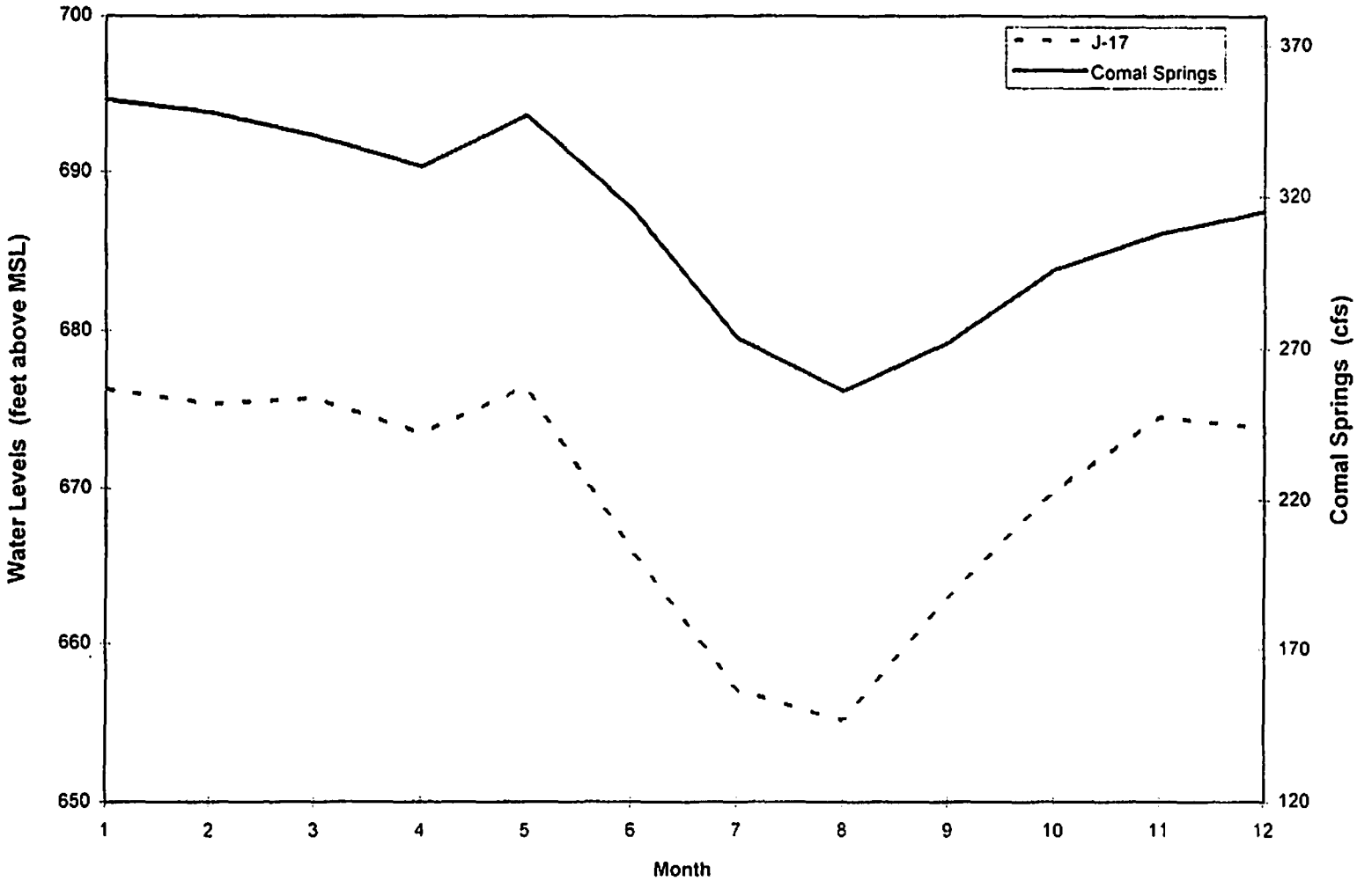
Water table well in Leona Formation.

Uvalde County Index Well (Ehler well) YP 69-51-406
1994



Land surface datum = 874.9

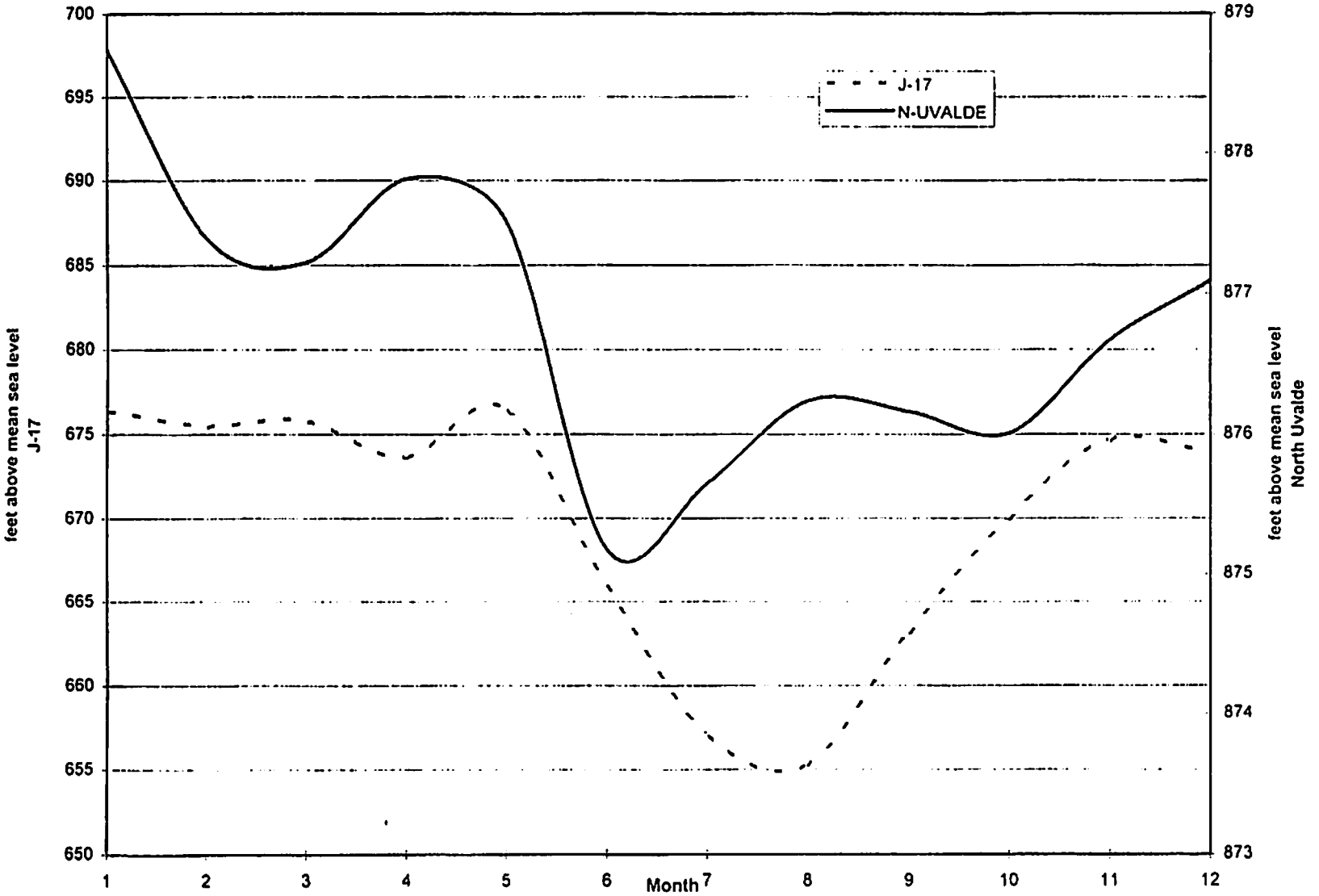
Comparison of Springflow from Comal Springs to J-17 Water Levels for the year 1994



Land surface datum for J-17 is 730.81'.
AY 68-37-203

Land surface datum for Comal Springs is 623.1'.

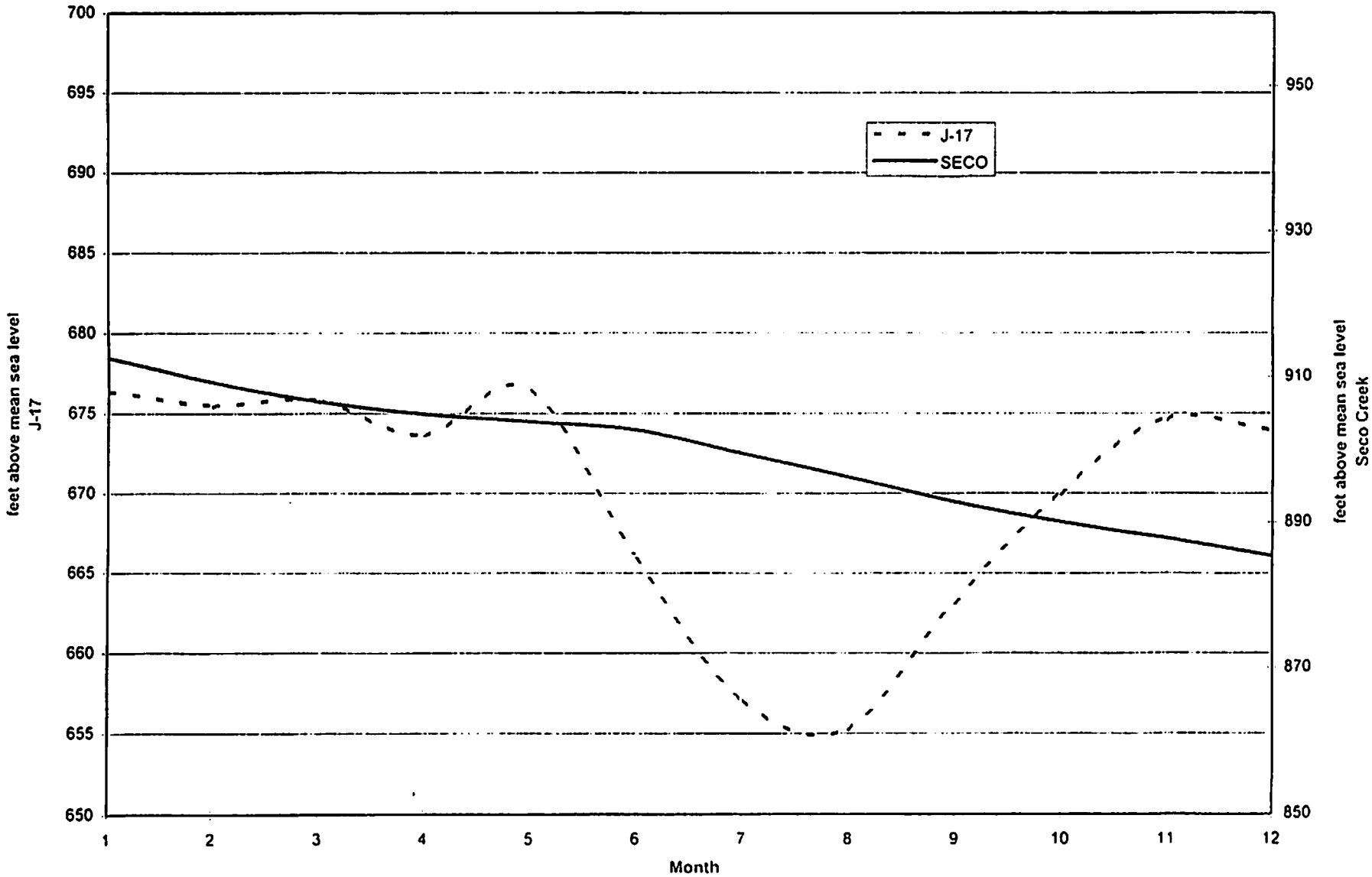
Bexar Co. Index Well (J17) and Uvalde Co. Index Well (North Uvalde) for 1994



Land surface datum for J-17 is 730.81'.
AY 68-37-203

Land surface datum for North Uvalde well is 1056'.
YP 69-43-409

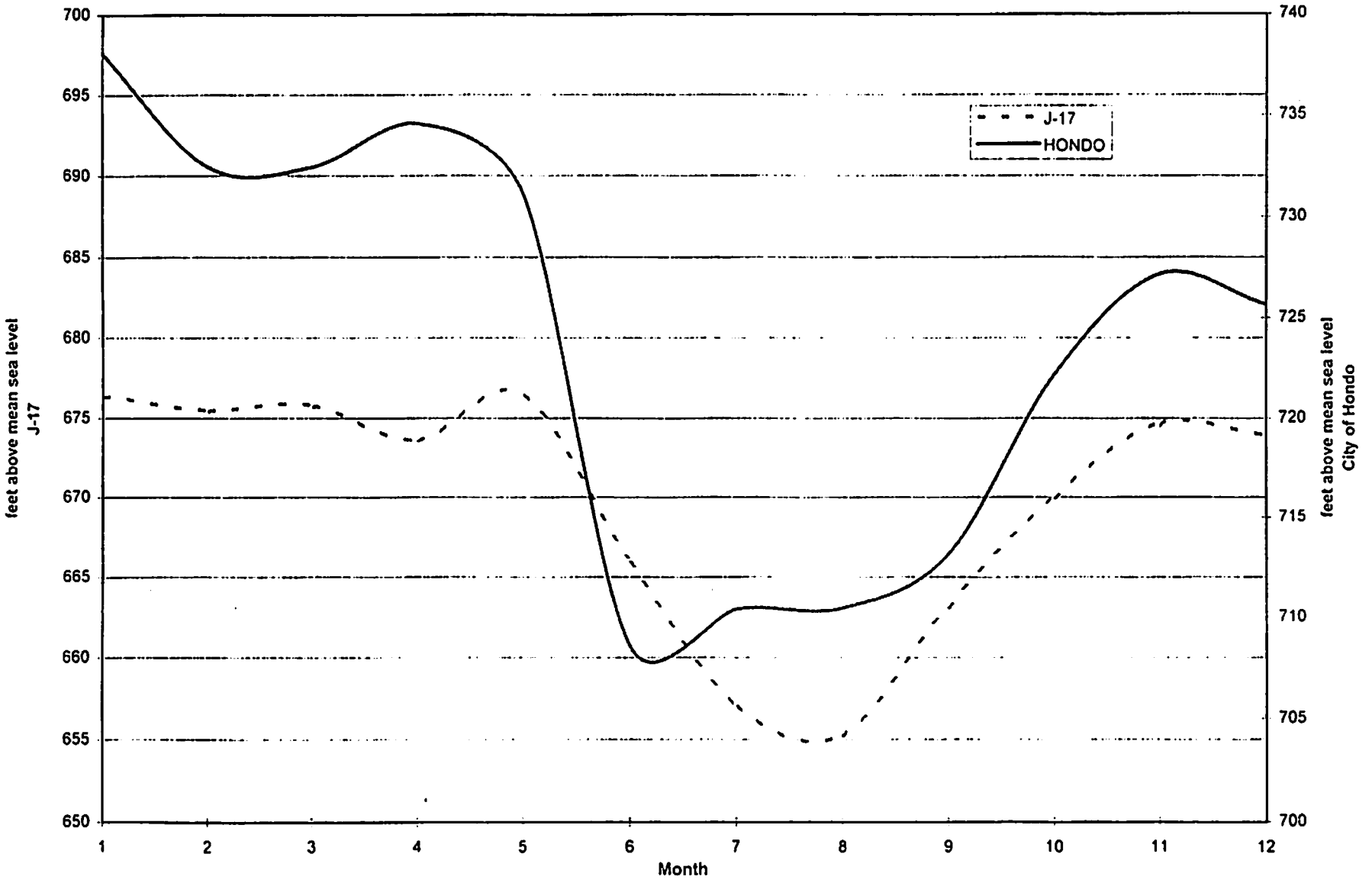
Bexar Co. Index Well (J-17) and Medina Co. Index Well (Seco Creek) for 1994



Land surface datum for J17 is 730.81'.
AY 68-37-203

Land surface for Seco creek well is 1008.3'.
TD 69-38-601

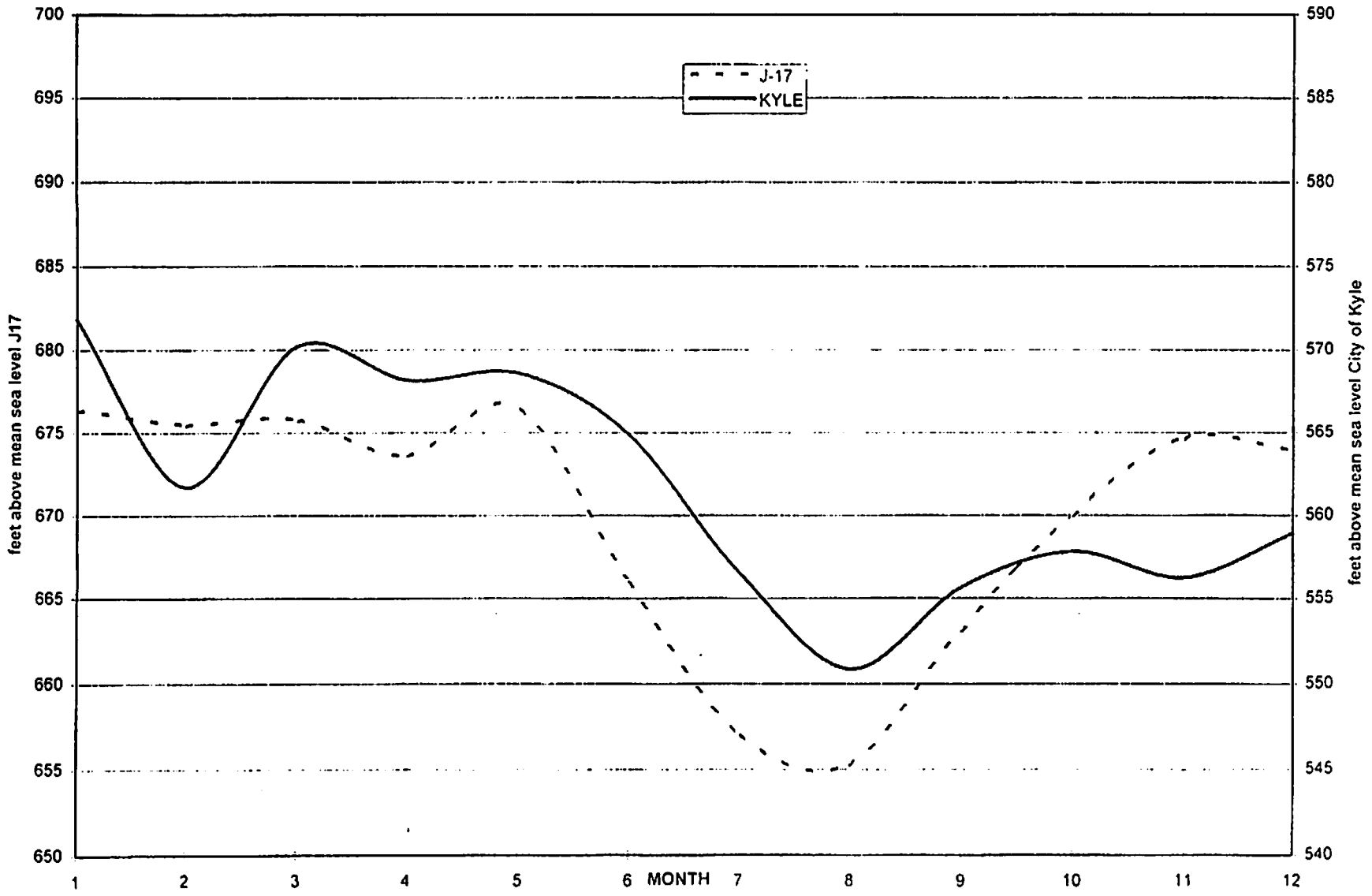
Bexar Co. Index Well (J-17) and Medina Co. Index Well (Hondo City) for 1994



Land surface datum for J-17 is 730.81'.
AY 68-37-203

Land surface datum for the Hondo City Well is 887.5
TD 69-47-306

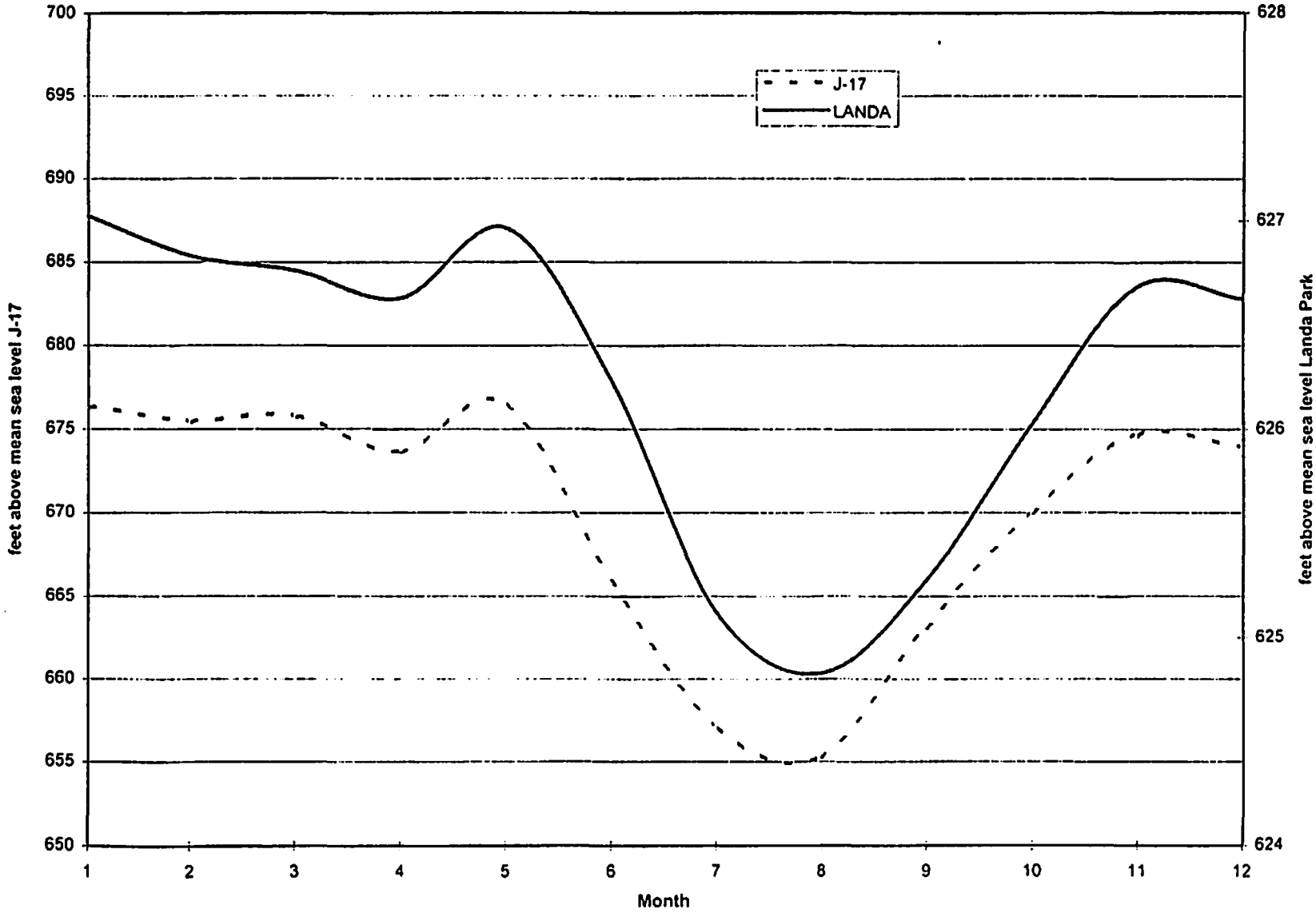
Bexar Co. Index Well (J17) and Hays Co. Index Well (City of Kyle) for 1994



Land surface datum for J-17 is 730.81'.
AY 68-37-203

Land surface datum for City of Kyle well is 715'.
LR 67-01-303

Bexar Co. Index Well (J17) and Comal Co. Index Well (Landa Park) for 1994



Land surface datum for J-17 is 730.81'.
AY 68-37-203

Land surface datum for Landa Park is 642.7'.
DX 68-23-302

Daily high water levels
in feet above MSL.
LSD = 904.9

EDWARDS UNDERGROUND WATER DISTRICT
WATER LEVELS IN OBSERVATION WELLS
YEAR 1994

UVALDE CO.
YP 69-50-302
CITY OF UVALDE

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	27.6	28.09	29.29	28.6	28.62	28.28	30.33	30.01				
2	27.61	28.1	29.32	28.57	28.58	28.44	30.41	30				
3	27.65	28.12	29.34	28.53	28.57	28.58	30.46	30.18				
4	27.67	28.15	29.35	28.5	28.57	28.72	30.48					
5	27.75	28.17	29.36	28.48	28.54	28.84	30.56	NO WATER LEVEL DATA WAS COLLECTED				
6	27.76	28.22	29.38	28.46	28.49	28.94	30.58	DURING THIS PERIOD OF TIME DUE TO				
7	27.84	28.27	29.44	28.43	28.47	29.13	30.6	CONSTRUCTION IN THE CITY OF UVALDE'S				
8	27.87	28.34	29.42	28.4	28.19	29.27	30.63		WATER STORAGE TOWER			
9	27.9	28.38	29.41	28.36	28.05	29.48	30.55					
10	27.9	28.47	29.42	28.36	28.02	29.62	30.52					
11	27.96	28.5	29.42	28.34	27.98	29.67	30.48					
12	27.99	28.54	29.43	28.36	27.93	29.72	30.61					
13	27.99	28.61	29.42	28.34	27.86	29.87	30.56					
14	27.99	28.65	29.41	28.35	27.82	29.42	30.39					
15	28	28.67	29.12	28.35	27.72	29.8	30.23					
16	28	28	28.75	28.34	27.69	28.84	30.22					
17	28.04	28.8	29.1	28.34	27.65	29.9	30.21					
18	28.06	28.85	29.09	28.35	27.62	29.98	30.19					
19	28.07	28.89	29.07	28.41	27.57	29.93	30.18					
20	28.08	29.94	29.09	28.42	27.54	29.89	30.18					
21	27.99	29.02	29.02	28.45	27.5	29.9	30.21					
22	27.92	29.01	28.98	28.52	27.49	29.89	30.25					
23	27.92	29.05	28.93	28.57	27.46	29.91	30.25					
24	27.96	29.1	28.86	28.63	27.5	29.94	30.25					
25	27.99	29.14	28.8	28.67	27.54	29.99	30.24					
26	27.99	29.21	28.75	28.82	27.57	30.03	30.24					
27	28	29.24	28.83	28.95	27.68	30.06	30.31					
28	28.05	29.25	28.71	29.07	27.79	30.11	30.3					
29	28.06		28.68	28.91	27.89	30.23	30.24					
30	28.07		28.65	28.63	27.96	30.25	30.19					
31	28.08		28.62		28.15		30.07					

Artesian well in Edwards Limestone

Appendix 10.2 - Water Quality Data

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
AY-68-28-203	8/23/94	13:48	435	33	280	23.1	697	6.7	290	290	106
AY-68-28-501	8/23/94	14:52	468	42	122	22.8	538	6.9	270	260	100.8
AY-68-28-702	9/21/94	11:52	450	22	1200	22	570	7.1	250	260	89.4
AY-68-28-904	9/8/94	11:52	640	1440	600	22.4	571	7.1	260	280	94.6
AY-68-29-109	8/24/94	10:15	460	1440		23	612	6.7	290	290	106.8
AY-68-29-405	8/24/94	8:58	395	18	100	23.1	665	6.8	310	310	126.2
AY-68-29-410	8/24/94	10:52	318	1440		23.5	589	6.9	280	270	102
AY-68-36-803	9/8/94	10:42	1409	27	1700	25.5	502	7.3	200	220	71.2
AY-68-36-908	9/8/94	9:20	1708	35	2000	27	495	7.2	200	220	75
AY-68-35-203	9/21/94	9:40	540	1440		23.9	500	7.5	200	230	76.8
AY-68-35-506	9/21/94	10:45	700	1440		23.4	519	7.3	210	240	72.8
AY 68-37-521	1/11/94	10:30	1489	96	13	30.6	5670	6.8	240	2100	558
AY 68-37-521	2/11/94	10:51	1489	111	25	29.7	5810	6.8	240	2100	568
AY 68-37-521	3/11/94	10:06	1489	126	25	30.9	5670	6.7	220	2200	572
AY 68-37-521	4/13/94	11:17	1489	147	10	31	5680	6.9	260	2400	572
AY 68-37-521	5/11/94	11:15	1489	129	12	31.2	5600	6.8	230	2100	567
AY 68-37-521	6/9/94	11:15	1489	129	12	31.2	5600	6.8	230	2200	556
AY 68-37-521	7/26/94	12:55	1489	141	14	31.1	5530	7	280	2200	556
AY 68-37-521	8/26/94	12:35	1489	133	17	31.2	5450	6.8	270	2200	573
AY 68-37-521	9/29/94	11:35	1489	125	20	31.2	5480	6.8	270	2200	583
AY 68-37-521	10/31/94	10:32	1489	102	20	31.6	5440	6.8	240	2200	577
AY 68-37-521	11/29/94	10:15	1489	85	20	31.5	5430	6.8	220	4200	575
AY 68-37-521	12/30/94	12:40	1489	145	20	31.1	5450	8.2	230	2300	541
AY-68-37-522	1/11/94	10:17	1075	87	12	29.4	4400	6.9	230	1600	428
AY-68-37-522	2/11/94	10:35	1075	98	33	29	4460	6.9	210	1600	423
AY-68-37-522	3/11/94	9:45	1075	105	30	28.9	4360	6.9	240	1600	424
AY-68-37-522	4/13/94	10:50	1075	125	15	30	4350	7	240	320	443
AY-68-37-522	5/11/94	10:55	1075	117	10	30.2	4260	7	220	1700	425
AY-68-37-522	6/9/94	10:09	1075	104	12	30.4	4270	7	210	1700	374
AY-68-37-522	7/26/94	12:30	1075	120	15	30.4	4240	7	240	1600	411
AY-68-37-522	8/26/94	12:10	1075	111	27	30.4	4190	6.9	240	1700	417
AY-68-37-522	9/29/94	11:15	1075	110	23	30.4	4200	7	260	1600	427
AY-68-37-522	10/31/94	10:43	1075	118	25	30.9	4160	7	200	1600	425

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolve mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
AY-68-28-203	8/23/94	13:48	435	5	20.5	2	44	11	0.11	7	264
AY-68-28-501	8/23/94	14:52	468	4	11.5	2	22	7	0.02	6.5	224
AY-68-28-702	9/21/94	11:52	450	16.2	9.5	1	19	23	0.16	4.4	252
AY-68-28-904	9/8/94	11:52	640	14.2	8	1	17	21	<0.01	7.2	232
AY-68-29-109	8/24/94	10:15	460	11	9.5	<1	23	8	<0.01	5.4	272
AY-68-29-405	8/24/94	8:58	395	8	11	1	21	16	0.08	8.03	256
AY-68-29-410	8/24/94	10:52	318	11	8	<1	20	7	0.08	6.5	256
AY-68-36-803	9/8/94	10:42	1409	15	14	1.5	27	21	0.15	7.6	236
AY-68-36-908	9/8/94	9:20	1708	16.8	10	1	26	27	0.19	8.3	228
AY-68-35-203	9/21/94	9:40	540	17.8	9.5	2	19	31	0.17	3.3	244
AY-68-35-506	9/21/94	10:45	700	17.6	9	1	19	36	0.18	4.4	264
AY 68-37-521	1/11/94	10:30	1489	18	9	<1	18	49	0.34	8.5	388
AY 68-37-521	2/11/94	10:51	1489	195	560	36.5	930	1893	4.7	8.8	4312
AY 68-37-521	3/11/94	10:06	1489	210	590	29	930	1664	4.7	9	4316
AY 68-37-521	4/13/94	11:17	1489	214	600	41	950	1891	3.8	8.6	4600
AY 68-37-521	5/11/94	11:15	1489	212	580	52	930	2070	5.2	9	4552
AY 68-37-521	6/9/94	11:15	1489	193	620	32	900	1807	4.3	9.7	4692
AY 68-37-521	7/26/94	12:55	1489	185	570	28	910	1730	4.5	8.9	4632
AY 68-37-521	8/26/94	12:35	1489	188	570	37	820	1753	3.11	11.7	4340
AY 68-37-521	9/29/94	11:35	1489	187	450	35	900	1862	3.75	8.6	4576
AY 68-37-521	10/31/94	10:32	1489	181	560	31	950	1908	4.06	9.1	4220
AY 68-37-521	11/29/94	10:15	1489	192	540	30	870	1955	3.5	9.4	4404
AY 68-37-521	12/30/94	12:40	1489	195	660	32.5	930	1828	3.73	12.3	4384
AY-68-37-522	1/11/94	10:17	1075	154	460	26.5	690	1543	4.5	8.4	3100
AY-68-37-522	2/11/94	10:35	1075	140	390	29	690	1322	3.9	8	3100
AY-68-37-522	3/11/94	9:45	1075	155	385	27	680	1361	4.2	8.1	3200
AY-68-37-522	4/13/94	10:50	1075	165	390	36	730	1578	4.2	7.4	3700
AY-68-37-522	5/11/94	10:55	1075	154	410	39	670	1387	4.1	8.9	3300
AY-68-37-522	6/9/94	10:09	1075	145	400	25	690	1134	3.4	7.8	3500
AY-68-37-522	7/26/94	12:30	1075	142	370	24	670	1293	3.9	8.1	3404
AY-68-37-522	8/26/94	12:10	1075	138	400	31	600	1381	2.94	8.9	3144
AY-68-37-522	9/29/94	11:15	1075	141	368	27	670	1370	3.45	8.2	3492
AY-68-37-522	10/31/94	10:43	1075	131	380	24	670	1342	5.05	8.4	3232

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
AY-68-37-522	11/29/94	10:22	1075	90	25	30.4	4150	7	210	1600	440
AY-68-37-522	12/30/94	12:45	1075	150	25	30.7	4160	7.9	210	1600	404.5
AY-68-37-523	1/11/94	10:25	1175	93	18	29.4	5800	6.7	270	2200	568
AY-68-37-523	2/11/94	10:38	1175	98	20	29	5940	6.8	250	2200	545
AY-68-37-523	3/11/94	9:56	1175	116	19	29.1	5850	6.7	240	2200	557
AY-68-37-523	4/13/94	11:04	1175	136	10	30.1	5860	6.8	220	2400	579
AY-68-37-523	5/11/94	11:10	1175	125	12	30.3	5750	6.8	250	2300	549
AY-68-37-523	6/9/94	10:20	1175	113	12	30.3	5750	6.8	240	2200	507
AY-68-37-523	7/26/94	12:40	1175	133	12	30.1	5710	6.9	260	2220	569
AY-68-37-523	8/26/94	12:25	1175	125	13	30.2	5660	6.7	280	2200	573
AY-68-37-523	9/29/94	11:25	1175	117	15	30.3	5680	6.8	240	2200	580
AY-68-37-523	10/31/94	10:37	1175	110	15	31	5670	6.8	230	2200	560
AY-68-37-523	11/29/94	10:18	1175	87	15	30.6	5650	6.8	220	2200	578
AY-68-37-523	12/30/94	12:50	1175	155	17	30.8	5650	8.1	220	2300	555.5
AY-68-37-524	1/11/94	9:52	881	72	18	26.9	889	7.4	240	340	96.4
AY-68-37-524	2/11/94	10:22	881	92	60	25.1	1040	7.6	220	340	95.8
AY-68-37-524	3/11/94	9:15	881	85	50	26.3	1050	7.5	260	360	95
AY-68-37-524	4/13/94	10:30	881	115	20	27.4	910	7.6	210	350	97
AY-68-37-524	5/11/94	10:40	881	104	20	27.9	960	7.4	230	360	98
AY-68-37-524	6/9/94	9:50	881	90	12	28.4	1030	7.4	200	360	101
AY-68-37-524	7/26/94	12:10	881	110	30	28.3	940	7.5	220	350	100
AY-68-37-524	8/26/94	11:40	881	83	27	28.3	940	7.3	200	400	103
AY-68-37-524	9/29/94	10:57	881	97	37	28.1	960	7.4	220	360	104
AY-68-37-524	10/31/94	9:55	881	80	27	28.6	907	7.5	200	350	100
AY-68-37-524	11/29/94	9:38	881	56	27	28	910	7.5	200	320	103
AY-68-37-524	12/30/94	11:10	881	65	27	28	935	8.1	190	360	95
AY-68-37-525	1/11/94	10:00	1150	75	25	27.9	6250	6.8	240	2400	594
AY-68-37-525	2/11/94	10:10	1150	80	25	26.9	6410	6.9	260	2400	578
AY-68-37-525	3/11/94	9:20	1150	90	27	27.4	6420	6.8	270	2500	590
AY-68-37-525	4/13/94	10:05	1150	85	10	28	6420	6.9	250	2500	592
AY-68-37-525	5/11/94	10:20	1150	85	10	28.3	6260	6.8	250	2500	581
AY-68-37-525	6/9/94	9:40	1150	83	10	28.6	6160	6.8	250	2500	564

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolve mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
AY-68-37-522	11/29/94	10:22	1075	145	375	24	640	1272	3.32	8.3	3268
AY-68-37-522	12/30/94	12:45	1075	141.5	430	27	670	1180	4.28	10.7	3188
AY-68-37-523	1/11/94	10:25	1175	227	660	33.5	1000	2286	4.7	9.2	4496
AY-68-37-523	2/11/94	10:38	1175	200	660	39	1000	2040	4.5	8.4	4548
AY-68-37-523	3/11/94	9:56	1175	215	550	35	980	1897	5	8.2	4420
AY-68-37-523	4/13/94	11:04	1175	228	530	42.5	1000	1918	5	7.4	4820
AY-68-37-523	5/11/94	11:10	1175	230	730	54	960	2055	4.7	9.2	4684
AY-68-37-523	6/9/94	10:20	1175	209	480	33	970	1704	4.3	8.6	4672
AY-68-37-523	7/26/94	12:40	1175	204	530	28.5	960	1807	4.3	8.7	4728
AY-68-37-523	8/26/94	12:25	1175	203	500	38	930	1908	4	11.3	4520
AY-68-37-523	9/29/94	11:25	1175	198	495	38	970	1860	3.85	8.5	4744
AY-68-37-523	10/31/94	10:37	1175	190	530	32	1000	1937	4	8.8	4444
AY-68-37-523	11/29/94	10:18	1175	213	510	32	930	1849	3.75	12.7	4704
AY-68-37-523	12/30/94	12:50	1175	210.5	610	35.5	990	1759	4.15	10.4	4476
AY 68-37-524	1/11/94	9:52	881	32	52	6	74	173	1.28	6.1	536
AY 68-37-524	2/11/94	10:22	881	29	60	6	74	178	1.45	6.1	536
AY 68-37-524	3/11/94	9:15	881	33	57	5	73	146	1.4	6.5	560
AY 68-37-524	4/13/94	10:30	881	33	54	6	74	150	1.3	6.2	580
AY 68-37-524	5/11/94	10:40	881	32	58	5.5	74	145	1.55	6.8	580
AY 68-37-524	6/9/94	9:50	881	30	52	5	73	140	1.25	7.6	644
AY 68-37-524	7/26/94	12:10	881	30	48	3.5	80	157	1.3	6.4	644
AY 68-37-524	8/26/94	11:40	881	32	51	5	73	158	0.85	6.5	576
AY 68-37-524	9/29/94	10:57	881	31	47	4	78	189	1.24	6.6	640
AY 68-37-524	10/31/94	9:55	881	28	50	4	82	160	1.23	6.8	576
AY 68-37-524	11/29/94	9:38	881	32	47	4	76	171	1.32	7.5	552
AY 68-37-524	12/30/94	11:10	881	31	51	4	77	160	1.47	8.6	572
AY-68-37-525	1/11/94	10:00	1150	261	710	37	1120	2108	5.20	9.3	4880
AY-68-37-525	2/11/94	10:10	1150	240	685	42	1120	2282	6.00	8.3	4896
AY-68-37-525	3/11/94	9:20	1150	263	620	36	1120	2116	6.20	8.8	5000
AY-68-37-525	4/13/94	10:05	1150	269	670	44.5	1120	2354	4.50	7.4	5100
AY-68-37-525	5/11/94	10:20	1150	258	700	56	1090	2094	4.70	9	5052
AY-68-37-525	6/9/94	9:40	1150	237	740	35	1100	2030	4.30	9.2	4932

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
AY-68-37-525	7/26/94	11:47	1150	87	15	28.9	6260	7	290	2400	557
AY-68-37-525	8/26/94	11:30	1150	75	14	28.4	6160	6.8	250	2400	571
AY-68-37-525	9/29/94	10:50	1150	93	18	28.5	6220	6.8	280	2400	605
AY-68-37-525	10/31/94	9:50	1150	72	18	29.1	6320	6.9	220	2400	600
AY-68-37-525	11/29/94	9:35	1150	55	18	28.3	6320	6.9	220	2400	612
AY-68-37-525	12/30/94	11:15	1150	70	26	28.7	6310	8.2	220	2600	574.5
AY-68-37-526	1/11/94	10:50	1223	110	17	25.4	950	7.4	210	370	97.7
AY-68-37-526	2/11/94	9:43	1223	63	21	24.4	1000	7.6	200	360	94.8
AY-68-37-526	3/11/94	8:56	1223	61	19	24.4	990	7.5	160	390	98.6
AY-68-37-526	4/13/94	9:45	1223	70	12	25.2	970	7.5	200	380	98.6
AY-68-37-526	5/11/94	10:02	1223	74	8.6	25.6	930	7.4	200	370	97.8
AY-68-37-526	6/9/94	9:15	1223	65	10	25.9	1060	7.5	190	400	107
AY-68-37-526	7/26/94	11:20	1223	65	9	25.3	813	7.6	230	330	85.6
AY-68-37-526	8/26/94	11:25	1223	73	9	25.5	829	7.5	200	350	95
AY-68-37-526	9/29/94	10:15	1223	63	14	25.5	930	7.4	210	350	103
AY-68-37-526	10/31/94	11:07	1223	102	14	26.4	897	7.4	190	360	100
AY-68-37-526	11/29/94	10:53	1223	140	14	26.1	900	7.4	200	340	101
AY-68-37-526	12/30/94	12:00	1223	120	18	26	901	8.2	180	370	92.5
AY-68-37-527	1/11/94	9:28	926	63	75	24.9	535	7.8	210	230	68.4
AY-68-37-527	2/11/94	9:52	926	72	75	24.3	531	7.6	200	240	67.4
AY-68-37-527	3/11/94	8:45	926	65	75	24.1	518	7.4	220	230	68
AY-68-37-527	4/13/94	9:40	926	65	75	25.1	511	7.5	210	250	75.8
AY-68-37-527	5/11/94	9:50	926	64	75	25.9	508	7.2	190	240	68
AY-68-37-527	6/9/94	9:20	926	68	75	26.3	491	7.4	190	210	60.8
AY-68-37-527	7/26/94	11:36	926	84	75	26.4	508	7.5	230	230	70.2
AY-68-37-527	8/26/94	11:12	926	62	100	26.3	508	7.3	210	240	71
AY-68-37-527	9/29/94	10:30	926	80	150	25.9	500	7.4	210	230	73
AY-68-37-527	10/31/94	11:14	926	172	100	26.6	505	7.4	200	220	75
AY-68-37-527	11/29/94	11:10	926	156	100	26.1	510	7.2	190	220	74
AY-68-37-527	12/30/94	12:05	926	134	100	26.2	512	8.4	200	230	66

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolve mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
AY-68-37-525	7/26/94	11:47	1150	225	600	32	1100	1919	4.80	8.7	5108
AY-68-37-525	8/26/94	11:30	1150	249	710	42	1160	2084	2.60	8.5	4956
AY-68-37-525	9/29/94	10:50	1150	243	580	40	1080	1871	3.85	8.7	5436
AY-68-37-525	10/31/94	9:50	1150	223	700	35	1130	2141	4.33	8.7	5076
AY-68-37-525	11/29/94	9:35	1150	243	640	36	1100	2246	4.85	8.7	5038
AY-68-37-525	12/30/94	11:15	1150	241	780	36.5	1100	1987	4.90	12.4	5044
AY-68-37-526	1/11/94	10:50	1223	34	77	5	88	182	0.95	5.4	580
AY-68-37-526	2/11/94	9:43	1223	32	57	5	85	180	0.86	5.5	580
AY-68-37-526	3/11/94	8:56	1223	35	56	4.5	84	150	1.00	5.1	608
AY-68-37-526	4/13/94	9:45	1223	36	64	5	84	147	0.84	5.2	640
AY-68-37-526	5/11/94	10:02	1223	34	53	4	80	132	1.06	5.5	600
AY-68-37-526	6/9/94	9:15	1223	36	58	5	97	165	0.80	4.3	762
AY-68-37-526	7/26/94	11:20	1223	30	49	2.5	77	133	0.68	5.2	608
AY-68-37-526	8/26/94	11:25	1223	31	46	3	77	138	0.25	5.7	604
AY-68-37-526	9/29/94	10:15	1223	33	45	3	86	162	0.76	5.7	622
AY-68-37-526	10/31/94	11:07	1223	30	43	1	79	143	0.88	5.8	596
AY-68-37-526	11/29/94	10:53	1223	32	43	2	78	145	0.98	6.5	584
AY-68-37-526	12/30/94	12:00	1223	31.5	53	3	79	153	0.87	6.8	560
AY-68-37-527	1/11/94	9:28	926	19	17	2.5	29	27	0.37	5.4	294
AY-68-37-527	2/11/94	9:52	926	17	20	3.5	29	34	0.34	5.4	300
AY-68-37-527	3/11/94	8:45	926	18	17.5	2.5	29	28	0.38	5.2	308
AY-68-37-527	4/13/94	9:40	926	19	15	3.5	27	26	0.42	5	324
AY-68-37-527	5/11/94	9:50	926	18	18.3	3.5	29	30	0.40	5.36	324
AY-68-37-527	6/9/94	9:20	926	15	11.7	2	27	21	0.18	5.5	280
AY-68-37-527	7/26/94	11:36	926	16	11.5	1	29	24	0.30	5.7	308
AY-68-37-527	8/26/94	11:12	926	18	15	1	29	34	0.16	5.9	336
AY-68-37-527	9/29/94	10:30	926	19	13	1	27	29	0.28	5.8	304
AY-68-37-527	10/31/94	11:14	926	17	10	1	27	26	0.39	5.7	308
AY-68-37-527	11/29/94	11:10	926	17	13	1	27	28	0.46	5.4	308
AY-68-37-527	12/30/94	12:05	926	17.5	12	1	27	27	0.39	7.2	280

Analytical data for minor elements and nutrients in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Arsenic Dissolved ug/L as As	Barium, Dissolved ug/L as Ba	Cadmium, Dissolved ug/L as Cd	Chromium, Dissolved ug/L as Cr	Lead, Dissolved ug/L as Pb	Silver, Dissolved ug/L as Ag	Selenium, Dissolved ug/L as Se	Mercury Dissolved ug/L as Hg	Nitrogen, Nitrite Total mg/L as N	Phosphorus Total mg/L as P
AY-68-28-203	8/23/94	11:52	435	<0.2	40	0.5	2	2	<1	<0.2	<0.2	<0.005	0.04
AY-68-28-501	8/23/94	10:15	468	<0.2	40	0.5	4	2	<1	<0.2	<0.2	<0.005	0.04
AY-68-28-702	9/21/94	10:45	450	<0.2	40	0.5	2	<2	<1	0.3	<0.2	<0.005	<0.02
AY-68-28-904	9/8/94	8:58	640	<0.2	30	<0.5	1	3	<1	0.3	<0.2	<0.005	<0.01
AY-68-29-109	8/24/94	14:52	460	<0.2	50	<0.5	1	3	<1	<0.2	<0.2	<0.005	0.02
AY-68-29-405	8/24/94	13:48	395	<0.2	50	0.6	<1	<2	<1	<0.2	<0.2	<0.005	0.05
AY-68-29-410	8/24/94	11:52	318	<0.2	40	<0.5	<1	2	<1	0.4	<0.2	<0.005	0.04
AY-68-36-803	9/8/94	10:42	1409	0.3	50	<0.5	1	<2	<1	<0.2	<0.2	<0.005	<0.01
AY-68-36-908	9/8/94	10:52	1708	<0.2	90	<0.5	1	<2	<1	0.3	<0.2	<0.005	<0.01
AY-68-35-203	9/21/94	9:20	540	<0.2	40	0.6	1	3	<1	<0.2	<0.2	<0.005	<0.02
AY-68-35-506	9/21/94	9:40	700	<0.2	40	0.8	2	4	1	0.2	<0.2	<0.005	<0.02

Analytical data for volatile organic compounds in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Bexar County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Di-chloro-bromo-methane Total ug/L	Carbon-tetra-chlo-ride Total ug/L	1,2-Di-chloro-ethane Total ug/L	Bromo-form Total ug/L	Chloro-Di-bromo-methan Total ug/L	Chloro-form Total ug/L	Toluene Total ug/L	Benzene Total ug/L	Chloro-benzene Total ug/L
AY-68-29-410	8/24/94	10:52	318	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-28-904	9/8/94	11:52	640	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-36-908	9/8/94	9:20	1708	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-36-803	9/8/94	10:42	1409	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-35-203	9/21/94	9:40	540	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-28-702	9/21/94	11:52	450	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

State Well ID Number	Date	Time	Depth of Well, Total Feet	Chloro-ethane Total ug/L	Ethyl-benzene Total ug/L	Methyl-ene Chlo-ride Total ug/L	1,1-Di-chloro-ethane Total ug/L	1,1,1-Tri-chloro-ethane Total ug/L	1,1,2-Tri-chloro-ethane Total ug/L	Ethane, 1,1,2,2 Tetrachl ro Wat U Rec ug/L	1,2-Di-chloro-propane Total ug/L	1,2-Trans-di-chloro-ethene Total ug/L
AY-68-29-410	8/24/94	10:52	318	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-28-904	9/8/94	11:52	640	<5.0	<3.0	7	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-36-908	9/8/94	9:20	1708	<5.0	<3.0	7	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-36-803	9/8/94	10:42	1409	<5.0	<3.0	8	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-35-203	9/21/94	9:40	540	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
AY-68-28-702	9/21/94	11:52	450	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

State Well ID Number	Date	Time	Depth of Well, Total Feet	2-Chloro-ethyl-vinyl-ether Total ug/L	Dichloro-difluoro-methane Total ug/L	Vinyl Chlo-ride Total ug/L	Cis 1,3-Di-chloro-propene Total ug/L	Styrene Total ug/L	Xylene Water Unfiltrd Rec ug/L
AY-68-29-410	8/24/94	10:52	318	<10	<5.0	<5.0	<3.0	<3.0	<8.0
AY-68-28-904	9/8/94	11:52	640	<5.0	<5.0	<5.0	<3.0	<3.0	<8.0
AY-68-36-908	9/8/94	9:20	1708	<5.0	<5.0	<5.0	<3.0	<3.0	<8.0
AY-68-36-803	9/8/94	10:42	1409	<5.0	<5.0	<5.0	<3.0	<3.0	<8.0
AY-68-35-203	9/21/94	9:40	435	<10	<5.0	<5.0	<3.0	<3.0	<8.0
AY-68-28-702	9/21/94	11:52	450	<10	<5.0	<5.0	<3.0	<3.0	<8.0

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smpling Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
DX-68-15-901	8/19/94	13:20	a/	1440		22.1	578	6.4	270	270	98.6
DX-68-16-502	9/15/94	11:25	230	25	833	23.2	575	7	260	270	92.4
DX-68-22-901	9/7/94	10:18	255	78	1350	23.1	495	7	240	240	89
DX-68-22-902	9/7/94	9:30	240	45	820	22.5	533	7	240	260	102.6
DX-68-23-156	9/15/94	14:22		22		23.6	569	6.8	260	270	91.8
DX-68-23-301	8/19/94	14:43	a/	1440		23.3	541	6.5	260	240	85
DX-68-23-303	9/1/94	10:53	1045	33	4200	24.4	572	7.2	230	270	88
DX-68-23-305	9/1/94	9:58	255	33	2750	24.2	546	7.2	240	260	84.6
DX-68-23-602	9/1/94	11:58	790	38	2700	23.1	523	7.1	220	250	82
DX-68-23-616A	1/12/94	14:00	576	65	11.5	23.2	3050	7.1	280	800	161
DX-68-23-616A	2/9/94	13:05	576	70	11.5	23.1	2960	7.2	260	780	163
DX-68-23-616A	3/9/94	13:50	576	80	10	23.7	3350	6.9	260	810	160
DX-68-23-616A	5/18/94	13:00	576	78	10	25.2	2960	7	280	800	161
DX-68-23-616A	6/8/94	13:38	576	68	9	25.7	2980	7	260	810	170
DX-68-23-616A	7/14/94	14:10	576	105	9	25.9	2990	7	270	810	162.6
DX-68-23-616A	8/10/94	13:15	576	75	12.5	25	3000	7	580	800	171
DX-68-23-616A	9/7/94	12:25	576	65	12	25.4	2920	6.9	280	850	170.2
DX-68-23-616A	10/20/94	13:12	576	67	13	25.6	2910	7	260	790	164.8
DX-68-23-616A	11/16/94	14:03	576	48	13	25.2	2900	7	270	1940	178.5
DX-68-23-616A	12/20/94	12:48	576	63	13	25.4	2900	7.4	260	830	172
DX-68-23-616B	1/12/94	14:10	738	75	0.25	25.3	1670	7.3	240	480	92.6
DX-68-23-616B	2/9/94	13:07	738	72	0.05	26.7	1570	7.4	210	470	91.2
DX-68-23-616B	3/9/94	13:50	738	215	0.75	21.6	1800	7	240	530	104
DX-68-23-616B	5/18/94	12:50	738	68	10	25.9	1770	7.2	250	530	103
DX-68-23-616B	6/8/94	13:45	738	75	10	26.2	1800	7.2	210	530	106
DX-68-23-616B	7/14/94	13:55	738	90	10	26.6	1730	7.2	240	520	99.6
DX-68-23-616B	8/10/94	13:00	738	67	14	26.5	1730	7.1	250	510	106
DX-68-23-616B	9/7/94	12:25	738	65	11.5	26	1780	7.1	240	530	111
DX-68-23-616B	10/20/94	13:05	738	60	13	26.3	1720	7.1	220	520	100.4
DX-68-23-616B	11/16/94	14:03	738	48	13	26.1	1700	7.1	220	1260	109
DX-68-23-616B	12/20/94	12:34	738	49	13	26.1	1700	7.6	220	550	105

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
DX-68-23-617	1/12/94	11:50	916.5	60	13	24.3	568	7.4	220	260	57.6
DX-68-23-617	2/9/94	11:08	916.5	65	15	23.3	560	7.5	230	250	58.4
DX-68-23-617	3/9/94	11:08	916.5	68	10	25	560	6.8	230	270	60.4
DX-68-23-617	4/14/94	10:19	916.5	64	7.5	25.3	560	7.4	210	260	64
DX-68-23-617	5/18/94	11:10	916.5	60	12	25.2	548	7.3	230	260	62.8
DX-68-23-617	6/8/94	10:36	916.5	60	8.6	25.9	548	7.3	220	260	65.4
DX-68-23-617	7/13/94	11:52	916.5	60	12	26.6	559	7.3	210	260	59.6
DX-68-23-617	8/10/94	11:22	916.5	52	12	26.4	561	7.2	230	260	61.6
DX-68-23-617	9/1/94	11:50	916.5	65	11.5	26.4	541	7.2	230	280	63.4
DX-68-23-617	10/20/94	11:15	916.5	60	13	26.2	561	7.3	220	270	54.8
DX-68-23-617	11/16/94	12:35	916.5	50	13	26	561	7.3	220	260	64.5
DX-68-23-617	12/20/94	11:17	916.5	62	13	26	560	7.4	210	270	63
DX-68-23-618	1/12/94	12:00	660.1	75	13	24	611	7.6	210	260	51.2
DX-68-23-618	2/9/94	11:20	660.1	77	13.6	22.9	630	7.8	220	250	54.4
DX-68-23-618	3/9/94	11:05	660.1	65		24.7	605	6.8	200	260	54.4
DX-68-23-618	4/14/94	10:31	660.1	76		24.8	615	7.5	210	260	57.6
DX-68-23-618	5/18/94	11:20	660.1	70	8.6	25.1	610	7.4	200	260	54
DX-68-23-618	6/8/94	10:30	660.1	64	7.5	25.6	610	7.4	190	260	57.8
DX-68-23-618	7/13/94	13:55	660.1	73		26.4	622	7.3	210	260	51.8
DX-68-23-618	8/10/94	11:30	660.1	60	11.5	25.3	608	7.3	230	250	55.8
DX-68-23-618	9/1/94	12:01	660.1	76	12	25.4	594	7.3	240	250	54.2
DX-68-23-618	10/20/94	11:10	660.1	55	13	25.6	616	7.4	200	260	50.8
DX-68-23-618	11/16/94	11:45	660.1	50	13	25.3	621	7.2	200	250	60
DX-68-23-618	12/20/94	11:10	660.1	55	13	25.4	623	7.4	200	260	58
DX-68-23-619A	1/12/94	12:30	652	95		23.9	528	7.4	230	240	50.4
DX-68-23-619A	2/9/94	9:25	652	70	12	23.7	534	7.6	200	230	50.8
DX-68-23-619A	3/9/94	12:30	652	60	8.6	23.4	532	7.1	200	250	52.2
DX-68-23-619A	4/14/94	12:50	652	115		25.5	542	7.4	220	240	54.6
DX-68-23-619A	5/18/94	14:40	652	65	7.5	25.4	523	7.4	230	250	52.2
DX-68-23-619A	6/8/94	11:56	652	61	7.5	25.8	156	7.5	220	240	53
DX-68-23-619A	7/14/94	11:52	652	92		26.5	536	7.3	210	240	52
DX-68-23-619A	8/10/94	10:02	652	52	11.5	25.2	526	7.3	210	240	54.8
DX-68-23-619A	9/1/94	9:55	652	52	12	25.2	514	7.4	210	240	51.6

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
DX-68-23-619A	10/20/94	9:55	652	53	13	25.7	535	7.5	190	240	54
DX-68-23-619A	11/16/94	10:03	652	58		25.4	536	7.4	210	240	56.5
DX-68-23-619A	12/20/94	9:52	652	52	13	22.4	539	7.6	190	240	55.5
DX-68-23-619B	1/12/94	12:15	787	80		24.6	542	7.4	200	260	57.6
DX-68-23-619B	2/9/94	9:40	787	85	7.3	23.6	55	7.5	220	260	59.6
DX-68-23-619B	3/9/94	12:30	787	60		24.9	540	6.9	220	260	61
DX-68-23-619B	4/14/94	12:10	787	75		25.2	537	7.6	230	260	64
DX-68-23-619B	5/18/94	14:50	787	70	13.3	26	542	7.3	230	270	60.8
DX-68-23-619B	6/8/94	12:05	787	70	13.3	26	537	7.4	230	260	62.4
DX-68-23-619B	7/14/94	12:02	787	92		26.6	557	7.3	220	260	58.4
DX-68-23-619B	8/10/94	10:10	787	60		26.2	558	7.3	230	260	63.2
DX-68-23-619B	9/1/94	10:05	787	60	16	25.8	536	7.2	260	260	61
DX-68-23-619B	10/20/94	9:55	787	53	13	26.2	558	7.3	220	260	56.8
DX-68-23-619B	11/16/94	10:03	787	58		25.9	558	7.3	220	250	69.5
DX-68-23-619B	12/20/94	9:43	787	43	13	25.9	558	7.3	220	270	72

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
DX-68-15-901	8/19/94	13:20	a/	14	9	2	18	15	0.33	7.4	272
DX-68-16-502	9/15/94	11:25	230	16.6	9	1	18	17	0.14	7	304
DX-68-22-901	9/7/94	10:18	255	11	6	1	14	8	<0.01	8.7	240
DX-68-22-902	9/7/94	9:30	240	12.6	7.5	1	16	14	0.06	7.8	250
DX-68-23-156	9/15/94	14:22		16.4	9	1	19	18	0.08	6.1	244
DX-68-23-301	8/19/94	14:43	a/	15	11	2	21	22	0.09	6	284
DX-68-23-303	9/1/94	10:53	1045	17	12	<1	21	37	0.24	6.5	308
DX-68-23-305	9/1/94	9:58	255	16	12	<1	21	27	0.21	6.7	272
DX-68-23-602	9/1/94	11:58	790	13	8.3	<1	18	15	0.33	6.6	248
DX-68-23-616A	1/12/94	14:00	576	106	365	26	530	631	3.45	5.9	1956
DX-68-23-616A	2/9/94	13:05	576	101	390	27	530	617	2.6	5	1864
DX-68-23-616A	3/9/94	13:50	576	104	310	26	520	566	4	4.8	1948
DX-68-23-616A	5/18/94	13:00	576	104	390	26	520	533	2.1	7.7	1964
DX-68-23-616A	6/8/94	13:38	576	97	380	26	510	530	3.8	4.9	1920
DX-68-23-616A	7/14/94	14:10	576	97	308	22.5	506	371	2.85	6.7	2000
DX-68-23-616A	8/10/94	13:15	576	100	298	16	560	553	3.7	4.2	2060
DX-68-23-616A	9/7/94	12:25	576	97	344	1	520	721	2.93	8	1960
DX-68-23-616A	10/20/94	13:12	576	93.6	330	23	515	551	3.67	6.4	1848
DX-68-23-616A	11/16/94	14:03	576	99	328	19	520	514	3.8	6.6	1912
DX-68-23-616A	12/20/94	12:48	576	98	310	22.5	530	537	3.48	7.5	1856
DX-68-23-616B	1/12/94	14:10	738	60	150	12	250	266	3.35	5.84	1052
DX-68-23-616B	2/9/94	13:07	738	56	152	12	250	265	2.65	4.6	984
DX-68-23-616B	3/9/94	13:50	738	64	148	14	275	306	3.55	4.8	1116
DX-68-23-616B	5/18/94	12:50	738	69	172	14	275	280	3.05	7.3	1188
DX-68-23-616B	6/8/94	13:45	738	59	168	12.5	265	260	3.5	5	1132
DX-68-23-616B	7/14/94	13:55	738	59	138	11.5	260	235	3.05	6.7	1120
DX-68-23-616B	8/10/94	13:00	738	59	138	8	258	303	3.85	4.6	1168
DX-68-23-616B	9/7/94	12:25	738	62.6	154	11	275	347	2.95	7.6	1180
DX-68-23-616B	10/20/94	13:05	738	60.8	162.5	12	275	297	3.35	6.3	1096
DX-68-23-616B	11/16/94	14:03	738	61.5	157	10	275	273	3.5	6.1	1140
DX-68-23-616B	12/20/94	12:34	738	65	170	11	270	289	3.55	6.6	550

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
DX-68-23-617	1/12/94	11:50	916.5	27	13	3.5	21	55	1.25	5.4	344
DX-68-23-617	2/9/94	11:08	916.5	26	15	3	21	55	1	4.36	352
DX-68-23-617	3/9/94	11:08	916.5	27	13	3	20	51	1.43	4	368
DX-68-23-617	4/14/94	10:19	916.5	29	18.5	4.5	20	52	1	5.4	386
DX-68-23-617	5/18/94	11:10	916.5	31	12.5	3	21	47	0.6	6.9	356
DX-68-23-617	6/8/94	10:36	916.5	25	15	3.5	18	44	1.21	4.2	338
DX-68-23-617	7/13/94	11:52	916.5	25	9	1	22	44	1.28	5.8	392
DX-68-23-617	8/10/94	11:22	916.5	25	10.5	1	20	47	1.24	3.4	364
DX-68-23-617	9/1/94	11:50	916.5	26	12	<1	21	51	1.31	6.3	396
DX-68-23-617	10/20/94	11:15	916.5	24.8	10.5	2.5	28	50	1.3	6	360
DX-68-23-617	11/16/94	12:35	916.5	27	10	1.8	22	48	1.3	5.8	336
DX-68-23-617	12/20/94	11:17	916.5	28.5	11.5	1.5	21	51	1.35	6.1	376
DX-68-23-618	1/12/94	12:00	660.1	33	33.5	4	42	66	2.2	5.7	372
DX-68-23-618	2/9/94	11:20	660.1	32	31.5	3.5	42	49	2.05	4.5	368
DX-68-23-618	3/9/94	11:05	660.1	33	37	4	42	62	2.85	4.4	372
DX-68-23-618	4/14/94	10:31	660.1	34	39	4	40	59	2.65	5.8	400
DX-68-23-618	5/18/94	11:20	660.1	35	32.5	3.8	41	56	2.15	7.2	396
DX-68-23-618	6/8/94	10:30	660.1	33	30.5	4.75	39	53	2.5	5.4	380
DX-68-23-618	7/13/94	13:55	660.1	30	21.5	1	42	49	2.85	6.2	372
DX-68-23-618	8/10/94	11:30	660.1	31	28.5	1.5	42	61	1.91	5.1	400
DX-68-23-618	9/1/94	12:01	660.1	31	31	1	42	61	2.87	5.7	412
DX-68-23-618	10/20/94	11:10	660.1	30	27.5	3	48	61	2.55	6.3	396
DX-68-23-618	11/16/94	11:45	660.1	32	28	1.8	42	58	2.6	6.1	416
DX-68-23-618	12/20/94	11:10	660.1	33.5	27	2	43	61	2.83	6.1	380
DX-68-23-619A	1/12/94	12:30	652	31	17	3	27	44	2.2	5.7	328
DX-68-23-619A	2/9/94	9:25	652	29	22	1.2	27	47	1.83	4.05	324
DX-68-23-619A	3/9/94	12:30	652	30	20	2.5	25	42	2.5	4.6	332
DX-68-23-619A	4/14/94	12:50	652	31	22.5	2.5	25	43	2.25	5.7	344
DX-68-23-619A	5/18/94	14:40	652	31	19	2.5	27	38	1.75	7	336
DX-68-23-619A	6/8/94	11:56	652	28	20	3	23	36	2.38	4.7	340
DX-68-23-619A	7/14/94	11:52	652	28	11.5	2	27	30	2	6.4	368
DX-68-23-619A	8/10/94	10:02	652	29	15	<1	27	39	2.37	4.5	388
DX-68-23-619A	9/1/94	9:55	652	29	16.5	<1	26	43	2.87	8.2	328

Data for common constituents and selected parameters,
in Edwards Aquifer wells and springs sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
DX-68-23-619A	10/20/94	9:55	652	32.8	16	2.5	32	44	2.6	6.2	332
DX-68-23-619A	11/16/94	10:03	652	30.5	15	1	27	44	2.4	6.3	344
DX-68-23-619A	12/20/94	9:52	652	31	16	<1	26	42	2.52	7.1	316
DX-68-23-619B	1/12/94	12:15	787	27	14.5	2.5	22	51	1.27	5.4	328
DX-68-23-619B	2/9/94	9:40	787	25	17	2	22	50	1.36	4.6	344
DX-68-23-619B	3/9/94	12:30	787	26	13	2	22	46	1.5	3.8	360
DX-68-23-619B	4/14/94	12:10	787	27	20	2.2	21	45	1.66	5.3	376
DX-68-23-619B	5/18/94	14:50	787	26	17	1.8	22	41	1.32	6.6	376
DX-68-23-619B	6/8/94	12:05	787	25	15	2.5	21	38	1.8	3.8	356
DX-68-23-619B	7/14/94	12:02	787	24	9	1	22	37	1.06	6	352
DX-68-23-619B	8/10/94	10:10	787	25	12	<1	22	45	1.37	4.5	356
DX-68-23-619B	9/1/94	10:05	787	25	13	<1	22	47	1.52	7.3	356
DX-68-23-619B	10/20/94	9:55	787	25.2	11.5	2.5	30	49	1.54	5.9	336
DX-68-23-619B	11/16/94	10:03	787	26	11.5	1	23	46	1.4	5.9	344
DX-68-23-619B	12/20/94	9:43	787	28	12	<1	23	49	1.68	6.3	352

Analytical data for minor elements and nutrients in waters from wells completed in and springs discharging from the Edwards aquifer sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Arsenic Dis-solved ug/L as As	Barium, Dis-solved ug/L as Ba	Cadmium, Dis-solved ug/L as Cd	Chro-mium, Dis-solved ug/L as Cr	Lead, Dis-solved ug/L as Pb	Silver, Dis-solved ug/L as Ag	Sele-nium, Dis-solved ug/L as Se	Mercury Dis-solved ug/L as Hg	Nitro-gen, Nitrite Total mg/L as N	Phos-phorus Total mg/L as P
DX-68-23-301	8/19/94	14:43	a/	<0.2	60	0.5	1	5	<1	<0.2	<0.2	0.019	0.03
DX-68-15-901	8/19/94	13:20	a/	<0.2	40	<0.5	1	<2	<1	<0.2	<0.2	<0.005	0.04
DX-68-23-602	9/1/94	11:58	790	<0.2	30	<0.5	<1	<2	<1	<0.2	<0.2	<0.005	<0.01
DX-68-23-305	9/1/94	9:58	255	<0.2	50	<0.5	<1	2	<1	<0.2	<0.2	<0.005	<0.01
DX-68-22-901	9/7/94	10:18	255	<0.2	20	<0.5	<1	<2	1	0.2	<0.2	<0.001	<0.01
DX-68-22-902	9/7/94	9:30	240	<0.2	30	<0.5	1	<2	<1	<0.2	<0.2	<0.005	<0.01
DX-68-16-502	9/15/94	11:25	230	0.2	40	<0.5	1	4	<1	0.2	<0.2	<0.005	<0.02
DX-68-23-156	9/15/94	14:22		<0.2	50	<0.5	1	2	<1	<0.2	<0.2		<0.02
DX-68-23-617	3/9/94	11:08	916.5	<0.2	110	<0.5	3	2	1	<0.2	<0.2		
DX-68-23-618	3/9/94	11:05	660.1	0.2	30	<0.5	3	<2	<1	<0.2	<0.2		

Analytical data for pesticides in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Aldrin, Total ug/L	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, Sulfate Total ug/L	Endrin Water Unfiltrd Rec ug/L
DX-68-23-301	8/19/94	14:43	a/	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
DX-68-15-901	8/19/94	13:20	a/	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
DX-68-23-602	9/1/94	11:58	790	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
DX-68-23-305	9/1/94	9:58	255	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
DX-68-22-902	9/7/94	9:30	240	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
DX-68-16-502	9/15/94	11:25	230	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06

State Well ID Number	Date	Time	Depth of Well, Total Feet	Toxaphene Total ug/L	Heptachlor, Total ug/L	Heptachlor Epoxide Toatl ug/L	PCB, Total ug/L	2,4-D Total ug/L	2,4,5-T Total ug/L	Silvex, Total ug/L
DX-68-23-301	8/19/94	14:43	a/	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10
DX-68-15-901	8/19/94	13:20	a/	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10
DX-68-23-602	9/1/94	11:58	790	<2.4	<0.03	<0.83	<0.65	<0.1000	<0.1000	<0.1000
DX-68-23-305	9/1/94	9:58	255	<2.4	<0.03	<0.83	<0.65	<0.1000	<0.1000	<0.1000
DX-68-22-902	9/7/94	9:30	240	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10
DX-68-16-502	9/15/94	11:25	230	<2.4	<0.03	<0.83	<0.65	<0.100	<0.100	<0.100

Analytical data for volatile organic compounds in water wells completed in and springs discharging from the Edwards aquifer sampled in 1994

Comal County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Di-chloro-bromo-methane Total ug/L	Carbon-tetra-chlo-ride Total ug/L	1,2-Di-chloro-ethane Total ug/L	Bromo-form Total ug/L	Chloro-Di-bromo-methane Total ug/L	Chloro-form Total ug/L	Toluene Total ug/L	Benzene Total ug/L	Chloro-benzene Total ug/L
DX-68-23-301	8/19/94	14:43	a/	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-22-901	9/7/94	10:18	255	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-16-502	9/15/94	11:25	230	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-23-617	3/9/94	11:08	916.5	<5	<5	<5	<5	<5	<5	<5	<5	<5
DX-68-23-618	3/9/94	11:05	660.1	<5	<5	<5	<5	<5	<5	<5	<5	<5

State Well ID Number	Date	Time	Depth of Well, Total Feet	Chloro-ethane Total ug/L	Ethyl-benzene Total ug/L	Methyl-ene Chlo-ride Total ug/L	Tri-chloro-fluoro-methane Total ug/L	1,1-Di-chloro-ethane Total ug/L	1,1,1-Tri-chloro-ethane Total ug/L	1,1,2-Tri-chloro-ethane Total ug/L	Ethane, 1,1,2,2 Tetrachlo-ro Wat Un Rec ug/L	1,2-Di-chloro-propane Total ug/L
DX-68-23-301	8/19/94	14:43	a/	<5.0	<3.0	<3.0		<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-22-901	9/7/94	10:18	255	<5.0	<3.0	4		<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-16-502	9/15/94	11:25	230	<5.0	<10	<3.0		<3.0	<3.0	<3.0	<3.0	<3.0
DX-68-23-617	3/9/94	11:08	916.5	<10	<5	<5	<5	<5	<5	<5	<5	<5
DX-68-23-618	3/9/94	11:05	660.1	<10	<5	<5	<5	<5	<5	<5	<5	<5

State Well ID Number	Date	Time	Depth of Well, Total Feet	1,2-Trans-di-chloro-ethene Total ug/L	2-Chloro-ethyl-vinyl-ether Total ug/L	Dichloro difluoro-methan Total ug/L	Vinyl Chlo-ride Total ug/L	Benzene 1,3-Di-chloro-tr Unfltr Rec ug/L	Benzen 1,4-Di-chloro-tr Unfltr Rec ug/L	Cis 1,3-Di-chloro-propene Total ug/L	Styrene Total ug/L	Xylene Water Unfiltrd Rec ug/L
DX-68-23-301	8/19/94	14:43	a/	<3.0	<5.0	<5.0	<5.0			<3.0	<3.0	<5.0
DX-68-22-901	9/7/94	10:18	255	<3.0	<5.0	<5.0	<5.0			<3.0	<3.0	<8.0
DX-68-16-502	9/15/94	11:25	230	<3.0	<10	<5.0	<5.0			<3.0	<3.0	<8.0
DX-68-23-617	3/9/94	11:08	916.5	<5	<5		<10	<5	<5	<5	<5	
DX-68-23-618	3/9/94	11:05	660.1	<5	<5		<10	<5	<5	<5	<5	

Data for common constituents and selected parameters
in Edwards aquifer wells and springs sampled in 1994.

Hays County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
LR-67-09-105	9/14/94	11:38	330	1440	2330	24.7	612	7.1	260	282	102
LR-67-09-111	9/15/94	10:22	264	17	430	22.9	594	7	270	272	101
LR-67-01-302	9/14/94	10:28	360	28	580	25	701	7.3	190	348	64.8
LR-58-58-403	9/21/94	14:05	390	20	300	23	588	7.2	270	280	76.8
LR-67-01-801	8/19/94	10:48	a/	1440		21.9	582	6.5	250	196	86
LR-67-01-806	9/16/94	10:35	115	20	2200	22.7	616	7.1	280	276	113
LR-67-01-812	3/30/94	11:30	543	60		24	13500	6.7	380	3900	904
LR-67-01-812	6/23/94	11:00	543	60			13800	6.6	280	4100	884
LR-67-01-812	9/16/94	15:28	543	63	11.5	24.1	15700	6.5	360	3940	905
LR-67-01-812	12/21/94	15:13	543	48	13	24.3	14700	6.2	370	4200	922
LR-67-01-813A	3/30/94	13:05	564	60		23.5	13700	6.7	390	3750	857
LR-67-01-813A	6/23/94	14:10	564	60			13900	6.6	260	3900	881
LR-67-01-813A	9/16/94	13:10	564	55	8.6	24.2	15700	6.6	440	3920	905.5
LR-67-01-813A	12/21/94	11:10	564	60	10	24.3	14700	6.4	360	4200	910
LR-67-01-813B	3/30/94	13:05	699	60		24	13900	6.7	380	4000	868
LR-67-01-813B	6/23/94	14:10	699	60			14100	6.6	200	4200	897
LR-67-01-813B	9/16/94	13:10	699	55	11.5	24.9	15700	6.5	390	3860	907
LR-67-01-813B	12/21/94	10:50	699	60	12	25.3	14700	6.4	360	4400	926.5
LR-67-01-814A	3/30/94	15:30	556	60		24.5	14100	6.7	380	4100	877
LR-67-01-814A	6/23/94	12:25	556	60			13800	6.5	300	4000	885
LR-67-01-814A	9/16/94	11:10	556	55	12	24.6	15700	6.5	390	3980	903
LR-67-01-814A	12/21/94	13:05	556	75	13	24.9	14700	6.1	360	4400	957
LR-67-01-814B	3/30/94	15:30	726	60		25.5	14000	6.7	380	3800	853
LR-67-01-814B	6/23/94	12:25	726	60			13900	6.6	250	4000	884
LR-67-01-814B	9/16/94	11:10	726	55	11.1	25.6	15600	6.5	400	3840	892.5
LR-67-01-814B	12/21/94	13:07	726	77	13	26	14700	6.2	350	3500	889.5

Data for common constituents and selected parameters
in Edwards aquifer wells and springs sampled in 1994.

Hays County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
LR-67-09-105	9/14/94	11:38	330	19	15	<1	34	29	0.17	7.6	312
LR-67-09-111	9/15/94	10:22	264	17.6	11	1	22	23	0.22	6.6	252
LR-67-01-302	9/14/94	10:28	360	39.8	10	1.5	24	134	2.98	7.8	506
LR-58-58-403	9/21/94	14:05	390	26.2	7	1	17	24	0.31	6.5	332
LR-67-01-801	8/19/94	10:48	a/	17	13.3	2	25	26	0.13	4.7	266
LR-67-01-806	9/16/94	10:35	115	18.5	13	0.5	30	28	0.38	5.7	240
LR-67-01-812	3/30/94	11:30	543	456	3100	83	4150	3333	6.13	7.08	10712
LR-67-01-812	6/23/94	11:00	543	419	2500	85	4050	2427	5.5	7.1	10220
LR-67-01-812	9/16/94	15:28	543	438	1820	100	3850	3151	4.6	7	10628
LR-67-01-812	12/21/94	15:13	543	369	2125	124	3850	2520	5.3	8.7	12168
LR-67-01-813A	3/30/94	13:05	564	466	2400	79	3550	2472	5.75	7.28	10488
LR-67-01-813A	6/23/94	14:10	564	431	2550	84	4150	2497	6.5	7.3	10464
LR-67-01-813A	9/16/94	13:10	564	430	2160	98	3900	3107	4.5	7	10920
LR-67-01-813A	12/21/94	11:10	564	408	2100	114	3950	2660	4.6	7.4	12468
LR-67-01-813B	3/30/94	13:05	699	454	2850	97	4300	2806	5.9	7	11012
LR-67-01-813B	6/23/94	14:10	699	432	1700	74	4050	1930	6.5	7	10440
LR-67-01-813B	9/16/94	13:10	699	436	2000	98	3850	2848	4.7	6.9	10784
LR-67-01-813B	12/21/94	10:50	699	414	2100	114	4000	2576	4.9	5.7	12570
LR-67-01-814A	3/30/94	15:30	556	466	2150	74.5	3750	2569	4.5	6.92	10704
LR-67-01-814A	6/23/94	12:25	556	408	1800	71.5	3950	2395	5.5	6.9	10476
LR-67-01-814A	9/16/94	11:10	556	452	2000	96	4250	2922	4.54	7	10672
LR-67-01-814A	12/21/94	13:05	556	409	2150	110	3900	2711	4.4	8.5	12768
LR-67-01-814B	3/30/94	15:30	726	454	2250	69	4050	2944	6.5	6.8	10760
LR-67-01-814B	6/23/94	12:25	726	422	1950	57	3700	2211	3.5	6.8	10784
LR-67-01-814B	9/16/94	11:10	726	444	2000	95	4100	3035	4.87	6.8	10524
LR-67-01-814B	12/21/94	13:07	726	419	2100	112	3900	2598	3.2	7.1	12044

Analytical data for minor elements and nutrients in waters from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Hays County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Arsenic, Dissolved ug/L as As	Barium, Dissolved ug/L as Ba	Cadmium, Dissolved ug/L as Cd	Chromium, Dissolved ug/L as Cr	Lead, Dissolved ug/L as Pb	Silver, Dissolved ug/L as Ag	Selenium, Dissolved ug/L as Se	Mercury, Dissolved ug/L as Hg	Nitrogen, Nitrite Total mg/L as N	Phosphorus Total mg/L as P
LR-67-09-105	9/14/94	11:38	330	<0.2	40	<0.5	1	2	<1	0.3	<0.2		<0.02
LR-67-09-111	9/15/94	10:22	264	<0.2	40	<0.5	1	2	<1	<0.2	<0.2	<0.005	<0.02
LR-67-01-302	9/14/94	10:28	360	0.2	60	<0.5	<1	4	1	<0.2	<0.2	<0.005	<0.02
LR-58-58-403	9/21/94	14:05	390	<0.2	150	0.7	2	5	<1	<0.2	<0.5	<0.005	<0.02
LR-67-01-801	8/19/94	10:48	a/	<0.2	40	<0.5	1	2	<1	<0.2	<0.2	<0.005	0.04
LR-67-01-806	9/16/94	10:35	115	<0.2	40	0.8	1	2	<1	0.2	<0.2	<0.005	<0.02

Analytical data for pesticides in water from wells completed in and springs discharging fron the Edwards aquifer sampled in 1994.

Hays County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Aldrin, Total ug/L	Lindane, Total ug/L	Chlor-dane, Total ug/L	DDD, Total ug/L	DDE, Total ug/L	DDT, Total ug/L	Dieldrin Total ug/L	Endo-sulfan, Sulfate Total ug/L	Endrin Water Unfltrd Rec ug/L
LR-67-09-105	9/14/94	11:38	330	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
LR-67-09-111	9/15/94	10:22	264	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
LR-67-01-302	9/14/94	10:28	360	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
LR-58-58-403	9/21/94	14:05	390	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
LR-67-01-801	8/19/94	10:48	a/	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06
LR-67-01-806	9/16/94	10:35	115	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06

State Well ID Number	Date	Time	Depth of Well, Total Feet	Tox-aphene, Total ug/L	Hepta-chlor, Total ug/L	Hepta-chlor Epoxide Total ug/L	PCB, Total ug/L	2,4-D Total ug/L	2,4,5-T Total ug/L	Silvex, Total ug/L
LR-67-09-105	9/14/94	11:38	330	<2.4	<0.03	<0.83	<0.65	<0.100	<0.100	<0.100
LR-67-09-111	9/15/94	10:22	264	<2.4	<0.03	<0.83	<0.65	<0.100	<0.100	<0.100
LR-67-01-302	9/14/94	10:28	360	<2.4	<0.03	<0.83	<.065	<0.100	<0.100	<0.100
LR-58-58-403	9/21/94	14:05	390	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10
LR-67-01-801	8/19/94	10:48	a/	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10
LR-67-01-806	9/16/94	10:35	115	<2.4	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10

Analytical data for volitile organic compounds in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Hays County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Di-chloro-bromo-methane Total ug/L	Carbon-tetra-chlo-ride Total ug/L	1,2-Di-chloro-ethane Total ug/L	Bromo-form Total ug/L	Chloro-Di-bromo-methane Total ug/L	Chloro-form Total ug/L	Toluene Total ug/L	Benzene Total ug/L	Chloro-benzene Total ug/L
LR-67-01-302	9/14/94	10:28	360	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-58-58-403	9/21/94	14:05	390	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-67-01-801	8/19/94	10:48	a/	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

State Well ID Number	Date	Time	Depth of Well, Total Feet	Chloro-ethane Total ug/L	Ethyl-benzene Total ug/L	Methyl-ene Chlo-ride Total ug/L	1,1,-Di-chloro-ethane Total ug/L	1,1,1-Tri-chloro-ethane Total ug/L	1,1,2-Tri-chloro-ethane Total ug/L	Ethane, 1,1,2,2 Tetrachl ro Wat U Rec ug/L	1,2-Di-chloro-propane Total ug/L	1,2-Transdi-chloro-ethene Total ug/L
LR-67-01-302	9/14/94	10:28	360	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-58-58-403	9/21/94	14:05	390	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
LR-67-01-801	8/19/94	10:48	a/	<5.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0

State Well ID Number	Date	Time	Depth of Well, Total Feet	2-Chloro-ethyl-vinyl-ether Total ug/L	Dichloro-difluoro-methane Total ug/L	Vinyl Chlo-ride Total ug/L	Cis 1,3-Di-chloro-propene Total ug/L	Styrene Total ug/L	Xylene Water Unfiltrd Rec ug/L
LR-67-01-302	9/14/94	10:28	360	<5.0	<5.0	<5.0	<3.0	<3.0	<8.0
LR-58-58-403	9/21/94	14:05	390	<10	<5.0	<5.0	<3.0	<3.0	<8.0
LR-67-01-801	8/19/94	10:48	a/	<5.0	<5.0	<5.0	<3.0	<3.0	<5.0

Data for common constituents and selected parameters,
in Edwards aquifer wells and springs sampled in 1994.

Medina County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
TD-68-26-701	7/19/94	10:05	750	155	1000	23.4	533	7.2	220	260	74
TD-68-33-202	7/21/94	12:12	279	52	17	23.1	460	7.2	210	220	75
TD-68-41-303	7/20/94	10:47	717	117	360	24.7	494	7	210	230	70
TD-69-29-901	7/19/94	14:10	276	35	10	23	461	7.2	210	230	83.6
TD-69-37-302	9/22/94	10:18	410	33	20	22.6	486	7.2	210	210	81
TD-69-40-403	7/21/94	10:22	518	142	1750	23.4	467	7	210	230	81.2
TD-69-46-601	9/22/94	11:25	1289	10	210	23.6	474	7.3	210	220	72
TD-69-47-301	7/20/94	14:42	1510	58	1150	24.7	472	7.3	210	220	67.4

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Su of Constituents, Dissolved mg/L
TD-68-26-701	7/19/94	10:05	750	19	7.5	0.5	18	44	0.32	5.2	338
TD-68-33-202	7/21/94	12:12	279	9	6	<0.1	16	21	0.19	6.2	288
TD-68-41-303	7/20/94	10:47	717	14	9	0.2	27	12	0.25	4.3	296
TD-69-29-901	7/19/94	14:10	276	6	4.5	0.2	14	9	0.13	6.1	280
TD-69-37-302	9/22/94	10:18	410	14	7.5	1	22	14	0.16	6	262
TD-69-40-403	7/21/94	10:22	518	9	5	0.2	16	6	0.18	5.2	244
TD-69-46-601	9/22/94	11:25	1289	13.8	8	1	22	16	0.14	3.2	252
TD-69-47-301	7/20/94	14:42	1510	14	7.5	0.2	17	13	0.18	5.8	272

Analytical data for minor elements and nutrients in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Medina County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Arsenic Dissolved ug/L as As	Barium, Dissolved ug/L as Ba	Cadmium, Dissolved ug/L as Cd	Chromium, Dissolved ug/L as Cr	Lead, Dissolved ug/L as Pb	Silver, Dissolved ug/L as Ag	Selenium, Dissolved ug/L as Se	Mercury Dissolved ug/L as Hg	Nitrogen, Nitrite Total mg/L as N	Phosphorus Total mg/L as P
TD-68-26-701	7/19/94	10:05	750	0.2	30	<0.5	1	2	<1	<0.2	<0.2	<0.005	0.03
TD-68-33-202	7/21/94	12:12	279	<0.2	40	0.6	1	2	<1	<0.2	<0.2	<0.005	0.13
TD-68-41-303	7/20/94	10:47	717	<0.2	40	<0.5	2	<2	<1	<0.2	<0.2	<0.005	0.02
TD-69-29-901	7/19/94	14:10	276	<0.2	30	0.6	1	2	<1	<0.2	<0.2	<0.005	0.03
TD-69-37-302	9/22/94	10:18	410	<0.2	40	0.5	<1	2	<1	<0.2	<0.2	<0.005	<0.02
TD-69-40-403	7/21/94	10:22	518	<0.2	30	<0.5	2	4	<1	<0.2	<0.2	<0.005	0.03
TD-69-46-601	9/22/94	11:25	1289	<0.2	40	<0.5	1	2	5	<0.2	<0.2	<0.005	<0.02
TD-69-47-301	7/20/94	14:42	1510	<0.2	30	<0.5	2	2	<1	<0.2	<0.2	<0.005	<0.01

Analytical data for pesticides in water from wells in and springs discharging from the Edwards aquifer sampled in 1994.

Medina County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Aldrin, Total ug/L	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, Sulfate Total ug/L	Endrin Water Unfltrd Rec ug/L	Toxaphene, Total ug/L
TD-68-26-701	7/19/94	10:05	750	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
TD-69-29-901	7/19/94	14:10	276	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
TD-69-37-302	9/22/94	10:18	410	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4

State Well ID Number	Date	Time	Depth of Well, Total Feet	Heptachlor, Total ug/L	Heptachlor Epoxide Toatl ug/L	PCB, Total ug/L	Malathion, Total ug/L	Parathion, Total ug/L	Diazinon, Total ug/L	Methyl Parathion Total ug/L	2,4-D Total ug/L	2,4,5-T Total ug/L	Silvex, Total ug/L
TD-68-26-701	7/19/94	10:05	750	<0.03	<0.83	<0.65	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-29-901	7/19/94	14:10	276	<0.03	<0.83	<0.65	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
TD-69-37-302	9/22/94	10:18	410	<0.03	<0.83	<0.65					<0.10	<0.10	<0.10

Analytical data for volitile organic compounds in water wells completed in springs discharging from the Edwards aquifer sampled in 1994.

Medina County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Chloro-Di-bromo-methane Total ug/L	Tri-chloro-fluoro-methane Total ug/L	2-Chloro-ethyl-vinyl-ether Total ug/L	Benzene 1,3-Di-chloro- Wtr Unfltrd Rec ug/L	Benzene 1,4-Di-chloro- Wtr Unfltrd Rec ug/L	Cis 1,3-Di-chloro-propene Total ug/L
TD-68-41-303	7/20/94	10:47	717	<2.5	<5.0	<5.0	<2.5	<2.5	<2.5
TD-69-47-301	7/20/94	14:42	1510	<2.5	<5.0	<5.0	<2.5	<2.5	<2.5

Data for common constituents and selected parameters
in Edwards aquifer wells and springs sampled in 1994.

Uvalde County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Pump or Flow Period Prior to Smplng Min	Flow Rate, Inst G/M	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3
YP-69-43-606	9/23/94	10:50	698	22	900	23.5	510	7.2	180	220	79.6
YP-69-45-405	6/22/94	10:31	1200	25	667	22.5	461	7.5	220		
YP-69-36-702	6/29/94	12:15	538	480	1393	22.5	465	7.6	170	210	69
YP-69-50-203	6/23/94	15:03	525	30	1300	23	560	7.2	190	240	87.8
YP-69-50-501	9/23/94	13:20	600	1440	750	23	1250	6.8	210	460	164
YP-69-50-506	6/23/94	14:02	525	42	400	23.7	543	7.2	210	240	90.2

State Well ID Number	Date	Time	Depth of Well, Total Feet	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L as SiO2	Solids, Sum of Constituents, Dissolved mg/L
YP-69-36-702	6/29/94	12:15	538	15	9	1	34	12	0.07	3.5	288
YP-69-43-606	9/23/94	10:50	698	9.2	13	1	34	12	0.07	2.3	304
YP-69-50-203	6/23/94	15:03	525	9	20	2	42	16	0.11	6.3	332
YP-69-50-501	9/23/94	13:20	600	16.6	71	2.5	205	80	0.16	5.1	988
YP-69-50-506	6/23/94	14:02	525	8	19.5	1	35	18	0.19	5.6	336

Analytical data for minor elements and nutrients in water from wells completed in and springs discharging from the Edwards aquifer sampled in 1994.

Uvalde County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Arsenic Dis-solved ug/L as As	Barium, Dis-solved ug/L as Ba	Cadmium, Dis-solved ug/L as Cd	Chro-mium, Dis-solved ug/L as Cr	Lead, Dis-solved ug/L as Pb	Silver, Dis-solved ug/L as Ag	Sele-nium, Dis-solved ug/L as Se	Mercury Dis-solved ug/L as Hg	Nitro-gen, Nitrite Total mg/L as N	Phos-phorus Total mg/L as P
YP-69-36-702	6/29/94	12:15	538	<0.2	20	<0.5	1	2	<1	<0.2	<0.2		
YP-69-43-606	9/23/94	10:50	698	<0.2	50	1	1	<2	<1	<0.2	<0.2	<0.005	<0.02
YP-69-50-203	6/23/94	15:03	525	<0.2	60	<0.5	1	2	1	<0.2	<0.2		
YP-69-50-501	9/23/94	13:20	600									<0.005	<0.02
YP-69-50-506	6/23/94	14:02	525	0.2	70	0.5	1	3	<1	<0.2	<0.2		

Analytical data for pesticides in water from wells in and springs discharging from the Edwards aquifer sampled in 1994.

Uvalde County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Aldrin, Total ug/L	Lindane, Total ug/L	Chlor-dane, Total ug/L	DDD, Total ug/L	DDE, Total ug/L	DDT, Total ug/L	Dieldrin Total ug/L	Endo-sulfan, Sulfate Total ug/L	Endrin Water Unfltrd Rec ug/L	Tox-aphene, Total ug/L
YP-69-36-702	6/29/94	12:15	538	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
YP-69-50-203	6/23/94	15:03	525	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.66	<0.01	<0.10
YP-69-50-506	6/23/94	14:02	525	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.66	<0.01	<0.10

State Well ID Number	Date	Time	Depth of Well, Total Feet	Hepta-chlor, Total ug/L	Hepta-chlor Epoxide Toatl ug/L	PCB, Total ug/L	Mala-thion, Total ug/L	Para-thion, Total ug/L	Di-azinon, Total ug/L	Methyl Para-thion Total ug/L	2,4-D Total ug/L	2,4,5-T Total ug/L	Silvex, Total ug/L
YP-69-36-702	6/29/94	12:15	538	<0.03	<0.83	<0.65	<0.20	<0.20	<0.20	<0.20	<0.10	<0.10	<0.10
YP-69-50-203	6/23/94	15:03	525	<0.01	<0.01	<0.16	<0.16	<0.16	<0.16	<0.16	<1.2	<0.20	
YP-69-50-506	6/23/94	14:02	525	<0.01	<0.01	<0.16	<0.16	<0.16	<0.16	<0.16	<1.2	<0.20	

Data for common constituents, nutrients, selected parameters, and dissolved organic carbon in Edwards Aquifer wells and springs sampled in 1994

Uvalde County

State Well ID Number	Date	Time	Depth of Well, Total Feet	Chloro-Di-bromo-methane Total ug/L	Tri-chloro-fluoro-methane Total ug/L	2-Chloro-ethyl-vinyl-ether Total ug/L	Benzene 1,3-Di-chloro- Wtr Unfltrd Rec ug/L	Benzene 1,4-Di-chloro- Wtr Unfltrd Rec ug/L	Cis 1,3-Di-chloro-propene Total ug/L
YP-69-36-702	6/29/94	12:15	538	<2.5	<5.0	<5.0	<2.5	<2.5	<2.5
YP-69-50-203	6/23/94	15:03	525	<2.5	<5.0	<5.0	<2.5	<2.5	<2.5
YP-69-50-506	6/23/94	14:02	525	<2.5	<5.0	<5.0	<2.5	<2.5	<2.5

Water Quality Data from streams and rivers
crossing the Edwards Aquifer region.

Surface Water Data-1994

River or Stream	Date	Time	Discharge, Ins. Cubic Feet/ Second	Water Temp Deg C	Specific Conductance us/cm	pH stdrd units	Alkalinity, Fix End Field, CaCO3 mg/L	Hardness Total mg/L as CaCO3	Calcium Dissolved mg/L as CaCO3	Magnesium, Dissolved mg/L as Mg	Sodium, Dissolved mg/L as Na
Dry Frio Riv@Reagan Well	07/27/94	09:45		27	394	8.7	441	172	60.2	12	5.5
Frio River@Concan	07/27/94	13:00		27.2	407	7.8	180	180	61	13	6.5
Hondo Creek@Tarpley	07/26/94	13:30		30	375	7.8	307	164	53.6	10	7
Medina River@Bandera	07/26/94	10:30		27.5	492	7.6	403	232	75.6	18	7.25
Nueces River@Laguna	07/27/94	17:45		30.1	410	7.1	175	166	54.8	13	6.5
Sabinal Riv@ Sabinal	07/28/94	11:45		26.8	414	7.6	432	188	62.4	12	7
Seco Creek@D Haris	07/28/94	09:50		25.8	374	7.7	124	160	58.2	10	6

River or Stream	Date	Potassium, Dissolved mg/L as K	Chloride, Dissolved mg/L as Cl	Sulfate dissolved mg/L as SO4	Fluoride, dissolved mg/L as F	Silica Dissolved mg/L s SiO	Solids, Su of Constituents, Dissolved mg/L	Nitrogen, Nitrate Dissolved mg/L as N	Nitrogen, Nitrite Dissolved mg/L as N	Phosphorus Total mg/L as P	Carbon, Organic Total mg/l as C
Dry Frio Riv@Reagan Well	07/27/94	<1	15	12	0.07	5.9	224	0.68	0.007	0.072	<1.0
Frio River@Concan	07/27/94	1	16	13	0.1	6.4	244	0.68	0.005	0.036	<1.0
Hondo Creek@Tarpley	07/26/94	<1	17	41	0.23	7.7	252	<0.02	<0.005	0.02	<1.0
Medina River@Bandera	07/26/94	1	17	68	0.31	6.5	324	<0.02	<0.005	0.148	<1.0
Nueces River@Laguna	07/27/94	<1	17	10	0.07	6.2	220	0.98	0.01	0.052	<1.0
Sabinal Riv@ Sabinal	07/28/94	1	17	23	0.16	7.6	244	0.05	<0.005	0.012	<1.0
Seco Creek@D Haris	07/28/94	<1	17	48	0.19	7	240	0.02	<0.005	0.012	<1.0

River or Stream	Date	Arseni Dissolved ug/L as As	Barium, Dissolved ug/L as Ba	Cadmium Dissolved ug/L as Cd	Chromium, Dissolved ug/L as Cr	Lead, Dissolved ug/L as Pb	Silver, Dissolved ug/L as Ag	Selenium, Dissolved ug/L as Se	Mercury Dissolved ug/L as Hg
Dry Frio Riv@Reagan Well	07/27/94	<0.2	40	<0.5	<1	2	<1	<0.2	<0.2
Frio River@Concan	07/27/94	0.3	30	0.6	1	4	<1	0.2	<0.2
Hondo Creek@Tarpley	07/26/94	<0.2	30	0.7	<1	3	<1	<0.2	<0.2
Medina River@Bandera	07/26/94	<0.2	30	0.8	1	<2	<1	<0.2	<0.2
Nueces River@Laguna	07/27/94	<0.2	40	0.8	1	<2	<1	<0.2	<0.2
Sabinal Riv@ Sabinal	07/28/94	<0.2	30	<0.5	1	5	<1	<0.2	<0.2
Seco Creek@D Haris	07/28/94	<0.2	20	0.5	1	5	<1	0.2	<0.2

Water Quality Data from streams and rivers
crossing the Edwards Aquifer region.

Surface Water Data-1994

River or Stream	Date	Aldrin, Total ug/L	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 Sulfate ug/L	Endrin Water Unfltrd Rec ug/L	Toxaphene, Total ug/L
Dry Frio Riv@Reagan Well	07/27/94	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Frio River@Concan	07/27/94	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Hondo Creek@Tarpley	07/26/94	<0.05	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Medina River@Bandera	07/26/94	<0.04	<0.04	<0.14	<0.14	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Nueces River@Laguna	07/27/94	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Sabinal Riv@ Sabinal	07/28/94	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4
Seco Creek@D Haris	07/28/94	<0.04	<0.04	<0.14	<0.11	<0.04	<0.12	<0.02	<0.66	<0.06	<2.4

River or Stream	Heptachlor, Total ug/L	Heptachlor poxid Total ug/L	PCB, Total ug/L	2,4-D Total ug/L	2,4,5-T Total ug/L	Silvex, Total ug/L	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./ 100 ml)
Dry Frio Riv@Reagan Well	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	7.3	95	0.2	43	25*
Frio River@Concan	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	8.2	105	0.3	61	7*
Hondo Creek@Tarpley	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	8.2	112	0.2	36	73
Medina River@Bandera	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	7.5	96	0.2	50	16*
Nueces River@Laguna	<0.03	<0.83	<0.64	<0.10	<0.10	<0.10	7.7	106	0	6*	20*
Sabinal River@ Sabinal	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	7.2	94	2.5	35*	24*
Seco Creek@D Haris	<0.03	<0.83	<0.65	<0.10	<0.10	<0.10	7.4	95	0.3	89	16*

* Estimated count based on nonideal colony count