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Water-Level Altitudes in Wells Completed in the Northern Segment of the Edwards Aquifer, Travis, Williamson, and Bell Counties, Texas, March–June 2005

Data Series 125

U.S. Department of the Interior
U.S. Geological Survey

Cover. Edwards aquifer well in southern Williamson County (photograph by M.L. Greenslate, U.S. Geological Survey, June 2005).

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Contents

Figure

Table

Vertical and Horizontal Datums

Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

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Abstract

During March–June 2005, the U.S. Geological Survey, in cooperation with the Texas Commission on Environmental Quality (TCEQ), measured water levels in 80 Edwards aquifer wells in the outcrop of the northern segment of the aquifer in Travis, Williamson, and Bell Counties. Public-supply and private wells were selected in areas where outcrop water-level data were sparse. The altitude data can be used in the TCEQ Source Water Assessment and Protection program to help delineate zones of capture around sources of public water supply. Altitudes range from about 490 to about 935 feet above North American Vertical Datum of 1988.

Introduction

This report, prepared by the U.S. Geological Survey (USGS) in cooperation with the Texas Commission on Environmental Quality (TCEQ), presents water-level altitudes obtained from 80 wells completed in the outcrop of the northern segment of the Edwards aquifer in Travis, Williamson, and Bell Counties (fig. 1) during March–June 2005. The objective of the study was to compile a database of water-level altitudes for the TCEQ Source Water Assessment and Protection (SWAP) program in parts of the outcrop area where water-level-altitude data are sparse. The TCEQ implemented the SWAP program to determine the susceptibility to chemical constituents of the State's public water sources (Texas Natural Resource Conservation Commission, 2005). The altitude data can be used to help delineate zones of capture around sources.

The Edwards aquifer in Central Texas commonly is divided into the San Antonio segment, the Barton Springs segment, and the northern segment (fig. 1). The northern segment consists of the Edwards aquifer north of the Colorado River. Baker and others (1986) presents a comprehensive description of the geohydrology of the northern segment of the Edwards aquifer. From that report, the outcrop of the northern segment encompasses an area of about 500 square miles and consists mostly of limestone with some interbedded marl. These rocks typically are dense, grayish to white, and massive. Where present, soils on the outcrop typically are brown, silty to clayey loams that range in thickness from negligible to about 5 feet. The thickness of the northern segment of the aquifer, which has been influenced by erosion and faulting, ranges from negligible to about 450 feet. From the outcrop, the aquifer dips to the east-southeast at an average slope of 70 to 75 feet per mile beneath rocks that confine the Edwards aquifer and yield little to no water. Recharge to the northern Edwards aquifer occurs primarily by downward percolation of rainfall on the outcrop. Solution features such as honeycombing, sinkholes, and caverns allow for rapid infiltration of water. Water levels fluctuate over a wide range in most areas because of the rapid rates of recharge and, to a lesser extent, variations in rates of discharge.

The author acknowledges well owners for allowing USGS personnel access to their property and their wells.

Well Selection and Data Collection

Wells for water-level measurement were selected from available databases of well information compiled by the Texas Water Development Board (2005), the TCEQ (J. Meyer, Texas Commission on Environmental Quality, written commun., 2005), and the USGS (M.L. Greenslate, U.S. Geological Survey, written commun., 2005). Public-supply and private wells were selected in areas where outcrop water-level data were sparse. On the basis of available well depth and aquifer top and bottom altitude data, only wells completed in the Edwards aquifer outcrop were included. If well depth was unavailable, the decision to include a well was made on the basis of other information in the database. The wells selected for water-level measurement have comparable depths and screened intervals. Access to wells was provided by municipalities, private owners,

and ground-water conservation districts. Water-level measurements were obtained by electronic sensor, steel tape, or calibrated airline. Public-supply wells are pumped daily but were shut down for 12 hours prior to measurement so that static water-level measurements could be made.

Water-Level Altitudes

Water-level altitudes and associated data for the 80 wells in which measurements were made during March–June 2005 are listed in table 1. Altitudes range from about 490 to about 935 feet above NAVD 88. Depths to water range from about 5 to 265 feet below land surface. Well depths among wells with known depths range from 26 to 450 feet below land surface.

References

Ashworth, J.B, and Hopkins, Janie, 1995, Aquifers of Texas: Texas Water Development Board Report 345, 69 p.

Baker, E.T., Slade, R.M., Jr., Dorsey, M.E., Ruiz, L.M., and Duffin, G.L., 1986, Geohydrology of the Edwards aquifer in the Austin area, Texas: Texas Water Development Board Report 293, 215 p.

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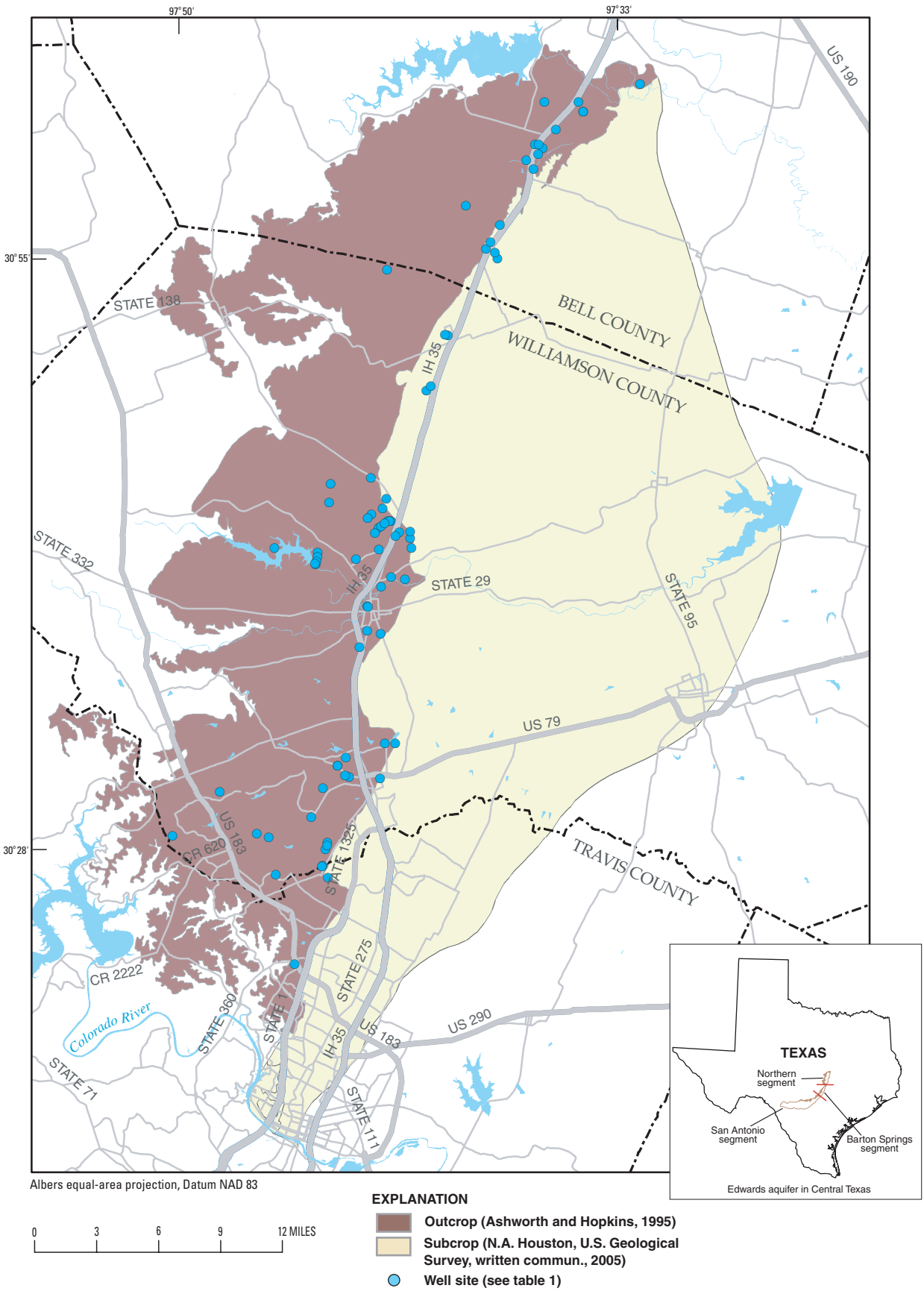

Figure 1. Map showing northern segment of the Edwards aquifer and sites of wells in which water levels measured, March–June 2005.

Table 1. Well locations and water-level altitudes in the northern segment of the Edwards aquifer, March–June 2005.

[dd, degrees; mm, minutes; ss, seconds; --, no data]

State well number	USGS site identifier	Latitude (ddmmss.ss)	Longitude (ddmmss.ss)	Well depth (feet below land surface)	Water use	Land-surface altitude (feet above NAVD 88)	Drill date	Water-level measurement date	Water level (feet below land surface)	Water-level altitude (feet above NAVD 88)
Travis County										
58–35–403	302720097431701	302720.00	974317.00	95.0	domestic	840.0	1964	04/16/2005	62.76	777.19
58–35–405	302717097431901	302717.00	974319.00	100.0	unused	845.0	1959	04/26/2005	57.93	784.71
58–35–415	302652097430501	302649.00	974303.00	112.0	stock	830.0	--	04/26/2005	90.28	739.89
58–35–702	302257097444701	302312.00	974444.00	49.0	unused	873.0	1935	05/12/2005	22.96	846.58
Williamson County										
58–18–605	304046097452001	304045.00	974519.00	140.0	domestic	856.60	2005	06/06/2005	14.16	842.44
58–19–104	304324097423001	304324.00	974230.00	140.0	domestic	801.31	2005	06/06/2005	48.12	753.19
58–19–105	304247097431101	304236.00	974235.00	100.0	domestic	794.80	2005	04/26/2005	73.93	720.87
58–19–204	304336097403201	304336.00	974032.00	126.0	domestic	810.0	05–20–1976	05/11/2005	61.06	729.69
58–19–316	304242097394801	304242.00	973948.00	--	public supply	739.17	--	04/26/2005	49.56	689.61
58–19–407	304031097431201	304031.00	974312.00	86.3	domestic	870.06	--	05/13/2005	62.95	807.11
58–19–408	304021097431301	304021.00	974313.00	86.3	domestic	852.44	--	05/13/2005	51.60	800.84
58–19–409	304001097431901	304001.00	974319.00	45.0	domestic	781.02	--	05/13/2005	11.30	769.72
58–19–410	304008097431601	304008.00	974316.00	26.0	domestic	802.85	--	05/13/2005	49.60	753.25
58–19–411	304003097432101	304003.00	974321.00	45.0	domestic	782.65	--	05/13/2005	11.90	770.75
58–19–502	304203097403201	304203.00	974032.00	124.0	domestic	740.0	1975	04/26/2005	71.60	667.95
58–19–506	304154097404401	304154.00	974044.00	110.0	domestic	750.0	1978	05/11/2005	54.74	700.15
58–19–507	304118097403101	304117.00	974023.00	185.0	public supply	770.0	05–11–1979	04/26/2005	36.50	722.34
58–19–518	304130097401201	304130.00	974012.00	--	domestic	742.72	--	05/13/2005	62.99	679.73
58–19–519	304132097400601	304132.00	974006.00	115.0	domestic	733.63	--	05/13/2005	56.44	677.19
58–19–521	304036097401301	304036.00	974013.00	--	public supply	728.59	--	04/26/2005	73.46	655.13
58–19–522	304012097412101	304011.00	974121.00	130.0	domestic	751.60	2005	06/06/2005	51.81	699.79
58–19–603	304139097395501	304139.00	973955.00	72.0	irrigation	700.0	--	04/26/2005	54.29	651.72
58–19–619	304117097384001	304117.00	973840.00	220.0	public supply	691.0	03–18–1985	05/10/2005	22.00	670.24
58–19–626	304217097400001	304217.00	974000.00	105.0	irrigation	705.0	04–06–1984	05/10/2005	21.52	689.27
58–19–628	304108097392401	304108.00	973924.00	200.0	public supply	733.0	12–05–1986	05/10/2005	38.69	695.69

Table 1. Well locations and water-level altitudes in the northern segment of the Edwards aquifer, March–June 2005—Continued.

State well number	USGS site identifier	Latitude (ddmmss.ss)	Longitude (ddmmss.ss)	Well depth (feet below land surface)	Water use	Land-surface altitude (feet above NAVD 88)	Drill date	Water-level measurement date	Water level (feet below land surface)	Water-level altitude (feet above NAVD 88)
58–19–632	304102097384001	304102.00	973840.00	--	stock	660.0	--	05/10/2005	22.00	640.69
58–19–633	304117097391201	304117.00	973912.00	--	domestic	679.80	--	05/13/2005	4.82	674.98
58–19–634	304145097394601	304145.00	973946.00	--	irrigation	688.10	--	05/13/2005	3.93	684.17
58–19–635	304146097393701	304146.00	973937.00	--	irrigation	693.85	--	05/13/2005	13.90	679.95
58–19–636	304145097394001	304145.00	973940.00	--	irrigation	688.82	--	05/13/2005	5.26	683.56
58–19–637	304037097383801	304037.00	973838.00	--	domestic	712.16	--	04/26/2005	39.01	673.15
58–19–802	303812097405001	303812.00	974050.00	102.0	unused	750.0	1912	04/26/2005	75.25	666.45
58–19–803	303809097404901	303809.00	974049.00	186.0	public supply	750.0	1952	04/26/2005	73.92	670.31
58–19–805	303859097400901	303901.00	974009.00	175.0	public supply	680.0	12–09–1957	04/26/2005	55.44	611.91
58–19–901	303919097385801	303919.00	973858.00	184.0	irrigation	680.0	1971	05/10/2005	35.93	645.77
58–19–914	303925097393801	303925.00	973938.00	100.0	domestic	705.0	--	05/10/2005	50.98	649.86
58–26–808	303032097481501	303032.00	974814.00	150.0	domestic	874.91	2005	06/06/2005	60.78	814.13
58–27–213	303702097401301	303702.00	974013.00	205.0	domestic	775.0	04–06–1973	04/25/2005	113.19	645.37
58–27–214	303629097411601	303629.00	974116.00	100.0	public supply	785.0	03–08–1977	05/11/2005	88.88	693.97
58–27–221	303710097405101	303710.00	974051.00	200.0	public supply	753.0	1982	04/26/2005	69.30	680.65
58–27–536	303247097403201	303247.00	974032.00	140.0	domestic	716.49	2005	06/29/2005	59.55	656.94
58–27–610	303230097395901	303230.00	973959.00	140.0	domestic	717.97	2005	06/29/2005	53.84	664.13
58–27–721	303104097431601	303036.00	974311.00	120.0	domestic	797.81	2005	04/22/2005	48.00	749.81
58–27–814	303101097415401	303101.00	974154.00	222.0	public supply	750.0	1940	04/22/2005	27.70	722.28
58–27–819	303117097421301	303108.00	974206.00	203.0	public supply	749.0	07–25–1978	04/22/2005	37.43	711.96
58–27–824	303132097422601	303132.00	974226.00	135.0	public supply	775.0	05–11–1979	04/22/2005	46.62	719.69
58–27–829	303132097422602	303132.00	974226.00	140.0	public supply	775.0	03–15–1979	04/22/2005	47.52	719.69
58–27–838	303152097420301	303152.00	974203.00	115.0	domestic	745.74	2005	06/06/2005	27.90	717.84
58–27–839	303057097402301	303057.00	974023.00	190.0	unused	702.65	--	04/14/2005	20.04	682.61
58–34–119	302844097503501	302844.00	975034.00	60.0	domestic	976.43	2005	06/06/2005	40.75	935.68
58–34–305	302834097455101	302833.00	974552.00	65.0	unused	895.0	04–19–1980	04/22/2005	14.41	871.04
58–34–309	302925097462001	302925.00	974620.00	140.0	domestic	910.10	2005	06/29/2005	46.10	864.00
58–34–621	302707097461101	302700.00	974536.00	180.0	domestic	889.88	2005	04/22/2005	14.57	875.31

Table 1. Well locations and water-level altitudes in the northern segment of the Edwards aquifer, March–June 2005—Continued.

State well number	USGS site identifier	Latitude (ddmmss.ss)	Longitude (ddmmss.ss)	Well depth (feet below land surface)	Water use	Land-surface altitude (feet above NAVD 88)	Drill date	Water-level measurement date	Water level (feet below land surface)	Water-level altitude (feet above NAVD 88)
58–35–102	302817097430101	302818.00	974301.00	46.0	industrial	775.0	--	04/26/2005	19.98	765.20
58–35–105	302801097430801	302801.00	974308.00	70.0	industrial	780.0	1970	04/26/2005	15.19	769.99
58–35–107	302810097430301	302810.00	974303.00	70.0	industrial	783.0	1969	04/26/2005	15.79	769.39
58–35–112	302947097440301	302923.00	974348.00	140.0	domestic	817.50	2005	04/22/2005	66.78	750.72
Bell County										
58–04–302	305917097313901	305917.00	973139.00	148.0	domestic	680.0	12–09–1973	05/16/2005	98.78	577.89
58–04–307	305805097310601	305805.00	973106.00	125.0	domestic	611.0	10–15–1970	05/16/2005	82.45	531.79
58–04–508	305649097323501	305649.00	973235.00	97.0	public supply	618.0	03–14–1979	05/16/2005	60.75	558.49
58–04–604	305718097314401	305720.00	973146.00	128.0	public supply	602.0	01–01–1972	05/16/2005	37.79	562.59
58–04–605	305729097320801	305729.00	973208.00	100.0	domestic	630.0	05–26–1979	05/20/2005	42.30	587.20
58–04–606	305728097315801	305728.00	973158.00	84.0	domestic	612.0	03–17–1971	05/20/2005	42.80	570.68
58–04–609	305703097315901	305703.00	973159.00	74.0	domestic	590.0	09–24–1971	05/20/2005	31.20	557.32
58–04–623	305624097321101	305626.00	973215.00	180.0	public supply	640.0	04–07–1992	03/01/2005	86.30	538.12
58–04–702	305457097353601	305457.00	973536.00	95.0	unused	730.0	07–24–1980	03/01/2005	72.20	653.37
58–04–811	305257097341401	305257.00	973414.00	250.0	public supply	787.25	--	05/25/2005	160.00	627.25
58–04–812	305242097340701	305242.00	973407.00	231.0	public supply	811.09	--	05/25/2005	200.00	611.09
58–04–813	305307097344001	305307.00	973440.00	--	irrigation	773.18	--	05/31/2005	148.00	625.18
58–04–814	305324097342601	305324.00	973426.00	--	irrigation	754.50	--	05/31/2005	127.88	626.62
58–04–815	305406097335701	305406.00	973357.00	--	irrigation	722.46	--	05/31/2005	99.49	622.97
58–05–102	305913097295801	305913.00	972958.00	152.0	domestic	612.0	04–23–1971	05/16/2005	77.95	533.43
58–05–103	305850097294401	305850.00	972944.00	157.0	domestic	589.0	10–31–1971	05/16/2005	98.90	490.85
58–05–204	305956097265601	305956.00	972656.00	222.0	unused	510.0	06–03–1972	03/03/2005	60.00	455.08
58–11–303	305221097393201	305221.00	973932.00	--	domestic	887.66	--	05/31/2005	73.57	814.09
58–11–908	304714097374301	304714.00	973743.00	293.0	public supply	930.26	--	05/25/2005	296.00	634.26
58–11–909	304725097373101	304725.00	973731.00	450.0	public supply	934.39	--	05/25/2005	320.00	614.39
58–12–407	304931097363701	304931.00	973637.00	357.0	public supply	902.05	--	05/25/2005	265.00	637.05
58–12–410	304933097364501	304933.00	973645.00	350.0	public supply	890.69	--	05/25/2005	260.00	630.69

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