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Barton Springs/ Edwards Aquifer
Conservation District



WELLS AND PUMPING (1989-2006) IN THE BARTON SPRINGS/EDWARDS AQUIFER CONSERVATION DISTRICT, CENTRAL TEXAS



BSEACD Data Series Report 2006-1005

Barton Springs/Edwards Aquifer Conservation District
1124 Regal Row
Austin, Texas

Disclaimer

All of the information provided in this report is believed to be accurate and reliable; however, the Barton Springs/Edwards Aquifer Conservation District (District), or its staff, assumes no responsibility for any errors or for the use of the information provided.

Cover. Photographs clockwise from top left: water well drilling rig mast; “Negley” Windmill near Mountain City, in Hays County; public water supply well in the Creedmoor-Maha Water Supply Corporation well field, Travis County; domestic well in Hays County (Photographs taken by Brian B. Hunt).

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by Brian B. Hunt, P.G.; Brian A. Smith, Ph.D., P.G.; Kirk Holland, P.G., and Joe Beery

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UNITS AND CONVERSIONS

Volume:

1 acre-ft = 325,900 gallons

1 acre-ft = 43,560 ft³

Flow Rate:

1 ft³/s = 723.97 acre-ft/year

1 ft³/s = 235,905,352 gallons/year

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ABSTRACT

The Barton Springs/Edwards Aquifer Conservation District (District) contains vital groundwater resources within its jurisdictional boundaries providing for municipal, industrial, domestic, recreational, and ecological needs. Approximately 50,000 to 60,000 people depend upon water from the Barton Springs segment of the Edwards Aquifer (Barton Springs aquifer), and the Barton Springs complex is the only known habitat for the endangered Barton Springs salamander.

The Barton Springs aquifer is a prolific, karst limestone aquifer producing water for 84% of the wells in the District. The Trinity Aquifer is the second-most prolific aquifer in the District composed of limestones and sandstones, producing water for about 3% of the wells in the District. At least 9% of the total of number of wells appear to derive their water from a combination of the Edwards and Trinity Aquifers. The remaining wells in the District are completed within small localized water-bearing units that include the terrace/alluvium, Austin Chalk, igneous, and the Taylor/Navarro.

The District has about 1,230 operational wells for the following purposes: domestic (71% of the wells), public-supply (9%), monitor (6%), commercial (5%), irrigation (4%), agricultural (3%), closed loop (1%), and industrial (1%).

In fiscal year (FY) 2006 about 94 permittees had an annual permitted volume of 2.5 billion gallons (8,200 acre-ft/yr, 11.4 cfs). Pumpage from non-permitted wells in FY 2006 was estimated to have been about 228 million gallons. Since 1988, users have pumped between 71% to 97% of the permitted volume, depending upon climatic conditions. In FY 2006 actual and estimated (non-permitted) pumping was 2.3 billion gallons (7,070 acre-ft/yr, 9.8 cfs). In Calendar Year 2005 permittee groundwater use was 80% public water supply, 13% Industrial, 7% irrigation, and less than 1% commercial. The majority of pumping occurs in the confined, southeastern portion of the Barton Springs aquifer.

Based on monthly pumping data from 1998 to 2005, peak irrigation and public water supply pumping follows seasonal trends with February having the lowest pumping totals, and August the highest pumping totals. Assuming the lowest usage months represent primarily indoor use for public supply, between 42% to 24% of the volume pumped has historically been used for outdoor use, with an average of 33%.

The Trinity Aquifer supplies water to 5 permittees that pumped a total of 44.3 million gallons in 2005. This total represents about 2% of the total pumped in 2005 by all District permittees.

INTRODUCTION

The Barton Springs/Edwards Aquifer Conservation District (District) contains vital groundwater resources within its jurisdictional boundaries providing for municipal, industrial, domestic, recreational, and ecological needs. Approximately 50,000 to 60,000 people depend upon water from the Barton Springs and Trinity Aquifers, and the Barton Springs complex is the only known habitat for the endangered Barton Springs salamander.

Location

The District is located mainly within parts of Travis and Hays Counties in Central Texas, and lies within the Balcones Fault Zone (BFZ) physiographic province. The District is generally bounded to the north by the Colorado River, to the south near the City of Kyle, and to the west by FM 1826. The eastern boundary is more irregular and extends east of IH-35 into Caldwell and Bastrop Counties (**Figure 1**).

Purpose and Scope

A statutory mandate charges the District with the responsibility of conserving, protecting, and enhancing groundwater resources. Part of this responsibility is to determine the amount of groundwater available for use in the aquifers. State law requires water planning for drought conditions and use of groundwater modeling in conjunction with other studies or data about the aquifers. The purpose of this report is to provide a foundation of data for scientific studies and planning. The scope of the report is outlined below:

- Part I provides an overview of the aquifers within the study area.
- Part II characterizes well classifications and use within the District.
- Part III describes and quantifies pumping from the principal aquifers in the District.

The **Appendix** at the end of this report contains a compact disk providing digital files of all figures and tables in this report.

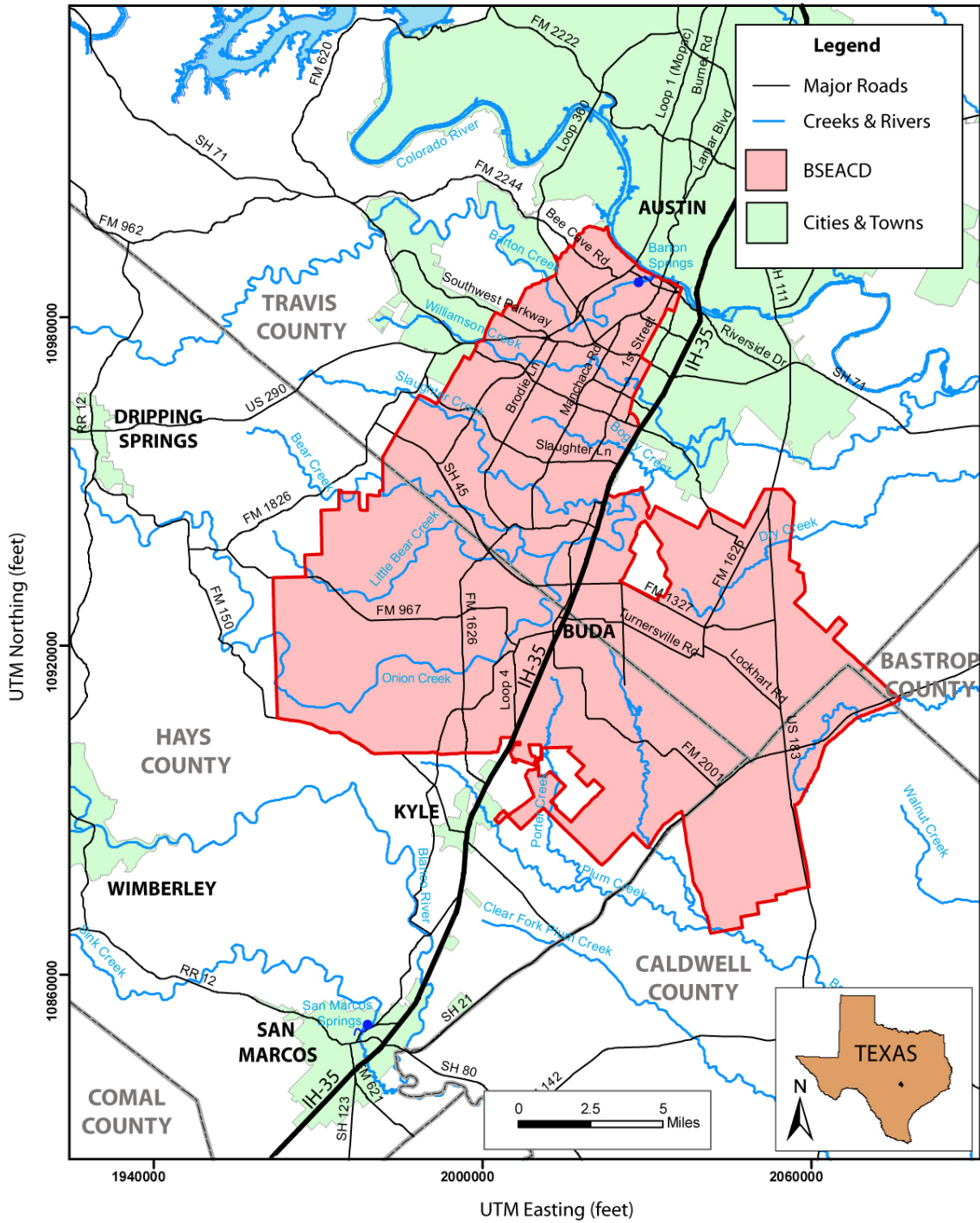


Figure 1: Location map of the Barton Springs/Edwards Aquifer Conservation District.

PART I: AQUIFERS

Introduction

This chapter summarizes aquifers found within the Balcones Fault Zone of Central Texas. Geologic units within the study area range in age from Cretaceous (ca. 100 Mya) to Holocene (10,000 years ago) and consist of limestone, gravel, sand, and clay. The most prolific aquifers within the study area are composed of Cretaceous-age limestone and sand units that comprise the Edwards and Trinity Aquifers. East- and northeast-trending normal faulting strongly influences groundwater flow in the Barton Springs aquifer. The reader is referred to Rose (1972); Baker et al., (1986), and Barker et al., (1994) for a detailed discussion of the geology, hydrogeology, and evolution of the aquifer units. A simplified column of geologic and aquifer units is shown in **Figure 2**, and a simplified major aquifer map is shown in **Figure 3**.

The number of wells completed within the various aquifers is displayed in **Figure 4**. A detailed tabulation of well completions is presented in **Table 1**. **Figure 5** is a map showing the distribution of wells and their aquifer completions. The principal aquifer in the District is the Barton Springs aquifer, with 84% of the total number of wells in the District completed within it. The Trinity Aquifer is the second most prolific aquifer in the District and has about 3% of the wells completed within it. The Trinity Aquifer underlies the Edwards Aquifer in the study area. At least 9% of the total of number of wells appear to derive their water from a combination of the Edwards and Trinity Aquifers and are considered hybrid Edwards-Trinity well completions (**Figure 4**). This hybrid completion is in large part due to the relatively thin Edwards Aquifer in the western portion of the District and the fact that most well drillers have historically drilled to a depth of about 400 feet. Public Water Supply Well 58-57-609 in **Figure 6** illustrates this condition. The remaining wells in the study area are completed within small local aquifers that include the terrace/alluvium, Austin Chalk, igneous, and the Taylor/Navarro units. These units are generally not the target of new wells.

Edwards Aquifer

The Edwards Aquifer of central Texas is subdivided into the Northern, Barton Springs, and San Antonio segments. The Edwards Aquifer is composed of the Cretaceous-age Edwards Group (Kainer and Person Formations) and the Georgetown Formation in Central Texas. The Barton Springs aquifer covers about 155 mi² (**Figure 2**) and is composed of limestone that is highly faulted, fractured, and dissolved, forming a very prolific karst aquifer ranging from 0 to 450 feet thick (**Figure 6**). The Barton Springs aquifer yields large quantities of fresh water with well yields ranging from less than 10 gallons per minute (gpm) to greater than 1,000 gpm. Water-supply wells in the District pump water for public, domestic, industrial, commercial, irrigation, and agricultural uses, which amounted to 2.5 billion gallons of water under permit in 2006 (see Part III).

Trinity Aquifer

The Trinity Aquifer is composed of Cretaceous-age limestones and sandstones that are divided into the Upper, Middle, and Lower Trinity aquifers. The Edwards Aquifer overlies the Trinity Aquifer system in the BFZ (**Figure 2**, **Figure 6**). Groundwater

quality of the Trinity Aquifer is generally poorer than the Edwards Aquifer with higher total dissolved solids (TDS) and undesirable constituents such as sulfates. The boundary between fresh and slightly saline (1,000-3,000 mg/l) water is poorly defined for the Trinity Aquifer. Along the western part of the District, where the Edwards Aquifer is thin, water-supply wells commonly penetrate the lower Edwards units and are completed in the Upper and Middle Trinity aquifers. The Trinity Aquifer supplies water for public-supply and irrigation uses, which amounted to 44.3 million gallons of permitted water in 2005 (see Section III). Many Trinity wells have open-hole completion and produce water from the upper and middle Trinity aquifers, with exact water-bearing units difficult to determine.

Upper Trinity Aquifer

The Upper Trinity aquifer is comprised solely of the Upper Glen Rose Formation. The Upper Glen Rose Formation is composed of 350- to 400-ft thick beds of alternating limestone, dolomite, marl, and shale; gypsum and anhydrite are common. This aquifer satisfies, almost exclusively, domestic and livestock needs with very small (less than 5 gpm) to small (5 to 20 gpm) yields of highly mineralized water (relative to the Edwards Aquifer) in the Central Texas Hill Country, and within the western portion of the District (DeCook, 1960; Ashworth, 1983; Muller and McCoy, 1987).

Middle Trinity Aquifer

The Middle Trinity aquifer is composed of (from stratigraphically lowest to highest) the Cow Creek, Bexar Shale/Hensell Sand, and the lower Glen Rose Formation. The Cow Creek is a massive, sandy dolomitic limestone. The Bexar Shale/Hensell Sand is composed of alternating gravel, sand, silt, and shale. The lower Glen Rose Formation is composed of massive fossiliferous limestone and dolomite that grade upward into thin beds of limestone, shale, and marl. The Middle Trinity aquifer yields small to moderate quantities of fresh to moderately saline water (Brune and Duffin, 1983).

The Lower Trinity

The Lower Trinity aquifer is the basal portion of the Cretaceous section and is composed of the Hosston and overlying Sligo Formations. The Hosston is a conglomerate, sand, siltstone, and shale unit. The Sligo is a limestone and dolomite unit with local sandy units. This aquifer yields small to large amounts of fresh to moderately saline water (Brune and Duffin, 1983).

Terrace and Alluvium Deposits

Terrace and alluvial deposits consist of localized Quaternary-age gravels, sands, silt, and clays. These units may locally yield small to moderate quantities of fresh to moderately saline water (Brune and Duffin, 1983).

Austin Chalk

The Cretaceous-age Austin Chalk consists of massive beds of chalk and marl with bentonitic seams. The Austin Chalk is generally considered a confining unit for the Edwards Aquifer. However, the Austin Chalk may locally yield small to very small

quantities of fresh water (Brune and Duffin, 1983), especially where faulted and fractured.

Igneous

Igneous rocks are composed of highly altered pyroclastic material and basaltic (basanite) intrusions. These units are locally found in the Edwards, Austin Chalk and Taylor groups and are related to the volcanics associated with the upper Cretaceous Balcones Magmatic Province and eruption centers such as Pilot Knob in the Austin area (Caran et al., 2006). The highly porous McKown limestone is locally associated with pyroclastic mounds and may be an additional source of water. These units may yield very localized and small quantities of fresh water (Brune and Duffin, 1983).

Navarro Clay and Taylor Marl

The Taylor and Navarro Groups are the youngest Cretaceous-age sediments in the District. They are composed of massive beds of shale and marl with clayey chalk and sand and are generally considered confining units of the Edwards Aquifer. However, locally they may yield very small quantities of fresh to moderately saline water (Brune and Duffin, 1983).

Era	Period	Stratigraphic unit	
Cenozoic	Quaternary	Alluvium and Terrace deposits	
	Tertiary	Carrizo Group	
		Wilcox Group	
		Midway Group	
Mesozoic	upper	Navarro Group	
		Taylor Group	
		Austin Group	
		Eagle Ford	
		Buda Limestone	
		Del Rio Clay	
		Edwards Group	Georgetown Formation
			Person Formation
			Kainer Formation
	lower	Glen Rose Limestone	
			upper
			lower
		Bexar Shale/ Hensell Sand Mbr	
		Cow Creek Mbr	
		Hammett Shale Mbr	
		Sligo Formation	
	Hosston Formation		
	Jurassic	Rocks absent	
	Triassic		
Permian			
Paleozoic	Penn. to Cambrian	Undifferentiated rocks of the Ouachita Structural Belt	

Modified from Barker and Ardis (1996).

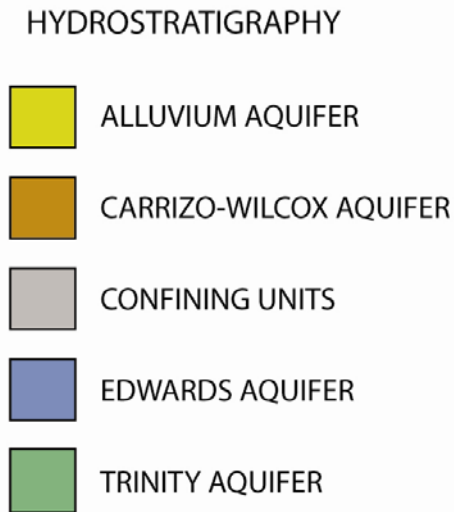


Figure 2: Generalized stratigraphic and hydrostratigraphic column for Central Texas. The Carrizo-Wilcox Aquifer is not within the District, but is shown because of its close proximity. Some of the units shown as confining may locally produce water.

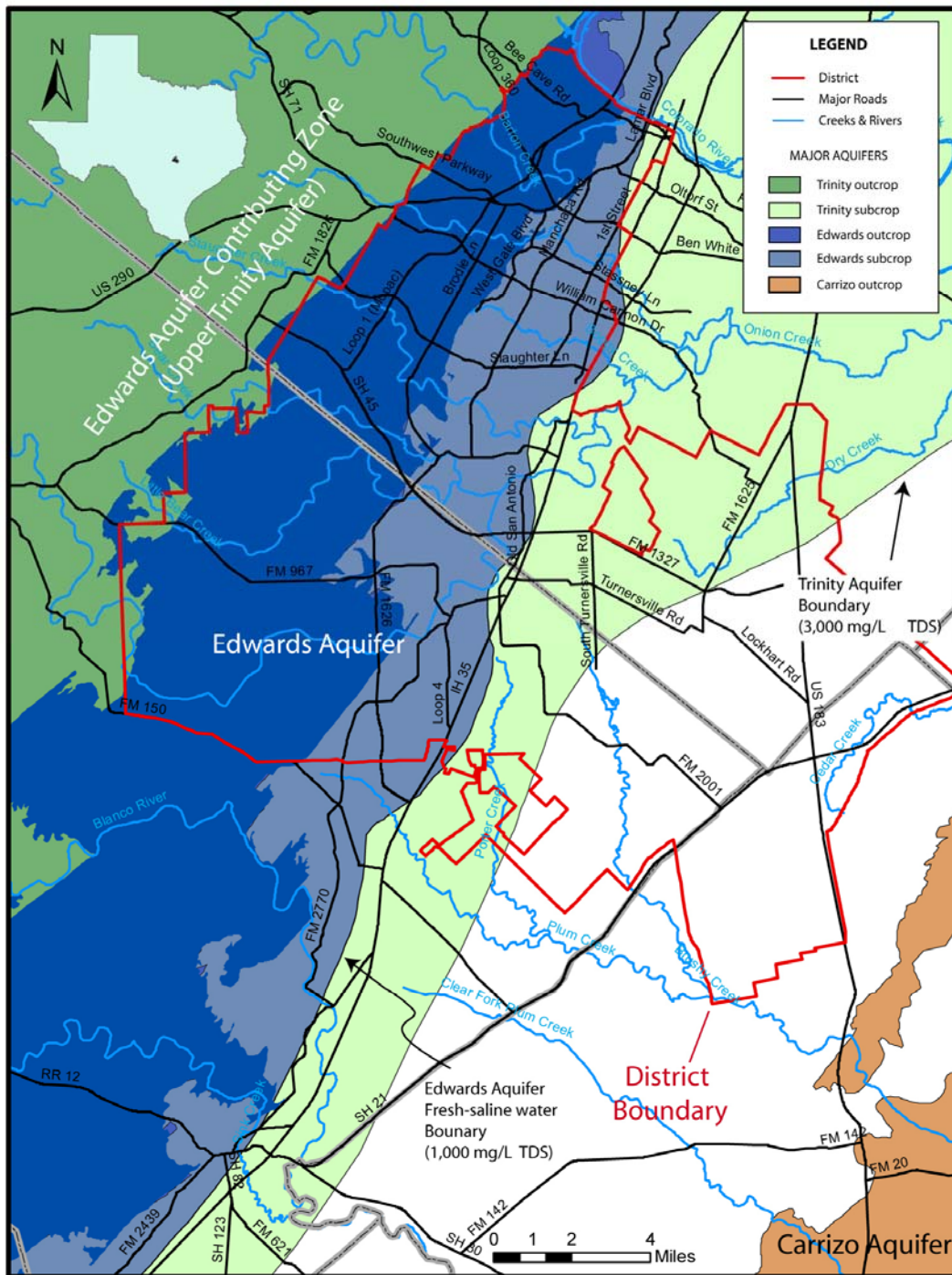


Figure 3: Simplified major aquifer map of central Texas modified from Ashworth and Hopkins (1995). The area shown in white does not have a major aquifer, although locally water may be available within the Alluvium/Terrace, Austin Chalk, Navarro-Taylor, and Igneous units (not shown). GIS coverages of major aquifers from the TWDB.

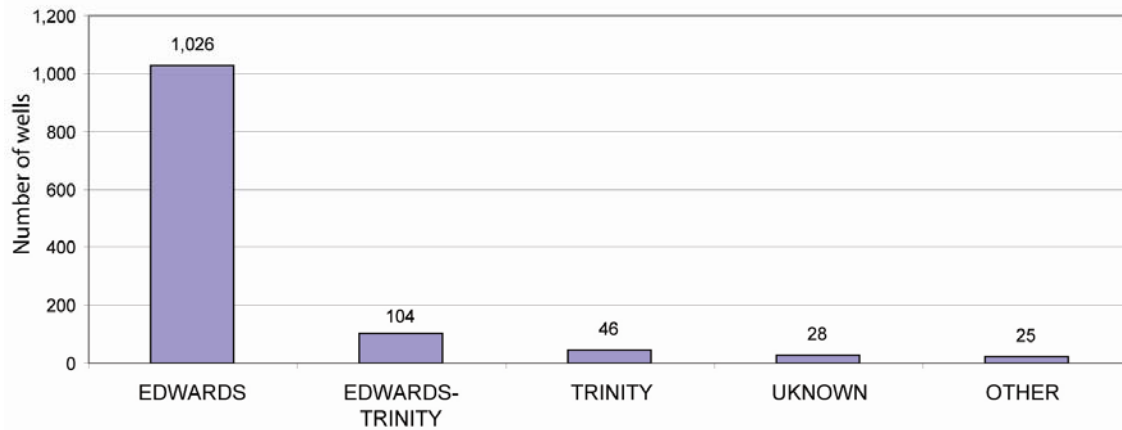


Figure 4: Simplified histogram of the number of wells and their aquifer completions within the District boundaries.

Table 1: Detailed tabulation of wells in the District and their aquifers.

Groundwater Sources (aquifers)*	Well Count	Percentage of wells	TWDB Aquifer Codes
Edwards	1,026	83.5%	218EDRDA, 218EBFZ, 218EDRD, 218EDRA
Edwards-Trinity	104	8.5%	218EDDT, 218EDGR, 218EDGRU, 218FRGR
Unknown Source	28	2.3%	888UNKN
Trinity Undivided	12	1.0%	218TRNT
Upper- Middle Trinity	11	0.9%	218GLRS, 218GRLU
Middle Trinity	10	0.8%	218GLRSL, 218GLRH, 218CCRK, 218GRCCU, 218GRHC, 218GLRH
Upper Trinity	8	0.7%	218GLRSU
Alluvium and Terrace	7	0.6%	100ALVM, 110TRRC
Buda/Eagle Ford	6	0.5%	211BUDA, 211EGFD
Austin Chalk	5	0.4%	211ASTN, 110AVAU
Navarro Clay and Taylor Marl	4	0.3%	211NVTY
Middle-Lower Trinity	3	0.2%	218HCSH, 218LGRLH
Austin Chalk and Edwards Limestone	2	0.2%	211AEDD
Lower Trinity	2	0.2%	217HSCC, 217HSTN, 217SLGO, 217LSGH
Igneous	1	0.1%	210CIGR
Total:	1,229		

*Reported or inferred sources; includes all classifications; plugged and abandoned wells not included.

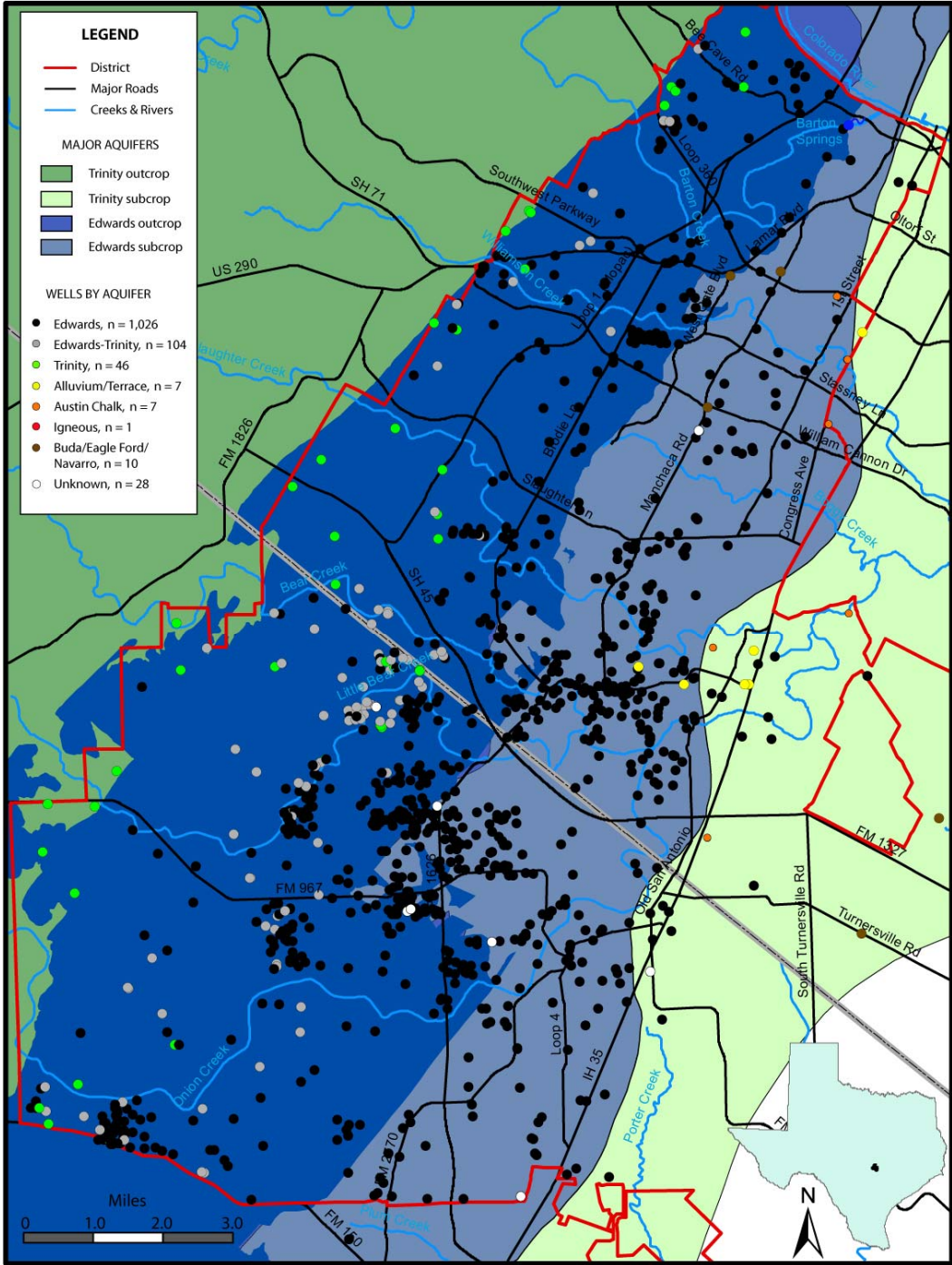


Figure 5: Map showing the distribution and aquifer completion of wells in the District.

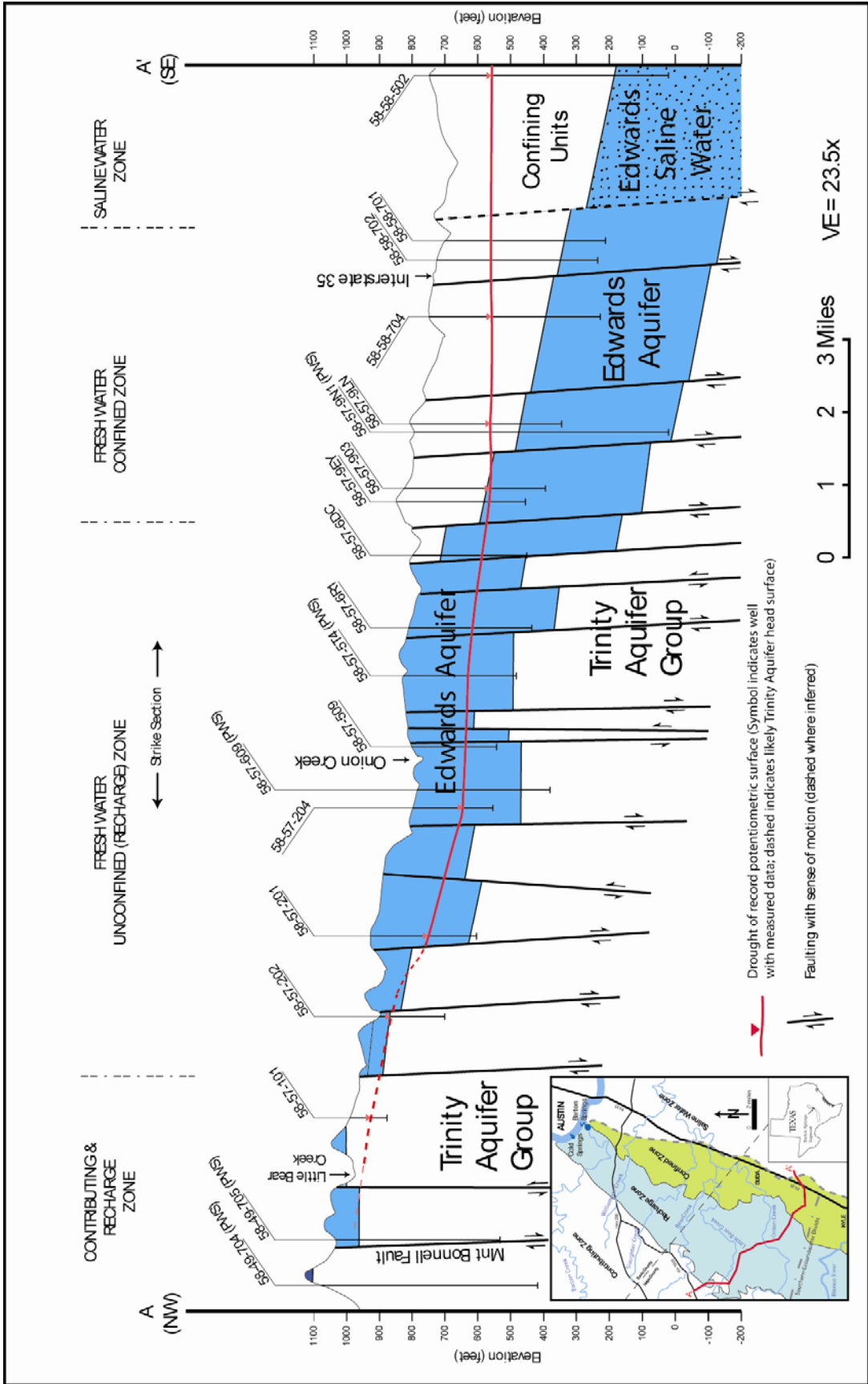


Figure 6: Cross section A-A' through the District showing the Edwards and Trinity Aquifers in Northern Hays County. Potentiometric surface is from the drought of record.

PART II: WELL CLASSIFICATIONS

This chapter summarizes the classifications of wells within the District. The District collects and maintains well information in an electronic database for wells covering a variety of information, including classification of groundwater use. About 1,230 operational wells are in the District. The majority of wells pump groundwater for public, domestic, industrial, commercial, irrigation, and agricultural purposes. A small number of wells within the district include monitor or closed-loop wells that are completed within the aquifer but do not generally pump significant amounts of groundwater. **Figure 7** is a pie chart showing the types of well classifications and the percentage of all wells and permitted wells by number within each category. **Table 2** is a tabulation of well classification and aquifers. **Table 3** is a tabulation of permittees in the District listing wells, aquifers, and permitted amount. **Figure 8** is a map showing the distribution of wells by their classification.

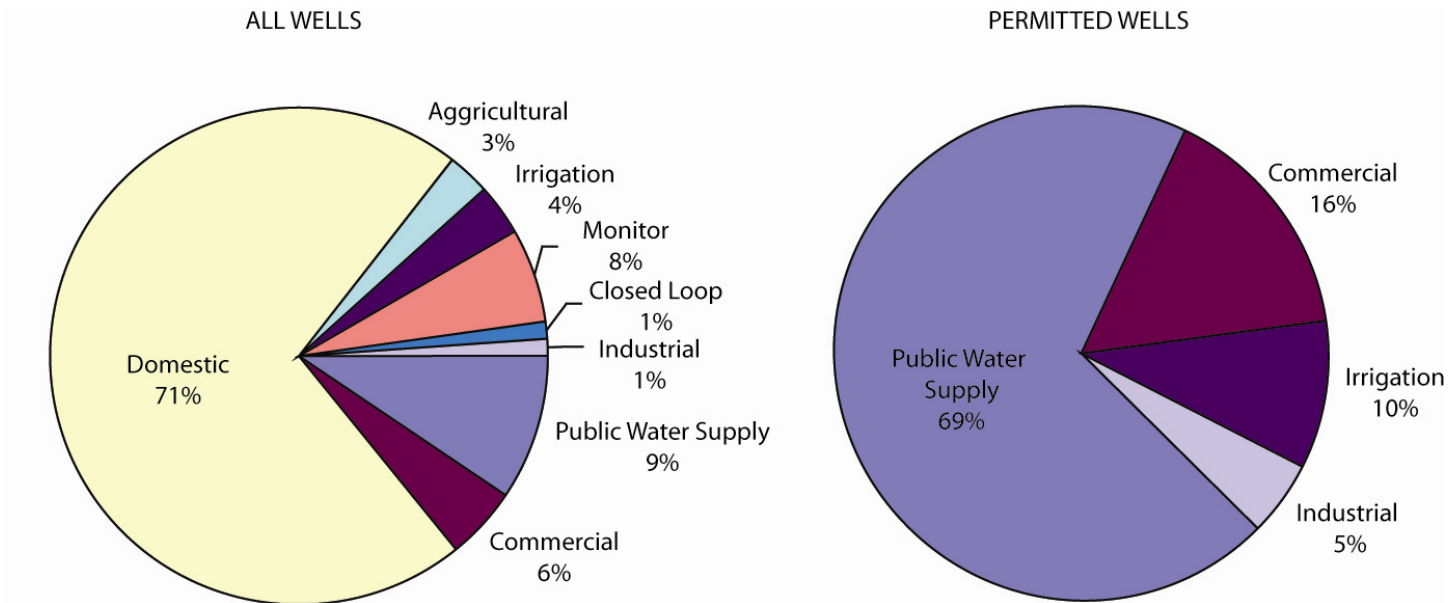


Figure 7: Pie charts of well classifications and the percentage of wells by number. Total operational wells in the District is about 1,230. There are a total of about 94 permittees within the District, and 165 wells belonging to those permittees in 2006.

Table 2: Tabulation of all wells by classification and generalized aquifers.

	District	Edwards*	Trinity**	Alluvium & Terrace	Buda & Eagle Ford	Austin Chalk	Navarro & Taylor	Igneous
Total well records	1,489							
Total operational wells	1,230	1,129	47	7	6	5	4	1
Well Classifications								
Domestic	873	814	21	4	-	-	3	1
Abandoned	148	-	-	-	-	-	-	-
Public water supply	113	104	9	-	-	-	-	-
Plugged	111	-	-	-	-	-	-	-
Monitor	94	78	7	-	6	4	-	-
Commercial	53	53	0	-	-	-	-	-
Irrigation	42	34	5	2	-	-	-	-
Agricultural	27	20	4	1	-	1	1	-
Closed loop	14	14	0	-	-	-	-	-
Industrial (IND)	13	12	1	-	-	-	-	-
Injection (INJ)	1	1	0	-	-	-	-	-

*Includes Edwards-Trinity Wells

**Includes Upper, Middle, and Lower Trinity

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
AAW Oak Hill, Ltd.	AAW Oak Hill, Ltd.	100,000	P265-93-00	58-50-122	Edwards	COM	Travis	30.23839	97.83824
Arroyo Doble Water System	Arroyo Doble Water System	52,800,000	P084-88-01	58-50-845	Edwards	PWS	Travis	30.13027	97.82185
Arroyo Doble Water System	Arroyo Doble Water System		P084-88-01	58-58-215	Edwards	PWS	Travis	30.12277	97.81532

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
Associated Drilling	Associated Drilling	2,000,000	P017-03-00	58-50-7AD	Edwards	PWS	Travis	30.12861	97.83528
Barton Properties	Barton Properties	400,000	P311-88-00	58-57-606	Edwards	PWS	Hays	30.04472	97.88528
Hays Consolidated I.S.D.	Beacon Hill	562,500	P044-92-00	58-57-305	Edwards	PWS	Hays	30.09986	97.88229
Bear Creek Office Park	Bear Creek Office Park	1,000,000	P025-93-00	58-50-744	Edwards	COM	Travis	30.14222	97.84278
Aqua Texas, Inc.	Bear Creek Park	12,098,000	P145-90-00	58-50-718	Edwards	PWS	Travis	30.13670	97.84542
Aqua Texas, Inc.	Bear Creek Park		P145-90-00	58-50-733	Edwards	PWS	Travis	30.14054	97.84488
Capital Soccer Club	Capital Soccer Club	12,000,000	P191-03-00	58-50-231	Edwards	IRR	Travis	30.20944	97.79195
Centex Materials, LP.	Centex Materials, LP.	214,291,000	P084-88-00	58-58-414	Edwards	IND	Hays	30.07083	97.86500
Centex Materials, LP.	Centex Materials, LP.		P084-88-00	58-58-415	Edwards	IND	Hays	30.04723	97.86748
Aqua Texas, Inc.	Chaparral	28,000,000	P084-88-01	58-49-910	Trinity	PWS	Hays	30.13316	97.88988
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-913	Trinity	PWS	Hays	30.13278	97.88944
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-914	Trinity	PWS	Hays	30.13314	97.88982
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-916	Edwards	PWS	Hays	30.13861	97.88472
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-919	Trinity	PWS	Hays	30.13778	97.89222
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-920	Trinity	PWS	Hays	30.13780	97.89276
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-911	Trinity	PWS	Hays	30.13305	97.88972
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-912	Edwards	PWS	Hays	30.13278	97.88944
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-915	Edwards	PWS	Hays	30.13874	97.88488
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-918	Trinity	PWS	Hays	30.13778	97.89261
Aqua Texas, Inc.	Chaparral		P084-88-01	58-49-917	Edwards	PWS	Hays	30.13861	97.88472
Chatleff Controls, Inc.	Chatleff Controls, Inc.	1,500,000	P084-88-02	58-58-509	Edwards	IND	Hays	30.07611	97.83000
Church Of Christ At Buda/Kyle	Church Of Christ At Buda/Kyle	266,825	P076-92-00	58-57-607	Edwards	PWS	Hays	30.08045	97.91660
Cimarron Park Water Company, Inc.	Cimarron Park Water Company, Inc.	118,000,000	P084-88-00	58-58-102	Edwards	PWS	Hays	30.08472	97.84250
Cimarron Park Water Company, Inc.	Cimarron Park Water Company, Inc.		P084-88-00	58-58-114	Edwards	PWS	Hays	30.12444	97.87389
City Of Buda	City Of Buda	275,000,000	P084-88-03	58-58-106	Edwards	PWS	Hays	30.10889	97.86604
City Of Buda	City Of Buda		P084-88-03	58-58-403	Edwards	PWS	Hays	30.06203	97.85602
City Of Buda	City Of Buda		P084-88-03	58-58-413	Edwards	PWS	Hays	30.06781	97.86275
City of Hays Water Department	City Of Hays Water Department	14,000,000	P084-88-05	58-58-111	Edwards	PWS	Hays	30.11503	97.86271
City of Hays Water Department	City Of Hays Water Department		P084-88-05	58-58-115	Edwards	PWS	Hays	30.09333	97.83916
City of Hays Water Department	City Of Hays Water Department (Elliot Ranch)	49,500,000	P245-00-00	58-57-314	Edwards	PWS	Hays	30.09667	97.88361

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
City of Hays Water Department	City Of Hays Water Department (Elliot Ranch)		P245-00-00	58-57-3Z4	Edwards	PWS	Hays	30.04950	97.93567
City Of Kyle	City Of Kyle	165,000,000	P029-99-00	58-57-9N1	Edwards	PWS	Hays	30.10459	97.85434
City Of Sunset Valley	City Of Sunset Valley	18,590,000	P084-88-04	58-50-215	Edwards	PWS	Travis	30.22764	97.81035
City Of Buda	CityOf Buda (Dahlstrom, Hays I.S.D.)		P084-88-06	58-57-307	Edwards	PWS	Hays	30.10956	97.87837
Comal Tackle Company	Comal Tackle Company	843,750	P084-88-04	58-58-423	Edwards	IND	Hays	30.08000	97.86987
Aqua Texas, Inc.	Copper Hills	7,000,000	P084-88-04	58-49-921	Trinity	PWS	Hays	30.14167	97.87917
Aqua Texas, Inc.	Copper Hills		P084-88-04	58-49-922	Trinity	PWS	Hays	30.14167	97.87917
Aqua Texas, Inc.	Copper Hills		P084-88-04	58-49-923	Trinity	PWS	Hays	30.14167	97.87917
Aqua Texas, Inc.	Copper Hills		P084-88-04	58-49-924	Trinity	PWS	Hays	30.14276	97.88005
Creedmoor	Maha PWS Corp	213,696,000	P084-88-00	58-50-846	Edwards	PWS	Travis	30.13015	97.82169
Creedmoor	Maha PWS Corp		P084-88-00	58-50-851	Edwards	PWS	Travis	30.16167	97.81834
Creedmoor	Maha PWS Corp		P084-88-00	58-50-848	Edwards	PWS	Travis	30.12613	97.81598
Creedmoor	Maha PWS Corp		P084-88-00	58-50-849	Edwards	PWS	Travis	30.12590	97.81580
Creedmoor	Maha PWS Corp		P084-88-00	58-50-847	Edwards	PWS	Travis	30.13014	97.82169
Creedmoor	Maha PWS Corp		P084-88-00	58-50-850	Edwards	PWS	Travis	30.12582	97.81564
Lougheed, Scott	Crestview R.V.	2,000,000	P084-88-07	58-58-510	Edwards	PWS	Hays	30.07938	97.82758
Diamondscape	Diamondscape	100,000	P351-91-00	58-50-726	Edwards	COM	Travis	30.15250	97.83334
Gilbert C Johnson	Gilbert C Johnson	5,500,000	P211-90-00	58-50-860	Edwards	IRR	Travis	30.14444	97.83139
Goforth Water Supply Company	Goforth Water Supply Company	350,900,000	P041-01-00	58-58-4GF	Edwards	PWS	Hays	30.07083	97.87361
Goforth Water Supply Company	Goforth Water Supply Company		P041-01-00	58-58-501	Edwards	PWS	Hays	30.07833	97.83056
Goforth Water Supply Company	Goforth Water Supply Company		P041-01-00	58-58-506	Edwards	PWS	Hays	30.07833	97.83056
Goforth Water Supply Company	Goforth Water Supply Company		P041-01-00	58-58-508	Edwards	PWS	Hays	30.07917	97.83099
Goforth Water Supply Company	Goforth Water Supply Company		P041-01-00	58-58-507	Edwards	PWS	Hays	30.07833	97.83056
Harold And Al Schuster Hicks	Harold And Al Schuster Hicks	3,000,000	P084-88-06	58-50-723	Edwards	PWS	Travis	30.14861	97.83444
Verizon	Hays	100,000	P076-91-00	58-57-3H	Edwards	PWS	Hays	30.10611	97.90334
Hays County Youth Athletic Assoc.	Hays County Youth Athletic Assoc.	4,820,550	P083-92-00	58-58-417	Edwards	IRR	Hays	30.07129	97.85825
Hays Consolidated I.S.D.	Hays High School	30,000,000	P010-94-00	58-57-901	Edwards	PWS	Hays	30.03500	97.89917
Hays Consolidated I.S.D.	Hays High School		P010-94-00	58-57-913	Edwards	PWS	Travis	30.02917	97.87917
Hays Hills Baptist Church	Hays Hills Baptist Church	300,000	P201-90-00	58-58-127	Edwards	PWS	Hays	30.10000	97.85667
Texas-Lehigh Cement Company	Howe	1,500,000	P353-91-00	58-58-418	Edwards	IND	Hays	30.04222	97.85278
Hunt Enterprises	Hunt Enterprises	600,000	P346-91-00	58-50-861	Edwards	IRR	travis	30.13833	97.82472

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
Huntington Utility Company, L.L.C.	Huntington Utility Company, L.L.C.	18,000,000	P084-88-06	58-57-308	Edwards	PWS	Hays	30.10611	97.90334
J. D. Malone	J. D. Malone	2,000,000	P084-88-07	58-50-852	Edwards	PWS	Travis	30.14593	97.81313
Kretchmar Alta Mae	Kretchmar Alta Mae	100,000	P209-93-00	58-50-862	Edwards	IRR	Travis	30.15028	97.83278
Aqua Texas, Inc.	Leisurewoods Water Company	88,764,000	P084-88-07	58-58-107	Edwards	PWS	Hays	30.10528	97.86195
Aqua Texas, Inc.	Leisurewoods Water Company		P084-88-07	58-58-118	Edwards	PWS	Hays	30.11065	97.86930
Aqua Texas, Inc.	Leisurewoods Water Company		P084-88-07	58-58-119	Edwards	PWS	Hays	30.11127	97.86252
Aqua Texas, Inc.	Leisurewoods Water Company		P084-88-07	58-58-121	Edwards	PWS	Hays	30.09472	97.84361
Aqua Texas, Inc.	Leisurewoods Water Company		P084-88-07	58-58-108	Edwards	PWS	Hays	30.12319	97.87226
Aqua Texas, Inc.	Leisurewoods Water Company		P084-88-07	58-58-120	Edwards	PWS	Hays	30.10503	97.86236
Lowden, Bob	Lowden Bob	1,000,000	P078-98-00	58-58-426	Edwards	PWS	Hays	30.04691	97.85017
Manchaca Baptist Church	Manchaca Baptist Church	600,000	P015-04-01	58-50-7MB	Edwards	COM	Travis	30.13889	97.85445
Manchaca Fellowship Baptist Church	Manchaca Fellowship Baptist Church	100,000	P244-91-01	58-50-737	Edwards	PWS	Travis	30.13611	97.83389
Manchaca Optimist Youth Sports	Manchaca Optimist Youth Sports	24,000,000	P113-04-01	58-50-7MO	Edwards	COM	Travis	30.13605	97.85053
Manchaca Volunteer Fire Dept.	Manchaca Volunteer Fire Dept.	600,000	P084-88-07	58-50-724	Edwards	COM	Travis	30.14111	97.83806
Marbridge Foundation	Marbridge Foundation	26,730,000	P084-88-08	58-50-703	Edwards	PWS	Travis	30.13813	97.85522
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-704	Edwards	PWS	Travis	30.13694	97.85555
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-719	Edwards	PWS	Travis	30.13861	97.85806
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-725	Edwards	PWS	Travis	30.13750	97.85361
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-727	Edwards	PWS	Travis	30.13806	97.85722
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-728	Edwards	PWS	Travis	30.13861	97.85555
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-740	Edwards	IRR	Travis	30.13806	97.85555
Marbridge Foundation	Marbridge Foundation		P084-88-08	58-50-7MF	Edwards	COM	Travis	30.13194	97.85500
McCoy Corporation	McCoy Corporation	120,000	P084-88-08	58-50-730	Edwards	COM	Travis	30.14000	97.83833
Michael Thames Custom Homes	Michael Thames Custom Homes	100,000	P242-95-00	58-58-1MT	Edwards	COM	Travis	30.12459	97.81374
Mision Cristiana Maranatha	Mision Cristiana Maranatha	500,000	P041-02-05	58-50-8mb	Edwards	COM	Travis	30.14139	97.83083
Aqua Texas, Inc.	Mooreland	6,000,000	P177-89-00	58-50-842	Edwards	PWS	Travis	30.14305	97.82445
Aqua Texas, Inc.	Mooreland		P177-89-00	58-50-863	Edwards	PWS	Travis	30.14000	97.83056
Mountain City Oaks Water System	Mountain City Oaks Water System	43,164,000	P084-88-08	58-57-910	Edwards	PWS	Hays	30.03389	97.89111
Mystic Oak Water Co-op	Mystic Oak Water Co-op	7,700,000	P084-88-08	58-58-202	Edwards	PWS	Travis	30.12022	97.82070
Mystic Oak Water Co-op	Mystic Oak Water Co-op		P084-88-08	58-58-216	Edwards	PWS	Hays	30.09472	97.81555
City of Austin	Nature Center	16,000,000	P043-96-00	58-42-9NC	Edwards	IRR	Travis	30.27083	97.77472

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
Neuro Institute of Austin, L.P.	Neuro Institute of Austin, L.P.	7,500,000	P049-92-00	58-50-5A	Edwards	IRR	Travis	30.19084	97.80651
New Forest Oaks, Inc.	New Forest Oaks, Inc.	5,000,000	P217-93-00	58-50-123	Edwards	IRR	Travis	30.23252	97.86346
New Forest Oaks, Inc.	New Forest Oaks, Inc.		P217-93-00	58-50-1NF	Edwards	IRR	Travis	30.23222	97.85750
Onion Creek Country Club	Onion Creek Country Club	95,166,500	P084-88-09	58-50-835	Edwards	IRR	Travis	30.14501	97.81313
Onion Creek Country Club	Onion Creek Country Club		P084-88-09	58-50-853	Edwards	IRR	Travis	30.14624	97.81927
Onion Creek Country Club	Onion Creek Country Club		P084-88-09	58-50-836	Edwards	IRR	Travis	30.13915	97.82104
Onion Creek Kennels	Onion Creek Kennels	466,838	P108-91-05	58-58-126	Edwards	COM	Hays	30.11750	97.87361
Aqua Texas, Inc.	Onion Creek Meadows	36,300,000	P084-88-10	58-58-207	Edwards	PWS	Travis	30.11639	97.81976
Aqua Texas, Inc.	Onion Creek Meadows		P084-88-10	58-58-208	Edwards	PWS	Travis	30.11934	97.81612
Aqua Texas, Inc.	Onion Creek Meadows		P084-88-10	58-58-209	Edwards	PWS	Travis	30.12250	97.82639
Onion Creek Memorial Park, Inc.	Onion Creek Memorial Park, Inc.	787,500	P128-89-00	58-50-859	Edwards	IRR	Travis	30.15361	97.82166
Lowden, Bob	Painted Horse Pavilion	1,000,000	P211-01-00	58-58-4LC	Edwards	COM	Travis	30.13944	97.83583
Park Hills Baptist Church	Park Hills Baptist Church	420,000	P084-88-09	58-42-913	Edwards	COM	Travis	30.26667	97.78222
Texas-Lehigh Cement Company	Plant	54,750,000	P084-88-11	58-58-407	Edwards	IND	Hays	30.07667	97.83444
Monarch Utilities, Inc.	Plum Creek Water Company	224,400,000	P084-88-09	58-58-409	Edwards	PWS	Hays	30.06683	97.83882
Monarch Utilities, Inc.	Plum Creek Water Company		P084-88-09	58-58-419	Edwards	PWS	Hays	30.06781	97.85912
Monarch Utilities, Inc.	Plum Creek Water Company		P084-88-09	58-58-708	Edwards	PWS	Hays	30.04214	97.85229
Monarch Utilities, Inc.	Plum Creek Water Company		P084-88-09	58-58-412	Edwards	PWS	Hays	30.07051	97.83549
Railroad Bar-B-Que	Railroad Bar-B-Que	330,000	P053-93-00	58-50-8rrb	Edwards	COM	Hays	30.09917	97.89222
Randolph Austin Company	Randolph Austin Company	585,000	P235-88-00	58-50-734	Edwards	IND	Travis	30.13417	97.85000
Randolph Austin Company	Randolph Austin Company		P235-88-00	58-50-735	Edwards	ABD	Travis	30.13472	97.85000
Rocket Water Company	Rocket Water Company	7,000,000	P037-97-00	58-57-312	Edwards	PWS	Hays	30.11571	97.89501
Rocket Water Company	Rocket Water Company		P037-97-00	58-57-3R2	Edwards	PWS	Hays	30.11672	97.89369
Rudy's Country Store	Rudy's Country Store	1,875,000	P098-18-00	58-42-825	Edwards	COM	Travis	30.26419	97.81432
Sac-n-pac Company	Sac-n-pac Company	150,000	P060-90-00	58-50-738	Edwards	COM	Travis	30.13472	97.85306
Savage, Andrea	Savage Andrea	500,000	P037-91-00	58-50-8AS	Edwards	PWS	Travis	30.14000	97.83056
Aqua Texas, Inc.	Shady Hollow Estates Water Co	80,000,000	P084-88-10	58-50-731	Edwards	PWS	Travis	30.15297	97.85870
Aqua Texas, Inc.	Shady Hollow Estates Water Co		P084-88-10	58-50-743	Edwards	PWS	Travis	30.15447	97.85878
Penbur Farms, Inc.	Shoal Creek Properties	500,000	P298-94-00	58-58-410	Edwards	COM	Hays	30.07667	97.83444
Slaughter Creek Acres Water Supply	Slaughter Creek Acres Water Supply	10,586,725	P084-88-10	58-50-829	Edwards	PWS	Travis	30.16069	97.81808
Slaughter Creek Acres Water Supply	Slaughter Creek Acres Water Supply		P084-88-10	58-50-830	Edwards	PWS	Travis	30.14671	97.81308
Sosebee E.Y.	Sosebee E.Y.	690,000	P157-90-00	58-58-125	Edwards	PWS	Hays	30.10361	97.87028

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
Southern Hills Church of Christ	Southern Hills Church of Christ	400,000	P006-03-00	58-57-315	Edwards	COM	Hays	30.11306	97.88389
Aqua Texas, Inc.	Southwest Territory	16,500,000	P084-88-10	58-49-927	Edwards	PWS	Hays	30.14528	97.87971
Aqua Texas, Inc.	Southwest Territory		P084-88-10	58-49-928	Trinity	PWS	Hays	30.14532	97.87984
Aqua Texas, Inc.	Southwest Territory		P084-88-10	58-49-929	Edwards	PWS	Hays	30.14536	97.87968
Aqua Texas, Inc.	Southwest Territory		P084-88-10	58-49-931	Trinity	PWS	Hays	30.14528	97.87972
Aqua Texas, Inc.	Southwest Territory		P084-88-10	58-49-932	Trinity	PWS	Hays	30.14522	97.87972
Aqua Texas, Inc.	Southwest Territory		P084-88-10	58-49-933	Trinity	PWS	Hays	30.14515	97.87982
Texas-Lehigh Cement Company	Spectrum	825,000	P353-91-00	58-58-406	Edwards	IND	Hays	30.05345	97.85553
St. Albans Episcopal Church	St. Albans Episcopal Church	750,000	P084-88-10	58-50-840	Edwards	COM	Travis	30.15005	97.83235
St. Andrews School	St. Andrews School	8,000,000	P042-99-00	58-50-125	Trinity	IRR	Travis	30.24594	97.85099
St. Andrews School	St. Andrews School		P042-99-00	58-50-126	Trinity	IRR	Travis	30.24572	97.85050
St. John's Presbyterian Church	St. John's Presbyterian Church	100,000	P259-93-01	58-50-732	Edwards	PWS	Travis	30.14305	97.84801
Stenger Ridgewood Village WS	Stenger Ridgewood Village WS	16,500,000	P084-88-10	58-42-816	Edwards	PWS	Travis	30.27750	97.79389
Steven Carlitz, Kuang Yu Chang and David T. Chang	Steven Carlitz, Kuang Yu Chang and David T. Chang	397,899	P084-88-05	58-42-821	Edwards	COM	Travis	30.26306	97.81389
Tanglewood Self Storage	Tanglewood Self Storage	100,000	P226-97-00	58-50-5SS	Trinity	COM	Travis	30.17167	97.81944
Texanna Properties, Inc.	Texanna Properties, Inc.	1,649,250	P084-88-00	58-50-843	Edwards	PWS	Travis	30.14305	97.82445
Texanna Properties, Inc.	Texanna Properties, Inc.		P084-88-00	58-50-844	Edwards	PWS	Travis	30.12406	97.82665
Tilson Custom Homes, Inc.	Thames and Wimmer, L.L.C.	100,000	P058-89-00	58-58-709	Edwards	COM	Hays	30.03860	97.85139
The Inn Above Onion Creek	The Inn Above Onion Creek	1,300,000	P310-95-00	58-57-5J2	Edwards	PWS	Hays	30.05853	97.92112
The Porter Co. Mech. Contractors	The Porter Co. Mech. Contractors	500,000	P273-94-00	58-50-7PC	Edwards	COM	Travis	30.13639	97.81944
Thomas Weatherford	Thomas Weatherford	5,000,000	P314-89-00	58-58-220	Edwards	PWS	Hays	30.08189	97.84270
Twc Enterprises, Inc.	Twc Enterprises, Inc.	24,200,000	P084-99-00	58-57-5T4	Edwards	PWS	Hays	30.04773	97.88367
Twc Enterprises, Inc.	Twc Enterprises, Inc.		P084-99-00	58-57-608	Edwards	PWS	Hays	30.08000	97.91722
Twc Enterprises, Inc.	Twc Enterprises, Inc.		P084-99-00	58-57-6T5	Edwards	PWS	Hays	30.03275	97.89030
Twc Enterprises, Inc.	Twc Enterprises, Inc.		P084-99-00	58-57-609	Edwards	PWS	Hays	30.07214	97.91615
Twc Enterprises, Inc.	Twc Enterprises, Inc.		P084-99-00	58-57-6M3	Edwards	PWS	Hays	30.07454	97.91382
Twin Creek Park Water Supply Co.	Twin Creek Park Water Supply Co.	12,000,000	P084-88-00	58-50-828	Edwards	PWS	Travis	30.15731	97.82000
Twin Creek Park Water Supply Co.	Twin Creek Park Water Supply Co.		P084-88-00	58-50-856	Edwards	PWS	Travis	30.13472	97.82889
Twin Creek Park Water Supply Co.	Twin Creek Park Water Supply Co.		P084-88-00	58-50-857	Edwards	PWS	Travis	30.13169	97.82233
Twin Creek Park Water Supply Co.	Twin Creek Park Water Supply Co.		P084-88-00	58-50-858	Edwards	PWS	Travis	30.14305	97.82417
Twin Oaks Ranch Church Camp	Twin Oaks Ranch Church Camp	1,000,000	P084-88-11	58-58-117	Edwards	PWS	Hays	30.11386	97.86561

Table 3: Tabulation of District permittees and wells (2006).

Well Owner	System Name	2006 Permitted Pumpage (gal)	Permit #	Well ID (SWN)	Aquifer*	Class	County	Ddlat	Ddlong
Twin Oaks Ranch Church Camp	Twin Oaks Ranch Church Camp		P084-88-11	58-58-122	Edwards	PWS	Hays	30.08361	97.87389
V.f.w. Post No. 3376	V.f.w. Post No. 3377	180,000	P084-88-12	58-50-729	Edwards	COM	Travis	30.12972	97.83417
Village Of San Leanna	Village Of San Leanna	29,013,600	P084-88-12	58-50-827	Edwards	PWS	Travis	30.13500	97.82528
Village Of San Leanna	Village Of San Leanna		P084-88-12	58-50-838	Edwards	PWS	Travis	30.12972	97.79833
Village Of San Leanna	Village Of San Leanna		P084-88-12	58-50-855	Edwards	PWS	Travis	30.13489	97.82649
Villita West Condo Assoc	Well #1	1,000,000	P226-97-00	58-42-8vw	Edwards	COM	Travis	30.26528	97.81528
Villita West Condo Assoc	Well #2	1,000,000	P243-99-00	58-42-8v2	Edwards	COM	Travis	30.26556	97.81667
TOTAL		2,469,469,937							

* Edwards Aquifer includes hybrid Edwards-Trinity well completions.

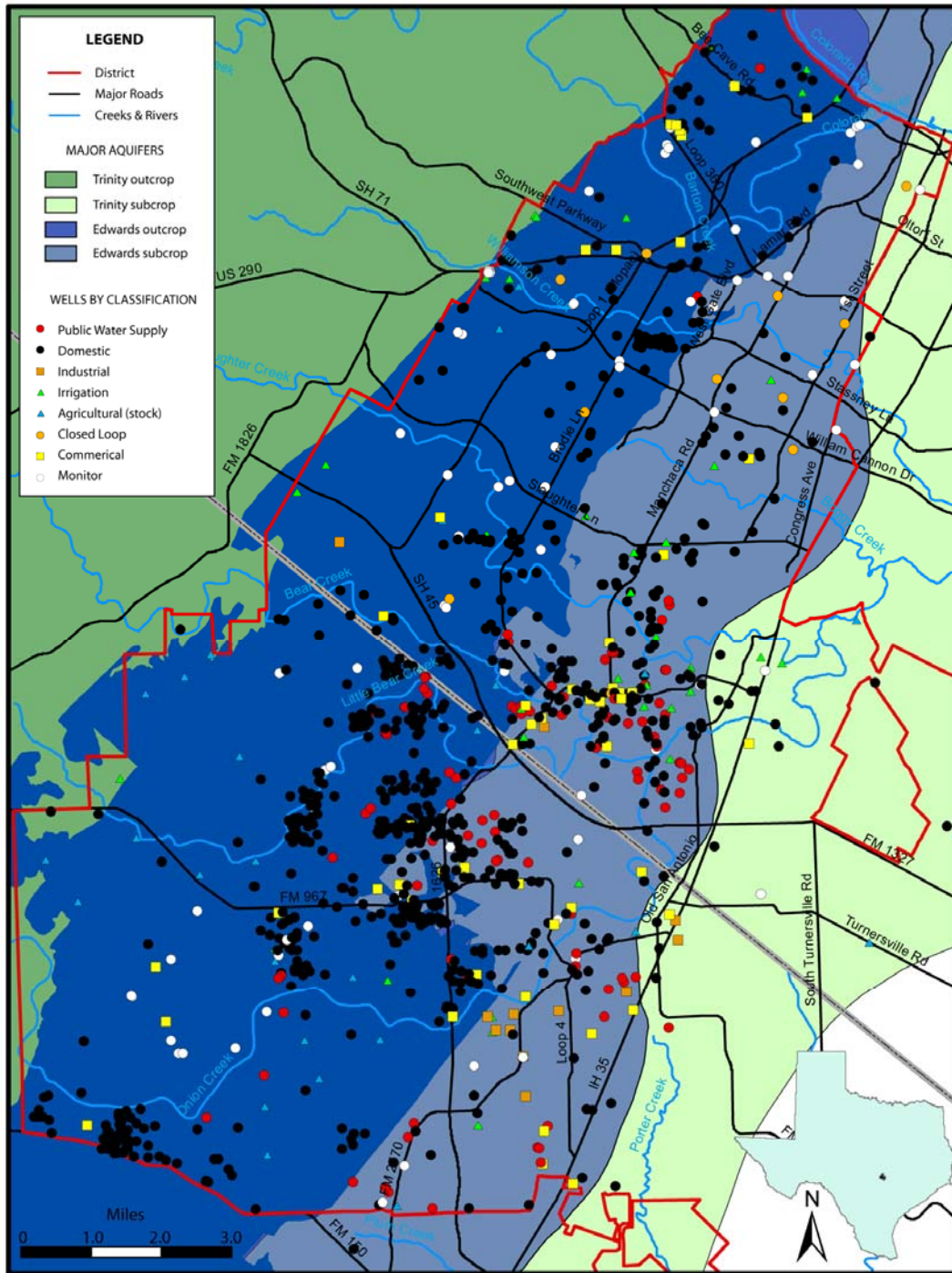


Figure 8: Map showing the distribution and general classification of wells in the District.

PART III: GROUNDWATER PUMPING

This chapter summarizes historical and current pumping within the District from 1988 to 2006. All dates are calendar year except where noted as fiscal year (FY). The District's fiscal year is from September 1 through August 31. Fiscal year pumpage closely follows calendar year pumpage during average years, but can vary as much as 14% due to climatic conditions.

Water-supply wells in the District include about 1,230 operational wells for public, domestic, industrial, commercial, irrigation, and agricultural uses (**Table 2**). **Table 4** is a tabulation of the annual permitted (maximum allowable), actual (metered), and estimated exempt pumpage from FY 1990 to FY 2006. In FY 2006, actual and estimated exempt pumping was 2.3 billion gallons (7,070 acre-ft/yr, 9.8 cfs) with the majority of pumping from the District's 94 permittees. Estimated exempt pumpage, such as agricultural and domestic supply, is thought to be 11% of the permitted pumpage volume. **Figure 9** is a chart showing the actual (metered) versus permitted pumpage for the fiscal years of 1990-2006 derived from **Table 4**. Actual and permitted pumpage have similar trends, although actual pumpage varies according to climatic conditions; for example, actual pumpage approaches permitted volume during dry periods.

Table 5 is a tabulation of total monthly pumping in millions gallons from 1988 to 2005. **Table 6** is a tabulation of monthly pumping (million gallons) by classification from 1988 to 2005. **Figure 10** illustrates the percentage of 2005 pumping by classification. The majority of water used within the District is for public water supply. **Figure 11** illustrates monthly pumping from 1988 to 2005 by general classification. Public water supply and irrigation pumpage have a notable seasonal cycle with peak use during the summer, and lowest use during the winter. Commercial and Industrial pumping is generally erratic with some seasonal peaks noted with Industrial use. **Figure 12** is a chart illustrating the months with the least and greatest pumping, on average, from 1988 to 2005. August is the highest use month, while February is the lowest. The lowest monthly pumpage is likely the amount used primarily indoors for domestic users, while the highest monthly pumpage reflects both indoor and outdoor usage. On an average annual basis, it is estimated that 33% of pumped water for public water supply was used for outdoor use (ranging from a maximum of 42% and a minimum of 24%).

Figure 13 is a map showing the distribution and range in volume of pumping from the District in 2004. **Table 7** is a tabulation of 2004 pumping that was used for numerical modeling in the Barton Springs aquifer by Smith and Hunt (2004). Note that the most significant volumes of pumping occur in the southeast part of the aquifer (**Figure 13**).

The District currently has five permittees that pumped about 44.3 million gallons from the Trinity Aquifer in 2005. This total represents about 2% of the total pumped in 2005 by all District permittees. The water is used for public water supplies (83%), irrigation (17%), and minor commercial use. **Table 8** presents the yearly permittee pumpage for the Trinity aquifer. It is important to note that where the Edwards Aquifer is thin, many

domestic (exempt users), and some permitted wells reported to be Edwards wells, may derive some of their water from the upper and even middle Trinity aquifers.

Pumpage data before to 1988 is not available. Estimates of pumping during this time period are very limited. However, Brune and Duffin (1983) estimate that 472 acre-ft/yr (about 0.66 cfs) was pumped in 1956 from the Barton Springs aquifer. **Table 9** contains estimated, or synthetic, monthly pumping rates from 1947 to 1987. The reliability of the synthetic data decreases regressively for the months and years before 1987.

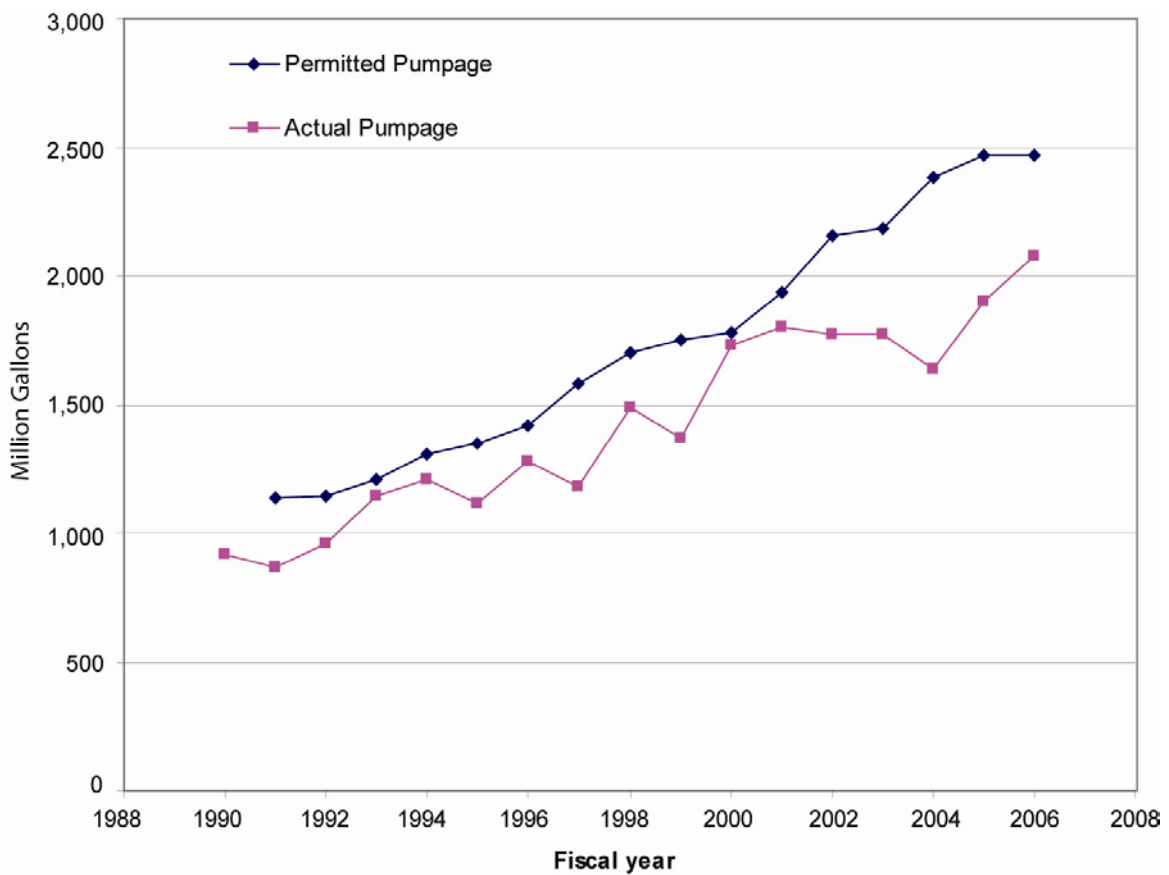


Figure 9: Actual (metered) versus Permitted fiscal year pumpage (from Table 4). The District’s fiscal year begins September 1. These values do not include an estimate for exempt pumpage.

Table 4: Fiscal Year Permitted and Actual (metered) Pumping in the District (1990 to 2006).

	1990	1991	1992	1993	1994	1995	1996	1997	1998
No. Permittees	52	62	74	75	77	91	86	95	96
Permitted pumpage (gal)	unknown	1,136,373,000	1,144,558,250	1,207,693,250	1,306,926,250	1,350,697,650	1,417,672,177	1,583,257,177	1,700,218,177
Exempt pumpage* (gal)	100,778,997	95,420,435	104,947,170	125,583,032	132,470,911	122,750,783	140,619,920	129,478,321	163,801,098
<i>Total pumpage (gal)</i>	unknown	1,231,793,435	1,249,505,420	1,333,276,282	1,439,397,161	1,473,448,433	1,558,292,097	1,712,735,498	1,864,019,275
<i>Total pumpage (acre-ft)</i>	unknown	3,780	3,834	4,091	4,417	4,521	4,782	5,255	5,720
<i>Total pumpage (cfs)</i>	unknown	5.2	5.3	5.7	6.1	6.2	6.6	7.3	7.9
Actual (metered) permitted pumpage	916,172,700	867,458,500	954,065,186	1,141,663,931	1,204,281,007	1,115,916,211	1,278,362,913	1,177,075,648	1,489,100,893
Exempt pumpage*	100,778,997	95,420,435	104,947,170	125,583,032	132,470,911	122,750,783	140,619,920	129,478,321	163,801,098
<i>Total actual pumpage (gal)</i>	1,016,951,697	962,878,935	1,059,012,356	1,267,246,963	1,336,751,918	1,238,666,994	1,418,982,833	1,306,553,969	1,652,901,991
<i>Total pumpage (acre-ft)</i>	3,120	2,955	3,250	3,888	4,102	3,801	4,354	4,009	5,072
<i>Total pumpage (cfs)</i>	4.3	4.1	4.5	5.4	5.7	5.2	6.0	5.5	7.0
Actual as a % of permitted	--	78%	85%	95%	93%	84%	91%	76%	89%

	1999	2000	2001	2002	2003	2004	2005	2006
No. Permittees	91	87	89	90	90	94	94	94
Permitted pumpage (gal)	1,754,340,569	1,777,105,569	1,936,326,800	2,154,432,800	2,182,251,250	2,383,566,187	2,464,569,937	2,469,917,445
Exempt pumpage* (gal)	150,669,960	190,030,736	197,885,377	195,092,059	194,854,638	180,449,871	208,923,973	228,441,657
<i>Total pumpage (gal)</i>	1,905,010,529	1,967,136,305	2,134,212,177	2,349,524,859	2,377,105,888	2,564,016,058	2,673,493,910	2,698,359,102
<i>Total pumpage (acre-ft)</i>	5,845	6,036	6,549	7,209	7,294	7,867	8,203	8,280
<i>Total pumpage (cfs)</i>	8.1	8.3	9.0	10.0	10.1	10.9	11.3	11.4
Actual (metered) permitted pumpage	1,369,726,909	1,727,552,146	1,798,957,971	1,773,564,173	1,771,405,803	1,640,453,371	1,899,308,849	2,076,742,335
Exempt pumpage*	150,669,960	190,030,736	197,885,377	195,092,059	194,854,638	180,449,871	208,923,973	228,441,657
<i>Total actual pumpage (gal)</i>	1,520,396,869	1,917,582,882	1,996,843,348	1,968,656,232	1,966,260,441	1,820,903,242	2,108,232,822	2,305,183,992
<i>Total pumpage (acre-ft)</i>	4,665	5,884	6,127	6,041	6,033	5,587	6,469	7,073
<i>Total pumpage (cfs)</i>	6.4	8.1	8.5	8.3	8.3	7.7	8.9	9.8
Actual as a % of permitted	80%	97%	94%	84%	83%	71%	79%	85%

* Exempt pumpage is estimated to be 11% of actual permitted pumpage.

Table 5: Tabulation of total reported monthly pumping (million gallons) in the District (1988 to 2005).

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1988	74.03	88.52	47.71	92.27	97.74	115.72	116.68	129.11	121.20	116.91	104.74	91.46	1,196.11
1989	85.43	57.80	71.76	89.58	88.54	115.73	131.38	99.48	102.68	84.44	68.06	69.11	1,265.86
1990	58.54	52.20	50.24	57.26	74.35	107.03	88.38	104.05	84.70	82.98	61.21	64.95	885.89
1991	58.94	52.04	65.28	59.51	69.57	76.54	93.01	88.14	72.80	84.16	64.40	63.00	847.38
1992	62.41	61.52	66.07	78.46	80.11	91.83	129.15	135.08	114.95	100.70	64.00	67.29	1,051.59
1993	60.05	66.60	73.86	76.67	87.18	99.01	146.40	184.69	133.00	108.52	79.49	74.82	1,190.30
1994	76.20	65.67	74.29	89.31	82.99	120.88	167.05	127.43	97.98	95.78	76.17	69.14	1,142.88
1995	71.75	65.06	73.25	83.01	89.53	102.08	143.91	141.84	108.93	111.69	84.09	80.43	1,155.58
1996	79.45	90.52	93.03	108.27	120.95	117.40	160.55	127.23	96.87	102.20	91.19	76.84	1,264.51
1997	80.17	66.04	79.68	76.33	94.18	87.69	161.73	179.43	161.58	143.00	97.35	81.59	1,308.78
1998	80.53	79.32	89.31	111.33	162.68	191.14	167.35	157.14	120.62	110.05	91.28	86.54	1,447.29
1999	86.52	87.08	91.14	117.98	102.13	145.24	146.58	204.23	172.64	174.47	125.33	109.36	1,562.69
2000	103.72	97.63	106.20	124.32	145.27	141.02	218.21	212.91	199.61	121.15	99.15	104.27	1,673.45
2001	95.02	94.96	109.81	120.58	144.13	213.03	249.43	250.98	140.32	132.12	118.89	97.33	1,766.60
2002	100.27	98.64	117.40	146.13	214.53	198.27	168.23	239.56	190.74	128.02	104.25	100.07	1,806.11
2003	99.08	93.22	106.79	146.91	193.26	176.27	207.59	230.83	159.41	143.24	108.69	112.68	1,777.98
2004	107.39	98.25	117.04	122.10	146.90	139.97	174.03	210.89	184.07	141.41	109.02	115.47	1,666.55
2005	121.22	97.95	114.64	148.70	161.80	234.35	227.56	243.19	241.30	185.63	160.64	147.56	2,084.54

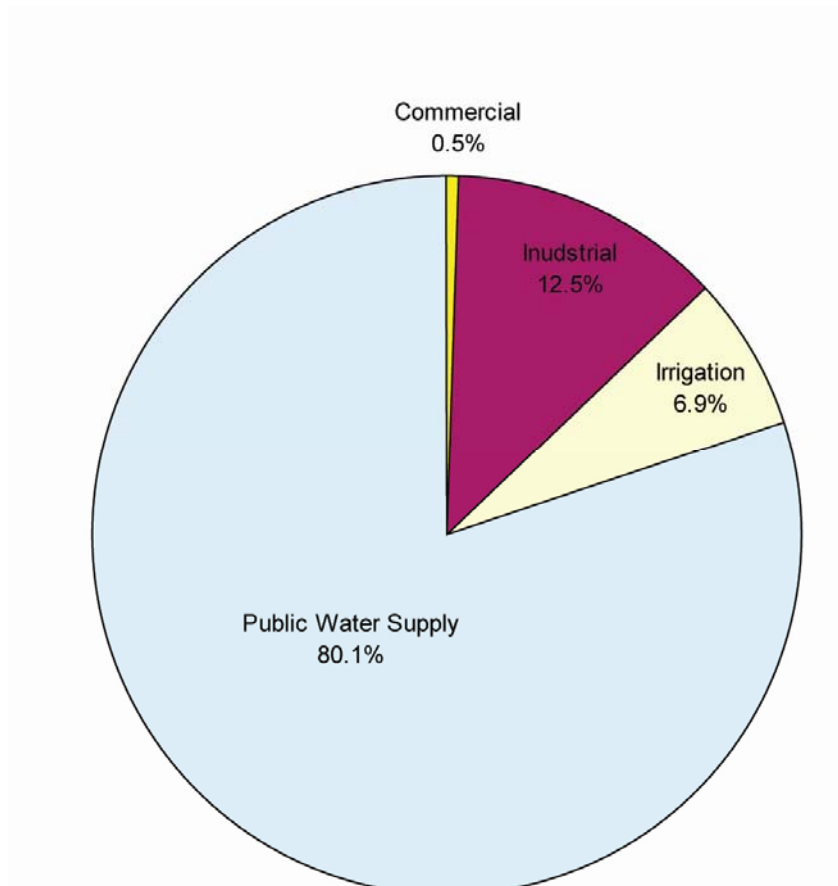


Figure 10: Pie chart showing the percentage of permitted groundwater pumping in Calendar Year 2005 by classification. This chart represents reported pumpage from permittees totaling 2.1 billion gallons in 2005 (6,400 acre-ft/yr; 8.9 cfs). This figure was derived from Table 6 and does not include exempt pumping estimates.

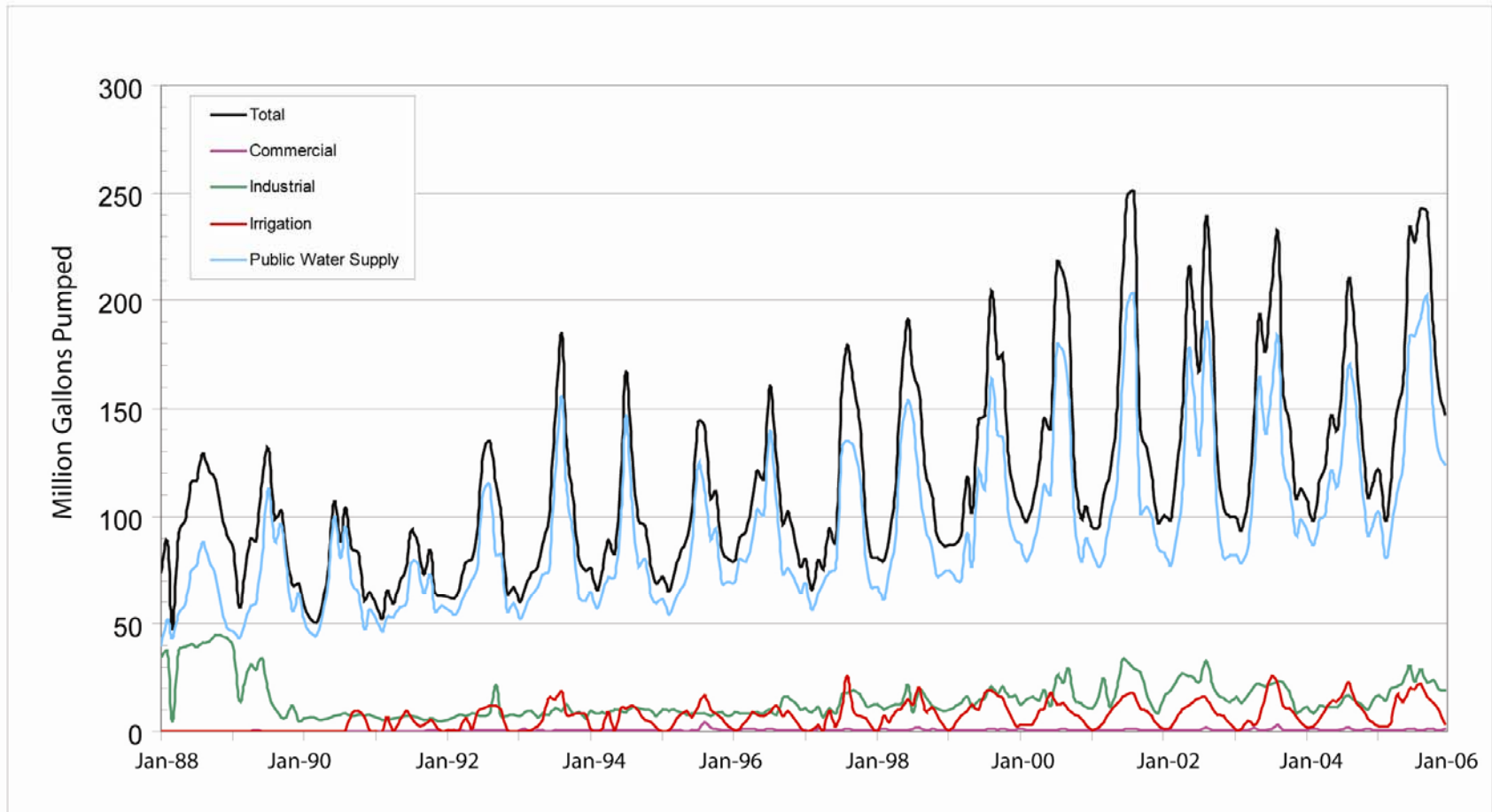


Figure 11: Metered monthly pumping by classification from 1988 to 2005 in the District (derived from Table 6).

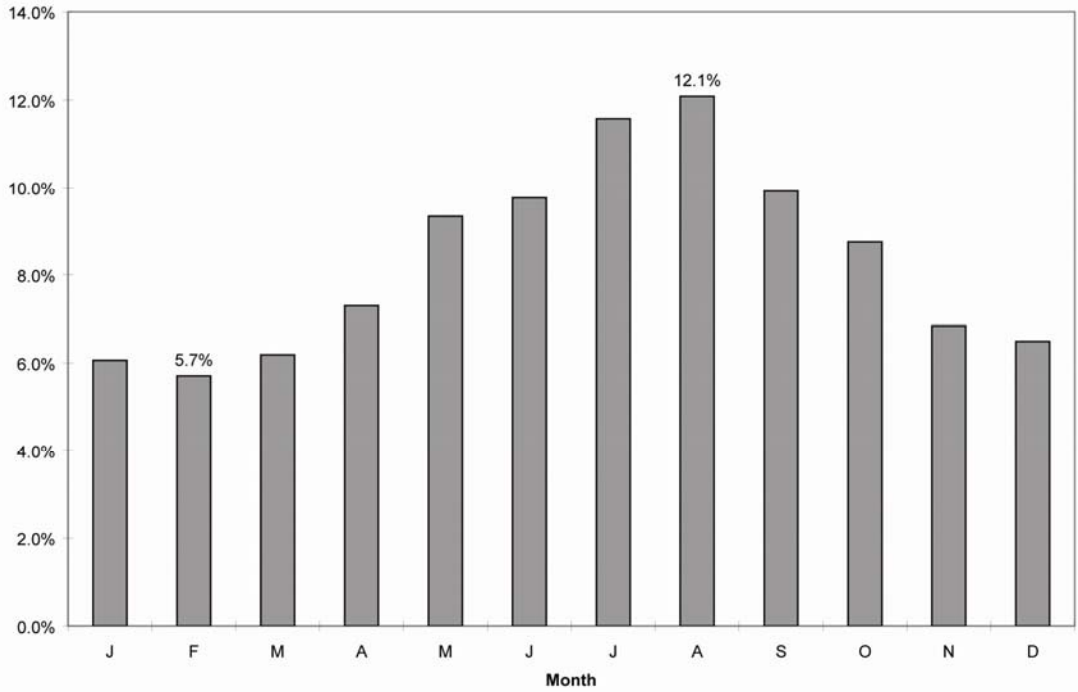


Figure 12: Chart illustrating the months with the greatest and least pumping in the District based on monthly averages from 1988 to 2004.

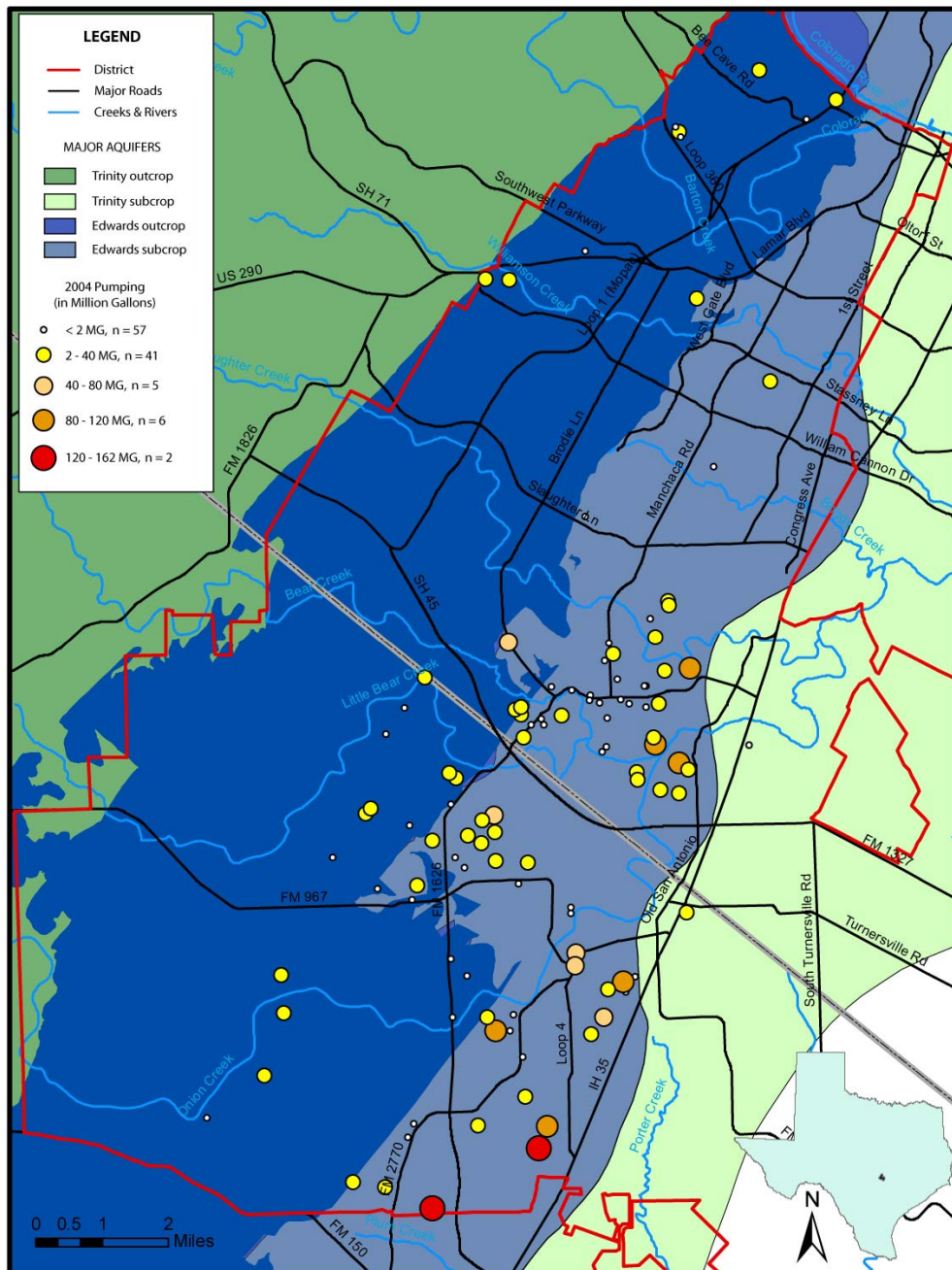


Figure 13: Map showing the distribution and volume of pumping from the Edwards Aquifer in 2004 from permittees (derived from Table 9). Each circle represents a well or well field of a permittee. These values were used in numerical modeling during evaluations of the sustainable yield of the aquifer. In 2004 a total of 1.64 billion gallons was pumped by permittees. Exempt well pumpage is not included, but is estimated to be 0.18 billion gallons distributed throughout the aquifer.

Table 6: Tabulation of total reported monthly pumping (million gallons) in the District by well classification (1988-2005).

Classification	Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
COM	1988	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.09	0.07	0.06	0.06	0.10	0.44
COM	1989	0.04	0.04	0.27	0.29	0.31	0.25	0.24	0.25	0.11	0.13	0.11	0.10	2.14
COM	1990	0.06	0.06	0.07	0.07	0.06	0.20	0.18	0.20	0.28	0.25	0.22	0.15	1.79
COM	1991	0.17	0.17	0.19	0.25	0.25	0.24	0.28	0.27	0.28	0.34	0.36	0.28	3.08
COM	1992	0.23	0.28	0.43	0.23	0.25	0.44	0.46	0.54	0.37	0.36	0.43	0.10	4.11
COM	1993	0.37	1.14	0.27	0.39	0.38	0.29	0.39	0.67	0.45	0.44	0.34	0.54	5.70
COM	1994	0.33	0.30	0.48	0.36	0.50	0.50	0.52	0.45	0.34	0.35	0.36	0.45	4.93
COM	1995	0.27	0.22	0.35	0.45	0.25	0.41	0.45	4.18	1.54	0.94	0.60	0.81	10.48
COM	1996	0.43	0.57	1.07	1.35	0.64	0.56	1.35	0.76	0.37	0.40	0.50	0.42	8.41
COM	1997	0.35	0.24	1.48	0.48	0.39	0.85	0.54	1.03	0.46	0.67	0.64	0.35	7.49
COM	1998	0.39	1.10	0.45	0.83	0.82	0.75	0.91	1.62	0.42	1.15	0.46	0.53	9.42
COM	1999	0.63	0.52	0.54	0.54	0.64	0.58	0.58	1.15	0.84	1.26	0.77	0.64	8.70
COM	2000	1.10	0.62	0.74	0.65	0.78	0.76	0.76	0.90	0.80	0.64	0.82	0.66	9.24
COM	2001	0.51	0.51	0.44	0.57	0.49	0.75	1.25	1.17	0.69	0.67	0.57	0.47	8.10
COM	2002	0.43	0.42	0.65	0.71	0.84	0.66	0.63	1.74	0.52	0.60	0.41	0.42	8.01
COM	2003	0.52	0.34	0.37	1.95	0.84	0.66	1.03	3.17	0.82	0.76	0.82	0.79	12.08
COM	2004	0.79	1.00	0.63	0.72	0.81	0.72	1.25	1.59	0.83	0.70	1.06	0.76	10.86
COM	2005	0.63	0.67	0.55	0.70	0.86	0.97	0.92	0.71	1.20	1.02	0.82	0.98	10.02
IND	1988	34.35	37.11	4.48	37.71	39.12	40.65	39.21	40.99	41.46	44.26	44.71	43.27	447.31
IND	1989	38.94	14.15	22.24	30.87	28.53	33.74	18.49	10.59	6.39	6.57	12.07	4.65	429.11
IND	1990	5.99	6.49	5.72	5.53	6.00	7.01	7.51	8.33	7.13	7.93	7.23	7.59	82.45
IND	1991	6.27	5.52	5.51	6.19	6.26	7.05	7.40	6.65	5.19	5.67	5.12	4.47	71.30
IND	1992	5.59	6.79	7.58	7.36	8.36	7.44	7.40	8.44	21.10	7.20	7.42	7.68	102.36
IND	1993	7.39	8.88	9.78	6.65	8.24	8.02	10.54	9.73	12.63	8.42	9.08	5.88	105.23
IND	1994	9.68	8.48	9.03	8.28	9.96	9.32	8.81	11.21	10.60	9.91	9.42	7.42	112.12

Table 6: Tabulation of total reported monthly pumping (million gallons) in the District by well classification (1988-2005).

Classification	Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
IND	1995	10.31	9.64	9.92	9.08	7.97	8.04	8.37	8.60	7.34	8.58	8.65	7.41	103.90
IND	1996	8.97	8.23	8.16	8.48	8.97	8.58	10.18	7.72	15.29	16.06	13.70	10.38	124.72
IND	1997	10.85	8.92	11.18	6.76	10.46	8.52	17.05	17.66	19.10	17.11	11.87	11.68	151.16
IND	1998	12.69	9.86	11.28	12.76	13.07	21.66	8.63	19.34	16.14	12.00	10.53	9.80	157.77
IND	1999	10.40	11.80	13.26	16.10	11.46	14.29	15.35	20.77	17.33	20.93	15.86	16.84	184.40
IND	2000	12.28	14.62	15.80	14.26	19.30	12.13	25.46	22.54	29.01	14.80	13.34	11.10	204.65
IND	2001	10.75	15.97	24.38	11.44	19.12	33.45	32.05	29.23	27.22	17.23	11.68	8.13	240.66
IND	2002	15.94	19.05	22.73	27.02	25.34	25.05	23.33	32.90	21.99	17.10	15.65	13.78	259.88
IND	2003	16.02	13.33	16.82	20.70	21.78	20.72	22.25	23.21	22.53	18.43	9.00	9.30	214.10
IND	2004	11.03	8.28	11.68	11.50	11.32	11.09	15.22	16.59	14.51	12.31	10.28	14.15	147.98
IND	2005	16.81	13.98	19.73	20.60	23.23	30.52	23.02	28.32	22.31	24.00	19.50	18.72	260.73
IRR	1988	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
IRR	1989	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.00	0.00	0.06
IRR	1990	0.00	0.00	0.00	0.01	0.01	0.08	0.03	0.39	8.35	9.76	6.27	0.81	25.69
IRR	1991	0.06	0.07	6.62	0.29	5.45	9.68	6.78	2.68	3.12	5.09	3.11	0.29	43.26
IRR	1992	0.38	0.33	0.86	5.91	0.90	8.57	10.48	11.65	11.73	10.35	0.56	0.13	61.86
IRR	1993	0.16	0.19	0.59	2.53	5.55	15.74	14.85	18.45	7.90	7.84	8.52	7.79	90.10
IRR	1994	1.33	0.01	1.39	9.07	0.57	10.86	10.87	11.80	9.70	5.44	4.27	1.84	67.17
IRR	1995	0.18	0.88	3.75	7.43	9.31	6.44	11.57	16.70	10.38	8.51	6.22	2.51	83.88
IRR	1996	0.42	1.35	4.84	8.72	8.02	7.30	9.15	11.98	7.26	9.41	5.88	1.85	76.19
IRR	1997	0.02	0.70	3.11	0.31	9.22	2.10	11.95	25.78	9.41	7.05	5.67	2.49	77.80
IRR	1998	0.21	7.37	4.14	9.08	10.78	14.92	12.30	20.13	9.73	11.21	7.54	2.73	110.16
IRR	1999	0.60	4.04	6.99	9.46	12.60	9.90	17.74	19.11	16.87	15.41	8.66	3.00	124.39
IRR	2000	2.81	3.10	3.68	9.72	10.53	17.83	12.52	13.08	10.16	7.56	5.75	2.97	99.72
IRR	2001	0.75	1.74	4.31	9.15	12.39	16.14	17.05	17.13	10.92	9.48	6.84	3.13	109.03

Table 6: Tabulation of total reported monthly pumping (million gallons) in the District by well classification (1988-2005).

Classification	Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
IRR	2002	0.90	1.93	5.32	10.10	11.94	13.96	15.16	15.49	10.66	8.00	7.13	3.86	104.45
IRR	2003	0.66	1.20	4.54	2.91	6.22	16.40	25.55	21.41	12.08	10.40	7.15	4.18	112.70
IRR	2004	2.02	2.17	6.08	9.46	13.68	14.31	18.26	22.50	14.27	10.68	5.98	4.29	123.71
IRR	2005	2.08	2.61	3.54	16.75	13.48	19.45	19.78	22.23	16.19	13.28	10.34	3.57	143.30
NDU	2004	0.00	0.00	0.04	0.01	0.02	0.02	0.02	0.04	0.06	0.01	0.02	0.02	0.25
NDU	2005	0.02	0.02	0.02	0.03	0.03	0.05	0.04	0.05	0.04	0.03	0.03	0.03	0.39
PWS	1988	39.68	51.41	43.24	54.56	58.62	75.05	77.45	88.03	79.67	72.59	59.97	48.09	748.35
PWS	1989	46.45	43.62	49.24	58.41	59.68	81.73	112.63	88.63	96.18	77.73	55.88	64.35	834.55
PWS	1990	52.49	45.65	44.45	51.66	68.28	99.75	80.66	95.14	68.95	65.03	47.49	56.41	775.95
PWS	1991	52.44	46.28	52.96	52.77	57.60	59.57	78.54	78.54	64.22	73.06	55.81	57.95	729.74
PWS	1992	56.21	54.13	57.21	64.95	70.60	75.38	110.81	114.45	81.74	82.80	55.60	59.38	883.27
PWS	1993	52.13	56.40	63.22	67.10	73.02	74.96	120.63	155.84	112.02	91.81	61.55	60.60	989.26
PWS	1994	64.86	56.88	63.39	71.61	71.95	100.20	146.85	103.96	77.33	80.07	62.12	59.43	958.66
PWS	1995	61.00	54.32	59.24	66.04	72.00	87.19	123.52	112.37	89.68	93.66	68.61	69.70	957.32
PWS	1996	69.63	80.37	78.97	89.72	103.33	100.96	139.86	106.78	73.95	76.33	71.11	64.18	1,055.19
PWS	1997	68.95	56.17	63.91	68.78	74.11	76.22	132.19	134.96	132.61	118.18	79.17	67.07	1,072.32
PWS	1998	67.23	61.00	73.45	88.67	138.01	153.81	145.50	116.05	94.32	85.68	72.75	73.48	1,169.95
PWS	1999	74.89	70.72	70.35	91.87	77.42	120.46	112.91	163.21	137.60	136.86	100.04	88.87	1,245.19
PWS	2000	87.52	79.29	85.98	99.70	114.66	110.30	179.47	176.38	159.63	98.14	79.23	89.54	1,359.84
PWS	2001	83.02	76.73	80.68	99.43	112.12	162.68	199.07	203.45	101.50	104.74	99.79	85.60	1,408.81
PWS	2002	83.00	77.25	88.71	108.30	176.41	158.60	129.11	189.44	157.57	102.32	81.06	82.01	1,433.77
PWS	2003	81.87	78.34	85.05	121.35	164.42	138.50	158.75	183.04	123.98	113.66	91.71	98.41	1,439.11
PWS	2004	93.55	86.79	98.62	100.41	121.06	113.83	139.28	170.17	154.40	117.71	91.69	96.25	1,383.75
PWS	2005	101.68	80.68	90.80	110.62	124.20	183.36	183.81	191.89	201.56	147.30	129.95	124.26	1,670.10

Table 7: Tabulation of pumping (million gallons) in 2004 and locations used for numerical model in the Barton Springs segment of the Edwards Aquifer.

State WellNum	System/Owner Name	Class.	DD Long	DD Lat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2004 Total
58-42-816	Stenger Ridgewood Village Water System	PWS	97.7938900	30.2775000	0.65	0.43	0.59	0.66	0.97	0.74	0.96	1.52	1.09	0.74	0.46	0.60	9.41
58-42-821	Steven Carlitz, Kuang Yu Chang and David T. Chang	COM	97.8138900	30.2630600	0.05	0.08	0.08	0.09	0.00	0.12	0.00	0.15	0.00	0.00	0.07	0.05	0.68
58-42-825	Rudy's Country Store	COM	97.8143200	30.2641900	0.13	0.12	0.12	0.13	0.15	0.17	0.22	0.20	0.15	0.19	0.13	0.13	1.83
58-42-8VW	Well #1	COM	97.8152800	30.2652800	0.02	0.02	0.02	0.03	0.12	0.06	0.11	0.23	0.21	0.14	0.01	0.02	0.98
58-42-913	Park Hills Baptist Church	COM	97.7822200	30.2666700	0.02	0.02	0.02	0.02	0.05	0.01	0.01	0.03	0.00	0.02	0.01	0.01	0.23
58-42-9NC	Nature Center	IRR	97.7747200	30.2708300	1.00	1.18	1.19	1.12	1.41	1.34	1.37	1.59	1.59	1.59	1.59	3.25	18.22
58-49-911	Chaparral	PWS	97.8897200	30.1330500	0.10	0.10	0.14	0.11	0.14	0.15	0.15	0.19	0.13	0.10	0.08	0.07	1.46
58-49-915	Chaparral	PWS	97.8848800	30.1387400	0.10	0.10	0.14	0.11	0.14	0.15	0.15	0.19	0.13	0.10	0.08	0.07	1.46
58-49-927	Southwest Territory	PWS	97.8797100	30.1452800	0.68	0.69	0.97	0.78	1.12	1.16	1.43	1.78	1.48	0.64	0.18	0.97	11.87
58-50-122	AAW Oak Hill, Ltd.	COM	97.8382400	30.2383900	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-50-123	New Forest Oaks, Inc.	IRR	97.8634600	30.2325200	0.00	0.00	0.00	0.11	0.16	0.06	0.37	0.38	0.43	0.10	0.01	0.00	1.62
58-50-1NF	New Forest Oaks, Inc.	IRR	97.8575000	30.2322200	0.00	0.00	0.00	0.11	0.16	0.06	0.37	0.38	0.43	0.10	0.01	0.00	1.62
58-50-215	City Of Sunset Valley	PWS	97.8103500	30.2276400	0.82	0.70	1.05	0.86	1.43	0.18	1.65	2.65	2.57	1.49	0.94	0.82	15.17
58-50-231	Austin United Capital Soccer Club	IRR	97.7919500	30.2094400	0.18	0.01	0.10	0.04	0.43	0.00	0.50	2.60	1.37	0.17	0.28	0.18	5.87
58-50-414	Johnson Lee V.	IRR	97.8388900	30.1802800	0.00	0.00	0.03	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.05
58-50-5A	Neuro Institute of Austin, L.P.	IRR	97.8065100	30.1908400	0.19	0.00	0.25	0.33	0.00	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.90
58-50-704	Marbridge Foundation	PWS	97.8555500	30.1369400	1.22	1.12	1.19	1.05	1.40	1.22	1.62	1.80	1.54	1.28	0.84	0.77	15.05
58-50-718	Bear Creek Park	PWS	97.8454200	30.1367000	0.55	0.52	0.50	0.49	0.65	0.64	0.92	0.94	0.90	0.45	0.51	0.37	7.45
58-50-723	Harold And Al Schuster Hicks	PWS	97.8344400	30.1486100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-50-724	Manchaca Volunteer Fire Department	COM	97.8380600	30.1411100	0.05	0.06	0.07	0.05	0.08	0.06	0.05	0.06	0.06	0.07	0.06	0.06	0.75
58-50-726	Diamondscape	COM	97.8333400	30.1525000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
58-50-727	Marbridge Foundation	PWS	97.8572200	30.1380600	0.26	0.24	0.25	0.23	0.30	0.26	0.35	0.39	0.33	0.27	0.18	0.17	3.22
58-50-728	Marbridge Foundation	PWS	97.8555500	30.1386100	0.26	0.24	0.25	0.23	0.30	0.26	0.35	0.39	0.33	0.27	0.18	0.17	3.22
58-50-729	V.f.w. Post No. 3377	COM	97.8341700	30.1297200	0.01	0.01	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.16
58-50-730	McCoy Corporation	COM	97.8383300	30.1400000	0.00	0.06	0.00	0.00	0.02	0.00	0.00	0.01	0.01	0.00	0.01	0.00	0.10
58-50-731	Shady Hollow Estates Water Company	PWS	97.8587000	30.1529700	2.23	2.19	3.09	2.96	6.27	4.61	6.94	8.58	7.14	3.55	2.91	2.38	52.83

Table 7: Tabulation of pumping (million gallons) in 2004 and locations used for numerical model in the Barton Springs segment of the Edwards Aquifer.

State WellNum	System/Owner Name	Class.	DD Long	DD Lat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2004 Total
58-50-732	St. John's Presbyterian Church	PWS	97.8480100	30.1430500	0.01	0.00	0.01	0.00	0.03	0.01	0.02	0.02	0.01	0.01	0.00	0.01	0.13
58-50-735	Randolph Austin Company	ABD	97.8500000	30.1347200	0.02	0.03	0.03	0.03	0.03	0.03	0.03	0.02	0.04	0.03	0.03	0.01	0.34
58-50-737	Manchaca Bible Fellowship Baptist Church	PWS	97.8338900	30.1361100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
58-50-738	Sac-n-pac Company	COM	97.8530600	30.1347200	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.04	0.02	0.20
58-50-744	Bear Creek Office Park	COM	97.8427800	30.1422200	0.01	0.01	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.13
58-50-7AD	Associated Drilling	PWS	97.8352800	30.1286100	0.05	0.11	0.05	0.04	0.00	0.15	0.08	0.25	0.05	0.09	0.06	0.05	1.00
58-50-7MO	Manchaca Optimist Youth Sports Complex	IRR	97.8550000	30.1319400	0.00	0.00	0.38	0.00	0.20	0.00	0.14	0.80	0.00	0.00	0.32	0.00	1.84
58-50-7PC	The Porter Co. Mechanical Contractors	COM	97.8505300	30.1360500	0.01	0.01	0.01	0.09	0.02	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.22
58-50-830	Slaughter Creek Acres Water Supply	PWS	97.8180800	30.1606900	0.52	0.47	0.56	0.55	0.77	0.70	0.96	1.04	0.93	0.65	0.62	0.63	8.40
58-50-835	Onion Creek Country Club	IRR	97.8130800	30.1467100	0.00	0.75	3.38	7.04	9.76	11.65	13.71	14.95	9.54	8.01	3.22	0.75	82.77
58-50-838	Village Of San Leanna	PWS	97.8210400	30.1391500	0.52	0.45	0.51	0.59	0.83	0.72	1.00	1.40	1.23	0.71	0.48	0.51	8.95
58-50-840	St. Albans Episcopal Church	COM	97.7983300	30.1297200	0.04	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.30
58-50-842	Mooreland	PWS	97.8323500	30.1500500	0.33	0.26	0.40	0.35	0.46	0.46	0.51	0.57	0.68	0.40	0.00	0.39	4.81
58-50-843	Texanna Properties, Inc.	PWS	97.8244500	30.1430500	0.07	0.08	0.09	0.07	0.07	0.09	0.09	0.04	0.13	0.05	0.05	0.09	0.92
58-50-845	Arroyo Doble Water System	PWS	97.8266500	30.1240600	1.29	1.23	1.39	1.40	1.74	1.71	2.27	2.85	2.37	1.51	1.18	1.29	20.22
58-50-846	Creedmoor-maha Water Supply Corporation	PWS	97.8218500	30.1302700	6.72	6.26	6.73	6.83	6.89	7.36	8.22	8.52	8.56	7.35	7.04	7.09	87.56
58-50-849	Creedmoor-maha Water Supply Corporation	PWS	97.8159800	30.1261300	6.72	6.26	6.73	6.83	6.89	7.36	8.22	8.52	8.56	7.35	7.04	7.09	87.56
58-50-852	J. D. Malone	PWS	97.8183400	30.1616700	0.10	0.07	0.11	0.07	0.12	0.10	0.00	0.22	0.00	0.68	0.11	0.16	1.74
58-50-855	Village Of San Leanna	PWS	97.8192700	30.1462400	1.05	0.91	1.03	1.19	1.68	1.46	2.04	2.85	2.50	1.44	0.98	1.04	18.17
58-50-858	Twin Creek Park Water Supply Co.	PWS	97.8223300	30.1316900	0.72	0.59	0.42	0.63	0.65	0.65	0.70	0.56	0.60	0.72	0.36	0.45	7.06
58-50-859	Onion Creek Memorial Park, Inc.	IRR	97.8241700	30.1430500	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-50-860	Gilbert C Johnson	IRR	97.8216600	30.1536100	0.21	0.11	0.29	0.23	0.68	0.45	0.82	0.77	0.52	0.57	0.28	0.21	5.14
58-50-861	Hunt Enterprises	IRR	97.8313900	30.1444400	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.37
58-50-862	Kretchmar Alta Mae	IRR	97.8241700	30.1383300	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-50-8AS	Whittington, Keith And Kelly	PWS	97.8305600	30.1400000	0.01	0.01	0.00	0.02	0.01	0.01	0.01	0.03	0.02	0.01	0.01	0.01	0.13
58-50-8KL	Laurie Lindholm	DOM	97.8228500	30.1578300	0.00	0.00	0.04	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.16

Table 7: Tabulation of pumping (million gallons) in 2004 and locations used for numerical model in the Barton Springs segment of the Edwards Aquifer.

State WellNum	System/Owner Name	Class.	DD Long	DD Lat	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2004 Total
58-50-8LB	Linda Bell	DOM	97.8283900	30.1390700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.06
58-50-8RRB	Railroad Bar-B-Que	COM	97.8305600	30.1400000	0.04	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.29
58-57-305	Beacon Hill	COM	97.8922200	30.0991700	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-57-307	Dahlstrom	PWS	97.8822900	30.0998600	0.79	0.29	0.20	0.39	0.60	0.57	0.51	0.64	0.62	0.48	0.35	0.46	5.90
58-57-308	Huntington Utility Company, L.L.C.	PWS	97.8783700	30.1095600	0.88	0.69	0.85	0.86	1.23	1.06	1.65	1.94	1.36	0.93	0.79	0.82	13.04
58-57-312	Rocket Water Company	PWS	97.9033400	30.1061100	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-57-314	Elliott Ranch	PWS	97.8950100	30.1157100	0.74	0.65	0.88	0.97	1.61	1.29	1.69	2.70	2.00	1.66	1.20	0.73	16.12
58-57-315	Southern Hills Church of Christ	COM	97.8836100	30.0966700	0.03	0.00	0.01	0.00	0.02	0.00	0.03	0.03	0.02	0.01	0.00	0.00	0.16
58-57-3H	Hays	COM	97.8838900	30.1130600	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58-57-3Z4	Elliott Ranch	PWS	97.8936900	30.1167200	0.74	0.65	0.88	0.97	1.61	1.29	1.69	2.70	2.00	1.66	1.20	0.73	16.12
58-57-5J2	The Inn Above Onion Creek	COM	97.9356700	30.0495000	0.05	0.00	0.07	0.06	0.07	0.05	0.10	0.12	0.10	0.05	0.05	0.06	0.79
58-57-5T4	Twc Enterprises, Inc.	PWS	97.9211200	30.0585300	0.38	0.29	0.39	0.41	0.59	0.53	0.93	0.97	0.90	0.57	0.38	0.47	6.82
58-57-606	Barton Properties	PWS	97.8836700	30.0477300	0.02	0.02	0.03	0.03	0.03	0.05	0.07	0.04	0.04	0.04	0.02	0.01	0.40
58-57-607	Church Of Christ At Buda/Kyle	PWS	97.8852800	30.0447200	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.14
58-57-608	Twc Enterprises, Inc.	PWS	97.9166000	30.0804500	0.38	0.29	0.39	0.41	0.59	0.53	0.93	0.97	0.90	0.57	0.38	0.47	6.82
58-57-6M3	Twc Enterprises, Inc.	PWS	97.9161500	30.0721400	0.38	0.29	0.39	0.41	0.59	0.53	0.93	0.97	0.90	0.57	0.38	0.47	6.82
58-57-910	Mountain City Oaks Water System	PWS	97.8991700	30.0350000	1.79	1.50	1.52	2.00	2.04	2.50	3.08	3.71	2.96	2.10	1.73	1.86	26.78
58-57-913	Hays High School	PWS	97.8911100	30.0338900	1.82	1.20	1.27	1.43	2.21	1.43	1.08	2.03	2.64	2.08	1.50	1.25	19.96
58-57-9N1	City Of Kyle	PWS	97.8791700	30.0291700	9.69	14.33	12.83	15.37	14.84	13.46	10.38	15.57	16.12	15.82	10.45	12.33	161.21
58-58-102	Cimarron Park Water Company, Inc.	PWS	97.8543400	30.1045900	1.35	1.13	1.34	1.45	1.95	1.74	2.71	3.65	2.68	1.77	1.32	1.28	22.38
58-58-106	City Of Buda	PWS	97.8425000	30.0847200	3.27	3.00	3.43	3.12	3.71	3.40	4.67	5.61	5.75	4.04	3.06	3.27	46.33
58-58-107	Leisurewoods Water Company	PWS	97.8660400	30.1088900	0.57	0.55	0.56	0.60	0.76	0.70	1.20	1.41	1.07	0.73	0.49	0.56	9.21
58-58-111	City Of Hays Water Department	PWS	97.8722600	30.1231900	0.28	0.20	0.30	0.27	0.39	0.31	0.41	0.68	0.43	0.35	0.33	0.22	4.16
58-58-114	Cimarron Park Water Company, Inc.	PWS	97.8627100	30.1150300	4.04	3.39	4.03	4.36	5.86	5.23	8.13	10.94	8.04	5.32	3.97	3.83	67.14
58-58-115	City Of Hays Water Department	PWS	97.8738900	30.1244400	0.28	0.20	0.30	0.27	0.39	0.31	0.41	0.68	0.43	0.35	0.33	0.22	4.16
58-58-117	Twin Oaks Ranch Church Camp	PWS	97.8436100	30.0933300	0.05	0.01	0.04	0.06	0.02	0.08	0.07	0.07	0.03	0.03	0.05	0.03	0.54

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58-58-118	Leisurewoods Water Company	PWS	97.8656100	30.1138600	0.57	0.55	0.56	0.60	0.76	0.70	1.20	1.41	1.07	0.73	0.49	0.56	9.21
58-58-119	Leisurewoods Water Company	PWS	97.8693000	30.1106500	0.57	0.55	0.56	0.60	0.76	0.70	1.20	1.41	1.07	0.73	0.49	0.56	9.21
58-58-120	Leisurewoods Water Company	PWS	97.8625200	30.1112700	0.57	0.55	0.56	0.60	0.76	0.70	1.20	1.41	1.07	0.73	0.49	0.56	9.21
58-58-121	Leisurewoods Water Company	PWS	97.8623600	30.1050300	1.53	1.47	1.50	1.61	2.01	1.86	3.20	3.77	2.86	1.94	1.31	1.48	24.55
58-58-122	Twin Oaks Ranch Church Camp	COM	97.8436100	30.0947200	0.05	0.01	0.04	0.06	0.02	0.08	0.07	0.07	0.03	0.03	0.05	0.03	0.54
58-58-125	Sosebee E.Y.	PWS	97.8738900	30.0836100	0.02	0.01	0.01	0.01	0.00	0.07	0.01	0.02	0.01	0.02	0.02	0.01	0.22
58-58-126	Onion Creek Kennels	COM	97.8702800	30.1036100	0.03	0.01	0.02	0.02	0.03	0.01	0.07	0.03	0.04	0.01	0.03	0.02	0.32
58-58-127	Hays Hills Baptist Church	PWS	97.8736100	30.1175000	0.03	0.03	0.04	0.03	0.04	0.03	0.03	0.02	0.02	0.02	0.02	0.02	0.32
58-58-1JS	Joe Sandoval	DOM	97.8726700	30.1057800	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.01	0.00	0.04
58-58-1MT	Michael Thames Custom Homes	COM	97.8566700	30.1000000	0.01	0.01	0.01	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.06
58-58-202	Mystic Oak Water Co-op	PWS	97.8137400	30.1245900	0.22	0.31	0.34	0.24	0.48	0.34	0.57	0.78	0.36	0.18	0.33	0.12	4.28
58-58-207	Onion Creek Meadows	PWS	97.8207000	30.1202200	0.34	0.35	0.45	0.44	0.47	0.41	0.52	0.66	0.70	0.40	0.47	0.37	5.56
58-58-209	Onion Creek Meadows	PWS	97.8161200	30.1193400	1.35	1.40	1.80	1.77	1.86	1.62	2.08	2.63	2.79	1.60	1.86	1.49	22.26
58-58-215	Arroyo Doble Water System	PWS	97.8263900	30.1225000	1.29	1.23	1.39	1.40	1.74	1.71	2.27	2.85	2.37	1.51	1.18	1.29	20.22
58-58-220	Thomas Weatherford	ABD	97.8144500	30.0933300	0.08	0.04	0.10	0.14	0.19	0.22	0.29	0.28	0.34	0.25	0.20	0.32	2.45
58-58-403	City Of Buda	PWS	97.8427000	30.0818900	3.27	3.00	3.43	3.12	3.71	3.40	4.67	5.61	5.75	4.04	3.06	3.27	46.33
58-58-406	Spectrum	IND	97.8560200	30.0620300	0.03	0.02	0.02	0.13	0.03	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.35
58-58-407	Plant	IND	97.8555300	30.0534500	2.07	1.81	2.36	2.19	1.92	2.53	3.36	2.46	3.10	2.65	2.21	2.69	29.35
58-58-409	Monarch Utilities (Tecon)	PWS	97.8344400	30.0766700	1.06	0.93	1.03	1.03	1.25	1.44	1.69	1.69	1.59	1.37	1.18	1.35	15.61
58-58-410	Shoal Creek Properties	COM	97.8388200	30.0668300	0.20	0.00	0.00	0.00	0.00	0.00	0.38	0.53	0.00	0.00	0.46	0.24	1.82
58-58-413	City Of Buda	PWS	97.8354900	30.0705100	3.27	3.00	3.43	3.12	3.71	3.40	4.67	5.61	5.75	4.04	3.06	3.27	46.33
58-58-414	Centex Materials, LP.	IND	97.8627500	30.0678100	7.81	5.62	8.12	7.96	8.05	7.29	10.17	12.13	9.66	8.26	6.90	9.84	101.82
58-58-415	Centex Materials, LP.	IND	97.8650000	30.0708300	0.87	0.62	0.90	0.88	0.89	0.81	1.13	1.35	1.07	0.92	0.77	1.09	11.31
58-58-417	Hays County Youth Athletic Association	PWS	97.8674800	30.0472300	0.15	0.11	0.09	0.34	0.06	0.16	0.32	0.42	0.49	0.33	0.10	0.61	3.17
58-58-418	Howe	IND	97.8582500	30.0712900	0.04	0.04	0.03	0.04	0.06	0.04	0.07	0.12	0.11	0.03	0.03	0.06	0.66
58-58-423	Comal Tackle Company	IND	97.8591200	30.0678100	0.04	0.04	0.05	0.06	0.05	0.05	0.06	0.05	0.07	0.07	0.05	0.04	0.63

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58-58-426	Lowden Bob	PWS	97.8698700	30.0800000	0.04	0.03	0.03	0.04	0.04	0.04	0.04	0.03	0.04	0.03	0.03	0.04	0.44
58-58-4GF	Goforth Water Supply Company	PWS	97.8501700	30.0469100	8.03	6.04	8.34	7.66	9.23	8.63	9.47	11.56	10.89	8.68	6.57	7.14	102.24
58-58-4LC	Painted Horse Pavilion	COM	97.8736100	30.0708300	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02
58-58-4MC	Manchaca Baptist Church	COM	97.8358300	30.1394400	0.00	0.45	0.02	0.03	0.04	0.00	0.06	0.05	0.02	0.01	0.01	0.03	0.71
58-58-501	Goforth Water Supply Company	PWS	97.8305600	30.0783300	8.03	6.04	8.34	7.66	9.23	8.63	9.47	11.56	10.89	8.68	6.57	7.14	102.24
58-58-509	Chatteff Controls, Inc.	IND	97.8300000	30.0761100	0.10	0.09	0.10	0.11	0.13	0.13	0.12	0.19	0.14	0.12	0.10	0.09	1.40
58-58-510	Crestview R.V.	PWS	97.8275800	30.0793800	0.00	0.08	0.12	0.08	0.08	0.09	0.07	0.15	0.12	0.09	0.12	0.18	1.18
58-58-708	Monarch Utilities (Tecon)	PWS	97.8522900	30.0421400	9.52	8.40	9.26	9.27	11.26	12.95	15.17	15.25	14.35	12.30	10.63	12.12	140.49

Table 8: Tabulation of calendar year pumping (million gallons) from the Trinity Aquifer in the District (1988-2005)

Year	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Million gallons	17.37	39.96	32.82	30.66	18.57	42.82	37.35	36.45	36.56	45.74	46.16

Year	1999	2000	2001	2002	2003	2004	2005
Million gallons	48.72	48.06	43.90	38.86	49.02	38.92	44.37

Table 9: Synthetic monthly pumpage (million gallons) in the Barton Springs segment of the Edwards Aquifer, 1947-1987.

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1987	78.55	71.53	61.24	86.11	93.83	121.72	121.01	119.65	111.00	102.32	84.27	81.25	1,164.00
1986	76.45	69.61	59.69	83.74	91.23	118.21	117.53	116.21	107.83	99.45	81.97	79.05	1,100.98
1985	74.34	67.69	58.14	81.38	88.63	114.70	114.05	112.78	104.67	96.57	79.66	76.86	1,069.47
1984	72.23	65.77	56.59	79.01	86.03	111.18	110.58	109.35	101.50	93.70	77.36	74.66	1,037.96
1983	70.12	63.84	55.05	76.65	83.43	107.67	107.10	105.91	98.33	90.83	75.05	72.47	1,006.45
1982	68.02	61.92	53.50	74.28	80.83	104.16	103.62	102.48	95.16	87.95	72.75	70.27	974.94
1981	65.91	60.00	51.95	71.92	78.23	100.64	100.15	99.05	92.00	85.08	70.44	68.08	943.43
1980	63.80	58.08	50.40	69.55	75.63	97.13	96.67	95.61	88.83	82.20	68.13	65.89	911.92
1979	61.69	56.15	48.85	67.19	73.03	93.61	93.19	92.18	85.66	79.33	65.83	63.69	880.41
1978	59.59	54.23	47.30	64.82	70.43	90.10	89.71	88.75	82.49	76.45	63.52	61.50	848.90
1977	57.48	52.31	45.75	62.46	67.83	86.59	86.24	85.32	79.32	73.58	61.22	59.30	817.39
1976	55.37	50.39	44.20	60.09	65.23	83.07	82.76	81.88	76.16	70.71	58.91	57.11	785.88
1975	53.26	48.47	42.65	57.73	62.63	79.56	79.28	78.45	72.99	67.83	56.61	54.91	754.37
1974	51.16	46.54	41.10	55.36	60.03	76.04	75.81	75.02	69.82	64.96	54.30	52.72	722.86
1973	49.05	44.62	39.56	53.00	57.43	72.53	72.33	71.58	66.65	62.08	51.99	50.53	691.35
1972	46.94	42.70	38.01	50.63	54.83	69.02	68.85	68.15	63.48	59.21	49.69	48.33	659.84
1971	44.83	40.78	36.46	48.27	52.23	65.50	65.38	64.72	60.32	56.34	47.38	46.14	628.33
1970	42.73	38.85	34.91	45.90	49.63	61.99	61.90	61.28	57.15	53.46	45.08	43.94	596.82
1969	40.62	36.93	33.36	43.54	47.03	58.48	58.42	57.85	53.98	50.59	42.77	41.75	565.31
1968	38.51	35.01	31.81	41.17	44.43	54.96	54.95	54.42	50.81	47.71	40.47	39.55	533.80
1967	36.40	33.09	30.26	38.81	41.83	51.45	51.47	50.99	47.64	44.84	38.16	37.36	502.29
1966	34.30	31.17	28.71	36.44	39.23	47.93	47.99	47.55	44.48	41.96	35.85	35.17	470.78
1965	32.19	29.24	27.16	34.08	36.63	44.42	44.51	44.12	41.31	39.09	33.55	32.97	439.27
1964	30.08	27.32	25.61	31.72	34.03	40.91	41.04	40.69	38.14	36.22	31.24	30.78	407.76

Table 9: Synthetic monthly pumpage (million gallons) in the Barton Springs segment of the Edwards Aquifer, 1947-1987.

Calendar Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1963	27.97	25.40	24.07	29.35	31.42	37.39	37.56	37.25	34.97	33.34	28.94	28.58	376.25
1962	25.87	23.48	22.52	26.99	28.82	33.88	34.08	33.82	31.80	30.47	26.63	26.39	344.75
1961	23.76	21.55	20.97	24.62	26.22	30.37	30.61	30.39	28.64	27.59	24.32	24.19	313.24
1960	21.65	19.63	19.42	22.26	23.62	26.85	27.13	26.95	25.47	24.72	22.02	22.00	281.73
1959	19.54	17.71	17.87	19.89	21.02	23.34	23.65	23.52	22.30	21.85	19.71	19.81	250.22
1958	17.44	15.79	16.32	17.53	18.42	19.82	20.18	20.09	19.13	18.97	17.41	17.61	218.71
1957	15.33	13.87	14.77	15.16	15.82	16.31	16.70	16.66	15.96	16.10	15.10	15.42	187.20
1956	13.22	11.94	13.22	12.80	13.22	12.80	13.22	13.22	12.80	13.22	12.80	13.22	155.69
1955	11.12	10.02	11.67	10.43	10.62	9.28	9.75	9.79	9.63	10.35	10.49	11.03	124.18
1954	9.01	8.10	10.12	8.07	8.02	5.77	6.27	6.36	6.46	7.47	8.18	8.83	92.67
1953	6.90	6.18	8.58	5.70	5.42	2.25	2.79	2.92	3.29	4.60	5.88	6.64	61.16
1952	4.79	4.25	7.03	3.34	2.82	2.00	2.00	2.00	2.00	2.00	3.57	4.45	40.25
1951	2.69	2.33	5.48	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.25	28.75
1950	2.00	2.00	3.93	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	25.93
1949	2.00	2.00	2.38	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	24.38
1948	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	24.00
1947	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	24.00

ACKNOWLEDGMENTS

This report is chiefly a product of the District's sustainable yield evaluations (Smith and Hunt, 2004). Data in this report are the culmination of many years of data collection by a variety of District and other agencies. The Texas Water Development Board collected much of the data prior to creation of the District in 1987. Shu Liang (District) developed and originally populated the District databases with historic data from the Texas Water Development Board. Many district employees collected and entered well and pumping data into the District databases including: Shu Liang, Nico Hauwert, Joe Beery, Shannon DeLong, Ron Fieseler, Stefani Campbell, Beckie Morris, Brian Hunt, and Mark Mathis. Kirk Holland created Table 9, a synthetic pumpage data set from 1987 to 1947 that was used for evaluations in the District's Habitat Conservation Plan. Joe Beery created Table 3, a list of 2006 permittees and their wells.

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GLOSSARY

(from District Rules and Bylaws, dated January 2006)

“**Abandoned Well**” - a well that has not been used for a beneficial purpose for at least six consecutive months and/or a well not registered with the District. A well is considered to be in use in the following cases:

1. A non-deteriorated well which contains the casing, pump and pump column in good condition; or
2. A non-deteriorated well which has been capped; or
3. the well is used in the normal course and scope and with the intensity and frequency of other similar users in the general community; or
4. the owner is participating in the Conservation Reserve Program authorized by Sections 1231-1236, Food Security Act of 1985 (16 U.S.C. Sections 3831-3836), or a similar governmental program.

“**Agricultural Well**” - a well providing groundwater for agricultural livestock use or agricultural irrigation use. (A non-exempt well.)

“**Aquifer**” - a geologic formation that will yield water to a well in sufficient quantities to make the production of water from this formation feasible for beneficial use.

“**Artesian Zone**” - a zone where water is confined in an aquifer under pressure so that the water will rise in the well casing or drilled hole above the bottom of the confining bed overlying the aquifer.

“**Bad Water Line**” - the eastern boundary of Edwards Aquifer water in the Barton Springs segment of the Edwards Aquifer characterized by having more than 1,000 milligrams per liter (mg/l) of total dissolved solids.

“**Barton Springs Segment**” - that segment of the Edwards Aquifer which is hydrologically connected to Barton Springs and is the term used to distinguish this segment from the San Antonio segment of the Edwards Aquifer and from the northern Edwards Aquifer.

“**Closed Loop Well**” - a well constructed for circulating water through a continuous length of tubing, generally for earth coupled-heat exchange purposes. See also Earth Coupled Heat Exchange-Closed Loop System. (An exempt well).

“**Commercial Use**” – the use associated with supplying water to properties or establishments, which are in business to build, supply, or sell products, or provide goods, services or repairs and which use water in those processes or used primarily for employee and customer conveniences (i.e. flushing of toilets, sanitary purposes, and limited landscape watering). This includes use in other

business enterprises for which monetary consideration is given or received, which will typically increase water demand compared to typical domestic use.

“Confining Bed” - a body of impermeable or distinctly less permeable material stratigraphically adjacent to one or more aquifers.

“Cubic Feet Per Second” (cfs) - the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second of time. This rate is equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute.

“Discharge” – means the amount of water that leaves an aquifer by natural or artificial means.

“District” - the Barton Springs/Edwards Aquifer Conservation District (BS/EACD).

“Domestic Use”- water used by, and connected to a household for personal needs or for household purposes such as drinking, bathing, heating, cooking, sanitation or cleaning, and landscape irrigation. Ancillary use may include watering of domestic animals.

“Drought” - a shortfall in Edwards Aquifer recharge, generally brought about by below-normal rainfall for an extended period of time that is accompanied by high rates of pumping from the Aquifer, that has the potential for substantial negative impacts to water-supply wells and to endangered species at Barton Springs.

“Edwards Aquifer” - the water-bearing zone comprised of the Edwards and associated limestone formations.

“Exempt Well” - a well may be exempt if it is:

- A. A well that is used solely to supply the domestic use needs of 5 or fewer households and a person who is a member of each household is either the owner of the well, a person related to the owner or a member of the owner’s household within the second degree by consanguinity, or an employee of the owner that is either drilled, completed or equipped so that it is incapable of producing more than 10,000 gallons of groundwater a day on a tract of land larger than 10 acres or;
- B. A well that is used for providing water for livestock or poultry that is either drilled, completed, or equipped so that it is incapable of producing more than 10,000 gallons of groundwater a day on a tract of land larger than 10 acres.

“Fault” - a fracture or fracture zone in a rock or body of rock, along which there has been movement of the geologic formation on one side of the fault plane relative to the other side, parallel to the fracture.

“Fiscal Year” - the business year of the District begins on September 1 of each year and ends on August 31 of the following year.

“Groundwater or Underground Water” - water located beneath the earth's surface but does not include water produced with oil and gas production.

“Industrial Use” – the use of water in the building, production, manufacturing, or alteration of a product or good. This includes the use associated with washing, cleansing, cooling, or heating such goods or products.

“Injection Well” - a well used to inject water or other material into a subsurface formation or into pipe or tubing placed in the formation for the purpose of storage or disposal of the fluid. (An exempt well.) “Injection well” includes:

- (1) an air-conditioning return flow well used to return water that has been used for heating or cooling in a heat pump to the aquifer that supplied the water;
- (2) a cooling water return flow well used to inject water that has been used for cooling;
- (3) a drainage well used to drain surface fluid into a subsurface formation;
- (4) a recharge well used to replenish water in an aquifer;
- (5) a saltwater intrusion barrier well used to inject water into a freshwater aquifer to prevent the intrusion of salt water into fresh water;
- (6) a sand backfill well used to inject a mixture of water and sand, mill tailings, or other solids into subsurface mines; and
- (7) a subsidence control well used to inject fluids into a non-oil-producing or non-gas-producing zone to reduce or eliminate subsidence associated with the overdraft of fresh water.

“Irrigation Use” - the application of water, not associated with agricultural irrigation use, to plants or land in order to promote growth of plants, turf, or trees. Irrigation use includes but is not limited to athletic fields, parks, golf courses, and landscape irrigation not tied to domestic use.

“Karst” - a terrain and topography usually associated with limestone, dolomite, and gypsum formations, characterized by distinctive landforms above and below the surface such as sinkholes, caves, and underground drainages which have developed due to a combination of high rock solubility, well-developed secondary porosity (such as fractures, solution cavities, and caves), the physical structure of the rock, and the presence of an aggressive sub-surface hydrology.

“Monitor Well” - An artificial excavation, generally by drilling, that is constructed by non-governmental entities to measure or monitor the quality, quantity, or movement of substances, elements, chemicals, or fluids beneath the surface of the ground. Included within this definition are environmental soil borings, piezometer wells, observation wells, and recovery wells. (Non-exempt wells). The term shall not include any well that is used in conjunction with the production of oil, gas, coal, lignite, or other minerals.

“Non-Exempt Well” - a well required to obtain a permit for the production of groundwater from within the District and required to report groundwater use.

“Permittee” - a person who is required to obtain a permit from the District.

“Permit” – term used collectively for authorizations issued by the District for well drilling, well modification, groundwater production, or transfers of produced groundwater out of the District.

“Public Water Supply Use” – water used primarily for residential use, but may include commercial, industrial, or other use, and which is sold or distributed to the users by a retail water utility (may include non-profit public corporations or municipalities).

“Pumpage” - all water withdrawn from the ground, measured at the wellhead.

“Recharge Zone” - the area of the aquifer in which water infiltrates the surface and enters permeable rock layers.

“Scientific Monitor Well” – a well used primarily for scientific monitoring of an aquifer, specifically for water-quality sampling and /or taking water-level measurements, by local, state, and federal government entities. (An exempt well.)

“Spring” - a point(s) of natural discharge from an aquifer.

“Sustainable Yield” – the amount of water that can be pumped for beneficial use from the Barton Springs segment of the Edwards Aquifer under a reoccurrence of the drought of record conditions after considering adequate water levels in water wells and degradation of water quality that could result from low water levels and low spring discharge.

“Total Dissolved Solids” (TDS) - a measurement of the quantity of minerals, chemical compounds, elements, or other matter contained in a state of solution by water.

“Trinity Group Aquifer” - includes: the Upper Member of the Glen Rose Formation, known as the Upper Trinity; the Lower Member of the Glen Rose Formation, and the Hensel Sand and Cow Creek Limestone Members of the Travis Peak Formation, known as the Middle Trinity; and the Sligo and Hosston Members of the Travis Peak Formation, known as the Lower Trinity.

APPENDIX

Compact disk containing digital files of figures and tables within the report. In addition, the disk contains: 1) Pumping database 1988 to 2005; and 2) Well database containing basic well information.

Software needed to open digital files include Microsoft Word and Excel, and Adobe Acrobat Reader.