



*Clearwater Underground Water
Conservation District*

District Management Plan

Original Plan Adopted October 24, 2000

(Certified by TWDB February 21, 2001)

Revisions Adopted

December 13, 2005 (Approved by TWDB March 6, 2006)

February 8, 2011 (Approved by TWDB March __, 2011)

TABLE OF CONTENTS

I.	DISTRICT MISSION	3
II.	PURPOSE OF THE MANAGEMENT PLAN	3
III.	DISTRICT INFORMATION	3
	A. Creation.....	3
	B. Directors.....	5
	C. Authority	5
	D. Location and Extent	5
	E. Topography and Drainage.....	5
	F. Groundwater Resources of Bell County	5
IV.	STATEMENT OF GUIDING PRINCIPLES	7
V.	CRITERIA FOR PLAN APPROVAL	7
	A. Planning Horizon	7
	B. Board Resolution	7
	C. Plan Adoption	7
	D. Coordination with Surface Water Management Entities	8
VI.	ESTIMATES OF TECHNICAL INFORMATION REQUIRED BY	
	TWC § 36.1071 / 31TAC 356.5	8
	A. Managed Available Groundwater based on the Desired Future Condition of	
	Aquifers in the District.....	8
	1. Edwards (BFZ) Aquifer	8
	2. Trinity Aquifer	9
	B. Amount of Groundwater Being Used Within the District	10
	C. Annual Amount of Recharge From Precipitation to the Groundwater	
	Resources within the District.....	13
	1. Edwards (BFZ) Aquifer	13
	2. Trinity Aquifer	13
	D. Annual Volume of Discharge from the Aquifer to Springs and Surface	
	Water Bodies.....	13
	1. Edwards (BFZ) Aquifer	13
	2. Trinity Aquifer	13
	E. Annual Volume of Flow Into and Out of the District within each Aquifer	
	and Between Aquifers in the District.....	14
	1. Edwards (BFZ) Aquifer	14
	2. Trinity Aquifer	14
	F. Projected Surface Water Supply in the District	14
	G. Projected Total Demand for Water in the District	15

VII.	WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES	17
A.	Water Shortages	17
B.	Water Surplus.....	18
VIII.	MANAGEMENT OF GROUNDWATER SUPPLIES	20
IX.	ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION	21
X.	METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS	22
XI.	GOALS, MANAGEMENT OBJECTIVES AND PERFORMANCE STANDARDS	22
A.	Providing Efficient Use of Groundwater	22
B.	Controlling and Preventing Waste of Groundwater.....	23
C.	Addressing Conjunctive Surface Water Management Issues	23
D.	Addressing Natural Resource Issues.....	23
E.	Addressing Drought Conditions	24
F.	Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement and Brush Control.....	24
G.	Addressing Desired Future Conditions of the Groundwater Resources	25
XII.	MANAGEMENT GOALS DETERMINED NOT-APPLICABLE	26
A.	Controlling and Preventing Subsidence.....	26
B.	Precipitation Enhancement.....	26
APPENDICES & EXHIBITS		
Appendix A	Groundwater Resources of Bell County	27
Appendix B	District Resolution Adopting Management Plan	30
Appendix C	Public Notice of Hearing	32
Appendix D	Letter to Surface Water Management Entities.....	33
Appendix E	Map of Groundwater Management Areas in Texas.....	35
Exhibit A	Clearwater Underground Water Conservation District Boundary.....	4
Exhibit B	Major Aquifers in Bell County	6
Exhibit C	Estimates of the Annual Amount of Groundwater Being Used in Bell County in Acre-Feet per Year	11
Exhibit D	Total Projected Bell County Surface Water Supplies.....	15
Exhibit E	Total Projected Bell County Water Demand	16
Exhibit F	Bell County Population and Water Demand Projections.....	16
Exhibit G	Identified Water Needs	19
Exhibit H	Recommended Water Management Strategies	20
Exhibit I	Geologic and Hydrologic Units of Bell County	29

I. DISTRICT MISSION

The mission of the Clearwater Underground Water Conservation District (District) is to develop and implement an efficient, economical and environmentally sound groundwater management program to protect and enhance the water resources of the District.

II. PURPOSE OF THE MANAGEMENT PLAN

Senate Bill 1 (SB 1), enacted by the 75th Texas Legislature in 1997, and Senate Bill 2 (SB 2), enacted by the 77th Texas Legislature in 2001, established a comprehensive statewide planning process and the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas. These bills required all underground water conservation districts to develop a management plan which defines the water needs and supply within each district and the goals each district will use to manage the underground water in order to meet their needs. In addition, the 79th Texas Legislature enacted HB 1763 in 2005 that requires joint planning among districts that are in the same Groundwater Management Area (GMA). These districts must establish the desired future conditions of the aquifers within their respective GMAs. Through this process, the districts will submit the desired future conditions to the executive administrator of the Texas Water Development Board (TWDB) who will provide each district with the managed available groundwater in the management area based on the desired future conditions of the aquifers in the area. Technical information, such as the desired future conditions of the aquifers within the District's jurisdiction and the amount of managed available groundwater from such aquifers is required to be included in the District's management plan and will guide the District's regulatory and management policies.

The District's management plan satisfies the requirements of SB 1, SB 2, HB 1763, the statutory requirements of Texas Water Code (TWC) Chapter 36, and the rules and requirements of the TWDB.

III. DISTRICT INFORMATION

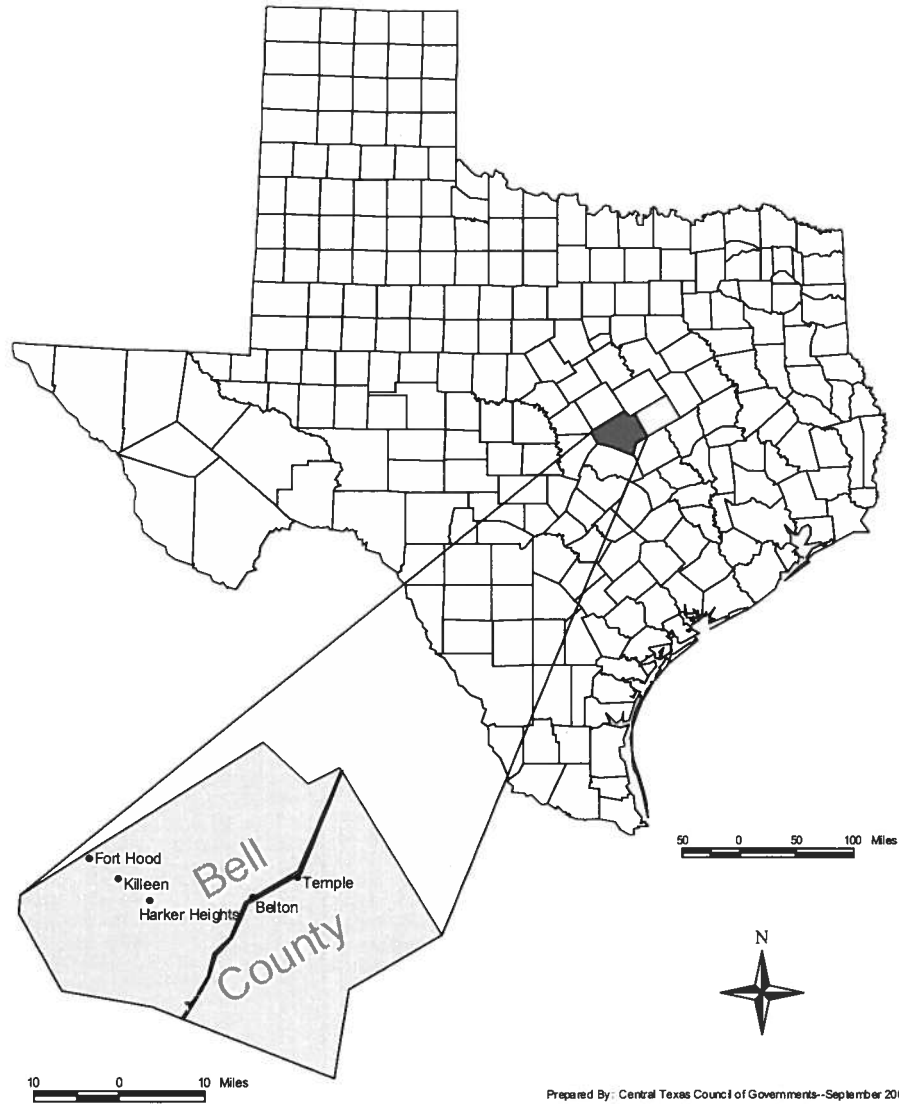
A. Creation

Creation of the District was authorized in 1989 by the 71st Texas Legislature under HB 3172. The citizens of Bell County confirmed creation of the District by an election held on August 21, 1999.

The District was formed to protect the underground water resources for the citizens of Bell County. Beyond its enabling legislation, the District is governed primarily by the provisions of Chapter 36 of the Texas Water Code, the District's Management Plan, and the District Rules.

Exhibit A

**CLEARWATER UNDERGROUND WATER
CONSERVATION DISTRICT BOUNDARY**



Prepared By: Central Texas Council of Governments--September 2000

B. Directors

The Board of Directors consists of five members. These five directors are elected by the voters of Bell County and serve a four year term. The District observes the same precincts as the Bell County Commissioners—four precincts with one at-large position. Director terms are staggered with a two year interval. Directors from Precincts 1 and 3 serve the same term while directors from Precincts 2, 4 and the at-large position serve the same term. Elections are held in November in even numbered years.

C. Authority

The District is governed primarily by the provisions of TWC Chapter 36 and 31 Texas Administrative Code (TAC) Chapter 356. The District has the power and authority to undertake various hydrogeological studies, to adopt a management plan, to establish a program for the permitting of certain water wells, and to implement programs to achieve its statutory mandates. The District has rule-making authority to implement its policies and procedures and to help ensure the management of the groundwater resources of Bell County.

D. Location and Extent

The jurisdiction of the District includes all territory located within Bell County (Exhibit A). This area encompasses approximately 1,055 square miles. The district is bounded by McLennan County to the north, Falls and Milam Counties to the east, Williamson County to the south, and Burnet, Lampasas and Coryell Counties to the west. Bell County has a vibrant economy dominated by the military, medical, manufacturing and agricultural communities. Based on the 2002 Census of Agriculture, approximately 450,923 of Bell County's 675,200 acres, or 66.8% of this area, is farmland.

E. Topography and Drainage

Bell County is divided into two separate ecological regions by the Balcones Escarpment, which runs from the southeast part of the county to the northwest. The region east of the Balcones Escarpment is the Blackland Prairie while the Grand Prairie is located to the west.

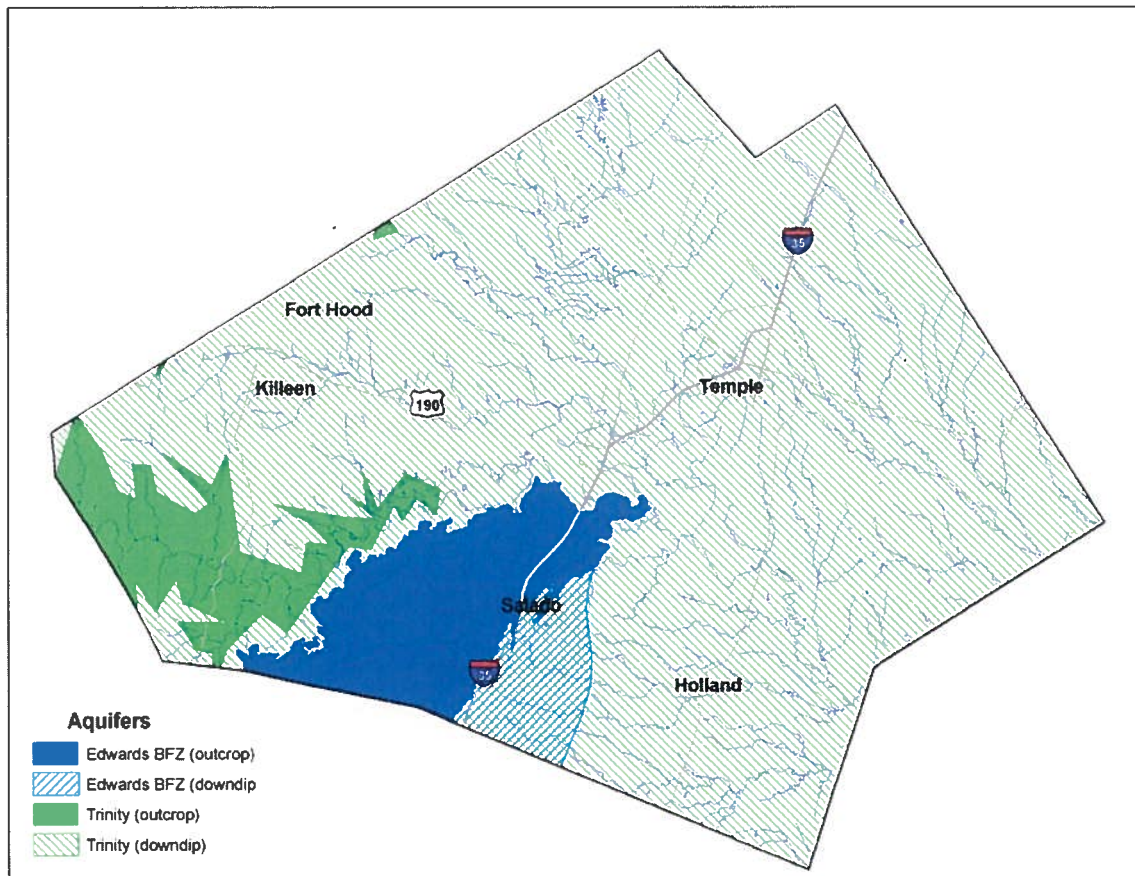
In the Grand Prairie area drainage flows to the Little River and its tributaries. The Leon and Lampasas Rivers and Salado Creek converge at Three Forks.

F. Groundwater Resources of Bell County

Bell County enjoys a variety of groundwater resources. The two primary sources of groundwater in Bell County are the Edwards Balcones Fault Zone (BFZ) aquifer and the Trinity aquifer. These aquifers are recognized as major aquifers by the Texas Water

Development Board. The Edwards aquifer is the source of Salado Springs and is the primary source of water supply for the City of Salado. The Trinity aquifer consists of three distinct subdivisions. It is the primary source of groundwater in much of western Bell County. The deepest subdivision of the Trinity aquifer also serves or has served the Cities of Rogers, Holland and Bartlett in eastern Bell County. The portion of Bell County east of IH-35 also has a number of groundwater sources that are not widely recognized as aquifers outside of the County but are of vital importance. Approximately 40 percent of the wells registered with the District are located in eastern Bell County and produce water from alluvium, the Lake Waco Formation (Fm), the Kemp Fm, the Ozan Fm, the Pecan Gap Fm, the Austin Chalk or the Buda Limestone. Additionally there are wells which produce water from the Edwards Fm and associated limestones outside of the recognized limits of the Edwards (BFZ) aquifer which are recognized by CUWCD as producing water from the Edwards Equivalent aquifer. See Appendix A for a more detailed discussion of Bell County's groundwater resources.

Exhibit B -- Major Aquifers in Bell County



IV. STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of Bell County and the Central Texas region are of vital importance. The preservation of this most valuable resource can be managed in a prudent and cost effective manner through education, cooperation and developing a comprehensive understanding of the aquifers. The greatest threat to the District in achieving its stated mission is the inappropriate management of its groundwater resources, based on a lack of understanding of local conditions. The District's management plan is intended to serve as a tool to focus the thoughts and actions of those given the responsibility for the execution of the District's activities.

V. CRITERIA FOR PLAN APPROVAL

A. Planning Horizon

The time period for this plan is five years from the date of approval by the executive administrator or, if appealed, on approval by the TWDB. The original management plan was certified by the TWDB in February 2001. The District's Board of Directors adopted a revised groundwater management plan on December 13, 2005 and approved by TWDB in March 2006. This plan is being submitted as part of the five-year review and re-adoption process as required by TWC 36.1072(e). This management plan will remain in effect until a revised management plan is approved by the executive administrator or the TWDB. The Plan shall be reviewed (annually), and updated and readopted in accordance with the requirements of the Texas Water Code.

B. Board Resolution

Certified copy of the Clearwater Underground Water Conservation District resolution adopting the plan 31 TAC §356.6(a)(2)

A certified copy of the Clearwater Underground Water Conservation District resolution adopting the plan is located in Appendix B - District Resolution.

C. Plan Adoption

Evidence that the plan was adopted after notice and hearing 31 TAC §356.6(a)(3)

Public notices documenting that the plan was adopted following appropriate public meetings and hearings are located in Appendix C – Notice of Meetings.

D. Coordination with Surface Water Management Entities

Evidence that following notice and hearing the District coordinated in the development of its management plan with surface water management entities. TWC 36.1071(a)

A letter transmitting a copy of this plan to surface water management entities is located in Appendix D – Letter to Surface Water Management Entities.

VI. ESTIMATES OF TECHNICAL INFORMATION REQUIRED BY TWC § 36.1071 / 31TAC 356.5

A. Managed available groundwater in the district based on the desired future condition established under TWC 36.108—TWC § 36.10701(e)(3)(A)

Managed available groundwater is defined in TWC §36.001 as “the amount of water that may be permitted by a district for beneficial use in accordance with the desired future condition of the aquifer.” The desired future condition of the aquifer may only be determined through joint planning with other groundwater conservation districts (GCDs) in the same groundwater management area (GMA) as required by the 79th Legislature with the passage of HB 1763 into law. The District is located in GMA 8. The GCDs of GMA 8 have completed the joint planning process to determine the desired future condition of the aquifers in the GMA.

To determine the desired future conditions, the District conducted a series of simulations using the TWDB’s Groundwater Availability Models (GAMs) for the Northern Edwards (BFZ) and the Northern Trinity/Woodbine aquifers. Each series of GAM simulations was conducted by iteratively applying varying amounts of simulated groundwater pumping from the aquifer over a predictive period that included a simulated repeat of the drought of record. Pumping was increased, until the amount of pumping that could be sustained by the aquifer without impairing the aquifer conditions selected for consideration as the indicator of the aquifer desired future condition was identified.

See Appendix E for a map of the GMA boundaries.

1. Edwards (BFZ) Aquifer

a. Desired Future Conditions

The desired future condition of the Edwards (BFZ) aquifer is based on maintaining Salado Spring discharge into Salado Creek during a repeat of conditions similar to the 1950’s drought of record. Under the drought of record conditions, a spring discharge of 200 acre-feet per month is preferred and 100 acre-feet per month is the minimum acceptable spring flow.

b. Managed Available Groundwater

The managed available groundwater value for the Edwards (BFZ) aquifer in Bell County, as given in TWDB GAM Run 08-10mag, is 6,469 acre-feet per year, and is based on the desired future condition discussed above. CUWCD estimates that

by year 2050, exempt use of the Edwards (BFZ) aquifer may reach approximately 825 acre-feet per year and that volume of water is allocated for exempt well users on an annual basis. This leaves approximately **5,644 acre-feet per year as the volume of groundwater available for permitting in the Edwards (BFZ) aquifer.**

2. Trinity Aquifer

a. Desired Future Conditions

There are three recognized subdivisions in the Trinity aquifer; the Upper, Middle and Lower Trinity aquifers. In Bell County the three subdivisions of the Trinity aquifer are made up of several geologic units. The geologic units are: the Paluxy Sand; the Glen Rose Limestone and; the Hensell Sand and Hosston Conglomerate of the Travis Peak Formation. GMA-8 developed a desired future condition for each of the water-bearing geologic units which make up the Trinity aquifer in Bell County. The desired future conditions for the several water-bearing units describe the amount of water-level draw down which may occur after 50 years when the draw down is averaged across the area of occurrence of the water bearing unit in the District. The amount of draw down described in the desired future conditions is indexed to year 2000 water levels.

- From estimated year 2000 conditions, the average draw down of the Paluxy aquifer should not exceed approximately 134 feet after 50 years.
- From estimated year 2000 conditions, the average draw down of the Glen Rose aquifer should not exceed approximately 155 feet after 50 years.
- From estimated year 2000 conditions, the average draw down of the Hensell aquifer should not exceed approximately 286 feet after 50 years.
- From estimated year 2000 conditions, the average draw down of the Hosston aquifer should not exceed approximately 319 feet after 50 years.

For the purpose of managing groundwater in the District, CUWCD groups the water-bearing geologic units into the three Trinity aquifer subdivisions as follows: the Upper Trinity aquifer (Paluxy Sand + Glen Rose Limestone); the Middle Trinity aquifer (Hensell Sand); and the Lower Trinity aquifer (Hosston Conglomerate).

b. Managed Available Groundwater

The total of managed available groundwater values for the Trinity aquifer in Bell County is 7,068 acre-feet per year which is based on the amounts of groundwater that could be pumped while maintaining the desired future conditions in each water-bearing geologic unit discussed above. CUWCD estimates that by year 2050, exempt use of the Trinity aquifer may reach approximately 1,419 acre-feet per year and that volume of water is allocated for exempt well users on an annual basis. This leaves approximately **5,649 acre-feet per year as the volume of groundwater available for permitting in the Trinity aquifer.**

The managed available groundwater values of the several water-bearing geologic units of the Trinity aquifer in Bell County, as given in TWDB GAM Run 08-84mag, are as follows:

- a. Paluxy – 96 ac-ft per year
- b. Glen Rose – 880 ac-ft per year
- c. Hensell – 1,099 ac-ft per year
- d. Hosston – 4,993 ac-ft per year

The District intends through its rules to regulate the Trinity aquifer within the District; however, at some time in the future and within the duration of the effectiveness of this plan, the District may consider management of the Trinity aquifer within the District by aquifer subdivision or geologic water-bearing unit, if determined appropriate. If management by subdivision or geologic unit is implemented through the District's rules, the managed available groundwater values for each Trinity aquifer subdivision or geologic water-bearing unit will require a separate allocation of water for exempt well use.

3. Other Water Bearing Formations

Other groundwater sources in Bell County include Alluvium, the Austin Chalk, the Buda Limestone, the Edwards Group and equivalent rocks outside the recognized bounds of the Edwards (BFZ) aquifer (Edwards Equivalent aquifer), the Kemp Fm., the Lake Waco Fm., the Ozan Fm., and the Pecan Gap Fm. These sources of groundwater produce limited water supply in limited areas in the District. GMA-8 did not find these aquifers relevant for planning purposes at the present time or develop desired future conditions for them; as a result there are no managed available groundwater values for these sources of groundwater. See Appendix A for a more detailed discussion of these water bearing formations.

B. Amount of groundwater being used within the district on an annual basis— 31TAC356.5(a)(5)(B) (Implementing TWC §36.1071(e)(3)(B))

The amount of groundwater used in Bell County during year 2009 is shown in the table below. Data from 1974 to 2008 is provided by the Texas Water Development Board from their Water Use Survey database. This data does not distinguish between exempt and non-exempt wells. Exempt wells are wells that are used for domestic use or livestock watering (including certain additional uses defined in State law) and not capable of producing more than approximately 17 gallons per minute. Groundwater use data for 2003 through 2009 is provided from the District's records. The District began registering wells in February 2002 and began recording production from non-exempt wells during 2003. At the end of 2009, approximately 4,558 wells were registered. Although the District has made considerable progress in registering wells, it is likely there are still wells in Bell County that are not registered, and are therefore not considered in the table below. The District requires monthly production reports for all Classification 2 non-exempt wells (commercial). Classification 1 non-exempt wells are wells that would otherwise be considered exempt but are located on a tract of land of less than 10 acres. Production reports are not required for Classification 1 wells; however, production cannot exceed 25,000 gallons per day. In 2004, the District began estimating production from exempt wells.

**Exhibit C-1 – District Estimates of the Annual Amount of
Groundwater Being Used in Bell County in Acre-Feet per Year**

Year	Edwards (BFZ)			Trinity			Other			Total All Aquifers
	Non-Exempt	Estimated Exempt	Total	Non-Exempt	Estimated Exempt	Total	Non-Exempt	Estimated Exempt	Total	
2003	1,388	--	1,388	997	--	997	222.5	--	222.5	2,607.5
2004	1,371	285	1,656	934	811	1,745	53	902	955	4,356
2005	1,569	301	1,870	778	838	1,616	294	909	1,203	4,689
2006	1,767	422	2,189	967	1,186	2,153	157	1,255	1,412	5,754
2007	1,533	432	1,965	908	1,207	2,115	1	1,264	1,265	5,345
2008	1,815	436	2,251	964	1,223	2,187	200	1,272	1,472	5,910
2009	1,834	447	2,281	914	1,235	2,149	198	1,274	1,472	5,902

Source: CUWCD Groundwater Use Estimates 2003 – 2009

**Exhibit C-2 – TWDB Estimates of the Annual Amount of Water
Being Used in Bell County in Acre-Feet per Year**

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	2,917	16	0	90	384	302	3,709
	SW	21,090	1,662	87	1,712	127	1,301	25,979
	Total	24,007	1,678	87	1,802	511	1,603	29,688
1980	GW	2,887	193	0	100	126	157	3,463
	SW	24,354	904	0	1,770	0	1,016	28,044
	Total	27,241	1,097	0	1,870	126	1,173	31,507
1984	GW	1,344	94	0	42	117	101	1,698
	SW	28,403	10,201	0	666	0	909	40,179
	Total	29,747	10,295	0	708	117	1,010	41,877
1985	GW	1,283	245	0	60	117	98	1,803
	SW	30,201	588	0	940	0	889	32,618
	Total	31,484	833	0	1,000	117	987	34,421
1986	GW	1,505	106	1	75	122	92	1,901
	SW	31,723	480	0	425	0	829	33,457
	Total	33,228	586	1	500	122	921	35,358
1987	GW	1,297	215	0	25	0	97	1,634
	SW	31,902	440	0	475	0	876	33,693
	Total	33,199	655	0	500	0	973	35,327
1988	GW	1,165	193	0	50	0	104	1,512
	SW	33,098	450	0	450	0	939	34,937
	Total	34,263	643	0	500	0	1,043	36,449
1989	GW	1,373	50	0	177	0	99	1,699
	SW	30,090	678	0	459	0	896	32,123
	Total	31,463	728	0	636	0	995	33,822
1990	GW	1,254	377	0	211	0	98	1,940
	SW	31,909	589	0	544	0	884	33,926
	Total	33,163	966	0	755	0	982	35,866
1991	GW	1,162	0	0	211	145	100	1,618
	SW	28,047	488	0	544	0	901	29,980
	Total	29,209	488	0	755	145	1,001	31,598

Source: TWDB Water Use Survey Data 1974, 1980, 1984-2004, 2006-2008

**Exhibit C-2 (continued) – TWDB Estimates of the Annual
Amount of Water Being Used in Bell County in Acre-Feet per Year**

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1992	GW	1,342	368	0	211	145	112	2,178
	SW	29,966	981	0	544	0	1,007	32,498
	Total	31,308	1,349	0	755	145	1,119	34,676
1993	GW	1,494	368	0	207	145	113	2,327
	SW	31,959	1,094	0	420	0	1,013	34,486
	Total	33,453	1,462	0	627	145	1,126	36,813
1994	GW	1,448	368	0	279	145	113	2,353
	SW	32,326	999	0	677	0	1,013	35,015
	Total	33,774	1,367	0	956	145	1,126	37,368
1995	GW	1,619	368	0	315	145	102	2,549
	SW	33,162	967	0	641	0	916	35,686
	Total	34,781	1,335	0	956	145	1,018	38,235
1996	GW	1,887	32	0	612	145	92	2,768
	SW	37,317	1,050	0	1,243	0	824	40,434
	Total	39,204	1,082	0	1,855	145	916	43,202
1997	GW	1,768	4	0	1,361	145	82	3,360
	SW	34,258	966	0	2,221	0	735	38,180
	Total	36,026	970	0	3,582	145	817	41,540
1998	GW	2,018	0	0	912	145	88	3,163
	SW	36,285	860	0	1,695	0	788	39,628
	Total	38,303	860	0	2,607	145	876	42,791
1999	GW	2,059	0	0	1,702	145	95	4,001
	SW	39,033	542	0	1,702	0	853	42,130
	Total	41,092	542	0	3,404	145	948	46,131
2000	GW	2,265	268	0	558	145	95	3,331
	SW	44,015	532	0	1,121	0	858	46,526
	Total	46,280	800	0	1,679	145	953	49,857
2001	GW	2,042	2	0	564	174	95	2,877
	SW	39,575	562	0	1,144	0	853	42,134
	Total	41,617	564	0	1,708	174	948	45,011
2002	GW	2,279	2	0	611	174	94	3,160
	SW	44,164	497	0	1,241	0	846	46,748
	Total	46,443	499	0	1,852	174	940	49,908
2003	GW	2,228	1	0	454	132	92	2,907
	SW	43,163	222	0	2,553	0	828	46,766
	Total	45,391	223	0	3,007	132	920	49,673
2004	GW	2,301	2	0	173	132	92	2,700
	SW	44,593	453	0	749	0	828	46,623
	Total	46,894	455	0	922	132	920	49,323
2005	data unavailable							
2006	GW	2,204	0	0	60	0	311	2,575
	SW	42,209	718	0	2,119	306	727	46,079
	Total	44,413	718	0	2,179	306	1,038	48,654
2007	GW	1,904	0	0	308	0	292	2,504
	SW	38,124	627	0	2,013	140	681	41,585
	Total	40,028	627	0	2,321	140	973	44,089
2008	GW	2,530	0	0	62	0	293	2,885
	SW	45,225	595	0	1,769	250	684	48,523
	Total	47,755	595	0	1,831	250	977	51,408

Source: TWDB Water Use Survey Data 1974, 1980, 1984-2004, 2006-2008

C. Annual amount of recharge from precipitation to the groundwater resources within the district—31TAC356.5(a)(5)(C) (Implementing TWC §36.1071(e)(3)(C))

The estimates of the annual amount of recharge to the groundwater resources of the District that are recognized as Major Aquifers by TWDB are based on the GAM simulations provided by TWDB to the District for use in this plan. The District has made no estimate of the amount of annual recharge to the local sources of groundwater in the District.

1. Edwards (BFZ) Aquifer Recharge

27,549 acre-feet per year

2. Trinity Aquifer Recharge

4,533 acre-feet per year

Estimate source: TWDB GAM Run 10-009; May 28, 2010

D. For each aquifer, annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers—TWC §36.1071(e)(3)(D)

The estimates of the annual amount of water discharged to surface water systems by the groundwater resources of the District recognized as Major Aquifers by TWDB are based on the GAM simulations provided by TWDB to the District for use in this plan. The District has made no estimate of the amount of the annual discharge to surface water systems by the minor sources of groundwater in the District.

1. Edwards (BFZ) Aquifer

27,485 acre-feet per year

2. Trinity aquifer

4,164 acre-feet per year

Estimate source: TWDB GAM Run 10-009; May 28, 2010

E. Annual volume of flow into and out of the district within each aquifer and between aquifers in the district, if a groundwater availability model is available — TWC §36.1071(e)(3)(E)

There are two aquifers in the District for which a TWDB GAM is available; the Trinity and the Edwards BFZ aquifers. The estimates of the amount of water flowing into and out of the District within each aquifer and between aquifers in the District are based on the GAM simulations provided by TWDB to the District for use in this plan.

1. Edwards (BFZ) Aquifer

Flow into the aquifer within the District:

6,478 acre-feet per year

Flow out of the aquifer in the District:

5,721 acre-feet per year

Net flow out of the aquifer to overlying units in the District:

121 acre-feet per year

2. Trinity Aquifer

Flow into the aquifer within the District:

5,214 acre-feet per year

Flow out of the aquifer within the District:

4,154 acre-feet per year

Net flow into the aquifer from the overlying Washita-Fredericksburg Confining Unit in the District:

51 acre-feet per year

Estimate source: TWDB GAM Run 10-009; May 28, 2010

F. Projected surface water supply in the district, according to the most recently adopted state water plan— TWC §36.1071(e)(3)(F)

The most recently adopted state water plan is the 2007 State Water Plan. The 2007 State Water Plan indicates a projected surface water supply for Bell County of 117,027 acre-feet/year for year 2010. This information is shown below in Exhibit D.

Two major water reservoirs located in Bell County are Lake Belton and Lake Stillhouse Hollow. The 2011 Brazos G Initially Prepared Regional Water Plan (Table 3.1-1, Major Reservoirs of the Brazos River Basin) identifies 100,257 acre-feet/year as the authorized diversion, or permitted yield, from Lake Belton, and 67,768 acre-feet/year for Lake Stillhouse Hollow. This provides a total yield of 168,025 acre-feet/year for the two lakes. Currently, the Brazos River Authority has under contract approximately 113,906 acre-feet/year to Bell County entities. The US Corps of Engineers is the owner and operator of

Lakes Belton and Stillhouse Hollow. The Brazos River Authority manages water rights in both lakes. The Department of the Army (Fort Hood) also manages the water rights from Lake Belton.

Exhibit D -- Total Projected Bell County Surface Water Supplies

Water User Group	Source Name	2010	2020	2030	2040	2050	2060
439 WSC	Brazos River Authority Little River Lake/Reservoir System	2,156	2,151	2,148	2,143	2,140	2,136
Bell-Milam Falls WSC	Brazos River Authority Little River Lake/Reservoir System	196	196	196	196	196	196
Belton	Brazos River Authority Little River Lake/Reservoir System	7,452	7,439	7,425	7,411	7,397	7,384
Chisholm Trail SUD	Brazos River Authority Little River Lake/Reservoir System	185	185	185	184	184	184
County-Other	Brazos River Authority Little River Lake/Reservoir System	668	666	665	664	662	661
Dog Ridge WSC	Brazos River Authority Little River Lake/Reservoir System	671	671	671	671	671	671
East Bell County WSC	Brazos River Authority Little River Lake/Reservoir System	235	235	235	235	235	235
Elm Creek WSC	Brazos River Authority Little River Lake/Reservoir System	37	37	37	37	37	37
Fort Hood	Brazos River Authority Little River Lake/Reservoir System	6,144	6,144	6,144	6,144	6,144	6,144
Harker Heights	Brazos River Authority Little River Lake/Reservoir System	8,399	8,384	8,368	8,353	8,337	8,321
Holland	Brazos River Authority Little River Lake/Reservoir System	258	258	258	258	258	258
Irrigation	Brazos River Combined Run-of-River	5,743	5,755	5,768	5,780	5,793	5,805
Jarrell-Schwertner WSC	Brazos River Authority Little River Lake/Reservoir System	311	311	311	311	311	312
Kempner WSC	Brazos River Authority Little River Lake/Reservoir System	2,693	2,646	2,602	2,558	2,510	2,455
Killeen	Brazos River Authority Little River Lake/Reservoir System	29,909	29,854	29,798	29,743	29,687	29,632
Little River-Academy	Brazos River Authority Little River Lake/Reservoir System	68	68	68	68	68	68
Livestock	Livestock Local Supply	953	953	953	953	953	953
Mining	Brazos River Combined Run-of-River	2	2	2	2	2	2
Moffat WSC	Brazos River Authority Little River Lake/Reservoir System	402	430	457	468	477	488
Morgans Point Resort	Brazos River Authority Little River Lake/Reservoir System	291	291	291	291	291	291
Nolanville	Brazos River Authority Little River Lake/Reservoir System	739	737	736	735	733	732
Pendleton WSC	Brazos River Authority Little River Lake/Reservoir System	250	265	273	278	282	287
Rogers	Brazos River Authority Little River Lake/Reservoir System	368	368	368	368	368	368
Salado WSC	Brazos River Authority Little River Lake/Reservoir System	1,597	1,594	1,591	1,588	1,585	436
Steam Electric Power	Brazos River Combined Run-of-River	8,762	8,762	8,762	8,762	8,762	8,762
Temple	Brazos River Authority Little River Lake/Reservoir System	27,396	27,345	27,294	27,243	27,191	26,704
Temple	Leon River Combined Run-of-River	10,097	10,097	10,097	10,097	10,097	10,097
Troy	Brazos River Authority Little River Lake/Reservoir System	124	124	124	124	124	124
West Bell County WSC	Brazos River Authority Little River Lake/Reservoir System	921	921	921	921	921	921
Total Projected Surface Water Supplies (ac-ft / year) =		117,027	116,889	116,748	116,586	116,416	114,664

Source: 2007 State Water Plan

G. Projected total demand for water in the district according to the most recently adopted state water plan— TWC §36.1071(e)(3)(G)

The most recently adopted state water plan is the 2007 State Water Plan. The 2007 State Water Plan indicates a projected total water demand for Bell County of 62,039 acre-feet/year for year 2010. The projected water demands for Bell County in the 2007 State Water Plan are shown below in Exhibit E. The projections are from year 2010 to 2060 and include demands that may be met by water from either or both surface water and groundwater. District records indicate that groundwater usage in Bell County during year

2009 totaled 5,902 acre-feet or approximately 9.5% of the County's projected 2010 total demand for water.

Exhibit E -- Total Projected Bell County Water Demand

Water User Group	2010	2020	2030	2040	2050	2060
439 WSC	803	909	999	1,057	1,090	1,122
Bartlett	184	196	206	211	216	220
Bell-Milam Falls WSC	342	371	398	415	425	435
Belton	2,824	3,199	3,542	3,723	3,875	3,920
Cisholm Trail SUD	103	127	149	166	176	183
County-Other	280	276	272	270	267	267
Dog Ridge WSC	715	799	876	926	955	982
East Bell County WSC	263	271	276	279	282	286
Elm Creek WSC	184	206	224	236	243	249
Fort Hood	4,395	4,337	4,279	4,221	4,182	4,182
Harker Heights	3,676	4,669	5,461	6,127	6,307	6,417
Holland	125	121	117	114	111	111
Irrigation	1,656	1,634	1,611	1,591	1,569	1,546
Jarrell-Schwertner WSC	308	344	376	395	409	420
Kempner WSC	1,142	1,297	1,443	1,535	1,591	1,636
Killeen	18,031	23,507	25,837	27,827	29,735	31,789
Little River-Academy	275	285	292	294	297	301
Livestock	953	953	953	953	953	953
Manufacturing	980	1,085	1,180	1,273	1,355	1,463
Mining	155	150	147	144	141	139
Moffat WSC	402	430	457	468	477	488
Morgans Point Resort	414	455	493	518	532	546
Nolanville	311	320	326	326	329	334
Pendleton WSC	250	265	273	278	282	287
Rogers	195	191	188	184	181	181
Salado WSC	1,195	1,334	1,461	1,544	1,594	1,636
Steam Eelectric Power	-	3,674	4,296	5,053	5,977	7,102
Temple	21,033	23,018	25,170	26,892	28,804	30,613
Troy	185	181	176	171	168	168
West Bell County WSC	660	642	623	605	599	599
Total Projected Water Demands (ac-ft / year)=	62,039	75,246	82,101	87,796	93,122	98,575

Source: 2007 State Water Plan

Exhibit F – 2011 Regional Water Plan Population Projections for Bell County

County	2000	2010	2020	2030	2040	2050	2060
Bell	237,974	289,672	327,610	364,632	396,478	424,255	449,460

Source: TWDB 2011 Regional Water Plan and 2012 State Water Plan Population Projections Data

VII. CONSIDER THE WATER SUPPLY NEEDS AND WATER MANAGEMENT STRATEGIES INCLUDED IN THE ADOPTED STATE WATER PLAN— TWC §36.1071(E)(4)

The most recently adopted state water plan is the 2007 State Water Plan. In the 2007 State Water Plan, water needs were identified for eight Water User Groups (WUGs) in Bell County. Water needs are identified when the projected water demand of a WUG exceeds the projected water supplies of the WUG. See Exhibit G below. Positive values given in Exhibit G indicate a water surplus and negative values (expressed as values in parenthesis or with a – symbol) indicate a water need.

In the 2007 State Water Plan eleven water management strategies (WMSs) were recommended for the eight Bell County WUGs with identified water needs. Three of the WMSs involved conservation of existing water supplies. Each of the remaining eight recommended WMSs involved the increase of surface water supplies of the WUG. The Fort Hood WUG had a surplus of water supply identified by the Regional Water Planning process. There were no groundwater based WMS recommended in the 2007 State Water plan to supply WUGs in Bell County or to supply WUGs in other counties with groundwater from Bell County. See Exhibit H below. The desired future conditions and amounts of groundwater available for annual use in managed available groundwater values for the Edwards and Trinity aquifers in the District will not prevent the implementation of any recommended WMS or restrict the amount of groundwater considered available in the 2007 State Water Plan.

A. Water Shortages

Of the 30 Bell County WUGs identified in the 2007 State Water Plan, eight were projected to have water shortages by the year 2060. The projected shortage of water for these eight users ranges from approximately 1,337 acre-feet in 2010 to approximately 4,579 acre-feet/year in 2060. Three of these users use only surface water (Dog Ridge WSC; City of Killeen; City of Morgan's Point Resort), three use a mixture of groundwater and surface water (Bell-Milam-Falls WSC; Elm Creek WSC; City of Little River-Academy), and two use only groundwater (City of Bartlett, Manufacturing). The source of groundwater for these users is identified as the Trinity aquifer. All of the management strategies involve purchasing additional surface water and implementing conservation measures. Additional use of groundwater is not identified as a management strategy.

Jarrell-Schwertner WSC's service area includes southern Bell County and northern Williamson County. The State Water Plan identifies them as a water user in Williamson County. In the 2011 initially prepared Brazos G Regional Water Plan, by the year 2060 they are projected to have a shortage of water of 1,385 acre-feet/year. Their water supply is groundwater from the Edwards (BFZ) aquifer. Their recommended management strategies include implementing conservation measures and purchasing surface water.

Additional use of groundwater in Bell County is not identified as part of the management strategies. Through participation in a local water supply planning initiative Jarrell-Schwertner WSC is considering participation in the Lake Granger Conjunctive Use Project.

B. Water Surplus

Twenty two of the Water User Groups identified in the Brazos G Regional Water Plan are projected to have surplus water through the year 2060. Four of these are identified as using both surface water and groundwater (East Bell WSC; Moffat WSC; Salado WSC; City of Troy). With the exception of Salado WSC, the source of groundwater is identified as the Trinity aquifer. Salado WSC uses water from the Edwards (BFZ). However, District records indicate six others also use or have the potential to use groundwater (City of Holland; Pendleton WSC; City of Rogers; Mining; Irrigation; Livestock). Since these users are projected to have a surplus of water or no projected needs, no changes in water supply are recommended.

Exhibit G -- Bell County Identified Water Needs

Water User Group	2010	2020	2030	2040	2050	2060
439 WSC	1,353	1,242	1,149	1,086	1,050	1,014
Bartlett	(63)	(75)	(85)	(90)	(95)	(99)
Bell-Milam Falls WSC	17	(12)	(39)	(56)	(66)	(76)
Belton	4,628	4,240	3,883	3,688	3,522	3,464
Cisholm TrailSUD	117	94	71	54	44	36
County-Other	401	403	406	407	408	407
Dog Ridge WSC	(44)	(128)	(205)	(255)	(284)	(311)
East Bell County WSC	105	97	92	89	86	82
Elm Creek WSC	(141)	(163)	(181)	(193)	(200)	(206)
Fort Hood	1,749	1,807	1,865	1,923	1,962	1,962
Harker Heights	4,723	3,715	2,907	2,226	2,030	1,904
Holland	133	137	141	144	147	147
Irrigation	4,299	4,330	4,363	4,393	4,425	4,457
Jarrell-Schwertner WSC	115	78	45	25	10	-
Kempner WSC	1,551	1,349	1,159	1,023	919	819
Killeen	11,878	6,347	3,961	1,916	(48)	(2,157)
Little River-Academy	(3)	(13)	(20)	(22)	(25)	(29)
Livestock	-	-	-	-	-	-
Manufacturing	(963)	(1,068)	(1,163)	(1,256)	(1,338)	(1,446)
Mining	2	2	2	2	2	2
Moffat WSC	145	145	145	145	145	145
Morgans Point Resort	(123)	(164)	(202)	(227)	(241)	(255)
Nolanville	428	417	410	409	404	398
Pendleton WSC	-	-	-	-	-	-
Rogers	173	177	180	184	187	187
Salado WSC	1,602	1,460	1,330	1,244	1,191	-
Steam Eelectric Power	8,762	5,088	4,466	3,709	2,785	1,660
Temple	16,460	14,424	12,221	10,448	8,484	6,188
Troy	36	40	45	50	53	53
West Bell County WSC	261	279	298	316	322	322
Total Projected Water Needs (acre-feet/year) =	-1,337	-1,623	-1,895	-2,099	-2,297	-4,579

Source: 2007 State Water Plan

Exhibit H -- Bell County Recommended Water Management Strategies

WUG	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
Manufacturing	Water Conservation	Conservation	Bell	29	54	83	89	95	102
Bartlett	Water Conservation	Conservation	Bell	12	30	25	19	18	18
Killeen	Water Conservation	Conservation	Bell	820	1,839	1,752	1,439	875	381
Bartlett	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	51	45	60	71	77	81
Bell-Milam Falls WSC	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	-	20	40	60	70	80
Dog Ridge WSC	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	100	200	300	300	300	400
Elm Creek WSC	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	150	170	190	200	210	210
Killeen	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	-	-	-	-	-	2,500
Little River-Academy	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	50	50	50	50	50	50
Manufacturing	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	1,500	1,500	1,500	1,500	1,500	1,500
Morgans Point Resort	Voluntary Redistribution	Brazos River Authority Little River Lake/Reservoir System	Reservoir	300	300	300	300	300	300
Total Projected Water Management Strategies (acre-feet per year) =				3,012	4,208	4,300	4,028	3,495	5,622

Source: 2007 State Water Plan

VII. MANAGEMENT OF GROUNDWATER SUPPLIES

TWC Section 36.0015 states that groundwater conservation districts (GCDs) are the state’s preferred method of groundwater management and establishes that GCDs will manage groundwater resources through rules developed and implemented in accordance with TWC Chapter 36. Chapter 36 gives directives to GCDs and the statutory authority to carry out such directives, so that GCDs are provided the proper tools to protect and manage the groundwater resources within their boundaries.

The District will manage the supply of groundwater within the District in order to conserve the groundwater resources while seeking to maintain the economic viability of all groundwater user groups - public and private. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices which, if implemented, would result in a reduction of groundwater use. The existing observation network

of groundwater wells will be used to monitor the changing conditions of the groundwater resources within the District. If necessary, the observation network may be expanded.

The regulatory tools granted to GCDs by TWC Chapter 36 enable GCD's to preserve historic and existing users of groundwater. The District protects historic and existing users by granting such groundwater users historic and existing use permits that have priority over operating permits. TWC Chapter 36 also allows GCDs to establish management zones within an aquifer or aquifer subdivision. The District's rules provide for the designation of management areas as needed to better manage and regulate the groundwater resources of Bell County.

The District may deny a water well drilling permit or limit groundwater withdrawals in accordance with the requirements stated in the rules of the District. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider criteria identified in TWC Section 36.113.

In accordance with the District's mission of protecting the groundwater resources of Bell County, the District may require reduction of groundwater withdrawals to amounts that will not cause harm to the aquifer when considering the desired future condition of the District's aquifers and the amount of managed available groundwater within the District. To achieve this purpose, the District may, at the discretion of the Board, amend or revoke any permits after notice and hearing. The determination to seek the amendment or revocation of a permit by the District will be based on aquifer conditions as observed by the District. The District will enforce the terms and conditions of permits and the rules of the District by injunction or other appropriate relief in a court of competent jurisdiction as provided for in TWC §36.102.

A contingency plan to cope with the effects of water supply deficits due to climatic or other conditions may be developed by the District and adopted by the Board after notice and hearing. In developing the contingency plan, the District will consider the economic effect of conservation measures upon all water resource user groups, the local implications of the extent and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifers within the District and the appropriate conditions under which the contingency plan will be implemented. The District will evaluate the groundwater resources available within the District and determine the effectiveness of regulatory or conservation measures. A public or private user may appeal to the Board for discretion in enforcement of the provisions of the water supply deficit contingency plan on grounds of adverse economic hardship or unique local conditions. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

IX. ACTIONS, PROCEDURES, PERFORMANCE AND AVOIDANCE FOR PLAN IMPLEMENTATION

The District will implement the provisions of this plan and will utilize the provisions of this plan as a guidepost for determining the direction or priority for all District activities. All operations of

the District, all agreements entered into by the District, and any additional planning efforts in which the District may participate will be consistent with the provisions of this plan.

Rules adopted by the District for the permitting of wells and the production of groundwater shall comply with TWC Chapter 36, including §36.113, and the provisions of this management plan. All rules will be adhered to and enforced. The promulgation and enforcement of the rules will be based on the best technical evidence available to the District. District Rules are available on the District website at www.clearwaterdistrict.org.

X. METHODOLOGY FOR TRACKING DISTRICT PROGRESS IN ACHIEVING MANAGEMENT GOALS – 31 TAC 356.5(a)(6)

The District manager will prepare a draft Annual Report to the Board of Directors on District performance in regards to achieving management goals and objectives in each fiscal year for consideration for adoption by the Board of Directors. The report will be presented within 180 days following the completion of each fiscal year of the District. The Board will maintain the report on file, for public inspection at the District's offices upon adoption.

XI. GOALS, MANAGEMENT OBJECTIVES and PERFORMANCE STANDARDS

The management goals, objectives, and performance standards of the District in the areas specified in 31TAC§356.5 are addressed below.

Management Goals

A. Providing the Most Efficient Use of Groundwater –31TAC 356.5(a)(1)(A) (Implementing TWC §36.1071(a)(1))

1. **Objective:** Each year, the District will require the registration of all wells within the District's jurisdiction.

Performance Standard: Each year, the number of new and existing wells registered with the District will be presented in the District's annual report.

2. **Objective:** Each year, the District will require permits for all non-exempt use of groundwater in the District as defined in the District rules, in accordance with adopted procedures.

Performance Standard: Each year, a summary of the number of applications for the drilling of non-exempt wells, the number of applications for the permitted use of groundwater and the disposition of the applications will be presented in the District's annual report.

3. Objective: Each year, the District will maintain a groundwater database to include information relating to well location, production volume, and other pertinent information deemed necessary by the District to enable effective monitoring of groundwater in Bell County.

Performance Standard:

- a. Each year, the District's annual report will include a status report of the database development.
- b. Each year, the District's annual report will include a summary of changes in the water level condition of the aquifers included in the district water-level monitoring program.

4. Objective: Each year, the District will disseminate educational information on groundwater through publication of a District newsletter.

Performance Standard: The annual report will include a copy of the District newsletter published each year.

**B. Controlling and Preventing Waste of Groundwater –31TAC 356.5(a)(1)(B)
(Implementing TWC §36.1071(a)(2))**

Objective: Each year, the District will disseminate educational information on controlling and preventing the waste of groundwater focusing on water quality protection through at least one classroom or public presentation.

Performance Standard: The annual report will include a summary of the District presentation to disseminate educational information on controlling and preventing the waste of groundwater focusing on water quality protection.

**C. Addressing Conjunctive Surface Water Management Issues – 31TAC356.5
(a)(1)(D) (Implementing TWC §36.1071(a)(4))**

Objective: Each year, the District will participate in the regional planning process by attending a minimum of two meetings of the Brazos G Regional Water Planning Group per fiscal year.

Performance Standard: Each year, attendance at Region G meetings by a representative of the District will be reflected in the District's annual report and will include the number of meetings attended and the dates.

**D. Addressing Natural Resource Issues which Impact the Use and Availability of
Groundwater, and which are Impacted by the Use of Groundwater –
31TAC§356.5 (a)(1)(E) (Implementing TWC §36.1071(a)(5))**

Objective: Each year the District will monitor water quality within the District by obtaining water samples from wells and testing the water quality of at least 6 wells.

Performance Standard: Each year, the District's Annual Report will provide a status report on the number of wells tested and the testing results.

E. Addressing Drought Conditions – 31TAC356.5 (a)(1)(F) ((Implementing TWC §36.1071(a)(6))

1. **Objective:** Each year, the District will monitor drought conditions in the Edwards aquifer through the process established in the drought management plan for the Edwards aquifer adopted by the Board of Directors.

Performance Standard: Each year, a summary of the District monitoring of drought conditions in the Edwards aquifer and the implementation of any conservation measures will be provided in the annual report.

2. **Objective:** Each year, the District will monitor drought conditions in the Trinity aquifer through the process established in the drought management plan for the Trinity aquifer adopted by the Board of Directors.

Performance Standard: Each year, a summary of the District monitoring of drought conditions in the Trinity aquifer and the implementation of any conservation measures will be provided in the annual report.

F. Addressing Conservation, Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement, and Brush Control, Where Appropriate and Cost-Effective – 31TAC356.5 (a)(1)(G) (Implementing TWC §36.1071(a)(7))

Conservation

1. **Objective:** Each year, the District will promote conservation by conducting an annual scholastic contest on water conservation or; distributing conservation brochures/literature to the public.

Performance Standard: Each year, the annual report will include a summary of the District activity during the year to promote conservation.

Rainwater Harvesting

2. **Objective:** Each year, the District will promote rainwater harvesting by posting information on rainwater harvesting on the District web site.

Performance Standard: Each year, the annual report will include a copy of the information on rainwater harvesting that is provided on the District web site.

Precipitation Enhancement

(See Section on Goals Not Applicable to the District)

Brush Control

3. Objective: Each year, the District will provide information relating to brush control on the District web site.

Performance Standard: Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to brush control.

Recharge Enhancement

4. Objective: Each year, the District will provide information relating to recharge enhancement on the District web site.

Performance Standard: Each year, the District annual report will include a copy of the information that has been provided on the District web site relating to recharge enhancement.

G. Addressing in a Quantitative Manner the Desired Future Conditions of the Groundwater Resources – 31TAC (a)(1)(H) (Implementing TWC §36.1071(a)(8))

1. Objective – Each year, the District will operate a gauge system on Salado Creek to develop estimates of the discharge from the Edwards aquifer at Salado Springs.
1. Performance Standard – Each year, the District will include a summary of the monthly average discharge rate of Salado Springs and a discussion of the conservation measures implemented (if any are necessary) to avoid impairment of the Desired Future Conditions for the Edwards aquifer established by GMA-8, in the Annual Report to the Board of Directors.
2. Objective – Each year, the District will collect at least 5 water-level measurements from the Trinity aquifer monitor wells located in the District.
- 2a Performance Standard – Each year, the Annual Report to the Board of Directors will post the water-level measurements collected from the Trinity aquifer and identify the aquifer subdivision from which the measurement is taken.
- 2b Performance Standard – Each year, the Annual Report to the Board of Directors will include a discussion of the change in water-levels in each Trinity aquifer subdivision for which a Desired Future Condition is established by GMA-8.

- 2c Performance Standard – Every five years, the Annual Report to the Board of Directors will include a discussion of the change in water-levels in each Trinity aquifer subdivision for which a Desired Future Condition is established by GMA-8 comparing the change to the incremental time-appropriate change in water-levels indicated by the established Desired Future Condition of the aquifer.

XII. MANAGEMENT GOALS DETERMINED NOT-APPLICABLE TO THE DISTRICT

A. Controlling and Preventing Subsidence – 31TAC§356.5 (a)(1)(C)

This category of management goal is not applicable to the District because the major water producing formations in the District are composed primarily of competent limestone. The structural competency of the aquifer materials significantly limits the potential for the occurrence of land surface subsidence in the District.

B. Precipitation Enhancement – 31TAC§356.5 (a)(1)(G)

Precipitation enhancement is not an appropriate or cost-effective program for the District at this time because there is not an existing precipitation enhancement program operating in nearby counties in which the District could participate and share costs. The cost of operating a single-county precipitation enhancement program is prohibitive and would require the District to increase taxes in Bell County.

APPENDIX A

Groundwater Resources of Bell County

The Texas Water Development Board classifies groundwater sources as major or minor aquifers. Major aquifers are aquifers that are capable of producing large yields to wells or that produce groundwater over a large area. Minor aquifers are aquifers that may be capable of producing only limited yields to wells or that produce groundwater over a limited area. Many localized sources of groundwater may not be listed as a major or minor aquifer by TWDB. However, TWDB recognizes that whether an aquifer is classified as a major aquifer, a minor aquifer or not included in either list may have no bearing on the local importance of a particular source of groundwater.

Major Aquifers

Two major aquifers are located in Bell County. They are the Trinity and Edwards Balcones Fault Zone (BFZ) aquifers (Exhibit B). Several water supply corporations in Bell County have the ability to utilize groundwater in an emergency situation.

Edwards (BFZ) aquifer

The Edwards (BFZ) aquifer is composed of the Edwards and Associated Limestones. It is located in the southern part of the county and serves as the water supply for the City of Salado and other communities in the area. The outcrop of the aquifer is generally found to the west of I-35 and the down-dip portion of the aquifer is generally to the east of I-35. Recharge to the Edwards aquifer generally is from percolation of storm run-off water in intermittent streams flowing across the outcrop area, as well as direct infiltration of rainfall over the outcrop area. Water quality in the Edwards aquifer is generally high; however, within a relatively short distance east of IH 35 the water quality is rapidly reduced. In Bell County water in the aquifer generally moves from the recharge zone toward natural discharge via the Salado Springs. Within Bell County the availability of groundwater from the Edwards aquifer water is based on maintaining at least a minimum spring flow at Salado Springs during a repeat of the drought of record.

Trinity aquifer

The Trinity aquifer is composed of three subdivisions; the Upper Trinity; the Middle Trinity and the Lower Trinity aquifers. The Upper Trinity aquifer is composed of the Glen Rose Formation; the Middle Trinity aquifer is composed of the Hensell Sand and Cow Creek Limestone; and the Lower Trinity aquifer is composed of the Sligo Limestone and Hosston Sand. The Upper Trinity aquifer crops out in western Bell County and is located generally west of the Edwards aquifer outcrop. The Middle and Lower Trinity aquifers do not outcrop in Bell County. However, the Trinity aquifer underlies all of Bell County. Water quality in the Trinity aquifer is good to moderate in western Bell County. East of IH 35 the water quality in the Upper and Middle Trinity aquifers deteriorates, but the water quality of the Lower Trinity aquifer remains useable for most purposes over most of Bell County. The availability of groundwater from the

subdivisions of the Trinity aquifer is based on the management of aquifer pumping to maintain the resulting draw down within acceptable limits. The Trinity aquifer has established management targets for the limit of acceptable draw down.

Other Local Sources of Groundwater

The local sources of groundwater which are not recognized as major or minor aquifers by TWDB are particularly important to Bell County. A significant percentage of the wells registered with CUWCD are completed in formations which are not widely recognized as aquifers but are vitally important sources of water. In the area of Bell County east of IH-35, the majority of wells registered with CUWCD are completed in these water bearing formations. A brief description of these groundwater sources follows:

Alluvium / Terrace deposits

Alluvium and Terrace deposits consist of sand, gravel, silt and clay deposited by streams. Alluvium deposits are unconsolidated; terrace deposits may have some cement. Alluvium is closely associated with stream channels and terrace deposits are found at higher elevation across the broader floodplain of the stream. Well yields range from low to moderate.

Austin Chalk

The Austin Chalk consists of nodular chalk and marl with some clay seams. Well yields are typically low with generally fresh water.

Buda Limestone

The Buda Limestone is a fine grained hard limestone with abundant fossils or fossil fragments. Wells completed in this formation may yield little or no water.

Edwards Equivalent

The term Edwards Equivalent aquifer refers to the areas in Bell County where the limestones and associated formations of the Edwards Group are productive of generally limited volumes of groundwater and which are located outside of the TWDB recognized bounds of the Edwards (BFZ) aquifer.

Kemp Clay-Marlbrook Marl / Pecan Gap Fm / Ozan Fm

These three geologic units are distinguishable from each other but consist of similar materials and have similar water bearing properties. They consist of thick beds of marl, chalky marl or calcareous clays containing thin beds of silt. Well yields are typically low with fresh to moderately saline water. These geologic units are all associated as members of the Taylor Marl.

Lake Waco Fm

The Lake Waco Fm is a member of the Eagle Ford Group. The formation consists of limestone and shale. While not generally recognized as productive of water it appears to produce limited amounts of useable quality water in limited areas of Bell County.

Exhibit I -- Geologic and Hydrologic Units of Bell County

Group	Formation	Member	Hydrologic Unit	
N/A	Alluvium		Alluvium and terrace deposits	
	Terrace deposits			
Navarro/Taylor	Kemp Clay / Marlbrook Marl		Kemp Clay/ Marlbrook Marl	
	Pecan Gap Chalk		Pecan Gap Formation	
	Ozan Formation		Ozan Formation	
Austin	Austin Chalk		Austin Chalk	
Eagle Ford	Eagle Ford Shale Lake Waco Fm		Eagle Ford not recognized as a groundwater source; Lake Waco has limited production in limited areas	
Washita	Buda Formation		Buda Limestone	
	Del Rio Clay		Not recognized as a groundwater source	
Edwards	Georgetown		Edwards (Balcones Fault Zone) aquifer	
	Kiamichi			
	Edwards			
	Comanche Peak			
	Walnut		Not recognized as a groundwater source	
Trinity	Paluxy		Upper Trinity aquifer	
	Glen Rose			
	Travis Peak	Hensell Sand		Middle Trinity aquifer
		Cow Creek Limestone		
		Hammett Shale		Not recognized as a groundwater source
		Sligo limestone		Lower Trinity aquifer
		Hosston Sand/Conglomerate		

Source: Geologic and Hydrologic Units of Bell County, after Duffin and Musick, 1991

APPENDIX B
RESOLUTION
OF THE BOARD OF DIRECTORS OF THE
CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT
MEETING HELD FEBRUARY 8, 2011

A RESOLUTION ADOPTING AMENDED MANAGEMENT PLAN

WHEREAS, the Clearwater Underground Water Conservation District (the "District") is a political subdivision of the State of Texas organized and existing under and by virtue of Article XVI, § 59, of the Texas Constitution, and a groundwater conservation district acting under Chapters 36 and 49 of the Texas Water Code and the District's enabling act, Act of the 71st Legislature, Regular Session, Chapter 525, 1989, as amended by Act of the 77th Legislature, Regular Session, Chapter 22, 2001, and by Act of the 81st Legislature, Regular Session, Chapter 64, 2009;

WHEREAS, under the direction of the Board of Directors, and in accordance with Texas Water Code §§ 36.1071 and 36.1072, Title 31, Chapter 356 of the Texas Administrative Code, and the District's rules, the District has timely undertaken the requisite five-year review of its existing Management Plan, initially adopted by the District's Board on October 24, 2000, and certified by the Texas Water Development Board (the "TWDB") on February 21, 2001, and revised and readopted by the District's Board on December 13, 2005, and certified by TWDB on March 6, 2006;

WHEREAS, in conducting a five-year review of its existing Management Plan, the District and its consultants reviewed, analyzed, and factored in the District's best available data, the groundwater availability modeling information provided by the TWDB, the technical information and estimates required by the TWDB, the Desired Future Conditions of the aquifers within the District, and the available site-specific information that has previously been provided by the District to the TWDB for review and comment;

WHEREAS, the District issued the appropriate notice and held a public hearing to receive public comments on the proposed amendments to the Management Plan at the District's office located at 2180 North Main, Belton, Texas, on February 8, 2011;

WHEREAS, the District obtained comments from the TWDB through a preliminary review of the District's Management Plan conducted by TWDB staff, and the District has considered and addressed all such comments in the development of its Management Plan;

WHEREAS, the District received, reviewed, and took into consideration comments from the Brazos River Authority during preparation of its Management Plan;

WHEREAS, the Board of Directors finds that the Management Plan meets all of the requirements of Chapter 36 of the Texas Water Code, the District's enabling act, Chapter 356, Title 31, Texas Administrative Code, and the District's rules; and

WHEREAS, the Board of Directors, upon proper notice and in an open meeting, seeks to readopt its existing Management Plan pursuant to Texas Water Code § 36.1072(e).

NOW THEREFORE BE IT RESOLVED THAT:

The above recitals are true and correct;

The Management Plan is hereby readopted with those changes reflected in the proposed, draft Management Plan before the District's Board of Directors on this date, along with those changes agreed upon during deliberation and after formal action on this date by the District's Board of Directors;

The Board of Directors further instructs the General Manager to compile a final, readopted Management Plan, and file it with the TWDB's Executive Director within 60 calendar days from the date of readoption, pursuant to Texas Water Code § 36.1072(e); and

The Board of Directors and General Manager are further authorized to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of § 36.1072 of the Texas Water Code.

AND IT IS SO ORDERED.

Upon motion duly made by Vice President Biskup, and seconded by Director Mayer, and upon discussion, the Board of Directors voted 5 in favor and 0 opposed, 0 abstained, and 0 absent, and the motion thereby PASSED on this 8th day of February, 2011.

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

By 
Leland Gersbach, Board President

ATTEST:


Judy Parker, Board Secretary

APPENDIX C
NOTICE OF PUBLIC HEARING

The Clearwater Underground Water Conservation District (CUWCD) will hold a public hearing and consider adopting proposed revisions to the District Management Plan at 1:30 p.m., February 8, 2011 in the Central Texas Council of Governments (CTCOG) Building located at 2180 N. Main Street, Belton, Texas. Copies of the revised Management Plan are available for review at the CUWCD office in the CTCOG Building and on the CUWCD website at www.clearwaterdistrict.org. Contact the CUWCD at 254/933-0120 for additional information.

Dated: January 18, 2011

CLEARWATER UNDERGROUND WATER CONSERVATION DISTRICT

By: Cheryl Maxwell, Administrative Manager and Assistant Secretary to the Board of Directors

FILED FOR RECORD

JAN 18 2011

**SHELLEY COSTON
CO. CLK. BELL CO. TX**

APPENDIX D

Clearwater Underground Water Conservation District

P.O. Box 729, Belton, Texas 76513

Phone: 254/933-0120 Fax: 254/770-2360

www.clearwaterdistrict.org



Every drop counts!

Leland Gersbach, President

Wallace Biskup

Judy Parker

John Mayer

Bill Bartlett

March 3, 2011

TO: Surface Water Management Entities
(via email)

RE: Revised Management Plan

Dear Manager:

Attached is the revised District Management Plan for the Clearwater Underground Water Conservation District (CUWCD). As required in Texas Water Code §36.1072, we have conducted a five year review and update of our Management Plan. One component of the plan is evidence of its coordination with surface water management entities pursuant to TWC 36.1071 (a):

Evidence that following notice and hearing the Clearwater Underground Water Conservation District coordinated in the development of its Management plan with surface water management entities.

The Directors of the CUWCD approved the revised Management Plan on February 8, 2011 and are submitting it for review and approval by the Texas Water Development Board.

Please feel free to contact me if you have any questions regarding the Management Plan or need additional information.

Sincerely,

Cheryl Maxwell, AICP
Administrative Manager

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West Bell County WSC	westbellwater@hotmail.com	Karen Dunn

APPENDIX E

Groundwater Management Areas In Texas

