Cow Creek Groundwater Conservation District

GROUNDWATER MANAGEMENT PLAN

Originally Adopted
September 7, 2004

Board of Directors

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Precinct 4
W. K. "Skip" Shumpes, Vice-President
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Precinct 3
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Precinct 1

Revision, Adopted
December 14, 2009

Board of Directors

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GROUNDWATER MANAGEMENT PLAN

REVISION RECORD

Date Adopted	Effective Date	Affected Sections or General Comments
9/7/04	9/7/04	Original Adoption, CCGCD Board Resolution 090704-1
12/14/09	12/14/09	Re-adoption, CCGCD Board Resolution 2009-019

TABLE OF CONTENTS

Section ..... Page #

List of Tables

TIME PERIOD FOR THIS PLAN

This plan becomes effective upon adoption by the Cow Creek Groundwater Conservation District Board of Directors (District Board) and subsequent approval by the Texas Water Development Board (TWDB). This plan incorporates a planning period of fifty years. After five years, the plan will be reviewed for consistency with the applicable Regional Water Plans, the State Water Plan and Groundwater Management Area 9's Desired Future Conditions (DFC) and shall be readopted with or without amendments. The plan may be revised at anytime in order to maintain such consistency or as necessary to address any new or revised data, Groundwater Availability Models, Desired Future Conditions, or District management strategies.

DISTRICT MISSION

The Cow Creek Groundwater Conservation District (CCGCD or District) was created for the purpose of conserving, preserving, recharging, protecting and preventing waste of groundwater from the aquifers within the District. The District will conduct administrative and technical activities and programs to achieve these purposes. The District will collect and archive water well and aquifer data, regulate water well drilling and production from permitted, non-exempt wells, promote the capping or plugging of abandoned wells, provide information and educational material to local property owners, interact with other governmental or organizational entities, and undertake other groundwater-related activities that may help meet the purposes of the District. The Texas Hill Country Area, which includes the Cow Creek GCD, was declared a Critical Groundwater Area by the then Texas Water Commission in 1990. This declaration, now known as the Hill Country Priority Groundwater Management Area (PGMA), gave notice to the residents of the area that water availability and quality will be at risk within the next 25 years.

STATEMENT OF GUIDING PRINCIPLES FOR AQUIFER MANAGEMENT

The CCGCD was created in order that appropriate groundwater management techniques and strategies could be implemented at the local level to address groundwater issues or problems within the District. The District will continue to incorporate the best and most current site-specific data available in the development of this plan to ensure the sustainability of the aquifer and achievement of the DFC's. This plan serves as a guideline the District can follow to ensure greater understanding of local aquifer conditions, development of groundwater management concepts and strategies, and subsequent implementation of appropriate groundwater management policies.

COMMITMENT TO IMPLEMENT GROUNDWATER MANAGEMENT PLAN

To address potential groundwater quantity and quality issues, the District is committed to, and will actively pursue, the groundwater management strategies identified in this groundwater management plan. The management plan will be coordinated with District Rules, policies, and activities in order to effectively manage and regulate the drilling of wells, production of groundwater within the District, protection of recharge features, prevent pollution and waste, the transfer of groundwater out of the District, and encouragement of conservation practices and efficient water use within the District. This includes the evaluation of the impact(s) of conjunctive use of surface and groundwater. A conjunctive water source is the combined use of groundwater and surface water sources to optimize the beneficial characteristics of each. The term "conjunctive use" means the combined use of groundwater and surface water sources that optimizes the beneficial characteristics of each source (Texas Water Code, Chapter 36).

Three basic terms form the basis of water planning. The key terms that need to be understood are available water, existing water supplies and drought. Note there is a critical distinction between available water and existing water supplies.
As the agency responsible for the State Water Plan, the Texas Water Development Board (TWDB) defines available water as "the maximum amount of water available during the drought of record, regardless of whether the supply is physically or legally available." The existing water supply is defined by the TWDB as the "maximum amount of water available from existing sources for use during drought of record conditions that is physically and legally available for use."

Texas water planning requires both must be managed under a worst-case scenario - the drought of record. By TWDB definition, this is "the period of time during recorded history when natural hydrological conditions provided the least amount of water supply. For Texas as a whole, the drought of record is generally considered to be from about 1950 to 1957."

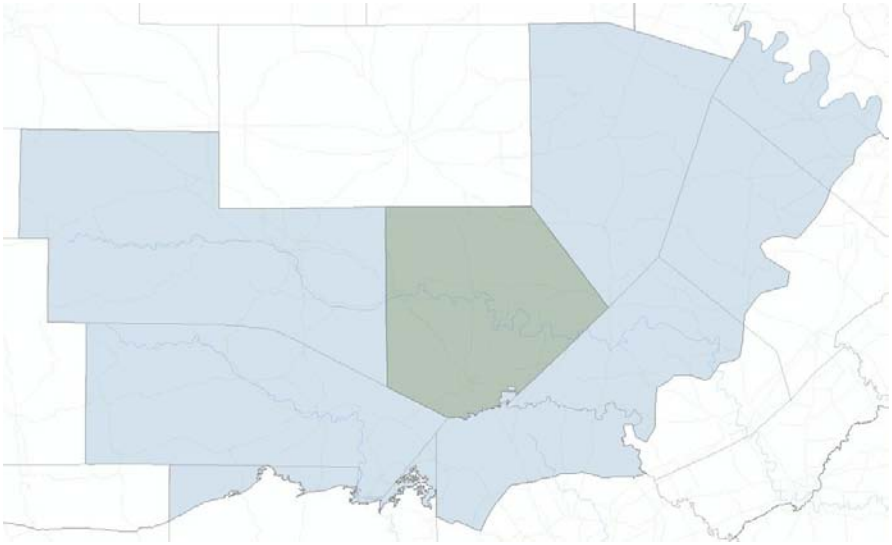
To the greatest extent practical, the District will cooperate with and coordinate its management plan and regulatory policies with adjacent groundwater districts, Regional Water Planning Groups, and Groundwater Management Area 9 (GMA9).

JOINT PLANNING IN MANAGEMENT AREA

Not later than September 1, 2010, and every five years thereafter, the districts in GMA 9 shall consider groundwater availability models and other data or information for the management area and shall establish desired future conditions for the relevant aquifers within the management area. In establishing the desired future conditions of the aquifers under this section, the districts shall consider uses or conditions of an aquifer within the management area that differ substantially from one geographic area to another.

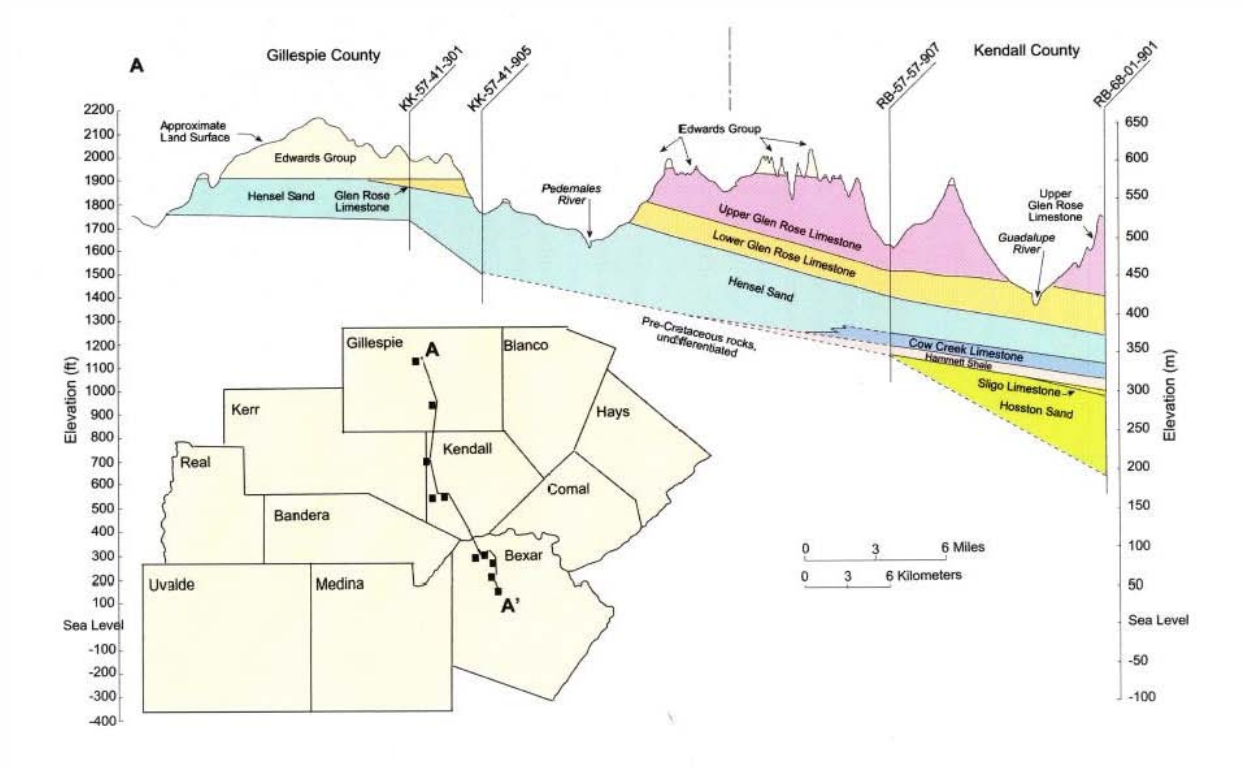
The GMA may establish different desired future conditions for each aquifer, subdivision of an aquifer, or geologic strata located in whole or in part within the boundaries of the management area; or each geographic area overlying an aquifer in whole or in part or subdivision of an aquifer within the boundaries of the management area. The Texas Water Development Board will calculate the Managed Available Groundwater (MAG) from the adopted Desired Future Conditions (DFC) of the management area.

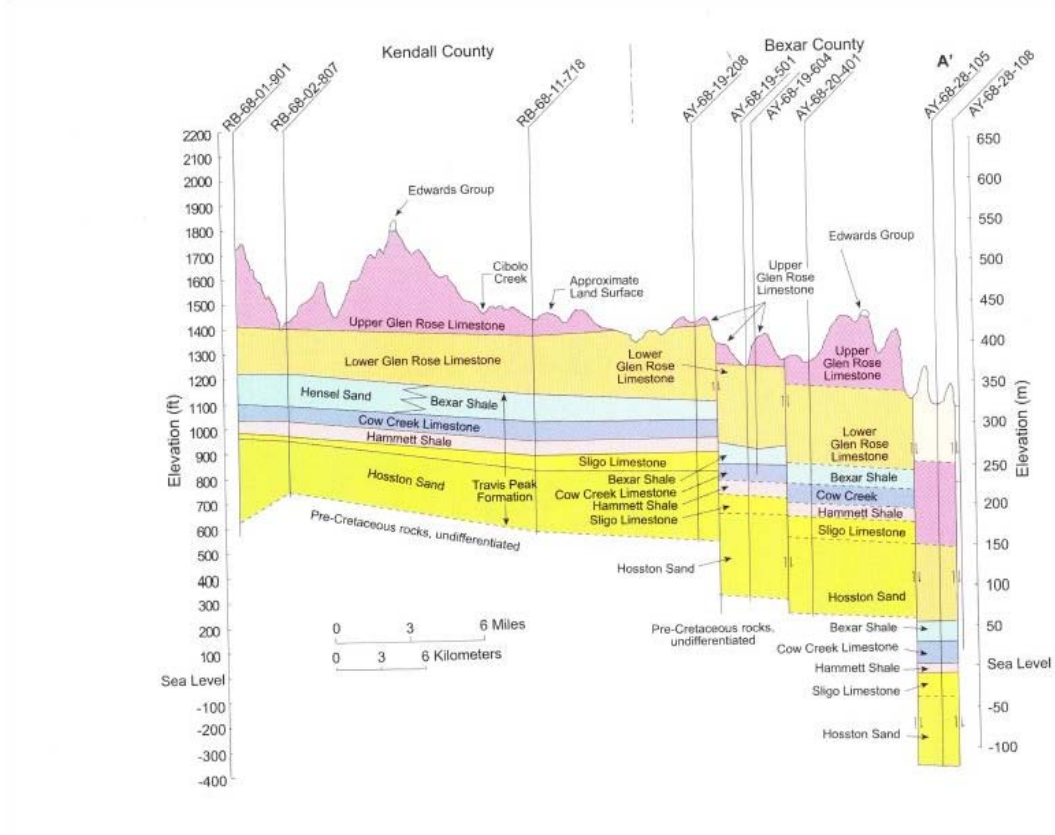
Map of Groundwater Management Area 9:



Source: TWDB GMA 9 website - http://www.twdb.state.tx.us/mapping/maps/pdf/gma/GMA_9.pdf

Stratigraphic cross sections of the Hill Country Area:

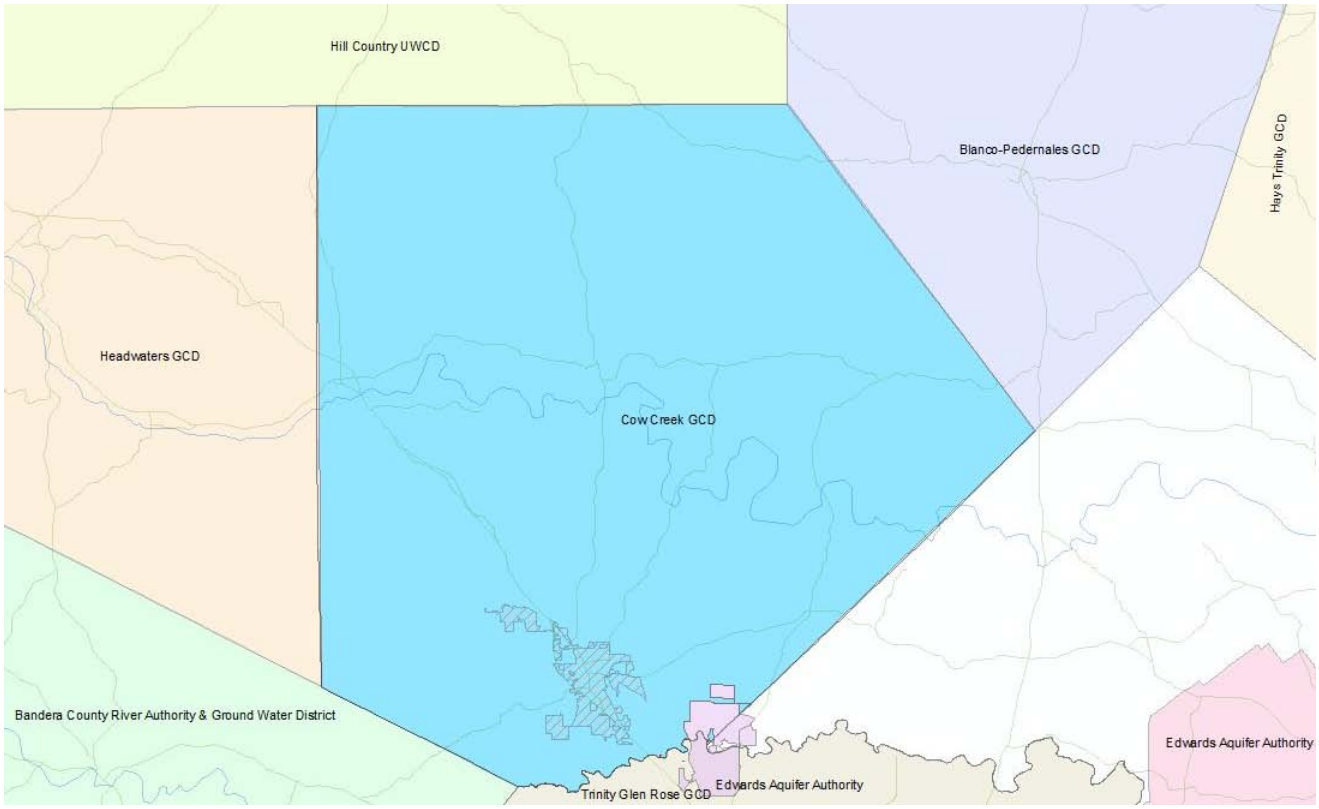




Source: modified from Ashworth, 1983; Mace and others, 2000

GENERAL DESCRIPTION OF THE DISTRICT

The Cow Creek Groundwater Conservation District includes all of Kendall County and encompasses roughly 663 square miles (424,320 acres), excluding the incorporated area of the City of Fair Oaks Ranch. The CCGCD was created in accordance with Chapter 36, HB 3544 and SB 2 of the 77th Legislature. On November 5, 2002, Kendall County voters approved the creation of the District and elected five Directors to govern the District. The District is currently funded through ad valorem property taxes and fees. The District's authority and duties are derived primarily from Chapter 36 of the Texas Water Code, Vernon's Texas Civil Statues.



Source: CCGCD

The District Board of Directors (as of Fiscal Year 2009) is comprised of Tommy Mathews - Director Precinct 4 and Board President, John Kight - Director Precinct 1 and Board Vice President, Milan Michalec - Director Precinct 2 and Board Secretary, Don Dietzmann - Director At Large and Board Treasurer, and R.K. "Bobby" Schwab - Director Precinct 3 and Asst. Secretary/Treasurer. The District General Manager is Micah Voulgaris.

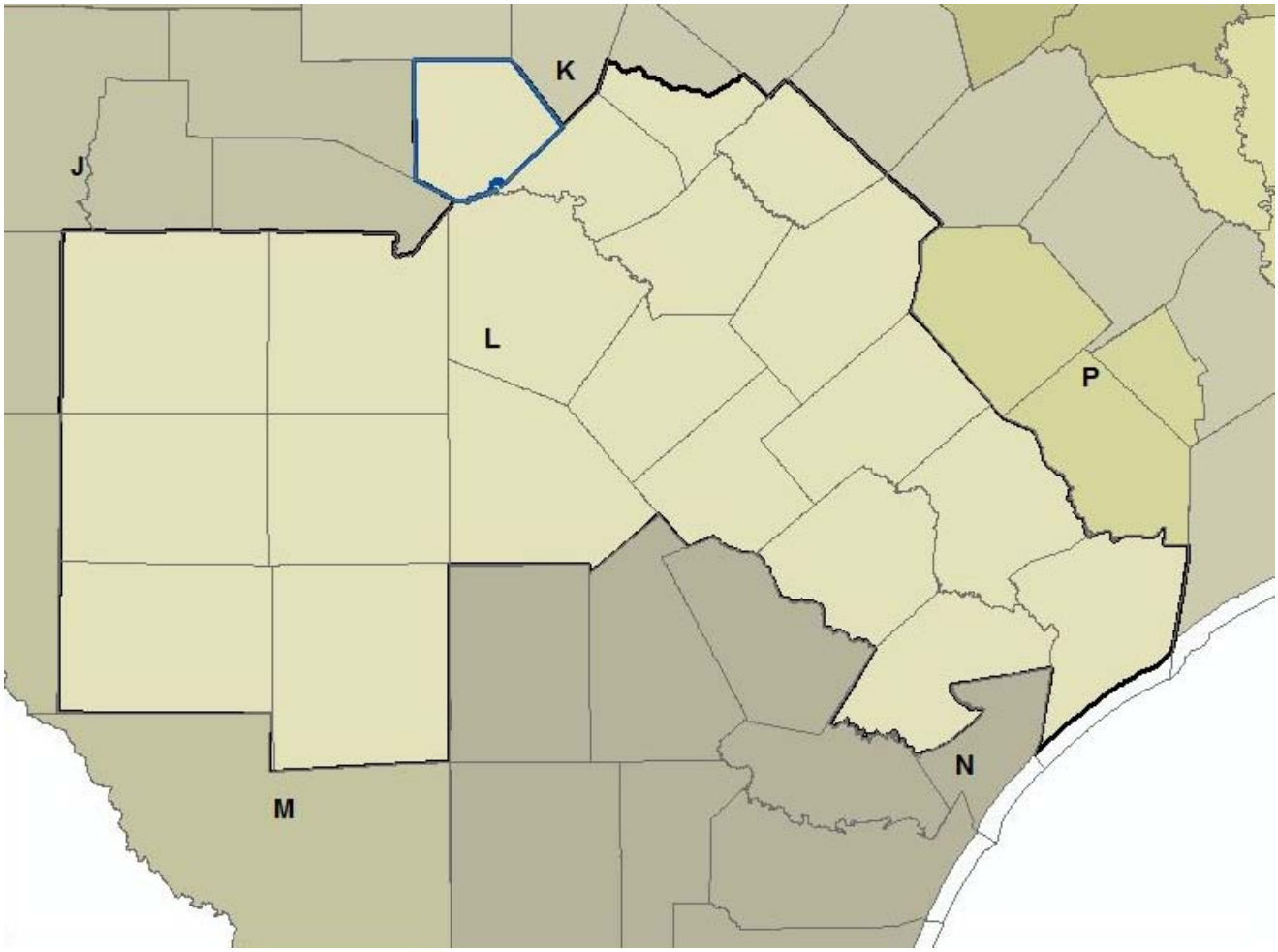
The Districts current economy is best characterized as a service oriented, bedroom community tied closely to San Antonio, the Interstate 10 corridor, and to a lesser extent, U.S. 281 and Interstate 35 corridors. Originally considered an area relying primarily on an agricultural-based economy, the District still retains that same rural flavor, but may be even better known for its shopping, antique stores, restaurants, small industries, and tourist facilities. Wildlife hunting, some fishing, and other outdoor activities also contribute significantly to the local economy. Tourists visiting nearby State Parks and other attractions also contribute revenues to the local economy.

Over the past few decades, Kendall County and other Hill Country counties in close proximity to the cities of Austin or San Antonio have seen rapid growth in population due to subdivision of large tracts

of land into smaller acreage.

The City of Boerne and the townships of Comfort, Sisterdale, Waring, Bergheim, Kendalia, and Welfare are located in the District.

The District lies primarily within the Guadalupe River basin and for statewide water planning purposes is part of the 21 county South Central Texas Regional Water Planning Group (Region L).

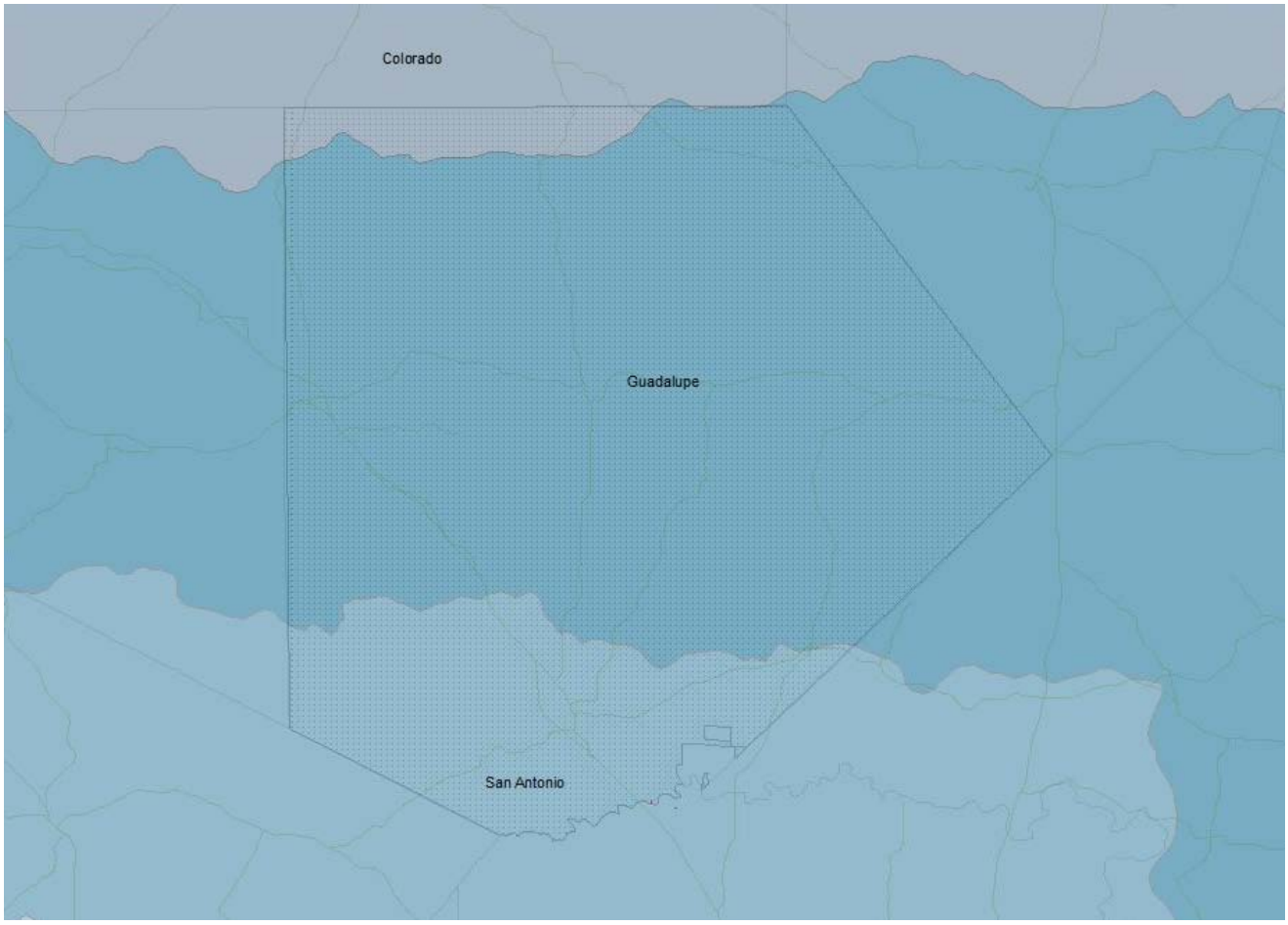


Source: CCGCD

Drainage and Topography

The District's primary drainage is the Guadalupe River, which flows through the central part of the county. Secondary watersheds include the Cibolo Creek, the Blanco, Pedernales, and the Medina Rivers. Surface drainage within the District is generally from northwest to southeast.

Map of River Basins:



Source: CCGCD

The topography of the District is predominantly rough and hilly. The primary geologic feature in the area, the Edwards Plateau, is dominated by stream-dissected hills grading into rolling terrain and shallow valleys. This is an elevated structure made up of Cretaceous age limestone, dolomite and marl. The Edwards Plateau extends westward from the Balcones Fault Zone and covers many West Texas counties. The District lies near the southeastern edge of the Plateau.

Elevation within the District ranges from a low of approximately 1,020 feet above sea level where the Guadalupe River leaves southeastern Kendall County to approximately 2,080 feet above sea level in the western part of the District.

WATER RESOURCES WITHIN THE COW CREEK GROUNDWATER CONSERVATION DISTRICT

Groundwater Resources and Usage in the Cow Creek GCD

Estimated groundwater usage in Cow Creek GCD between 2003 and 2008 has been compiled by the District. The District's estimates are provided below in Table 1.

TABLE 1

Last 5 years groundwater use in acre feet

	2003	2004	2005	2006	2007	2008
Municipal	2099	2120	2140	2161	2181	2202
Manufacturing	1	1	1	1	1	1
Steam/Electric	0	0	0	0	0	0
Irrigation	975	975	975	975	975	975
Mining	6	6	6	6	6	6
Livestock (exempt)	422	422	422	422	422	422
Domestic (exempt)	2575	2730	2886	3042	3198	3353
Total	6078	6254	6430	6607	6783	6959

Source: CCGCD

The TWDB Historical Water Use Estimate Summary and the Historical Groundwater Pumpage Summary for Kendall County/CCGCD are included in the Appendix as Table A and Table B, respectively.

Within the CCGCD there are two primary aquifers, the Trinity and the Edwards Group of the Edwards-Trinity (Plateau) Aquifer, which provide groundwater to county residents. Well depths vary from shallow, hand-dug wells 20-30 feet deep to drilled wells that are up to 1,200 feet deep. Depths are highly variable even within the same aquifer and depend entirely on site-specific topography and geology. Water quality and water quantity also vary greatly throughout the District. Water quality within a specific aquifer can often be defined or characterized in a general sense, but can still be affected by local geology and hydrology. The District will consider new data as it becomes available and will amend this plan as appropriate.

Current groundwater availability for the Middle Trinity Aquifer in the CCGCD has been estimated by the District using GAM Run 08-70b (50% > 2008) at 9,189 acre feet per year. The Edwards Group of the Edwards-Trinity (Plateau) Aquifer (318 acre feet) availability numbers are based on a Desired Future Condition (DFC) adopted by GMA 9 and corresponding Managed Available Groundwater (MAG) provided by the TWDB.

Managed Available Groundwater (Based on Desired Future Conditions)

Groundwater Management Area 9 has adopted Desired Future Conditions for four of the Aquifers located within the planning area. The total Managed Available Groundwater for the Edwards Group of the Edwards-Trinity (Plateau) Aquifer is 318 acre feet per year for the District. Desired Future Conditions were also adopted for the Hickory Aquifer, the Ellenburger-San Saba Aquifer, and the

Marble Falls Aquifers. The MAG numbers for the Edwards Group of the Edwards-Trinity (Plateau) Aquifer in the District are provided below in Table 2.

Table 2
MAG Estimates

Aquifer	River Basin	MAG (in acre feet/year)	Source Citation
Edwards Group of the Edwards-Trinity (Plateau)	Colorado	46	GAM run 08-90mag
Edwards Group of the Edwards-Trinity (Plateau)	Guadalupe	103	GAM run 08-90mag
Edwards Group of the Edwards-Trinity (Plateau)	San Antonio	169	GAM run 08-90mag

Draft Managed Available Groundwater figures were also calculated for the Hickory, the Ellenburger-San Saba, and the Marble Falls Aquifers. These numbers were small and resulted in draft MAG numbers of nine (9) acre feet annually for the Ellenburger-San Saba Aquifer and two (2) acre feet annually for the Hickory Aquifer. The Marble Falls Aquifer does not exist within the District. Therefore, no estimates for the Hickory, the Ellenburger-San Saba, and the Marble Falls Aquifers are presented in Table 2.

On November 30th, 2009, GMA 9 determined that the Ellenburger-San Saba and the Hickory were not relevant currently since no wells were known to produce from these aquifers at this time. The District will continue to work cooperatively with the surrounding GCD's (Blanco-Pedernales GCD and the Hill Country Underground Water Conservation District) to quantify and re-evaluate these estimates. These estimates will be reviewed annually with the Groundwater Management Area 9.

Aquifer Descriptions

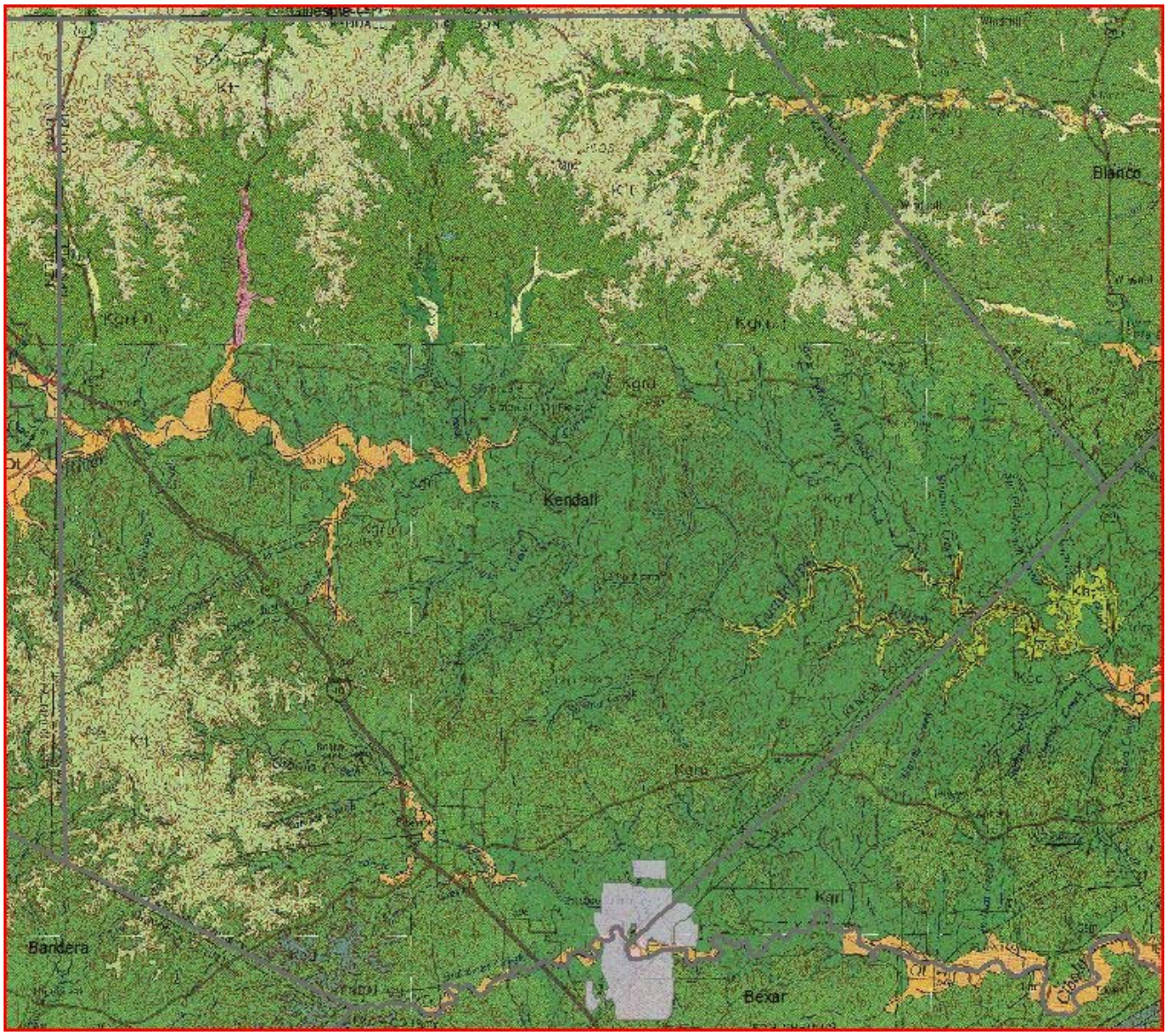
The Trinity aquifer in the District is comprised primarily of the Upper Glen Rose (Upper Trinity), Lower Glen Rose Limestone, Hensell Sand, and the Cow Creek Limestone (Middle Trinity), and to a lesser extent, the Hosston and Sligo Formations (Lower Trinity). It extends across the majority of the District. The Trinity aquifer is recharged primarily from local precipitation on its outcrop and through fracturing and porosity in the overlying units where the Trinity is in the subsurface. Most recharge originates from outside of the District and flows down gradient into and through the District. Well yields vary greatly and are highly dependent on local subsurface hydro geological characteristics. Yields are generally low, less than 20 gpm, but can occasionally be higher, with yields of 200-275 gpm being reported. Production from Trinity wells is primarily used for municipal, rural domestic, and livestock demands. A small amount of irrigation occurs for golf courses, nurseries, vegetables, hay crops, peaches, pecans, grapes and grains.

The Edwards Group of the Edwards-Trinity (Plateau) Aquifer within the District is located at higher elevations along ridges in the northern and southwestern portions of the county. It is comprised of relatively thin layers of limestone and dolomite that is an extension of the Edwards Plateau into the District from the west. In general, yields from the aquifer are low (less than 20 gpm) and the water is used occasionally for rural domestic and livestock demands. The Edwards Group of the Edwards-Trinity (Plateau) Aquifer in the District exists in an unconfined condition. Recharge is solely from local precipitation occurring over the outcrop. Water not pumped from wells will generally discharge from small seeps and springs at the base of the Edwards outcrop and provides some base flow to small

streams within the county.

Several minor aquifers occur in the District. These include alluvial aquifers, the Ellenburger, the Hickory, and the Marble Falls Aquifers.

Geologic Map of the District:



Surface Water Resources and Usage in CCGCD

Groundwater supplies in the District are augmented by several other water sources. The City of Boerne has a firm supply of 833 acre feet per year of surface water from Boerne Lake and 3,611 acre feet per year of surface water from Canyon Lake (GBRA). Rural water systems (Kendall County Utility Company, Cordillera Ranch, and Lerin Hills) supplies have a total of 3,000 acre feet per year of surface water from Canyon Lake (GBRA). Other adjudicated surface water withdrawals total approximately 3,624 acre feet per year (Guadalupe River, other surface water streams, and reservoirs).

In summary, annual surface water availability in the District totals approximately 2,208 acre feet per year in 2010 increasing to 7,444 acre feet per year in 2060. This is based on contracted amounts of surface water from GBRA and Boerne Lake. Total County Supply in Table 3 does not include the adjudicated surface water withdrawals/run of the river rights (approximately 3,624 acre feet per year).

Projected Total Water Supply in CCGCD

As shown in the Table 3 below, the projected total water supply in the Cow Creek GCD currently stands at about 10,349 acre feet per year and is expected to increase to 16,960 acre feet per year in 2060 due to the increase in GBRA surface water (which includes all sources except adjudicated surface water withdrawals/run of the river rights). The District's projected estimates of surface water supplies are based on actual contracted amounts between the water providers and the GBRA. The most recently adopted state water plan projected surface water supply is included as Table C in the appendix.

TABLE 3
District's projected total supply in acre feet per year

	2000	2010	2020	2030	2040	2050	2060
Available **Groundwater**	9,516	9,516	9,516	9,516	9,516	9,516	9,516

	2000	2010	2020	2030	2040	2050	2060
Projected Available **Surface Water**	833	2,208	4,063	5,588	6,493	6,943	7,444
Run of the River Rights	3,624	3,624	3,624	3,624	3,624	3,624	3,624
Total (excluding Run of the River)	10,349	11,724	13,579	15,104	16,009	16,459	16,960

Source: CCGCD

Based on the District's estimated projected supply from Table 3 and the estimated demands from Table 7, the District has compiled Table 4 to illustrate projected surpluses and shortages.

TABLE 4
Projected Supply, Demand, and Surplus/Shortage in acre feet per year

	2000	2010	2020	2030	2040	2050	2060
Total County Supply (all sources)	10,349	11,724	13,579	15,104	16,009	16,459	16,960
Total Demand (all sources)	**5,549**	**7,313**	**10,115**	**12,761**	**14,813**	**16,417**	**17,984**
Surplus/Shortage	4800	4411	3464	2343	1196	42	-1024

Source: CCGCD

The Texas Water Development Board (TWDB) defines available water as "the maximum amount of water available during the drought of record, regardless of whether the supply is physically or legally available."

The existing water supply is defined by the TWDB as the "maximum amount of water available from existing sources for use during drought of record conditions that is physically and legally available for use."

Projected Population and Water Demands in CCGCD

Population projections for the District were derived from the Region L Plan. Tables 5, 6, and 7 incorporate those numbers and provide updated District populations and water demand projections for every ten years beginning in 2010 and ending with 2060.

TABLE 5
CCGCD Population Summary

Water User Group	2000	2010	2020	2030	2040	2050	2060
Boerne	6,178	12,126	17,457	25,924	27,480	29,129	30,877
Fair Oaks Ranch	650	1,234	1,282	1,308	1,335	1,362	1,389
PWS other	255	313	383	457	519	570	620
Aqua Texas	1,500	1,700	1,800	1,900	1,900	1,900	1,900
KCWCID #1	1,750	2,700	3,200	3,750	4,400	5,150	6,000
KCUC	1,850	3,238	3,715	4,390	5,060	5,740	6,750
Cordillera Ranch (GBRA water)		440	2,500	3,750	5,000	5,000	5,000
Lerin Hills			1,000	2,000	3,000	4,000	5,200
County – Other	11,560	13,969	18,946	22,273	29,996	36,461	41,962
Kendall County/District Total Population	**23,743**	**35,720**	**50,283**	**65,752**	**78,690**	**89,312**	**99,698**

Source: Region L, modified by CCGCD

TABLE 6

CCGCD Per Capita Water Use Summary

in average gallons per capita per day

Water User Group	2000	2010	2020	2030	2040	2050	2060
Boerne	169	163	160	158	156	156	156
Fair Oaks Ranch	209	207	206	205	204	203	203
PWS other	130	123	121	119	119	117	117
Aqua Texas	150	149	160	160	169	169	169
KCWCID #1	140	140	135	130	125	120	120
KCUC	190	133	133	133	133	133	133
Cordillera Ranch (GBRA)		406	268	268	268	268	268
Lerin Hills			140	135	130	130	125
County - Other	144	142	140	138	136	136	136
Kendall County/District Average Per Capita Use	**162**	**183**	**163**	**161**	**160**	**159**	**159**

Source: CCGCD

Table 7 illustrates the District's estimated water needs through 2060. The most recently adopted state water plan projected total demand for water is included as Table D in the appendix.

TABLE 7

CCGCD Water Demand

in acre feet per year

Water User Group	2000	2010	2020	2030	2040	2050	2060
Municipal							
Boerne	1,170	2,214	3,129	4,588	4,802	5,090	5,396
Fair Oaks Ranch	152	286	296	300	305	310	316
PWS other	37	43	52	61	69	75	81
Aqua Texas	252	284	322	341	360	360	360
KCWCID #1	275	340	484	546	616	692	807
KCUC	394	320	550	650	750	850	1,000
Cordillera Ranch		200	750	1,125	1,500	1,500	1,500
Lerin Hills			157	303	437	582	728
County - Other	1,865	2,222	2,971	3,443	4,570	5,554	6,392
Total Municipal	**4,145**	**5,909**	**8,711**	**11,357**	**13,409**	**15,013**	**16,580**
Industrial	1	1	1	1	1	1	1
Steam-Electric	0	0	0	0	0	0	0
Mining	6	6	6	6	6	6	6
Irrigation	975	975	975	975	975	975	975
Livestock	422	422	422	422	422	422	422
Total	**5,549**	**7,313**	**10,115**	**12,761**	**14,813**	**16,417**	**17,984**

Source: CCGCD

Growth Patterns and Groundwater Impacts in CCGCD

Between 2010 and 2060, total District-wide water demand is estimated to increase by approximately 2.5 times or an additional 146% from 7,313 acre feet per year in 2010 to 17,984 acre feet per year in 2060 (Table 7). The estimated amount of groundwater currently available within the District is approximately 9,516 acft/yr per year, based on TWDB GAM Run 08-70b and the MAG number for the Edwards Group of the Edwards-Trinity (Plateau) Aquifer based on GAM run 08-90mag.

In the absence of new surface water sources, groundwater may have to be completely allocated to partially meet increased demands and water shortages that will occur in the District sometime between 2040 and 2060. As the demand increases, aquifers with areas of low production capability will probably experience a stressed condition sooner than anticipated and may not be able to meet higher demands. This may be particularly true in those areas where development is more intense. The most recently adopted state water plan water supply needs are included as Table E in the appendix. The 2007 State Water Plan projects needs (shortages) in 2010. The State Water Plan also addresses Projected Water Management Strategies adopted by Region L. These strategies are included as Table F in the appendix.

Much of the growth now occurring in the District is focused on the southern end of the District. This area is served primarily by private water wells producing from various stratigraphic units of the Trinity Aquifer. This aquifer is known for low yield wells and water quality concerns involving hardness and other factors. TWDB PGMA studies and the Trinity GAM indicate that with continued growth, this particular aquifer will be over extended by 2015 to the point where quantity and quality problems are likely.

The Edwards Group of the Edwards-Trinity (Plateau) Aquifer is located in areas that are expected to slowly undergo development. The Edwards Group of the Edwards-Trinity (Plateau) Aquifer will be unlikely to provide enough water to support extensive growth. Therefore, any growth that does occur during the 50 year planning horizon will more than likely have to rely on some other water source such as the Trinity, and may have to take in consideration the associated water quantity or quality problems.

Recharge of Groundwater in CCGCD

The annual natural recharge occurring in the Cow Creek GCD is thought to be primarily through percolation of rainfall. More localized recharge, along with potentially higher rates of recharge, is probably occurring in the beds of rivers, creeks, and tributaries, particularly if associated with cave entrances or fracture zones. Recharge also occurs from flow through fracturing and porosity in the overlying units where the Trinity is in the subsurface. Most recharge originates from areas outside of the District and flows into and through the District. The District is aware of several significant recharge features in the area that are providing a major avenue for recharge.

Initial studies of the Trinity Aquifer calculated an annual recharge coefficient of approximately 4% of annual rainfall. This was documented in the September 2000 TWDB report on “Groundwater Availability of the Trinity Aquifer, Hill Country Area, and Texas: Numerical simulations through 2050” by Robert E. Mace, et. al.

John Ashworth also developed a similar annual effective recharge coefficient (also 4% of average annual rainfall…about 30 inches) for the Trinity aquifer in the Texas Department of Water Resources Report 273, Ground-Water Availability of the Lower Cretaceous Formations in the Hill Country of

South-Central Texas, January 1983.

A subsequent 2008 study, funded by the District, indicated more realistic recharge rates to range between 6% and 9% for the Guadalupe River Basin portion of the District. This was documented in Wet Rock Groundwater Services report "An Evaluation of the Trinity Aquifer Within Kendall County and Analysis of the Trinity (Hill Country) GAM", June 25, 2008, Kaveh Khorzad.

Table 8 provides a flow budget and recharge variables for the District based on version 2.01 of the GAM for the Hill Country portion of the Trinity Aquifer (2009). Table 8 addresses some of the flow variables that affect recharge calculations and is derived from GAM Run 09-030.

TABLE 8

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the District	Edwards Group (Edwards-Trinity Plateau Aquifer)	3,346
	Upper Trinity (Edwards-Trinity Plateau Aquifer)	123
	Middle Trinity (Edwards-Trinity Plateau Aquifer)	0
	Lower Trinity (Edwards-Trinity Plateau Aquifer)	0
	Upper Trinity (Trinity Aquifer)	29,514
	Middle Trinity (Trinity Aquifer)	22,654
	Lower Trinity (Trinity Aquifer)	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	Edwards Group (Edwards-Trinity Plateau Aquifer)	3,061
	Upper Trinity (Edwards-Trinity Plateau Aquifer)	0
	Middle Trinity (Edwards-Trinity Plateau Aquifer)	0
	Lower Trinity (Edwards-Trinity Plateau Aquifer)	0
	Upper Trinity (Trinity Aquifer)	4,521
	Middle Trinity (Trinity Aquifer)	24,728
	Lower Trinity (Trinity Aquifer)	0
Estimated annual volume of flow into the District within each aquifer in the District	Edwards Group (Edwards-Trinity Plateau Aquifer)	238
	Upper Trinity (Edwards-Trinity Plateau Aquifer)	2,848
	Middle Trinity (Edwards-Trinity Plateau Aquifer)	5,504
	Lower Trinity (Edwards-Trinity Plateau Aquifer)	294
	Upper Trinity (Trinity Aquifer)	3,555
	Middle Trinity (Trinity Aquifer)	11,549
	Lower Trinity (Trinity Aquifer)	1,551
Estimated annual volume of flow out of the District within each aquifer in the District	Edwards Group (Edwards-Trinity Plateau Aquifer)	333
	Upper Trinity (Edwards-Trinity Plateau Aquifer)	2,332
	Middle Trinity (Edwards-Trinity Plateau Aquifer)	5,719
	Lower Trinity (Edwards-Trinity Plateau Aquifer)	721
	Upper Trinity (Trinity Aquifer)	11,632
	Middle Trinity (Trinity Aquifer)	18,432
	Lower Trinity (Trinity Aquifer)	7,065

Table 8, Continued

Estimated net annual volume of flow between each aquifer in the District	Edwards Group to the Upper Trinity (Edwards-Trinity Plateau Aquifer)	97
	Upper Trinity to the Middle Trinity (Edwards-Trinity Plateau Aquifer)	659
	Middle Trinity to the Lower Trinity (Edwards-Trinity Plateau Aquifer)	427
	Edwards Group (outside Edwards-Trinity Plateau Aquifer) to the Upper Trinity (Trinity Aquifer)	58*
	Upper Trinity to the Middle Trinity (Trinity Aquifer)	15,988
	Middle Trinity to the Lower Trinity (Trinity Aquifer)	5,571

* The groundwater availability model includes some portions of the Edwards Group outside the official boundary of the Edwards-Trinity (Plateau) Aquifer. Though flow for these areas is not explicitly reported, the interaction between the Edwards Group (outside the Edwards-Trinity Plateau Aquifer) and the underlying Trinity Aquifer is shown here.

Source: TWDB GAM Run 09-030

Estimated maximum annual recharge for the Edwards Group of the Edwards-Trinity (Plateau) Aquifer, the Upper Trinity, the Middle Trinity, and the Lower Trinity aquifers in the District based on the Recharge Flow Variables is also shown in Table 8. The District will review future and/or updated calculations being investigated and/or prepared by TWDB for the Hill County portion of the Trinity aquifer model. The District will consider this and other new data as it becomes available and will amend this plan as appropriate.

Estimated recharge and estimated groundwater availability clearly need further study and refinement.

These recharge potentials are not to be confused with “recoverable” groundwater. Not all groundwater is recoverable. Some is lost to spring flow and seeps, some is used by plant life while the water is still near the surface, while some is almost permanently retained within the rock itself. For instance, much of the Trinity is a rather “tight” formation, particularly in the vertical direction. The Trinity is known for its low porosity and permeability, limited fracturing and faulting, and a complicated stratigraphy that includes layers of rock that reduce transmissivity and retard downward-moving recharge water. As a result, individual well yields are often quite low and, though large quantities of water may be present in the subsurface in specific local sites and in certain wells, much of the groundwater in the Cow Creek GCD as a whole may be unrecoverable due to local hydro-geologic conditions.

Whereas, significant recharge occurs within the District for the Edwards Trinity (Plateau) and the Upper and Lower Glen Rose, formations underlying these are predominantly recharged from outside the District’s Boundary

As previously mentioned, considerable amounts of water recharging the Trinity aquifer will be lost, some through biologic uptake and a significant amount through discharge at springs and seeps that provide relatively reliable base flow to local rivers and tributaries. Thus, much of the annual recharge may enter the ground, only to leave it again as base flow to surface streams. This is water that the aquifer rejects on an average annual basis and is potentially available and can theoretically be retrieved (at least on a short-term basis) without diminishing the average volume of groundwater

being recharged to storage or, in other words, without creating a mining situation within the aquifer. However, if extensive pumping of this available water occurs, then base flow to area springs and streams will be greatly reduced and the effects of this reduction may be undesirable. Extensive pumping will also reduce the pressure head and may result in a significantly smaller quantity of recharge water actually percolating downward through the complex geology before providing deeper aquifer recharge that would be available for more reliable, long-term well production. Once pumping exceeds average annual recharge, then an aquifer mining condition will clearly exist and groundwater availability will decline.

Recharge Enhancement Potential

The District has yet to assess potential recharge projects in the area. The District may solicit ideas and information and may investigate any potential recharge enhancement opportunities, natural or artificial, that are brought to the District's attention. Such projects may include, but are not limited to: cleanup or site protection projects at any identified significant recharge feature, encouragement of prudent brush control/water enhancement projects, non-point source pollution mitigation projects, aquifer storage and recovery projects, development of recharge ponds or small reservoirs, and the encouragement of appropriate and practical erosion and sedimentation control at construction projects located near surface streams.

GROUNDWATER MANAGEMENT POLICIES
(Actions, Procedures, Performance and Avoidance for Plan Implementation)

The District will manage the supply of groundwater within the District based on the District's best available data and its assessment of water availability and groundwater storage conditions. The Groundwater Availability Model (including subsequent runs) and the Managed Available Groundwater developed by the TWDB for the Trinity Aquifer will also aid in the decision making process of the District.

The District has adopted Rules that require the permitting of wells and groundwater production limits for non-exempt wells within the District consistent with this Groundwater Management Plan, the provisions of Chapter 36.113 and other pertinent sections of Chapter 36.

The District is in agreement with the commonly accepted groundwater management principle that opposes the mining of groundwater. Therefore, it shall be the policy of the District to limit withdrawal of groundwater from all current and future wells producing from the District's aquifers to no more than the current existing supply. Development or analysis of new or existing groundwater or aquifer data (MAG revisions) may result in changes to the groundwater availability volumes, with a corresponding change in production limits from the affected aquifers.

The District has adopted Rules that regulate the spacing of wells and the production of groundwater consistent with the provisions Chapter 36.116. The District wishes to emphasize that in regulating or limiting groundwater production, it shall be the policy of the District to preserve historic use to the greatest extent practical and consistent with this plan. A copy of the District's Rules is available at http://www.ccgcd.org/Rules/CCGCD_RULES_052308.pdf.

The District will implement and utilize the provisions of this groundwater management 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. The District's current and future Rules will be promulgated pursuant to the provisions of Texas Water Code Chapter 36 shall be based on the best technical evidence available, and will address, implement, and be consistent with the provisions and policies of this plan.

The District shall review and re-adopt this plan, with or without revisions, at least once every five years in accordance with Chapter 36.1072(e). Any amendment to this plan shall be in accordance with Chapter 36.1073.

The District shall treat all citizens with equality. Citizens may apply to the District for discretion in enforcement of the Rules on grounds of adverse economic effect or unique local conditions. In granting of discretion to any rule, the District Board shall consider the potential for adverse effect on adjacent landowners. The exercise of said discretion by the District Board shall not be construed as limiting the power of the District Board.

The District will seek cooperation and coordination in the development and implementation of this plan, management of groundwater resources, and appropriate District activities with the appropriate state, regional or local water management or planning entities.

The District will monitor groundwater conditions through its water level and water quality monitoring programs that are currently in place and will continue to maintain and update the District's database, which was established in 2004.

The District will encourage cooperative and voluntary Rule compliance, but if Rule enforcement becomes necessary, the enforcement will be legal, fair, and impartial. The promulgation and enforcement of the Rules will be based on the best technical evidence available.

METHODOLOGY FOR TRACKING PROGRESS IN ACHIEVING MANAGEMENT GOALS

The District will use the following methodology to track its progress toward achieving its management goals:

The District General Manager, District Board President, or a Contracting Consultant will present an annual report to the District's Board of Directors on District performance and progress in achieving management goals and objectives at the last regular District Board meeting of the fiscal year (September meeting)

GROUNDWATER MANAGEMENT GOALS

1.0 Implement management strategies that will provide for the most efficient use of groundwater.

1.1 Management Objective

Implement and maintain a program of issuing well operating permits for non-exempt wells within the District.

Performance Standard(s)

Ongoing program of issuance or re-issuance of one or more well operating permits each year. The number of well operating permit applications and the number of permits issued will be included in the annual report to the District Board of Directors.

1.2 Management Objective

Ongoing program of collecting and maintaining actual meter readings from permitted non-exempt wells within the District.

Performance Standard(s)

Annual report submitted to the District Board outlining the previous year's water use from at least 25% of the District's permitted non-exempt wells.

2.0 Implement strategies that will control and prevent waste of groundwater.

2.1 Management Objective

Each year the District will provide to local media articles describing groundwater waste prevention practices available for implementation by groundwater users.

Performance Standard(s)

Each year provide at least one article to the local media related to groundwater waste prevention practices.

2.2 Management Objective

Provide to the public water efficient literature handouts.

Performance Standard(s)

Each year provide water efficient literature handouts on at least one occasion. The District will also maintain a supply of water efficient literature at the office.

2.3 Management Objective

Provide either a speaker at a local club or organization or a display booth at public events.

Performance Standard(s)

Each year the District will provide a speaker at a local club or organization or a display booth at public events a minimum of twice a year.

3.0 Implement strategies that will control and prevent subsidence.

The rigid geologic framework of the region precludes significant subsidence from occurring. Therefore, this goal is not applicable to the operations of this District.

4.0 Implement management strategies that will address conjunctive surface water management issues.

4.1 Management Objective

Meet with Kendall County Officials regarding water availability reports, County subdivision requirements, and District Rules.

Performance Standard(s)

Meet with Kendall County Officials regarding water availability reports, County subdivision requirements, and District Rules at least once a year and submit a comparative analysis of the Rules and requirements.

4.2 Management Objective

Maintain ongoing studies regarding correlations between spring flow, surface stream elevations/flows, rainfall, and groundwater levels.

Performance Standard(s)

An annual report submitted to the District Board will include a review of the ongoing studies.

4.3 Management Objective

Meet with the local entities responsible for surface water management.

Performance Standard(s)

Meet with the Guadalupe Blanco River Authority and appropriate local entities responsible for surface water management at least once a year.

5.0 Implement strategies that will address natural resource issues which impact the use and availability of groundwater, or which are impacted by the use of groundwater.

The District is not aware of any such natural resource issues. Therefore, this goal is not applicable to the operations of the District at this time.

6.0 Implement strategies that will address drought conditions.

6.1 Management Objective

Review the District's monitor well data, the Palmer Drought Severity Index, stream flow and rainfall data to determine status of drought condition and, if necessary, report to District Board on need to implement drought contingency plan.

Performance Standards(s)

The District Board will conduct a review of the current drought stage status on a monthly basis. A copy of the review will be included in the annual report to the District Board of Directors.

6.2 Management Objective

Provide to the public drought-orientated literature handouts.

Performance Standards(s)

Each year provide drought-oriented literature handouts on at least one occasion. The District will also maintain a supply of drought-oriented literature at the office.

6.3 Management Objective

To evaluate groundwater availability the District will monitor water levels on selected wells representative of the Trinity aquifer within the District in accordance with the water level monitoring schedule in Table 10.

Table 10

Water Level Monitoring Schedule

Aquifer	# of Wells	Minimum Frequencies
Trinity	25	1 time per month

Performance Standard(s)

The District will take a minimum of 250 well readings annually and report the findings to the District Board.

7.0 Implement strategies to address:

Conservation

7.1 Management Objective

Each year the District will provide to local media articles identifying the importance of groundwater conservation and various groundwater conservation methods available for implementation by groundwater users.

Performance Standards(s)

Each year provide at least one article to the local media related to the importance of groundwater conservation and various groundwater conservation methods available for implementation by groundwater users.

7.2 Management Objective

Provide to the public water conservation literature handouts.

Performance Standards(s)

Each year provide water conservation literature handouts on at least one occasion.

Recharge Enhancement

7.3 Management Objective

The District will investigate potential recharge enhancement sites either natural or artificial.

Performance Standard(s)

Annually, the General Manager will include a report to the District's Board on the District's findings related to recharge enhancement.

7.4 Management Objective

The District will investigate, identify, and catalog existing recharge features and adopt Best Management Practices to protect these features.

Performance Standard(s)

Annually, the District will conduct a review of the policies related to the Best Management Strategies for existing recharge features. A copy of the review will be included in the annual report to the District Board of Directors.

Rainwater Harvesting

7.5 Management Objective

The District will encourage rain-water harvesting and provide to the public literature related to rain-water harvesting.

Performance Standard(s)

The District will provide rainwater harvesting literature on at least one occasion.

Precipitation Enhancement

7.6 Not applicable to include since this objective is not cost effective at this time.

Brush Control

7.7 Management Objective

The District will encourage brush control and Best Management Practices related to the same where appropriate

Performance Standard(s)

Annually, the District will conduct a review of the policies adopted by the District Board related to brush control practices and/or the progression of brush control within the District. A copy of the review will be included in the annual report to the District Board of Directors. If it is found from review that no policies that relate to brush control practices were adopted by the District Board of Directors during the previous year, then a statement of such will be included in the annual report to the District Board of Directors.

8.0 Addressing Desired Future Conditions in a quantitative manner

8.1 Management Objective

The District will identify at least one monitor well in the Edwards Group of the Edwards-Trinity (Plateau) Aquifer to monitor the static water level in that Aquifer to ensure the achievement of the adopted DFC.

Performance Standard(s)

Within one year of the adoption of this Plan, the District will identify and begin

monitoring the static water level in the Edwards Group of the Edwards-Trinity (Plateau) Aquifer on a bi-monthly basis. The data will be presented to the District Board of Directors in an annual report.

Appendix

TABLE A

Historical Groundwater Pumpage Summary

TWDB - Water Use Survey

Kendall County

Unit: Acre Feet (ACFT)

Year	Aquifer	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1980	TRINITY	1,110	0	0	200	0	441	1,751
1984	TRINITY	1,610	7	0	282	0	330	2,229
1985	TRINITY	1,521	9	0	132	0	326	1,988
1986	TRINITY	1,574	8	0	176	0	228	1,986
1987	TRINITY	1,412	2	0	176	0	249	1,839
1988	TRINITY	1,607	2	0	440	0	276	2,325
1989	TRINITY	1,792	2	0	369	0	274	2,437
1990	TRINITY	1,672	2	0	274	0	312	2,260
1991	TRINITY	1,469	2	0	274	6	319	2,070
1992	TRINITY	1,526	7	0	274	6	410	2,223
1993	TRINITY	1,730	9	0	808	6	407	2,960
1994	TRINITY	1,913	8	0	718	6	386	3,031
1995	TRINITY	2,048	0	0	808	6	374	3,236
1996	TRINITY	2,201	6	0	808	6	303	3,324
1997	TRINITY	2,694	5	0	808	6	298	3,811
1998	TRINITY	2,855	0	0	808	6	302	3,971
1999	TRINITY	3,042	0	0	808	6	360	4,216
2000	TRINITY	2,766	0	0	286	6	357	3,415
2001	TRINITY	3,243	0	0	726	6	353	4,328
2002	TRINITY	2,721	0	0	726	6	309	3,762
2003	TRINITY	2,547	0	0	131	6	268	2,952

NOTE: All Pumpage reported in acre-feet
Source: TWDB Water Use Survey Database
(http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=2)

TABLE B

Historical Water Use Estimate Summary

TWDB - Water Use Survey

Kendall County

Unit: Acre Feet (ACFT)

GW = groundwater; SW = surface water

Year	Source	Municipal	Manufacturing	Steam Electric	Irrigation	Mining	Livestock	Total
1974	GW	1,047	10	0	217	30	653	1,957
	SW	0	0	0	300	0	0	300
	Total	**1,047**	**10**	**0**	**517**	**30**	**653**	**2,257**
1980	GW	1,103	4	0	200	0	441	1,748
	SW	381	3	0	336	0	98	818
	Total	**1,484**	**7**	**0**	**536**	**0**	**539**	**2,566**
1984	GW	1,622	9	0	282	0	330	2,243
	SW	410	0	0	38	0	81	529
	Total	**2,032**	**9**	**0**	**320**	**0**	**411**	**2,772**
1985	GW	1,516	10	0	132	0	326	1,984
	SW	451	0	0	18	0	80	549
	Total	**1,967**	**10**	**0**	**150**	**0**	**406**	**2,533**
1986	GW	1,608	10	0	176	0	228	2,022
	SW	524	0	0	24	0	56	604
	Total	**2,132**	**10**	**0**	**200**	**0**	**284**	**2,626**
1987	GW	1,452	3	0	176	0	249	1,880
	SW	701	0	0	24	0	62	787
	Total	**2,153**	**3**	**0**	**200**	**0**	**311**	**2,667**
1988	GW	1,653	3	0	440	0	276	2,372
	SW	468	0	0	60	0	68	596
	Total	**2,121**	**3**	**0**	**500**	**0**	**344**	**2,968**
1989	GW	1,843	6	0	369	0	274	2,492
	SW	456	0	0	140	0	68	664
	Total	**2,299**	**6**	**0**	**509**	**0**	**342**	**3,156**
1990	GW	1,734	2	0	274	0	312	2,322
	SW	396	0	0	106	0	77	579
	Total	**2,130**	**2**	**0**	**380**	**0**	**389**	**2,901**
1991	GW	1,524	2	0	274	6	319	2,125
	SW	544	0	0	106	0	80	730
	Total	**2,068**	**2**	**0**	**380**	**6**	**399**	**2,855**
1992	GW	1,578	12	0	274	6	410	2,280
	SW	767	0	0	106	0	102	975
	Total	**2,345**	**12**	**0**	**380**	**6**	**512**	**3,255**
1993	GW	1,791	9	0	808	6	407	3,021
	SW	957	0	0	416	0	101	1,474
	Total	**2,748**	**9**	**0**	**1,224**	**6**	**508**	**4,495**
1994	GW	2,017	8	0	718	6	386	3,135
	SW	902	0	0	505	0	96	1,503
	Total	**2,919**	**8**	**0**	**1,223**	**6**	**482**	**4,638**
1995	GW	2,164	1	0	808	6	374	3,353
	SW	807	0	0	416	0	93	1,316

	Total	**2,971**	**1**	**0**	**1,224**	**6**	**467**	**4,669**
1996	GW	2,444	7	0	808	6	303	3,568
	SW	795	0	0	416	0	77	1,288
	Total	**3,239**	**7**	**0**	**1,224**	**6**	**380**	**4,856**
1997	GW	2,776	5	0	808	6	298	3,893
	SW	442	0	0	416	0	75	933
	Total	**3,218**	**5**	**0**	**1,224**	**6**	**373**	**4,826**
1998	GW	2,942	0	0	808	6	302	4,058
	SW	620	0	0	416	0	76	1,112
	Total	**3,562**	**0**	**0**	**1,224**	**6**	**378**	**5,170**
1999	GW	3,135	0	0	808	6	360	4,309
	SW	135	0	0	416	0	91	642
	Total	**3,270**	**0**	**0**	**1,224**	**6**	**451**	**4,951**
2000	GW	2,850	0	0	286	6	357	3,499
	SW	696	0	0	110	0	89	895
	Total	**3,546**	**0**	**0**	**396**	**6**	**446**	**4,394**
2001	GW	3,423	0	0	726	6	231	4,386
	SW	190	0	0	282	0	212	684
	Total	**3,613**	**0**	**0**	**1,008**	**6**	**443**	**5,070**
2002	GW	2,920	0	0	726	6	202	3,854
	SW	469	0	0	282	0	186	937
	Total	**3,389**	**0**	**0**	**1,008**	**6**	**388**	**4,791**
2003	GW	2,664	0	0	131	6	165	2,966
	SW	631	0	0	358	0	151	1,140
	Total	**3,295**	**0**	**0**	**489**	**6**	**316**	**4,106**
2004	GW	2,726	0	0	115	6	171	3,018
	SW	681	0	0	105	0	157	943
	Total	**3,407**	**0**	**0**	**220**	**6**	**328**	**3,961**

NOTE: All Pumpage reported in acre-feet
Source: TWDB Water Use Survey Database
(http://www.twdb.state.tx.us/wushistorical/DesktopDefault.aspx?PageID=1)

TABLE C

2007 State Water Plan
Projected Surface Water Supplies
Kendall County
acre feet per year

RWPG	Water User Group	County	River Basin	Source Name	2010	2020	2030	2040	2050	2060
L	Boerne	Kendall	San Antonio	Boerne Lake/Reservoir	506	506	506	506	506	506
L	Boerne	Kendall	San Antonio	Canyon Lake/Reservoir	650	1,300	1,861	1,861	1,861	1,861
L	County Other	Kendall	San Antonio	Canyon Lake/Reservoir	732	1,160	1,500	1,500	1,500	1,500
L	Fair Oaks Ranch	Kendall	San Antonio	Canyon Lake/Reservoir	252	273	294	294	294	294
L	Irrigation	Kendall	Guadalupe	Guadalupe River Combined Run-of-River Irrigation	187	187	187	187	187	187
L	Livestock	Kendall	Colorado	Livestock Local Supply	7	7	7	7	7	7
L	Livestock	Kendall	Guadalupe	Livestock Local Supply	177	177	177	177	177	177
L	Livestock	Kendall	San Antonio	Livestock Local Supply	40	40	40	40	40	40
Total Projected Surface Water Supplies (acre-feet per year) =					**2,551**	**3,650**	**4,572**	**4,572**	**4,572**	**4,572**

Source: Volume 3, 2007 State Water Planning Database
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

TABLE D

2007 State Water Plan
Projected Water Demands
Kendall County
acre feet per year

RWPG	Water User Group	County	River Basin	2010	2020	2030	2040	2050	2060
L	Boerne	Kendall	San Antonio	1,570	2,188	2,843	3,370	3,831	4,282
L	County Other	Kendall	Colorado	35	49	63	75	86	96
L	County Other	Kendall	Guadalupe	1,635	2,279	2,936	3,487	3,966	4,434
L	County Other	Kendall	San Antonio	1,080	1,506	1,939	2,304	2,620	2,930
L	Fairoaks Ranch	Kendall	San Antonio	286	296	300	305	310	316
L	Irrigation	Kendall	Guadalupe	521	510	500	490	480	471
L	Irrigation	Kendall	San Antonio	193	189	185	181	178	175
L	Livestock	Kendall	Colorado	13	13	13	13	13	13
L	Livestock	Kendall	Guadalupe	353	353	353	353	353	353
L	Livestock	Kendall	San Antonio	80	80	80	80	80	80
L	Mining	Kendall	Colorado	6	6	6	6	6	6
L	Water Services Inc.	Kendall	San Antonio	43	52	61	69	75	81
Total Projected Water Demands (acre-feet per year) =				**5,815**	**7,521**	**9,279**	**10,733**	**11,998**	**13,237**

Source: Volume 3, 2007 State Water Planning Database
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

TABLE E

2007 State Water Plan
Projected Water Needs
Kendall County

Positive values reflect a water surplus; negative values reflect a water need.

RWPG	WUG	County	River Basin	2010	2020	2030	2040	2050	2060
L	Boerne	Kendall	San Antonio	38	71	-23	-549	-1,092	-1,542
L	County Other	Kendall	Colorado	61	47	33	21	10	0
L	County Other	Kendall	Guadalupe	-221	-865	-1,522	-2,073	-2,552	-3,020
L	County Other	Kendall	San Antonio	0	3	-90	-455	-833	-1,143
L	Fair Oaks Ranch	Kendall	San Antonio	0	11	28	23	12	6
L	Irrigation	Kendall	Guadalupe	5	9	13	16	20	23
L	Irrigation	Kendall	San Antonio	-147	-145	-141	-138	-144	-141
L	Livestock	Kendall	Colorado	0	0	0	0	0	0
L	Livestock	Kendall	Guadalupe	0	0	0	0	0	0
L	Livestock	Kendall	San Antonio	-25	-25	-25	-25	-28	-28
L	Mining	Kendall	Colorado	0	0	0	0	0	0
L	Water Services Inc.	Kendall	San Antonio	-41	-50	-59	-67	-73	-79
Total Projected Water Needs (acre-feet per year) =				**-434**	**-1,085**	**-1,860**	**-3,307**	**-4,722**	**-5,953**

Source:Volume 3, 2007 State Water Planning Database

(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

TABLE F

2007 State Water Plan
Projected Water Management Strategies
Kendall County

RWPG	WUG	WUG County	River Basin	Water Management Strategy	Source Name	Source County	2010	2020	2030	2040	2050	2060
L	County Other	Kendall	Guadalupe	Canyon Reservoir - Downstream Diversions	Canyon Lake/Reservoir	Reservoir	221	865	0	0	0	0
L	Water Services Inc.	Kendall	San Antonio	Edwards Transfers	Edwards-BFZ Aquifer	Medina	41	50	59	67	73	79
L	Boerne	Kendall	San Antonio	LGWSP for GBRA Needs	Guadalupe River Run-of-River	Cahoun	0	0	23	549	1,092	1,542
L	County Other	Kendall	Guadalupe	LGWSP for GBRA Needs	Guadalupe River Run-of-River LGWSP	Cahoun	0	0	1,522	2,073	2,552	3,020
L	County Other	Kendall	San Antonio	LGWSP for GBRA Needs	Guadalupe River Run-of-River LGWSP	Cahoun	0	0	90	455	833	1,143
L	Irrigation	Kendall	San Antonio	Local Groundwater (Trinity Aquifer)	Trinity Aquifer	Kendall	148	148	148	148	148	148
L	Livestock	Kendall	San Antonio	Local Groundwater (Trinity Aquifer)	Trinity Aquifer	Kendall	28	28	28	28	28	28
L	Fair oaks Ranch	Kendall	San Antonio	Municipal Water Conservation	Conservation	Bexar	26	51	75	97	101	107
L	County Other	Kendall	Guadalupe	Municipal Water Conservation	Conservation	Kendall	0	0	0	0	73	264
L	Boerne	Kendall	San Antonio	Municipal Water Conservation	Conservation	Kendall	98	280	394	502	652	816
Total Projected Water Management Strategies (acre-feet per year) =							**562**	**1,422**	**2,339**	**3,919**	**5,552**	**7,147**

Source: Volume 3, 2007 State Water Planning Database
(http://www.twdb.state.tx.us/DATA/db07/defaultReadOnly.asp)

Cow Creek Groundwater Conservation District

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