GROUNDWATER MANAGEMENT PLAN

GUADALUPE COUNTY GROUNDWATER CONSERVATION DISTRICT

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GUADALUPE COUNTY GROUNDWATER CONSERVATION DISTRICT

GROUNDWATER MANAGEMENT PLAN

1. District Mission

The Guadalupe County Groundwater Conservation District will conserve and regulate the use of groundwater through monitoring of aquifer levels and production and encourage conservation rules which limit pumping, thereby extending the quantity and quality of the water available in the entire Carrizo-Wilcox aquifer in Guadalupe County.

2. Time Period of this Plan

This plan will become effective upon adoption by the Guadalupe County Groundwater Conservation District Board of Directors and certification as administratively complete by the Texas Water Development Board. The plan will remain in effect for five (5) years after the date of certification or until a revised plan is adopted and certified.

3. Statement of Guiding Principles

The Guadalupe County Groundwater Conservation District recognizes that the groundwater resources of the region are of vital importance to the continued economic well being of landowners, agriculture, citizens, economy, environment and long term use of the resource within the District. The preservation of groundwater resources shall be managed in the most prudent and cost effective manner through the regulation of production as effected by the District's well permitting, production permits and, if necessary, the well spacing rules. This management plan is intended as a guide or blueprint for action of those individuals charged with the responsibility for the execution of District activities.

4. Background

The Guadalupe County Groundwater Conservation District was first created in 1997, in Chapter 1066, Acts of the 75th Legislature and was then amended in 1999 by House Bill 3817 which created the District with seven directors elected from seven single member districts and limited the district to only a portion of Guadalupe County outside the Edwards Aquifer Authority boundaries in Guadalupe County. The District does not have the power to tax and receives all of its income from fees imposed on municipal/commercial pumpers of groundwater. A confirmation election was held on November 2, 1999 which confirmed the district and elected seven initial directors from single member districts. The board has adopted rules and held public hearings thereon in accordance with Texas Water Code Ann Section 36.001 et. seq.

5. Groundwater Resources

The Guadalupe County Groundwater Conservation District has Carrizo and Wilcox and Leona formations within its boundaries. Only Carrizo and Wilcox have sufficient capacity for commercial or irrigation type production. The Carrizo-Wilcox is substantially recharged in Guadalupe County and contains water table levels and some artesian or contained areas of the aquifer. The recharge for the down dip artesian areas of the Carrizo located in Gonzales County are located primarily in Guadalupe County.

6. Public Information

The District will take the necessary steps to ensure the public is informed and will cooperate with the media and all interested parties. The dissemination of information to the public is vital to create awareness of the District function and the public support that is needed to control and reduce production from the underground aquifer.

The District will also continue to pursue water conservation through a public information and educational program. If used properly, voluntary conservation measures can significantly extend the healthy and continued life of the groundwater, thereby preventing the need for mandatory programs by this District or the State. Voluntary programs are entirely a function of providing necessary education on conservation methods and habits along with the means to implement those methods. The District will continue to provide information to school districts and the general public in an effort to create voluntary conservation, registration of existing Carrizo wells and cooperation with the District's regulatory scheme.

7. Regulation

The primary objective of the Plan is to control groundwater withdrawal to reduce aquifer mining within the District to a sustainable yield of the aquifer. Groundwater withdrawals can be reduced through conservation of groundwater and regulating non-exempt pumping. In regulating groundwater withdrawals, the District shall take into account several factors, including:

- ***7.1*** economic impact of conservation measures;
- ***7.2*** the degree and effect of aquifer mining impact, or potential impact, upon water wells in the areas;
- ***7.3*** differing hydrological characteristics of the aquifer(s) with the District; and,
- ***7.4*** all statutorily identified factors.
- ***7.5*** best available data on recharge over multi year time lines as shown by actual measured data from monitor wells both in and outside the District and measurable rainfall in the recharge areas in Guadalupe County.

8. Management of Groundwater Supplies

The District will manage the supply of groundwater within the District in order to conserve the resource while seeking to maintain the economic viability of all resource user groups, public and private. A monitor well observation network shall be established and maintained in order to evaluate changing conditions of groundwater supplies (water in storage) within the District. The District will make a regular assessment of water supply and groundwater storage conditions and will report those conditions to the Board and to the public through the District newsletter. The District will undertake steps to cooperate with landowners and adjoining districts in investigations of the groundwater resources within the District and will make the results of investigations available to the public upon request.

The District will adopt rules to regulate groundwater withdrawals by means of well spacing and production limits. The District may deny a well construction permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District. In making a determination to deny a permit or limit groundwater withdrawals, the District will consider the public benefit against individual hardship after considering all appropriate testimony.

The relevant factors to be considered in making a determination to deny a permit or limit groundwater withdrawals will include:

8.1 The purpose of the rules of the District;
8.2 The equitable distribution of the resource;
8.3 The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit.
8.4 The potential effect the permit may have on aquifer health and sustainability of the recharge on the aquifer as a whole.

In pursuit of the District's mission of protecting the resource, the District may require reduction of groundwater withdrawals to amounts which will not cause harm to the aquifer. To achieve this purpose, the District may, at the Board's discretion, 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 observed by the District. The District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder in a court of competent jurisdiction as provided for in Texas Water Code (TWC) §36.102 should voluntary cooperation not achieve the desired results.

The desired future conditions of the groundwater within the District have not yet been established in accordance with Chapter 36.108 of the Texas Water Code. The District is actively participating in the joint planning process and the development of a desired future condition for the portion of the aquifer within the District and the GMA area.

A Drought Management Plan to cope with the effects of water supply deficits due to climatic or other conditions will be 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 degree and effect of changes in water storage conditions, the unique hydrogeologic conditions of the aquifers within the District and the appropriate conditions under which to implement the contingency plan.

The District will employ all technical resources at its disposal to evaluate the resources available within the District and to 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.

9. Action, 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.

The District will adopt rules relating to the permitting of wells and the production of groundwater. The rules adopted by the District shall be pursuant to TWC § 36 and the provisions of this 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.

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 Board shall consider the potential for adverse effect on adjacent landowners. The exercise of said discretion by the Board shall not be construed as limiting the power of the Board.

The District will seek the cooperation in the implementation of this plan and the management of groundwater supplies within the District. All activities of the District will be undertaken in cooperation and coordinated with the appropriate state, regional or local management entity.

10. Management Goals, Objectives & Performance Standards

10.1 Efficient Use of Groundwater

Management Objectives: District will establish a Carrizo-Wilcox aquifer water-level observation well program with a minimum of nine (9) observation wells. The nine observation wells will be measured twice annually, in January and September.

Performance Standard: Number of times the wells are measured per year. The water level database will be maintained by the District office.

10.2 Controlling & Preventing Waste of Groundwater

Management Objectives: The District will once a year provide public information on closure of abandoned water wells and uncontrolled flowing wells through articles in local newspapers or the District's newsletter and website.

Performance Standard: Number of times a year the District will address the proper closure of abandoned water wells and uncontrolled flowing wells in the local newspaper or the District's newsletter and website.

10.3 Conjunctive Use of Surface and Groundwater

Management Objectives: Each year the District will confer at least on one occasion with the Guadalupe-Blanco River Authority (GBRA) on cooperative opportunities for conjunctive resource management.

Performance Standard: Number of meetings per year with GBRA on conjunctive resource management. A memo to document the meeting will be on file in the District's office.

10.4 Address Natural Resource Issues that Impact the Use and Availability of Groundwater

Management Objectives: Each year the District will evaluate all proposed new wells prior to drilling. Information submitted by the applicant will be evaluated in order assess water level impacts within the District.

Performance Standard: A monthly report to the Board will be made on the results of all water level impact studies and number of wells evaluated each month.

10.5 Control & Prevent Subsidence

Does not apply to the Guadalupe County Groundwater Water Conservation District.

10.6 Develop a Management Strategy to Address Drought Conditions

Management Objectives: The District developed and adopted a Drought Management Plan in 2007. The District will obtain the Palmers Drought Severity Index (PDSI) each month, as per the District's Drought Management Plan.

Performance Standard: Number of reports made to the board each year on the PDSI.

10.7 Conservation of Groundwater

Management Objectives: The District once a year will provide public information on water conservation, recharge enhancement, rainwater harvesting, precipitation enhancement, and brush control through articles published in local newspapers or the District's newsletter and website.

Performance Standard: Number of articles published in local newspapers or the District's newsletter and website each year. The articles will be on a five year rotating basis, so that at least one topic is covered each year.

10.8 Accurate Measurement of Rainfall

Management Objectives: The District has established a rainfall measurement system in the Guadalupe County Carrizo-Wilcox recharge area to obtain specific data on annual rainfall amounts.

Performance Standard: The rainfall data will be saved and made public, and used in making management decisions. Data from the seven rainfall gauges will be reported to the Board each month. Number of times the data is reported to the board each year.

10.9 Desired Future Conditions

The desired future conditions of the groundwater within the District have not yet been established in accordance with Chapter 36.108 of the Texas Water Code. The District is actively participating in the joint planning process and the development of a desired future condition for the portion of the aquifer within the District and the GMA area.

10.10 Methodology

The District Manager will prepare an annual report on the District performances in achieving the management goals. The annual report will be presented to the Board of Directors during the first quarter of the calendar year. The report will include the number of instances each management activity was engaged in during the year. The annual report will be maintained on file at the District Office and made available to the public upon adoption by the Board.

11. Existing Total Useable Amount of Groundwater (ac-ft/year)

12,583 acre feet

This amount of groundwater from the Carrizo-Wilcox aquifer may be utilized each year for the next twenty (20) years without causing excessive water-level declines within the District. This availability estimate was derived the Texas Water Development Board Water Planning Database Report No. 7.

12. Estimate of Groundwater Used and Discharged

The following use, discharge and movement values in Section 12 are for the Guadalupe County Groundwater Conservation District only.

12.1 Estimate of Groundwater Used (ac-ft)

1993	**1994**	**1995**	**1996**	**1997**	**1998**
1,483	1,421	1,333	1,447	1,273	1,309
1999	**2000**	**2001**	**2002**	**2003**	
1,504	1,627	2,447	2,387	2,578	

The 2003 groundwater use from the Carrizo-Wilcox aquifer was about 2,578 which can be divided into the following categories:

Municipal	1,785.0 ac-ft
Manufacturing	0.0 ac-ft
Power	0.0 ac-ft
Mining	157.0 ac-ft
Irrigation	186.0 ac-ft
Livestock	450.0 ac-ft

These estimates are from the 2007 State Water Plan, Volume 3, Regional Water Planning Group Database.

12.2 Estimate of Groundwater Discharge to Springs and Surface Water Bodies

Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams and rivers	Sparta, Queen City, Carrizo, and Upper, Middle and Lower Wilcox Aquifers	4,857 ac-ft

These estimates are from Table 2, GAM Run 07-25, Texas Water Development Board (Exhibit "J", Appendix).

12.3 Estimate of Annual Volume of Flow in and out of District Aquifers, in ac-ft

Estimated annual volume of flow into the District within each aquifer in the District	Sparta Aquifer	0
	Queen City Aquifer	3
	Carrizo Aquifer	10

	Upper Wilcox	1
	Middle Wilcox	1,045
	Lower Wilcox	596
Estimated annual volume of flow out of the District within each aquifer in the District	Sparta Aquifer	0
	Queen City Aquifer	2
	Carrizo Aquifer	6,752
	Upper Wilcox	48
	Middle Wilcox	4,874
	Lower Wilcox	4,378
Estimated annual volume of flow between each aquifer in the District	Younger units and Sparta Aquifer	0
	Sparta Aquifer and Weches Confining Unit	0
	Weches Confining Unit and Queen City Aquifer	0
	Queen City Aquifer and Reklaw Confining Unit	3
	Reklaw Confining Unit and Carrizo Aquifer	390
	Carrizo Aquifer and Upper Wilcox Aquifer	738
	Upper Wilcox Aquifer and Middle Wilcox Aquifer	99
	Middle Wilcox Aquifer and Lower Wilcox Aquifer	557

These estimates are from Table 2, GAM Run 07-25, Texas Water Development Board (Exhibit "J", Appendix).

12.4 Selected flow terms for each aquifer layer, into and out of the District, averaged for the years 1980 to 1999 from the groundwater availability model for the southern part of the Queen City, Sparta and Carrizo-Wilcox Aquifers, in ac-ft per year

Aquifer	Surface Water inflow	Surface water outflow	Lateral inflow into district	Lateral outflow from district	Net interaquifer flow (upper)	Net interaquifer flow (lower)
Sparta Aquifer (Layer 1)	0	0	0	0	0	0
Queen City Aquifer (Layer 3)	0	0	3	2	0	-3
Carrizo Aquifer (Layer 5)	75	-287	10	-6,752	390	-738
Upper Wilcox (Layer 6)	0	0	1	-48	738	-99

Middle Wilcox (Layer 7)	1,896	-3,965	1,045	-4,874	99	-557
Lower Wilcox (Layer 8)	719	-605	596	-4,378	557	0

A negative sign refers to flow out of the aquifer in the District. A positive sign refers to flow into the aquifer in the District. These estimates are from Table 1, GAM Run 07-25, Texas Water Development Board (Exhibit "J", Appendix).

13. Estimated Annual Groundwater Recharge from Precipitation(ac-ft/year)

Estimated annual amount of recharge from precipitation to the District	All aquifers and confining units	18,184

These estimates are from Table 2, GAM Run 07-25, Texas Water Development Board (Exhibit "J", Appendix).

Based upon data from the Evergreen Underground Water Conservation District, airborne seeding of cuculiform clouds with either glaciogenic, or hygroscopic material can increase rainfall. A ten percent (10%) increase in normal rainfall could add an additional 2,000 acre feet of recharge of groundwater annually to the Carrizo-Wilcox aquifer in the District.

14. Projected Water Supply (ac-ft/year) for year 2020

14.1 County total: 44,400 acre feet. This estimate was determined by adding the 2020 projected surface water supply (2007 State Water Plan, Volume 3, Regional Water Planning Group Database) to the Carrizo-Wilcox Aquifer total availability (Water Planning Database Report No. 7).

14.2 Carrizo-Wilcox: 12,583 acre feet, derived from estimates for the San Antonio River Basin (3,010 ac/ft) and Guadalupe River Basin (9,573 ac/ft). Data taken from the Water Planning Database Report No. 7.

14.3 Surface Water Supply, in ac-ft

Area	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**
Guadalupe County	27,833	31,817	31,817	32,144	32,144	32,144
District	16,906	19,326	19326	19,524	19,524	19,524

Data taken from the 2007 State Water Plan, Volume 3, Regional Water Planning Group Database. District totals found by multiplying county total by .6074.

15. Projected Total Water Demands (ac-ft/year) (2007 State Water Plan, Volume 3, Regional Water Planning Group Database)

15.1 County total: in ac-ft per year

2010	2020	2030	2040	2050	2060
32,832	42,085	49,787	58,002	67,455	78,248

15.2 District Total:

Basin	2010	2020	2030	2040	2050	2060
Guadalupe	19,099	24,340	28,264	32,498	37,408	43,062
San Antonio	1,847	1,848	2,193	2,539	2,926	3,345
Total	20,946	26,188	30,457	35,037	40,334	46,407

16. Water Supply Needs and Management Strategies

The State's 2007 Water Plan identifies projected water needs for Guadalupe County (Table 1). The Plan also identifies water management strategies to meet those needs (Table 2). To meet the ground-water needs of the Water user groups (WUGs) identified above (Table 2), the Carrizo-Wilcox and Edwards aquifers will be utilized. Strategies include the following: a) additional future development of the Carrizo-Wilcox aquifer for municipal supplies; b) continued use of the Edwards aquifer; and c) temporary over draft of the Carrizo-Wilcox aquifer to meet peak summer demands of the WUGs. Ground-water conservation will be achieved through public information (local newspapers and the District's newsletter).

17. Coordination with Surface Water Management Entity (GBRA)

After notice and hearing the Board authorized the Water District President to confer and meet with the Guadalupe-Blanco River Authority (GBRA) to coordinate and seek comment on the District's proposed management plan. A copy of the correspondence to Mr. Randy Worden, Executive Manager of Business Development and Resource Management of GBRA to discuss groundwater management issues and the GBRA Board policy on groundwater is attached as Exhibit "G".

18. Consistency with Region "L" Planning Document

Attached as Exhibit "H" is the certified mail letter to Con Mims, Chairman of the Region L Planning Committee submitting the plan for comment by the Region L committee.