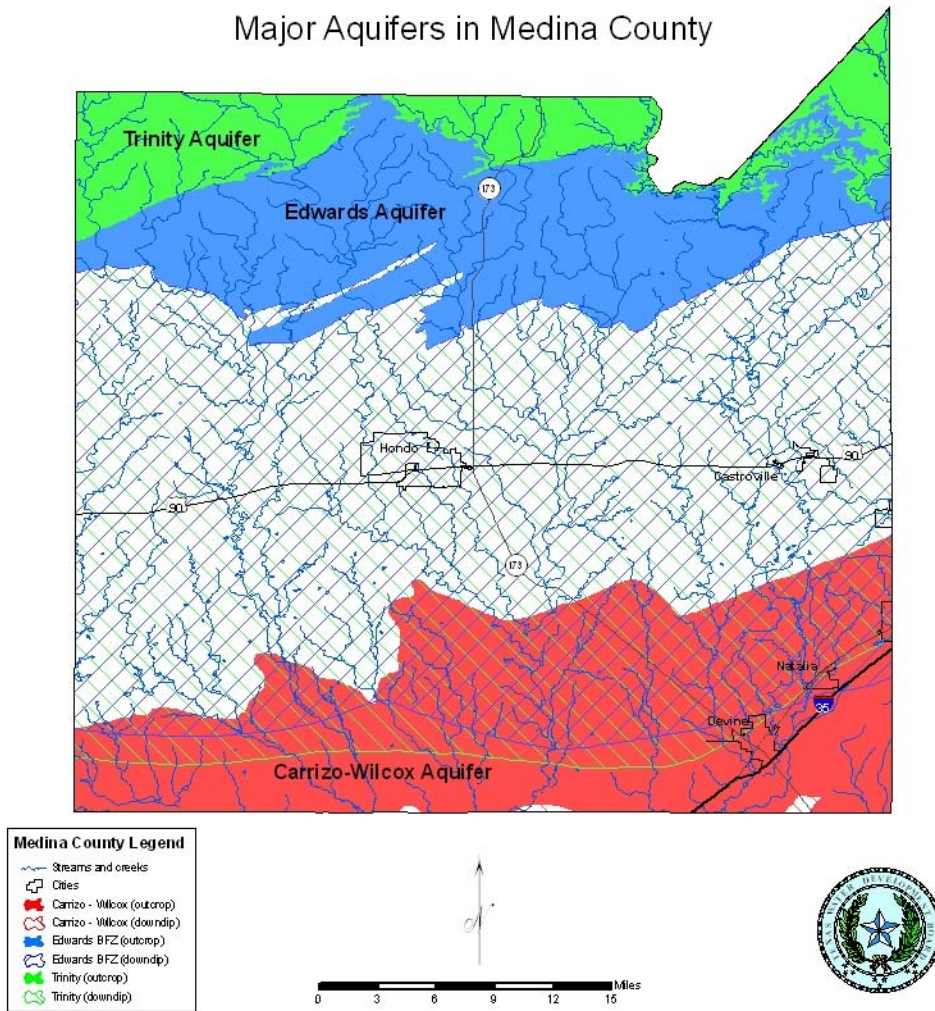


Medina County Groundwater Conservation District Groundwater Management Plan

Major Aquifers in Medina County



Adopted January 19, 2011

Medina County
Groundwater Conservation District
Groundwater Management Plan

Adopted January 19, 2011

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District Mission

The Medina County Groundwater Conservation District (GCD) strives to bring about conservation, preservation, and the efficient, beneficial, and wise use of water for the benefit of the citizens and economy of Medina County.

Time Period for the Plan

This plan becomes effective upon adoption by the Board of Directors and will remain in effect until a revised plan is adopted by the district board of directors and then approved by the Texas Water Development Board (TWDB). The plan will be reviewed at least every five years.

Guiding Principles

The District recognizes that the groundwater resources of this region are of vital importance to the residents and that these resources must be managed effectively. A basic understanding of the aquifers and their hydrogeologic properties, as well as a quantification of resources is the foundation from which to build prudent planning measures. This management plan is intended as a tool to focus the programs and plans of the District.

About the District

The District has the same boundaries as the County of Medina. The Medina County Commissioners Court originally created the District on July 17, 1989, following the petition process. Confirmation and election of permanent directors was held on November 11, 1989. The District was then validated by Act of the legislature under Section 59, Article 16, Texas Constitution and validated by the 72nd Legislature in 1991.

The District Board of Directors is composed of five members elected to staggered four-year terms. Elections for Directors are held in November. A director is elected from each of the county precincts in and one Director is elected from the County at-large. The Board of Directors holds regular monthly meetings at the District offices located at 1613 Ave. K, Ste 105, Hondo, Texas. Meetings of the Board of Directors are public meetings noticed and held in accordance with public meeting requirements.

Since the creation of the Edwards Aquifer Authority, the District's jurisdiction is limited to those aquifers other than the Edwards aquifer found in Medina County. The District revised its programs and rules to reflect these changes. The Edwards Aquifer continues to be the major source of water for the citizens of Medina County and therefore information, education, and coordination between the District and the Edwards Aquifer Authority remains a priority to the District Board of Directors.

With pumping limitations now in effect for the Edwards Aquifer, the other aquifers

within Medina County have the potential of becoming a supplemental supply. The District anticipates demand increasing in these aquifers. Additional interest in aquifer storage and recovery projects also exists, as does the potential of transport of these groundwater resources outside the District boundaries.

The District is located in three Groundwater Management Areas (GMAs): 9, 10 and 13. Chapter 36 Texas Water Code requires the Medina County GCD to coordinate its management of groundwater with other GCDs in its GMAs. Medina County GCD is unique in that it is in three management areas requiring coordination with other GCDs. These include: nine GCDs that are located in GMA 9; nine GCDs in GMA 10; and nine GCDs in GMA 13 (Figure 1). Several of these GCDs overlap into multiple GMAs.

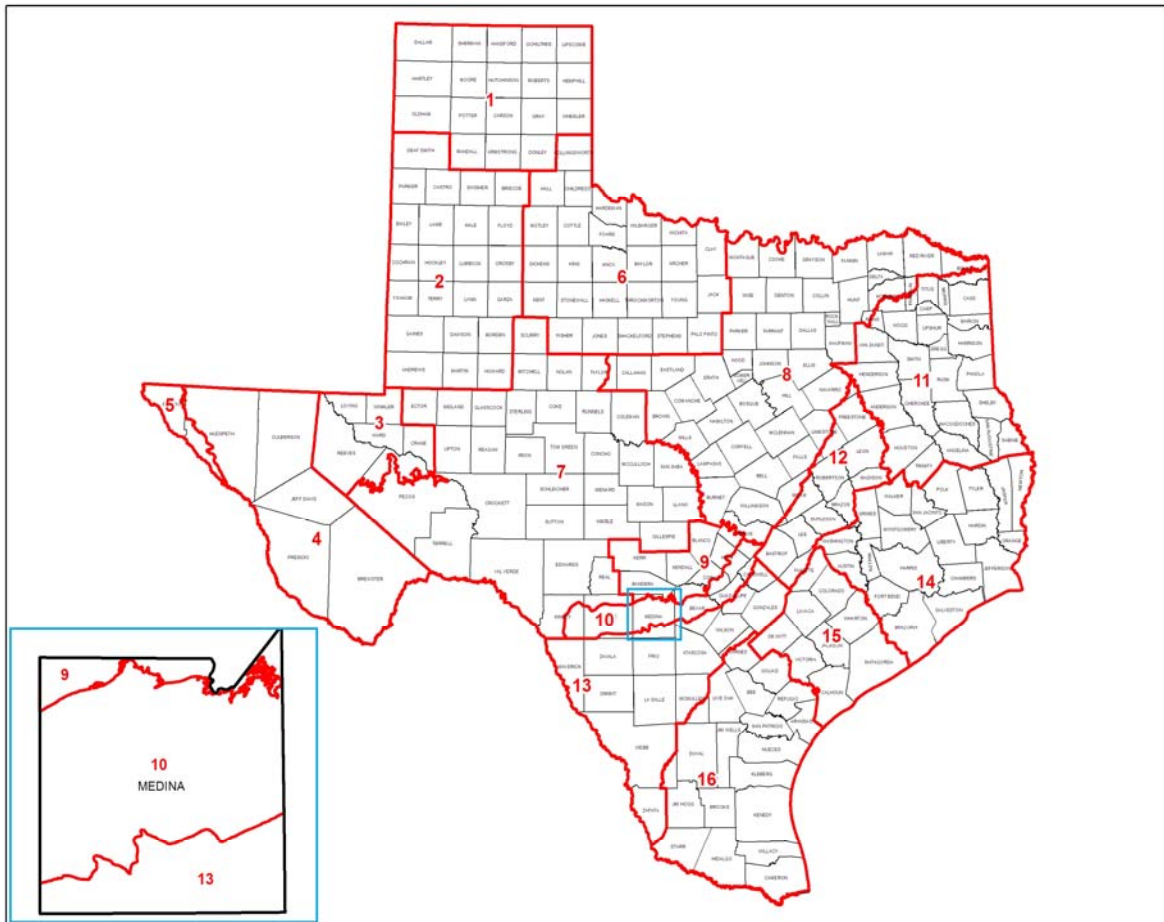


Figure 1. Groundwater Management Areas in Texas and Medina County

The District will coordinate with the GCDs and surface water management entities within Medina County by providing written notification via email or U.S. Postal Services when the Medina County GCD considers for revision and adoption by the Board of Directors the Groundwater Management Plan, Rules, and other policy related matters that impact the operation and management of the groundwater within Medina County. The 17 GCDs in the three GMAs, surface water management entities, and other interested parties are encouraged and invited to provide information and written or oral comments on

issues of concern to them to the Medina County GCD Board of Directors. The District’s standard practices will be used for posting public notice as established by the Board of Directors and in accordance with the Texas Open Meeting Acts and related requirements for GCDs in Texas.

Groundwater Resources of the District

The Aquifers within the jurisdiction of the District include the Carrizo-Wilcox, Trinity, Glen Rose, Leona Gravel, and Anacacho. Additional information on these aquifers is available from TWDB’s *Aquifers of Texas* (Report 345, 1995). However, specific information on pumping, availability, and recharge are limited to the Carrizo-Wilcox, Trinity and Leona Gravel Aquifers. This plan, therefore, focuses on those aquifers.

Water Use in the District

Table 1 summarizes the historical groundwater use for Medina County. The estimated historical average amount of groundwater being used in the District on an annual basis (1980 through 2003) is 75,343 acre-feet per year. The total reported groundwater use in the District for the year 2007 is 31,888 acre-feet per year. Until recently, response to the TWDB survey was voluntary. As a result, the TWDB water use survey data is subject to variations in completeness and accuracy. TWDB data on estimated groundwater use is available from 1980 to 2006, although years 2005 through 2007 are not broken out by aquifer.

Table 1-1. Estimated Historical Pumpage 1980 – 2003 (acre-feet)

Year	Aquifer	Municipal	Manufacturing	Steam-Electric	Mining	Irrigation	Livestock	Total Pumpage
1980	Carrizo-Wilcox	97	0	0	0	7,787	90	7,974
	Edwards-BFZ	4,650	0	0	2	66,377	114	71,143
	Trinity	26	0	0	0	0	42	68
1984	Carrizo-Wilcox	203	0	0	24	18,252	60	18,539
	Edwards-BFZ	5,522	0	0	109	66,659	76	72,366
	Trinity	33	0	0	0	0	28	61
1985	Carrizo-Wilcox	207	0	0	31	424	50	712
	Edwards-BFZ	4,763	0	0	90	56,905	64	61,822
	Trinity	31	0	0	19	0	22	72
1986	Carrizo-Wilcox	201	0	0	0	702	49	952
	Edwards-BFZ	5,203	0	0	0	94,180	63	99,446
	Trinity	36	0	0	0	0	22	58

Table 1-1. Estimated Historical Pumpage 1980 – 2003 (acre-feet)

Year	Aquifer	Municipal	Manufacturing	Steam-Electric	Mining	Irrigation	Livestock	Total Pumpage
1987	Carrizo-Wilcox	202	0	0	28	797	59	1,086
	Edwards-BFZ	4,701	0	0	79	81,049	76	85,905
	Trinity	24	0	0	17	0	26	67
1988	Carrizo-Wilcox	221	0	0	28	696	56	1,001
	Edwards-BFZ	5,527	0	0	83	93,354	92	99,056
	Trinity	27	0	0	18	0	25	70
1989	Carrizo-Wilcox	159	0	0	26	746	56	987
	Edwards-BFZ	6,288	0	0	77	95,676	71	102,112
	Trinity	30	0	0	17	0	25	72
1990	Carrizo-Wilcox	110	0	0	26	574	57	767
	Edwards-BFZ	5,343	0	0	77	77,120	73	82,613
	Trinity	29	0	0	17	0	25	71
1991	Carrizo-Wilcox	109	0	0	24	760	58	951
	Edwards-BFZ	5,190	0	0	76	102,120	75	107,461
	Trinity	41	0	0	18	0	25	84
1992	Carrizo-Wilcox	117	0	0	24	718	70	929
	Edwards-BFZ	4,871	0	0	76	96,518	91	101,556
	Trinity	58	0	0	18	0	30	106
1993	Carrizo-Wilcox	130	1	0	24	489	88	732
	Edwards-BFZ	5,389	0	0	76	63,946	114	69,525
	Trinity	65	0	0	18	0	38	121
1994	Carrizo-Wilcox	266	2	0	24	5,733	72	6,097
	Edwards-BFZ	4,999	0	0	76	54,437	93	59,605
	Trinity	25	0	0	18	0	31	74
1995	Carrizo-Wilcox	267	4	0	24	6,380	77	6,752
	Edwards-BFZ	5,499	0	0	76	60,589	100	66,264
	Trinity	30	0	0	18	0	34	82
1996	Carrizo-Wilcox	136	0	0	24	6,439	71	6,670
	Edwards-BFZ	6,214	0	0	76	61,144	92	67,526
	Trinity	32	0	0	18	0	31	81
1997	Carrizo-Wilcox	422	2	0	24	3,751	62	4,261
	Edwards-BFZ	5,805	0	0	76	35,624	80	41,585
	Trinity	20	0	0	18	0	27	65

Table 1-1. Estimated Historical Pumpage 1980 – 2003 (acre-feet)

Year	Aquifer	Municipal	Manufacturing	Steam-Electric	Mining	Irrigation	Livestock	Total Pumpage
1998	Carrizo-Wilcox	488	7	0	24	5,475	45	6,039
	Edwards-BFZ	6,717	0	0	76	51,997	58	58,848
	Trinity	23	0	0	18	0	19	60
1999	Carrizo-Wilcox	481	10	0	24	3,642	51	4,208
	Edwards-BFZ	6,614	0	0	76	34,583	66	41,339
	Trinity	23	0	0	18	0	22	63
2000	Carrizo-Wilcox	483	1	0	24	4,160	48	4,716
	Edwards-BFZ	6,645	0	0	76	39,509	62	46,292
	Trinity	23	0	0	18	0	21	62
2001	Carrizo-Wilcox	883	1	0	24	6,135	41	7,084
	Edwards-BFZ	6,088	1	0	76	55,041	53	61,259
	Trinity	20	0	0	18	0	18	56
2002	Carrizo-Wilcox	1,011	2	0	24	6,000	47	7,084
	Edwards-BFZ	5,921	1	0	76	53,830	61	59,889
	Trinity	20	0	0	18	0	21	59
2003	Carrizo-Wilcox	989	2	0	24	3,403	443	4,861
	Edwards-BFZ	5,501	1	0	76	26,497	572	32,647
	Trinity	20	0	0	18	0	193	231

Source: TWDB Water Use Survey Database/Groundwater Pumpage Estimates

Table 1-2. Historical Water Use Estimate 2004 – 2007 (acre-feet)

Year	Aquifer	Municipal	Manufacturing	Steam-Electric	Mining	Irrigation	Livestock	Total Pumpage
2004	All Aquifers	5,656	7	0	60	34,945	95	40,763
2005	Groundwater numbers are not available per use category for 2005 or 2006.							
2006								
2007	All Aquifers	6,353	20	0	0	13,415	1,168	20,956
2008	All Aquifers	6,991	23	0	0	36,694	897	44,605

Source: TWDB Water Use Survey Database/Water Use Survey Estimates

Actual water use may vary from year to year based on differing conditions. However, the degree of variation of the reported values for some years causes concern that the water use reported to TWDB may not reflect the full extent of groundwater use in the District.

Projected Water Demands for the District

The TWDB published projected groundwater needs in their planning document *State Water Plan 2007*, which is based on the South-Central Texas (Region L) Regional Water Plan. The estimates contained in the State Plan, the Adopted Regional Plan, and related files of the TWDB have been used for the purpose of devising this plan. As shown in Table 2, the projected *net* water demands (which takes into account estimated volumes conserved via plumbing code changes) for Medina County water user groups (WUGs) will be 62,347 acre-feet per year in 2020 and 57,793 in 2060.

Table 2. Projected Water Demands by Water User Group (ac-ft/yr)

WUG Name	Basin Name	2010	2020	2030	2040	2050	2060
BENTON CITY WSC	NUECES	414	504	589	661	737	805
COUNTY-OTHER	NUECES	1,489	1,816	2,108	2,367	2,635	2,876
DEVINE	NUECES	837	850	856	862	878	896
EAST MEDINA SUD	NUECES	833	944	1,048	1,132	1,221	1,310
HONDO	NUECES	1,784	2,001	2,205	2,374	2,548	2,717
IRRIGATION	NUECES	45,357	43,466	41,655	39,919	38,258	36,665
LIVESTOCK	NUECES	1,116	1,116	1,116	1,116	1,116	1,116
LYTLE	NUECES	62	60	59	58	58	58
MANUFACTURING	NUECES	67	75	82	89	95	103
MINING	NUECES	68	71	72	73	74	75
NATALIA	NUECES	330	374	415	450	485	519
BEXAR MET WATER DIST	SAN ANTONIO	24	33	41	47	54	60
CASTROVILLE	SAN ANTONIO	680	743	802	854	908	961
COUNTY-OTHER	SAN ANTONIO	38	46	54	60	67	73
EAST MEDINA SUD	SAN ANTONIO	48	54	60	65	70	75
IRRIGATION	SAN ANTONIO	9,093	8,713	8,350	8,003	7,669	7,350
LACOSTE	SAN ANTONIO	205	222	239	251	265	281
LIVESTOCK	SAN ANTONIO	182	182	182	182	182	182
MINING	SAN ANTONIO	62	64	65	66	67	68
YANCEY WSC	SAN ANTONIO	832	1,013	1,180	1,328	1,469	1,603
TOTAL		63,521	62,347	61,178	59,957	58,856	57,793
Source: 2007 State Water Plan							

Projected Water Supplies

The TWDB has projected that the total water demands for Medina County water user groups (WUGs) will be 62,176 acre-feet per year in 2020 and 61,721 in 2060 as shown in Table 3. These numbers are from the 2007 State Water Plan.

Table 3. Projected Water Supplies by Water User Group (ac-ft/yr)

WUG Name	Source Basin	2010	2020	2030	2040	2050	2060
BENTON CITY WSC	NUECES	602	602	602	602	602	602
COUNTY-OTHER	NUECES	1,139	1,139	1,139	1,139	1,139	1,139
COUNTY-OTHER	NUECES	170	170	170	170	170	170
DEVINE	NUECES	496	496	496	496	496	496
DEVINE	NUECES	404	404	404	404	404	404
EAST MEDINA SUD	NUECES	959	959	959	959	959	959
HONDO	NUECES	980	980	980	980	980	980
IRRIGATION	NUECES	3,084	2,956	2,832	2,714	2,601	2,493
IRRIGATION	NUECES	37,622	37,622	37,622	37,622	37,622	37,622
LIVESTOCK	NUECES	205	205	205	205	205	205
LIVESTOCK	NUECES	264	264	264	264	264	264
LIVESTOCK	NUECES	558	558	558	558	558	558
LIVESTOCK	NUECES	89	89	89	89	89	89
LYTLE	NUECES	39	39	39	39	39	39
MANUFACTURING	NUECES	546	546	546	546	546	546
MINING	NUECES	39	41	41	42	42	43
MINING	NUECES	29	30	31	31	32	32
NATALIA	NUECES	132	132	132	132	132	132
BEXAR MET WATER DIST	SAN ANTONIO	9	9	9	9	9	9
CASTROVILLE	SAN ANTONIO	406	406	406	406	406	406
COUNTY-OTHER	SAN ANTONIO	150	150	150	150	150	150
COUNTY-OTHER	SAN ANTONIO	1	1	1	1	1	1
EAST MEDINA SUD	SAN ANTONIO	54	54	54	54	54	54
IRRIGATION	SAN ANTONIO	19	19	19	19	19	19
IRRIGATION	SAN ANTONIO	13,694	13,694	13,694	13,694	13,694	13,694
IRRIGATION	SAN ANTONIO	1	1	1	1	1	1
LACOSTE	SAN ANTONIO	109	109	109	109	109	109
LIVESTOCK	SAN ANTONIO	68	68	68	68	68	68
LIVESTOCK	SAN ANTONIO	91	91	91	91	91	91
LIVESTOCK	SAN ANTONIO	23	23	23	23	23	23
MINING	SAN ANTONIO	1	1	1	1	1	1
MINING	SAN ANTONIO	61	63	64	65	66	67
YANCEY WSC	SAN ANTONIO	255	255	255	255	255	255
TOTAL		62,299	62,176	62,054	61,938	61,827	61,721

Source: 2007 State Water Plan

Based on Tables 2 and 3, the resulting surpluses and needs for the Medina County WUGs are shown in Table 4. Shortages of between 4,700 and 6,900 ac-ft are expected in every decade of the 50-year planning period.

Table 4. Projected Water Surplus and Needs by Water User Group (ac-ft/yr)

WUG Name	Basin Name	2010	2020	2030	2040	2050	2060
BENTON CITY WSC	NUECES	188	98	13	-59	-135	-203
COUNTY-OTHER	NUECES	-180	-507	-799	-1,058	-1,326	-1,567
DEVINE	NUECES	63	50	44	38	22	4
EAST MEDINA SUD	NUECES	126	15	-89	-173	-262	-351
HONDO	NUECES	-804	-1,021	-1,225	-1,394	-1,568	-1,737
IRRIGATION	NUECES	-4,651	-2,888	-1,201	417	1,965	3,450
LIVESTOCK	NUECES	0	0	0	0	0	0
LYTLE	NUECES	-23	-21	-20	-19	-19	-19
MANUFACTURING	NUECES	479	471	464	457	451	443
MINING	NUECES	0	0	0	0	0	0
NATALIA	NUECES	-198	-242	-283	-318	-353	-387
BEXAR MET WATER DISTRICT	SAN ANTONIO	-15	-24	-32	-38	-45	-51
CASTROVILLE	SAN ANTONIO	-274	-337	-396	-448	-502	-555
COUNTY-OTHER	SAN ANTONIO	113	105	97	91	84	78
EAST MEDINA SUD	SAN ANTONIO	6	0	-6	-11	-16	-21
IRRIGATION	SAN ANTONIO	4,621	5,001	5,364	5,711	6,045	6,364
LACOSTE	SAN ANTONIO	-96	-113	-130	-142	-156	-172
LIVESTOCK	SAN ANTONIO	0	0	0	0	0	0
MINING	SAN ANTONIO	0	0	0	0	0	0
YANCEY WSC	SAN ANTONIO	-577	-758	-925	-1,073	-1,214	-1,348
TOTAL OF ALL NEEDS		-6,818	-5,911	-5,106	-4,733	-5,596	-6,411

A negative value indicates a need.
Source: 2007 State Water Plan

Total Projected Availability from All Water Supply Sources

Total available supply from all sources in 2020 is estimated to be 62,176 acre-feet per year, exclusive of the Leona Gravel Aquifer (Table 3). Projected supplies within the District for the year 2020 are as follows:

Groundwater from Carrizo-Wilcox	5,459 acre-feet per year
Groundwater from Edwards	55,861 acre-feet per year
Groundwater from Trinity	206 acre-feet per year
Local surface water supplies	650 acre-feet per year

The Leona Gravel Aquifer is predicted to supply an additional 22,100 to 34,780 acre-feet annually (depending on management strategies), but was not considered in the 2007 State Water Plan.

Table 5. Projected Surface Water Supply for the Medina County GCD

SRC Name	SRC Type	SRC Basin Name	2010	2020	2030	2040	2050	2060
LIVESTOCK LOCAL SUPPLY	SURFACE WATER	NUECES	558	558	558	558	558	558
LIVESTOCK LOCAL SUPPLY	SURFACE WATER	SAN ANTONIO	91	91	91	91	91	91
SAN ANTONIO RIVER COMBINED RUN-OF-RIVER IRRIGATION	SURFACE WATER	SAN ANTONIO	1	1	1	1	1	1
TOTAL SURFACE WATER			650	650	650	650	650	650

All units are acre-feet/yr
Source: 2007 State Water Plan

Water Management Strategies

The Region L Regional Water Planning Group has developed various water management strategies to address shortages in various water user groups within the Medina County GCD. These strategies will be implemented over the next 10-50 years as necessary. The General Manager serves as a representative of the District on the Region L Water Planning Group.

It is expected that as supplies within the Edwards aquifer become less available that users will begin to increase use of other aquifers over which the Medina County GCD has jurisdiction. The District will manage the groundwater use within these aquifers, and permit wells determined to be in compliance with the District rules and the Management Plan the District has adopted.

Recommended water management strategies are estimated to produce 7,301 acre-feet per year in 2010, and increase to 8,387 acre-feet per year by the year 2060 (Table 6).

Table 6. Recommended Water-Related Management Strategies (ac-ft/yr)

WMS Name	WUG Name	WUG Basin	2010	2020	2030	2040	2050	2060
MUNICIPAL WATER CONSERVATION	CASTROVILLE	SAN ANTONIO	53	111	176	242	270	302
MUNICIPAL WATER CONSERVATION	LACOSTE	SAN ANTONIO	0	0	0	0	4	11
MUNICIPAL WATER CONSERVATION	YANCEY WSC	SAN ANTONIO	61	136	171	214	259	316
MUNICIPAL WATER CONSERVATION	BENTON CITY WSC	NUECES	0	0	0	4	16	29
MUNICIPAL WATER CONSERVATION	COUNTY-OTHER	NUECES	0	20	41	86	160	244
MUNICIPAL WATER CONSERVATION	DEVINE	NUECES	63	127	152	159	175	196
MUNICIPAL WATER CONSERVATION	EAST MEDINA SUD	NUECES	0	0	0	0	19	54
MUNICIPAL WATER CONSERVATION	HONDO	NUECES	125	289	420	477	551	640
MUNICIPAL WATER CONSERVATION	LYTLE	NUECES	3	5	6	6	7	8
MUNICIPAL WATER CONSERVATION	NATALIA	NUECES	24	31	38	46	58	73
IRRIGATION WATER CONSERVATION	IRRIGATION	NUECES	4,651	2,888	1,201	0	0	0
EDWARDS TRANSFERS	LYTLE	NUECES	23	21	20	19	19	19
EDWARDS TRANSFERS	CASTROVILLE	SAN ANTONIO	274	337	396	448	502	555
EDWARDS TRANSFERS	COUNTY-OTHER	NUECES	180	507	799	1,058	1,326	1,567
EDWARDS TRANSFERS	EAST MEDINA SUD	SAN ANTONIO	0	0	6	11	16	21
EDWARDS TRANSFERS	EAST MEDINA SUD	NUECES	0	0	89	173	262	351
EDWARDS TRANSFERS	HONDO	NUECES	804	1,021	1,225	1,395	1,568	1,737
EDWARDS TRANSFERS	LACOSTE	SAN ANTONIO	96	113	130	142	156	172
EDWARDS TRANSFERS	NATALIA	NUECES	198	242	283	318	353	387
EDWARDS TRANSFERS	YANCEY WSC	SAN ANTONIO	577	758	925	1,073	1,214	1,348
LOCAL GROUNDWATER (CARRIZO-WILCOX AQUIFER) - INCLUDES TEMPORARY OVERDRAFTS	BENTON CITY WSC	NUECES	154	154	154	154	306	306
WELLS RANCH PROJECT - TEMPORARY OVERDRAFT	BEXAR MET WATER DISTRICT	SAN ANTONIO	15	24	32	38	45	51
TOTAL			7,301	6,784	6,264	6,063	7,286	8,387

Source: 2007 State Water Plan

Groundwater Recharge

The Medina County Groundwater Conservation District requested the TWDB to perform a Groundwater Availability Model (GAM) run to determine the average annual recharge rates for the Trinity (Hill Country) and Carrizo-Wilcox aquifers within Medina County.

Estimates of recharge and managed available groundwater (MAG) are based on TWDB’s GTA Aquifer Assessment 09-01 (February, 2010) and GAM Run 09-031 (Ashenbach, 2010). The District has determined that groundwater use should be managed to sustain the supply by not issuing permits in excess of estimated recharge. When combined with production values, these estimates can be used by the District to derive goals for future estimates of available groundwater.

Recharge rates for Medina County were calculated as total average annual volume of recharge per year (acre-feet per year) from the Trinity aquifer (Hill Country), the Carrizo-Wilcox aquifer, and Leona Gravel aquifer. The annual recharge volume for each of the aquifers within Medina County is shown in Table 7.

Table 7. Estimated Recharge by Aquifer in Medina County

Aquifer	Estimated Recharge (ac-ft/yr)	Source
(Southern) Carrizo-Wilcox	14,102	GAM Run 09-31
Trinity	6,918	GAM Run 09-31
Leona Gravel	27,607	GTA Aquifer Assessment 09-01
TOTAL	48,627	-

The general distribution of the Leona Gravel aquifer is shown in Figure 2. Details of the spatial distribution of recharge can be found in George (2010).

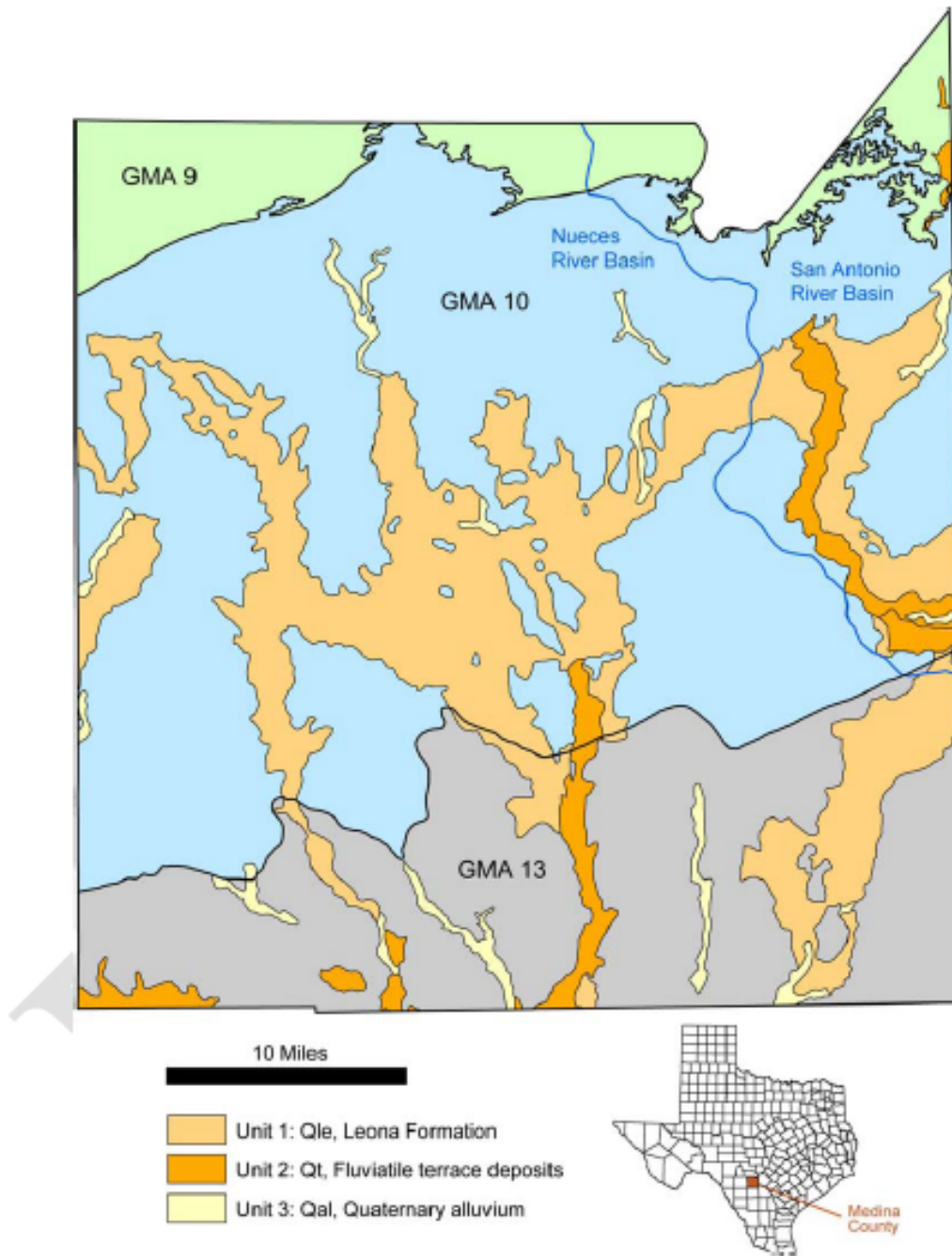


Figure 2. Partial geology of Medina County showing distribution of Leona Formation, terrace deposits, and alluvium, with GMA and river basin boundaries. Source: GTA Aquifer Assessment 09-01 (George, 2009).

Annual Flow In, Out, and Between Aquifers

In order to develop estimates of water flow in, out, and between aquifers, the district requested a groundwater availability model run (TWDB GAM run 09-31). The information derived from this model run is summarized in Table 8.

Table 8. Groundwater flow estimates from GAM Run 09-31 (ac-ft/yr)

Flow	Trinity Aquifer	Carrizo-Wilcox Aquifer	Reklaw Confining Unit into the Carrizo-Wilcox Aquifer
Estimated annual amount of recharge from precipitation to the district	6,918	14,102	Not applicable
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, and rivers	6,412	588	Not applicable
Estimated annual volume of flow into the district within each aquifer in the district	21,749	1,395	Not applicable
Estimated annual volume of flow out of the district within each aquifer in the district	8,526	29,792	Not applicable
Estimated net annual volume of flow between each aquifer in the district	Not applicable	Not applicable	14

All units are acre-feet/yr

Managed Available Groundwater Estimates and Desired Future Conditions

Desired Future Conditions (DFCs) for aquifers located within Groundwater Management Areas 9, 10, and 13 have been adopted. However, the *final* MAG estimates have not yet been calculated for the Trinity, Carrizo-Wilcox, and Leona Gravel aquifers. When the final MAG estimates become available, the groundwater management plan will be amended to reflect the MAGs and appropriate management approaches to implement the adopted DFCs. Adopted DFCs are shown in Table 9.

Table 9. Adopted Desired Future Conditions

GMA	Aquifer	Adopted DFC	Adoption Date
9	Trinity	Allow for an increase in average drawdown of approximately 30 feet through 2060 consistent with "Scenario 6" in TWDB Draft GAM Task 10-005	August 23, 2010
10	Trinity	A regional average well drawdown during average recharge conditions that does not exceed 25 feet (including exempt and non-exempt well use)	August 23, 2010
10	Leona Gravel	An average drawdown of 15 feet over the next 50 years	May 17, 2010
13	Carrizo-Wilcox	An average drawdown of 23 feet for the Sparta, Weches, Queen City, Reklaw, Carrizo and the Wilcox Aquifers (GAM run 09-034)	April 9, 2010

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. In consideration of the economic and cultural activities occurring within the District, the District will identify and engage in such activities and practices, that if implemented, would result in the most efficient use of groundwater. The District will monitor an ongoing TWDB and United State Geological Survey (USGS) observation network in order to gain additional information regarding changing storage conditions of groundwater supplies within the District. The District will work cooperatively with investigations of groundwater resources within the District and will make the results of investigations available to the public once accepted by the District or allowed to be released by a cooperating organization or agency.

The District will employ all technical resources at its disposal to evaluate the groundwater resources available within the District and to determine the effectiveness of conservation measures.

Actions, Procedures, Performance, and Avoidance for Plan Implementation

The District rules will be used to regulate groundwater withdrawals by means of spacing and production limits. A link to the District rules is provided as follows: <http://www.medinagwcd.org/rules.html>

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:

- 1) the purpose of the rules of the District;
- 2) the equitable distribution of the resource;
- 3) the economic hardship resulting from grant or denial of a permit or the term prescribed by the permit;
- 4) other factors that may be pertinent to a specific aquifer or applicant condition.

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, or other factors as noted above. The District will enforce the terms and conditions of permits and the rules of the District by enjoining the permit holder, when

determined necessary by the District's Board of Directors, in a court of competent jurisdiction as provided for in Texas Water Code 36.102.

Methodology to Track Management Plan Progress

The District manager will prepare an annual report on District performance in achieving the management goals. The annual report will be presented to the Board of Directors during the first quarter of each fiscal year. The report will include the number of instances each management objective or related activity the District was engaged in during the year compared to the goals for the specific activity. The annual report will be maintained on file at the District office and made available to the public upon adoption by the District's Board of Directors.

Management Goals, Objectives, and Performance Standards

Resource Goals

Goal 1.0: To Control and Prevent the Waste of Groundwater

Management Objective

Each year the District will provide at least one public service announcement concerning waste, which is prohibited under the District rule, to the newspapers and to the general public.

Performance Standards

(a) The District will furnish at least one newspaper article and/or public service announcement on an annual basis.

(b) The District will investigate all written reports of waste of groundwater within 24 hours.

Goal 2.0: Addressing Natural Resource Issues That Impact the Use and Availability of Groundwater and Are Impacted by the Use of Groundwater

Management Objective

Each year the District will work with various interest groups and appropriate

agencies, such as the San Antonio Water System (SAWS), Texas Alliance of Groundwater Districts (TAGD) and Texas Water Conservation Association (TWCA) to provide information on aquifer storage and recovery projects and will require permits for all aquifer storage and recovery projects.

Performance Standards

(a) The District will require permits for all aquifer storage and projects within the District and report the number of applications submitted annually.

(b) The District will provide one article annually to a newspaper of general circulation in the District regarding aquifer storage and recovery projects across the state.

Management Objective

Each year the District will require issuance of a well construction permit prior to drilling all new wells.

Performance Standard

Each year all well construction permits in compliance with the District rules will be issued within 15 working days. Well construction permits not in compliance will be considered at the next regular board meeting.

Goal 3.0: Providing for the Efficient Use of Groundwater within the District

Management Objective

Each year, the District will provide informative speakers to schools and civic groups to raise public awareness of practices, which ensure the efficient use of groundwater.

The District will contract with Nueces River Authority (NRA) or similar organizations to provide information on efficient use of groundwater to students in Medina County.

Performance Standard

The District will make at least 2 public speaking appearances to promote the efficient use groundwater per year.

The District will approve a contract with NRA or a similar organization to provide an educational program annually.

Goal 4.0: The Control and Prevention of Subsidence

This Management Goal is not applicable to the district. The geologic framework of

the District Area precludes any significant subsidence from occurring.

Goal 5.0: Addressing Conjunctive Surface Water Management Issues

Except as provided in Chapter 36 of the Texas Water Code, the District has no jurisdiction over surface water. The District shall consider the effects of surface water resources as required by Section 36.113 and other state law.

Management Objective:

The District will attend at least one of the regular meetings of the Region L Regional Water Planning Group and coordinate activities when requested by surface water management entities within the District.

Performance Standard

The District will attend at least one of the regular meetings of the Region L Regional Water Planning Group and coordinate activities when requested by surface water management entities within the District. The District will report these activities annually in the District annual report to the Board of Directors.

Conservation and Drought Goals

Goal 6.0: Addressing Conservation

Management Objective:

The District will annually submit an article regarding water conservation for publication to at least one newspaper of general circulation in Medina County.

Performance Standard

A copy of the article submitted by the District for publication to a newspaper of general circulation in Medina County regarding water conservation will be included in the Annual Report to the Board of Directors.

Goal 7.0: Addressing Drought Conditions

Management Objective:

Each month, the District will download the updated Palmer Drought Severity Index (PDSI) map and review information from the Texas Drought Preparedness Council.

Performance Standard:

Quarterly, the District will make an assessment of the status of drought in the District and prepare a quarterly briefing to the Board of Directors. The downloaded PDSI maps and Situation Reports will be included with copies of the quarterly briefing in the District Annual Report to the Board of Directors.

Goal 8.0: Addressing Recharge Enhancement, Rainwater Harvesting, Precipitation Enhancement and Brush Control

8.01 – Recharge Enhancement

8.01.A Management Objective:

The District will require permits for all recharge enhancement projects.

Performance Standard:

District staff will complete technical review of all permits for recharge enhancement projects within 30 days of filing. Report to the board annually on the number of permits reviewed.

8.02 – Rainwater Harvesting

8.02. A Management Objective:

The District will encourage rainwater harvesting and provide literature or other information related to rainwater harvesting to the public at least once per year.

Performance Standard:

Each year the District annual report will include a summary of the District’s activity regarding rainwater harvesting.

8.03 – Precipitation Enhancement

8.03.A Management Objective:

Monitor the precipitation enhancement program within Medina County conducted by the Edwards Aquifer Authority on a monthly basis during the seeding season.

Performance Standard:

Report on the Edwards Aquifer Authority’s precipitation enhancement program to the board on an annual basis.

8.04 – Brush Control

This strategy is too costly for consideration by the District at this time. Therefore, this goal is not applicable to the operations of the District.

Goal 9.0: Addressing in a quantitative manner the Desired Future Conditions of the Groundwater Resources

Management Objective:

Each month, weather permitting, the District will monitor water levels on at least one well in each of the three relative aquifers located within the District.

Performance Standard:

Monthly, the District staff will report to the Board of Directors on water levels and trends in the Trinity, Leona Gravel, and Carrizo-Wilcox Aquifers. The water well information will be shared with the member districts in GMA 9, 10 and 13 at least annually.

References

Ashenbach, E. 2010. GAM Run 09-031. TWDB Report, 8 p.

George, P.G., 2010. GTA Aquifer Assessment 09-01. TWDB Report, 14 p.

Kelley, V. A., Deeds, N. E., Fryar, D. G., and Nicot, J-P, with Jones, T. L., Dutton, A. R., Bruehl, G., Unger-Holtz, T., and Machin, J. L., 2004, Groundwater Availability Model for the Queen City and Sparta aquifers: Final Report prepared for the Texas Water Development Board.

Mace, R. E., Chowdhury, A. H., Anaya, R., and Way, S.-C., 2000, Groundwater availability of the Trinity Aquifer, Hill Country Area, Texas: numerical simulations through 2050: Texas Water Development Board Report 353, 117 p. 3

Appendix A

Evidence of the Administrative Processes
Required For the Approval of the
Groundwater Management Plan as
Administratively Complete

