NECHES & TRINITY VALLEYS GROUNDWATER CONSERVATION DISTRICT

MANAGEMENT PLAN

APOPTED June 11, 2003
Amended & Adopted August 20, 2009
Amended & Adopted June 19, 2014

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Protecting Anderson, Cherokee, and Henderson Counties
In the State of Texas

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NECHES AND TRINITY VALLEYS GROUNDWATER CONSERVATION DISTRICT MISSION STATEMENT

The Neches and Trinity Valleys Groundwater Conservation District (District) will strive for the conservation, preservation, and prevention of waste of groundwater reservoirs over which the District has jurisdiction. The District will implement water conservation and management strategies to prevent the extreme decline of water levels for the benefit of all water users, water rights owners, the economy, or citizens, and the environment of the territory inside the District.

TIME PERIOD FOR THIS PLAN

This District Management Plan became effective June 11, 2003, following adoption by the District Board of Directors and approved by the Texas Water Development Board (TWDB) affirming the plan as administratively complete and was re-adopted by Board Resolution on June 19, 2014. This revised and amended plan was This District Management Plan will remain in effect for a period of five (5) years as a minimum planning period, or until a revised or amended plan may be approved, whichever comes first.

This document has been developed in accordance with the requirements of Chapter 36 of the Texas Water Code and the provisions of Texas Administrative Code Title 31, Chapter 356, Groundwater Management Plan Certification.

STATEMENT OF GUIDING PRINCIPLES

The District recognizes that the groundwater resources of the region are of vital importance to the continued vitality of the citizens, economy, and environment within the District. The preservation of the groundwater resources can be managed and protected in the most prudent and cost effective manner through the local regulation of production as effected by the District's well permitting and well spacing rules. This management plan is intended as a tool to direct the efforts of those individuals charged with the responsibility for the managing and execution of District activities.

GENERAL DESCRIPTION

In 2001 the Texas Legislature passed Senate Bill 1821 which authorized the creation of the Neches and Trinity Valleys Groundwater Conservation District (referred to as the "District") as a governmental agency to regulate groundwater in order to protect it from overuse and wasteful use. This was approved by the voters in a general election in November 2001. The District includes all of Cherokee and Henderson Counties. Presently all of Anderson County is also included except for the part in the existing Anderson County Underground Water Conservation District. Anderson County Underground Water Conservation District may join the District by action of its board of directors.

The District has an unpaid Board of Directors. The Commissioners' Court of Anderson, Henderson, and Cherokee Counties have each appointed two directors, one to represent rural water, utilities, and small municipal water

supply interests; and one to represent agricultural, industrial, and landowner interests. The cities of Athens, Palestine, and Jacksonville share a seventh Director on a rotating basis.

The District is prohibited by legislation from levying taxes. It also may not exercise the power of eminent domain. It also may not issue or sell bonds in the name of the District.

It is the goal of the District that its activities be consistent with sound business practices; that the interest of the public shall always be considered in conducting District business; that impropriety or the appearance of impropriety shall be avoided to ensure and maintain public confidence in the District; and that the Board and staff shall control and manage the affairs of the District lawfully, fairly, impartially, and in accordance with the stated purposes of the District.

The District employs a General Manager to manage the administrative affairs of the District and provides for additional staff as needed to assist in those duties. The General Manager is responsible for ensuring that the rules, regulations, policies, and procedures adopted by the Board are followed. The General Manager is held responsible by the Board and is required to provide timely reports about the administrative affairs of the District.

GROUNDWATER RESOURCES

The Desired Future Conditions for the aquifers located within the District boundaries and within Groundwater Management Area 11 (GMA-11) were established in accordance with Chapter 36.108 of the Texas Water Code at a meeting of the GMA-11 representatives on April 13, 2010.

The Carrizo-Wilcox aquifers are the primary source of groundwater within the District. The Queen City and Sparta are other minor aquifers with pumping for use within the District. Groundwater in the aquifers is under water table or unconfined conditions and the depths of the aquifer sands are highly variable within the district. Groundwater represents 32 percent of the water source within the District with surface water being the major remaining source. The estimated water pumping during 1999 by aquifer was 90.4% from Carrizo-Wilcox; 4% from Queen City; 5.4% from Sparta; and the balance from undifferentiated aquifers.

A. THE AMOUNT OF WATER BEING USED WITHIN THE DISTRICT ON AN ANNUAL BASIS

There are slivers of the Nacatoch Aquifer in westernmost Henderson County. However, water from the Nacatoch Aquifer within the District are statistically insufficient and are not considered available or used within the District. Data from GMA-8 establishing a desired future condition will be considered to account for the Nacatoch Aquifer water use and availability.

It should be noted that 95.57 percent, as calculated by TWDB, of the land in Anderson County is included in the District with the remainder being in the Anderson County Underground Water Conservation District. Only one

public water supply using groundwater and a small percentage of the total exempt wells are located in the part of the county that is not in the Neches and Trinity Valleys GCD area. Therefore, this Management Plan differentiates statistical information between what is or is not located only in the Neches and Trinity Valleys GCD when using data from the TWDB, State Water Plans, or other non-district sources, when that entity provides the breakout of data and, in those cases, the data is indicated by an asterisk (*).

The following charts present the annual water usage within the District from 2000 to 2011 and include both ground water (GW) and surface water (SW) use. They show a total annual usage of 44,470 acre feet including 26,473 acre feet of groundwater and 17,997 acre feet of surface water in 2011.

Figure 1

ANDERSON COUNTY *95.57 % (multiplier)* All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2011	GW	9,612	0	41	0	438	52	10,143
	SW	4,690	0	10	0	117	972	5,789
2010	GW	9,136	0	48	0	248	52	9,484
	SW	3,534	0	12	0	143	982	4,671
2009	GW	8,931	0	28	0	406	61	9,426
	SW	2,893	0	7	0	10	1,153	4,063
2008	GW	8,709	0	11	0	172	59	8,951
	SW	3,104	0	2	0	271	1,125	4,502
2007	GW	8,530	0	0	0	271	74	8,875
	SW	2,695	0	0	0	154	1,394	4,243
2006	GW	9,354	0	0	0	0	74	9,428
	SW	3,246	0	0	0	291	1,396	4,933
2005	GW	8,949	0	0	0	54	70	9,073
	SW	3,649	0	0	0	298	1,332	5,279
2004	GW	8,625	14	0	0	29	290	8,958
	SW	3,192	0	0	0	214	1,157	4,563
2003	GW	8,862	4,270	0	0	16	293	13,441
	SW	3,161	0	0	0	242	1,168	4,571
2002	GW	8,539	4,270	0	0	77	323	13,209
	SW	3,252	0	0	0	77	1,288	4,617
2001	GW	8,563	340	0	0	92	323	9,318
	SW	3,222	0	0	0	92	1,281	4,595
2000	GW	9,199	325	0	0	92	653	10,269
	SW	3,469	0	0	0	92	980	4,541

NOTE: All Pumpage reported in acre-feet

Source: TWDB Water Use Survey Database 3/26/2014

Figure 2

CHEROKEE COUNTY *100.00 % (multiplier)* All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2011	GW	7,612	6	30	181	9	204	8,097
	SW	2,229	9	15	968	263	1,155	4,639
2010	GW	7,055	5	53	121	204	204	7,690
	SW	1,897	2	27	91	267	1,154	3,462
2009	GW	6,732	8	77	167	147	180	7,387
	SW	1,796	1	39	585	153	1,023	3,607
2008	GW	7,043	8	101	127	131	207	7,690
	SW	1,248	1	51	756	179	1,172	3,417
2007	GW	6,792	7	0	155	245	211	7,481
	SW	1,102	3	0	776	111	1,194	3,219
2006	GW	7,454	9	0	136	4	216	7,947
	SW	1,365	4	0	606	211	1,223	3,448
2005	GW	7,051	9	0	124	5	207	7,527
	SW	1,788	1	0	482	197	1,172	3,836
2004	GW	7,178	1	0	115	2	557	7,981
	SW	1,451	4	0	515	163	836	3,009
2003	GW	6,455	1	0	119	1	572	7,277
	SW	1,661	4	0	1,093	181	858	4,193
2002	GW	6,317	1	0	86	3	689	7,237
	SW	1,762	4	0	1,115	137	1,033	4,508
2001	GW	6,540	1	0	128	2	714	7,526
	SW	1,634	5	0	1,552	124	1,071	4,890
2000	GW	6,796	1	0	132	3	706	7,827
	SW	1,767	4	0	2,371	149	1,059	5,798

NOTE: All Pumpage reported in acre-feet

Source: TWDB Water Use Survey Database 3/26/2014

Figure 3

HENDERSON COUNTY *100.00 % (multiplier)* All values are in acre-feet/year

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2011	GW	6,973	643	54	0	50	513	8,233
	SW	6,284	62	111	132	210	770	7,569
2010	GW	6,105	409	68	0	133	512	7,227
	SW	5,920	75	141	65	149	767	7,117
2009	GW	5,156	1,106	58	0	150	456	6,926
	SW	5,463	65	120	103	20	684	6,455
2008	GW	4,912	834	47	0	155	502	6,450
	SW	5,280	172	98	43	127	753	6,473
2007	GW	4,428	736	2	0	139	507	5,812
	SW	4,925	239	0	30	105	761	6,060
2006	GW	5,177	723	2	0	119	504	6,525
	SW	5,787	218	0	25	265	756	7,051
2005	GW	5,018	809	2	0	41	531	6,401
	SW	5,878	231	0	23	302	796	7,230
2004	GW	4,696	842	2	0	39	431	6,010
	SW	5,101	211	0	15	41	956	6,324
2003	GW	4,514	844	2	0	23	427	5,810
	SW	13,720	174	0	41	268	947	15,150
2002	GW	4,755	945	2	0	2	142	5,846
	SW	5,329	149	0	46	1	313	5,838
2001	GW	4,738	864	8	0	0	519	6,129
	SW	5,687	123	0	464	0	1,150	7,424
2000	GW	4,983	769	3	0	0	931	6,686
	SW	6,496	225	0	477	0	620	7,818

NOTE: All Pumpage reported in acre-feet

Source: TWDB Water Use Survey Database 3/26/2014

B. PROJECTED TOTAL WATER DEMANDS

The following tables show the projected water demand for Anderson, Cherokee, and Henderson Counties through the year 2060. This is the combined surface water and groundwater use for the District. The projections are from the 2012 State Water Plan and include agriculture, municipal and industrial use.

Since the District does not cover all of Anderson County, the generic county-wide data have been converted to a proportional value (relative to the size of the District) by multiplying each value from the County Water Demands data sheet by 0.9557. Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

Figure 4

ANDERSON COUNTY *95.57 % (multiplier)* *All values are in acre-feet/year*

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
I	FRANKSTON	NECHES	524	547	564	582	598	612
I	MINING	NECHES	442	480	502	524	545	566
I	IRRIGATION	NECHES	13	13	13	13	13	13
I	LIVESTOCK	NECHES	767	767	767	767	767	767
I	STEAM ELECTRIC POWER	NECHES	0	10,805	12,632	14,860	17,575	20,885
I	BRUSHY CREEK WSC	NECHES	150	152	154	153	155	159
I	CONSOLIDATED WSC	NECHES	29	30	30	29	30	31
I	WALSTON SPRINGS WSC	NECHES	427	438	441	444	452	464
I	PALESTINE	NECHES	1,955	2,018	2,062	2,106	2,156	2,210
I	COUNTY-OTHER	NECHES	765	794	812	831	851	872
I	FOUR PINE WSC	TRINITY	283	292	296	301	306	314
I	PALESTINE	TRINITY	1,762	1,819	1,858	1,898	1,943	1,992
I	COUNTY-OTHER	TRINITY	4,453	4,627	4,732	4,839	4,955	5,080
I	ELKHART	TRINITY	177	183	185	188	192	196
I	MINING	TRINITY	49	53	55	57	60	62
I	LIVESTOCK	TRINITY	865	865	865	865	865	865
I	IRRIGATION	TRINITY	189	189	189	189	189	189
I	BRUSHY CREEK WSC	TRINITY	122	124	126	125	127	130
I	CONSOLIDATED WSC	TRINITY	98	99	99	98	100	102
Sum of Projected Water Demands (acre-feet/year)			**13,070**	**24,295**	**26,382**	**28,869**	**31,879**	**35,509**

Source: 2012 State Water Plan

Figure 5

CHEROKEE COUNTY *100.00 % (multiplier)* *All values are in acre-feet/year*

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
I	NEW SUMMERFIELD	NECHES	208	258	302	338	379	427
I	BULLARD	NECHES	13	13	13	13	13	14
I	COUNTY-OTHER	NECHES	902	790	617	378	272	218
I	NORTH CHEROKEE WSC	NECHES	387	439	482	519	560	616
I	ALTO RURAL WSC	NECHES	393	404	409	411	424	447
I	CRAFT-TURNEY WSC	NECHES	515	614	742	908	995	1,078
I	STEAM ELECTRIC POWER	NECHES	2,245	1,790	2,093	2,462	2,912	3,460
I	RUSK RURAL WSC	NECHES	358	372	381	388	401	423
I	SOUTHERN UTILITIES COMPANY	NECHES	421	458	486	513	543	583
I	MANUFACTURING	NECHES	718	784	839	891	934	1,007
I	RUSK	NECHES	1,194	1,283	1,353	1,421	1,495	1,591
I	TROUP	NECHES	6	6	7	7	8	8
I	WELLS	NECHES	122	121	119	117	115	116
I	MINING	NECHES	593	1,597	99	101	103	105
I	IRRIGATION	NECHES	321	321	321	321	321	321
I	LIVESTOCK	NECHES	1,765	1,765	1,765	1,765	1,765	1,765
I	JACKSONVILLE	NECHES	3,502	3,637	3,741	3,827	3,948	4,111
I	ALTO	NECHES	233	248	261	273	286	304
Sum of Projected Water Demands (acre-feet/year)			**13,896**	**14,900**	**14,030**	**14,653**	**15,474**	**16,594**

Figure 6

HENDERSON COUNTY *100.00 % (multiplier)* *All values in acre-feet/year*

RWPG	WUG	WUG Basin	2010	2020	2030	2040	2050	2060
C	EAST CEDAR CREEK FWSD	TRINITY	1,698	1,866	2,215	2,382	2,580	2,777
C	MABANK	TRINITY	95	109	123	140	159	184
C	MALAKOFF	TRINITY	348	361	372	383	404	434

C	*SEVEN POINTS*	*TRINITY*	*188*	*222*	*254*	*288*	*330*	*385*
C	*TOOL*	*TRINITY*	*405*	*452*	*500*	*548*	*610*	*695*
C	*TRINIDAD*	*TRINITY*	*183*	*183*	*183*	*181*	*184*	*190*
C	*PAYNE SPRINGS*	*TRINITY*	*165*	*174*	*182*	*191*	*203*	*220*
C	*GUN BARREL CITY*	*TRINITY*	*1,408*	*1,629*	*1,840*	*2,071*	*2,352*	*2,720*
C	*EUSTACE*	*TRINITY*	*146*	*143*	*140*	*138*	*137*	*137*
C	*ATHENS*	*TRINITY*	*2,693*	*3,169*	*3,739*	*4,392*	*5,248*	*6,306*
C	*VIRGINIA HILL WSC*	*TRINITY*	*393*	*384*	*375*	*366*	*361*	*364*
C	*WEST CEDAR CREEK MUD*	*TRINITY*	*1,010*	*1,423*	*1,735*	*1,994*	*2,329*	*2,753*
C	*LOG CABIN*	*TRINITY*	*96*	*128*	*144*	*142*	*141*	*141*
C	*BETHEL-ASH WSC*	*TRINITY*	*163*	*194*	*222*	*253*	*290*	*342*
C	*LIVESTOCK*	*TRINITY*	*854*	*854*	*854*	*854*	*854*	*854*
C	*MINING*	*TRINITY*	*265*	*302*	*327*	*352*	*378*	*399*
C	*STEAM ELECTRIC POWER*	*TRINITY*	*460*	*427*	*7,000*	*8,000*	*9,000*	*10,000*
C	*MANUFACTURING*	*TRINITY*	*110*	*118*	*133*	*151*	*172*	*195*
C	*COUNTY-OTHER*	*TRINITY*	*262*	*257*	*253*	*248*	*246*	*246*
I	*MANUFACTURING*	*NECHES*	*12*	*14*	*16*	*18*	*20*	*22*
I	*MURCHISON*	*NECHES*	*139*	*148*	*157*	*166*	*179*	*196*
I	*MINING*	*NECHES*	*14*	*14*	*14*	*14*	*14*	*14*
I	*LIVESTOCK*	*NECHES*	*2,594*	*2,594*	*2,594*	*2,594*	*2,594*	*2,594*
I	*R P M WSC*	*NECHES*	*69*	*75*	*80*	*86*	*95*	*106*
I	*ATHENS*	*NECHES*	*77*	*107*	*136*	*163*	*199*	*246*
I	*IRRIGATION*	*NECHES*	*10*	*10*	*10*	*10*	*10*	*10*
I	*COUNTY-OTHER*	*NECHES*	*2,761*	*2,901*	*3,032*	*3,162*	*3,365*	*3,645*
I	*BERRYVILLE*	*NECHES*	*126*	*134*	*142*	*149*	*162*	*179*
I	*BETHEL-ASH WSC*	*NECHES*	*250*	*303*	*351*	*404*	*468*	*556*
I	*BRUSHY CREEK WSC*	*NECHES*	*72*	*79*	*86*	*91*	*100*	*114*
I	*BROWNSBORO*	*NECHES*	*158*	*182*	*206*	*232*	*263*	*304*
I	*CHANDLER*	*NECHES*	*409*	*453*	*494*	*538*	*596*	*674*
Sum of Projected Water Demands (acre-feet/year)			***17,633***	***19,409***	***27,909***	***30,701***	***34,043***	***38,002***

C. PROJECTED SURFACE WATER SUPPLIES

The following charts show the surface water supplies for the District for 2010 and the projected surface water supplies through the year 2060. *All data is from the 2012 State Water Plan.*

Note that the data for Anderson County includes the entire county and not just the area within the District. The

percentage of surface water supply not in the District is not material to the presentation of data as a whole because there is no major surface water supply in the area not in the District.

Figure 7

Anderson County (in Acre-feet) 100.00 % (multiplier)

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
I	CONSOLIDATED WSC	NECHES	HOUSTON COUNTY LAKE/RESERVOIR	23	24	24	23	24	24
I	CONSOLIDATED WSC	TRINITY	HOUSTON COUNTY LAKE/RESERVOIR	79	78	78	79	78	78
I	IRRIGATION	NECHES	NECHES RIVER COMBINED RUN-OF- RIVER IRRIGATION	188	188	188	188	188	188
I	IRRIGATION	TRINITY	TRINITY COMBINED RUN-OF-RIVER IRRIGATION	1,013	1,013	1,013	1,013	1,013	1,013
I	LIVESTOCK	NECHES	LIVESTOCK LOCAL SUPPLY	572	572	572	572	572	572
I	LIVESTOCK	TRINITY	LIVESTOCK LOCAL SUPPLY	654	654	654	654	654	654
I	PALESTINE	NECHES	PALESTINE LAKE/RESERVOIR	2,278	2,278	2,278	2,278	2,278	2,278
I	PALESTINE	TRINITY	PALESTINE LAKE/RESERVOIR	2,053	2,053	2,053	2,053	2,053	2,053
Sum of Projected Surface Water Supplies (acre-feet/year)				**6,860**	**6,860**	**6,860**	**6,860**	**6,860**	**6,860**

Figure 8

Cherokee County (in Acre-feet) 100.00 % (multiplier)

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
I	COUNTY-OTHER	NECHES	JACKSONVILLE LAKE/RESERVOIR	218	180	134	78	54	41
I	CRAFT-TURNEY WSC	NECHES	JACKSONVILLE LAKE/RESERVOIR	497	559	643	752	790	811

I	IRRIGATION	NECHES	NECHES RIVER COMBINED RUN-OF- RIVER IRRIGATION	182	182	182	182	182	182
I	IRRIGATION	NECHES	PALESTINE LAKE/RESERVOIR	296	293	290	287	285	282
I	JACKSONVILLE	NECHES	JACKSONVILLE LAKE/RESERVOIR	3,381	3,311	3,243	3,168	3,135	3,093
I	LIVESTOCK	NECHES	LIVESTOCK LOCAL SUPPLY	1,059	1,059	1,059	1,059	1,059	1,059
I	MANUFACTURING	NECHES	JACKSONVILLE LAKE/RESERVOIR	693	714	727	738	742	758
I	MINING	NECHES	OTHER LOCAL SUPPLY	2	2	2	2	2	2
I	NORTH CHEROKEE WSC	NECHES	JACKSONVILLE LAKE/RESERVOIR	374	400	418	430	445	463
I	RUSK	NECHES	RUSK CITY LAKE/RESERVOIR	64	63	63	62	61	60
I	STEAM ELECTRIC POWER	NECHES	STRIKER LAKE/RESERVOIR	2,245	1,790	2,093	2,462	2,912	3,460
Sum of Projected Surface Water Supplies (acre-feet/year)				**9,011**	**8,553**	**8,854**	**9,220**	**9,667**	**10,211**

Figure 9

Henderson County (in Acre-feet)

100.00 % (multiplier)

RWPG	WUG	WUG Basin	Source Name	2010	2020	2030	2040	2050	2060
C	ATHENS	TRINITY	ATHENS LAKE/RESERVOIR	2,027	977	1,165	1,333	1,507	1,670
C	COUNTY-OTHER	TRINITY	TRINITY RIVER RUN-OF-RIVER MUNICIPAL	0	0	0	0	0	0
C	COUNTY-OTHER	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	78	71	59	50	44	38
C	EAST CEDAR CREEK FWSD	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	1,637	1,713	1,728	1,608	1,525	1,431
C	GUN BARREL CITY	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	1,397	897	861	839	834	841
C	LIVESTOCK	TRINITY	LIVESTOCK LOCAL SUPPLY	341	341	341	341	341	341
C	MABANK	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	94	100	96	94	94	95
C	MALAKOFF	TRINITY	TRWD	171	165	145	129	119	112

			LAKE/RESERVOIR SYSTEM						
C	MANUFACTURING	TRINITY	ATHENS LAKE/RESERVOIR	100	61	61	62	62	61
C	MINING	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	79	84	76	72	67	62
C	PAYNE SPRINGS	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	0	0	0	0	0	0
C	SEVEN POINTS	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	186	204	198	194	195	198
C	STEAM ELECTRIC POWER	TRINITY	FOREST GROVE LAKE/RESERVOIR	0	0	0	0	0	0
C	STEAM ELECTRIC	TRINITY	TRINIDAD	3,050	3,050	3,050	3,050	3,050	3,050
C	STEAM ELECTRIC POWER	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	0	0	0	0	0	0
C	TOOL	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	401	415	390	370	360	358
C	TRINIDAD	TRINITY	TRINIDAD CITY LAKE/RESERVOIR	450	450	450	450	450	450
C	WEST CEDAR CREEK MUD	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	988	937	892	854	821	795
I	ATHENS	NECHES	ATHENS LAKE/RESERVOIR	62	33	42	50	57	65
I	COUNTY-OTHER	NECHES	PALESTINE LAKE/RESERVOIR	99	98	97	96	95	94
I	IRRIGATION	NECHES	ATHENS LAKE/RESERVOIR	171	94	86	79	71	64
I	LIVESTOCK	NECHES	ATHENS LAKE/RESERVOIR	380	1,735	1,546	1,376	1,203	1,040
I	LIVESTOCK	NECHES	LIVESTOCK LOCAL SUPPLY	248	248	248	248	248	248
Sum of Projected Surface Water Supplies (acre-feet/year)				**11,959**	**11,673**	**11,531**	**11,295**	**11,143**	**11,013**

D. GROUNDWATER AVAILABILITY

The Wilcox group and the overlaying Carrizo Formation of the Claiborne Group form a hydro-logically

connected system known as the Carrizo-Wilcox Aquifer. This aquifer extends from the Rio Grande in South Texas northeastward into Arkansas and Louisiana, providing all or part of the water in 60 counties in Texas. Municipal and irrigation Pumpage account for about 35 and 51 percent, respectively, of pumping from the Carrizo-Wilcox Aquifer.

The Queen City Aquifer extends across Texas from the Frio River in South Texas northeastward into Louisiana. The aquifer provides water for domestic and livestock purposes throughout most of its extent and significant amounts for municipal and industrials supplies in Northeast Texas. The water may be acidic in much of Northeast Texas and relatively high in iron concentrations in some locations.

The Sparta aquifer extends in a narrow band from the Frio River in South Texas northeastward to the Louisiana border in Sabine County. The aquifer provides water for domestic and livestock purposes throughout most of its extent and water for municipal, industrial, and irrigation in much of the region. Water may contain iron concentrations in excess of drinking water standards.
There are slivers of the Nacatoch Aquifer in westernmost Henderson County. However, water from the Nacatoch Aquifer within the District are statistically insufficient and are not considered available or used within the District.

A very small portion of the northern section of the Trinity Aquifer is located in western Henderson County. The water budget values for this aquifer are very small or zero (TWBD GAM Run 09-021).

The modeled available groundwater is the amount of groundwater available for permitting purposes in each of the aquifers within the district. This is determined to be between 25% and 75% of the Total Storage of the aquifer. Total estimated recoverable storage values may
include a mixture of water quality types, including fresh, brackish, and saline groundwater.

TABLE 1: TOTAL ESTIMATED RECOVERABLE STORAGE BY COUNTY

In Acre-feet

Aquifer	County	Total	25%	75%
Carrizo-Wilcox	**Anderson**	**170,000,000**	**42,500,000**	**127,500,000**
	Cherokee	**200,000,000**	**50,000,000**	**150,000,000**
	Henderson	**66,000,000**	**16,500,000**	**49,500,000**
Total		**436,000,000**	**109,000,000**	**327,000,000**

Aquifer	County	Total	25%	75%
Queen City	**Anderson**	**19,000,000**	**4,750,000**	**14,250,000**
	Cherokee	**15,000,000**	**3,750,000**	**11,250,000**
	Henderson	**6,700,000**	**1,675,000**	**5,025,000**
Total		**40,700,000**	**10,175,000**	**30,525,000**

Aquifer	County	Total	25%	75%
Sparta	**Anderson**	**640,000**	**160,000**	**480,000**
	Cherokee	**1,700,000**	**425,000**	**1,275,000**
	Henderson	**0**	**0**	**0**
Total		**2,340,000**	**585,000**	**1,755,000**

Aquifer	County	Total	25%	75%
Nacatoch	**Henderson**	**9,800**	**2,450**	**7,350**

Aquifer	County	Total	25%	75%
Trinity	**Henderson**	**500,000**	**125,000**	**375,000**

Source: GAM 13-034 (April 2, 2014), Texas Water Development Board

The following tables shows the water flowing into and out of the aquifers including water discharging from each aquifer to springs and surface water bodies including lakes, streams and rivers. Other data presented included the storage, flow between aquifers, recharge, general head boundary, evapotranspiration, and other flows in and out.

TABLE 2: ANNUAL WATER BUDGET VALUES

A groundwater budget summarizes the water entering and leaving the aquifer according to a groundwater availability model. Selected components were extracted from the groundwater budget for the aquifers located within the District and were averaged over the duration of the calibrated portion of the model runs (1980-1999). The projected water into and out of the aquifers within the District is taken from Groundwater Availability Model 08-71 prepared by TWDB, October 3, 2008

GAM 08-71 used model runs for the northern sections of the Carrizo-Wilcox, Queen City, and Sparta aquifers and the northern sections of the Trinity aquifer. The Nacatoch aquifer also underlies the district; however, a GAM had not been completed for this minor aquifer at the time GAM 08-71 was performed.
The components of the modified budgets shown in the following tables include precipitation recharge, surface water outflow, flow into and out of district, and flow between aquifers. The tables show the annual water budgets for each county extracted from the groundwater budget reported in acre feet per year.

GAM 09-01 (July 31, 2009) contains information for the Nacatoch Aquifer as included in the annual water budget values below. The other information is from GAM 08-71.

Precipitation recharge: This is the areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifer. The estimated annual amount of recharge from participation to the district in acre-feet per year (rounded to nearest 1 acre-foot) is:

Estimated annual recharge from precipitation:

Sparta Aquifer	22,771
Weches Confining Unit	2,420
Queen City Aquifer	74,954
Reklaw Confining Unit	4,395
CarrizoAquifer	7,206
Upper Wilcox Aquifer	6,639
Middle Wilcox Aquifer	3,584
Lower Wilcox Aquifer	1,329
Nacatoch Aquifer	56
Woodbine Aquifer	0
Washita and Fredericksburg Confining Unit	0
Paluxy Aquifer	0
Glen Rose Confining Unit	0
Hensell Aquifer	0
Peasall/Cow Creek/Hammett/ Sligo Confining Unit	0
Hosston Aquifer	0

The estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams and rivers in acre-feet per year (rounded to nearest 1 acre-foot) is:

Surface water outflow:

Sparta Aquifer	5,985
Weches Confining Unit	395
Queen City Aquifer	43,978
Reklaw Confining Unit	3,899
CarrizoAquifer	3,669
Upper Wilcox Aquifer	2,167
Middle Wilcox Aquifer	3,296
Lower Wilcox Aquifer	1,221
Nacatoch Aquifer	357
Woodbine Aquifer	0
Washita and Fredericksburg Confining Unit	0
Paluxy Aquifer	0
Glen Rose Confining Unit	0
Hensell Aquifer	0
Peasall/Cow Creek/Hammett/ Sligo Confining Unit	0
Hosston Aquifer	0

The flow into and out of the district describes lateral flow within the aquifer between the district and adjacent counties and the flow into and out of the district is presented in the following tables.

The estimated annual volume of flow into the district within each aquifer in the district in acre-feet per year (rounded to nearest 1 acre-foot) is:

Flow into the district:

Sparta Aquifer	510
Weches Confining Unit	61
Queen City Aquifer	5,249
Reklaw Confining Unit	994
CarrizoAquifer	7,998
Upper Wilcox Aquifer	5,867
Middle Wilcox Aquifer	4,227
Lower Wilcox Aquifer	4,465
Nacatoch Aquifer	1,092
Woodbine Aquifer	40
Washita and Fredericksburg Confining Unit	6
Paluxy Aquifer	18
Glen Rose Confining Unit	12
Hensell Aquifer	31
Peasall/Cow Creek/Hammett/ Sligo Confining Unit	0
Hosston Aquifer	148

The estimated annual volume of flow out of the district within each aquifer in the district in acre-feet per year (rounded to nearest 1 acre-foot) is:

Flow out of the district:

Sparta Aquifer	2,063
Weches Confining Unit	148
Queen City Aquifer	3,718
Reklaw Confining Unit	785
CarrizoAquifer	5,820
Upper Wilcox Aquifer	5,654
Middle Wilcox Aquifer	3,652
Lower Wilcox Aquifer	2,269
Nacatoch Aquifer	260
Woodbine Aquifer	42
Washita and Fredericksburg Confining Unit	6
Paluxy Aquifer	19
Glen Rose Confining Unit	12

Hensell Aquifer	32
Peasall/Cow Creek/Hammett/ Sligo Confining Unit	0
Hosston Aquifer	152

Flow between the aquifers describes the vertical flow, or leakage, between aquifers or confining units. Inflow to an aquifer from an overlaying or underlying aquifer will always equal the outflows from the other aquifer. The estimated net annual volume of flow between each aquifer in the district in acre-feet per year (rounded to nearest 1 acre-foot) is:

Estimated flow between aquifers:

Sparta Aquiferto the Weches Confining Unit	6,876
Weches Confining Unit to the Queen City Aquifer	7,916
Queen City Aquifer to the Reklaw Confining Unit	7,113
Reklaw Confining Unit to the Carrizo Aquifer	8,776
CarrizoAquifer to the Upper Wilcox Aquifer	7,496
Upper Wilcox Aquifer to the Middle Wilcox aquifer	3,392
Middle Wilcox Aquifer to the Lower Wilcox Aquifer	4,053
Kemp Clay and Midway Units to the Nacatoch Aquifer	223
Washita and Fredericksburg Confining Unit to the Woodbine Aquifer	1
Washita and Fredericksburg Confining Unit in/out of The Paluxy Aquifer	0
Paluxy Aquifer in/out of the Glen Rose Confining Unit	0
Glen Rose Confining Unit to the Hensell Aquifer	1
Hensell Aquifer to the Pearsall/Cow Creek/Hammett/Sligo Confining Unit	1
Peasall/Cow Creek/Hammett/Sligo Confining Unit to The Hosston Aquifer	3

A very small portion of the northern section of the Trinity aquifer is located within the district. The water budget values of this aquifer are, therefore, very small or zero. Since only the confined portion of the ~~t~~Trinity aquifer is located within the district, surface water outflow values using both the evapotranspiration and streamflow-routing modeling packages were zero for this aquifer.

SOURCE: Texas Water Development Board, Groundwater Availability Model Run 08-71, October 3, 2008 and GAM 09-021, July 31, 2009.

E. PROJECTED WATER NEEDS WITHIN THE DISTRICT

The TWDB has published projected water demands in "*Water for Texas - 2007*". The water need estimates in this plan have been extracted from that TWDB document and will be used until alternatives may be generated. With normal rainfall and the advent of expected conservation practices, total water demands within the District projected to be used within the District on an annual basis 2010 to 2060 in acre feet is as follows:

TABLE 3: WATER SUPPLY NEEDS IN YEARS 2010 AND 2060

In acre feet per year

	2010	2060
Anderson County	18	22,105 (note 1)
Cherokee County	54	705
Henderson County	4,682	17,270
TOTAL PROJECTED NEEDS	**4,754**	**40,080**

Note 1: Increase of 21,853 acre feet due to demand by steam-electric needs.
Source: Water for Texas – 2007, Texas Water Development Board

F. PROJECTED WATER MANAGEMENT STRATEGIES

The projected water management strategies from the 2012 State Water Plan to supply the needs of the district are presented below.

Figure 10
PROJECT WATER MANAGEMENT STRATEGIES

ANDERSON COUNTY

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
COUNTY-OTHER, NECHES (I)							
OVERDRAFT CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [ANDERSON]	0	0	0	100	100	100
COUNTY-OTHER, TRINITY (I)							
NEW WELLS - QUEEN CITY AQUIFER	QUEEN CITY AQUIFER [ANDERSON]	0	0	0	0	0	100
FRANKSTON, NECHES (I)							
MUNICIPAL CONSERVATION	CONSERVATION [ANDERSON]	0	0	6	7	8	9

NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [ANDERSON]	0	0	121	121	121	121
MINING, NECHES (I)							
NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [ANDERSON]	0	86	86	86	86	87
MINING, TRINITY (I)							
NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [ANDERSON]	18	34	34	34	34	33
STEAM ELECTRIC POWER, NECHES (I)							
PURCHASE WATER FROM PROVIDER (2)	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	21,853	21,853	21,853	21,853	21,853
Sum of Projected Water Management Strategies (acre-feet/year)		**18**	**21,973**	**22,100**	**22,201**	**22,202**	**22,303**

CHEROKEE COUNTY

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
JACKSONVILLE, NECHES (I)							
INFRASTRUCTURE IMPROVEMENTS	JACKSONVILL LAKE/RESERVOIR [RESERVOIR]	1,000	1,000	1,000	1,000	1,000	1,000
PURCHASE WATER FROM P ROVIDER (3)	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	1,7000	1,700	1,700	1,700	1,700	1,700
MINING, NECHES (I)							
PURCHASE WATER FROM PROVIDER(2)	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	500	1,500	0	0	0	0
NEW SUMMERFIELD, NECHES (I)							
MUNICIPAL CONSERVATION	CONSERVATION [CHEROKEE]	0	10	18	21	23	26
PURCHASE WATER FROM PROVIDER (1)	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	1,000	1,000	1,000	1,000	1,000
RUSK, NECHES (I)							
MUNICIPAL CONSERVATION	CONSERVATION [CHEROKEE]	0	0	0	51	66	76
PURCHASE WATER FROM PROVIDER (2)	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	3,000	3,000	3,000	3,000	3,000
Sum of Projected Water Management Strategies (acre-feet/year)		**1,500**	**8,210**	**6,718**	**6,772**	**6,789**	**6,802**

HENDERSON COUNTY

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
ATHENS, TRINITY (C)							
FOREST GROVE RESERVOIR PROJECT	FOREST GROVE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	0
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	21	170	290	383	505	662
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	25	39	55	69	84	99
OVERDRAFT CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	803	801	801	800	799
PURCHASE FROM WATER PROVIDER (1)	FOREST GROVE LAKE/RESERVOIR [RESERVOIR]	0	0	0	155	933	1,894
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	621	829	1,013	786	554
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
BETHEL-ASH WSC, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	3	11	17	21	25	30

WUG, Basin (RWPG)		All values are in acre-feet/year					
Water Management Strategy	**Source Name [Origin]**	**2010**	**2020**	**2030**	**2040**	**2050**	**2060**
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	1	1	2	2	2	2
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
COUNTY-OTHER, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	2	7	9	10	11	12
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	523	573
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	21	0	0	0	0	0
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	1,325	1,990	2,017	2,439	2,685
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
TRWD THIRD PIPELINE AND REUSE	INDIRECT REUSE [HENDERSON]	0	1,325	1,990	2,017	2,439	2,685
EAST CEDAR CREEK FWSD, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	49	103	156	190	227	268
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	12	17	20	21	23	24
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	392	513
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	33	312	563	414	541
WATER TREATMENT PLANT - EXPANSION	RICHLAND CHAMBERS LAKE/RESERVOIR NON-SYSTEM PORTION [RESERVOIR]	0	0	0	0	0	0
EUSTACE, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	2	5	7	7	8	8
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
GUN BARREL CITY, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	11	72	105	136	174	224
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	196	276
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	599	574	559	556	561

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [NAVARRO]	0	62	138	268	207	291
PURCHASE FROM WATER PROVIDER (3)	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	162	270	385	528
WATER TREATMENT PLANT - NEW	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	0	0	0	0
LIVESTOCK, TRINITY (C)							
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
LOG CABIN, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	1	6	8	9	9	10
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
MABANK, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	1	9	23	28	32	38
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	0	0	0	0	1	1
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	16	25
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	0	0	0	0
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	0	4	18	17	26
MALAKOFF, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	3	11	15	17	20	22
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	30	40
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	4	26	45	32	43
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
MANUFACTURING, TRINITY (C)							
MANUFACTURING CONSERVATION	CONSERVATION [HENDERSON]	0	0	3	4	5	5
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	45	59	74	93	119
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
MINING, TRINITY (C)							
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	22	28
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	7	22	34	24	30
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
PAYNE SPRINGS, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	5	9	11	14	16	20
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	2	3	3	3	3	4
NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	154	154	154	154	154	154
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
SEVEN POINTS, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	2	8	12	15	18	23
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	54	58
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	108	0	0	0	0	0
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	150	212	213	251	273
STEAM ELECTRIC POWER, TRINITY (C)							
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	1,184	1,639
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	3,081	3,341	3,516	3,581
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	0	869	1,609	1,250	1,730
TOOL, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	4	15	21	26	31	38
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	108	114
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	251	0	0	0	0	0

WUG, Basin (RWPG) All values are in acre-feet/year

Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	332	452	437	504	534
TRINIDAD, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	2	6	8	9	10	11
VIRGINIA HILL WSC, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	4	14	20	21	22	24
SUPPLEMENTAL WELLS	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	0
WEST CEDAR CREEK MUD, TRINITY (C)							
MUNICIPAL CONSERVATION-BASIC	CONSERVATION [HENDERSON]	15	62	93	116	143	178
MUNICIPAL CONSERVATION-EXPANDED	CONSERVATION [HENDERSON]	8	11	13	15	18	21
PURCHASE FROM WATER PROVIDER (1)	TOLEDO BEND LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	385	553
PURCHASE FROM WATER PROVIDER (1)	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	370	462	492	555	623
PURCHASE FROM WATER PROVIDER (2)	INDIRECT REUSE [HENDERSON]	0	44	275	517	407	583
ATHENS, NECHES (I)							
INDIRECT REUSE	INDIRECT REUSE [HENDERSON]	0	19	29	42	65	94
MUNICIPAL CONSERVATION	CONSERVATION [HENDERSON]	1	6	12	17	22	30
NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	27	29	29	30	31
BROWNSBORO, NECHES (I)							
OVERDRAFT CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	0	0	0	0	0	40
COUNTY-OTHER, NECHES (I)							
MUNICIPAL CONSERVATION	CONSERVATION [HENDERSON]	31	57	74	92	108	129
NEW WELLS - CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	50	50	50	50	50	50
NEW WELLS - QUEEN CITY AQUIFER	QUEEN CITY AQUIFER [HENDERSON]	50	50	50	100	200	500
OVERDRAFT CARRIZO WILCOX AQUIFER	CARRIZO-WILCOX AQUIFER [HENDERSON]	100	0	0	0	0	0

WUG, Basin (RWPG)		All values are in acre-feet/year					
Water Management Strategy	Source Name [Origin]	2010	2020	2030	2040	2050	2060
PURCHASE WATER FROM PROVIDER (2)	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	150	200	300	400	500
IRRIGATION, NECHES (I)							
INDIRECT REUSE	INDIRECT REUSE [HENDERSON]	0	70	83	95	108	121
LIVESTOCK, NECHES (I)							
INDIRECT REUSE	INDIRECT REUSE [HENDERSON]	0	1,288	1,477	1,647	1,820	1,983
Sum of Projected Water Management Strategies (acre-feet/year)		**939**	**8,170**	**15,307**	**18,085**	**22,862**	**27,255**

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 a reduction of groundwater use. A monitor well observation network may be established and maintained in order to evaluate changing conditions of groundwater supplies (aquifer water table levels) 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. The District will undertake as necessary and cooperate with investigations of the groundwater resources within the District and will make the results of investigations available to the public upon adoption by the Board.

The District will consider the water supply needs and water management strategies from Water Planning Group I and other sources included in the adopted state water plan as shown in Water for Texas – 2007, Texas Water Development Board. This plan shows that the largest projected increase in water demand will be for steam-electric use which is expected to require about half of the total water demand in 2060. The region as a whole appears to have enough water supplies to meet demands through 2060. In the District the major water supply project is the development of Lake Columbia in Cherokee county and the District supports this effort.

The District will enforce the terms and conditions of permits and rules of the District. The District will adopt rules, and amend rules as necessary, to regulate groundwater withdrawals by means of well spacing, well permits, and production limits. The District may deny a well permit or limit groundwater withdrawals in accordance with the guidelines stated in the rules of the District and drought contingency plan. 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.

In pursuit of the District's mission of protecting the groundwater resources, 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.

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

1) The proposed use of the water and affect of existing groundwater and surface water resources or existing permits under the rules and management plan of the District.
2) The beneficial use of the water resource to protect groundwater quality, avoid waste, and achieve water conservation.
3) The economic hardship resulting from grant or denial of a permit or the terms prescribed by the permit.
4) The application conforms to the requirements of the District and TWC Chapter 36 and is accompanied by the prescribed fees.
5) Other factors that may be specific to the application.

DROUGHT CONTINGENCY PLAN

A contingency plan to cope with the effects of water supply shortages due to climatic or other conditions was developed by the District and adopted by the Board after notice and hearing. In developing the contingency plan, the District considered the economic effects 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 hydro-geologic conditions of the aquifer and the appropriate conditions under which to implement the contingency plan. The plan is reviewed annually and revised as necessary.

ACTIONS, PROCEDURES, PERFORMANCE, AND AVOIDANCE NECESSARY TO EFFECTUATE THE MANAGEMENT PLAN

The District will implement the provisions of this plan and will utilize the provisions of the plan as a guidepost for determining the direction of priority for District activities. Operations, agreements, and planning efforts of the District will be consistent with this plan. The District will seek the cooperation of all interested parties in the implementation of this plan. The plan is for a five-year planning period; however, the Board may review the plan annually or as desired and re-adopt the plan with or without revisions at least every five years.

DISTRICT RULES

The District will enforce District rules requiring the permitting of all new non-exempt wells to prevent the waste of groundwater. District rules are available upon request from the district or may be viewed at the district's website at www.ntvgcd.org.

REGIONAL WATER PLAN

This management plan has been adopted after the development of the regional management plan for Region I RWP Group and Region C RWP Group. As required by TWC 36.1071(b) this management plan and any amendments thereon shall be consistent with the regional water plans. After the time a regional water plan has been adopted, the District shall address water supply needs in a manner that is not in conflict with the appropriate approved regional water plan which must be approved under Section 16.053. Senate Bill 1 intended for water management to be a bottom up approach. Therefore, the regional planning groups must consider this local approved NTVGCD Management Plan in the development of their regional water plan to meet the intent of Senate Bill 1 and Senate Bill 1763 and, consequently, result in a regional management plan which is consistent with this local management plan, resulting in the protection of the local control of groundwater management by the local citizens.

GOALS, MANAGEMENT OBJECTIVES, PERFORMANCE STANDARDS AND METHODOLOGY TO EVALUATE PROGRESS FOR IMPLEMENTATION OF THE DISTRICT MANAGEMENT PLAN AND FUTURE BOARD REVIEW

GOAL 1.0 PROVIDING FOR THE MOST EFFICIENT USE OF GROUNDWATER WITHIN THE DISTRICT

It is the intent of the district to provide for the most efficient use of groundwater by regulating the drilling of wells within the district and by enforcing district Rules.

Management Objective

Each year the District will require the registration of all new wells drilled within the District's jurisdiction and the District will require a permit for drilling all non-exempt wells.

Performance Standard

At all regularly scheduled Board meetings, the General Manager reports to the Board of Directors on the number of new wells registered with the District and the number of permit applications received and approved for new wells within the District.

Management Objective

Each year the District will provide informative speakers to schools, civic groups, social clubs, and other organizations for presentations to inform a minimum of 50 citizens on the activities and programs, the geology and hydrology of groundwater, and the principles of water conservation relating to the best management practices for the efficient use of groundwater.

Performance Standard

The number of citizens in attendance annually at District presentations concerning the principals of water conservation relating to the best practices for the efficient use of groundwater.

Management Objective

Each year, on four or more occasions, the District will disseminate educational information relating to the conservation practices for the efficient use of water resources.

Performance Standard

Number of occasions, annually, the District disseminated educational information relating to the conservation practices for the efficient use of water resources.

Methodology

Annually, the District will prepare and present a report to the Board on presentations in regards to achieving Goal 1. The report will include the number of instances each activity was engaged in during the year. The report will be maintained on file in the District Office.

GOAL 2.0 CONTROLLING AND PREVENTING WASTE OF GROUNDWATER

Management Objective

100 percent of complete permit applications will be reviewed by the District within 90 days to ensure all procedures are followed to control and prevent the waste of groundwater. The District will report annually to the Board the number of permit application requests that met the District's rules and requirements for approval within 90 days of the receipt of the completed application.

Performance Standard

1. Number of permits issued each year by the District for new non-exempt wells in compliance with District rules and procedures.
2. Percent of completed applications reviewed within 90 days of receipt of application.

Management Objective

The District will maintain procedures for the receipt of well permit applications. Annual reports will be made to the Board on the number and type of well permits approved. If no applications are received by the District during a reporting period, this will annually be reported to the Board.

Performance Standard

The procedures for the receipt of well permit applications will be maintained in District files. An annual report will be made by the District to the Board on the number and type of well permits approved. If no well permit applications are filed and completed during the year, this will be reported to the Board.

Methodology

Annually, the District will prepare and present a report to the Board on the number of permit

applications in compliance with District rules and procedures and the percent of completed applications reported to the Board within 90 days. The report will be maintained on file in the District Office.

GOAL 3.0 CONTROLLING AND PREVENTING SUBSIDENCE

This goal is not applicable to the district.

GOAL 4.0 ADDRESSING CONJUNCTIVE SURFACE WATER MANAGEMENT ISSUES

This goal is not applicable to the district.

GOAL 5.0 NATURAL RESOURCE ISSUES THAT IMPACT THE USE AND AVAILABILITY OF GROUNDWATER AND ARE IMPACTED BY THE USE OF GROUNDWATER

This goal is not applicable to the district.

GOAL 6.0 ADDRESSING DROUGHT CONDITIONS

Management Objective

The Board has adopted a contingency plan to cope with the effects of water supply shortages due to climatic or other conditions. The plan is reviewed at least annually by the Board. In developing the contingency plan, the District considered the economic effects 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 hydro-geologic conditions of the aquifer and the appropriate conditions under which to implement the contingency plan.

During drought conditions within the District, all efforts will be made to see that all municipalities and public water supply companies follow their drought contingency plans. During severe drought conditions that materially affects the aquifer levels, the District staff will closely monitor the aquifer levels through establishment of a District monitoring plan of static levels in selected monitoring wells or by obtaining well water levels from selected water supply companies who have such data available to ensure that adequate quantities of water are available to the District and will coordinate with the Region C and I Water Planning Groups.

Performance Standard

A drought contingency plan developed by the District and approved by the Board will be reviewed by the Board every year and revised as necessary.

Methodology

The District will maintain a drought contingency plan as developed by the District and approved by the Board. The plan and revisions will be maintained in the District office. The Board will include a report of the annual review in Board records and maintain the report in the District office.

Performance Standard

During drought conditions within the District, efforts will be made through contact by District staff. to see that municipalities and public water supply companies follow their drought contingency plans

Methodology

When a drought occurs that requires implementing drought contingency plans by municipalities and public water supply companies, the District will prepare and present a report to the Board on the number of water users contacted and number of plans implemented with the results of water use reduction when such data is available. The report will be maintained on file in the District Office.

GOAL 7.0 ADDRESSING CONSERVATION, RECHARGE ENHANCEMENT, RAINWATER HARVEST ING, PRECIPITATION ENHANCEMENT, OR BRUSH CONTROL

Management Objective: Conservation

Each year, on four or more occasions, the District will disseminate educational information relating to the conservation practices for the efficient use of water resources.

Performance Standard

Number of occasions, annually, the District disseminated educational information relating to the conservation practices for the efficient use of water resources.

Methodology

Annually, the District will prepare and present a report to the Board on District performance in meeting this goal. The report will include the number of instances each activity was engaged in during the year. The report will be maintained on file in the District Office.

Management Objective: Recharge Enhancement

This goal is presently not applicable or cost effective and is therefore, not applicable to the district at this time.

Management Objective: Rainwater Harvesting

This goal is presently not applicable or cost effective and is therefore, not applicable to the district at this time.

Management Objective: Precipitation Enhancement

This goal is presently not applicable or cost effective and is therefore, not applicable to the district at this time.

Management Objective: Brush Control

This goal is presently not applicable or cost effective and is therefore, not applicable to the district at this time.

GOAL 8.0 ADDRESSING THE DESIRED FUTURE CONDITIONS OF THE GROUNDWATER RESOURCES

The Desired Future Conditions of the groundwater within the District have been established in accordance with Chapter 36.108 of the Texas Water Code at a meeting of the GMA-11 representatives on April 13, 2010. The Desired Future Conditions are established at a 17 foot overall average drawdown based on 178 individual drawdowns by aquifer and county as represented in **table 4**:

Management Goal

To conserve and manage groundwater resources in order to provide sufficient water resources for domestic, industrial and public water supply use to meet the needs of the future.

Management Objective

The District will issue permits with annual pumping limits and will maintain a database to limit the total annual withdrawal by permit to be representative of the Modeled Available Groundwater volume without restricting industrial or domestic growth.

Performance Standard

The District will frequently monitor the total permitted allowances to determine if the permitted volume is within or representative of the Modeled Available Groundwater allowable.

Drawdown Details for Adopted Desired Future Conditions in 2060
Groundwater Management Area 11

County		Model Layer Defning Aquifer or Confining Unit (CU)								Overall (except Yegua-Jackson)
	Yegua-Jackson	Sparta	Weches (CU)	Queen City	Reklaw (CU)	Carrizo	Upper Wilcox	Middle Wilcox	Lower Wilcox	
ANDERSON (ACUWCD)				1	12	35	26	12	5	15
ANDERSON (NTVGCD)		-2	1	7	15	36	26	11	4	16
ANGELINA	32	10	11	16	22	42	5	-18	-3	11
BOWIE							21			1
CAMP				12		18	17	39		19
CASS				8	6	10	7	7		8
CHEROKEE		7	14	11	11	32	32	15	10	18
FRANKLIN					-16	-3	7	19		11
GREGG				7	11	42	49	56	79	35
HARRISON					2	24	13	5	4	9
HENDERSON				4	15	41	32	27	15	23
HOPKINS					-22	-12	-15	-28		-26
HOUSTON	3	2	1	2	15	35	12	2	-2	8
MARION				17	11	21	15	15		16
MORRIS				13	10	29	25	23		21
NACOGDOCHES	8	3	3	11	10	14	11	-10	-6	4
PANOLA				-11	-19	11	2	1	4	2
RAINS							7	-10	-5	-8
RUSK			-46	-15	-2	6	6	23	21	12
SABINE	15	5	5	7	15	24	13	6	5	10
SAN AUGUSTINE	13	-4	-4	-3	11	20	9	-3	-2	3
SHELBY				-18	-19	23	-3	3	1	1
SMITH		-5	-5	11	34	103	118	92	76	68
TITUS				-1	-3	31	14	5		9
TRINITY	11	5	4	4	12	33	-3	-7	-1	6
UPSHUR		-5	-5	5	17	56	66	66	97	44
VAN ZANDT				7	11	31	13	17	11	14
WOOD		-5	-7	-2	36	110	83	55	114	59
Overall	**17**	**3**	**4**	**7**	**15**	**38**	**26**	**15**	**11**	**17**

Note: negative drawdown means groundwater level increase, blank spaces means absence of aquifer in that county

Table 4

END