



**NECHES & TRINITY VALLEYS
GROUNDWATER
CONSERVATION DISTRICT**



GROUNDWATER MANAGEMENT PLAN

ADOPTED June 11, 2003
Amended & Adopted August 20, 2009
Amended & Adopted June 19, 2014
Amended & Adopted April 26, 2018
Amended & Adopted August 15, 2019

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**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 the prevention of the 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. It was re-adopted by Board Resolution on August 20, 2009, June 19, 2014, and April 26, 2018. This revised and amended plan adopted on August 15, 2019 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, Anderson and Henderson counties.

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 (DFC) 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 Aquifer is 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 are 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. Maps of the District and the aquifers are shown for reference in **Appendix A.9**.

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 is statistically insufficient and is 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.

The charts in **Appendix A.1** present the annual water usage within the District from 2001 to 2016 and include both ground water (GW) and surface water (SW) use. They show a total annual usage of 41,741 acre feet including 25,126 acre feet of groundwater and 16,615 acre feet of surface water in 2016.

B. PROJECTED TOTAL WATER DEMANDS

The tables in Appendix A.2 show the projected water demand for Anderson, Cherokee, and Henderson counties

through the year 2070. This is the combined surface water and groundwater use for the District. The projections are from the 2017 State Water Plan and include agriculture, municipal and industrial use.

Since the District originally did not cover all of Anderson County, the generic county-wide data have been converted to a proportional value (relative to the original 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.

C. PROJECTED SURFACE WATER SUPPLIES

The charts in **Appendix A.3** show the surface water supplies for the District for 2020 and the projected surface water supplies through the year 2070. All data is from the 2017 State Water Plan.

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.

D. GROUNDWATER AVAILABILITY

The Wilcox group and the overlaying Carrizo Formation of the Claiborne Group form a hydrologically 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 industrial 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 18-017).

The modeled available groundwater is the amount of groundwater production per year, on an average basis, that will achieve a desired future condition. Total estimated recoverable storage values may include a mixture of water quality types, including fresh, brackish, and saline groundwater.

E. WATER SUPPLY NEEDS

The water need estimates in this plan have been extracted from 2017 State Water Plan and other GAM runs based on existing data 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 2020 to 2070 in acre feet is as follows as shown in **Appendix A.5**. As shown in **Appendix A.5**, there are several water user groups that have a projected water supply need. These groups by county are as follows: Anderson County – steam electric; Cherokee County – Alto Rural Water Supply Company (WSC) and mining; and Henderson County – City of Athens, Henderson County other, East Cedar Creek, City of Eustace, Gun Barrel City, City of Mabank, City of Malakoff, manufacturing, mining, Payne Springs, Seven Points, steam electric, City of Tool, West Cedar Creek Mud, City of Berryville, City of Chandler, and R-P-M WSC..

F. WATER MANAGEMENT STRATEGIES

Water management strategies are specific plans to increase water supply or maximize existing water supply to meet a specific need. The projected water management strategies from the 2017 State Water Plan to supply the needs of the District are presented in **Appendix A.6**. There are two water management strategies that use groundwater as a source, Alto Rural WSC and the City of Eustace.

G. 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. The projected water into and out of the aquifers within the District is taken from Groundwater Availability Model 18-017 prepared by TWDB, March 6, 2019.

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), the groundwater availability models for the Trinity, Nacatoch, Carrizo -Wilcox, Queen City, and Sparta aquifers were run for this analysis. Neches & Trinity Valleys Groundwater Conservation District Water groundwater budgets for the historical 1980 to 1999 model period were extracted using ZONEBUDGET Version 3.01 (Harbaugh, 2009) The average annual water budget values for recharge, surface water outflow, inflow to the district, outflow from the district, net inter-aquifer flow (upper), and net inter-aquifer flow (lower) for the portions of the aquifers located within the district are summarized in **Appendix A.7**.

H. MODELED AVAILABLE GROUNDWATER IN THE DISTRICT BASED ON THE DFC

As defined in Chapter 36 of the Texas Water Code, “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a DFC.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future

condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the TWDB is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report. **Appendix A.8** shows the available groundwater based on the model run, GAM 17-024 MAG on June 19, 2017.

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 Regional Water Planning Group I and other sources included in the adopted state water plan. 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 2070. The region as a whole appears to have enough water supplies to meet demands through 2070. 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 effect 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. 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

Report annually, the number of citizens in attendance 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

Report annually, the number of occasions 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

One hundred 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

Management Objective

The geologic framework and abundance of groundwater in the region precludes significant subsidence from occurring. The District will review the TWDB subsidence risk report annually as part of the permitting process. Please find TWDB subsidence risk report at:

<http://www.twdb.texas.gov/groundwater/models/research/subsidence/subsidence.asp>

Performance Standard

The District will review the TWDB subsidence risk report annually as part of the permitting process.

Methodology

The District will stay informed on subsidence risk by attending Regional Water Planning Group meetings, obtaining reports at the GMA-11 meetings, and reviewing the TWDB subsidence risk report.

GOAL 4.0 ADDRESSING CONJUNCTIVE SURFACE WATER MANAGEMENT ISSUES

Management Objective

The water demands increase each year with a growing population and industrial needs. The District will work with the River Authorities in the District and with the Regional Planning Groups to assist with studies and coordinate to plan to meet the needs of the area for water.

Performance Standard

Each year, the District will participate in the regional planning process by attending at least 25 percent of the Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the District.

Methodology

The District will stay informed on surface water issues by attending Regional Water Planning Group meetings and obtaining reports at the GMA-11 meetings.

GOAL 5.0 ADDRESSING NATURAL RESOURCE ISSUES

Management Objective

The District will investigate, or refer to the proper agency, any citizen's or district initiated complaint related to

surface water, groundwater, or any natural resource with the district.

Performance Standard

The District will record any citizen’s or district initiated complaint related to surface water, groundwater, or any natural resource with the district and report these to the Board in the District’s Annual Report.

Methodology

Annually, the District will prepare and present a report to the Board of any citizen’s or district initiated complaint related to surface water, groundwater, or any natural resource with the district.

Management Objective

The District will encourage the plugging of abandoned and nuisance groundwater wells. The District will conduct inspections of groundwater wells with the District’s boundaries to encourage proper maintenance of groundwater wells and to document abandoned and nuisance groundwater wells that pose a risk to the District’s groundwater resources.

Performance Standard

A description of the number of wells inspected, the number of wells in violation, and the number of wells brought into compliance or plugged will be included in the District’s annual report.

Methodology

Annually, the District will prepare and present a report to the Board on District performance in meeting this goal. The report will include a description of the number of wells inspected, the number of wells in violation, and the number of wells brought into compliance or plugged.

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. Additional information can be found and utilized on drought at: <http://waterdatafortexas.org/drought/>

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

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.

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

Management Objective: Conservation

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

Performance Standard

Report annually the number of occasions 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.

Recharge Enhancement

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

Rainwater Harvesting

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

Precipitation Enhancement

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

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 DFC 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 January 11, 2017. The DFC drawdowns are established as shown in **Appendix A.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 manage and maintain its existing water level monitoring program. The District will monitor water levels within the District boundaries at least annually and will be recorded in the District's database. The District will evaluate water level trends and compare to the DFCs adopted by the Districts.

Performance Standard

A description of the number of wells measured and the monitoring results of the year will be included in the District's Annual Report. An annual comparison of water level changes to the District's DFC will be evaluated and included in the District's Annual Report.

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 wells measured, the monitoring results of the year, and an evaluation of the water level changes to the District's DFC. The report will be maintained on file in the District Office.

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.

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 total permitted water and the allowable available water based on the Modeled Available Groundwater. The report will be maintained on file in the District Office.

APPENDIX

A.1 WATER BEING USED WITHIN THE DISTRICT

ANDERSON COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2016	GW	8,580	1,537	2	0	368	54	10,541
	SW	2,979	0	1	0	352	1,035	4,367
2015	GW	8,631	724	1	0	355	54	9,765
	SW	3,120	0	0	0	320	1,016	4,456
2014	GW	8,923	0	27	0	625	52	9,627
	SW	4,858	0	6	0	352	989	6,205
2013	GW	9,757	0	1	0	452	50	10,260
	SW	5,886	0	0	0	347	951	7,184
2012	GW	9,979	0	0	0	414	47	10,440
	SW	4,784	0	0	0	108	888	5,780
2011	GW	10,057	0	0	0	458	54	10,569
	SW	4,908	0	0	0	122	1,017	6,047
2010	GW	9,559	0	50	0	259	54	9,922
	SW	3,698	0	12	0	150	1,028	4,888
2009	GW	9,345	0	30	0	425	64	9,864
	SW	3,027	0	7	0	10	1,206	4,250
2008	GW	9,113	0	11	0	180	62	9,366
	SW	3,248	0	2	0	284	1,177	4,711
2007	GW	8,926	0	0	0	284	77	9,287
	SW	2,819	0	0	0	161	1,459	4,439
2006	GW	9,788	0	0	0	0	77	9,865
	SW	3,397	0	0	0	305	1,461	5,163
2005	GW	9,364	0	0	0	56	73	9,493
	SW	3,818	0	0	0	312	1,393	5,523
2004	GW	9,025	15	0	0	30	304	9,374
	SW	3,340	0	0	0	224	1,210	4,774
2003	GW	9,273	461	0	0	17	307	10,058
	SW	3,307	0	0	0	253	1,222	4,782
2002	GW	8,935	461	0	0	81	339	9,816
	SW	3,403	0	0	0	81	1,347	4,831
2001	GW	8,960	356	0	0	96	337	9,749
	SW	3,371	0	0	0	96	1,340	4,807

CHEROKEE COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2016	GW	7,713	36	108	156	231	272	8,516
	SW	479	21	46	141	172	1,543	2,402
2015	GW	7,138	35	61	119	314	264	7,931
	SW	937	25	26	171	184	1,495	2,838
2014	GW	7,191	34	102	144	303	267	8,041
	SW	972	22	44	183	197	1,512	2,930
2013	GW	7,539	61	41	118	284	267	8,310
	SW	983	34	17	190	236	1,515	2,975
2012	GW	7,577	68	2	170	285	275	8,377
	SW	1,197	9	1	981	207	1,557	3,952
2011	GW	7,693	78	0	181	9	298	8,259
	SW	2,274	19	0	968	263	1,687	5,211
2010	GW	7,055	74	53	121	204	299	7,806
	SW	1,897	36	27	91	267	1,694	4,012
2009	GW	6,732	84	77	167	147	180	7,387
	SW	1,796	11	39	585	153	1,023	3,607
2008	GW	7,043	81	101	127	131	207	7,690
	SW	1,248	11	51	756	179	1,172	3,417
2007	GW	6,792	78	0	155	245	211	7,481
	SW	1,102	36	0	776	111	1,194	3,219
2006	GW	7,454	98	0	136	43	216	7,947
	SW	1,365	43	0	606	211	1,223	3,448
2005	GW	7,051	91	0	124	54	207	7,527
	SW	1,788	197	0	482	197	1,172	3,836
2004	GW	7,178	108	0	115	23	557	7,981
	SW	1,451	44	0	515	163	836	3,009
2003	GW	6,455	114	0	119	17	572	7,277
	SW	1,661	400	0	1,093	181	858	4,193
2002	GW	6,317	115	0	86	30	689	7,237
	SW	1,762	461	0	1,115	137	1,033	4,508
2001	GW	6,540	117	0	128	27	714	7,526
	SW	1,634	509	0	1,552	124	1,071	4,890

HENDERSON COUNTY

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2016	GW	4,512	146	160	0	770	481	6,069
	SW	5,674	672	9	53	135	3,303	9,846
2015	GW	5,343	431	0	0	945	471	7,190
	SW	5,792	729	0	1,649	109	3,447	11,726
2014	GW	5,584	456	1	0	1,408	476	7,925
	SW	5,512	34	0	1,017	181	3,386	10,130
2013	GW	5,924	696	10	0	1,348	455	8,433
	SW	5,484	28	2	85	221	3,398	9,218
2012	GW	6,233	722	2	0	181	424	7,562
	SW	5,691	84	0	101	66	4,750	10,692
2011	GW	6,973	643	2	0	50	514	8,182
	SW	6,284	62	0	132	210	770	7,458
2010	GW	6,105	409	68	0	133	511	7,226
	SW	5,920	75	141	65	149	768	7,118
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	889	2	0	23	427	5,855
	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

A.2 PROJECTED TOTAL WATER DEMANDS

ANDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
I	BRUSHY CREEK WSC	NECHES	149	146	141	138	138	138
I	BRUSHY CREEK WSC	TRINITY	89	87	84	82	81	81
I	COUNTY-OTHER, ANDERSON	NECHES	877	878	867	856	854	854
I	COUNTY-OTHER, ANDERSON	TRINITY	2,895	2,899	2,863	2,825	2,817	2,817
I	ELKHART	TRINITY	249	251	250	247	246	246
I	FOUR PINES WSC	TRINITY	336	336	331	327	326	325
I	FRANKSTON	NECHES	239	240	238	236	236	236
I	IRRIGATION, ANDERSON	NECHES	207	207	207	207	207	207
I	IRRIGATION, ANDERSON	TRINITY	255	255	255	255	255	255
I	LIVESTOCK, ANDERSON	NECHES	648	648	648	648	648	648
I	LIVESTOCK, ANDERSON	TRINITY	754	754	754	754	754	754
I	MANUFACTURING, ANDERSON	NECHES	14	18	19	20	21	22
I	MANUFACTURING, ANDERSON	TRINITY	16	22	23	24	25	26
I	MINING, ANDERSON	NECHES	64	81	85	68	48	35
I	MINING, ANDERSON	TRINITY	76	96	100	79	57	40
I	PALESTINE	NECHES	2,588	2,626	2,620	2,600	2,596	2,596
I	PALESTINE	TRINITY	2,457	2,492	2,484	2,465	2,462	2,462
I	STEAM ELECTRIC POWER, ANDERSON	NECHES	11,306	13,218	15,549	18,390	21,853	25,968
I	THE CONSOLIDATED WSC	TRINITY	189	189	185	182	181	181
I	WALSTON SPRINGS WSC	NECHES	291	288	283	277	276	276
I	WALSTON SPRINGS WSC	TRINITY	117	116	113	111	111	111
Sum of Projected Water Demands (acre-feet)			23,816	25,847	28,099	30,791	34,192	38,278

CHEROKEE COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
I	ALTO	NECHES	249	266	284	308	335	366
I	ALTO RURAL WSC	NECHES	638	678	734	802	873	951
I	BULLARD	NECHES	11	12	13	14	15	16
I	COUNTY-OTHER, CHEROKEE	NECHES	1,139	1,205	1,277	1,379	1,500	1,633
I	CRAFT-TURNEY WSC	NECHES	483	502	523	560	609	663
I	IRRIGATION, CHEROKEE	NECHES	355	355	355	355	355	355
I	JACKSONVILLE	NECHES	2,680	2,858	3,042	3,297	3,588	3,908
I	LIVESTOCK, CHEROKEE	NECHES	1,681	1,681	1,681	1,681	1,681	1,681
I	MANUFACTURING, CHEROKEE	NECHES	413	442	469	492	530	571

I	MINING, CHEROKEE	NECHES	295	304	267	204	141	97
I	NEW SUMMERFIELD	NECHES	156	166	177	192	209	228
I	NORTH CHEROKEE WSC	NECHES	602	640	681	737	801	873
I	RUSK	NECHES	1,019	1,089	1,162	1,260	1,371	1,494
I	RUSK RURAL WSC	NECHES	365	383	402	433	470	512
I	SOUTHERN UTILITIES COMPANY	NECHES	480	513	546	592	644	701
I	STEAM ELECTRIC POWER, CHEROKEE	NECHES	1,790	2,093	2,462	2,912	3,460	3,835
I	TROUP	NECHES	14	15	16	17	18	20
I	WELLS	NECHES	139	148	157	170	185	201
I	WRIGHT CITY WSC	NECHES	69	73	78	84	91	99
Sum of Projected Water Demands (acre-feet)			12,578	13,423	14,326	15,489	16,876	18,204

HENDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	ATHENS	TRINITY	2,916	3,185	3,411	3,743	6,415	9,709
C	BETHEL-ASH WSC	TRINITY	218	237	254	280	303	327
C	COUNTY-OTHER, HENDERSON	TRINITY	314	233	215	189	167	147
C	EAST CEDAR CREEK FWSD	TRINITY	742	807	980	1,061	1,141	1,221
C	EUSTACE	TRINITY	119	125	132	191	248	297
C	GUN BARREL CITY	TRINITY	944	996	1,053	1,222	1,852	2,957
C	LIVESTOCK, HENDERSON	TRINITY	490	490	490	490	490	490
C	LOG CABIN	TRINITY	80	82	84	89	93	98
C	MABANK	TRINITY	149	156	164	197	383	764
C	MALAKOFF	TRINITY	272	270	268	272	287	307
C	MANUFACTURING, HENDERSON	TRINITY	575	594	613	633	652	671
C	MINING, HENDERSON	TRINITY	607	607	607	607	607	607
C	PAYNE SPRINGS	TRINITY	143	155	165	181	200	246
C	SEVEN POINTS	TRINITY	331	380	430	543	641	747
C	STEAM ELECTRIC POWER, HENDERSON	TRINITY	4,000	7,000	8,000	9,000	10,000	11,000
C	TOOL	TRINITY	553	583	607	646	976	1,300
C	TRINIDAD	TRINITY	91	86	83	83	93	111
C	VIRGINIA HILL WSC	TRINITY	244	267	287	318	350	394
C	WEST CEDAR CREEK MUD	TRINITY	674	675	676	677	807	1,009
I	ATHENS	NECHES	57	59	62	66	69	73
I	BERRYVILLE	NECHES	118	124	128	137	147	156
I	BETHEL-ASH WSC	NECHES	325	354	380	419	455	491

I	BROWNSBORO	NECHES	218	260	295	343	386	428
I	BRUSHY CREEK WSC	NECHES	65	66	67	70	74	78
I	CHANDLER	NECHES	608	723	820	954	1,073	1,189
I	COUNTY-OTHER, HENDERSON	NECHES	1,043	957	890	862	837	817
I	FRANKSTON	NECHES	9	13	16	20	24	28
I	IRRIGATION, HENDERSON	NECHES	384	384	384	384	384	384
I	LIVESTOCK, HENDERSON	NECHES	1,253	1,253	1,253	1,253	1,253	1,253
I	MANUFACTURING, HENDERSON	NECHES	54	62	70	78	86	95
I	MINING, HENDERSON	NECHES	77	86	77	59	40	28
I	MURCHISON	NECHES	93	91	89	88	88	88
I	R-P-M WSC	NECHES	77	89	98	113	126	138
I	VIRGINIA HILL WSC	NECHES	176	193	207	230	252	273
Sum of Projected Water Demands (acre-feet)			18,019	21,642	23,355	25,498	30,999	37,921

A.3 PROJECTED SURFACE WATER SUPPLIES

ANDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
I	COUNTY-OTHER, ANDERSON	NECHES	PALESTINE LAKE/RESERVOIR	47	47	47	47	47	47
I	IRRIGATION, ANDERSON	NECHES	NECHES RUN-OF-RIVER	197	197	197	197	197	197
I	IRRIGATION, ANDERSON	TRINITY	TRINITY RUN-OF-RIVER	1,060	1,060	1,060	1,060	1,060	1,060
I	LIVESTOCK, ANDERSON	NECHES	NECHES LIVESTOCK LOCAL SUPPLY	333	333	333	333	333	333
I	LIVESTOCK, ANDERSON	TRINITY	TRINITY LIVESTOCK LOCAL SUPPLY	684	684	684	684	684	684
I	PALESTINE	NECHES	PALESTINE LAKE/RESERVOIR	2,222	2,222	2,223	2,223	2,223	2,223
I	PALESTINE	TRINITY	PALESTINE LAKE/RESERVOIR	2,109	2,109	2,108	2,108	2,108	2,108
I	THE CONSOLIDATED WSC	TRINITY	HOUSTON COUNTY LAKE/RESERVOIR	102	104	103	102	100	98
Sum of Projected Surface Water Supplies (acre-feet)				6,754	6,756	6,755	6,754	6,752	6,750

CHEROKEE COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
I	COUNTY-OTHER, CHEROKEE	NECHES	JACKSONVILLE LAKE/RESERVOIR	199	211	223	241	262	286
I	CRAFT-TURNEY WSC	NECHES	JACKSONVILLE LAKE/RESERVOIR	338	351	366	392	426	464
I	IRRIGATION, CHEROKEE	NECHES	NECHES RUN-OF-RIVER	182	182	182	182	182	182
I	IRRIGATION, CHEROKEE	NECHES	PALESTINE LAKE/RESERVOIR	41	36	32	28	25	25
I	JACKSONVILLE	NECHES	JACKSONVILLE LAKE/RESERVOIR	1,876	2,000	2,129	2,308	2,511	2,735
I	LIVESTOCK, CHEROKEE	NECHES	NECHES LIVESTOCK LOCAL SUPPLY	1,555	1,555	1,555	1,555	1,555	1,555
I	MANUFACTURING, CHEROKEE	NECHES	JACKSONVILLE LAKE/RESERVOIR	289	309	328	344	371	400
I	MINING, CHEROKEE	NECHES	NECHES OTHER LOCAL SUPPLY	19	19	19	19	19	19
I	NORTH CHEROKEE WSC	NECHES	JACKSONVILLE LAKE/RESERVOIR	417	444	473	512	557	607
I	RUSK	NECHES	RUSK CITY LAKE/RESERVOIR	63	63	62	61	60	59
I	STEAM ELECTRIC POWER, CHEROKEE	NECHES	STRIKER LAKE/RESERVOIR	5,000	5,000	5,000	5,000	5,000	5,000
Sum of Projected Surface Water Supplies (acre-feet)				9,979	10,170	10,369	10,642	10,968	11,332

HENDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	Source Name	2020	2030	2040	2050	2060	2070
C	ATHENS	TRINITY	ATHENS LAKE/RESERVOIR	1,977	2,200	2,303	2,444	3,332	3,923
C	COUNTY-OTHER, HENDERSON	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	239	144	112	81	59	41
C	EAST CEDAR CREEK FWSD	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	488	496	535	517	427	328
C	GUN BARREL CITY	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	620	611	575	594	691	794
C	LIVESTOCK, HENDERSON	TRINITY	TRINITY LIVESTOCK LOCAL SUPPLY	341	341	341	341	341	341
C	MABANK	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	149	140	130	120	165	236
C	MALAKOFF	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	29	25	20	21	29	37
C	MANUFACTURING, HENDERSON	TRINITY	ATHENS LAKE/RESERVOIR	341	335	333	326	238	179
C	MINING, HENDERSON	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	182	166	146	129	115	103
C	PAYNE SPRINGS	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	47	48	45	44	37	33
C	SEVEN POINTS	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	289	295	298	327	288	250
C	STEAM ELECTRIC POWER, HENDERSON	TRINITY	TRINIDAD LAKE/RESERVOIR	3,050	3,050	3,050	3,050	3,050	3,050
C	TOOL	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	483	453	420	390	439	434
C	TRINIDAD	TRINITY	TRINIDAD CITY LAKE/RESERVOIR	450	450	450	450	450	450
C	WEST CEDAR CREEK MUD	TRINITY	TRWD LAKE/RESERVOIR SYSTEM	578	515	460	401	357	331
I	ATHENS	NECHES	ATHENS LAKE/RESERVOIR	39	41	42	43	36	29
I	IRRIGATION, HENDERSON	NECHES	ATHENS LAKE/RESERVOIR	168	160	154	146	103	76
I	IRRIGATION, HENDERSON	NECHES	PALESTINE LAKE/RESERVOIR	82	73	64	57	51	51
I	IRRIGATION, HENDERSON	NECHES	TRINITY RUN-OF-RIVER	415	415	415	415	415	415

I	LIVESTOCK, HENDERSON	NECHES	ATHENS LAKE/RESERVOIR	1,547	1,474	1,416	1,341	951	700
I	LIVESTOCK, HENDERSON	NECHES	NECHES LIVESTOCK LOCAL SUPPLY	770	770	770	770	770	770
Sum of Projected Surface Water Supplies (acre-feet)				12,284	12,202	12,079	12,007	12,344	12,571

A.4 THE DESIRED FUTURE CONDITIONS**DRAWDOWN FOR USE AS DESIRED FUTURE CONDITIONS (2000 TO 2070, IN FEET) [TABLE 5 FROM GMA 11 TECHNICAL MEMORANDUM 16-02 (DRAFT 2), DATED MARCH 25, 2016].**

County	Sparta	Queen City	Carrizo-Wilcox
Anderson	NRS	9	90
Angelina	16	NRS	48
Bowie	NP	NP	5
Camp	NP	NRS	33
Cass	NP	10	68
Cherokee	NRS	14	99
Franklin	NP	NP	14
Gregg	NP	NRS	58
Harrison	NP	1	18
Henderson	NP	5	50
Hopkins	NP	NP	3
Houston	3	6	80
Marion	NP	24	45
Morris	NP	NRS	46
Nacogdoches	5	4	29
Panola	NP	NP	3
Rains	NP	NP	1
Rusk	NP	NRS	23
Sabine	1	NP	9
San Augustine	2	NP	7
Shelby	NP	NP	1
Smith	NP	17	119
Titus	NP	NRS	11
Trinity	9	NRS	51
Upshur	NP	9	77
Van Zandt	NP	NRS	21
Wood	NP	5	89
Grand Total	4	10	56

Notes: NP = Not present

NRS = Not relevant due to size (less than 200 square miles)

Yellow Cells represent average drawdown calculations that assume negative drawdown is zero (model artifact and model limitation)

Green Cell represents the recommended DFC for Panola County as described in report

A.5 PROJECTED WATER NEEDS WITHIN THE DISTRICT

ANDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
I	BRUSHY CREEK WSC	NECHES	147	150	155	158	158	158
I	BRUSHY CREEK WSC	TRINITY	293	295	298	300	301	301
I	COUNTY-OTHER, ANDERSON	NECHES	48	48	48	48	48	
I	COUNTY-OTHER, ANDERSON	TRINITY	260	260	260	260	260	260
I	ELKHART	TRINITY	179	177	178	181	182	182
I	FOUR PINES WSC	TRINITY	213	213	218	222	223	224
I	FRANKSTON	NECHES	149	142	140	136	130	124
I	IRRIGATION, ANDERSON	NECHES	263	263	263	263	263	263
I	IRRIGATION, ANDERSON	TRINITY	1,104	1,104	1,104	1,104	1,104	1,104
I	LIVESTOCK, ANDERSON	NECHES	0	0	0	0	0	0
I	LIVESTOCK, ANDERSON	TRINITY	21	21	21	21	21	21
I	MANUFACTURING, ANDERSON	NECHES	0	0	0	0	0	0
I	MANUFACTURING, ANDERSON	TRINITY	0	0	0	0	0	0
I	MINING, ANDERSON	NECHES	0	0	0	0	0	0
I	MINING, ANDERSON	TRINITY	53	33	29	50	72	89
I	PALESTINE	NECHES	0	0	0	0	0	0
I	PALESTINE	TRINITY	0	0	0	0	0	0
I	STEAM ELECTRIC POWER, ANDERSON	NECHES	-11,306	-13,218	-15,549	-18,390	-21,853	-25,968
I	THE CONSOLIDATED WSC	TRINITY	167	169	172	174	173	171
I	WALSTON SPRINGS WSC	NECHES	8	11	16	22	23	23
I	WALSTON SPRINGS WSC	TRINITY	0	0	0	0	0	0
Sum of Projected Water Supply Needs (acre-feet)			-11,306	-13,218	-15,549	-18,390	-21,853	-25,968

CHEROKEE COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
I	ALTO	NECHES	259	242	224	200	173	142
I	ALTO RURAL WSC	NECHES	98	58	2	-66	-137	-215
I	BULLARD	NECHES	15	13	11	9	7	6
I	COUNTY-OTHER, CHEROKEE	NECHES	675	625	571	495	404	304
I	CRAFT-TURNEY WSC	NECHES	0	0	0	0	0	0
I	IRRIGATION, CHEROKEE	NECHES	81	76	72	68	65	65
I	JACKSONVILLE	NECHES	0	0	0	0	0	0
I	LIVESTOCK, CHEROKEE	NECHES	132	132	132	132	132	132
I	MANUFACTURING, CHEROKEE	NECHES	11	11	11	11	11	11
I	MINING, CHEROKEE	NECHES	-238	-247	-210	-147	-84	-40
I	NEW SUMMERFIELD	NECHES	97	87	76	61	44	25

I	NORTH CHEROKEE WSC	NECHES	0	0	0	0	0	0
I	RUSK	NECHES	383	314	241	143	31	8
I	RUSK RURAL WSC	NECHES	192	174	155	124	87	45
I	SOUTHERN UTILITIES COMPANY	NECHES	0	0	0	0	0	0
I	STEAM ELECTRIC POWER, CHEROKEE	NECHES	3,210	2,907	2,538	2,088	1,540	1,165
I	TROUP	NECHES	0	0	0	0	0	0
I	WELLS	NECHES	243	234	225	212	197	181
I	WRIGHT CITY WSC	NECHES	33	29	24	18	11	0
Sum of Projected Water Supply Needs (acre-feet)			-238	-247	-210	-213	-221	-255

HENDERSON COUNTY

All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	ATHENS	TRINITY	-110	-133	-103	-69	-1,623	-4,232
C	BETHEL-ASH WSC	TRINITY	109	90	73	47	24	0
C	COUNTY-OTHER, HENDERSON	TRINITY	0	-14	-28	-33	-33	-31
C	EAST CEDAR CREEK FWSD	TRINITY	-254	-311	-445	-544	-714	-893
C	EUSTACE	TRINITY	75	69	62	3	-54	-103
C	GUN BARREL CITY	TRINITY	-324	-385	-478	-628	-1,161	-2,163
C	LIVESTOCK, HENDERSON	TRINITY	364	364	364	364	364	364
C	LOG CABIN	TRINITY	18	16	14	9	5	0
C	MABANK	TRINITY	0	-16	-34	-77	-218	-528
C	MALAKOFF	TRINITY	0	-2	-5	-8	-16	-28
C	MANUFACTURING, HENDERSON	TRINITY	168	143	122	95	-11	-89
C	MINING, HENDERSON	TRINITY	0	-16	-36	-53	-67	-79
C	PAYNE SPRINGS	TRINITY	5	-6	-19	-36	-62	-112
C	SEVEN POINTS	TRINITY	-42	-85	-132	-216	-353	-497

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
C	STEAM ELECTRIC POWER, HENDERSON	TRINITY	-950	-3,950	-4,950	-5,950	-6,950	-7,950
C	TOOL	TRINITY	-70	-130	-187	-256	-537	-866
C	TRINIDAD	TRINITY	359	364	367	367	357	339
C	VIRGINIA HILL WSC	TRINITY	143	120	101	69	38	0
C	WEST CEDAR CREEK MUD	TRINITY	-96	-160	-216	-276	-450	-678
I	ATHENS	NECHES	-2	-3	-2	-1	-17	-33
I	BERRYVILLE	NECHES	0	0	0	0	0	0
I	BETHEL-ASH WSC	NECHES	334	283	245	201	161	125
I	BROWNSBORO	NECHES	0	0	0	0	0	0
I	BRUSHY CREEK WSC	NECHES	0	0	0	0	0	0
I	CHANDLER	NECHES	269	154	57	-77	-196	-312
I	COUNTY-OTHER, HENDERSON	NECHES	540	540	540	540	540	540
I	FRANKSTON	NECHES	6	8	9	11	13	15
I	IRRIGATION, HENDERSON	NECHES	388	372	366	362	310	278
I	LIVESTOCK, HENDERSON	NECHES	1,612	1,539	1,481	1,406	1,016	765
I	MANUFACTURING, HENDERSON	NECHES	24	16	8	1	1	1
I	MINING, HENDERSON	NECHES	42	33	42	60	79	91
I	MURCHISON	NECHES	0	0	0	0	0	0
I	R-P-M WSC	NECHES	-3	-17	-26	-39	-52	-63
I	VIRGINIA HILL WSC	NECHES	104	87	72	50	27	0
Sum of Projected Water Supply Needs (acre-feet)			-1,851	-5,228	-6,661	-8,263	-12,514	-18,657

A.6 PROJECTED WATER MANAGEMENT STRATEGIES

ANDERSON COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
STEAM ELECTRIC POWER, ANDERSON, NECHES (I)							
ANDE-SEP1 ANDERSON STEAM ELECTRIC POWER	PALESTINE LAKE/RESERVOIR [RESERVOIR]	11,306	13,218	15,549	18,390	21,853	21,632
		11,306	13,218	15,549	18,390	21,853	21,632
THE CONSOLIDATED WSC, TRINITY (I)							
HCWC PERMIT AMENDMENT	HOUSTON COUNTY LAKE/RESERVOIR [RESERVOIR]	56	57	58	58	57	57
		56	57	58	58	57	57
Sum of Projected Water Management Strategies (acre-feet)		11,362	13,275	15,607	18,448	21,910	21,689

CHEROKEE COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
ALTO, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	428	428	428	428	85
		0	428	428	428	428	85
ALTO RURAL WSC, NECHES (I)							
ALRU ENHANCED PUBLIC AND SCHOOL EDUCATION	DEMAND REDUCTION [CHEROKEE]	0	0	5	7	9	11
CHE-ALT - ALTO RURAL WSC	CARRIZO-WILCOX AQUIFER [CHEROKEE]	0	0	0	61	130	250
		0	0	5	68	139	261
BULLARD, NECHES (I)							
BULL ENHANCED PUBLIC AND SCHOOL EDUCATION	DEMAND REDUCTION [CHEROKEE]	0	0	0	0	0	0
BULL WATER CONSERVATION PRICING	DEMAND REDUCTION [CHEROKEE]	0	0	0	0	0	0
		0	0	0	0	0	0
COUNTY-OTHER, CHEROKEE, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	3,848	3,848	3,848	3,848	767

WUG, Basin (RWPG)		All values are in acre-feet					
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
		0	3,848	3,848	3,848	3,848	767
JACKSONVILLE, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	4,275	4,275	4,275	4,275	4,275
		0	4,275	4,275	4,275	4,275	4,275
MINING, CHEROKEE, NECHES (I)							
ANRA-RUN-OF-RIVER (NEW APPLICATION)	NECHES RUN-OF-RIVER [CHEROKEE]	238	247	210	147	84	40
		238	247	210	147	84	40
NEW SUMMERFIELD, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	2,565	2,565	2,565	2,565	511
		0	2,565	2,565	2,565	2,565	511
NORTH CHEROKEE WSC, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	4,275	4,275	4,275	4,275	852
		0	4,275	4,275	4,275	4,275	852
RUSK, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	4,275	4,275	4,275	4,275	852
		0	4,275	4,275	4,275	4,275	852
RUSK RURAL WSC, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	855	855	855	855	170
		0	855	855	855	855	170
STEAM ELECTRIC POWER, CHEROKEE, NECHES (I)							
ANRA-RUN-OF-RIVER (NEW APPLICATION)	NECHES RUN-OF-RIVER [CHEROKEE]	8,000	15,000	20,000	20,000	20,000	20,000
		8,000	15,000	20,000	20,000	20,000	20,000
TROUP, NECHES (I)							
ANRA-COL - LAKE COLUMBIA	COLUMBIA LAKE/RESERVOIR [RESERVOIR]	0	145	144	141	138	28
		0	145	144	141	138	28
Sum of Projected Water Management Strategies (acre-feet)		8,238	35,913	40,880	40,877	40,882	27,841

HENDERSON COUNTY

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
ATHENS, TRINITY (C)							
AMWA ATHENS FISH HATCHERY REUSE	INDIRECT REUSE [HENDERSON]	713	676	645	611	1,347	1,924
AMWA-BOOSTER PUMPSTATION IMPROVEMENTS	ATHENS LAKE/RESERVOIR [RESERVOIR]	26	135	103	69	36	0
CONSERVATION - ATHENS	DEMAND REDUCTION [HENDERSON]	38	68	100	123	232	385
CONSERVATION - WASTE PROHIBITION, ATHENS	DEMAND REDUCTION [HENDERSON]	6	14	16	19	41	67
CONSERVATION, WATER LOSS CONTROL - ATHENS	DEMAND REDUCTION [HENDERSON]	15	15	0	0	0	0
		798	908	864	822	1,656	2,376
BETHEL-ASH WSC, TRINITY (C)							
CONSERVATION - BETHEL-ASH WSC	DEMAND REDUCTION [HENDERSON]	0	1	1	1	2	2
CONSERVATION, WATER LOSS CONTROL - BETHEL-ASH WSC	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0
		0	1	1	1	2	2
COUNTY-OTHER, HENDERSON, TRINITY (C)							
CONSERVATION - HENDERSON COUNTY	DEMAND REDUCTION [HENDERSON]	0	0	0	1	0	0
CONSERVATION, WATER LOSS CONTROL - HENDERSON	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	11	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	14
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	4	5	5
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	5	8	3	3	2
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	1	1	1	1	1
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	8	13	16	10	6
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	6	8	3	3
		0	14	28	33	33	31

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
EAST CEDAR CREEK FWSD, TRINITY (C)							
CONSERVATION - EAST CEDAR CREEK FWSD	DEMAND REDUCTION [HENDERSON]	2	5	10	14	19	24
CONSERVATION, WATER LOSS CONTROL - EAST CEDAR CREEK FWSD	DEMAND REDUCTION [HENDERSON]	4	4	0	0	0	0
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	141	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	233
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	34	63	79
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	254	255	286	263	327	384
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	4	9	7	12	29
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	43	95	146	115	98
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	45	81	37	46
		260	311	445	545	714	893
EUSTACE, TRINITY (C)							
CONSERVATION - EUSTACE	DEMAND REDUCTION [HENDERSON]	0	1	1	3	4	6
CONSERVATION, WATER LOSS CONTROL - EUSTACE	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0
EUSTACE NEW WELL IN CARRIZO-WILCOX	CARRIZO-WILCOX AQUIFER [HENDERSON]	103	103	103	103	103	103
		104	105	104	106	107	109
GUN BARREL CITY, TRINITY (C)							
CONSERVATION - GUN BARREL CITY	DEMAND REDUCTION [HENDERSON]	3	7	11	16	31	59
CONSERVATION, WATER LOSS CONTROL - GUN BARREL CITY	DEMAND REDUCTION [HENDERSON]	5	5	0	0	0	0
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	229	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	564

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	39	103	191
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	324	316	308	305	531	931
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	5	9	9	20	69
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	53	102	167	187	237
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	48	93	60	112
		332	386	478	629	1,161	2,163

LIVESTOCK, HENDERSON, TRINITY (C)

AMWA ATHENS FISH HATCHERY REUSE	INDIRECT REUSE [HENDERSON]	603	614	623	633	417	254
AMWA-BOOSTER PUMPSTATION IMPROVEMENTS	ATHENS LAKE/RESERVOIR [RESERVOIR]	9	43	30	18	5	0
		612	657	653	651	422	254

LOG CABIN, TRINITY (C)

CONSERVATION - LOG CABIN	DEMAND REDUCTION [HENDERSON]	0	1	1	1	2	2
CONSERVATION, WATER LOSS CONTROL - LOG CABIN	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0
		0	1	1	1	2	2

MABANK, TRINITY (C)

CONSERVATION - MABANK	DEMAND REDUCTION [HENDERSON]	2	3	5	7	14	30
CONSERVATION, WATER LOSS CONTROL - MABANK	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	50	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	189
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	6	21	64
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	4	6	24	79	103
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	1	1	1	4	23

WUG, Basin (RWPG)		All values are in acre-feet					
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	7	15	25	37	81
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	7	14	13	38
		3	16	34	77	218	528
MALAKOFF, TRINITY (C)							
CONSERVATION - MALAKOFF	DEMAND REDUCTION [HENDERSON]	1	2	3	4	5	6
CONSERVATION, WATER LOSS CONTROL - MALAKOFF	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	4	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	10
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	1	2	3
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	0	0	0	1	1
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	0	1	0	0	1
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	0	1	2	3	4
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	0	2	1	3
		2	3	5	9	16	28
MANUFACTURING, HENDERSON, TRINITY (C)							
UNALLOCATED SUPPLY - LAKE ATHENS	ATHENS LAKE/RESERVOIR [RESERVOIR]	4	21	35	54	59	27
		4	21	35	54	59	27
MINING, HENDERSON, TRINITY (C)							
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	24	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	36
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	6	11	12
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	4	7	5	4	3

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	1	1	2	3	5
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	11	19	26	19	16
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	9	14	6	7
		0	16	36	53	67	79

PAYNE SPRINGS, TRINITY (C)

CONSERVATION - PAYNE SPRINGS	DEMAND REDUCTION [HENDERSON]	0	1	2	2	3	5
CONSERVATION, WATER LOSS CONTROL - PAYNE SPRINGS	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0
LAKE PALESTINE	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	12	0
PAYNE SPRINGS ADDITIONAL WELLS (CARRIZO-WILCOX)	CARRIZO-WILCOX AQUIFER [HENDERSON]	145	145	145	145	145	145
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	12
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	3	5	8
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	25	24	25	23	29	39
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	1	0	1	1	3
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	3	7	12	10	9
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	4	6	3	4
		171	175	183	192	208	225

SEVEN POINTS, TRINITY (C)

CONSERVATION - SEVEN POINTS	DEMAND REDUCTION [HENDERSON]	5	8	13	19	24	30
CONSERVATION, WATER LOSS CONTROL - SEVEN POINTS	DEMAND REDUCTION [HENDERSON]	2	2	0	0	0	0
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	69	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	136

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	16	33	46
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	35	57	60	70	140	183
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	2	4	4	6	18
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	16	37	69	62	57
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	18	38	19	27
		42	85	132	216	353	497

STEAM ELECTRIC POWER, HENDERSON, TRINITY (C)

DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	903	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	1,589
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	200	404	538
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	107	3,790	3,243	1,052	1,153
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	25	46	47	77	194
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	272	506	855	732	669
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	239	473	237	316
TRWD UNALLOCATED SUPPLY UTILIZATION	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	4,500	4,096	369	1,143	3,545	3,491
		4,500	4,500	4,950	5,961	6,950	7,950

TOOL, TRINITY (C)

CONSERVATION - TOOL	DEMAND REDUCTION [HENDERSON]	8	13	18	22	36	52
CONSERVATION, WATER LOSS CONTROL - TOOL	DEMAND REDUCTION [HENDERSON]	3	3	0	0	0	0
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	114	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	236

WUG, Basin (RWPB)		All values are in acre-feet						
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070	
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	19	51	80	
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	59	87	86	84	205	324	
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	2	5	4	9	28	
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	25	53	83	92	99	
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	25	44	30	47	
		70	130	187	256	537	866	
TRINIDAD, TRINITY (C)								
CONSERVATION - TRINIDAD	DEMAND REDUCTION [HENDERSON]	0	1	1	1	2	2	
CONSERVATION, WATER LOSS CONTROL - TRINIDAD	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0	
		0	1	1	1	2	2	
VIRGINIA HILL WSC, TRINITY (C)								
CONSERVATION - VIRGINIA HILL WSC	DEMAND REDUCTION [HENDERSON]	1	1	2	2	3	5	
CONSERVATION, WATER LOSS CONTROL - VIRGINIA HILL WSC	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0	
		2	2	2	2	3	5	
WEST CEDAR CREEK MUD, TRINITY (C)								
CONSERVATION - WEST CEDAR CREEK MUD	DEMAND REDUCTION [HENDERSON]	2	5	7	9	13	20	
CONSERVATION, WATER LOSS CONTROL - WEST CEDAR CREEK MUD	DEMAND REDUCTION [HENDERSON]	4	3	0	0	0	0	
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	101	0	
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	192	
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	22	45	65	
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	90	113	106	95	175	258	
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	TRWD LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	3	6	5	8	24	
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	36	66	93	82	81	

WUG, Basin (RWPG)

All values are in acre-feet

Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	31	52	26	38
		96	160	216	276	450	678
ATHENS, NECHES (I)							
AMWA ATHENS FISH HATCHERY REUSE	INDIRECT REUSE [HENDERSON]	14	13	12	11	14	14
AMWA-BOOSTER PUMPSTATION IMPROVEMENTS	ATHENS LAKE/RESERVOIR [RESERVOIR]	0	2	2	1	0	0
CONSERVATION - ATHENS	DEMAND REDUCTION [HENDERSON]	1	1	2	2	3	3
CONSERVATION - WASTE PROHIBITION, ATHENS	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	1
CONSERVATION, WATER LOSS CONTROL - ATHENS	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0
		15	16	16	14	17	18
BETHEL-ASH WSC, NECHES (I)							
CONSERVATION - BETHEL-ASH WSC	DEMAND REDUCTION [HENDERSON]	1	1	2	2	2	4
CONSERVATION, WATER LOSS CONTROL - BETHEL-ASH WSC	DEMAND REDUCTION [HENDERSON]	1	1	0	0	0	0
		2	2	2	2	2	4
CHANDLER, NECHES (I)							
CHAN ENHANCED PUBLIC AND SCHOOL EDUCATION	DEMAND REDUCTION [HENDERSON]	0	0	0	6	9	12
CHAN WATER CONSERVATION PRICING	DEMAND REDUCTION [HENDERSON]	0	0	0	10	21	24
TYL-PAL-EXISTING SURPLUS FOR TYLER	PALESTINE LAKE/RESERVOIR [RESERVOIR]	0	0	0	350	350	350
		0	0	0	366	380	386
COUNTY-OTHER, HENDERSON, NECHES (I)							
CONSERVATION - HENDERSON COUNTY	DEMAND REDUCTION [HENDERSON]	1	2	2	2	3	3
CONSERVATION, WATER LOSS CONTROL - HENDERSON	DEMAND REDUCTION [HENDERSON]	2	2	0	0	0	0
		3	4	2	2	3	3
IRRIGATION, HENDERSON, NECHES (I)							
AMWA ATHENS FISH HATCHERY REUSE	INDIRECT REUSE [HENDERSON]	0	0	0	0	29	32
AMWA-BOOSTER PUMPSTATION IMPROVEMENTS	ATHENS LAKE/RESERVOIR [RESERVOIR]	2	9	6	3	1	0

WUG, Basin (RWPG)		All values are in acre-feet					
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
		2	9	6	3	30	32
LIVESTOCK, HENDERSON, NECHES (I)							
AMWA ATHENS FISH HATCHERY REUSE	INDIRECT REUSE [HENDERSON]	1,542	1,569	1,592	1,617	1,065	648
AMWA-BOOSTER PUMPSTATION IMPROVEMENTS	ATHENS LAKE/RESERVOIR [RESERVOIR]	24	109	76	45	13	0
		1,566	1,678	1,668	1,662	1,078	648
MINING, HENDERSON, NECHES (I)							
DWU - MAIN STEM REUSE	INDIRECT REUSE [DALLAS]	0	0	0	0	0	0
SULPHUR BASIN SUPPLY	MARVIN NICHOLS LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	0
SULPHUR BASIN SUPPLY	WRIGHT PATMAN LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	0
TRWD - ADDITIONAL CEDAR CREEK AND RICHLAND-CHAMBERS	INDIRECT REUSE [NAVARRO]	0	0	0	0	0	0
TRWD - CEDAR CREEK WETLANDS	INDIRECT REUSE [HENDERSON]	0	0	0	0	0	0
TRWD - TEHUACANA	TEHUACANA LAKE/RESERVOIR [RESERVOIR]	0	0	0	0	0	0
		0	0	0	0	0	0
R-P-M WSC, NECHES (I)							
DRILL NEW WELLS (R-P-M WSC, CARRIZO-WILCOX, NECHES)	CARRIZO-WILCOX AQUIFER [VAN ZANDT]	3	17	26	39	52	63
		3	17	26	39	52	63
VIRGINIA HILL WSC, NECHES (I)							
CONSERVATION - VIRGINIA HILL WSC	DEMAND REDUCTION [HENDERSON]	0	1	1	2	3	3
CONSERVATION, WATER LOSS CONTROL - VIRGINIA HILL WSC	DEMAND REDUCTION [HENDERSON]	0	0	0	0	0	0
		0	1	1	2	3	3
Sum of Projected Water Management Strategies (acre-feet)		8,587	9,219	10,076	11,975	14,525	17,872

A.7 ANNUAL WATER BUDGET VALUES

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Trinity Aquifer	0
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Trinity Aquifer	0
Estimated annual volume of flow into the district within each aquifer in the district	Trinity Aquifer	99
Estimated annual volume of flow out of the district within each aquifer in the district	Trinity Aquifer	167
Estimated net annual volume of flow between each aquifer in the district	Between the Trinity Aquifer and overlying units	0
	From downdip Trinity units into the Trinity Aquifer	67
	Between the Trinity Aquifer and underlying units ¹	0
Estimated annual amount of recharge from precipitation to the district	Nacatoch Aquifer	56
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Nacatoch Aquifer	357
Estimated annual volume of flow into the district within each aquifer in the district	Nacatoch Aquifer	428
Estimated annual volume of flow out of the district within each aquifer in the district	Nacatoch Aquifer	101
Estimated net annual volume of flow between each aquifer in the district	Flow into the Nacatoch Aquifer from overlying units	223
	Flow into the Nacatoch Aquifer from downdip units	518
	Flow between the Nacatoch Aquifer and underlying units ²	0

Estimated annual amount of recharge from precipitation to the district	Carrizo-Wilcox Aquifer	18,770
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Carrizo-Wilcox Aquifer	10,374
Estimated annual volume of flow into the district within each aquifer in the district	Carrizo-Wilcox Aquifer	21,789
Estimated annual volume of flow out of the district within each aquifer in the district	Carrizo-Wilcox Aquifer	15,550
Estimated net annual volume of flow between each aquifer in the district	Flow into the Carrizo-Wilcox Aquifer from the overlying Reklaw confining unit	8,913
	Flow between the Carrizo-Wilcox Aquifer and underlying units ³	0
Estimated annual amount of recharge from precipitation to the district	Queen City Aquifer	75,061
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Queen City Aquifer	42,583
Estimated annual volume of flow into the district within each aquifer in the district	Queen City Aquifer	4,559
Estimated annual volume of flow out of the district within each aquifer in the district	Queen City Aquifer	3,240
Estimated net annual volume of flow between each aquifer in the district	Flow into the Queen City Aquifer from the Weches confining unit	7,917
	Flow into the Reklaw confining unit from the Queen City Aquifer	7,065

Estimated annual amount of recharge from precipitation to the district	Sparta Aquifer	17,031
Estimated annual volume of water that discharges from the aquifer to springs and any surface-water body including lakes, streams, and rivers	Sparta Aquifer	5,975
Estimated annual volume of flow into the district within each aquifer in the district	Sparta Aquifer	389
Estimated annual volume of flow out of the district within each aquifer in the district	Sparta Aquifer	1,913
Estimated net annual volume of flow between each aquifer in the district	Flow from the Sparta aquifer into overlying younger units	195
	Flow from the Sparta Aquifer System into the Weches confining unit	3,129

A.8 MODELED AVAILABLE GROUNDWATER BASED ON THE DFCs OF GMA-11

MODELED AVAILABLE GROUNDWATER FOR THE CARRIZO-WILCOX AQUIFER IN GROUNDWATER MANAGEMENT AREA 11 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2070
Neches & Trinity Valleys GCD	Anderson	Carrizo-Wilcox	29,088	29,088	29,088	29,088	29,088	29,088	29,088
Neches & Trinity Valleys GCD	Cherokee	Carrizo-Wilcox	20,933	20,933	20,933	20,933	20,933	20,933	20,470
Neches & Trinity Valleys GCD	Henderson	Carrizo-Wilcox	13,866	13,866	13,866	13,866	13,768	13,614	13,585
Neches & Trinity Valleys GCD Total		Carrizo-Wilcox	63,886	63,886	63,886	63,886	63,789	63,634	63,143
Panola County GCD	Panola	Carrizo-Wilcox	8,376	8,376	8,218	8,218	8,218	8,068	8,068
Pineywoods GCD	Angelina	Carrizo-Wilcox	27,591	27,591	27,591	27,591	27,591	27,591	27,591
Pineywoods GCD	Nacogdoches	Carrizo-Wilcox	24,181	24,181	24,181	24,181	24,181	24,181	24,181
Pineywoods GCD Total		Carrizo-Wilcox	51,773	51,773	51,773	51,773	51,773	51,773	51,773
Rusk County GCD Total	Rusk	Carrizo-Wilcox	20,847	20,837	20,837	20,837	20,818	20,818	20,818
Total (GCDs)		Carrizo-Wilcox	144,882	144,872	144,714	144,714	144,598	144,293	143,801
No District-County	Bowie	Carrizo-Wilcox	10,845	9,872	9,558	9,278	9,278	8,999	8,999
No District-County	Camp	Carrizo-Wilcox	4,050	4,050	4,050	4,050	4,050	4,050	4,050
No District-County	Cass	Carrizo-Wilcox	18,078	18,023	17,925	17,863	17,786	17,702	17,626
No District-County	Franklin	Carrizo-Wilcox	9,786	9,786	9,786	9,786	9,786	9,786	9,786
No District-County	Gregg	Carrizo-Wilcox	8,041	8,041	8,041	8,041	8,041	8,041	8,041
No District-County	Harrison	Carrizo-Wilcox	11,165	11,035	10,961	10,921	10,873	10,853	10,827
No District-County	Hopkins	Carrizo-Wilcox	6,392	6,392	6,392	6,392	6,392	6,392	6,392
No District-County	Houston	Carrizo-Wilcox	26,294	26,294	26,294	26,294	26,294	26,294	26,294
No District-County	Marion	Carrizo-Wilcox	2,729	2,726	2,726	2,726	2,726	2,726	2,726

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2070
No District-County	Morris	Carrizo-Wilcox	2,627	2,569	2,569	2,569	2,569	2,569	2,569
No District-County	Rains	Carrizo-Wilcox	1,922	1,839	1,839	1,839	1,802	1,802	1,745
No District-County	Red River	Carrizo-Wilcox	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Sabine	Carrizo-Wilcox	3,606	3,606	3,606	3,606	3,606	3,606	3,606
No District-County	San Augustine	Carrizo-Wilcox	1,439	1,439	1,439	1,439	1,439	1,439	1,439
No District-County	Shelby	Carrizo-Wilcox	11,210	10,894	10,441	10,305	9,723	9,287	9,100
No District-County	Smith	Carrizo-Wilcox	35,951	35,951	35,925	35,925	35,925	35,912	35,889
No District-County	Titus	Carrizo-Wilcox	10,354	10,052	9,902	9,672	9,624	9,573	9,472
No District-County	Trinity	Carrizo-Wilcox	368	368	368	368	368	368	368
No District-County	Upshur	Carrizo-Wilcox	7,132	7,132	7,132	7,132	7,132	7,132	7,132
No District-County	Van Zandt	Carrizo-Wilcox	10,330	10,330	10,330	10,157	10,098	10,098	9,971
No District-County	Wood	Carrizo-Wilcox	21,544	21,457	21,413	21,338	21,316	21,292	21,237
No District-County Total		Carrizo-Wilcox	203,863	201,856	200,696	199,700	198,827	197,920	197,268
Total for GMA 11		Carrizo-Wilcox	348,745	346,728	345,410	344,414	343,424	342,213	341,069

¹A desired future condition was not specified for the Carrizo-Wilcox Aquifer in Red River County; however, other counties with fewer than 200 square miles of aquifer were noted as not relevant due to size (NRS) in the desired future condition statement. Areas which are not relevant due to size are listed with a NULL value for modeled available groundwater.

MODELED AVAILABLE GROUNDWATER FOR THE QUEEN CITY AQUIFER IN GROUNDWATER MANAGEMENT AREA 11 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2070
Neches & Trinity Valleys GCD	Anderson	Queen City	19,101	19,101	19,101	19,101	19,101	19,101	19,101
Neches & Trinity Valleys GCD	Cherokee	Queen City	23,211	23,211	23,211	23,211	23,211	23,039	22,866
Neches & Trinity Valleys GCD	Henderson	Queen City	15,412	15,412	15,412	15,412	15,412	15,412	15,412
Neches & Trinity Valleys GCD Total		Queen City	57,725	57,725	57,725	57,725	57,725	57,552	57,380
Pineywoods GCD	Angelina	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Pineywoods GCD	Nacogdoches	Queen City	2,985	2,985	2,985	2,985	2,985	2,985	2,985
Pineywoods GCD Total		Queen City	2,985	2,985	2,985	2,985	2,985	2,985	2,985
Rusk County GCD Total	Rusk	Queen City	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹
Total (GCDs)		Queen City	60,710	60,710	60,710	60,710	60,710	60,537	60,365
No District-County	Camp	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Cass	Queen City	38,509	38,509	38,509	38,509	38,509	38,509	38,509
No District-County	Gregg	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Harrison	Queen City	10,071	10,071	10,071	10,071	10,071	10,071	10,071
No District-County	Houston	Queen City	2,301	2,301	2,301	2,301	2,301	2,301	2,301
No District-County	Marion	Queen City	15,407	15,407	15,407	15,407	15,407	15,338	15,271
No District-County	Morris	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Smith	Queen City	59,034	59,034	59,034	59,034	58,904	58,709	58,578
No District-County	Titus	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Trinity	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Upshur	Queen City	27,391	27,391	27,391	27,197	27,197	27,197	27,145

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2070
No District-County	Van Zandt	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
No District-County	Wood	Queen City	10,046	10,046	10,046	10,046	10,046	10,046	10,046
No District-County Total		Queen City	162,759	162,759	162,759	162,566	162,435	162,172	161,922
Total for GMA 11		Queen City	223,469	223,469	223,469	223,275	223,145	222,709	222,287

¹Counties with fewer than 200 square miles of aquifer were noted as not relevant due to size (NRS) in the desired future condition statement. Areas which are not relevant due to size are listed with a NULL value for modeled available groundwater. For additional information in pumping in the model run see Table 6 from Technical Memorandum 16-02 (Hutchison, 2016).

MODELED AVAILABLE GROUNDWATER FOR THE SPARTA AQUIFER IN GROUNDWATER MANAGEMENT AREA 11 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2010	2020	2030	2040	2050	2060	2070
Neches & Trinity Valleys GCD	Anderson	Sparta	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Neches & Trinity Valleys GCD	Cherokee	Sparta	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Neches & Trinity Valleys GCD Total		Sparta	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹	NULL¹
Pineywoods GCD	Angelina	Sparta	371	371	371	371	371	371	371
Pineywoods GCD	Nacogdoches	Sparta	365	365	365	365	365	365	365
Pineywoods GCD Total		Sparta	737	737	737	737	737	737	737
Total (GCDs)		Sparta	737	737	737	737	737	737	737
No District-County	Houston	Sparta	1,454	1,454	1,454	1,454	1,454	1,454	1,454
No District-County	Sabine	Sparta	197	197	197	197	197	197	197
No District-County	San Augustine	Sparta	166	166	166	166	166	166	166
No District-County	Trinity	Sparta	182	182	182	182	182	182	182
No District-County Total		Sparta	1,999	1,999	1,999	1,999	1,999	1,999	1,999
Total for GMA 11		Sparta	2,736	2,736	2,736	2,736	2,736	2,736	2,736

¹Counties with fewer than 200 square miles of aquifer were noted as not relevant due to size (NRS) in the desired future condition statement. Areas which are not relevant due to size are listed with a NULL value for modeled available groundwater. For additional information in pumping in the model run see Table 6 from Technical Memorandum 16-02 (Hutchison, 2016).

MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE CARRIZO-WILCOX AQUIFER IN GROUNDWATER MANAGEMENT AREA 11. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), RIVER BASIN, AND AQUIFER.

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070
Anderson	I	Neches	Carrizo-Wilcox	23,335	23,335	23,335	23,335	23,335	23,335
Anderson	I	Trinity	Carrizo-Wilcox	5,753	5,753	5,753	5,753	5,753	5,753
Angelina	I	Neches	Carrizo-Wilcox	27,591	27,591	27,591	27,591	27,591	27,591
Bowie	D	Sulphur	Carrizo-Wilcox	9,872	9,558	9,278	9,278	8,999	8,999
Camp	D	Cypress	Carrizo-Wilcox	4,050	4,050	4,050	4,050	4,050	4,050
Cass	D	Cypress	Carrizo-Wilcox	15,159	15,132	15,132	15,119	15,106	15,094
Cass	D	Sulphur	Carrizo-Wilcox	2,864	2,794	2,731	2,667	2,596	2,532
Cherokee	I	Neches	Carrizo-Wilcox	20,933	20,933	20,933	20,933	20,933	20,470
Franklin	D	Cypress	Carrizo-Wilcox	7,765	7,765	7,765	7,765	7,765	7,765
Franklin	D	Sulphur	Carrizo-Wilcox	2,021	2,021	2,021	2,021	2,021	2,021
Gregg	D	Cypress	Carrizo-Wilcox	862	862	862	862	862	862
Gregg	D	Sabine	Carrizo-Wilcox	7,179	7,179	7,179	7,179	7,179	7,179
Harrison	D	Cypress	Carrizo-Wilcox	6,183	6,109	6,070	6,036	6,016	5,990
Harrison	D	Sabine	Carrizo-Wilcox	4,851	4,851	4,851	4,837	4,837	4,837
Henderson	C	Trinity	Carrizo-Wilcox	7,829	7,829	7,829	7,732	7,577	7,548
Henderson	I	Neches	Carrizo-Wilcox	6,036	6,036	6,036	6,036	6,036	6,036
Hopkins	D	Cypress	Carrizo-Wilcox	313	313	313	313	313	313
Hopkins	D	Sabine	Carrizo-Wilcox	2,842	2,842	2,842	2,842	2,842	2,842
Hopkins	D	Sulphur	Carrizo-Wilcox	3,237	3,237	3,237	3,237	3,237	3,237
Houston	I	Neches	Carrizo-Wilcox	22,488	22,488	22,488	22,488	22,488	22,488
Houston	I	Trinity	Carrizo-Wilcox	3,806	3,806	3,806	3,806	3,806	3,806
Marion	D	Cypress	Carrizo-Wilcox	2,726	2,726	2,726	2,726	2,726	2,726
Morris	D	Cypress	Carrizo-Wilcox	2,166	2,166	2,166	2,166	2,166	2,166
Morris	D	Sulphur	Carrizo-Wilcox	402	402	402	402	402	402
Nacogdoches	I	Neches	Carrizo-Wilcox	24,181	24,181	24,181	24,181	24,181	24,181
Panola	I	Cypress	Carrizo-Wilcox	6	6	6	6	6	6

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070
Panola	I	Sabine	Carrizo-Wilcox	8,370	8,212	8,212	8,212	8,062	8,062
Rains	D	Sabine	Carrizo-Wilcox	1,839	1,839	1,839	1,802	1,802	1,745
Red River	D	Sulphur	Carrizo-Wilcox	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Rusk	I	Neches	Carrizo-Wilcox	11,769	11,769	11,769	11,750	11,750	11,750
Rusk	I	Sabine	Carrizo-Wilcox	9,068	9,068	9,068	9,068	9,068	9,068
Sabine	I	Neches	Carrizo-Wilcox	356	356	356	356	356	356
Sabine	I	Sabine	Carrizo-Wilcox	3,249	3,249	3,249	3,249	3,249	3,249
San Augustine	I	Neches	Carrizo-Wilcox	1,149	1,149	1,149	1,149	1,149	1,149
San Augustine	I	Sabine	Carrizo-Wilcox	290	290	290	290	290	290
Shelby	I	Neches	Carrizo-Wilcox	2,577	2,288	2,151	2,018	2,018	2,018
Shelby	I	Sabine	Carrizo-Wilcox	8,317	8,154	8,154	7,705	7,269	7,081
Smith	D	Sabine	Carrizo-Wilcox	13,246	13,220	13,220	13,220	13,206	13,196
Smith	I	Neches	Carrizo-Wilcox	22,705	22,705	22,705	22,705	22,705	22,693
Titus	D	Cypress	Carrizo-Wilcox	7,215	7,064	6,834	6,786	6,735	6,634
Titus	D	Sulphur	Carrizo-Wilcox	2,838	2,838	2,838	2,838	2,838	2,838
Trinity	H	Trinity	Carrizo-Wilcox	99	99	99	99	99	99
Trinity	I	Neches	Carrizo-Wilcox	269	269	269	269	269	269
Upshur	D	Cypress	Carrizo-Wilcox	5,442	5,442	5,442	5,442	5,442	5,442
Upshur	D	Sabine	Carrizo-Wilcox	1,689	1,689	1,689	1,689	1,689	1,689
Van Zandt	D	Neches	Carrizo-Wilcox	4,317	4,317	4,317	4,317	4,317	4,317
Van Zandt	D	Sabine	Carrizo-Wilcox	4,629	4,629	4,456	4,397	4,397	4,270
Van Zandt	D	Trinity	Carrizo-Wilcox	1,384	1,384	1,384	1,384	1,384	1,384
Wood	D	Cypress	Carrizo-Wilcox	2,053	2,053	2,053	2,053	2,053	2,053
Wood	D	Sabine	Carrizo-Wilcox	19,404	19,360	19,285	19,263	19,239	19,184
GMA 11 Total			Carrizo-Wilcox	346,728	345,410	344,414	343,424	342,213	341,069

¹ A desired future condition was not specified for the Carrizo-Wilcox Aquifer in Red River County; however, other counties with fewer than 200 square miles of aquifer were noted as not relevant due to size (NRS) in the desired future condition statement. Areas which are not relevant due to size are listed with a NULL value for modeled available groundwater.

**MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE QUEEN CITY AQUIFER IN GROUNDWATER MANAGEMENT AREA
11. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA),
RIVER BASIN, AND AQUIFER.**

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070
Anderson	I	Neches	Queen City	11,828	11,828	11,828	11,828	11,828	11,828
Anderson	I	Trinity	Queen City	7,274	7,274	7,274	7,274	7,274	7,274
Angelina	I	Neches	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Camp	D	Cypress	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Cass	D	Cypress	Queen City	35,499	35,499	35,499	35,499	35,499	35,499
Cass	D	Sulphur	Queen City	3,010	3,010	3,010	3,010	3,010	3,010
Cherokee	I	Neches	Queen City	23,211	23,211	23,211	23,211	23,039	22,866
Gregg	D	Cypress	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Gregg	D	Sabine	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Harrison	D	Cypress	Queen City	7,762	7,762	7,762	7,762	7,762	7,762
Harrison	D	Sabine	Queen City	2,310	2,310	2,310	2,310	2,310	2,310
Henderson	C	Trinity	Queen City	3,345	3,345	3,345	3,345	3,345	3,345
Henderson	I	Neches	Queen City	12,067	12,067	12,067	12,067	12,067	12,067
Houston	I	Neches	Queen City	2,043	2,043	2,043	2,043	2,043	2,043
Houston	I	Trinity	Queen City	258	258	258	258	258	258
Marion	D	Cypress	Queen City	15,407	15,407	15,407	15,407	15,338	15,271
Morris	D	Cypress	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Nacogdoches	I	Neches	Queen City	2,985	2,985	2,985	2,985	2,985	2,985
Rusk	I	Neches	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Rusk	I	Sabine	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Smith	D	Sabine	Queen City	28,343	28,343	28,343	28,213	28,018	27,887
Smith	I	Neches	Queen City	30,692	30,692	30,692	30,692	30,692	30,692
Titus	D	Cypress	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Trinity	H	Trinity	Queen City	0	0	0	0	0	0
Trinity	I	Neches	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070
Upshur	D	Cypress	Queen City	19,642	19,642	19,448	19,448	19,448	19,396
Upshur	D	Sabine	Queen City	7,749	7,749	7,749	7,749	7,749	7,749
Van Zandt	D	Neches	Queen City	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Wood	D	Cypress	Queen City	986	986	986	986	986	986
Wood	D	Sabine	Queen City	9,060	9,060	9,060	9,060	9,060	9,060
GMA 11 Total			Queen City	223,469	223,469	223,276	223,145	222,709	222,287

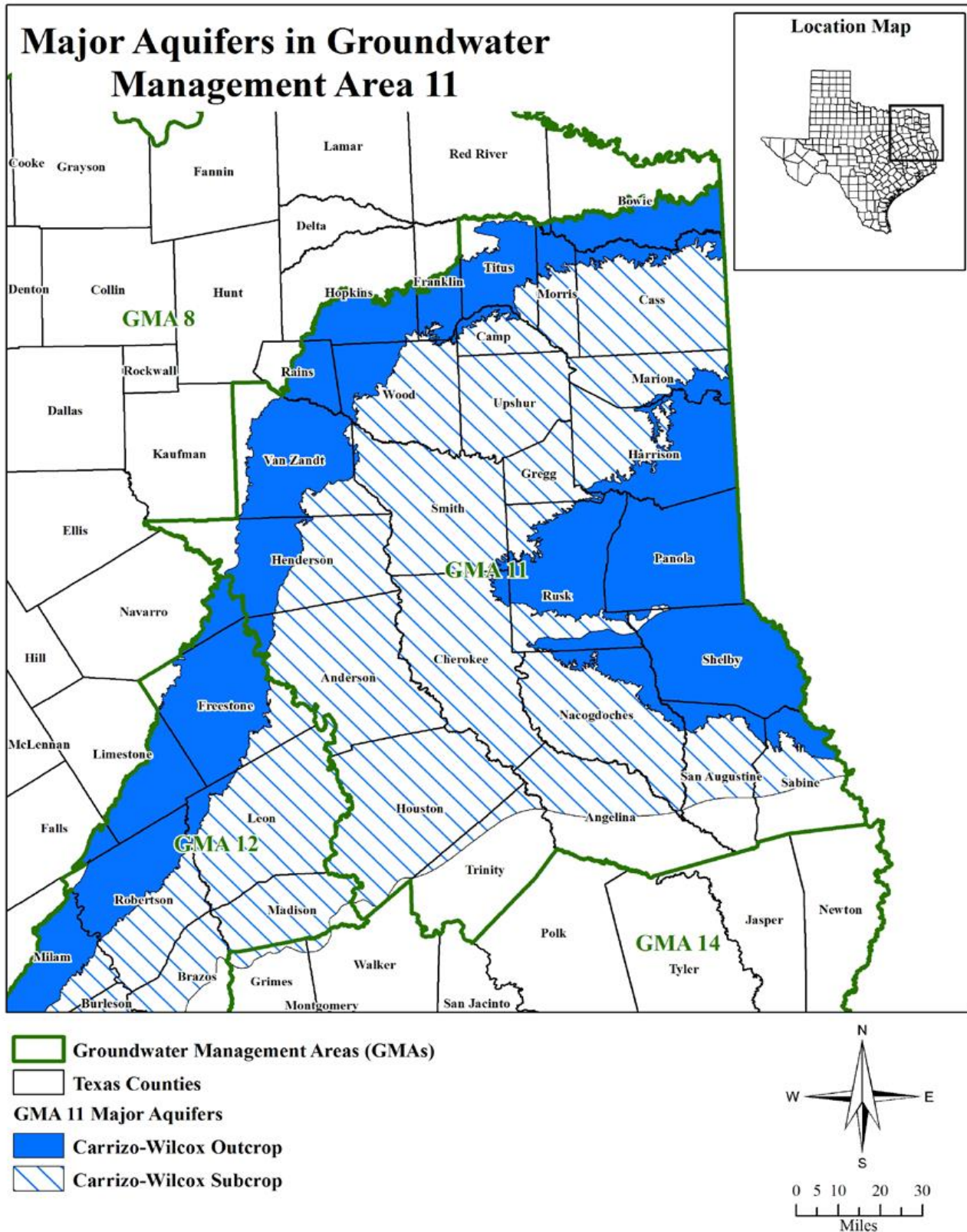
¹Counties with fewer than 200 square miles of aquifer were noted as not relevant due to size (NRS) in the desired future condition statement. Areas which are not relevant due to size are listed with a NULL value for modeled available groundwater. For additional information in pumping in the model run see Table 6 from Technical Memorandum 16-02 (Hutchison, 2016).

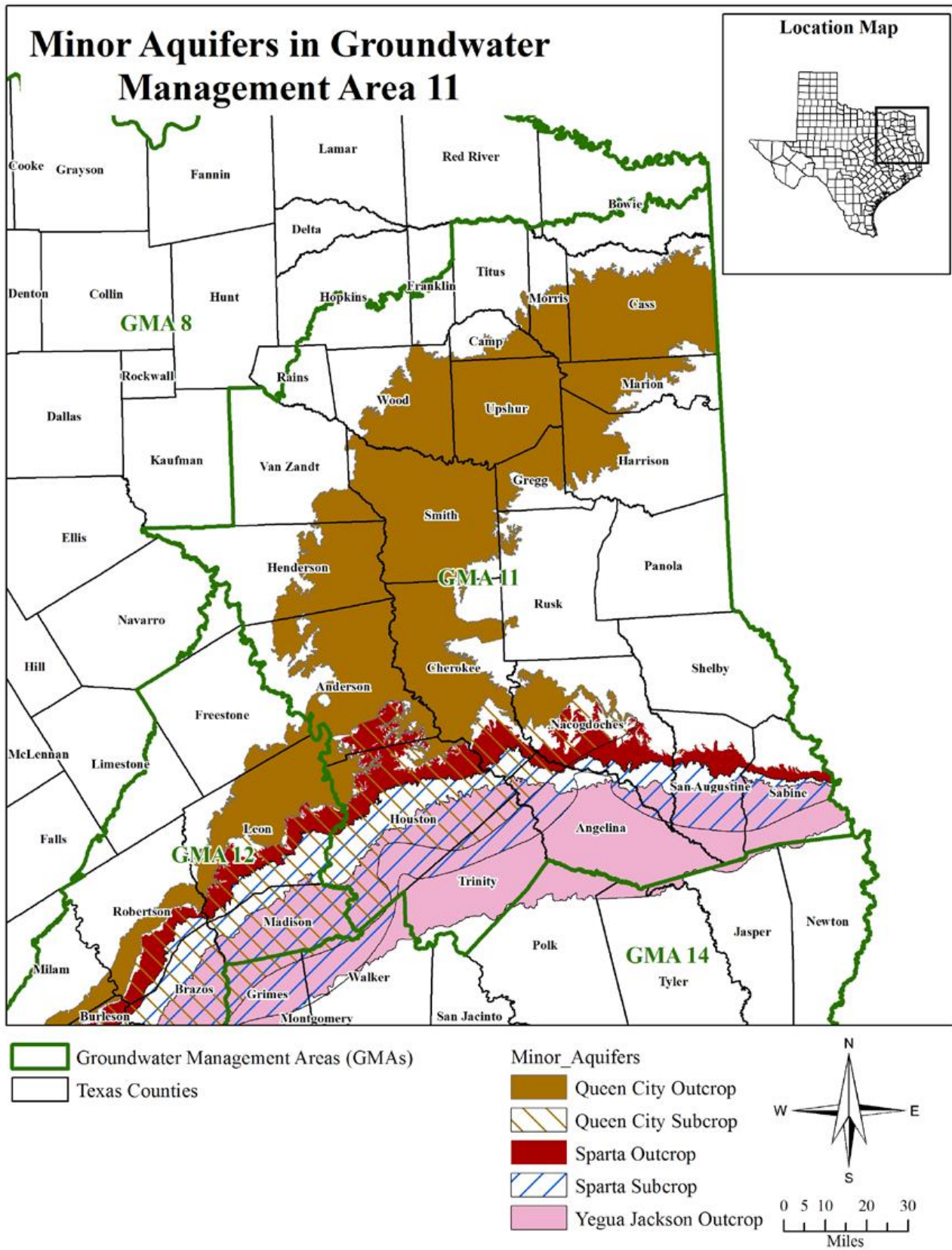
**MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE SPARTA AQUIFER IN GROUNDWATER MANAGEMENT AREA 11.
RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA),
RIVER BASIN, AND AQUIFER.**

County	RWP A	River Basin	Aquifer	2020	2030	2040	2050	2060	2070
Anderson	I	Neches	Sparta Aquifer	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Anderson	I	Trinity	Sparta Aquifer	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Angelina	I	Neches	Sparta Aquifer	371	371	371	371	371	371
Cherokee	I	Neches	Sparta Aquifer	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹	NULL ¹
Houston	I	Neches	Sparta Aquifer	477	477	477	477	477	477
Houston	I	Trinity	Sparta Aquifer	977	977	977	977	977	977
Nacogdoches	I	Neches	Sparta Aquifer	365	365	365	365	365	365
Sabine	I	Neches	Sparta Aquifer	37	37	37	37	37	37
Sabine	I	Sabine	Sparta Aquifer	160	160	160	160	160	160
San Augustine	I	Neches	Sparta Aquifer	163	163	163	163	163	163
San Augustine	I	Sabine	Sparta Aquifer	3	3	3	3	3	3
Trinity	H	Trinity	Sparta Aquifer	29	29	29	29	29	29
Trinity	I	Neches	Sparta Aquifer	154	154	154	154	154	154
GMA 11 Total			Sparta Aquifer	2,736	2,736	2,736	2,736	2,736	2,736

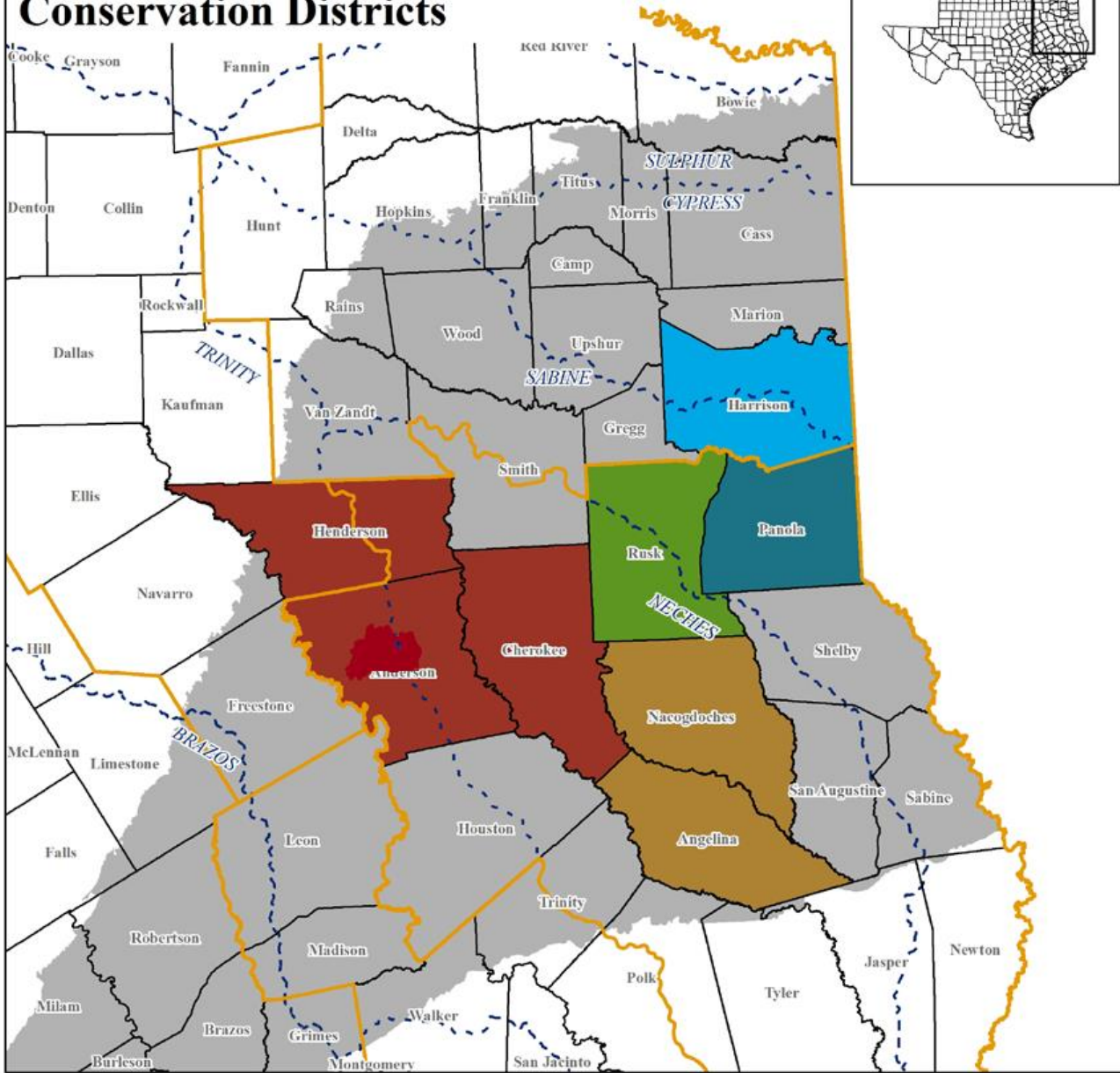
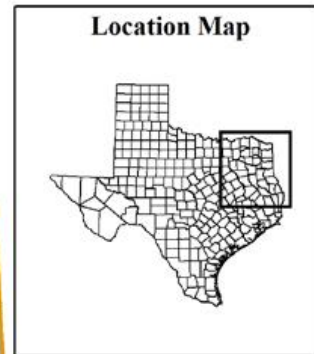
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

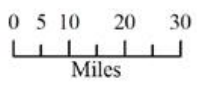







A.9 MAPS





Regional Water Planning Areas, River Basins, and Groundwater Conservation Districts



	Regional Water Planning Areas (RWPAs)		Neches & Trinity Valleys GCD	 
	Texas Counties		Panola County GCD	
	River Basins		Pineywoods GCD	
	GMA 11 Aquifers		Rusk County GCD	
			Harrison County GCD (Pending)	

A.10 SURFACE WATER AND GCD'S REGIONAL PLANNING NOTICES



**NECHES & TRINITY VALLEYS
GROUNDWATER CONSERVATION DISTRICT**

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P.O. Box 1387 **501 Devereaux Suite 201** **Jacksonville, Texas 75766**

Gary Douglas, President
Donald Foster, Secretary

Sam Hurley, Vice President
Jimmy Terrell, Director
Julianna S. Peacock, Director

Terry Morrow, Treasurer
Tim Perry, Director

August 16, 2019

Kelly Holcomb
Angelina & Neches River Authority
P.O. Box 387
Lufkin, TX 75902

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The Management Plan has been amended and adopted on August 15, 2019 to include data from GAM Run 18-017 and the Estimated Historical Water Use and 2017 State Water Plan Datasets from the Texas Water Development Board.

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North East Texas Municipal Water District
PO Box 955
Hughes Springs, TX 75656

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August 16, 2019

Panola County Groundwater Conservation District
419 W. Sabine Street
Carthage, TX 75633

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Tim Perry, Director

August 16, 2019

Pineywoods Groundwater Conservation District
PO Box 635187
Nacogdoches, TX 75963-5187

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Terry Morrow, Treasurer
Tim Perry, Director

August 16, 2019

Gary Douglas, Chair
Region C Water Planning Group
2702 ACR 489
Montalba, TX 75853

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Julianna S. Peacock, Director

Terry Morrow, Treasurer
Tim Perry, Director

August 16, 2019

Richard LeTourneau, Chair
North East Texas Region D water Planning Group
P.O. Box 12071
Longview, TX 75607

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Terry Morrow, Treasurer
Tim Perry, Director

August 16, 2019

Kelly Holcomb, Chair
East Texas Region I Water Planning Group
Angelina and Neches River Authority
PO Box 387
Lufkin, TX 75902

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Jimmy Terrell, Director
Julianna S. Peacock, Director

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Tim Perry, Director

August 16, 2019

Rusk County Groundwater Conservation District
P.O. Box 97
Henderson, TX 75652

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Tim Perry, Director

August 16, 2019

Trinity River Authority of Texas
PO Box 60
Arlington, TX 76004

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Tim Perry, Director

August 16, 2019

Upper Neches River Municipal Water Authority
PO Box 1965
Palestine, TX 75802

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A.11 POSTED NOTICE POSTED

JACKSONVILLE PROGRESS — Saturday, August 3, 2019 — A11

**NOTICE OF
PUBLIC HEARING**

The Board of Directors for the Neches and Trinity Valleys Groundwater Conservation District will consider re-adopting and amending their Management Plan at the regularly scheduled meeting on August 15, 2019 at 501 Devereux, Jacksonville, TX at 11:00 AM. The purpose of the hearing is to receive comments and/or discuss the 2019 District Management Plan prior to Board adoption and submittal to the Texas Water Development Board for approval. Copies of the proposed Management Plan will be available at the District Office at 501 Devereaux, Suite 201, Jacksonville, TX.

A.12 POSTED AGENDA



**NECHES & TRINITY VALLEYS
GROUNDWATER CONSERVATION DISTRICT**

Protecting and Serving Anderson, Cherokee and Henderson Counties

Phone: (903) 541-4845

Fax: (903) 541-4869

Email: office@ntvgcd.org

www.ntvgcd.org

P.O. Box 1387

501 Devereaux Suite 201

Jacksonville, Texas 75766

**NOTICE OF A WORKSHOP AND BUSINESS MEETING OF THE BOARD
OF DIRECTORS OF THE NECHES AND TRINITY VALLEYS
GROUNDWATER CONSERVATION DISTRICT**

Notice is hereby given that the Board of Directors of the Neches and Trinity Valleys Groundwater Conservation District will hold a scheduled meeting beginning at 11:00 AM, on Thursday, August 15, 2019, at 501 Devereux in Jacksonville, Texas, in Cherokee County, for the following purposes:ⁱ

11:00 a.m. Meeting: Public Comments may be submitted to the District office in writing prior to the meeting

1. Declaration of a Quorum and Invocation.
2. Public Forum for items not on the agenda.
3. Public Forum for items on the agenda.
4. Consent Items: Discuss and approve Minutes for the June 27, 2019 meeting and payment of bills for August 1 through September 30, 2019.
5. Hear and discuss operational reports from staff:
 - A. Well permits received, issued and completed
 - B. Production reports and fees
 - C. Financial statements and reports
6. Receive update on monthly accounting from Randy Gorham, CPA.
7. Public Hearing - Receive and possibly take action on adoption of the 2019 Groundwater Management Plan.
8. Receive update on 2018 violations by Phillips Water Well, Bari Shae Phillips.
9. Receive update on non-payment of 2018 violations by Keithville Water Well Drilling.
10. Receive update and possibly take action on late production reporting and payment of production and late fees by Eagle's Bluff Club, LLC.
11. Receive update on late production reporting and payment of production and late fees by Lakeshore Utility Co., Inc. and Hidden Acres Water System.
12. Receive and possibly take action on amended District Investment Policy.
13. Receive Quarterly Investment Report.
14. Receive and possibly take action on updating computers.
15. Discuss and possibly take action on Employee Policies.
16. Adjourn

Posted by:  Date: August 12, 2019

Penny Hanson, Interim General Manager NTVGCD

NTVGCD is committed to compliance with the American Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the District Office at (903) 541-4845 at least two days prior to the meeting if accommodation is needed.

ⁱ **CLOSED SESSION:** During the meeting, the Board reserves the right to go into closed session for any of the purposes authorized under Texas Government Code Section 551.071, for any item on the above agenda or as otherwise authorized by law.

NOTICE: ENTRY TO THIS MEETING WITH A HANDGUN IS FORBIDDEN

This meeting is a public meeting under Chapter 551 of the Texas Government Code. Pursuant to Section 30.06, Penal Code (trespass by license holder with a concealed handgun), a person licensed under Subchapter H, Chapter 411, Government Code (handgun licensing law) may not enter this property with a concealed handgun. Pursuant to Section 30.07, Penal Code (trespass by license holder with an openly carried handgun), a person licensed under Subchapter H, Chapter 411, Government Code (handgun licensing law) may not enter this property with a handgun that is carried openly. For purposes of this notice, "property" means the room or rooms where the open meeting of the Neches and Trinity Valleys Groundwater Conservation District is held.