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Chapter 3: Evaluation of Current Water Supplies in the Region

2026 Initially Prepared Plan

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East Texas Regional Water Planning Group

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LIST OF ABBREVIATIONS

ABBREVIATION	DESCRIPTION
AMWA	Athens Municipal Water Authority
DFC	Desired Future Condition
ETRWPA	East Texas Regional Water Planning Area
ft	foot
ft msl	Foot mean sea level
ft/yr	foot per year
FWSD	Fresh Water Supply District
GAM	Groundwater Availability Model
GCDs	groundwater conservation districts
GMAs	Groundwater Management Areas
LNVA	Lower Neches Valley Authority
MAG	Modeled Available Groundwater
mg/L	milligram per liter
MGD	million gallons per day
MUD	Municipal Utility District
MWD	Municipal Water District
MWPs	Major Water Providers
RWP	Regional Water Plan
RWPA	Regional Water Planning Area
RWPGs	Regional Water Planning Groups
SRA	Sabine River Authority
SUD	Special Utility District
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TPWD	Texas Parks and Wildlife Department
TRWD	Tarrant Regional Water District
TWDB	Texas Water Development Board
UNRMWA	Upper Neches River Municipal Water Authority
WAMs	water availability models
WCID	Water Control and Improvement District
WSC	Water Supply Corporation
WTP	Water Treatment Plant
WUG	water user group
WWP	wholesale water provider

Chapter 3. Evaluation of Current Water Supplies in the Region

3 EVALUATION OF CURRENT WATER SUPPLIES IN THE REGION

Under regional water planning guidelines, each region is to identify currently available water supplies to the region by 1) source and 2) user. The supplies available by source are based on the supply available during drought-of-record conditions. Surface water and groundwater represent the primary types of water supply sources. Reuse of treated wastewater (i.e., water reuse) is also considered a source of supply. However, the current level of water reuse in the East Texas Regional Water Planning Area (ETRWPA) is small compared to groundwater and surface water supplies.

Existing water supplies that are available to each user include those that have been permitted or contracted, with infrastructure in place to transport and treat (if necessary). Some water supplies are permitted or are contracted for use, but the infrastructure is not yet in place, or some other water supply limitation exists. Water supply limitations considered in this analysis include raw water source availability, well field production capacities, permit limits, contract amounts, water quality, transmission infrastructure, and water treatment capacities. In this case, connecting such supplies is considered a water management strategy for future use.

The following sections discuss the water supplies available in the ETRWPA on a regional basis (Section 3.1) and water available through surface water (Section 3.2), groundwater (Section 3.3), and reuse (Section 3.4). Section 3.5 discusses impacts on water availability, including imports and exports of water related to the ETRWPA, water quality of water supplies in the ETRWPA, and the status of the State environmental flow process for the Sabine and Neches River Basins. Discussions are also included for existing supplies by water user group (WUG) (Section 3.6) and by wholesale water provider (WWP) (Section 3.7). The Texas Water Development Board (TWDB) data reports pertaining to water availability and water supplies are included in Appendix 3-A and 3-B respectively. These reports include a listing of total available supply by source, existing supplies available to water users, and the amount of water by source that may be available for future use.

Most of the available water supply (84 percent) in the ETRWPA is surface water. Approximately 16 percent of the total freshwater supply is groundwater. However, groundwater is an important resource in the region and is used to supply much of the municipal and rural water needs.

Groundwater resources in the region consist of two major aquifers and three minor aquifers. The two major aquifers are the Gulf Coast aquifer and the Carrizo Wilcox aquifer (Figure 3.1). The three minor aquifers are Sparta, Queen City, and Yegua-Jackson (Figure 3.2). A small amount of water is also available from "non-relevant" and "other" local aquifers that have not been designated as major or minor aquifers by the TWDB.

Surface water includes reservoirs, run-of-river supplies, and local surface water (such as stock ponds). For surface water reservoirs, the reliable supply by source is the equivalent of firm yield supply or permitted amount (whichever is lower). For run-of-the-river supplies, this is the minimum supply available in a year over the historical hydrologic record. For both of these types of surface water supplies, the Texas Commission on Environmental Quality (TCEQ) water availability models (WAMs) are used to determine reliable supplies. For local surface water, estimates of historical use as reported by the TWDB are the basis for these supply quantities. Figure 3.3 presents the major surface water sources in the ETRWPA, including major river basins and water supply reservoirs.

Other water supplies considered for planning purposes include reuse of treated wastewater. Reuse supplies are assessed based on historical and current use.

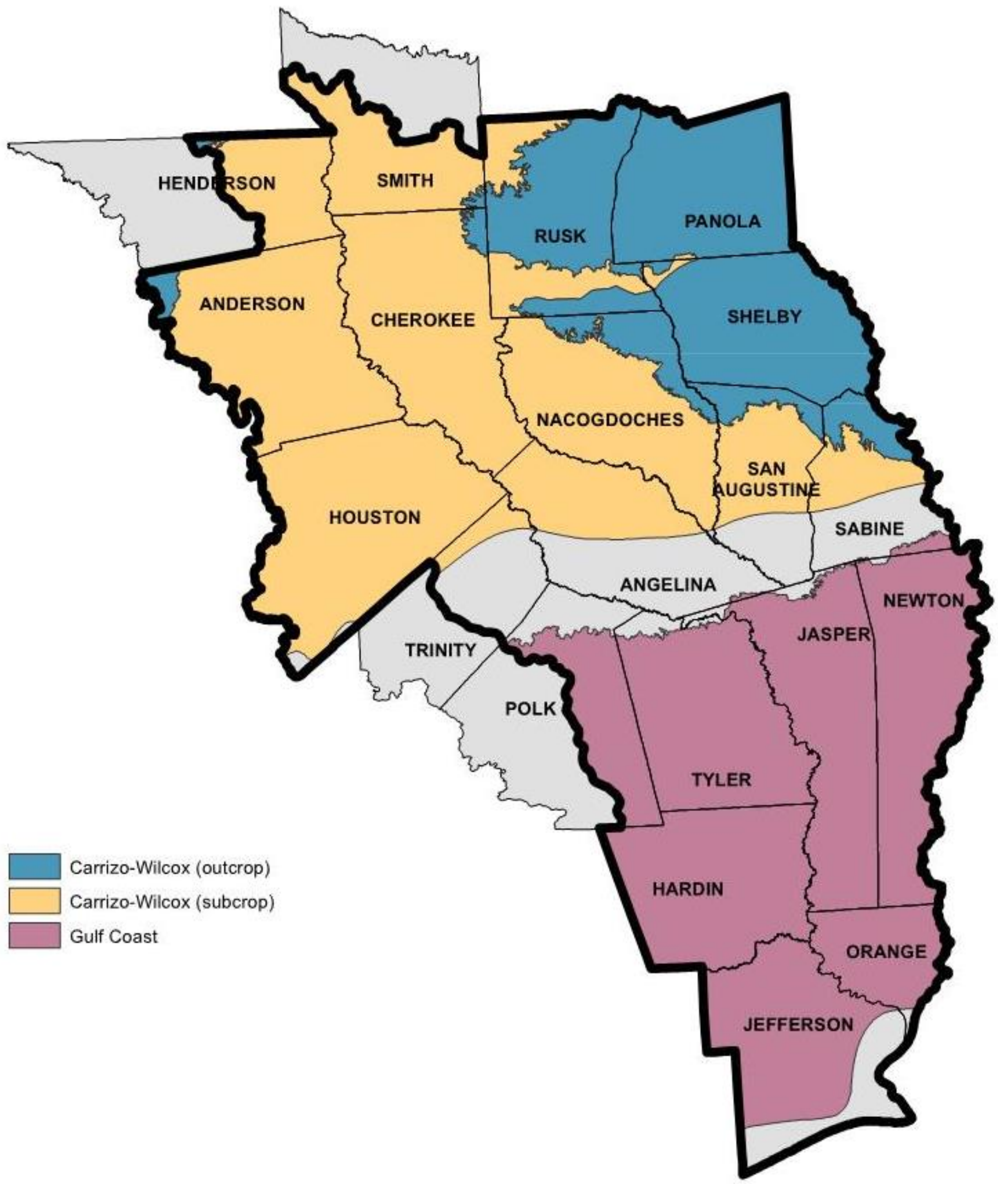


Figure 3.1 Major Aquifers

SOURCE: TEXAS WATER DEVELOPMENT BOARD

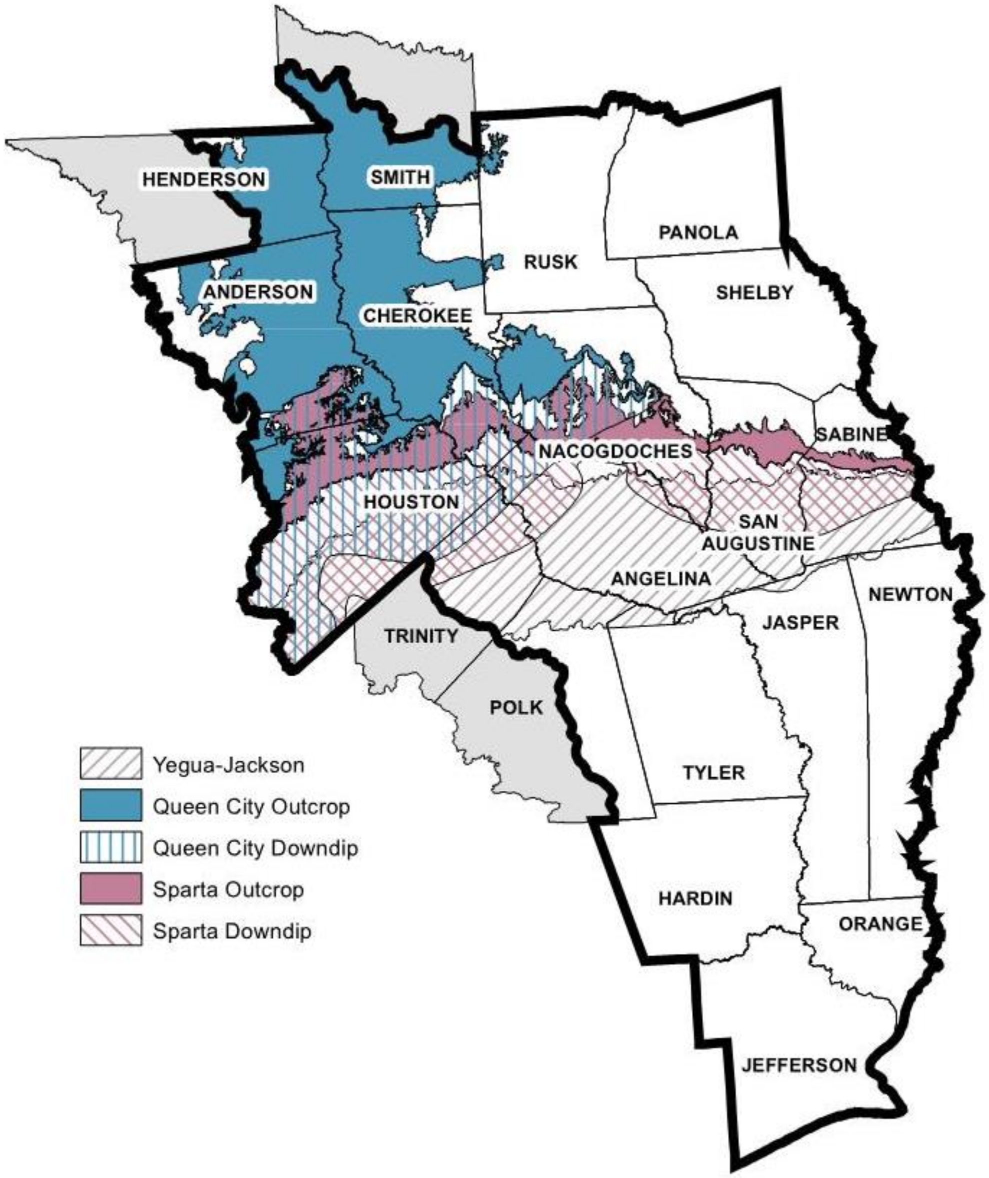
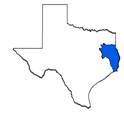


Figure 3.2 Minor Aquifers

SOURCE: TEXAS WATER DEVELOPMENT BOARD



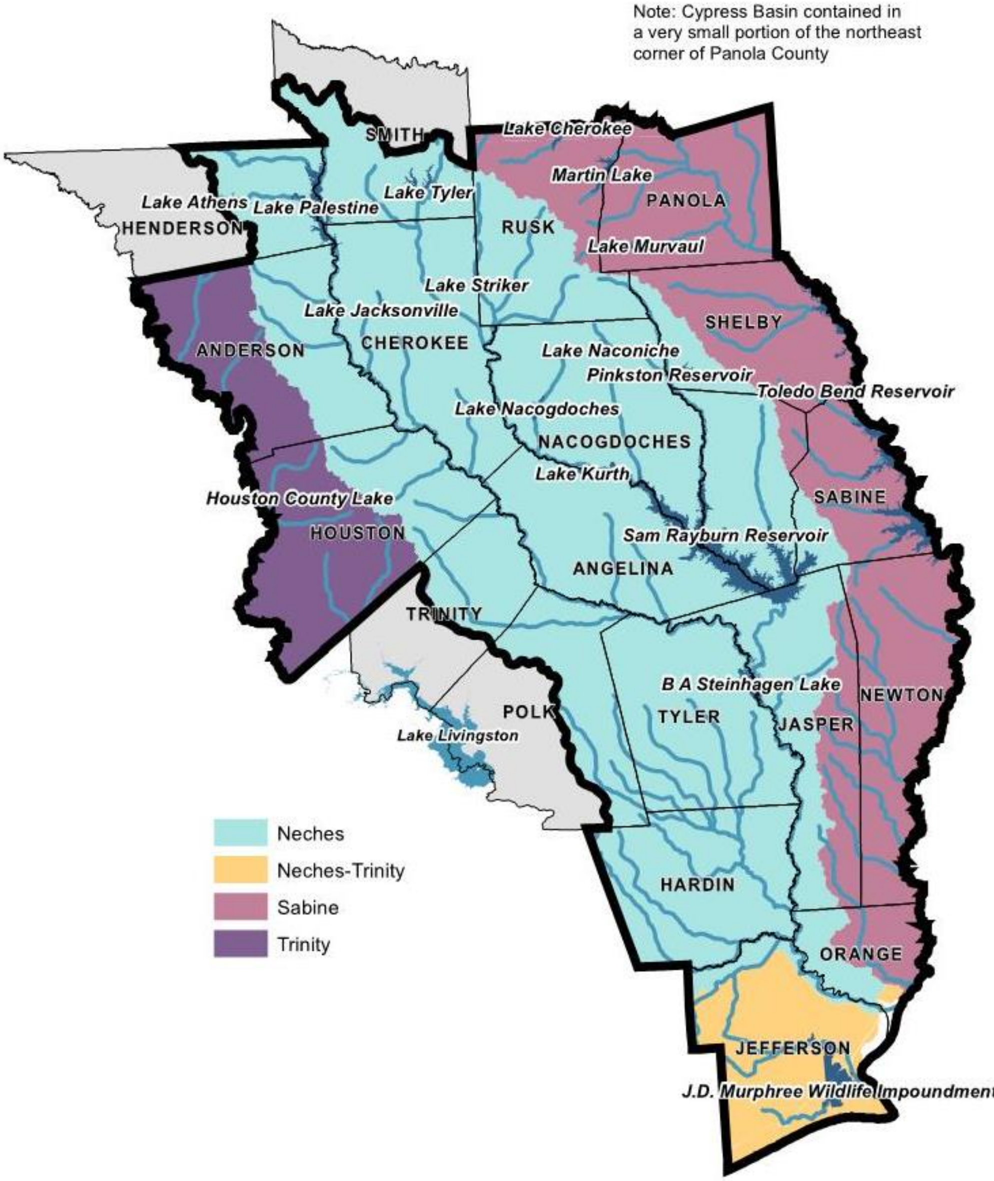


Figure 3.3 Surface Water Sources

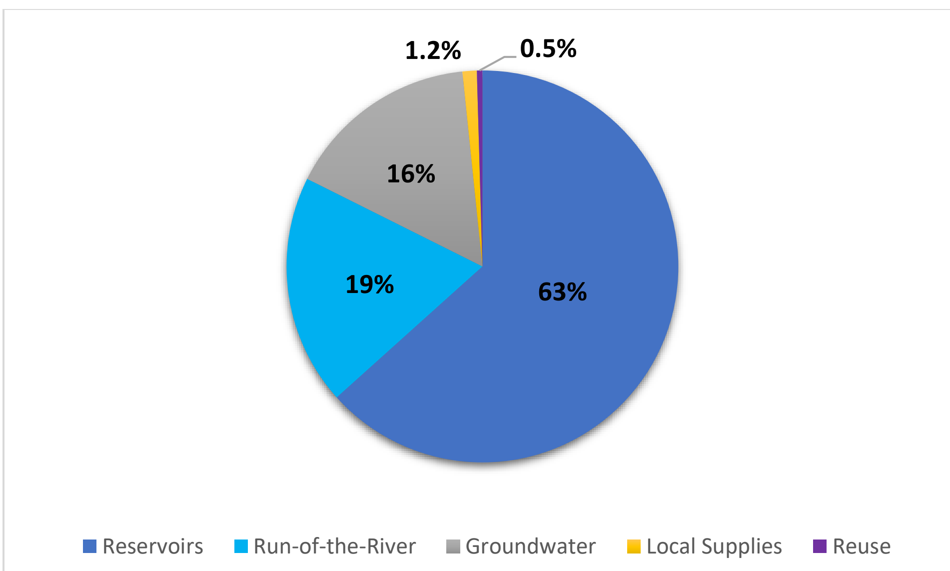
SOURCE: TEXAS WATER DEVELOPMENT BOARD & U.S. CENSUS BUREAU

Table 3.1 and Figure 3.4 summarize overall water supply availability in the ETRWPA. Approximately 2.6 million ac-ft per year of surface water supplies are currently available in the region. The total groundwater availability in the ETRWPA is slightly less than 490,000 ac-ft per year. Reuse supplies total approximately 14,000 ac-ft per year. [Reuse supplies will be updated upon meeting with MWPs.]

Table 3.1 Summary of Currently Available Water Supplies in the East Texas Regional Water Planning Area (ac-ft/yr)

Source of Supply	2030	2040	2050	2060	2070	2080
Reservoirs	1,936,406	1,928,683	1,921,165	1,913,294	1,905,629	1,897,964
Run-of-the-River	581,392	581,850	582,267	582,085	582,094	582,259
Groundwater	488,746	488,746	488,745	488,745	488,362	488,362
Local Supplies	36,094	36,094	36,094	36,094	36,094	36,094
Reuse	13,986	13,999	14,012	14,023	14,037	14,052
Total	**3,056,624**	**3,049,372**	**3,042,283**	**3,034,241**	**3,026,216**	**3,018,731**

Note: Values subjected to change until the end of the planning cycle.



Note: total may not sum due to rounding.

Figure 3.4 Year 2030 Available Supplies by Source Type

Chapter 3. Evaluation of Current Water Supplies in the Region

3.1 SURFACE WATER AVAILABILITY

In accordance with the established procedures of the TWDB, the surface water supplies for the regional water plans were determined using the TCEQ WAMs. In the ETRWPA, surface water supply availability was evaluated in four major river basins: Neches, Neches-Trinity, Trinity, and Sabine (see Figure 3.3).

The WAMs were developed for the purpose of reviewing and granting new surface water rights permits using a hypothetical repetition of historical hydrology. The results from the modeling for regional water planning are used for planning purposes only and do not affect the right of an existing water right holder to divert and use the full amount of water authorized by its permit. The assumptions in the WAMs are based in part on the legal interpretation of water rights, and, in some cases, do not accurately reflect current operations. For planning purposes, adjustments were made to the TCEQ WAMs to better reflect current and future surface water conditions in the region.

TCEQ WAM Run 3, as modified below, was used to assess surface water supplies. The principal assumptions of Run 3 are that all water right holders divert the full permitted amount of their right by priority date order and do not return any of the diversion to the watershed unless an amount is specified in the permit. This assumption provides a conservative estimate of surface water supplies in the ETRWPA. For the Region I 2026 RWP, a hydrologic variance request was submitted to use modified versions of the WAM Run 3 for the Trinity River, Neches River, and Sabine River Basins to develop supplies. Changes to the TCEQ WAMs generally include the following:

- Assessment of reservoir sedimentation rates, and the calculation of area-capacity conditions for current (2020) and future conditions (2030 -2080). Reservoir supplies for future conditions were estimated assuming each incremental horizontal volume was best represented by either a trapezoidal or conical cross-section, where the method with the best fit to the original rating curve data was used.
- Inclusion of subordination agreements that are currently in place;
- Inclusion of system operations where appropriate;
- Basin-specific modifications.

3.1.1 Trinity Basin and Neches-Trinity Basin WAMs

For the Trinity River Basin, Region I adopted the updated Trinity Basin WAM developed by the Region C Water Planning Group for the 2026 Region C Water Plan. These changes are documented in Region C's hydrologic variance request to the TWDB. Region I also includes part of the Neches-Trinity Coastal Basin. No changes were proposed by Region I to the Neches-Trinity WAM, therefore surface water supplies in that basin were developed using the unmodified Neches-Trinity Coastal Basin WAM Run 3.

3.1.2 Neches River Basin WAM

Changes to the Neches River Basin WAM for the 2026 RWP are based on changes consistent with previous cycles of regional water planning, as well as the inclusion of updated sedimentation of major reservoirs, as specified by Exhibit C ("Second Amended General Guidelines for Sixth Cycle of Regional Water Plan Development"). The following subsections describe all changes made to the TCEQ Neches WAM Run 3 (2021) to develop the modified Neches WAM, which was used to determine existing supplies in the Neches River Basin in the 2026 RWP.

Area-Capacity Relationships. Exhibit C requires RWPGs to include anticipated sedimentation of all major reservoirs (those with a capacity greater than 5,000 ac-ft) in the WAM model runs. There are twelve permitted major reservoirs in the Neches Basin; information related to the methodology utilized for calculating anticipated sedimentation rates and revised area-capacity rating curves for these reservoirs is shown in Table 3.2. The source of the sedimentation rates used for each reservoir is summarized in Appendix 3-C. The area-capacity-elevation data were determined for the 2030, 2050, and 2080 decades. This information was included in the Region I WAM for each of these decades.

Lake Columbia has not yet been constructed, so to be conservative, Lake Columbia's full design capacity and original area-capacity curve were used when evaluating firm yields for all other reservoirs in the Neches Basin. The effect of sedimentation on Lake Columbia was assessed, assuming the reservoir would be built in 2030 and begin collecting sediment at that time.

Table 3.2 Sedimentation Rates and Projected Storage Capacity of Major Reservoirs in the Neches River Basin

Reservoir	Most Recent Survey		2026 RWP Sedimentation Rate (ac-ft/yr/ mi^2)	Sediment-Contributing Drainage Area (mi^2)	Projected 2030 Capacity (ac-ft)	Projected 2080 Capacity (ac-ft)
	Year	Conservation Pool Capacity (ac-ft)				
Lake Athens	2016	29,475	4.35	22	26,449	21,679
Lake Columbia**	*	195,500	0.19	277	195,500	192,910
Lake Jacksonville	2006	25,732	2.88	34	23,420	18,532
Lake Kurth	1996	14,769	8.57	4	13,636	11,923
Lake Nacogdoches	1994	39,523	1.75	89	33,929	26,115
Lake Naconiche	*	9,072	0.19	27	8,953	8,699
Lake Palestine	2012	367,310	0.76	817	356,531	325,482
Pinkston Lake	*	7,380	0.19	14	7,237	7,104
Sam Rayburn Reservoir	2004	2,876,033	0.18	3,010	2,861,827	2,834,167
Lake B. A. Steinhagen	2011	69,259	0.06	3,251	65,971	56,921
Lake Striker	2021	21,799	0.62	182	20,813	15,184
Lake Tyler	2013	77,284	1.00	45	75,472	70,122

** No survey available. Conservation pool capacity reflects design capacity.*
*** Permitted but not yet constructed. Projected 2080 capacity based on assumption of sedimentation beginning 1/1/2030.*

Subordination of Sam Rayburn Reservoir and B. A. Steinhagen Lake. Special conditions 5C and 5D of Certificate of Adjudication 06-4411 require subordination of LNVA's rights in the Rayburn-Steinhagen system to (a) water rights upstream of the proposed Weches and Ponta Dam sites and (b) intervening municipal rights above Sam Rayburn Reservoir. These conditions were last amended in Amendment H, filed August 14, 2008, and granted July 20, 2010, which limited subordination to rights with priority dates between November 1963 and April 2008.

Changes were implemented in the WAM related to dual simulation, output, and the refilling of Rayburn and Steinhagen including:

- The 1963 rights for impoundment at Rayburn and Steinhagen were reordered so that Rayburn, the upstream reservoir, would be filled from available streamflow before refilling Steinhagen.

Reservoir System Operations. Two additional reservoir system operations were identified and implemented within the Neches River Basin WAM Run 3:

(1) UNRMWA – Lake Palestine and Rocky Point Dam. The Upper Neches River Municipal Water Authority operates Lake Palestine in conjunction with Rocky Point Dam, a downstream diversion dam on the Neches River in Anderson and Cherokee Counties. Diversions associated with Rocky Point Dam draw from intervening flows between Lake Palestine and Rocky Point Dam, impounded water behind the dam, and downstream releases from Lake Palestine. To limit the impact on the yield of Lake Palestine in the Region I WAM, the Rocky Point diversions were modified so that they would first be backed up by the water made available by the subordination of Steinhagen Lake before making releases from Lake Palestine so that intervening flows would be fully used before making releases of stored Lake Palestine water. Any remaining shortages would be backed up by releases from Lake Palestine

(2) LNVA – Sam Rayburn Backup of Pine Island Bayou. Operation of LNVA's water rights was modeled as a system by including the backup of LNVA's Pine Island water rights with storage from Sam Rayburn.

Minimum Elevations – Sam Rayburn and B.A. Steinhagen. An inactive pool capacity was set for Sam Rayburn Reservoir. The top elevation of the inactive pool is 149 ft msl, and the inactive pool capacity was updated each decade based on updated area-capacity-elevation curves. The City of Lufkin has a right to a lakeside diversion of up to 28,000 ac-ft/yr from Sam Rayburn Reservoir; no inactive pool capacity was applied for this diversion. This diversion is lakeside, so it was not limited by the inlet elevation. A dead pool capacity was also set for B. A. Steinhagen using an inactive pool elevation of 81 ft msl. Inactive pools were not applied to subordination-related backup rights for either reservoir.

Lake Tyler For the 2026 Region I WAM, Lake Tyler was modeled as a single reservoir, and associated water rights were adjusted accordingly. This is consistent with the development of the original Neches WAM, which treated this source as one reservoir.

City of Beaumont Available supply was evaluated based on daily time-step analysis based on historical data from October 1951 to December 2022. The City of Beaumont is the only major municipal water user with a run-of-river water right. Other major users that receive water from run-of-river water rights either purchase water from the Lower Neches Valley Authority (LNVA) or use saline water. The purchased run-of-the-river water is backed up by stored water that is owned and operated by LNVA, making this supply less vulnerable to drought. This approach was applied in the development of supplies for the 2026 East Texas RWP.

3.1.3 Sabine River Basin WAM for the 2026 RWP

The following subsections describe all changes made to the TCEQ Sabine WAM Run 3 (2015) to develop the modified Sabine WAM, which was used to determine existing supplies from the Sabine River Basin in the 2026 RWP.

Area-Capacity Relationships Exhibit C requires RWPGs to include anticipated sedimentation of all major reservoirs (those with a capacity greater than 5,000 ac-ft) in the WAM model runs. There are 12 such permitted reservoirs in the Sabine Basin; information related to the methodology utilized for calculating anticipated sedimentation rates and revised area-capacity rating curves for these reservoirs is shown in Table 3.3. The source of the sedimentation rates used for each reservoir is summarized in Appendix 3-C. The area-capacity-elevation data were determined for the 2030, 2050, and 2080 decades. This information was included in the Region I WAM for each of these decades.

Table 3.3 Sedimentation Rates and Projected Storage Capacity of Major Reservoirs in the Sabine River Basin

Reservoir	Most Recent Survey		2026 Sedimentation Rate (ac-ft/yr/ mi^2)	Sediment-Contributing Drainage Area (mi^2)	Projected 2030 Capacity (ac-ft)	Projected 2080 Capacity (ac-ft)
	Year	Conservation Pool Capacity (ac-ft)				
Lake Tawakoni	2009	871,693	1.75	756	844,627	778,513
Lake Fork Reservoir	2009	636,504	2.69	493	609,572	543,216
Lake Gladewater	2000	4,738	1.33	35	3,345	1,017
Lake Cherokee	2015	44,475	0.47	158	44,553	40,930
Brandy Branch Reservoir	*	29,513	0.24	4.1	29,467	29,419
Martin Lake	2014	75,726	0.37	130	74,996	72,622
Murvaul Lake	1998	38,284	1.64	115	32,418	22,988
Toledo Bend Reservoir	*	4,477,000	0.12	5,384	4,436,134	4,403,831
Lake Hawkins	1962	11,890	0.24	30	11,405	11,045
Lake Holbrook	*	7,990	0.24	15	7,748	7,568
Lake Quitman	*	7,440	0.24	31	6,937	6,565
Lake Winnsboro	*	8,100	0.24	27	7,662	7,338

** No survey available. Conservation pool capacity reflects design capacity.*

Firm Yield of Toledo Bend Reservoir. The Sabine River Authority (SRA) has a right to divert up to 970,067 acre-feet per year from Toledo Bend. Of that amount, 220,067 ac-ft of water can be diverted when hydropower generation is turned off as per Certificate of Adjudication (CoA) 4658B. If hydropower is being used, the total amount is 945,650 acre-feet per year. Hydropower operations were included in the evaluation of supplies for all reservoirs and run-of-river supplies. The yield of Toledo Bend was evaluated assuming all diversions were taken lakeside, after passing water for SRA's downstream senior run-of-the-river rights and hydropower generation. Within the WAM, all diversions from the lake are shared equally between SRA-Texas and SRA-Louisiana.

3.1.4 Reservoir Availability

Reservoirs in the ETRWPA with over 5,000 ac-ft of conservation storage (i.e., major reservoirs) were evaluated, as were some smaller reservoirs that are used for municipal supply. The available water supply from reservoirs is limited to currently permitted diversions or firm yield. The firm yield is the greatest amount of water a reservoir could have supplied on an annual basis without shortage during a repeat of historical hydrologic conditions, particularly the drought of record.

Both Sam Rayburn and Toledo Bend Reservoirs were constructed for multiple purposes, and include hydropower generation. Hydropower is not considered a consumptive use of water, but it is an operational consideration. The inclusion of hydropower in the firm yield analyses was an operating decision by the reservoir owner. As mentioned above, hydropower is not considered in the yield determination of Toledo Bend Reservoir. Hydropower is included for the Sam Rayburn/Lake B. A. Steinhagen System; however, the actual operation of hydropower may differ from the assumptions in the WAM models. A summary of the available supplies for reservoirs in the ETRWPA is shown in Table 3.4.

Table 3.4 Currently Available Supplies from Permitted Reservoirs Serving the ETRWPA (ac-ft/yr)

Reservoir	Water Right No.	Priority Date	Basin	County	Permitted Diversion	2030	2040	2050	2060	2070	2080
Lake Athens	CA-3256	1/17/1955	Neches	Henderson	8,500	4,540	4,480	4,420	4,360	4,300	4,240
Bellwood Lake	CA-3237	11/10/1915 10/10/1978	Neches	Smith	2,200	859	859	859	859	859	859
Lake Columbia*	CA-4537	1/22/1985	Neches	Cherokee	85,507	68,850	68,780	68,710	68,639	68,569	68,499
Lake Jacksonville	CA-3274	6/13/1955	Neches	Cherokee	6,200	6,200	6,200	6,200	6,200	6,200	6,200
Lake Kurth	CA-4393	9/1/1957	Neches	Angelina	19,100	17,425	17,448	17,471	17,494	17,517	17,540
Lake Nacogdoches	CA-4864	5/24/1988	Neches	Nacogdoches	22,000	14,335	13,973	13,611	13,249	12,887	12,525
Lake Palestine system	CA-3254	01/05/1970 06/27/1977	Neches	Anderson	238,110	177,110	175,040	172,970	170,950	168,930	166,910
Pinkston Reservoir	CA-4404	2/7/1972	Neches	Shelby	3,800	3,612	3,600	3,587	3,575	3,562	3,550
Rusk City Lake	CA-4219	6/1/1982	Neches	Cherokee	160	10	10	10	10	10	10
San Augustine City Lake	CA-4409	11/1/1957	Neches	San Augustine	1,285	1,285	1,285	1,285	1,285	1,285	1,285
Sam Rayburn & Steinhagen System	CA-4411	Multiple	Neches	Jasper	820,000	644,100	640,960	637,820	634,680	631,540	628,400
Striker Creek Reservoir	CA-4847	1/10/1984	Neches	Rusk	20,600	10,500	9,990	9,480	8,970	8,460	7,950
Lake Timpson	CA-4399	5/9/1955	Neches	Shelby	350	350	350	350	350	350	350
Lake Tyler/Tyler East	CA-4853	Multiple	Neches	Smith	40,325	32,900	32,665	32,430	32,203	31,977	31,750
Lake Cherokee**	CA-4642	10/5/1946	Sabine	Cherokee/ Gregg	62,400	31,480	31,224	30,960	30,712	30,456	30,200

Reservoir	Water Right No.	Priority Date	Basin	County	Permitted Diversion	2030	2040	2050	2060	2070	2080
Lake Center	CA-4657	08/04/1922 08/14/1952	Sabine	Shelby	1,460	500	500	500	500	500	500
Lake Murvaul	CA-4654	7/19/1956	Sabine	Panola	22,400	20,800	20,016	19,482	18,448	17,664	16,880
Martin Lake	CA-4649	7/19/1971	Sabine	Rusk	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Toledo Bend	CA-4658	03/05/1958 01/22/1986	Sabine	Sabine	970,067	941,900	941,583	941,230	940,949	940,632	940,315
Houston County Lake	CA-5097	03/03/0965	Trinity	Houston	3,500	3,500	3,500	3,500	3,500	3,500	3,500
TOTAL – PERMITTED RESERVOIRS						**1,936,406**	**1,928,683**	**1,921,165**	**1,913,294**	**1,905,629**	**1,897,964**

* *The yield for Lake Columbia is not included in the total for the region since it has not yet been constructed. The yield shown in the table represents the estimated firm yield using the modified Neches WAM Run 3 from 2030 to 2080.*

***Lake Cherokee is located in both the ETRWPA and Northeast Texas region (Region D). Most of the water from this source is used in the Northeast Texas region.*

Note: Values subjected to change until the end of the planning cycle.

3.1.1 Run-of-the-River Diversion Availability

Table 3.5 presents the run-of-the-river supplies by county and basin. The run-of-the-river supplies were calculated using the TCEQ WAM Run 3. The firm supply was determined as the minimum annual diversion from the river for all use types (municipal, industrial, mining, recreational, and irrigation). Since all municipal users in ETRWPA have multiple sources of water, it was assumed that the run-of-the-river supplies would be used conjunctively with these sources and a monthly analysis was not appropriate to determine availability. The run-of-river supplies associated with City of Beaumont (WR 4415) increase over time because of this reason. Appendix 3-C includes a memorandum summarizing the WAM analysis for this municipal water right.

Table 3.5 Summary of the Available Supply from Run-of-River Diversions (ac-ft/yr)

County	River Basin	Use	Water Right Number	Owner	2030	2040	2050	2060	2070	2080
Anderson	Neches	Irrigation	3261, 3266, 3280, 3282, 3283, 3284, 3285, 3286, 5228	Multiple	80	80	80	80	80	80
Anderson	Trinity	Irrigation	3261, 3266, 3280, 3282, 3283, 3284, 3285, 3286, 5228	Multiple	1,290	1,290	1,290	1,290	1,290	1,290
Angelina	Neches	Industrial	4384	Georgia-Pacific Panel Products LLC	0	0	0	0	0	0
Angelina	Neches	Irrigation	4382, 4383, 4386, 5389	Multiple	10	10	10	10	10	10
Cherokee	Neches	Irrigation	3878, 3269, 3275, 3276, 3277, 3278, 3279, 4543, 3301, 4596, 3303, 4094, 4857, 4858, 4859, 4860, 4861, 4055, 4846	Multiple	58	58	58	58	58	58
Hardin	Neches	Irrigation	4432	Idylwild Golf Club, Inc.	54	54	54	54	54	54
Henderson	Neches	Irrigation	3248, 3250	Multiple	0	0	0	0	0	0
Houston	Neches	Irrigation	3287, 3288, 3292, 3291, 3290, 3293, 3294, 3289, 3295, 3297, 3296, 3298, 3299	Multiple	147	147	147	147	147	147
Houston	Trinity	Irrigation	3287, 3288, 3292, 3291, 3290, 3293, 3294, 3289, 3295, 3297, 3296, 3298, 3299	Multiple	2,522	2,522	2,522	2,522	2,522	2,522

County	River Basin	Use	Water Right Number	Owner	2030	2040	2050	2060	2070	2080
Jasper, Jefferson	Neches	Industrial	4411	LNVA	381,876	381,876	381,876	381,876	381,876	381,876
Jasper	Neches	Industrial	4412	TPWD (hatchery)	557	557	557	557	557	557
Jasper	Neches	Industrial	5027	Louisiana Pacific	0	0	0	0	0	0
Jasper	Neches	Irrigation	4413, 4414	Tin LLC, Crown Pine Timber	93	93	93	93	93	93
Jefferson	Neches	Industrial	4415	Beaumont	836	1,005	1,168	1,314	1,477	1,659
Jefferson	Neches	Municipal	4415	Beaumont	11,266	11,555	11,809	11,481	11,327	11,310
Jefferson	Neches-Trinity	Industrial	4441, 4479	Kansas City Southern Railway Co.; Veolia ES Technical Solutions	586	586	586	586	586	586
Jefferson	Neches-Trinity	Irrigation	Multiple	Multiple	40,194	40,194	40,194	40,194	40,194	40,194
Jefferson	Neches-Trinity	Irrigation	4475	M Half Circle Ranch Company	5,139	5,139	5,139	5,139	5,139	5,139
Jefferson	Neches-Trinity	Irrigation	4477	Joe E. Broussard, II	5,321	5,321	5,321	5,321	5,321	5,321
Jefferson	Neches-Trinity	Mining	4442	Premcor Pipeline Co	34	34	34	34	34	34
Nacogdoches	Neches	Industrial	4401	Charles Frederick and George B Frederick	3	3	3	3	3	3
Nacogdoches	Neches	Irrigation	4862, 5486, 4865, 4866, 4867, 5134, 4869, 4872, 4873,	Multiple	79	79	79	79	79	79

County	River Basin	Use	Water Right Number	Owner	2030	2040	2050	2060	2070	2080
			4395, 4397, 4396, 4401, 4403, 4406							
Newton	Sabine	Industrial	4659	Weirgate Lumber Company, Inc.	135	135	135	135	135	135
Newton	Sabine	Industrial	4662	SRA	93,987	93,987	93,987	93,987	93,987	93,987
Newton	Sabine	Irrigation	4662	SRA	35,974	35,974	35,974	35,974	35,974	35,974
Newton	Sabine	Irrigation	4660	Crown Pine Timber 1, L.P.	50	50	50	50	50	50
Orange	Sabine	Irrigation	4663	J A Heard Et Al	28	28	28	28	28	28
Panola	Sabine	Industrial	4652	Hills Lake Fishing Club	114	114	114	114	114	114
Panola	Sabine	Industrial	5219	Luminant Mining Company LLC	147	147	147	147	147	147
Panola	Sabine	Irrigation	4226, 4238, 4653, 4656	Multiple	152	152	152	152	152	152
Panola	Sabine	Mining	5747	Luminant Mining Company LLC	168	168	168	168	168	168
Rusk	Neches	Industrial	4839, 5314	CR Kelley Estate & CD Josh Ham	1	1	1	1	1	1
Rusk	Neches	Irrigation	4839, 4840, 4841, 5629	Multiple	59	59	59	59	59	59
Rusk	Sabine	Irrigation	4627, 4638, 4639, 4640	Multiple	127	127	127	127	127	127
Rusk	Sabine	Municipal	5578	Henderson	10	10	10	10	10	10
Sabine	Neches	Industrial	4410	Georgia-Pacific Wood Products LLC	162	162	162	162	162	162
Smith	Neches	Irrigation	3224, 3226, 3233, 3235, 3236, 4030	Multiple	45	45	45	45	45	45

County	River Basin	Use	Water Right Number	Owner	2030	2040	2050	2060	2070	2080
Smith	Neches	Mining	3230, 3231	Bell Sand Company	0	0	0	0	0	0
Trinity	Neches	Irrigation	4380	Temple Boggy Slough, LLC, TII Temple Foundation	0	0	0	0	0	0
Tyler	Neches	Irrigation	5484, 4387, 4392, 4426, 4429, 4430	Multiple	88	88	88	88	88	88
TOTAL					**581,392**	**581,850**	**582,267**	**582,085**	**582,094**	**582,259**

Note: Values subjected to change until the end of the planning cycle.

3.1.5 Local Supply Availability

Local supply generally includes small surface water supplies that are not associated with a water right. Most of the local supply is surface water used from livestock ponds. A small amount of local supply is for mining purposes. These stock ponds are generally filled using groundwater supplies or recycled water captured from surface flow that has not entered the waters of the State. The maximum recent historical use from these sources (according to TWDB records) is assumed to be available in the future. Local supplies are summarized by county, river basin, and use in Table 3.6.

Table 3.6 Summary of Available Local Supply (ac-ft/yr)

County	River Basin	Use	2030	2040	2050	2060	2070	2080
Anderson	Neches	Livestock	427	427	427	427	427	427
Anderson	Trinity	Livestock	848	848	848	848	848	848
Angelina	Neches	Livestock	997	997	997	997	997	997
Cherokee	Neches	Livestock	1,694	1,694	1,694	1,694	1,694	1,694
Hardin	Neches	Livestock	184	184	184	184	184	184
Henderson	Neches	Livestock	632	632	632	632	632	632
Houston	Neches	Livestock	473	473	473	473	473	473
Houston	Trinity	Livestock	1,318	1,318	1,318	1,318	1,318	1,318
Jasper	Neches	Livestock	118	118	118	118	118	118
Jasper	Sabine	Livestock	93	93	93	93	93	93
Jefferson	Neches	Livestock	800	800	800	800	800	800
Nacogdoches	Neches	Livestock	8,913	8,913	8,913	8,913	8,913	8,913
Newton	Sabine	Livestock	157	157	157	157	157	157
Orange	Neches	Livestock	27	27	27	27	27	27
Orange	Sabine	Livestock	71	71	71	71	71	71
Panola	Sabine	Livestock	2,596	2,596	2,596	2,596	2,596	2,596
Polk	Neches	Livestock	147	147	147	147	147	147
Rusk	Neches	Livestock	991	991	991	991	991	991
Rusk	Sabine	Livestock	424	424	424	424	424	424
Sabine	Neches	Livestock	26	26	26	26	26	26
Sabine	Sabine	Livestock	175	175	175	175	175	175
San Augustine	Neches	Livestock	1,632	1,632	1,632	1,632	1,632	1,632
San Augustine	Sabine	Livestock	203	203	203	203	203	203
Shelby	Neches	Livestock	2,101	2,101	2,101	2,101	2,101	2,101
Shelby	Sabine	Livestock	8,168	8,168	8,168	8,168	8,168	8,168
Smith	Neches	Livestock	313	313	313	313	313	313
Trinity	Neches	Livestock	233	233	233	233	233	233
Tyler	Neches	Livestock	239	239	239	239	239	239
Cherokee	Neches	Mining	58	58	58	58	58	58

County	River Basin	Use	2030	2040	2050	2060	2070	2080
Jefferson	Neches-Trinity	Mining	109	109	109	109	109	109
Nacogdoches	Neches	Mining	420	420	420	420	420	420
Newton	Sabine	Mining	78	78	78	78	78	78
Orange	Sabine	Mining	161	161	161	161	161	161
Polk	Neches	Mining	1	1	1	1	1	1
Rusk	Sabine	Mining	1,258	1,258	1,258	1,258	1,258	1,258
Tyler	Neches	Mining	8	8	8	8	8	8
TOTAL			**36,093**	**36,093**	**36,093**	**36,093**	**36,093**	**36,093**

Note: Values subjected to change until the end of the planning cycle.

3.2 GROUNDWATER AVAILABILITY

Chapter 36 of the Texas Water Code generally describes how groundwater conservation districts (GCDs) are the preferred entities to manage groundwater resources in Texas and that chapter contains provisions that require the GCDs to prepare management plans. Consistent with the Texas Water Code, the TWDB has also created 16 Groundwater Management Areas (GMAs), which are based largely on hydrogeologic and aquifer boundaries instead of political boundaries. One of the purposes for GMAs is to manage groundwater resources on a more aquifer-wide basis. GCDs within each GMA are responsible for executing joint groundwater planning as described in Chapter 36 to develop the amount of groundwater available for use and/or development by the Regional Water Planning Groups. To accomplish this, all GCDs within each GMA determine the Desired Future Conditions (DFCs) for the groundwater resources within the GMA boundaries at least once every 5 years. Figure 3.5 shows the regulatory boundaries of the GCDs and GMAs within the ETRWPA.

DFCs are defined by statute as "the desired, quantified condition of groundwater resources (such as water levels, spring flows, or volumes) within a management area at one or more specified future times as defined by participating groundwater conservation districts within a groundwater management area as part of the joint groundwater planning process." DFCs are quantifiable management goals that reflect what metrics the GCDs will use to manage groundwater in each GCD and throughout the GMA. The most common DFCs are based on the volume of groundwater in storage over time, water levels (limiting decline within the aquifer), water quality (limiting deterioration of quality) or spring flow (defining a minimum flow to sustain).

After the DFCs are determined by the GMAs, the TWDB performs quantitative analysis to determine the amount of groundwater available for production to meet the DFC. For aquifers where a Groundwater Availability Model (GAM) exists, the GAM is used to develop the Modeled Available Groundwater (MAG). For aquifers without a GAM, other quantitative approaches or models are used to estimate the MAG.

TWDB technical guidelines establish that the MAG (within each aquifer, county, and river basin) is the maximum amount of groundwater that can be used for existing uses and new strategies in Regional Water

Plans. In other words, the MAG volumes are a cap on groundwater production for TWDB planning purposes.

3.2.1 Model Assumptions

In the ETRWPA, GAM Run 21-016 for GMA-11 and GAM Run 21-019 for GMA-14 were used to develop the MAG volumes. Both models meet the desired future conditions adopted by the members of each groundwater management area. The TWDB reports documenting the Desired Future Conditions (DFCs) and Modeled Available Groundwater (MAGs) for aquifers in Region I are included in Appendix 3-D.

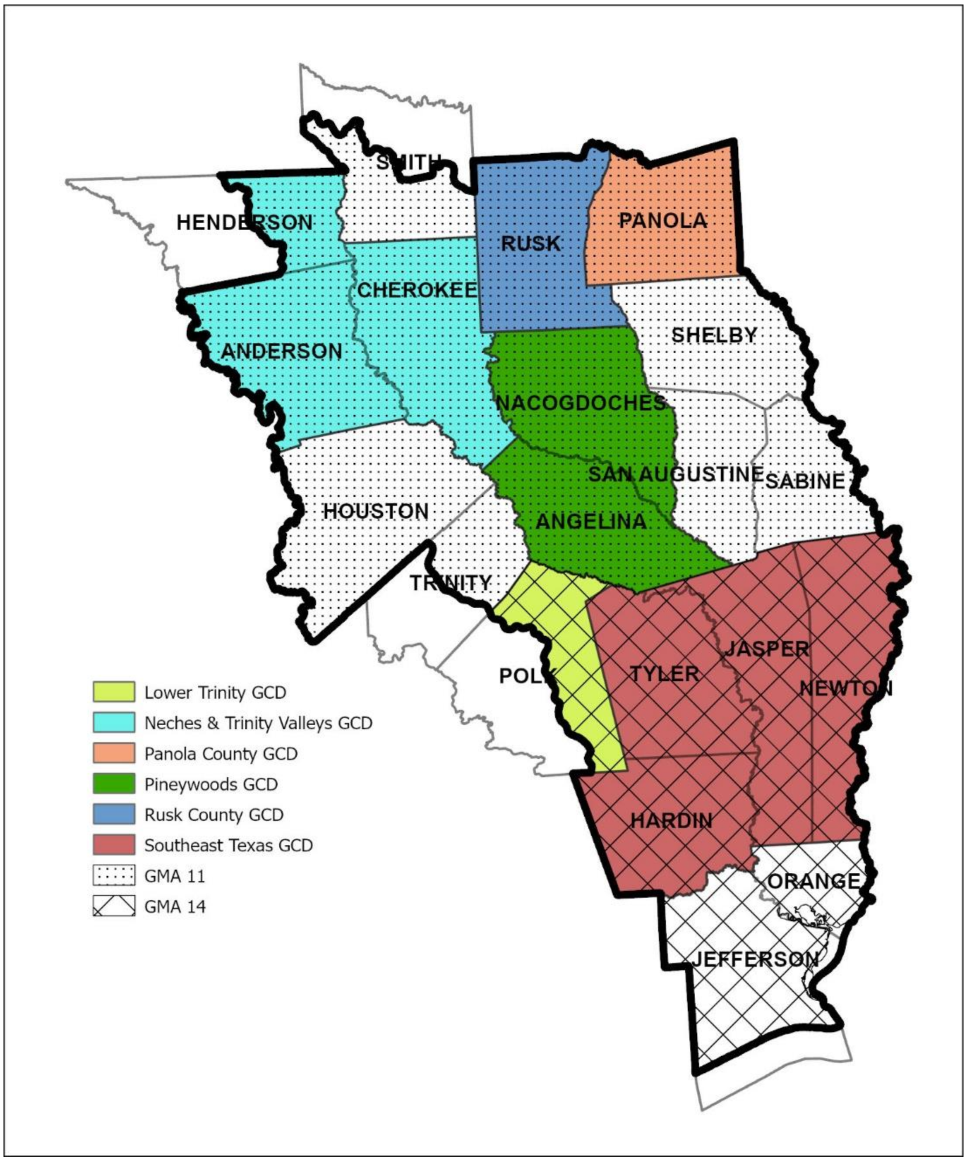


Figure 3.5: Groundwater Conservation Districts and Groundwater Management Areas

SOURCE: TEXAS WATER DEVELOPMENT BOARD

GAM Run 21-016. One model was used for the northern portion of the Carrizo-Wilcox, Queen City, and Sparta aquifers (Fryar and others, 2003; Kelley and others, 2004). The Trinity, Nacatoch, Yegua-Jackson and Gulf Coast aquifers were declared non-relevant in GMA-11. GMA-11 adopted the DFCs in Table 3.7 for each county within the ETRWPA.

Table 3.7 Desired Future Conditions in Groundwater Management Area-11 Modeled Drawdowns (in feet) by County and Aquifer

County	Carrizo-Wilcox	Queen City	Sparta
Anderson	155	44	30
Angelina	67	28	6
Cherokee	176	31	7
Henderson	106	33	NP
Houston	86	12	3
Nacogdoches	73	22	7
Panola	21	NP	NP
Rusk	86	17	26
Sabine	9	3	1
San Augustine	22	7	2
Shelby	17	12	18
Smith	265	132	121
Trinity	56	18	5

NP = Not present

On August 11, 2021, GMA-11 adopted DFCs intended provide a balance between the highest practicable level of groundwater production and the conservation, preservation, protection, recharging, and prevention of waste of groundwater in the management area. Model runs were conducted to determine an amount and distribution of pumping that would stimulate the adopted DFC; this pumping amount was then reported as the MAG for the GMA, RWPA, Districts, counties and river basins.

GAM Run 21-019 MAG. Resolution No. 2021-10-5 by GMA-14 provided the DFCs for each county in the GMA as the average modeled drawdown in the Chicot, Evangeline, and Jasper aquifers, as well as the Burkeville confining unit. On January 5, 2022, GMA-14 adopted the DFCs in Table 3.8 for each county within the ETRWPA.

Table 3.8 Desired Future Conditions in Groundwater Management Area-14

Aquifer	Desired Future Condition (DFC)
Gulf Coast	In each county in Groundwater Management Area 14, no less than 70 percent median available drawdown remaining in 2080 or no more than an average of 1.0 additional foot of subsidence between 2009 and 2080.

3.2.2 Regional Groundwater Availability

Groundwater supplies in the ETRWPA may be divided into the northern and southern regions. The northern region is generally consistent with GMA-11 and the southern region is generally consistent with GMA-14. The conditions and available information for each region are presented separately. A limited supply of groundwater in the region is also found in what are known as "non-relevant" portions of known aquifers and "other" aquifers. These local supplies are addressed at the end of this section.

Northern Region. The Carrizo-Wilcox Aquifer provides the majority of the groundwater supply in the northern region. Minor aquifers in the northern region include the Queen City, Sparta, and Yegua-Jackson. In some areas, the Queen City aquifer provides a significant quantity of water, although the well yields are typically smaller than in the underlying Carrizo-Wilcox aquifer. Because it has a relatively large surface area, the Queen City aquifer also receives a significant volume of recharge from precipitation and thus provides significant baseflow to creeks and rivers in the region. The Yegua-Jackson aquifer provides water in the area between the downdip extent of the Carrizo-Wilcox and the outcrop area of the Gulf Coast aquifer (See Figures 3.1 and 3.2).

The modeled available groundwater volumes for the counties in the northern region are provided in Table 3.9. MAG volumes are the largest amount of water that can be withdrawn from a given source without violating DFCs. Table 3.9 presents the total MAG volumes by aquifer in the ETRWPA. The Trinity, Nacatoch, Yegua-Jackson and Gulf Coast aquifers were declared non-relevant in GMA-11.

Southern Region. The Gulf Coast Aquifer provides most of the groundwater supply in the southern region (Figure 3.1) and has the largest amount of modeled available groundwater in the ETRWPA (Table 3.9). The Southeast Texas GCD (Jasper, Newton, Tyler, and Hardin Counties) is the only groundwater conservation district located in the southern region. Table 3.9 also contains a summary of modeled available groundwater volume in the southern region.

Table 3.9 Modeled Available Groundwater by Aquifer (ac-ft/yr)

County	Aquifer	Basin	2030	2040	2050	2060	2070	2080
Northern Region								
Anderson	Carrizo-Wilcox	Neches	21,958	21,958	21,958	21,958	21,958	21,958
Anderson	Carrizo-Wilcox	Trinity	5,066	5,066	5,066	5,066	5,066	5,066
Anderson	Queen City	Neches	11489	11489	11488	11488	11488	11,488
Anderson	Queen City	Trinity	5,102	5,102	5,102	5,102	5,102	5,102
Anderson	Sparta	Neches	109	109	109	109	109	109
Anderson	Sparta	Trinity	198	198	198	198	198	198
Angelina	Carrizo-Wilcox	Neches	27,611	27,611	27,611	27,611	27,611	27,611
Angelina	Queen City	Neches	1,095	1,095	1,095	1,095	1,095	1,095
Angelina	Sparta	Neches	390	390	390	390	390	390
Cherokee	Carrizo-Wilcox	Neches	15,241	15,241	15,241	15,241	15,241	15,241
Cherokee	Queen City	Neches	8,812	8,812	8,812	8,812	8,812	8,812
Cherokee	Sparta	Neches	352	352	352	352	352	352
Henderson	Carrizo-Wilcox	Neches	3,996	3,996	3,996	3,996	3,996	3,996
Henderson	Queen City	Neches	10,516	10,516	10,516	10,516	10,516	10,516
Houston	Carrizo-Wilcox	Neches	1,721	1,721	1,721	1,721	1,721	1,721
Houston	Carrizo-Wilcox	Trinity	634	634	634	634	634	634
Houston	Queen City	Neches	2,080	2,080	2,080	2,080	2,080	2,080
Houston	Queen City	Trinity	216	216	216	216	216	216
Houston	Sparta	Neches	505	505	505	505	505	505
Houston	Sparta	Trinity	977	977	977	977	977	977
Nacogdoches	Carrizo-Wilcox	Neches	20,859	20,859	20,859	20,859	20,859	20,859
Nacogdoches	Queen City	Neches	2946	2946	2946	2946	2946	2,946
Nacogdoches	Sparta	Neches	362	362	362	362	362	362
Panola	Carrizo-Wilcox	Cypress	0	0	0	0	0	0
Panola	Carrizo-Wilcox	Sabine	4,999	4,999	4,999	4,999	4,999	4,999
Rusk	Carrizo-Wilcox	Neches	7,111	7,111	7,111	7,111	7,111	7,111
Rusk	Carrizo-Wilcox	Sabine	6,907	6,907	6,907	6,907	6,907	6,907
Rusk	Queen City	Neches	39	39	39	39	39	39
Rusk	Queen City	Sabine	20	20	20	20	20	20
Rusk	Sparta	Neches	0	0	0	0	0	0
Sabine	Carrizo-Wilcox	Neches	356	356	356	356	356	356
Sabine	Carrizo-Wilcox	Sabine	1,032	1,032	1,032	1,032	1,032	1,032
Sabine	Queen City	Neches	0	0	0	0	0	0
Sabine	Queen City	Sabine	0	0	0	0	0	0

County	Aquifer	Basin	2030	2040	2050	2060	2070	2080
Sabine	Sparta	Neches	36	36	36	36	36	36
Sabine	Sparta	Sabine	13	13	13	13	13	13
San Augustine	Carrizo-Wilcox	Neches	303	303	303	303	303	303
San Augustine	Carrizo-Wilcox	Sabine	284	284	284	284	284	284
San Augustine	Queen City	Neches	0	0	0	0	0	0
San Augustine	Sparta	Neches	163	163	163	163	163	163
San Augustine	Sparta	Sabine	3	3	3	3	3	3
Shelby	Carrizo-Wilcox	Neches	2,621	2,621	2,621	2,621	2,621	2,621
Shelby	Carrizo-Wilcox	Sabine	3,698	3,698	3,698	3,698	3,698	3,698
Shelby	Queen City	Sabine	0	0	0	0	0	0
Shelby	Sparta	Sabine	0	0	0	0	0	0
Smith	Carrizo-Wilcox	Neches	17,607	17,607	17,607	17,607	17,607	17,607
Smith	Queen City	Neches	20121	20121	20121	20121	20121	20,121
Smith	Sparta	Neches	0	0	0	0	0	0
Trinity	Carrizo-Wilcox	Neches	266	266	266	266	266	266
Trinity	Queen City	Neches	0	0	0	0	0	0
Trinity	Sparta	Neches	152	152	152	152	152	152
County	**Aquifer**	**Basin**	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Southern Region								
Hardin	Gulf Coast	Neches	37,571	37,571	37,571	37,571	37,571	37,571
Hardin	Gulf Coast	Trinity	150	150	150	150	150	150
Jasper	Gulf Coast	Neches	40,821	40,821	40,821	40,821	40,821	40,821
Jasper	Gulf Coast	Sabine	32,544	32,544	32,544	32,544	32,544	32,544
Jefferson	Gulf Coast	Neches	1,853	1,853	1,853	1,853	1,853	1,853
Jefferson	Gulf Coast	Neches-Trinity	13,571	13,571	13,571	13,571	13,571	13,571
Newton	Gulf Coast	Neches	199	199	199	199	199	199
Newton	Gulf Coast	Sabine	37,309	37,309	37,309	37,309	37,309	37,309
Orange	Gulf Coast	Neches	6,266	6,266	6,266	6,266	6,266	6,266
Orange	Gulf Coast	Neches-Trinity	280	280	280	280	280	280
Orange	Gulf Coast	Sabine	18,659	18,659	18,659	18,659	18,659	18,659
Polk	Gulf Coast	Neches	16,765	16,765	16,765	16,765	16,765	16,765
Tyler	Gulf Coast	Neches	34,390	34,390	34,390	34,390	34,390	34,390

Note: Values subjected to change until the end of the planning cycle.

Table 3.10 presents the total MAG volumes by aquifer for planning years 2030 through 2080. The Gulf Coast aquifer has the largest volume of modeled available groundwater at 240,378 ac-ft per year in the ETRWPA.

Table 3.10 Modeled Available Groundwater Aquifer Totals (ac-ft/yr)

Region	Carrizo-Wilcox	Queen City	Sparta	Gulf Coast
GMA 11 TOTAL	142,270	62,435	3,260	N/A
GMA 14 TOTAL	N/A	N/A	N/A	240,378

Note: Values subjected to change until the end of the planning cycle.

SOURCE: DATA PROVIDED BY TWDB GAM RUN 21-016 MAG; GAM RUN 21-019 MAG

Non-Relevant Aquifer Availability. Non-relevant aquifers are areas determined by the GCDs that may have aquifer characteristics, groundwater demands, and/or current groundwater uses that do not warrant adoption of a DFC for purposes of joint groundwater planning. Declaring an area non-relevant does not preclude a GCD from managing the groundwater in the area through other means available to the district as outlined in Chapter 36 of the Texas Water Code. In some cases, an area is determined non-relevant because declaring a DFC for the aquifer or portion of the aquifer would not affect other GCDs or GMAs. Generally, if a groundwater conservation district determines an aquifer (or portions of an aquifer) to be non-relevant, it is anticipated that there will be no large-scale production from in the area prior to the next round of joint groundwater planning. Additionally, it is assumed that what production does occur will not affect conditions in relevant portions of the aquifer(s) or other GCDs or GMAs. Regional Water Planning Groups and the TWDB work together to establish groundwater volumes available from non-relevant aquifers by evaluating modeling data and local hydrogeologic information. Table 3.11 includes availability estimates for supplies in 'other aquifer'.

Table 3.11 Groundwater Availability from Non-Relevant Aquifers

Aquifer	County	Basin	2030	2040	2050	2060	2070	2080
Gulf Coast	Polk	Neches	1,060	1,060	1,060	1,060	1,060	1,060
Yegua-Jackson	Angelina	Neches	16,890	16,890	16,890	16,890	16,507	16,507
Yegua-Jackson	Houston	Neches	1,324	1,324	1,324	1,324	1,324	1,324
Yegua-Jackson	Houston	Trinity	4,061	4,061	4,061	4,061	4,061	4,061
Yegua-Jackson	Nacogdoches	Neches	235	235	235	235	235	235
Yegua-Jackson	Polk	Neches	570	570	570	570	570	570
Yegua-Jackson	Sabine	Neches	3,724	3,724	3,724	3,724	3,724	3,724
Yegua-Jackson	Sabine	Sabine	575	575	575	575	575	575
Yegua-Jackson	San Augustine	Neches	2,102	2,102	2,102	2,102	2,102	2,102
Yegua-Jackson	San Augustine	Sabine	9	9	9	9	9	9
Yegua-Jackson	Trinity	Neches	700	700	700	700	700	700

Groundwater Local Supplies (Other Aquifer) Availability. Groundwater from 'other aquifer' local supplies refers to groundwater that originates from another aquifer that has not been classified as either a major or a minor aquifer of the state. These areas are generally small, often are alluvial aquifers, but can be locally significant. Some may originate from a major or minor aquifer but have historically been classified incorrectly. Table 3.12 includes availability estimates for supplies in 'other aquifer.'

Table 3.12 Groundwater Availability from Other Aquifers

County	Basin	Availability (ac-ft/yr)
Anderson	Trinity	298
Angelina	Neches	812
Cherokee	Neches	268
Henderson	Neches	5
Henderson	Trinity	680
Houston	Neches	378
Houston	Trinity	888
Nacogdoches	Neches	1,131
Rusk	Neches	270
Rusk	Sabine	469
Sabine	Neches	336
San Augustine	Neches	1,395
Smith	Neches	922
Trinity	Neches	700
TOTAL		**8,552**

Note: Values subjected to change until the end of the planning cycle.

3.3 REUSE AVAILABILITY

There are two types of reuse: direct reuse and indirect reuse. Direct reuse is treated wastewater effluent that is beneficially reused directly from the treatment facility and is not discharged to a State water course. Indirect reuse is treated effluent that is discharged to a State water course and then re-diverted by the owner for beneficial use. The reuse listed as available to the region is for existing projects based on current permits and authorizations. Categories of reuse include (1) currently operating indirect reuse projects for non-industrial purposes, in which water is reused after being returned to the stream; and (2) authorized direct reuse projects for which facilities are already developed. The reuse activities within Region I from 2016 to 2022 are listed in Table 3.13. Currently, only direct non-potable reuse is available in Region I. In addition to the current activity, the City of Center plans to construct a facility for reuse in 1 MGD in the next 2 to 5 years. [To be updated upon meeting with MWPs.]

Table 3.13 Summary of Current Reuse Activity (ac-ft/yr)

WUGs	County	Total Reuse Intake (ac-ft/yr)						
		2016	2017	2018	2019	2020	2021	2022
City of Elkhart	Anderson	2	-	-	-	-	-	-
City of Jacksonville	Cherokee	9	8	6	6	6	6	6
City of Port Arthur	Jefferson	-	-	647	669	702	793	793(a)
Emerald Bay MUD	Smith	-	-	-	-	-	100	82
Georgia Pacific Chemicals LLC	Angelina	38	46	45	37	42	45	44
Georgia Pacific Wood Products	Polk	-	7	5	-	-	-	-
GP Wood Products South	Polk	3	-	-	-	-	-	-
Norbord Texas Nacogdoches OSB	Nacogdoches	0	0	0	0	0	23	0
Orion Engineered Carbons, LLC-Echo Plant	Orange	350	-	-	-	-	-	-
Oxbow Calcining LLC	Jefferson	158	158	202	1,153	1,153	1,152	1,152
Tyler Pipe Company	Smith	30	30	-	-	-	-	-
Direct Non-potable Reuse Total		**591**	**250**	**904**	**1,865**	**1,903**	**2,118**	**2,076**

Note: (a) For the City of Port Arthur, it is assumed that the reuse intake in 2022 was the same as it was in 2021.

SOURCE: REUSE INTAKE 2016-2022 REPORT FROM TWDB DATED 02/01/2024.

3.4 IMPACTS ON AVAILABILITY

3.4.1 Imports and Exports

There are several imported supplies to the ETRWPA from adjoining regions and Louisiana. Water from Lake Fork in the Northeast Region is used by the City of Henderson and the City of Kilgore, which sells water from Lake Fork to customers in the ETRWPA. Other surface water imports include water from Lake Livingston to Trinity County-Other , the TRWD Reservoir System to Henderson County-Other, Lake Gladewater to Smith County-Other, and surface water for the City of Joaquin and Shelby County-Other from the City of Logansport, Louisiana. The specific source for this import is the Louisiana portion of the Toledo Bend Reservoir.

There are also uses of groundwater from sources located outside of the ETRWPA. Most are associated with entities that extend over multiple regions. Groundwater from the Carrizo-Wilcox Aquifer in the Northeast Region (Region D) is provided to Jackson WSC, Southern Utilities, and Smith County-Other, while groundwater from this aquifer in Region C is provided to Bethel Ash WSC and Virginia Hill WSC. A small amount of groundwater from the Yegua-Jackson Aquifer in Trinity County (Region H) is provided to County-Other, irrigation, livestock, and mining industries within Trinity County. Groundwater from the Gulf Coast Aquifer System in Region H supplies Trinity County-Other and manufacturing in Polk County.

Some water from the ETRWPA is exported to users outside of the region. This supply is included in the total available supply in the ETRWPA but is not available to water users in the region. Water from the ETRWPA is used to supply the City of Tyler's customers in the Northeast Region as the City of Tyler overlaps with the Region I and Region D planning area, City of Athens in Region C, and several customers of the

LNVA in Region H. There is also an existing contract to supply water to Dallas from Lake Palestine for an amount 114,337 ac-ft per year. The infrastructure for this supply has not been constructed. A summary of exports and imports is provided in Table 3.14.

Table 3.14 Summary of Existing Exports and Imports in East Texas Regional Water Planning Area (ac-ft/yr)

Source	2030	2040	2050	2060	2070	2080
Exports						
Lake Athens – Region C	682	1,256	1,901	2,232	2,510	2,624
Sam Rayburn/B.A. Steinhagen – Region H	66,737	66,737	66,737	66,737	66,737	66,737
Lake Cherokee – Region D	16,039	16,039	16,039	16,039	16,039	16,039
Lake Tyler – Region D	TBD	TBD	TBD	TBD	TBD	TBD
TOTAL	**83,458**	**84,032**	**84,677**	**85,008**	**85,286**	**85,400**
Imports						
Carrizo-Wilcox Aquifer – Region C	483	501	509	521	533	547
Carrizo-Wilcox Aquifer – Region D	2,968	3,091	3,122	3,122	3,122	3,122
Yegua-Jackson Aquifer – Region H	41	39	36	35	33	31
Gulf Coast Aquifer – Region H	74	69	65	61	58	55
TRWD Reservoir System - Region C	TBD	TBD	TBD	TBD	TBD	TBD
Lake Gladewater – Region D	23	33	33	33	33	33
Lake Fork – Region D	4,795	4,772	4,740	4,716	4,697	4,681
Lake Livingston – Region H	511	511	511	511	511	511
Toledo Bend - Louisiana	224	194	170	145	125	107
TOTAL	**9,119**	**9,210**	**9,186**	**9,144**	**9,112**	**9,087**

Note: Values subjected to change until the end of the planning cycle.

3.4.2 Impacts of Water Quality on Supplies

The quality of a surface water body or groundwater aquifer can be a significant factor in the ability to use the water for specific purposes. Water quality dictates the level of treatment necessary to render a water body available for its intended use, which can affect the quantity of produced water. In cases of severe contamination, it is possible that a water supply source could be considered untreatable and, hence, unusable for some specific uses. The water quality impacts for sources within the ETRWPA are generally minor with respect to their effect on availability and treatability.

Key water quality parameters for the ETRWPA are identified and discussed in Chapter 6. These parameters are generally a consideration for surface waters. Some of these parameters could be an issue for groundwater as well. The key water quality parameters identified include the following:

- Total Dissolved Solids (TDS)

- Dissolved Oxygen
- Nutrients
- Metals
- Turbidity

These parameters can potentially affect some aspects of aquatic life or the use of the water for recreation. However, in some cases they could affect its availability for water supply as well. Water quality impacts for surface water and groundwater as they relate to availability and treatment requirements are discussed below. Overall, surface water quality in the ETRWPA is addressed in Chapter 1.

Generally, the water quality impairments identified for surface water sources through the TCEQ's Clean Rivers Program do not limit the availability of surface water or the treatability of these sources. The brackish or saline run-of-the-river water rights are limited to uses that are compatible with high TDS water. This plan assumes that these water rights are being used for such purposes.

Based on water quality data for aquifers within the ETRWPA the limitations on water supply availability or treatability are rare for groundwater supplies in the ETRWPA. The most prevalent of the primary drinking water contaminants was found to be arsenic, which exceeded the primary standard of 10 µg/L in about nine percent of samples collected between 1981 and 2019 in the Carrizo-Wilcox, Gulf Coast, Queen City and Sparta aquifers. However, the median concentration of arsenic is 2.0 µg/L and the average is 5.8 µg/L. Arsenic can be removed from water using advanced treatment processes such as iron removal (adsorption and co-precipitation in high iron waters), coagulation and filtration, filters, or ion exchange. Given the relatively low incidence of arsenic contamination, it is unlikely that it would become a significant issue for the ETRWPA.

Secondary drinking water contaminants evaluated included copper, fluoride, chloride, iron, manganese, pH, sulfate, and TDS. Of these, copper, iron, manganese, and pH were commonly found in excess of secondary standards in some samples from all four aquifers. Iron and manganese are naturally occurring constituents in groundwater. In excess, they can cause taste and odor problems in drinking water, but not significant health problems. This is commonly treated by aeration. Industrial users of water with excessive levels of iron or manganese may require significant removal prior to using the water in industrial processes.

The well data also indicated that it is relatively common for pH concentrations in groundwater to be outside the allowable range (i.e., 6.5 to 8.5 standard units) for the four aquifers evaluated. However, neither the median nor the average values were found outside the range for any of the aquifers. Control of pH is easily accomplished through the addition of pH adjusting chemicals. This indicates that the pH concerns for groundwater in the ETRWPA are not a significant limiting factor in availability or treatability.

TDS was found to exceed the Texas secondary standard of 1,000 mg/L in only five percent of the samples. The average concentration for samples in the Carrizo-Wilcox and Gulf Coast aquifers is 392 mg/L. In the Queen City and Sparta samples, the average TDS is 429 mg/L.

3.4.3 Impact of Environmental Flow Policies on Water Rights, Water Availability, and Water Planning

With the passage of Senate Bill 3 in the 2007 80th Regular Session, the State created a basin-by-basin process for developing recommendations to meet the instream flow needs of rivers as well as freshwater inflow needs of affected bays and estuaries and required TCEQ to adopt the recommendations in the form of environmental flow standards. Standards for the Neches and Sabine River Basins were adopted by the TCEQ on April 20, 2011. These standards are utilized in the decision-making process for new water right applications and in establishing an amount of unappropriated water to be set aside for the environment. Existing water rights at the time of adoption are not subject to the environmental flow standards. These water rights were evaluated on a case-by-case basis to assess the effect of authorizing a new use of water with the need for that water to maintain a sound ecological system as part of the water rights permitting process. The environmental flow requirements set forth through Senate Bill 3 do not impact the region's currently available supplies shown in previous sections.

The implementation of environmental flow recommendations will result in a need to more carefully consider environmental flow needs during the development of surface water management strategies. Environmental flow requirements are one component that is considered when assessing the long-term protection of the region's water resources in Chapter 6.

3.5 EXISTING WATER SUPPLIES BY WATER USER GROUP

The water availability by WUG is limited by the ability to deliver and/or use the water. These limitations include firm yield of reservoirs, well field capacity, aquifer characteristics, water quality, water rights, permits, contracts, regulatory restrictions, raw water delivery infrastructure and water treatment capacities where appropriate. Appendix 3-B presents the current water supplies for each WUG by county. (WUGs are cities, water supply corporations, county-other municipal users and county-wide manufacturing, irrigation, mining, livestock, and steam electric uses.) For county-wide user groups, historical use was considered in the determination of currently available supplies.

The table in Appendix 3-B shows the amount of supply available to each user group from each source by decade based on existing facilities. The supplies by county are shown in Table 3.15.

Table 3.15 Summary of Existing Water Supplies of Water User Groups by County (ac-ft/yr)

County	2030	2040	2050	2060	2070	2080
Anderson	22,798	23,007	23,159	23,268	23,388	23,512
Angelina	19,365	19,542	19,654	19,784	19,914	20,047
Cherokee	10,563	10,443	10,269	10,177	10,051	9,915
Hardin	9,669	10,450	11,186	11,130	11,080	11,038
Henderson*	9,310	9,294	8,751	8,326	7,955	7,762
Houston	9,826	9,723	9,582	9,475	9,370	9,276
Jasper	72,518	72,287	72,027	71,792	71,564	71,342
Jefferson	436,950	442,167	443,449	443,451	443,456	443,470
Nacogdoches	39,369	39,953	40,562	41,390	42,235	43,093
Newton	28,076	28,155	28,240	28,341	28,452	28,579
Orange	142,400	142,481	142,550	145,043	149,418	153,960
Panola	15,757	15,805	15,827	15,944	15,844	15,864
Polk*	2,374	2,471	2,557	2,642	2,725	2,805
Rusk	64,081	64,086	64,070	64,058	64,067	63,983
Sabine	3,159	3,212	3,188	3,171	3,157	3,142
San Augustine	4,938	4,949	4,953	4,953	4,953	4,953
Shelby	23,905	23,822	23,754	23,692	23,639	23,592
Smith*	59,553	63,965	68,951	71,662	74,548	77,625
Trinity*	647	647	618	600	580	561
Tyler	9,725	9,569	9,441	9,351	9,266	9,187
TOTAL	**984,983**	**996,028**	**1,002,788**	**1,008,250**	**1,015,662**	**1,023,706**

** County is split between two planning regions. The available supply presented in this table represents only the portion of the county within the ETRWPA.*

Note: Values subjected to change until the end of the planning cycle.

3.6 EXISTING WATER SUPPLIES BY MAJOR WATER PROVIDER

[This section will be updated upon meeting with all MWPs.]

There are 16 designated Major Water Providers (MWPs) in the ETRWPA. A MWP is a wholesale water provider that has water contracts for 1,000 ac-ft per year or is expected to contract for 1,000 ac-ft per year or more during the planning period. Similar to the available supply to WUGs, the water availability for each MWP is limited by the ability to deliver the raw water. These limitations include firm yield of reservoirs, well field capacity, aquifer characteristics, water quality, water rights, permits, contracts, regulatory restrictions, and infrastructure. Total available supply by decade for each wholesale provider is shown in Table 3.16.

Table 3.16 Summary of Existing Water Supplies for Wholesale Water Provider (ac-ft/yr)

Water Provider	2030	2040	2050	2060	2070	2080
Angelina and Neches River Authority	65	70	70	70	70	70
Angelina-Nagodoches WCID No. 1	10,500	9,990	9,480	8,970	8,460	7,950
Athens Municipal Water Authority	6,596	6,492	6,397	6,302	6,205	6,104
Beaumont	33,256	34,427	35,719	35,777	35,838	35,904
Carthage	13,863	13,863	13,863	13,863	13,863	13,863
Center	4,112	4,100	4,087	4,075	4,062	4,050
Houston Co. WCID 1	3,500	3,500	3,500	3,500	3,500	3,500
Jacksonville	7,391	7,391	7,391	7,391	7,391	7,391
Lower Neches Valley Authority	1,025,976	1,022,836	1,019,696	1,016,556	1,013,416	1,010,276
Lufkin	35,313	35,336	35,359	35,382	35,405	35,428
Nacogdoches	20,827	20,465	20,103	19,741	19,379	19,017
Panola Co. Freshwater Supply District No. 1	20,800	20,016	19,482	18,448	17,664	16,880
Port Arthur	33,955	37,990	37,990	37,990	37,990	37,990
Sabine River Authority of Texas (ETRWPA Only)	1,071,861	1,071,544	1,071,191	1,070,910	1,070,593	1,070,276
Tyler	66,930	66,695	66,460	66,233	66,007	65,780
Upper Neches River Municipal Water Authority	177,110	175,040	172,970	170,950	168,930	166,910
TOTAL	**2,532,055**	**2,529,755**	**2,523,758**	**2,516,158**	**2,508,773**	**2,501,389**

Note: Values subjected to change until the end of the planning cycle.

A brief description of the supply sources for each MWP is presented below. The analyses of the available supplies by source were determined using the assumptions outlined in Section 3.1.1. The results of these analyses are for planning purposes and do not affect the right of a water holder to divert and use the full amount of water authorized by its permit.

3.6.1 Angelina and Neches River Authority

Angelina and Neches River Authority has a state water right permit to construct Lake Columbia on Mud Creek in the Neches River Basin and divert 85,507 ac-ft per year. No currently available supply is shown since the reservoir is not constructed. The estimated firm yield using the modified Neches WAM Run 3 is 68,850 ac-ft per year in 2030. The supply shown in Table 3.16 for Angelina and Neches River Authority is groundwater for the Holmwood Utility.

3.6.2 Angelina-Nacogdoches Water Control Improvement District No 1

The Angelina-Nacogdoches Water Control & Improvement District No. 1 owns and operates Lake Striker in Rusk and Cherokee Counties. The firm yield from Lake Striker in 2080 is estimated at 10,500 ac-ft per year and is projected to decrease to 7,950 ac-ft per year by 2080.

3.6.3 Athens Municipal Water Authority

Athens Municipal Water Authority (AMWA) has 8,500 ac-ft per year of water rights in Lake Athens. The firm yield of the lake using the modified Neches WAM Run 3 was estimated at 4,540 ac-ft per year in 2030. AMWA has one existing groundwater well near the WTP with a capacity of 886 ac-ft per year that they are planning to use as a current supply. The AMWA also has a wastewater reuse permit for 2,677 ac-ft per year, but the infrastructure is not in place to utilize this source. The City of Athens and AMWA continue to study indirect reuse as a supplement to the yield of Lake Athens. The AMWA is also proposing to develop additional groundwater supplies to supplement the surface water, but these supplies are not available at this time.

3.6.4 City of Beaumont

The City of Beaumont obtains water from the Neches River, groundwater wells from the Gulf Coast Aquifer in Hardin County and a contract with LNVA for surface water. The City currently uses about 9,500 ac-ft per year of groundwater with a current well capacity of about 15 million gallons per day (MGD). However, due to aquifer availability, the estimated reliable groundwater supply for Beaumont is limited to 8,469 ac-ft per year. The reliable Neches River supplies are estimated at 12,102 ac-ft per year for 2030 based on the daily analysis of the City's run-of-the-river water rights. This supply increases over time as demands increase, whereby additional surface water is utilized during periods with sufficient flows. By 2080, the amount of available run-of-the-river water is 12,969 ac-ft per year. The City also has a contract with LNVA to supplement its surface water supplies with releases from the Sam Rayburn/Steinhagen system. It is assumed that the LNVA contract is used to meet the remainder of the City's projected demands, provided the City has available treatment capacity. The City's current water treatment system is rated for 50 MGD, limiting the available treated surface water to 29,673 ac-ft per year considering a peaking factor of 1.7 consistent with historical use. Considering both its groundwater and surface water sources the City's currently available treated water supplies total 33,256 ac-ft per year for 2030.

3.6.5 City of Carthage

The City of Carthage obtains its water from groundwater from the Carrizo-Wilcox Aquifer and surface water from Panola County Freshwater Supply District. The City has a contract with Panola County Freshwater Supply District for 12 MGD of water from Lake Murvaul. Considering its current water system capacities, the city of Carthage has approximately 5,565 ac-ft per year of reliable supply.

3.6.6 City of Center

The City of Center currently obtains water from Lake Center and Lake Pinkston for use within the City and for distribution to its municipal and industrial customers. The City owns and operates Lake Center, with a firm yield of 500 ac-ft per year of municipal water. The City holds rights to 3,800 ac-ft per year of water in Lake Pinkston. The firm yield from Lake Pinkston in 2030 using the modified Neches WAM Run 3 is 3,612 ac-ft per year. Water from Lake Pinkston is pumped from the Neches River Basin to the City, located in the Sabine River Basin. The total available supply for the City of Center is 4,112 ac-ft per year in 2030. The City of Center is plans to construct a facility for reuse in 1 MGD in the next 2 to 5 years.

3.6.7 Houston County Water Control Improvement District (WCID) No. 1

Houston County WCID No. 1's water rights to Houston County Lake include a right to divert 3,500 ac-ft per year at a rate not to exceed 6,300 gallons per minute. The entity originally had a right to divert 7,000 ac-ft per year, which was reduced to the current right of 3,500 ac-ft per year. Houston County WCID No. 1 applied for a water right permit to access the additional 3,500 ac-ft per year supplies in 2007 which was denied by TCEQ. Supplies to Houston County WCID No. 1 are limited to its permitted diversions. The entity plans to construct additional wells; however, the number of wells or the associated well capacities is unknown yet.

3.6.8 City of Jacksonville

The City of Jacksonville obtains water supplies from Lake Jacksonville and the Carrizo-Wilcox Aquifer. The City holds 6,200 ac-ft per year in water rights in Lake Jacksonville. The ability to use this water for municipal purposes is limited by the City's water treatment capacity (estimated at 5,173 ac-ft per year). The groundwater supplies are estimated at 2,218 ac-ft per year based on current well field production. The total supply available to Jacksonville is 7,391 ac-ft per year.

3.6.9 Lower Neches Valley Authority

The LNVA maintains water rights from Lake Sam Rayburn/Lake B.A. Steinhagen and run-of-the-river diversion from the Neches River. LNVA has an agreement to use full amount of Lufkin's share of supplies (28,000 ac-ft per year) from Lake Sam Rayburn/Lake B.A. Steinhagen through the 2020-2030 decade. LNVA's existing water rights total 1,201,876 ac-ft per year. The reliable supply from these water rights using the modified Neches WAM Run 3 is 1,025,976 ac-ft per year in 2030 and 1,010,276 ac-ft per year in 2080. The LNVA currently possesses the infrastructure to divert these water rights to its municipal, manufacturing, mining, and irrigation users.

3.6.10 City of Lufkin

The City of Lufkin presently obtains groundwater from the Carrizo-Aquifer in Angelina County and surface water from Lake Kurth. Groundwater supplies for the City of Lufkin are estimated to be 17,888 ac-ft throughout the planning horizon (2030-2080), based on its well field pumping capacity of the current 15 active wells. The City has water rights to divert from 16,200 ac-ft per year from Lake Kurth, plus run-of-river diversions. Lufkin also has a water right for 28,000 ac-ft per year of water from Lake Sam Rayburn. Currently there are no transmission facilities from Lake Sam Rayburn to use this water.

3.6.11 City of Nacogdoches

The City of Nacogdoches obtains groundwater from the Carrizo-Wilcox aquifer and surface water from Lake Nacogdoches. The groundwater supply of 6,492 ac-ft per year is based on the average annual current well field pumping capacity. The City currently has water rights to divert 22,000 ac-ft per year of water from Lake Nacogdoches. The modified Neches WAM Run 3 shows the current firm yield of this lake to be 14,335 ac-ft per year in 2030 and reducing to 12,525 ac-ft per year by 2080. The total supply to Nacogdoches in 2030 is 20,827 ac-ft per year.

3.6.12 Panola County Freshwater Supply District No. 1

The Panola County Freshwater Supply District No. 1 owns and operates Lake Murvaul in the ETRWPA. The estimated firm yield of Lake Murvaul using the modified Sabine WAM Run 3 is 20,800 ac-ft per year in year 2030, decreasing to 16,880 ac-ft per year by 2080.

3.6.13 City of Port Arthur

The City of Port Arthur receives raw water supply from the LNVA. Treated water is supplied to industrial users in addition to its citizens. It is assumed that LNVA will provide for 100% of the City's demands. The projected supply from LNVA is 33,955 ac-ft per year in 2030, decreasing to 37,990 ac-ft per year by 2080.

3.6.14 Sabine River Authority of Texas

The SRA owns and operates the Toledo Bend Reservoir, located in the ETRWPA, and Lakes Tawakoni and Fork, located in Region D. In addition, the SRA maintains run-of-the-river rights from the Sabine in Newton and Orange County. The SRA provides water to municipal and industrial customers in Region C and Region D from Lake Fork and Lake Tawakoni. Some customers in the ETRWPA receive water from Lake Fork through downstream releases and riverine diversions. Most of the water in the ETRWPA from SRA is provided from Toledo Bend Reservoir and diversions from the Sabine River through the SRA Canal System. SRA holds water rights of 238,100 ac-ft per year from Lake Tawakoni, 188,660 ac-ft per year from Lake Fork, 970,067 ac-ft per year from Toledo Bend Reservoir and 147,100 ac-ft per year from the Sabine River. In 2030, the reliable supply from SRA's Lower Basin sources (Toledo Bend Reservoir and the Canal System) in the ETRWPA is 1,071,861 ac-ft per year, and the Upper Basin sources (Lake Tawakoni and Lake Fork) in Region D is 395,205 ac-ft per year.

3.6.15 City of Tyler

The City of Tyler receives raw water supply from Lake Tyler and Tyler East with a firm yield of 32,900 ac-ft per year in 2040, which is expected to decrease to 31,750 ac-ft per year in 2080. Supply from these reservoirs is limited to 19,057 ac-ft per year by the water treatment plant capacity (34 MGD). The City also has a contract with the UNRMWA for 60 MGD from Lake Palestine. The City of Tyler has constructed a 30 MGD treatment facility at the lake and currently can use 33,630 ac-ft per year from Lake Palestine. The City possesses water rights to Lake Bellwood; however, the raw water from this source is used only for irrigation. Water is not treated by the City from this source. The City plans to plug all wells and will not use groundwater. Collectively, the City has a total of 66,530 ac-ft per year of treated water and an additional 400 ac-ft per year of raw water from Lake Bellwood.

3.6.16 Upper Neches River Municipal Water Authority

The UNRMWA maintains a total water right of 238,110 ac-ft per year for diversions from Lake Palestine and a downstream location at Rocky Point Dam. The UNRMWA operates these rights as a system. Available supply using the modified Neches WAM Run 3 is estimated at 177,110 ac-ft per year in year 2030, decreasing to 166,910 ac-ft per year by 2080.

Appendix 3-A
TWDB Data Report for Water Availability

The following appendix includes tables of the Source total Availability for the 2026 Regional Water Plan.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Groundwater Source Availability Total				**488,746**	**488,746**	**488,745**	**488,745**	**488,362**	**488,362**
Carrizo-Wilcox Aquifer	Anderson	Neches	Fresh	21,958	21,958	21,958	21,958	21,958	21,958
Carrizo-Wilcox Aquifer	Anderson	Trinity	Fresh	5,066	5,066	5,066	5,066	5,066	5,066
Carrizo-Wilcox Aquifer	Angelina	Neches	Fresh	27,611	27,611	27,611	27,611	27,611	27,611
Carrizo-Wilcox Aquifer	Cherokee	Neches	Fresh	15,241	15,241	15,241	15,241	15,241	15,241
Carrizo-Wilcox Aquifer	Henderson	Neches	Fresh	3,996	3,996	3,996	3,996	3,996	3,996
Carrizo-Wilcox Aquifer	Houston	Neches	Fresh	1,721	1,721	1,721	1,721	1,721	1,721
Carrizo-Wilcox Aquifer	Houston	Trinity	Fresh	634	634	634	634	634	634
Carrizo-Wilcox Aquifer	Nacogdoches	Neches	Fresh	20,859	20,859	20,859	20,859	20,859	20,859
Carrizo-Wilcox Aquifer	Panola	Cypress	Fresh	0	0	0	0	0	0
Carrizo-Wilcox Aquifer	Panola	Sabine	Fresh	4,999	4,999	4,999	4,999	4,999	4,999
Carrizo-Wilcox Aquifer	Rusk	Neches	Fresh	7,111	7,111	7,111	7,111	7,111	7,111
Carrizo-Wilcox Aquifer	Rusk	Sabine	Fresh	6,907	6,907	6,907	6,907	6,907	6,907
Carrizo-Wilcox Aquifer	Sabine	Neches	Fresh	356	356	356	356	356	356
Carrizo-Wilcox Aquifer	Sabine	Sabine	Fresh	1,032	1,032	1,032	1,032	1,032	1,032
Carrizo-Wilcox Aquifer	San Augustine	Neches	Fresh	303	303	303	303	303	303
Carrizo-Wilcox Aquifer	San Augustine	Sabine	Fresh	284	284	284	284	284	284
Carrizo-Wilcox Aquifer	Shelby	Neches	Fresh	2,621	2,621	2,621	2,621	2,621	2,621
Carrizo-Wilcox Aquifer	Shelby	Sabine	Fresh	3,698	3,698	3,698	3,698	3,698	3,698
Carrizo-Wilcox Aquifer	Smith	Neches	Fresh	17,607	17,607	17,607	17,607	17,607	17,607
Carrizo-Wilcox Aquifer	Trinity	Neches	Fresh	266	266	266	266	266	266
Gulf Coast Aquifer System	Hardin	Neches	Fresh	37,571	37,571	37,571	37,571	37,571	37,571

* Salinity field indicates whether the source availability is considered ‘fresh’ (less than 1,000 mg/L), ‘brackish’ (1,000 to 10,000 mg/L), ‘saline’ (10,001 mg/L to 34,999 mg/L), or ‘seawater’ (35,000 mg/L or greater). Sources can also be labeled as ‘fresh/brackish’ or ‘brackish/saline’, if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Gulf Coast Aquifer System	Hardin	Trinity	Fresh	150	150	150	150	150	150
Gulf Coast Aquifer System	Jasper	Neches	Fresh	40,821	40,821	40,821	40,821	40,821	40,821
Gulf Coast Aquifer System	Jasper	Sabine	Fresh	32,544	32,544	32,544	32,544	32,544	32,544
Gulf Coast Aquifer System	Jefferson	Neches	Fresh	1,853	1,853	1,853	1,853	1,853	1,853
Gulf Coast Aquifer System	Jefferson	Neches-Trinity	Fresh	13,571	13,571	13,571	13,571	13,571	13,571
Gulf Coast Aquifer System	Newton	Neches	Fresh	199	199	199	199	199	199
Gulf Coast Aquifer System	Newton	Sabine	Fresh	37,309	37,309	37,309	37,309	37,309	37,309
Gulf Coast Aquifer System	Orange	Neches	Fresh	6,266	6,266	6,266	6,266	6,266	6,266
Gulf Coast Aquifer System	Orange	Neches-Trinity	Fresh	280	280	280	280	280	280
Gulf Coast Aquifer System	Orange	Sabine	Fresh	18,659	18,659	18,659	18,659	18,659	18,659
Gulf Coast Aquifer System	Polk	Neches	Fresh	17,825	17,825	17,825	17,825	17,825	17,825
Gulf Coast Aquifer System	Sabine	Sabine	Fresh	0	0	0	0	0	0
Gulf Coast Aquifer System	Tyler	Neches	Fresh	34,390	34,390	34,390	34,390	34,390	34,390
Other Aquifer	Anderson	Trinity	Fresh	298	298	298	298	298	298
Other Aquifer	Angelina	Neches	Fresh	812	812	812	812	812	812
Other Aquifer	Cherokee	Neches	Fresh	268	268	268	268	268	268
Other Aquifer	Henderson	Neches	Fresh	5	5	5	5	5	5
Other Aquifer	Henderson	Trinity	Fresh	680	680	680	680	680	680
Other Aquifer	Houston	Neches	Fresh	378	378	378	378	378	378
Other Aquifer	Houston	Trinity	Fresh	888	888	888	888	888	888
Other Aquifer	Nacogdoches	Neches	Fresh	1,131	1,131	1,131	1,131	1,131	1,131

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Other Aquifer	Rusk	Neches	Fresh	270	270	270	270	270	270
Other Aquifer	Rusk	Sabine	Fresh	469	469	469	469	469	469
Other Aquifer	Sabine	Neches	Fresh	336	336	336	336	336	336
Other Aquifer	Sabine	Sabine	Fresh	0	0	0	0	0	0
Other Aquifer	San Augustine	Neches	Fresh	1,395	1,395	1,395	1,395	1,395	1,395
Other Aquifer	Smith	Neches	Fresh	922	922	922	922	922	922
Other Aquifer	Trinity	Neches	Fresh	700	700	700	700	700	700
Queen City Aquifer	Anderson	Neches	Fresh	11,489	11,489	11,488	11,488	11,488	11,488
Queen City Aquifer	Anderson	Trinity	Fresh	5,102	5,102	5,102	5,102	5,102	5,102
Queen City Aquifer	Angelina	Neches	Fresh	1,095	1,095	1,095	1,095	1,095	1,095
Queen City Aquifer	Cherokee	Neches	Fresh	8,812	8,812	8,812	8,812	8,812	8,812
Queen City Aquifer	Henderson	Neches	Fresh	10,516	10,516	10,516	10,516	10,516	10,516
Queen City Aquifer	Houston	Neches	Fresh	2,080	2,080	2,080	2,080	2,080	2,080
Queen City Aquifer	Houston	Trinity	Fresh	216	216	216	216	216	216
Queen City Aquifer	Nacogdoches	Neches	Fresh	2,946	2,946	2,946	2,946	2,946	2,946
Queen City Aquifer	Rusk	Neches	Fresh	39	39	39	39	39	39
Queen City Aquifer	Rusk	Sabine	Fresh	20	20	20	20	20	20
Queen City Aquifer	Sabine	Neches	Fresh	0	0	0	0	0	0
Queen City Aquifer	Sabine	Sabine	Fresh	0	0	0	0	0	0
Queen City Aquifer	San Augustine	Neches	Fresh	0	0	0	0	0	0
Queen City Aquifer	Shelby	Sabine	Fresh	0	0	0	0	0	0
Queen City Aquifer	Smith	Neches	Fresh	20,121	20,121	20,121	20,121	20,121	20,121

* Salinity field indicates whether the source availability is considered ‘fresh’ (less than 1,000 mg/L), ‘brackish’ (1,000 to 10,000 mg/L), ‘saline’ (10,001 mg/L to 34,999 mg/L), or ‘seawater’ (35,000 mg/L or greater). Sources can also be labeled as ‘fresh/brackish’ or ‘brackish/saline’, if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Queen City Aquifer	Trinity	Neches	Fresh	0	0	0	0	0	0
Sparta Aquifer	Anderson	Neches	Fresh	109	109	109	109	109	109
Sparta Aquifer	Anderson	Trinity	Fresh	198	198	198	198	198	198
Sparta Aquifer	Angelina	Neches	Fresh	390	390	390	390	390	390
Sparta Aquifer	Cherokee	Neches	Fresh	352	352	352	352	352	352
Sparta Aquifer	Houston	Neches	Fresh	505	505	505	505	505	505
Sparta Aquifer	Houston	Trinity	Fresh	977	977	977	977	977	977
Sparta Aquifer	Nacogdoches	Neches	Fresh	362	362	362	362	362	362
Sparta Aquifer	Rusk	Neches	Fresh	0	0	0	0	0	0
Sparta Aquifer	Sabine	Neches	Fresh	36	36	36	36	36	36
Sparta Aquifer	Sabine	Sabine	Fresh	13	13	13	13	13	13
Sparta Aquifer	San Augustine	Neches	Fresh	163	163	163	163	163	163
Sparta Aquifer	San Augustine	Sabine	Fresh	3	3	3	3	3	3
Sparta Aquifer	Shelby	Sabine	Fresh	0	0	0	0	0	0
Sparta Aquifer	Smith	Neches	Fresh	0	0	0	0	0	0
Sparta Aquifer	Trinity	Neches	Fresh	152	152	152	152	152	152
Yegua-Jackson Aquifer	Angelina	Neches	Fresh	16,890	16,890	16,890	16,890	16,507	16,507
Yegua-Jackson Aquifer	Houston	Neches	Fresh	1,324	1,324	1,324	1,324	1,324	1,324
Yegua-Jackson Aquifer	Houston	Trinity	Fresh	4,061	4,061	4,061	4,061	4,061	4,061
Yegua-Jackson Aquifer	Jasper	Neches	Fresh	600	600	600	600	600	600
Yegua-Jackson Aquifer	Nacogdoches	Neches	Fresh	235	235	235	235	235	235
Yegua-Jackson Aquifer	Newton	Neches	Fresh	0	0	0	0	0	0

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Yegua-Jackson Aquifer	Newton	Sabine	Fresh	0	0	0	0	0	0
Yegua-Jackson Aquifer	Polk	Neches	Fresh	570	570	570	570	570	570
Yegua-Jackson Aquifer	Sabine	Neches	Fresh	3,724	3,724	3,724	3,724	3,724	3,724
Yegua-Jackson Aquifer	Sabine	Sabine	Fresh	575	575	575	575	575	575
Yegua-Jackson Aquifer	San Augustine	Neches	Fresh	2,102	2,102	2,102	2,102	2,102	2,102
Yegua-Jackson Aquifer	San Augustine	Sabine	Fresh	9	9	9	9	9	9
Yegua-Jackson Aquifer	Trinity	Neches	Fresh	700	700	700	700	700	700
Yegua-Jackson Aquifer	Tyler	Neches	Fresh	0	0	0	0	0	0
Reuse Source Availability Total				**13,955**	**13,968**	**13,981**	**13,992**	**14,006**	**14,021**
Direct Reuse	Orange	Sabine	Fresh	15	15	15	15	15	15
Direct Reuse	Sabine	Sabine	Fresh	20	20	20	20	20	20
Direct Reuse	Shelby	Sabine	Fresh	233	246	259	270	284	299
Indirect Reuse	Jefferson	Neches-Trinity	Fresh	13,687	13,687	13,687	13,687	13,687	13,687
Surface Water Source Availability Total				**4,540,750**	**4,533,063**	**4,525,504**	**4,517,065**	**4,508,987**	**4,501,065**
Athens Lake/Reservoir	Reservoir**	Neches	Fresh	4,540	4,480	4,420	4,360	4,300	4,240
Bellwood Lake/Reservoir	Reservoir**	Neches	Fresh	859	859	859	859	859	859
Center Lake/Reservoir	Reservoir**	Sabine	Fresh	500	500	500	500	500	500
Cherokee Lake/Reservoir	Reservoir**	Sabine	Fresh	31,480	31,224	30,960	30,712	30,456	30,200
Cypress Livestock Local Supply	Panola	Cypress	Fresh	0	0	0	0	0	0
Houston County Lake/Reservoir	Reservoir**	Trinity	Fresh	6,250	6,145	6,040	5,935	5,830	5,725

* Salinity field indicates whether the source availability is considered ‘fresh’ (less than 1,000 mg/L), ‘brackish’ (1,000 to 10,000 mg/L), ‘saline’ (10,001 mg/L to 34,999 mg/L), or ‘seawater’ (35,000 mg/L or greater). Sources can also be labeled as ‘fresh/brackish’ or ‘brackish/saline’, if a combination of the salinity types is appropriate.
** Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Jacksonville Lake/Reservoir	Reservoir**	Neches	Fresh	6,200	6,200	6,200	6,200	6,200	6,200
Kurth Lake/Reservoir	Reservoir**	Neches	Fresh	17,425	17,448	17,471	17,494	17,517	17,540
Lake Naconiche Lake/Reservoir	Reservoir**	Neches	Fresh	4,500	4,500	4,500	4,500	4,500	4,500
Martin Lake/Reservoir	Reservoir**	Sabine	Fresh	25,000	25,000	25,000	25,000	25,000	25,000
Murvaul Lake/Reservoir	Reservoir**	Sabine	Fresh	20,800	20,016	19,482	18,448	17,664	16,880
Nacogdoches Lake/Reservoir	Reservoir**	Neches	Fresh	14,335	13,973	13,611	13,249	12,887	12,525
Neches Livestock Local Supply	Anderson	Neches	Fresh	427	427	427	427	427	427
Neches Livestock Local Supply	Angelina	Neches	Fresh	997	997	997	997	997	997
Neches Livestock Local Supply	Cherokee	Neches	Fresh	1,694	1,694	1,694	1,694	1,694	1,694
Neches Livestock Local Supply	Hardin	Neches	Fresh	184	184	184	184	184	184
Neches Livestock Local Supply	Henderson	Neches	Fresh	770	770	770	770	770	770
Neches Livestock Local Supply	Houston	Neches	Fresh	473	473	473	473	473	473
Neches Livestock Local Supply	Jasper	Neches	Fresh	118	118	118	118	118	118
Neches Livestock Local Supply	Nacogdoche s	Neches	Fresh	8,913	8,913	8,913	8,913	8,913	8,913
Neches Livestock Local Supply	Orange	Neches	Fresh	27	27	27	27	27	27
Neches Livestock Local Supply	Polk	Neches	Fresh	147	147	147	147	147	147
Neches Livestock Local Supply	Rusk	Neches	Fresh	991	991	991	991	991	991
Neches Livestock Local Supply	Sabine	Neches	Fresh	26	26	26	26	26	26
Neches Livestock Local Supply	San Augustine	Neches	Fresh	1,632	1,632	1,632	1,632	1,632	1,632
Neches Livestock Local Supply	Shelby	Neches	Fresh	2,101	2,101	2,101	2,101	2,101	2,101

* Salinity field indicates whether the source availability is considered ‘fresh’ (less than 1,000 mg/L), ‘brackish’ (1,000 to 10,000 mg/L), ‘saline’ (10,001 mg/L to 34,999 mg/L), or ‘seawater’ (35,000 mg/L or greater). Sources can also be labeled as ‘fresh/brackish’ or ‘brackish/saline’, if a combination of the salinity types is appropriate.
** Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Neches Livestock Local Supply	Smith	Neches	Fresh	313	313	313	313	313	313
Neches Livestock Local Supply	Trinity	Neches	Fresh	233	233	233	233	233	233
Neches Livestock Local Supply	Tyler	Neches	Fresh	239	239	239	239	239	239
Neches Other Local Supply	Cherokee	Neches	Fresh	58	58	58	58	58	58
Neches Other Local Supply	Hardin	Neches	Fresh	0	0	0	0	0	0
Neches Other Local Supply	Jefferson	Neches	Fresh	109	109	109	109	109	109
Neches Other Local Supply	Nacogdoches	Neches	Fresh	420	420	420	420	420	420
Neches Other Local Supply	Polk	Neches	Fresh	1	1	1	1	1	1
Neches Other Local Supply	Tyler	Neches	Fresh	8	8	8	8	8	8
Neches Run-of-River	Anderson	Neches	Fresh	80	80	80	80	80	80
Neches Run-of-River	Angelina	Neches	Fresh	10	10	10	10	10	10
Neches Run-of-River	Cherokee	Neches	Fresh	58	58	58	58	58	58
Neches Run-of-River	Hardin	Neches	Fresh	54	54	54	54	54	54
Neches Run-of-River	Houston	Neches	Fresh	147	147	147	147	147	147
Neches Run-of-River	Jasper	Neches	Fresh	382,526	382,526	382,526	382,526	382,526	382,526
Neches Run-of-River	Jefferson	Neches	Brackish	752,152	752,152	752,152	752,152	752,152	752,152
Neches Run-of-River	Jefferson	Neches	Fresh	12,102	12,560	12,977	12,795	12,804	12,969
Neches Run-of-River	Nacogdoches	Neches	Fresh	82	82	82	82	82	82
Neches Run-of-River	Orange	Neches	Brackish	17,310	17,310	17,310	17,310	17,310	17,310
Neches Run-of-River	Rusk	Neches	Fresh	60	60	60	60	60	60
Neches Run-of-River	Sabine	Neches	Fresh	162	162	162	162	162	162

* Salinity field indicates whether the source availability is considered ‘fresh’ (less than 1,000 mg/L), ‘brackish’ (1,000 to 10,000 mg/L), ‘saline’ (10,001 mg/L to 34,999 mg/L), or ‘seawater’ (35,000 mg/L or greater). Sources can also be labeled as ‘fresh/brackish’ or ‘brackish/saline’, if a combination of the salinity types is appropriate.

** Since reservoir sources can exist across multiple counties, the county field value, ‘reservoir’ is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Neches Run-of-River	Shelby	Neches	Fresh	1,000	1,000	1,000	1,000	1,000	1,000
Neches Run-of-River	Smith	Neches	Fresh	45	45	45	45	45	45
Neches Run-of-River	Trinity	Neches	Fresh	0	0	0	0	0	0
Neches Run-of-River	Tyler	Neches	Fresh	88	88	88	88	88	88
Neches-Trinity Livestock Local Supply	Jefferson	Neches-Trinity	Fresh	800	800	800	800	800	800
Neches-Trinity Other Local Supply	Jefferson	Neches-Trinity	Fresh	109	109	109	109	109	109
Neches-Trinity Run-of-River	Jefferson	Neches-Trinity	Fresh	51,274	51,274	51,274	51,274	51,274	51,274
Palestine Lake/Reservoir	Reservoir**	Neches	Fresh	177,110	175,040	172,970	170,950	168,930	166,910
Pinkston Lake/Reservoir	Reservoir**	Neches	Fresh	3,612	3,600	3,587	3,575	3,562	3,550
Rusk City Lake/Reservoir	Reservoir**	Neches	Fresh	10	10	10	10	10	10
Sabine Livestock Local Supply	Jasper	Sabine	Fresh	93	93	93	93	93	93
Sabine Livestock Local Supply	Newton	Sabine	Fresh	157	157	157	157	157	157
Sabine Livestock Local Supply	Orange	Sabine	Fresh	71	71	71	71	71	71
Sabine Livestock Local Supply	Panola	Sabine	Fresh	2,596	2,596	2,596	2,596	2,596	2,596
Sabine Livestock Local Supply	Rusk	Sabine	Fresh	424	424	424	424	424	424
Sabine Livestock Local Supply	Sabine	Sabine	Fresh	175	175	175	175	175	175
Sabine Livestock Local Supply	San Augustine	Sabine	Fresh	203	203	203	203	203	203
Sabine Livestock Local Supply	Shelby	Sabine	Fresh	8,168	8,168	8,168	8,168	8,168	8,168
Sabine Other Local Supply	Newton	Sabine	Fresh	78	78	78	78	78	78
Sabine Other Local Supply	Orange	Sabine	Fresh	161	161	161	161	161	161

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** Since reservoir sources can exist across multiple counties, the county field value, 'reservoir' is applied to all reservoir sources.

DRAFT Region I Source Total Availability

				Source Availability (acre-feet per year)					
Source Name	**County**	**Basin**	**Salinity***	**2030**	**2040**	**2050**	**2060**	**2070**	**2080**
Sabine Other Local Supply	Rusk	Sabine	Fresh	1,258	1,258	1,258	1,258	1,258	1,258
Sabine Run-of-River	Newton	Sabine	Fresh	130,146	130,146	130,146	130,146	130,146	130,146
Sabine Run-of-River	Orange	Sabine	Brackish	267,000	267,000	267,000	267,000	267,000	267,000
Sabine Run-of-River	Orange	Sabine	Fresh	28	28	28	28	28	28
Sabine Run-of-River	Panola	Sabine	Fresh	581	581	581	581	581	581
Sabine Run-of-River	Rusk	Sabine	Fresh	137	137	137	137	137	137
Sam Rayburn-Steinhagen Lake/Reservoir System	Reservoir**	Neches	Fresh	644,100	640,960	637,820	634,680	631,540	628,400
San Augustine Lake/Reservoir	Reservoir**	Neches	Fresh	1,285	1,285	1,285	1,285	1,285	1,285
Striker Lake/Reservoir	Reservoir**	Neches	Fresh	10,500	9,990	9,480	8,970	8,460	7,950
Timpson Lake/Reservoir	Reservoir**	Neches	Fresh	350	350	350	350	350	350
Toledo Bend Lake/Reservoir	Reservoir**	Sabine	Fresh	941,900	941,583	941,230	940,949	940,632	940,315
Toledo Bend Lake/Reservoir	Reservoir**	Sabine-Louisiana	Fresh	941,900	941,583	941,230	940,949	940,632	940,315
Trinity Livestock Local Supply	Anderson	Trinity	Fresh	848	848	848	848	848	848
Trinity Livestock Local Supply	Houston	Trinity	Fresh	1,318	1,318	1,318	1,318	1,318	1,318
Trinity Run-of-River	Anderson	Trinity	Fresh	1,290	1,290	1,290	1,290	1,290	1,290
Trinity Run-of-River	Houston	Trinity	Fresh	2,522	2,522	2,522	2,522	2,522	2,522
Tyler Lake/Reservoir	Reservoir**	Neches	Fresh	32,900	32,665	32,430	32,203	31,977	31,750

Region I Source Availability Total	**5,043,451**	**5,035,777**	**5,028,230**	**5,019,802**	**5,011,355**	**5,003,448**

* Salinity field indicates whether the source availability is considered 'fresh' (less than 1,000 mg/L), 'brackish' (1,000 to 10,000 mg/L), 'saline' (10,001 mg/L to 34,999 mg/L), or 'seawater' (35,000 mg/L or greater). Sources can also be labeled as 'fresh/brackish' or 'brackish/saline', if a combination of the salinity types is appropriate.

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Appendix 3-B

TWDB Data Report for Water Supplies to WUGs

The following appendix includes tables of the Water User Groups (WUG) Existing Water Supply.

DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Anderson County WUG Total			**23,151**	**23,276**	**23,410**	**23,527**	**23,649**	**23,773**
Anderson County / Neches Basin WUG Total			**8,967**	**9,046**	**9,124**	**9,208**	**9,299**	**9,393**
Berryville	I	Carrizo-Wilcox Aquifer | Henderson County	2	2	2	2	2	2
Brushy Creek WSC*	I	Carrizo-Wilcox Aquifer | Anderson County	288	286	282	278	275	272
Frankston	I	Carrizo-Wilcox Aquifer | Anderson County	212	211	208	205	203	200
Frankston Rural WSC	I	Carrizo-Wilcox Aquifer | Anderson County	236	234	232	228	226	222
Neches WSC	I	Carrizo-Wilcox Aquifer | Anderson County	156	154	152	152	150	148
Norwood WSC	I	Carrizo-Wilcox Aquifer | Anderson County	140	139	138	136	135	133
Palestine	I	Carrizo-Wilcox Aquifer | Anderson County	400	400	400	400	400	400
Palestine	I	Palestine Lake/Reservoir	3,114	3,114	3,114	3,114	3,114	3,114
Slocum WSC	I	Carrizo-Wilcox Aquifer | Anderson County	299	297	293	289	285	282
Walston Springs WSC	I	Carrizo-Wilcox Aquifer | Anderson County	334	361	391	424	460	499
County-Other	I	Other Aquifer | Anderson County	87	87	87	87	87	87
County-Other	I	Palestine Lake/Reservoir	16	16	16	16	16	16
County-Other	I	Queen City Aquifer | Anderson County	377	377	376	377	376	376
County-Other	I	Sparta Aquifer | Anderson County	82	82	82	82	82	82
Manufacturing	I	Carrizo-Wilcox Aquifer | Anderson County	1,686	1,748	1,813	1,880	1,950	2,022
Steam Electric Power		No water supply associated with WUG	0	0	0	0	0	0
Livestock	I	Carrizo-Wilcox Aquifer | Anderson County	145	145	145	145	145	145
Livestock	I	Local Surface Water Supply	333	333	333	333	333	333
Livestock	I	Queen City Aquifer | Anderson County	160	160	160	160	160	160
Livestock	I	Sparta Aquifer | Anderson County	60	60	60	60	60	60

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Irrigation	I	Carrizo-Wilcox Aquifer | Anderson County	400	400	400	400	400	400
Irrigation	I	Neches Run-of-River	80	80	80	80	80	80
Irrigation	I	Queen City Aquifer | Anderson County	360	360	360	360	360	360
Anderson County / Trinity Basin WUG Total			**14,184**	**14,230**	**14,286**	**14,319**	**14,350**	**14,380**
Anderson County Cedar Creek WSC	I	Carrizo-Wilcox Aquifer | Anderson County	114	114	112	110	109	108
B B S WSC*	I	Carrizo-Wilcox Aquifer | Anderson County	138	137	135	133	132	130
B C Y WSC	I	Carrizo-Wilcox Aquifer | Anderson County	264	262	258	255	252	249
Brushy Creek WSC*	I	Carrizo-Wilcox Aquifer | Anderson County	142	141	140	138	136	134
Elkhart	I	Carrizo-Wilcox Aquifer | Anderson County	304	303	299	296	292	289
Four Pines WSC	I	Carrizo-Wilcox Aquifer | Anderson County	298	296	293	290	287	284
Norwood WSC	I	Carrizo-Wilcox Aquifer | Anderson County	10	10	9	9	9	9
Palestine	I	Carrizo-Wilcox Aquifer | Anderson County	356	356	356	356	356	356
Palestine	I	Palestine Lake/Reservoir	2,774	2,774	2,774	2,774	2,774	2,774
Pleasant Springs WSC	I	Carrizo-Wilcox Aquifer | Anderson County	176	176	176	176	176	176
Pleasant Springs WSC	I	Palestine Lake/Reservoir	121	121	121	121	121	121
Slocum WSC	I	Carrizo-Wilcox Aquifer | Anderson County	26	26	25	25	25	24
TDCJ Beto Gurney & Powledge Units	I	Carrizo-Wilcox Aquifer | Anderson County	1,742	1,738	1,738	1,738	1,738	1,738
TDCJ Coffield Michael	I	Carrizo-Wilcox Aquifer | Anderson County	3,469	3,465	3,465	3,465	3,465	3,465
The Consolidated WSC	I	Houston County Lake/Reservoir	477	529	592	630	663	695
Tucker WSC	I	Carrizo-Wilcox Aquifer | Anderson County	130	130	128	126	124	122
Walston Springs WSC	I	Carrizo-Wilcox Aquifer | Anderson County	127	136	148	161	174	189

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
County-Other	I	Other Aquifer | Anderson County	173	173	173	173	173	173
County-Other	I	Palestine Lake/Reservoir	31	31	31	31	31	31
County-Other	I	Queen City Aquifer | Anderson County	747	747	748	747	748	748
County-Other	I	Sparta Aquifer | Anderson County	165	165	165	165	165	165
Mining	I	Other Aquifer | Anderson County	34	34	34	34	34	34
Steam Electric Power		No water supply associated with WUG	0	0	0	0	0	0
Livestock	I	Carrizo-Wilcox Aquifer | Anderson County	33	33	33	33	33	33
Livestock	I	Local Surface Water Supply	848	848	848	848	848	848
Livestock	I	Queen City Aquifer | Anderson County	64	64	64	64	64	64
Irrigation	I	Carrizo-Wilcox Aquifer | Anderson County	92	92	92	92	92	92
Irrigation	I	Queen City Aquifer | Anderson County	39	39	39	39	39	39
Irrigation	I	Trinity Run-of-River	1,290	1,290	1,290	1,290	1,290	1,290
Angelina County WUG Total			**19,365**	**19,542**	**19,654**	**19,784**	**19,914**	**20,047**
Angelina County / Neches Basin WUG Total			**19,365**	**19,542**	**19,654**	**19,784**	**19,914**	**20,047**
Angelina WSC	I	Other Aquifer | Angelina County	355	359	361	365	368	372
Central WCID of Angelina County	I	Carrizo-Wilcox Aquifer | Angelina County	620	631	637	643	650	656
Diboll	I	Carrizo-Wilcox Aquifer | Angelina County	1,806	1,806	1,806	1,806	1,806	1,806
Diboll	I	Yegua-Jackson Aquifer | Angelina County	520	520	520	520	520	520
Four Way SUD	I	Yegua-Jackson Aquifer | Angelina County	435	439	443	447	451	455
Hudson WSC	I	Carrizo-Wilcox Aquifer | Angelina County	1,003	1,020	1,028	1,038	1,047	1,057
Huntington	I	Carrizo-Wilcox Aquifer | Angelina County	448	448	448	448	448	448
Huntington	I	Yegua-Jackson Aquifer | Angelina County	261	264	266	269	271	274

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Lufkin	I	Carrizo-Wilcox Aquifer | Angelina County	4,144	4,119	4,093	4,066	4,038	4,010
Lufkin	I	Kurth Lake/Reservoir	2,448	2,555	2,633	2,726	2,819	2,912
Lufkin	I	Sam Rayburn-Steinhagen Lake/Reservoir System	0	0	0	0	0	0
M & M WSC	I	Carrizo-Wilcox Aquifer | Angelina County	260	262	264	267	269	272
Pollok-Redtown WSC	I	Carrizo-Wilcox Aquifer | Angelina County	197	199	200	202	204	206
Redland WSC	I	Carrizo-Wilcox Aquifer | Angelina County	508	510	512	514	516	518
Upper Jasper County Water Authority	I	Carrizo-Wilcox Aquifer | Angelina County	29	29	29	29	29	29
Woodlawn WSC	I	Carrizo-Wilcox Aquifer | Angelina County	242	245	246	249	251	254
Zavalla	I	Yegua-Jackson Aquifer | Angelina County	102	103	104	104	105	107
County-Other	I	Carrizo-Wilcox Aquifer | Angelina County	211	213	216	218	220	222
County-Other	I	Other Aquifer | Angelina County	0	0	0	0	0	0
County-Other	I	Sparta Aquifer | Angelina County	50	51	52	52	53	53
County-Other	I	Yegua-Jackson Aquifer | Angelina County	277	281	284	286	289	292
Manufacturing	I	Carrizo-Wilcox Aquifer | Angelina County	807	832	858	885	913	941
Manufacturing	I	Kurth Lake/Reservoir	293	311	311	311	311	311
Manufacturing	I	Other Aquifer | Angelina County	457	453	451	447	444	440
Manufacturing	I	Yegua-Jackson Aquifer | Angelina County	1,754	1,754	1,754	1,754	1,754	1,754
Mining	I	Other Aquifer | Angelina County	0	0	0	0	0	0
Livestock	I	Carrizo-Wilcox Aquifer | Angelina County	128	128	128	128	128	128
Livestock	I	Local Surface Water Supply	661	661	661	661	661	661
Livestock	I	Sparta Aquifer | Angelina County	73	73	73	73	73	73

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Livestock	I	Yegua-Jackson Aquifer | Angelina County	166	166	166	166	166	166
Irrigation	I	Kurth Lake/Reservoir	779	779	779	779	779	779
Irrigation	I	Yegua-Jackson Aquifer | Angelina County	331	331	331	331	331	331
Cherokee County WUG Total			**10,563**	**10,443**	**10,269**	**10,177**	**10,051**	**9,915**
Cherokee County / Neches Basin WUG Total			**10,563**	**10,443**	**10,269**	**10,177**	**10,051**	**9,915**
Afton Grove WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	64	66	68	69	71	74
Afton Grove WSC	I	Jacksonville Lake/Reservoir	150	153	157	162	167	171
Alto	I	Carrizo-Wilcox Aquifer | Cherokee County	218	215	211	206	202	197
Alto Rural WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	817	817	817	817	817	817
Blackjack WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	102	100	98	96	94	92
Bullard	I	Carrizo-Wilcox Aquifer | Cherokee County	103	106	109	111	113	116
Bullard	I	Jacksonville Lake/Reservoir	62	72	78	84	90	95
Craft Turney WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	191	188	184	180	176	172
Craft Turney WSC	I	Jacksonville Lake/Reservoir	444	438	429	420	410	400
Gum Creek WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	31	30	30	29	29	28
Gum Creek WSC	I	Jacksonville Lake/Reservoir	72	71	69	68	66	64
Jacksonville	I	Carrizo-Wilcox Aquifer | Cherokee County	773	763	748	733	717	702
Jacksonville	I	Jacksonville Lake/Reservoir	1,803	1,778	1,746	1,709	1,673	1,636
New Summerfield	I	Carrizo-Wilcox Aquifer | Cherokee County	113	111	109	106	104	101
North Cherokee WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	142	140	137	134	131	128
North Cherokee WSC	I	Jacksonville Lake/Reservoir	330	325	319	312	305	297

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year) 2030	2040	2050	2060	2070	2080
Pollok-Redtown WSC	I	Carrizo-Wilcox Aquifer | Angelina County	8	8	8	8	8	7
Rusk	I	Carrizo-Wilcox Aquifer | Cherokee County	845	846	848	849	853	858
Rusk	I	Rusk City Lake/Reservoir	10	10	10	10	10	10
Rusk Rural WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	331	326	321	315	310	304
South Rusk County WSC	I	Carrizo-Wilcox Aquifer | Rusk County	5	5	5	5	4	4
Southern Utilities*	I	Carrizo-Wilcox Aquifer | Cherokee County	22	21	21	21	20	20
Southern Utilities*	I	Carrizo-Wilcox Aquifer | Smith County	679	626	544	560	544	516
Troup	I	Carrizo-Wilcox Aquifer | Smith County	11	11	11	11	11	10
Walnut Grove WSC	I	Carrizo-Wilcox Aquifer | Smith County	6	5	5	5	4	4
Walnut Grove WSC	I	Palestine Lake/Reservoir	6	6	5	5	5	4
Walnut Grove WSC	I	Tyler Lake/Reservoir	6	5	5	5	4	4
Wells	I	Carrizo-Wilcox Aquifer | Cherokee County	124	130	138	146	155	164
West Jacksonville WSC	I	Carrizo-Wilcox Aquifer | Cherokee County	231	227	222	218	213	208
Wright City WSC	I	Carrizo-Wilcox Aquifer | Smith County	47	46	46	45	43	43
County-Other	I	Carrizo-Wilcox Aquifer | Cherokee County	238	202	160	114	63	10
County-Other	I	Other Aquifer | Cherokee County	0	0	0	0	0	0
County-Other	I	Queen City Aquifer | Cherokee County	160	136	108	77	43	6
County-Other	I	Sparta Aquifer | Cherokee County	37	32	25	18	10	1
Manufacturing	I	Carrizo-Wilcox Aquifer | Cherokee County	25	26	26	27	28	29
Manufacturing	I	Jacksonville Lake/Reservoir	57	59	62	64	66	68
Mining	I	Local Surface Water Supply	58	58	58	58	58	58
Mining	I	Other Aquifer | Cherokee County	129	129	129	129	129	129

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Steam Electric Power	I	Striker Lake/Reservoir	431	474	521	573	630	693
Livestock	I	Carrizo-Wilcox Aquifer | Cherokee County	168	168	168	168	168	168
Livestock	I	Local Surface Water Supply	853	853	853	853	853	853
Livestock	I	Queen City Aquifer | Cherokee County	210	210	210	210	210	210
Irrigation	I	Carrizo-Wilcox Aquifer | Cherokee County	170	170	170	170	170	170
Irrigation	I	Neches Run-of-River	58	58	58	58	58	58
Irrigation	I	Palestine Lake/Reservoir	41	36	32	28	25	25
Irrigation	I	Queen City Aquifer | Cherokee County	182	187	191	191	191	191
Hardin County WUG Total			**9,669**	**10,450**	**11,186**	**11,130**	**11,080**	**11,038**
Hardin County / Neches Basin WUG Total			**9,642**	**10,423**	**11,159**	**11,104**	**11,054**	**11,012**
Hardin County WCID 1	I	Gulf Coast Aquifer System | Hardin County	130	131	134	136	139	141
Kountze	I	Gulf Coast Aquifer System | Hardin County	248	245	242	237	231	226
Lumberton MUD	I	Gulf Coast Aquifer System | Hardin County	3,329	4,054	4,727	4,617	4,508	4,401
North Hardin WSC	I	Gulf Coast Aquifer System | Hardin County	539	553	568	583	598	614
Silsbee	I	Gulf Coast Aquifer System | Hardin County	1,001	1,051	1,109	1,171	1,236	1,305
Sour Lake	I	Gulf Coast Aquifer System | Hardin County	296	293	289	282	276	269
West Hardin WSC*	I	Gulf Coast Aquifer System | Hardin County	385	383	378	369	360	352
Wildwood POA	I	Gulf Coast Aquifer System | Hardin County	118	117	116	113	110	108
County-Other	I	Gulf Coast Aquifer System | Hardin County	2,105	2,105	2,105	2,105	2,105	2,105
Manufacturing	I	Gulf Coast Aquifer System | Hardin County	243	243	243	243	243	243
Mining	I	Gulf Coast Aquifer System | Hardin County	13	13	13	13	13	13
Steam Electric Power	I	Gulf Coast Aquifer System | Hardin County	1	1	1	1	1	1

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Livestock	I	Gulf Coast Aquifer System | Hardin County	61	61	61	61	61	61
Livestock	I	Local Surface Water Supply	184	184	184	184	184	184
Irrigation	I	Gulf Coast Aquifer System | Hardin County	935	935	935	935	935	935
Irrigation	I	Neches Run-of-River	54	54	54	54	54	54
Hardin County / Trinity Basin WUG Total			**27**	**27**	**27**	**26**	**26**	**26**
Lake Livingston WSC*	I	Gulf Coast Aquifer System | Hardin County	10	10	10	9	9	9
County-Other	I	Gulf Coast Aquifer System | Hardin County	16	16	16	16	16	16
Livestock	I	Gulf Coast Aquifer System | Hardin County	1	1	1	1	1	1
Henderson County WUG Total			**9,329**	**9,309**	**8,751**	**8,326**	**7,955**	**7,762**
Henderson County / Neches Basin WUG Total			**9,329**	**9,309**	**8,751**	**8,326**	**7,955**	**7,762**
Athens*	I	Athens Lake/Reservoir	9	15	18	18	17	16
Athens*	C	Carrizo-Wilcox Aquifer | Henderson County	19	15	0	0	0	0
Athens*	I	Carrizo-Wilcox Aquifer | Henderson County	14	12	9	7	6	6
Berryville	I	Carrizo-Wilcox Aquifer | Henderson County	95	90	97	98	99	99
Bethel Ash WSC*	I	Carrizo-Wilcox Aquifer | Henderson County	269	270	281	285	290	294
Brownsboro	I	Carrizo-Wilcox Aquifer | Henderson County	246	267	263	271	279	288
Brushy Creek WSC*	I	Carrizo-Wilcox Aquifer | Anderson County	5	5	5	5	5	5
Chandler	I	Carrizo-Wilcox Aquifer | Henderson County	676	831	980	980	980	980
Edom WSC*	D	Carrizo-Wilcox Aquifer | Van Zandt County	14	14	14	14	13	13
Frankston	I	Carrizo-Wilcox Aquifer | Anderson County	7	8	8	8	9	9
Leagueville WSC	I	Carrizo-Wilcox Aquifer | Henderson County	229	242	242	249	255	262
Moore Station WSC	I	Carrizo-Wilcox Aquifer | Henderson County	382	412	408	420	433	445

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Murchison	I	Carrizo-Wilcox Aquifer | Henderson County	110	108	114	115	116	118
R P M WSC*	D	Carrizo-Wilcox Aquifer | Van Zandt County	28	27	26	25	24	25
R P M WSC*	D	Queen City Aquifer | Van Zandt County	35	35	36	36	36	36
Virginia Hill WSC*	I	Carrizo-Wilcox Aquifer | Henderson County	202	208	212	217	221	226
County-Other*	I	Carrizo-Wilcox Aquifer | Henderson County	125	80	46	33	20	9
County-Other*	I	Other Aquifer | Henderson County	539	539	539	539	539	539
County-Other*	I	Queen City Aquifer | Henderson County	660	660	660	660	660	660
Mining*	I	Carrizo-Wilcox Aquifer | Henderson County	27	20	13	13	12	10
Mining*	I	Other Aquifer | Henderson County	120	120	120	120	120	120
Steam Electric Power*		No water supply associated with WUG	0	0	0	0	0	0
Livestock*	I	Athens Lake/Reservoir	3,023	3,023	2,516	2,126	1,789	1,615
Livestock*	I	Carrizo-Wilcox Aquifer | Henderson County	506	346	220	184	149	112
Livestock*	I	Local Surface Water Supply	632	632	632	632	632	632
Livestock*	I	Queen City Aquifer | Henderson County	419	419	419	419	419	419
Irrigation*	I	Athens Lake/Reservoir	85	90	79	70	62	59
Irrigation*	I	Carrizo-Wilcox Aquifer | Henderson County	73	50	32	27	21	16
Irrigation*	I	Palestine Lake/Reservoir	82	73	64	57	51	51
Irrigation*	I	Queen City Aquifer | Henderson County	698	698	698	698	698	698
Houston County WUG Total			**9,826**	**9,723**	**9,582**	**9,475**	**9,370**	**9,276**
Houston County / Neches Basin WUG Total			**1,769**	**1,646**	**1,505**	**1,371**	**1,256**	**1,159**
Grapeland	I	Carrizo-Wilcox Aquifer | Houston County	94	94	98	98	98	100
Grapeland	I	Houston County Lake/Reservoir	0	0	0	0	0	0

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Pennington WSC*	I	Yegua-Jackson Aquifer | Houston County	12	11	9	9	8	7
Pennington WSC*	I	Yegua-Jackson Aquifer | Trinity County	13	11	10	9	8	8
The Consolidated WSC	I	Carrizo-Wilcox Aquifer | Houston County	0	1	2	3	3	4
The Consolidated WSC	I	Houston County Lake/Reservoir	30	30	30	30	30	30
County-Other	I	Carrizo-Wilcox Aquifer | Houston County	48	34	25	16	8	0
County-Other	I	Other Aquifer | Houston County	0	0	0	0	0	0
County-Other	I	Queen City Aquifer | Houston County	67	48	34	20	10	0
County-Other	I	Sparta Aquifer | Houston County	155	110	78	48	22	0
County-Other	I	Yegua-Jackson Aquifer | Houston County	343	300	212	130	61	1
Manufacturing	I	Carrizo-Wilcox Aquifer | Houston County	2	2	2	2	2	2
Manufacturing	I	Houston County Lake/Reservoir	11	11	11	12	12	13
Livestock	I	Local Surface Water Supply	473	473	473	473	473	473
Livestock	I	Queen City Aquifer | Houston County	38	38	38	38	38	38
Irrigation	I	Neches Run-of-River	26	26	26	26	26	26
Irrigation	I	Trinity Run-of-River	457	457	457	457	457	457
Houston County / Trinity Basin WUG Total			**8,057**	**8,077**	**8,077**	**8,104**	**8,114**	**8,117**
Crockett	I	Carrizo-Wilcox Aquifer | Houston County	210	210	210	210	210	210
Crockett	I	Houston County Lake/Reservoir	1,080	1,014	915	888	852	809
Grapeland	I	Carrizo-Wilcox Aquifer | Houston County	136	138	142	144	146	148
Lovelady	I	Houston County Lake/Reservoir	109	105	100	98	96	94
Lovelady	I	Yegua-Jackson Aquifer | Houston County	133	133	133	133	133	133

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Pennington WSC*	I	Yegua-Jackson Aquifer | Houston County	23	21	18	17	16	14
Pennington WSC*	I	Yegua-Jackson Aquifer | Trinity County	23	21	17	17	15	14
TDCJ Eastham Unit	I	Sparta Aquifer | Houston County	977	977	977	977	977	977
The Consolidated WSC	I	Carrizo-Wilcox Aquifer | Houston County	0	93	204	263	313	362
The Consolidated WSC	I	Houston County Lake/Reservoir	1,281	1,281	1,281	1,281	1,281	1,281
County-Other	I	Carrizo-Wilcox Aquifer | Houston County	4	3	2	1	0	0
County-Other	I	Other Aquifer | Houston County	0	0	0	0	0	0
County-Other	I	Queen City Aquifer | Houston County	5	4	3	2	1	0
County-Other	I	Sparta Aquifer | Houston County	12	9	6	4	2	0
County-Other	I	Yegua-Jackson Aquifer | Houston County	27	24	17	10	5	0
Manufacturing	I	Carrizo-Wilcox Aquifer | Houston County	2	2	2	2	2	2
Manufacturing	I	Houston County Lake/Reservoir	190	197	205	212	220	228
Mining	I	Other Aquifer | Houston County	245	245	245	245	245	245
Livestock	I	Local Surface Water Supply	1,318	1,318	1,318	1,318	1,318	1,318
Livestock	I	Queen City Aquifer | Houston County	96	96	96	96	96	96
Irrigation	I	Neches Run-of-River	121	121	121	121	121	121
Irrigation	I	Trinity Run-of-River	2,065	2,065	2,065	2,065	2,065	2,065
Jasper County WUG Total			**72,591**	**72,360**	**72,100**	**71,865**	**71,637**	**71,415**
Jasper County / Neches Basin WUG Total			**66,366**	**66,198**	**65,999**	**65,816**	**65,632**	**65,445**
Brookeland FWSD	I	Gulf Coast Aquifer System | Jasper County	24	22	21	20	18	17
Brookeland FWSD	I	Yegua-Jackson Aquifer | Jasper County	21	20	19	17	17	15
Jasper	I	Gulf Coast Aquifer System | Jasper County	1,768	1,681	1,579	1,489	1,398	1,310

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Rayburn Country MUD	I	Yegua-Jackson Aquifer | Jasper County	278	264	247	231	216	201
Rural WSC	I	Gulf Coast Aquifer System | Jasper County	106	100	94	88	82	76
South Jasper County WSC	I	Gulf Coast Aquifer System | Jasper County	55	52	48	45	42	39
Upper Jasper County Water Authority	I	Gulf Coast Aquifer System | Jasper County	312	295	276	259	242	224
County-Other	I	Gulf Coast Aquifer System | Jasper County	622	584	535	487	437	383
Manufacturing	I	Gulf Coast Aquifer System | Jasper County	46,485	46,485	46,485	46,485	46,485	46,485
Manufacturing	I	Neches Run-of-River	557	557	557	557	557	557
Manufacturing	I	Sam Rayburn-Steinhagen Lake/Reservoir System	10,171	10,171	10,171	10,171	10,171	10,171
Mining	I	Gulf Coast Aquifer System | Jasper County	28	28	28	28	28	28
Livestock	I	Local Surface Water Supply	118	118	118	118	118	118
Livestock	I	Sam Rayburn-Steinhagen Lake/Reservoir System	5,630	5,630	5,630	5,630	5,630	5,630
Irrigation	I	Gulf Coast Aquifer System | Jasper County	132	132	132	132	132	132
Irrigation	I	Neches Run-of-River	59	59	59	59	59	59
Jasper County / Sabine Basin WUG Total			**6,225**	**6,162**	**6,101**	**6,049**	**6,005**	**5,970**
Jasper	I	Gulf Coast Aquifer System | Jasper County	9	8	8	7	7	6
Jasper County WCID 1	I	Gulf Coast Aquifer System | Jasper County	208	206	207	209	215	225
Kirbyville	I	Gulf Coast Aquifer System | Jasper County	407	404	406	412	424	443
Mauriceville SUD	I	Gulf Coast Aquifer System | Orange County	10	10	10	10	9	9
South Jasper County WSC	I	Gulf Coast Aquifer System | Jasper County	160	151	142	133	124	115
South Kirbyville Rural WSC	I	Gulf Coast Aquifer System | Jasper County	90	93	97	102	109	118
Upper Jasper County Water Authority	I	Gulf Coast Aquifer System | Jasper County	107	101	94	88	82	77

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
County-Other	I	Gulf Coast Aquifer System | Jasper County	583	538	486	437	384	326
Livestock	I	Gulf Coast Aquifer System | Jasper County	76	76	76	76	76	76
Livestock	I	Local Surface Water Supply	93	93	93	93	93	93
Livestock	I	Sam Rayburn-Steinhagen Lake/Reservoir System	4,370	4,370	4,370	4,370	4,370	4,370
Irrigation	I	Gulf Coast Aquifer System | Jasper County	78	78	78	78	78	78
Irrigation	I	Neches Run-of-River	34	34	34	34	34	34
Jefferson County WUG Total			**436,950**	**442,167**	**443,449**	**443,451**	**443,456**	**443,470**
Jefferson County / Neches Basin WUG Total			**101,790**	**103,973**	**104,459**	**104,621**	**104,787**	**104,952**
Beaumont	I	Gulf Coast Aquifer System | Jefferson County	2,659	2,659	2,659	2,659	2,659	2,659
Beaumont	I	Neches Run-of-River	3,054	3,146	3,226	3,122	3,074	3,069
Beaumont	I	Sam Rayburn-Steinhagen Lake/Reservoir System	3,525	3,657	3,839	3,816	3,739	3,621
Bevil Oaks	I	Gulf Coast Aquifer System | Jefferson County	99	100	100	98	97	96
China	I	Gulf Coast Aquifer System | Jefferson County	2	2	2	2	2	2
Groves	I	Sam Rayburn-Steinhagen Lake/Reservoir System	71	70	70	70	70	70
Jefferson County WCID 10	I	Sam Rayburn-Steinhagen Lake/Reservoir System	88	88	88	87	86	85
Meeker MWD	I	Gulf Coast Aquifer System | Jefferson County	102	103	102	101	100	99
Meeker MWD	I	Neches Run-of-River	1	1	1	1	1	1
Nederland	I	Sam Rayburn-Steinhagen Lake/Reservoir System	83	83	83	82	81	80
Nome	I	Sam Rayburn-Steinhagen Lake/Reservoir System	101	101	101	100	99	97
Port Neches	I	Sam Rayburn-Steinhagen Lake/Reservoir System	794	797	795	785	775	766
County-Other	I	Gulf Coast Aquifer System | Jefferson County	241	241	241	241	241	241
County-Other	I	Neches Run-of-River	47	48	47	47	47	47
County-Other	I	Sam Rayburn-Steinhagen Lake/Reservoir System	5	5	5	5	5	5

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Manufacturing	I	Gulf Coast Aquifer System | Hardin County	10	10	10	10	10	10
Manufacturing	I	Gulf Coast Aquifer System | Jefferson County	136	136	136	136	136	136
Manufacturing	I	Neches Run-of-River	22,839	22,915	22,988	23,053	23,127	23,208
Manufacturing	I	Sabine Run-of-River	582	582	582	582	582	582
Manufacturing	I	Sam Rayburn-Steinhagen Lake/Reservoir System	52,887	54,765	54,920	55,160	55,392	55,614
Livestock	I	Gulf Coast Aquifer System | Jefferson County	43	43	43	43	43	43
Livestock	I	Local Surface Water Supply	64	64	64	64	64	64
Irrigation	I	Gulf Coast Aquifer System | Jefferson County	53	53	53	53	53	53
Irrigation	I	Neches Run-of-River	9,800	9,800	9,800	9,800	9,800	9,800
Irrigation	I	Neches-Trinity Indirect Reuse	958	958	958	958	958	958
Irrigation	I	Neches-Trinity Run-of-River	3,546	3,546	3,546	3,546	3,546	3,546
Jefferson County / Neches-Trinity Basin WUG Total			**335,160**	**338,194**	**338,990**	**338,830**	**338,669**	**338,518**
Beaumont	I	Gulf Coast Aquifer System | Jefferson County	5,810	5,810	5,810	5,810	5,810	5,810
Beaumont	I	Neches Run-of-River	6,671	6,871	7,045	6,821	6,715	6,703
Beaumont	I	Sam Rayburn-Steinhagen Lake/Reservoir System	7,700	7,991	8,388	8,337	8,170	7,912
China	I	Gulf Coast Aquifer System | Jefferson County	176	177	177	174	172	170
Federal Correctional Complex Beaumont	I	Neches Run-of-River	613	610	610	610	610	610
Groves	I	Sam Rayburn-Steinhagen Lake/Reservoir System	2,218	2,209	2,209	2,209	2,209	2,209
Jefferson County WCID 10	I	Sam Rayburn-Steinhagen Lake/Reservoir System	509	512	510	504	498	492
Meeker MWD	I	Gulf Coast Aquifer System | Jefferson County	279	280	279	276	272	269
Meeker MWD	I	Neches Run-of-River	3	3	3	3	3	3
Nederland	I	Sam Rayburn-Steinhagen Lake/Reservoir System	2,339	2,350	2,344	2,315	2,287	2,260
Nome	I	Sam Rayburn-Steinhagen Lake/Reservoir System	44	45	44	44	43	43

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Port Arthur	I	Sam Rayburn-Steinhagen Lake/Reservoir System	18,309	18,454	18,405	18,183	17,964	17,748
Port Neches	I	Sam Rayburn-Steinhagen Lake/Reservoir System	764	767	765	756	747	738
Trinity Bay Conservation District*	I	Sam Rayburn-Steinhagen Lake/Reservoir System	18	17	16	15	14	13
Trinity Bay Conservation District*	H	Trinity Run-of-River	27	25	23	22	20	19
West Jefferson County MWD	I	Sam Rayburn-Steinhagen Lake/Reservoir System	929	928	936	948	960	972
County-Other	I	Gulf Coast Aquifer System | Jefferson County	1,863	1,863	1,863	1,863	1,863	1,863
County-Other	I	Neches Run-of-River	877	876	877	877	877	877
County-Other	I	Sam Rayburn-Steinhagen Lake/Reservoir System	105	105	105	105	105	105
Manufacturing	I	Gulf Coast Aquifer System | Hardin County	10	10	10	10	10	10
Manufacturing	I	Gulf Coast Aquifer System | Jefferson County	28	28	28	28	28	28
Manufacturing	I	Neches Run-of-River	27,997	28,090	28,180	28,261	28,350	28,451
Manufacturing	I	Sabine Run-of-River	538	538	538	538	538	538
Manufacturing	I	Sam Rayburn-Steinhagen Lake/Reservoir System	64,831	67,133	67,323	67,619	67,902	68,173
Mining	I	Gulf Coast Aquifer System | Jefferson County	288	288	288	288	288	288
Mining	I	Local Surface Water Supply	109	109	109	109	109	109
Mining	I	Neches-Trinity Run-of-River	34	34	34	34	34	34
Livestock	I	Gulf Coast Aquifer System | Jefferson County	596	596	596	596	596	596
Livestock	I	Local Surface Water Supply	736	736	736	736	736	736
Irrigation	I	Gulf Coast Aquifer System | Jefferson County	702	702	702	702	702	702
Irrigation	I	Neches Run-of-River	130,200	130,200	130,200	130,200	130,200	130,200
Irrigation	I	Neches-Trinity Indirect Reuse	12,729	12,729	12,729	12,729	12,729	12,729

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Irrigation	I	Neches-Trinity Run-of-River	47,108	47,108	47,108	47,108	47,108	47,108
Nacogdoches County WUG Total			**39,369**	**39,953**	**40,562**	**41,390**	**42,235**	**43,093**
Nacogdoches County / Neches Basin WUG Total			**39,369**	**39,953**	**40,562**	**41,390**	**42,235**	**43,093**
Appleby WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	1,070	1,102	1,134	1,187	1,240	1,291
Appleby WSC	I	Nacogdoches Lake/Reservoir	64	63	63	62	62	61
Caro WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	372	383	394	413	431	449
Cushing	I	Carrizo-Wilcox Aquifer | Nacogdoches County	139	144	148	155	162	168
D & M WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	876	878	879	881	882	884
D & M WSC	I	Nacogdoches Lake/Reservoir	178	176	175	173	172	170
Etoile WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	337	347	357	374	391	407
Garrison	I	Carrizo-Wilcox Aquifer | Nacogdoches County	259	266	273	284	295	305
Lilly Grove SUD	I	Carrizo-Wilcox Aquifer | Nacogdoches County	500	514	529	554	578	602
Melrose WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	827	851	875	916	956	994
Melrose WSC	I	Nacogdoches Lake/Reservoir	25	25	25	25	25	24
Nacogdoches	I	Carrizo-Wilcox Aquifer | Nacogdoches County	2,313	2,415	2,522	2,665	2,813	2,967
Nacogdoches	I	Nacogdoches Lake/Reservoir	5,108	5,199	5,287	5,439	5,584	5,723
Swift WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	422	434	446	468	489	509
Woden WSC	I	Carrizo-Wilcox Aquifer | Nacogdoches County	262	269	276	289	302	315
Woden WSC	I	Nacogdoches Lake/Reservoir	0	0	0	0	0	0
County-Other	I	Carrizo-Wilcox Aquifer | Nacogdoches County	75	89	107	137	167	196
County-Other	I	Nacogdoches Lake/Reservoir	46	46	45	45	45	44

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
County-Other	I	Other Aquifer | Nacogdoches County	79	79	79	79	79	79
County-Other	I	Queen City Aquifer | Nacogdoches County	221	221	221	221	221	221
County-Other	I	Sparta Aquifer | Nacogdoches County	156	156	156	156	156	156
County-Other	I	Yegua-Jackson Aquifer | Nacogdoches County	26	26	26	26	26	26
Manufacturing	I	Carrizo-Wilcox Aquifer | Nacogdoches County	902	951	1,004	1,061	1,120	1,184
Manufacturing	I	Nacogdoches Lake/Reservoir	1,990	2,048	2,106	2,164	2,224	2,284
Manufacturing	I	Sam Rayburn-Steinhagen Lake/Reservoir System	10,000	10,000	10,000	10,000	10,000	10,000
Mining	I	Local Surface Water Supply	1	1	1	1	1	1
Mining	I	Other Aquifer | Nacogdoches County	974	974	974	974	974	974
Steam Electric Power	I	Striker Lake/Reservoir	1,494	1,643	1,807	1,988	2,187	2,406
Livestock	I	Carrizo-Wilcox Aquifer | Nacogdoches County	851	851	851	851	851	851
Livestock	I	Local Surface Water Supply	8,913	8,913	8,913	8,913	8,913	8,913
Livestock	I	Other Aquifer | Nacogdoches County	78	78	78	78	78	78
Livestock	I	Queen City Aquifer | Nacogdoches County	310	310	310	310	310	310
Livestock	I	Sparta Aquifer | Nacogdoches County	156	156	156	156	156	156
Irrigation	I	Carrizo-Wilcox Aquifer | Nacogdoches County	266	266	266	266	266	266
Irrigation	I	Neches Run-of-River	79	79	79	79	79	79
Newton County WUG Total			**28,076**	**28,155**	**28,240**	**28,341**	**28,452**	**28,579**
Newton County / Sabine Basin WUG Total			**28,076**	**28,155**	**28,240**	**28,341**	**28,452**	**28,579**
Bon Wier WSC	I	Gulf Coast Aquifer System | Newton County	86	74	63	52	41	30
Brookeland FWSD	I	Gulf Coast Aquifer System | Newton County	61	55	49	43	37	32

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Mauriceville SUD	I	Gulf Coast Aquifer System | Orange County	31	31	30	27	23	20
Newton	I	Gulf Coast Aquifer System | Newton County	343	311	278	247	217	189
South Kirbyville Rural WSC	I	Gulf Coast Aquifer System | Jasper County	12	11	10	9	7	6
South Newton WSC	I	Gulf Coast Aquifer System | Newton County	233	211	187	165	143	122
County-Other	I	Gulf Coast Aquifer System | Newton County	693	618	543	474	407	340
Manufacturing	I	Gulf Coast Aquifer System | Newton County	394	394	394	394	394	394
Manufacturing	I	Sabine Run-of-River	5,746	5,973	6,209	6,453	6,706	6,969
Mining	I	Gulf Coast Aquifer System | Newton County	96	96	96	96	96	96
Mining	I	Local Surface Water Supply	78	78	78	78	78	78
Steam Electric Power	I	Sabine Run-of-River	19,603	19,603	19,603	19,603	19,603	19,603
Livestock	I	Gulf Coast Aquifer System | Newton County	105	105	105	105	105	105
Livestock	I	Local Surface Water Supply	157	157	157	157	157	157
Irrigation	I	Gulf Coast Aquifer System | Newton County	388	388	388	388	388	388
Irrigation	I	Sabine Run-of-River	50	50	50	50	50	50
Orange County WUG Total			**136,800**	**136,881**	**136,950**	**139,443**	**143,818**	**148,360**
Orange County / Neches Basin WUG Total			**12,805**	**12,648**	**12,585**	**12,649**	**12,758**	**12,866**
Bridge City	I	Gulf Coast Aquifer System | Orange County	221	236	238	245	252	257
Kelly G Brewer	I	Gulf Coast Aquifer System | Orange County	150	151	151	148	145	142
Mauriceville SUD	I	Gulf Coast Aquifer System | Orange County	69	73	76	76	76	76
Orange County WCID 1	I	Gulf Coast Aquifer System | Orange County	1,255	1,192	1,190	1,112	1,038	967
Orangefield WSC	I	Gulf Coast Aquifer System | Orange County	402	457	522	598	684	782
County-Other	I	Gulf Coast Aquifer System | Orange County	2,168	2,168	2,169	2,169	2,169	2,169

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
County-Other	I	Sabine Run-of-River	228	228	228	228	228	228
Manufacturing	I	Gulf Coast Aquifer System | Orange County	115	115	116	116	115	116
Manufacturing	I	Sabine Run-of-River	1,102	1,102	1,102	1,149	1,234	1,321
Manufacturing	I	Toledo Bend Lake/Reservoir	1,015	1,015	1,015	1,015	1,015	1,015
Mining	I	Gulf Coast Aquifer System | Orange County	101	101	101	101	101	101
Mining	I	Local Surface Water Supply	161	161	161	161	161	161
Steam Electric Power	I	Gulf Coast Aquifer System | Orange County	1,242	1,073	940	955	964	955
Steam Electric Power	I	Sabine Run-of-River	4,481	4,481	4,481	4,481	4,481	4,481
Livestock	I	Gulf Coast Aquifer System | Orange County	69	69	69	69	69	69
Livestock	I	Local Surface Water Supply	26	26	26	26	26	26
Orange County / Neches-Trinity Basin WUG Total			**144**	**153**	**153**	**158**	**162**	**165**
Bridge City	I	Gulf Coast Aquifer System | Orange County	139	148	149	154	158	161
County-Other	I	Gulf Coast Aquifer System | Orange County	2	2	1	1	1	1
Livestock	I	Gulf Coast Aquifer System | Orange County	1	1	1	1	1	1
Livestock	I	Local Surface Water Supply	2	2	2	2	2	2
Orange County / Sabine Basin WUG Total			**123,851**	**124,080**	**124,212**	**126,636**	**130,898**	**135,329**
Bridge City	I	Gulf Coast Aquifer System | Orange County	911	974	983	1,010	1,036	1,061
Kelly G Brewer	I	Gulf Coast Aquifer System | Orange County	165	166	167	163	160	156
Mauriceville SUD	I	Gulf Coast Aquifer System | Orange County	656	694	715	722	719	713
Orange	I	Gulf Coast Aquifer System | Orange County	3,522	3,582	3,598	3,561	3,525	3,489
Orange County WCID 1	I	Gulf Coast Aquifer System | Orange County	201	191	190	178	166	155

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Orange County WCID 2	I	Gulf Coast Aquifer System | Orange County	456	452	452	439	425	412
Orangefield WSC	I	Gulf Coast Aquifer System | Orange County	515	586	671	767	877	1,004
Pinehurst	I	Gulf Coast Aquifer System | Orange County	346	352	353	350	346	342
South Newton WSC	I	Gulf Coast Aquifer System | Orange County	188	192	193	191	189	187
County-Other	I	Gulf Coast Aquifer System | Orange County	3,050	3,050	3,050	3,050	3,050	3,050
Manufacturing	I	Gulf Coast Aquifer System | Orange County	5,750	5,750	5,749	5,749	5,750	5,749
Manufacturing	I	Sabine Run-of-River	54,859	54,859	54,859	57,224	61,423	65,779
Manufacturing	I	Toledo Bend Lake/Reservoir	50,536	50,536	50,536	50,536	50,536	50,536
Livestock	I	Gulf Coast Aquifer System | Orange County	181	181	181	181	181	181
Livestock	I	Local Surface Water Supply	70	70	70	70	70	70
Irrigation	I	Direct Reuse	15	15	15	15	15	15
Irrigation	I	Sabine Run-of-River	2,430	2,430	2,430	2,430	2,430	2,430
Panola County WUG Total			**15,757**	**15,805**	**15,827**	**15,844**	**15,844**	**15,864**
Panola County / Cypress Basin WUG Total			**8**	**7**	**6**	**5**	**5**	**5**
Panola-Bethany WSC*	I	Carrizo-Wilcox Aquifer | Panola County	8	7	6	5	5	5
County-Other		No water supply associated with WUG	0	0	0	0	0	0
Panola County / Sabine Basin WUG Total			**15,749**	**15,798**	**15,821**	**15,839**	**15,839**	**15,859**
Beckville	I	Carrizo-Wilcox Aquifer | Panola County	87	77	69	62	56	51
Carthage	I	Carrizo-Wilcox Aquifer | Panola County	49	48	48	47	46	45
Carthage	I	Murvaul Lake/Reservoir	1,600	1,584	1,561	1,531	1,503	1,475
Clayton WSC	I	Carrizo-Wilcox Aquifer | Panola County	198	222	252	266	281	296
Clayton WSC	I	Murvaul Lake/Reservoir	59	59	59	59	59	59
Deberry WSC	I	Carrizo-Wilcox Aquifer | Panola County	94	82	68	59	50	40

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Elysian Fields WSC*		No water supply associated with WUG	0	0	0	0	0	0
Gill WSC*	D	Carrizo-Wilcox Aquifer | Harrison County	126	126	126	126	126	126
Gill WSC*	D	O' the Pines Lake/Reservoir	33	33	33	33	33	33
Hollands Quarter WSC	I	Carrizo-Wilcox Aquifer | Panola County	71	65	58	53	48	43
Hollands Quarter WSC	I	Murvaul Lake/Reservoir	53	53	53	53	53	53
Minden Brachfield WSC	I	Carrizo-Wilcox Aquifer | Rusk County	13	15	19	20	22	24
Panola-Bethany WSC*	I	Carrizo-Wilcox Aquifer | Panola County	133	118	106	96	86	79
Rehobeth WSC	I	Murvaul Lake/Reservoir	88	79	68	61	54	47
Tatum	I	Carrizo-Wilcox Aquifer | Rusk County	33	25	20	15	11	9
County-Other	I	Carrizo-Wilcox Aquifer | Panola County	973	931	877	837	796	754
County-Other	I	Murvaul Lake/Reservoir	100	100	100	100	100	100
Manufacturing	I	Carrizo-Wilcox Aquifer | Panola County	128	137	147	156	166	177
Manufacturing	I	Murvaul Lake/Reservoir	1,056	1,095	1,135	1,178	1,222	1,267
Manufacturing	I	Sabine Run-of-River	114	114	114	114	114	114
Mining	I	Carrizo-Wilcox Aquifer | Panola County	1,189	1,240	1,288	1,332	1,370	1,406
Mining	I	Murvaul Lake/Reservoir	1,368	1,386	1,386	1,386	1,368	1,368
Mining	I	Sabine Run-of-River	168	168	168	168	168	168
Mining	I	Toledo Bend Lake/Reservoir	3,756	3,756	3,756	3,756	3,756	3,756
Livestock	I	Carrizo-Wilcox Aquifer | Panola County	595	620	645	666	686	704
Livestock	I	Local Surface Water Supply	2,596	2,596	2,596	2,596	2,596	2,596
Irrigation	I	Carrizo-Wilcox Aquifer | Panola County	917	917	917	917	917	917
Irrigation	I	Sabine Run-of-River	152	152	152	152	152	152

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Polk County WUG Total			**2,374**	**2,471**	**2,557**	**2,642**	**2,725**	**2,805**
Polk County / Neches Basin WUG Total			**2,374**	**2,471**	**2,557**	**2,642**	**2,725**	**2,805**
Chester WSC	I	Gulf Coast Aquifer System | Tyler County	49	53	55	57	59	61
Corrigan	I	Gulf Coast Aquifer System | Polk County	238	255	264	274	283	293
Damascus-Stryker WSC	I	Yegua-Jackson Aquifer | Polk County	188	202	210	218	226	234
Lake Livingston WSC*	I	Gulf Coast Aquifer System | Polk County	75	81	84	87	90	94
Leggett WSC*	H	Gulf Coast Aquifer System | Polk County	2	2	3	3	3	3
Moscow WSC*	I	Gulf Coast Aquifer System | Polk County	85	91	95	98	102	106
Soda WSC*	H	Gulf Coast Aquifer System | Polk County	17	18	19	20	20	21
County-Other*	I	Gulf Coast Aquifer System | Polk County	743	797	840	882	923	957
Manufacturing*	I	Gulf Coast Aquifer System | Polk County	401	416	431	447	463	480
Mining*	I	Gulf Coast Aquifer System | Polk County	103	83	83	83	83	83
Mining*	I	Local Surface Water Supply	1	1	1	1	1	1
Livestock*	I	Gulf Coast Aquifer System | Polk County	1	1	1	1	1	1
Livestock*	I	Local Surface Water Supply	147	147	147	147	147	147
Livestock*	I	Yegua-Jackson Aquifer | Polk County	11	11	11	11	11	11
Irrigation*	I	Gulf Coast Aquifer System | Polk County	313	313	313	313	313	313
Rusk County WUG Total			**64,081**	**64,086**	**64,070**	**64,058**	**64,041**	**63,925**
Rusk County / Neches Basin WUG Total			**10,305**	**10,229**	**10,138**	**10,039**	**9,938**	**9,843**
Ebenezer WSC	I	Carrizo-Wilcox Aquifer | Rusk County	181	175	166	156	146	137
Garrison	I	Carrizo-Wilcox Aquifer | Nacogdoches County	1	1	1	1	1	1
Gaston WSC	I	Carrizo-Wilcox Aquifer | Rusk County	149	144	137	128	120	112

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Goodsprings WSC	I	Carrizo-Wilcox Aquifer | Rusk County	230	221	210	198	185	173
Henderson	I	Carrizo-Wilcox Aquifer | Rusk County	1,396	1,396	1,396	1,396	1,396	1,396
Henderson	D	Fork Lake/Reservoir	3,472	3,433	3,395	3,357	3,318	3,282
Henderson	I	Striker Lake/Reservoir	118	129	142	157	172	189
Jacobs WSC	I	Carrizo-Wilcox Aquifer | Rusk County	5	5	5	5	6	5
Minden Brachfield WSC	I	Carrizo-Wilcox Aquifer | Rusk County	142	138	131	124	116	108
Mt Enterprise WSC	I	Carrizo-Wilcox Aquifer | Rusk County	222	214	204	191	179	167
New London	I	Carrizo-Wilcox Aquifer | Rusk County	164	158	151	142	133	124
Overton*	I	Carrizo-Wilcox Aquifer | Rusk County	42	41	39	37	34	32
South Rusk County WSC	I	Carrizo-Wilcox Aquifer | Rusk County	242	234	222	209	196	182
Wright City WSC	I	Carrizo-Wilcox Aquifer | Smith County	23	22	21	20	18	17
County-Other	I	Carrizo-Wilcox Aquifer | Rusk County	849	849	849	849	849	849
Manufacturing	I	Carrizo-Wilcox Aquifer | Rusk County	244	244	244	244	244	244
Manufacturing	I	Neches Run-of-River	1	1	1	1	1	1
Mining	I	Carrizo-Wilcox Aquifer | Rusk County	109	109	109	109	109	109
Mining	I	Local Surface Water Supply	828	828	828	828	828	828
Mining	I	Other Aquifer | Rusk County	264	264	264	264	264	264
Livestock	I	Carrizo-Wilcox Aquifer | Rusk County	289	289	289	289	289	289
Livestock	I	Local Surface Water Supply	991	991	991	991	991	991
Livestock	I	Queen City Aquifer | Rusk County	33	33	33	33	33	33
Irrigation	I	Carrizo-Wilcox Aquifer | Rusk County	251	251	251	251	251	251
Irrigation	I	Neches Run-of-River	59	59	59	59	59	59

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Rusk County / Sabine Basin WUG Total			**53,776**	**53,857**	**53,932**	**54,019**	**54,103**	**54,082**
Chalk Hill SUD*	I	Carrizo-Wilcox Aquifer | Rusk County	232	222	211	199	186	174
Cross Roads SUD*	I	Carrizo-Wilcox Aquifer | Rusk County	296	305	318	334	351	371
Cross Roads SUD*	D	Fork Lake/Reservoir	248	273	288	310	337	366
Crystal Farms WSC	I	Carrizo-Wilcox Aquifer | Rusk County	130	141	156	173	192	215
Elderville WSC*	I	Carrizo-Wilcox Aquifer | Rusk County	69	67	65	62	60	58
Elderville WSC*	I	Cherokee Lake/Reservoir	96	96	96	95	111	111
Elderville WSC*	D	Fork Lake/Reservoir	97	97	97	97	96	96
Henderson	I	Carrizo-Wilcox Aquifer | Rusk County	482	482	482	482	482	482
Henderson	D	Fork Lake/Reservoir	1,043	1,032	1,021	1,010	999	986
Henderson	I	Sabine Run-of-River	10	10	10	10	10	10
Henderson	I	Striker Lake/Reservoir	35	39	43	47	52	57
Jacobs WSC	I	Carrizo-Wilcox Aquifer | Rusk County	304	321	341	365	365	366
Kilgore*	D	Carrizo-Wilcox Aquifer | Gregg County	356	356	355	352	347	347
Kilgore*	D	Fork Lake/Reservoir	783	848	924	1,008	1,095	1,095
Minden Brachfield WSC	I	Carrizo-Wilcox Aquifer | Rusk County	71	69	65	61	57	53
New London	I	Carrizo-Wilcox Aquifer | Rusk County	118	115	109	102	96	90
New Prospect WSC	I	Carrizo-Wilcox Aquifer | Rusk County	149	143	136	128	120	112
Overton*	I	Carrizo-Wilcox Aquifer | Rusk County	404	391	372	350	330	309
Southern Utilities*	I	Carrizo-Wilcox Aquifer | Rusk County	79	76	72	68	64	59
Southern Utilities*	I	Carrizo-Wilcox Aquifer | Smith County	0	0	0	0	0	0
Tatum	I	Carrizo-Wilcox Aquifer | Rusk County	251	242	230	216	202	189
West Gregg SUD*	D	Carrizo-Wilcox Aquifer | Gregg County	22	22	22	22	23	23
County-Other	I	Carrizo-Wilcox Aquifer | Rusk County	614	614	614	614	614	614

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
County-Other	I	Other Aquifer | Rusk County	85	85	85	85	85	85
Mining	I	Carrizo-Wilcox Aquifer | Rusk County	1,974	1,983	1,992	2,001	2,001	1,986
Mining	I	Local Surface Water Supply	430	430	430	430	430	430
Mining	I	Other Aquifer | Rusk County	194	194	194	194	194	194
Steam Electric Power	I	Carrizo-Wilcox Aquifer | Rusk County	1,279	1,279	1,279	1,279	1,279	1,279
Steam Electric Power	I	Martin Lake/Reservoir	25,000	25,000	25,000	25,000	25,000	25,000
Steam Electric Power	I	Toledo Bend Lake/Reservoir	17,922	17,922	17,922	17,922	17,922	17,922
Livestock	I	Carrizo-Wilcox Aquifer | Rusk County	256	256	256	256	256	256
Livestock	I	Local Surface Water Supply	424	424	424	424	424	424
Irrigation	I	Other Aquifer | Rusk County	196	196	196	196	196	196
Irrigation	I	Sabine Run-of-River	127	127	127	127	127	127
Sabine County WUG Total			**3,159**	**3,212**	**3,188**	**3,171**	**3,157**	**3,142**
Sabine County / Neches Basin WUG Total			**1,077**	**1,071**	**1,053**	**1,041**	**1,029**	**1,018**
Brookeland FWSD	I	Yegua-Jackson Aquifer | Jasper County	70	63	58	54	51	47
G M WSC	I	Carrizo-Wilcox Aquifer | Sabine County	25	25	25	25	25	25
G M WSC	I	Toledo Bend Lake/Reservoir	114	115	114	114	113	114
G M WSC	I	Yegua-Jackson Aquifer | Sabine County	55	55	55	55	55	55
Pineland	I	Yegua-Jackson Aquifer | Sabine County	169	153	140	132	124	115
Manufacturing	I	Direct Reuse	20	20	20	20	20	20
Manufacturing	I	Neches Run-of-River	162	162	162	162	162	162
Manufacturing	I	Other Aquifer | Sabine County	336	336	336	336	336	336
Manufacturing	I	Yegua-Jackson Aquifer | Sabine County	45	45	45	45	45	45

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Livestock	I	Carrizo-Wilcox Aquifer | Sabine County	34	45	45	45	45	45
Livestock	I	Local Surface Water Supply	26	26	26	26	26	26
Livestock	I	Sparta Aquifer | Sabine County	21	26	27	27	27	28
Sabine County / Sabine Basin WUG Total			**2,082**	**2,141**	**2,135**	**2,130**	**2,128**	**2,124**
Brookeland FWSD	I	Carrizo-Wilcox Aquifer | Sabine County	10	9	8	8	7	7
G M WSC	I	Carrizo-Wilcox Aquifer | Sabine County	95	95	95	95	95	95
G M WSC	I	Toledo Bend Lake/Reservoir	430	429	428	428	429	428
G M WSC	I	Yegua-Jackson Aquifer | Sabine County	207	207	206	206	206	206
Hemphill	I	Toledo Bend Lake/Reservoir	476	476	476	476	476	476
New WSC	I	Carrizo-Wilcox Aquifer | San Augustine County	5	4	4	3	3	3
County-Other	I	Carrizo-Wilcox Aquifer | Sabine County	74	69	66	63	61	59
County-Other	I	Carrizo-Wilcox Aquifer | Shelby County	0	0	0	0	0	0
County-Other	I	Other Aquifer | Sabine County	0	0	0	0	0	0
County-Other	I	Sparta Aquifer | Sabine County	11	9	9	8	8	7
County-Other	I	Toledo Bend Lake/Reservoir	37	37	37	37	37	37
Mining	I	Other Aquifer | Sabine County	0	0	0	0	0	0
Mining	I	Toledo Bend Lake/Reservoir	334	334	334	334	334	334
Livestock	I	Carrizo-Wilcox Aquifer | Sabine County	103	136	136	136	136	136
Livestock	I	Local Surface Water Supply	175	175	175	175	175	175
Livestock	I	Sparta Aquifer | Sabine County	13	13	13	13	13	13

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Livestock	I	Yegua-Jackson Aquifer | Sabine County	112	148	148	148	148	148
San Augustine County WUG Total			**4,938**	**4,949**	**4,953**	**4,953**	**4,953**	**4,953**
San Augustine County / Neches Basin WUG Total			**4,535**	**4,545**	**4,545**	**4,545**	**4,545**	**4,546**
Choice WSC	I	Carrizo-Wilcox Aquifer | Shelby County	2	2	2	2	2	2
Denning WSC	I	Carrizo-Wilcox Aquifer | San Augustine County	120	108	98	91	84	77
New WSC	I	Carrizo-Wilcox Aquifer | San Augustine County	86	77	69	64	59	55
San Augustine	I	San Augustine Lake/Reservoir	642	610	593	583	583	595
San Augustine Rural WSC	I	San Augustine Lake/Reservoir	271	296	314	307	298	290
Sand Hills WSC	I	Carrizo-Wilcox Aquifer | Shelby County	6	7	8	8	8	8
County-Other	I	Carrizo-Wilcox Aquifer | Nacogdoches County	1	1	1	1	1	1
County-Other	I	Carrizo-Wilcox Aquifer | San Augustine County	22	25	27	27	29	31
County-Other	I	Other Aquifer | San Augustine County	196	200	199	211	218	215
County-Other	I	San Augustine Lake/Reservoir	65	65	65	65	65	65
County-Other	I	Sparta Aquifer | San Augustine County	83	83	83	83	83	83
County-Other	I	Yegua-Jackson Aquifer | San Augustine County	230	230	230	230	230	230
Manufacturing	I	Carrizo-Wilcox Aquifer | San Augustine County	8	8	8	8	8	8
Mining	I	Other Aquifer | San Augustine County	1,119	1,113	1,115	1,098	1,089	1,092
Mining	I	San Augustine Lake/Reservoir	292	298	296	313	322	319
Livestock	I	Carrizo-Wilcox Aquifer | San Augustine County	69	87	103	115	125	133
Livestock	I	Local Surface Water Supply	1,167	1,167	1,167	1,167	1,167	1,167
Livestock	I	Other Aquifer | San Augustine County	61	73	72	77	79	79

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Livestock	I	Sparta Aquifer | San Augustine County	80	80	80	80	80	80
Irrigation	I	Carrizo-Wilcox Aquifer | San Augustine County	15	15	15	15	15	16
San Augustine County / Sabine Basin WUG Total			**403**	**404**	**408**	**408**	**408**	**407**
G M WSC	I	Carrizo-Wilcox Aquifer | Sabine County	4	4	4	4	4	4
G M WSC	I	Toledo Bend Lake/Reservoir	16	16	18	18	18	18
G M WSC	I	Yegua-Jackson Aquifer | Sabine County	8	8	9	9	9	9
San Augustine Rural WSC	I	San Augustine Lake/Reservoir	15	16	17	17	17	16
County-Other	I	Carrizo-Wilcox Aquifer | San Augustine County	88	88	88	88	88	88
Livestock	I	Carrizo-Wilcox Aquifer | San Augustine County	139	139	139	139	139	139
Livestock	I	Local Surface Water Supply	132	132	132	132	132	132
Irrigation	I	Carrizo-Wilcox Aquifer | San Augustine County	1	1	1	1	1	1
Shelby County WUG Total			**23,634**	**23,592**	**23,555**	**23,519**	**23,487**	**23,457**
Shelby County / Neches Basin WUG Total			**4,079**	**4,101**	**4,114**	**4,115**	**4,106**	**4,092**
Choice WSC	I	Carrizo-Wilcox Aquifer | Shelby County	28	29	31	34	37	41
Sand Hills WSC	I	Carrizo-Wilcox Aquifer | Shelby County	153	153	152	152	152	151
Sand Hills WSC	I	Center Lake/Reservoir	19	23	27	29	31	34
Sand Hills WSC	I	Pinkston Lake/Reservoir	143	162	189	206	222	239
Timpson	I	Carrizo-Wilcox Aquifer | Shelby County	7	7	7	8	8	8
County-Other	I	Pinkston Lake/Reservoir	840	839	820	797	767	730
County-Other	I	Timpson Lake/Reservoir	350	350	350	350	350	350
Mining	I	Toledo Bend Lake/Reservoir	5	5	5	5	5	5
Livestock	I	Carrizo-Wilcox Aquifer | Shelby County	430	430	430	430	430	430
Livestock	I	Local Surface Water Supply	2,101	2,100	2,100	2,101	2,101	2,101

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Irrigation	I	Carrizo-Wilcox Aquifer | Shelby County	3	3	3	3	3	3
Shelby County / Sabine Basin WUG Total			**19,555**	**19,491**	**19,441**	**19,404**	**19,381**	**19,365**
Center	I	Center Lake/Reservoir	260	260	261	262	263	264
Center	I	Pinkston Lake/Reservoir	1,875	1,875	1,874	1,873	1,872	1,871
Choice WSC	I	Carrizo-Wilcox Aquifer | Shelby County	79	84	91	98	108	119
East Lamar WSC	I	Carrizo-Wilcox Aquifer | Shelby County	108	114	123	134	146	162
Five Way WSC	I	Carrizo-Wilcox Aquifer | Shelby County	151	152	153	152	152	151
Flat Fork WSC	I	Carrizo-Wilcox Aquifer | Shelby County	114	94	79	65	53	44
Huxley	I	Toledo Bend Lake/Reservoir	280	280	280	280	280	280
Joaquin	I	Toledo Bend Lake/Reservoir	124	99	80	63	50	39
McClelland WSC	I	Carrizo-Wilcox Aquifer | Shelby County	188	167	138	119	99	78
New WSC	I	Carrizo-Wilcox Aquifer | San Augustine County	4	5	6	6	7	7
Sand Hills WSC	I	Carrizo-Wilcox Aquifer | Shelby County	131	130	130	130	130	131
Sand Hills WSC	I	Center Lake/Reservoir	17	19	22	24	26	28
Sand Hills WSC	I	Pinkston Lake/Reservoir	121	137	160	173	188	202
Tenaha	I	Carrizo-Wilcox Aquifer | Shelby County	250	221	182	154	126	97
Timpson	I	Carrizo-Wilcox Aquifer | Shelby County	180	159	129	109	89	67
County-Other	I	Carrizo-Wilcox Aquifer | Shelby County	512	512	494	474	447	413
County-Other	I	Center Lake/Reservoir	116	117	114	112	108	103
County-Other	I	Toledo Bend Lake/Reservoir	100	95	90	82	75	68
Manufacturing	I	Carrizo-Wilcox Aquifer | Shelby County	218	247	247	247	247	247
Manufacturing	I	Center Lake/Reservoir	88	81	76	73	72	71
Manufacturing	I	Direct Reuse	80	80	80	80	80	80
Manufacturing	I	Pinkston Lake/Reservoir	633	587	544	526	513	508

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Mining	I	Carrizo-Wilcox Aquifer | Shelby County	1,026	1,026	1,026	1,026	1,026	1,026
Mining	I	Toledo Bend Lake/Reservoir	3,405	3,405	3,405	3,405	3,405	3,405
Livestock	I	Carrizo-Wilcox Aquifer | Shelby County	1,320	1,369	1,481	1,562	1,644	1,729
Livestock	I	Local Surface Water Supply	8,168	8,169	8,169	8,168	8,168	8,168
Irrigation	I	Carrizo-Wilcox Aquifer | Shelby County	7	7	7	7	7	7
Smith County WUG Total			**59,553**	**63,965**	**68,951**	**71,662**	**74,548**	**77,625**
Smith County / Neches Basin WUG Total			**59,553**	**63,965**	**68,951**	**71,662**	**74,548**	**77,625**
Arp	I	Carrizo-Wilcox Aquifer | Smith County	155	141	132	120	108	96
Ben Wheeler WSC*	D	Carrizo-Wilcox Aquifer | Van Zandt County	2	3	3	2	2	2
Bullard	I	Carrizo-Wilcox Aquifer | Cherokee County	299	342	371	399	426	452
Bullard	I	Carrizo-Wilcox Aquifer | Smith County	998	1,110	1,110	1,110	1,110	1,110
Bullard	I	Jacksonville Lake/Reservoir	699	797	866	930	993	1,054
Carroll WSC*	I	Carrizo-Wilcox Aquifer | Smith County	89	99	109	122	136	137
Crystal Systems Texas*	D	Carrizo-Wilcox Aquifer | Smith County	452	473	487	492	490	490
Crystal Systems Texas*	I	Carrizo-Wilcox Aquifer | Smith County	177	185	191	192	192	192
Dean WSC	I	Carrizo-Wilcox Aquifer | Smith County	723	776	815	846	875	904
Emerald Bay MUD	I	Carrizo-Wilcox Aquifer | Smith County	254	267	276	287	287	287
Jackson WSC*	D	Carrizo-Wilcox Aquifer | Smith County	291	313	329	342	355	367
Liberty Utilities Silverleaf Water*	D	Carrizo-Wilcox Aquifer | Wood County	202	201	202	202	202	202
Lindale Rural WSC*	I	Carrizo-Wilcox Aquifer | Smith County	811	811	811	811	811	811
Lindale*	I	Carrizo-Wilcox Aquifer | Smith County	468	474	491	485	474	474

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Overton*	I	Carrizo-Wilcox Aquifer | Rusk County	7	7	8	8	8	8
R P M WSC*	D	Carrizo-Wilcox Aquifer | Van Zandt County	11	10	10	9	9	9
R P M WSC*	D	Queen City Aquifer | Van Zandt County	14	14	13	14	14	14
Southern Utilities*	I	Carrizo-Wilcox Aquifer | Smith County	8,154	8,207	8,289	8,332	8,564	8,592
Southern Utilities*	I	Palestine Lake/Reservoir	216	231	243	251	260	269
Southern Utilities*	I	Tyler Lake/Reservoir	212	225	234	241	247	253
Troup	I	Carrizo-Wilcox Aquifer | Smith County	388	401	410	414	418	422
Tyler*	I	Palestine Lake/Reservoir	17,549	19,679	22,125	23,504	24,971	26,528
Tyler*	I	Tyler Lake/Reservoir	17,169	19,117	21,342	22,512	23,745	25,045
Walnut Grove WSC	I	Carrizo-Wilcox Aquifer | Smith County	727	728	728	728	729	729
Walnut Grove WSC	I	Palestine Lake/Reservoir	750	752	756	759	761	765
Walnut Grove WSC	I	Tyler Lake/Reservoir	733	732	729	726	725	722
Whitehouse	I	Carrizo-Wilcox Aquifer | Smith County	1,005	1,012	1,021	1,014	1,007	1,001
Whitehouse	I	Palestine Lake/Reservoir	377	379	380	382	383	384
Whitehouse	I	Tyler Lake/Reservoir	370	368	367	365	364	363
Wright City WSC	I	Carrizo-Wilcox Aquifer | Smith County	193	199	206	213	220	228
County-Other*	I	Carrizo-Wilcox Aquifer | Smith County	607	607	607	607	607	607
County-Other*	I	Palestine Lake/Reservoir	121	121	122	122	123	123
County-Other*	I	Queen City Aquifer | Smith County	19	19	19	19	19	19
County-Other*	I	Tyler Lake/Reservoir	118	118	117	117	116	116
Manufacturing*	I	Carrizo-Wilcox Aquifer | Smith County	888	687	616	508	257	236
Manufacturing*	I	Other Aquifer | Smith County	389	389	389	389	389	389
Manufacturing*	I	Palestine Lake/Reservoir	961	996	1,032	1,069	1,109	1,150
Manufacturing*	I	Queen City Aquifer | Smith County	100	100	100	100	100	100
Manufacturing*	I	Tyler Lake/Reservoir	841	870	899	930	959	992
Mining	D	Carrizo-Wilcox Aquifer | Smith County	0	0	0	0	0	0

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DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Mining	I	Other Aquifer | Smith County	113	113	113	113	113	113
Livestock*	I	Local Surface Water Supply	313	313	313	313	313	313
Livestock*	I	Queen City Aquifer | Smith County	500	500	500	500	500	500
Irrigation*	I	Bellwood Lake/Reservoir	400	400	400	400	400	400
Irrigation*	I	Neches Run-of-River	45	45	45	45	45	45
Irrigation*	I	Palestine Lake/Reservoir	487	478	469	462	456	456
Irrigation*	D	Queen City Aquifer | Smith County	156	156	156	156	156	156
Trinity County WUG Total			**647**	**647**	**618**	**600**	**580**	**561**
Trinity County / Neches Basin WUG Total			**647**	**647**	**618**	**600**	**580**	**561**
Centerville WSC	I	Yegua-Jackson Aquifer | Trinity County	119	106	91	81	70	58
Groveton*	H	Livingston-Wallisville Lake/Reservoir System	23	22	21	20	18	16
Groveton*	H	Yegua-Jackson Aquifer | Trinity County	23	19	13	10	7	4
Pennington WSC*	I	Yegua-Jackson Aquifer | Houston County	16	13	11	9	7	6
Pennington WSC*	I	Yegua-Jackson Aquifer | Trinity County	16	13	10	9	7	6
County-Other*	I	Other Aquifer | Trinity County	120	117	115	114	114	114
Mining*	H	Yegua-Jackson Aquifer | Trinity County	9	9	9	9	9	9
Livestock*	I	Local Surface Water Supply	187	187	187	187	187	187
Livestock*	I	Yegua-Jackson Aquifer | Trinity County	71	98	98	98	98	98
Irrigation*	I	Neches Run-of-River	0	0	0	0	0	0
Irrigation*	I	Yegua-Jackson Aquifer | Trinity County	63	63	63	63	63	63
Tyler County WUG Total			**9,725**	**9,569**	**9,441**	**9,351**	**9,266**	**9,187**
Tyler County / Neches Basin WUG Total			**9,725**	**9,569**	**9,441**	**9,351**	**9,266**	**9,187**
Chester WSC	I	Gulf Coast Aquifer System | Tyler County	101	88	74	64	54	43

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

DRAFT Region I Water User Group (WUG) Existing Water Supply

WUG Name	Source Region	Source Description	Existing Supply (acre-feet per year)					
			2030	2040	2050	2060	2070	2080
Colmesneil	I	Gulf Coast Aquifer System | Tyler County	163	156	151	147	143	140
Cypress Creek WSC	I	Gulf Coast Aquifer System | Tyler County	101	89	79	71	63	57
Moscow WSC*	I	Gulf Coast Aquifer System | Polk County	3	4	5	6	7	8
Seneca WSC	I	Gulf Coast Aquifer System | Tyler County	123	116	110	106	102	98
Tyler County SUD	I	Gulf Coast Aquifer System | Tyler County	632	602	579	563	548	535
Warren WSC	I	Gulf Coast Aquifer System | Tyler County	273	272	272	272	272	272
Wildwood POA	I	Gulf Coast Aquifer System | Tyler County	76	69	63	58	53	48
Woodville	I	Gulf Coast Aquifer System | Tyler County	880	920	970	1,024	1,088	1,162
Woodville	I	Sam Rayburn-Steinhagen Lake/Reservoir System	5,600	5,600	5,600	5,600	5,600	5,600
County-Other	I	Gulf Coast Aquifer System | Tyler County	790	670	555	457	353	241
Manufacturing	I	Gulf Coast Aquifer System | Tyler County	40	40	40	40	40	40
Mining	I	Gulf Coast Aquifer System | Tyler County	39	39	39	39	39	39
Mining	I	Local Surface Water Supply	3	3	3	3	3	3
Steam Electric Power	I	Gulf Coast Aquifer System | Tyler County	191	191	191	191	191	191
Livestock	I	Gulf Coast Aquifer System | Tyler County	85	85	85	85	85	85
Livestock	I	Local Surface Water Supply	183	183	183	183	183	183
Irrigation	I	Gulf Coast Aquifer System | Tyler County	354	354	354	354	354	354
Irrigation	I	Neches Run-of-River	88	88	88	88	88	88
Region I WUG Existing Water Supply Total			**979,557**	**990,555**	**997,313**	**1,002,709**	**1,010,218**	**1,018,247**

*A single asterisk next to a WUG's name denotes that the WUG is split by two or more planning regions.

Appendix 3-C
Surface Water Availability Technical Memorandum

The following appendix includes the Surface Water Availably Modeling Modifications for Region I.

Summary of WAM Modifications in the Development of Surface Water Supplies for the East Texas 2026 Regional Water Plan

The Texas Water Development Board (TWDB) requires regional water planning groups (RWPG) to use Full Authorization Water Availability Models (WAM Run 3) maintained by the Texas Commission on Environmental Quality (TCEQ) in the development of surface water availability for regional water plans (RWPs). In a letter submitted to TWDB on October 13, 2023, the Region I Consultant Team on behalf of the East Texas Regional Water Planning Group (Region I) requested a hydrologic variance to use modified versions of the Run 3 WAMs for the Trinity River, Neches River, and Sabine River Basins to develop supplies for the Region I 2026 RWP. This hydrologic variance request was approved by TWDB on December 20, 2023.

For the Trinity River Basin, Region I adopted the updated Trinity Basin WAM developed by the Region C Water Planning Group. These changes are documented in Region C's hydrologic variance request to the TWDB. Region I also includes part of the Neches-Trinity Coastal Basin. As no changes were proposed by Region I to the Neches-Trinity WAM, surface water supplies in that basin were developed using the unmodified Neches-Trinity Coastal Basin WAM Run 3. This memorandum describes the modifications made to the Neches River and Sabine River WAMs by Region I.

For all major reservoirs in the Neches and Sabine River Basins, anticipated sedimentation rates and revised area-capacity rating curves were developed to estimate reservoir storage in future decades (2030 – 2080). Anticipated sedimentation rates, expressed in acre-feet per square mile per year, were estimated for each major reservoir based on actual sediment surveys (part of a volumetric survey), published sedimentation rates, or comparing changes in conservation pool capacity between two or more reservoir surveys. The reservoirs were sliced into incremental storage volumes based on elevation, then a uniform reduction was applied to the horizontal surface area of each slice. New storage volumes were then calculated for each increment and added together to calculate the total storage at each elevation. Two standard methods were used to calculate revised incremental storage volumes. The simplest assumes that each incremental volume can be represented as a trapezoid (trapezoidal method), while the other assumes that each incremental volume is a cross-section of a cone (conical method). The method with the best fit to the original rating curve data was used. The data utilized for calculating anticipated sedimentation rates and revised area-capacity rating curves are shown in **Table 1** and **Table 2** at the end of this document.

Neches River Basin WAM for the 2026 Region I RWP

Changes to the WAM for the 2026 RWP are based on changes in previous cycles, as well as the inclusion of updated sedimentation of major reservoirs, as specified by Exhibit C ("Second Amended General Guidelines for Fifth Cycle of Regional Water Plan Development"). The following sections describe all changes made to the TCEQ Neches WAM Run 3 (2021) to develop the modified Neches WAM, which will be used to determine existing supplies in the Neches River Basin in the Region I 2026 RWP.

Area-Capacity Relationships

Exhibit C requires RWPGs to include anticipated sedimentation of all major reservoirs (those with a capacity greater than 5,000 ac-ft) in the WAM model runs. There are 12 permitted major reservoirs in the Neches Basin; information related to the methodology utilized for calculating anticipated sedimentation rates and revised area-capacity rating curves for these reservoirs is shown in **Table 1**. The area-capacity-elevation data were determined for the 2030, 2050, and 2080 decades. This information was included in the Region I base WAM for each of these decades.

Lake Columbia has not yet been constructed, so to be conservative, Lake Columbia's full design capacity and original area-capacity curve were used when evaluating firm yields for all other reservoirs in the Neches Basin. The effect of sedimentation on Lake Columbia was assessed, assuming the reservoir would be built in 2030 and begin collecting sediment at that time.

Subordination of Sam Rayburn Reservoir and B. A. Steinhagen Lake

Background

Special conditions 5C and 5D of Certificate of Adjudication 06-4411 require subordination of LNVA's rights in the Rayburn-Steinhagen system to (a) water rights upstream of the proposed Weches and Ponta Dam sites and (b) intervening municipal rights above Sam Rayburn Reservoir. These conditions were last amended in Amendment H, filed August 14, 2008, and granted July 20, 2010, which limited subordination to rights with priority dates between November 1963 and April 2008.

Changes were implemented in the WAM related to dual simulation, output, and the refilling of Rayburn and Steinhagen including:

a) The 1963 rights for impoundment at Rayburn and Steinhagen were reordered so that Rayburn, the upstream reservoir, would be filled from available streamflow before refilling Steinhagen.

Reservoir System Operations

UNRMWA – Lake Palestine and Rocky Point Dam

The Upper Neches River Municipal Water Authority operates Lake Palestine in conjunction with Rocky Point Dam, a downstream diversion dam on the Neches River in Anderson and Cherokee Counties. Diversions associated with Rocky Point Dam draw from intervening flows between Lake Palestine and Rocky Point Dam, impounded water behind the dam, and downstream releases from Lake Palestine. To limit the impact on the yield of Lake Palestine in the Region I WAM, the Rocky Point diversions were modified so that they would first be backed up by the water made available by the subordination of Steinhagen Lake before making releases from Lake Palestine so that intervening flows would be fully used before making releases of stored Lake Palestine water. Any remaining shortages would be backed up by releases from Lake Palestine.

LNVA – Sam Rayburn Backup of Pine Island Bayou

Operation of LNVA's water rights was modeled as a system by including the backup of LNVA's Pine Island water rights with storage from Sam Rayburn. This was implemented as part of the water rights group 'R4411'.

Minimum Elevations – Sam Rayburn and B.A. Steinhagen

WS and OR records were set to the inactive pool capacity for Sam Rayburn Reservoir. The top elevation of the inactive pool is 149 ft msl, and the inactive pool capacity was updated each decade based on updated area-capacity-elevation curves. The City of Lufkin has a right to a lakeside diversion of up to 28,000 ac-ft/yr from Sam Rayburn Reservoir; no inactive pool capacity was applied for this diversion. This diversion is lakeside, so it is not limited by the inlet elevation.

A dead pool capacity was also set for B. A. Steinhagen using an inactive pool elevation of 81 ft msl. Inactive pools were not applied to subordination-related backup rights for either reservoir.

Lake Tyler

For the 2026 Region I WAM, Lake Tyler was modeled as a single reservoir, and associated water rights were adjusted accordingly. This is consistent with the development of the original Neches WAM, which treated this source as one reservoir.

City of Beaumont

Available supply was evaluated based on daily time-step analysis based on historical data from October 1951 to December 2022. The City of Beaumont is the only major municipal water user with a run-of-river water right. Other major users that receive water from run-of-river water rights either purchase water from the Lower Neches Valley Authority (LNVA) or use saline water. The purchased run-of-the-river water is backed up by stored water that is owned and operated by LNVA, making this supply less vulnerable to drought. This approach was applied in the development of supplies for the 2021 East Texas Regional Water Plan.

Sabine River Basin WAM for the 2026 Region I RWP

The following sections describe all changes made to the TCEQ Sabine WAM Run 3 (2012) to develop the modified Sabine WAM, which will be used to determine existing supplies from the Sabine River Basin in the Region I 2026 RWP.

Area-Capacity Relationships

Exhibit C requires RWPGs to include anticipated sedimentation of all major reservoirs (those with a capacity greater than 5,000 ac-ft) in the WAM model runs. There are 12 such permitted reservoirs in the Sabine Basin; information related to the methodology utilized for calculating anticipated sedimentation rates and revised area-capacity rating curves for these reservoirs is shown in **Table 2**. The area-capacity-elevation data were determined for the 2030, 2050, and 2080 decades. This information was included in the Region I base WAM for each of these decades.

Firm Yield of Toledo Bend Reservoir

The Sabine River Authority (SRA) has a right to divert up to 970,067 acre-feet per year from Toledo Bend. Of that amount, 220,067 ac-ft of water can be diverted when hydropower generation is turned off as per Certificate of Adjudication (CoA) 4658B. If hydropower is being used, the total amount is 945,650 acre-feet per year. Hydropower operations were included in the evaluation of supplies for all reservoirs and run-of-river supplies. The yield of Toledo Bend was evaluated assuming all diversions were taken lakeside, after passing water for SRA's downstream senior run-of-the-river rights and hydropower generation. Within the WAM, all diversions from the lake are shared equally between SRA-Texas and SRA-Louisiana.

Table 1. Sedimentation Rates and Projected Storage Capacity of Major Reservoirs in the Neches River Basin

Reservoir	Most Recent Survey		2026 Sedimentation Rate (ac-ft/yr/ mi^2)	Source of Sedimentation Rate	Sediment-Contributing Drainage Area (mi^2)	Projected 2030 Capacity (ac-ft)	Projected 2080 Capacity (ac-ft)
	Year	Conservation Pool Capacity (ac-ft)					
Lake Athens	2016	29,475	4.35	TWDB Volumetric Survey-Derived Sedimentation Rate (2016)	22	26,449	21,679
Lake Columbia**	*	195,500	0.19	TBWE Bulletin 5912	277	195,500	192,910
Lake Jacksonville	2006	25,732	2.88	TWDB Volumetric Survey-Derived Sedimentation Rate (2006)	34	23,420	18,532
Lake Kurth	1996	14,769	8.57	TWDB Volumetric Survey-Derived Sedimentation Rate (1996)	4	13,636	11,923
Lake Nacogdoches	1994	39,523	1.75	TWDB Volumetric Survey-Derived Sedimentation Rate (1994)	89	33,929	26,115
Lake Naconiche	*	9,072	0.19	TBWE Bulletin 5912	27	8,953	8,699
Lake Palestine	2012	367,310	0.76	TWDB Published Sedimentation Rate (2012)	817	356,531	325,482
Pinkston Lake	*	7,380	0.19	TBWE Bulletin 5912	14	7,237	7,104
Sam Rayburn Reservoir	2004	2,876,033	0.18	TWDB Volumetric Survey-Derived Sedimentation Rates (2004)	3,010	2,861,827	2,834,167
Lake B. A. Steinhagen	2011	69,259	0.06	TWDB Published Sedimentation Rate (2011)	3,251	65,971	56,921
Lake Striker	2021	21,799	0.62	TWDB Volumetric Survey-Derived Sedimentation Rates (2021)	182	20,813	15,184
Lake Tyler	2013	77,284	1.00	TWDB Published Sedimentation Rate (2013)	45	75,472	70,122

** No survey available. Conservation pool capacity reflects design capacity.*

*** Permitted but not yet constructed.*

Table 2. Sedimentation Rates and Projected Storage Capacity of Major Reservoirs in the Sabine River Basin

Reservoir	Most Recent Survey		2026 Sedimentation Rate (ac-ft/yr/ mi²)	Source of Sedimentation Rate	Sediment-Contributing Drainage Area (mi²)	Projected 2030 Capacity (ac-ft)	Projected 2080 Capacity (ac-ft)
	Year	Conservation Pool Capacity (ac-ft)					
Lake Tawakoni	2009	871,693	1.75	TWDB Published Sedimentation Rate (2009)	756	844,627	778,513
Lake Fork Reservoir	2009	636,504	2.69	TWDB Published Sedimentation Rate (2009)	493	609,572	543,216
Lake Gladewater	2000	4,738	1.33	TWDB Volumetric Survey Derived Sedimentation Rate (2000)	35	3,345	1,017
Lake Cherokee	2015	44,475	0.47	TWDB Published Sedimentation Rate (2015)	158	44,553	40,930
Brandy Branch Reservoir	*	29,513	0.24	TBWE Bulletin 5912	4.1	29,467	29,419
Martin Lake	2014	75,726	0.37	TWDB Volumetric Survey Derived Sedimentation Rate (2014)	130	74,996	72,622
Murvaul Lake	1998	38,284	1.64	TWDB Published Sedimentation Rate (1998)	115	32,418	22,988
Toledo Bend Reservoir	*	4,477,000	0.12	Comprehensive Sabine Watershed Management Plan (1999)	5,384	4,436,134	4,403,831
Lake Hawkins	1962	11,890	0.24	TBWE Bulletin 5912	30	11,405	11,045
Lake Holbrook	*	7,990	0.24	TBWE Bulletin 5912	15	7,748	7,568
Lake Quitman	*	7,440	0.24	TBWE Bulletin 5912	31	6,937	6,565
Lake Winnsboro	*	8,100	0.24	TBWE Bulletin 5912	27	7,662	7,338

** No recent survey available. Conservation pool capacity reflects design capacity.*

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Texas Commission on Environmental Quality. Water Availability Models. Data retrieved October 2023 from: https://www.tceq.texas.gov/permitting/water_rights/wr_technical-resources/wam.html

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Appendix 3-D

Summary of WAM Modifications in the Development of Surface Water Supplies for the East Texas 2026 Regional Water Plan

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The following appendix includes a copy of the Modeled Available Groundwater for the Carrizo-Wilcox, Queen City, and Sparta Aquifers in Groundwater Management Area 11 and a copy of the Modeled Available Groundwater for the Gulf Coast Aquifer System in Groundwater Management Area 14.

GAM RUN 21-016 MAG:
MODELED AVAILABLE GROUNDWATER FOR THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS IN GROUNDWATER MANAGEMENT AREA 11

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
(512) 936-0883
February 17, 2022

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GAM RUN 21-016 MAG: MODELED AVAILABLE GROUNDWATER FOR THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS IN GROUNDWATER MANAGEMENT AREA 11

Shirley C. Wade, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Modeling Department
(512) 936-0883
February 17, 2022

EXECUTIVE SUMMARY:

The modeled available groundwater for Groundwater Management Area 11 for the Carrizo-Wilcox, Queen City, and Sparta aquifers is summarized by decade for the groundwater conservation districts (Tables 2 through 4 respectively) and for use in the regional water planning process (Tables 5 through 7 respectively). The modeled available groundwater estimates for the Carrizo-Wilcox Aquifer are approximately 251,220 acre-feet per year for each decade from 2020 through 2080. The modeled available groundwater estimates for the Queen City Aquifer are approximately 130,850 acre-feet per year for each decade from 2020 through 2080 (Table 3). The modeled available groundwater estimates for the Sparta Aquifer are approximately 3,260 acre-feet per year for each decade from 2020 to 2080 (Table 4). The estimates were extracted from results of a model run using the groundwater availability model for the northern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers (Version 3.01). The model run files, which meet the desired future conditions adopted by district representatives of Groundwater Management Area 11, were submitted to the Texas Water Development Board (TWDB) on August 26, 2021, as part of the Desired Future Conditions Explanatory Report for Groundwater Management Area 11. The explanatory report and other materials submitted to the Texas Water Development Board (TWDB) were determined to be administratively complete on October 29, 2021.

REQUESTOR:

Ms. Teresa Griffin, coordinator of Groundwater Management Area 11.

DESCRIPTION OF REQUEST:

In an email dated August 26, 2021, Dr. William R. Hutchison, on behalf of Groundwater Management Area 11, provided the TWDB with the desired future conditions of the Carrizo-Wilcox, Queen City, and Sparta aquifers adopted by the groundwater conservation districts in Groundwater Management Area 11. The desired future conditions for the Carrizo-Wilcox, Queen City, and Sparta aquifers are listed in Table 1 of the Resolution to Adopt Desired Future Conditions for Aquifers in Groundwater Management Area 11, adopted August 11, 2021, by the groundwater conservation districts within Groundwater Management Area 11. The desired future conditions (Table 1) are county-aquifer average water level drawdowns from 2013 to 2080 and are based on modeling Scenario 33 documented in Technical Memorandum 21-01 (Hutchison, 2021).

TABLE 1. DESIRED FUTURE CONDITIONS FOR EACH COUNTY-AQUIFER UNIT IN GROUNDWATER MANAGEMENT AREA 11 EXPRESSED AS AVERAGE DRAWDOWN FROM 2013 TO 2080 IN FEET.[1]

County	Sparta	Queen City	Carrizo-Wilcox
Anderson	30	44	155
Angelina	6	28	67
Bowie	NP[2]	NP	12
Camp	NP	11	85
Cass	66	34	79
Cherokee	7	31	176
Franklin	NP	NP	102
Gregg	NP	49	109
Harrison	NP	41	26
Henderson	NP	33	106
Hopkins	NP	NP	61
Houston	3	12	86
Marion	123	32	32
Morris	NP	39	78
Nacogdoches	7	22	73
Panola	NP	NP	21
Rains	NP	NP	17

[1] Based on table 1 from Resolution to Adopt Desired Future Conditions for Aquifers in Groundwater Management Area 11 dated August 11, 2021.
[2] NP: Aquifer not present in the county.

County	Sparta	Queen City	Carrizo-Wilcox
Red River	NP	NP	NR[3]
Rusk	26	17	86
Sabine	1	3	9
San Augustine	2	7	22
Shelby	18	12	17
Smith	121	132	265
Titus	NP[4]	9	66
Trinity	5	18	56
Upshur	10	30	149
Van Zandt	NP	73	55
Wood	9	16	122

[3] Carrizo-Wilcox considered non-relevant in Red River County.
[4] NP: Aquifer not present in the county.

TWDB staff reviewed the model files associated with the desired future conditions and received clarification on procedures and assumptions from the Groundwater Management Area 11 Technical Coordinator in an email on September 9, 2021. The Technical Coordinator confirmed that the Carrizo-Wilcox Aquifer should be considered non-relevant in Red River County, drawdown averages and modeled available groundwater values should be based on the model extent rather than the official aquifer extent, average drawdowns were not area-weighted, and a two-feet tolerance should be used when comparing model calculated drawdown with the desired future condition. Clarification also confirmed that no model cells converted to dry in the simulation.

METHODS:

The groundwater availability model for the northern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers Version 3.01 (Figures 1 through 4) was run using the model files submitted with the explanatory report (Hutchison, 2021). Model-calculated drawdowns were extracted for the year 2080. Drawdown averages were calculated for each county by aquifer. The calculated drawdown averages were compared with the desired future conditions to verify that the pumping scenario expressed in the model files achieved the desired future conditions within an acceptable tolerance of two feet based on a September 9, 2021 clarification from the Groundwater Management Area 11 Technical Coordinator. The modeled available groundwater values were determined by extracting pumping rates by decade from the model results using ZONEBUDGET for MODFLOW 6 Version 1.01 (U.S. Geological Survey, 2021). Annual pumping rates by aquifer are presented by county and groundwater conservation district, subtotaled by groundwater conservation district, and then summed for Groundwater Management Area 11 (Tables 2 through 4). Annual pumping rates by aquifer are also presented by county, river basin, and regional water planning area within Groundwater Management Area 11 (Tables 5 through 7).

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code (2011), “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. 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.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the modeled available groundwater estimates are described below:

- We used Version 3.01 of the groundwater availability model for the northern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers. See Panday and others (2021) for assumptions and limitations of the groundwater availability model for the northern part of the Carrizo-Wilcox, Queen City, and Sparta aquifers.
- This groundwater availability model includes nine layers, which represent quaternary alluvium adjacent to rivers and streams, the Sparta Aquifer (Layer 2), the Weches Confining Unit (Layer 3), the Queen City Aquifer (Layer 4), the Reklaw Confining Unit (Layer 5), the Carrizo (Layer 6), the Upper Wilcox (Layer 7), the Middle Wilcox (Layer 8), and the Lower Wilcox (Layer 9). Layers represent equivalent geologic units outside of the official aquifer extents.
- The model was run with MODFLOW 6 (Langevin and others, 2017).
- Drawdown averages and modeled available groundwater values were based on the extent of the model area (Figures 1 through 4).
- County average drawdowns were calculated as the sum of drawdowns for all model cells divided by the number of cells, without an area weighting correction.
- Based on a clarification from the Groundwater Management Area 11 Technical Coordinator, a tolerance of two feet was assumed when comparing desired future conditions (Table 1, average drawdown values per county) to model drawdown results.
- Estimates of modeled available groundwater from the model simulation were rounded to whole numbers.
- The Carrizo-Wilcox Aquifer in Red River County was assumed non-relevant for joint planning purposes.

RESULTS:

The modeled available groundwater estimates for the Carrizo-Wilcox Aquifer are approximately 251,220 acre-feet per year for each decade from 2020 through 2080. The modeled available groundwater estimates for the Queen City Aquifer are approximately 130,850 acre-feet per year for each decade from 2020 through 2080 (Table 3). The modeled available groundwater estimates for the Sparta Aquifer are approximately 3,260 acre-feet per year for each decade from 2020 to 2080 (Table 4). The modeled available groundwater is summarized by groundwater conservation district and county for the

Carrizo-Wilcox, Queen City, and Sparta aquifers (Tables 2, 3, and 4 respectively). The modeled available groundwater has also been summarized by county, river basin, and regional water planning area for use in the regional water planning process for the Carrizo-Wilcox, Queen City, and Sparta aquifers (Tables 5, 6, and 7 respectively). Small differences of values between table summaries are due to rounding.

The Gulf Coast, Nacatoch, Trinity, and Yegua-Jackson aquifers and the Carrizo-Wilcox Aquifer in Red River County were declared non-relevant for the purpose of adopting desired future conditions by the Groundwater Management Area 11 Districts; therefore, modeled available groundwater values were not calculated for those aquifers.

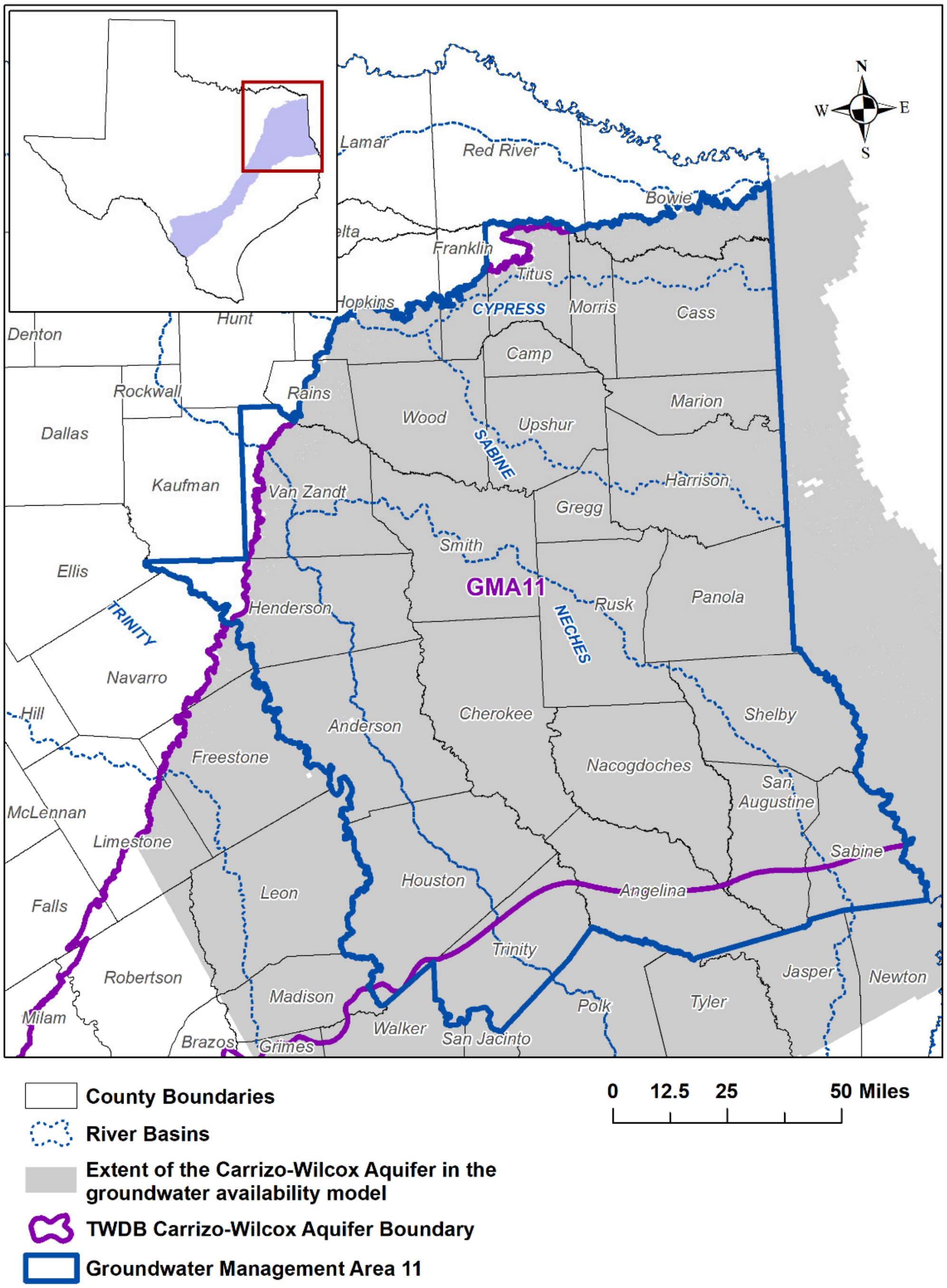

FIGURE 1. GROUNDWATER MANAGEMENT AREA (GMA) 11 BOUNDARY, RIVER BASINS, AND COUNTIES OVERLAIN ON THE EXTENT OF THE CARRIZO-WILCOX AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS.

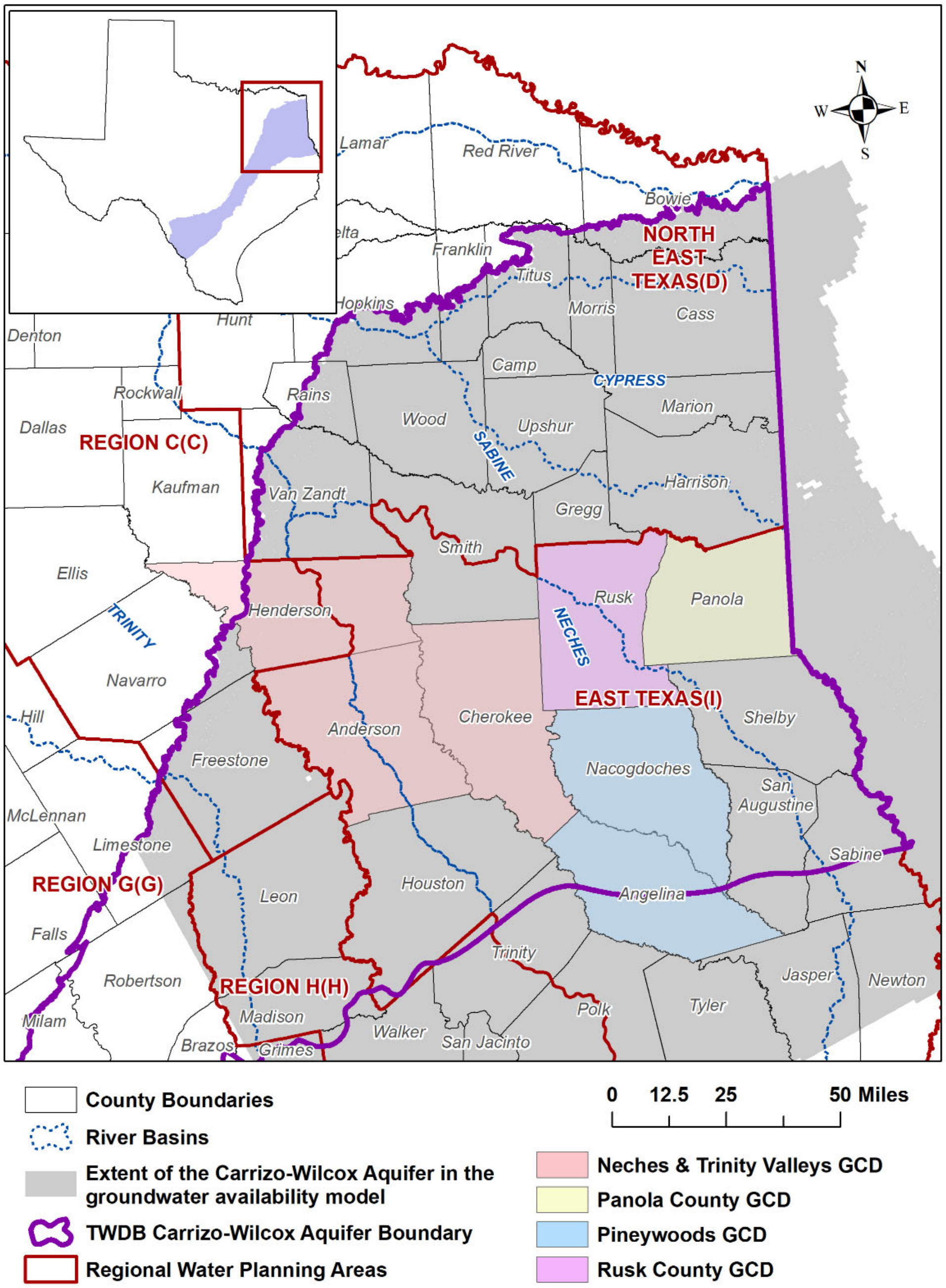

FIGURE 2. REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE CARRIZO-WILCOX AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS.

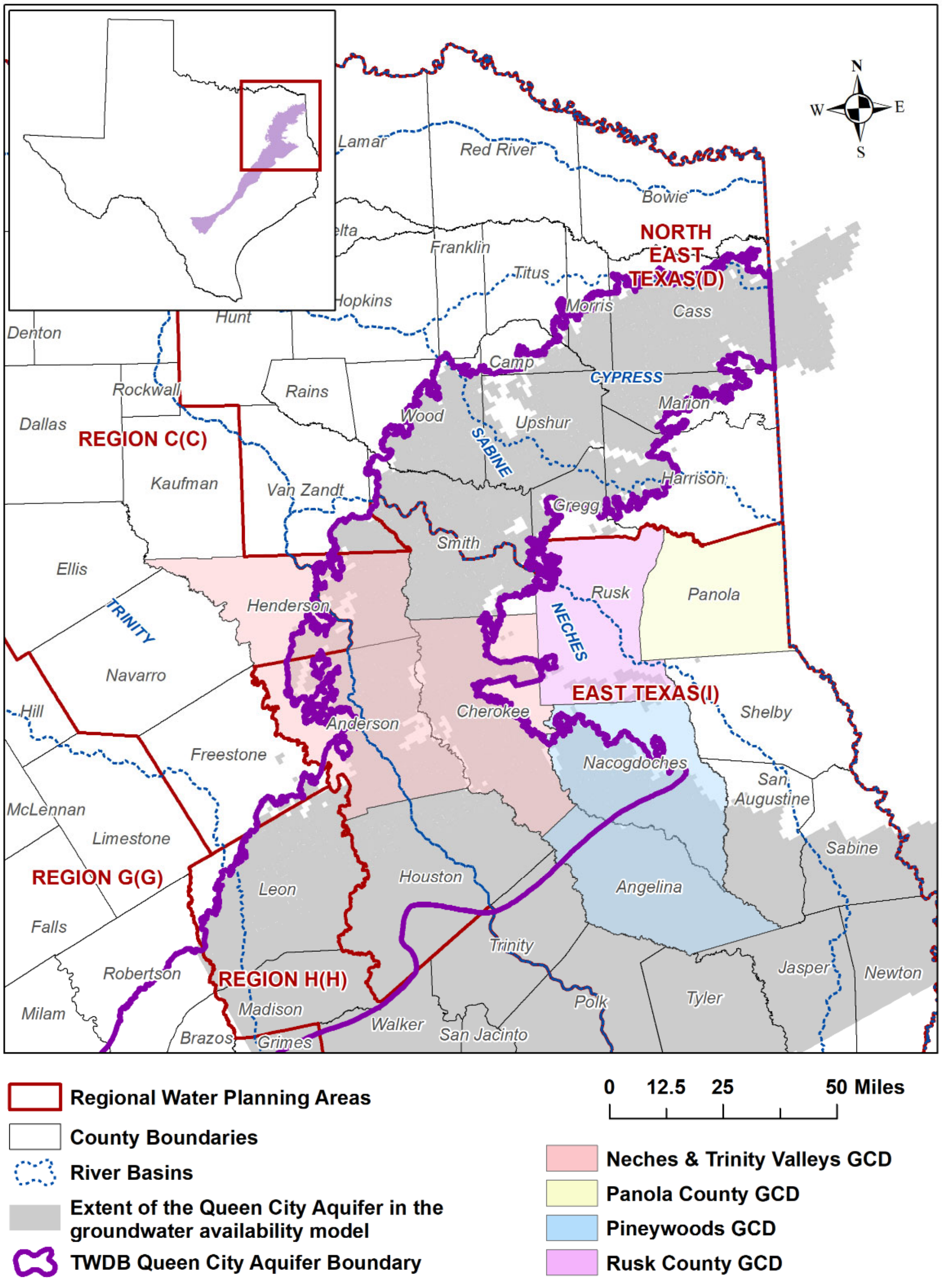

FIGURE 3. REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE QUEEN CITY AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS.

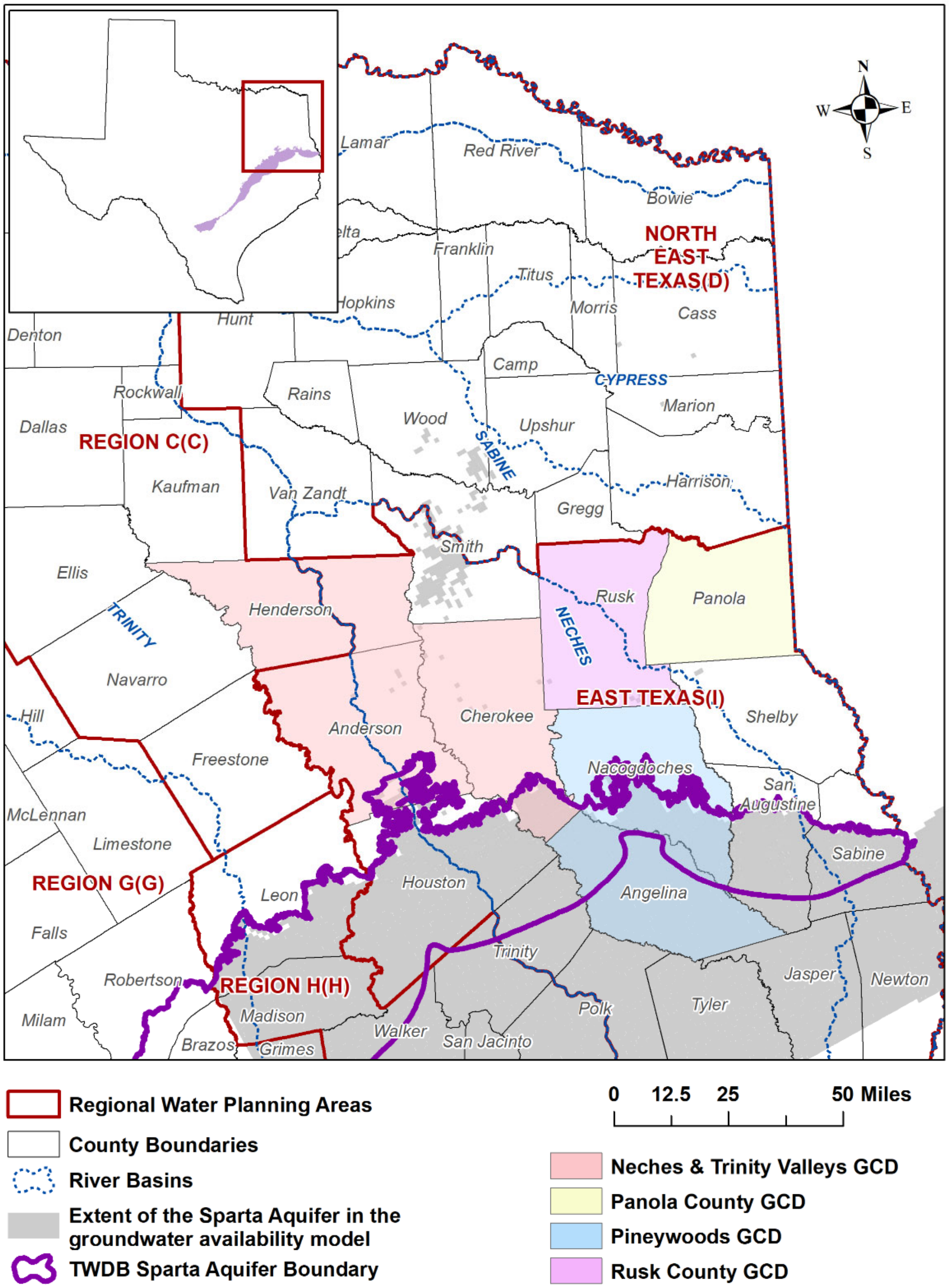

FIGURE 4. REGIONAL WATER PLANNING AREAS (RWPAS), RIVER BASINS, GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND COUNTIES OVERLAIN ON THE EXTENT OF THE SPARTA AQUIFER IN THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE CARRIZO-WILCOX, QUEEN CITY, AND SPARTA AQUIFERS.

TABLE 2. 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 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Neches & Trinity Valleys GCD	Anderson	Carrizo-Wilcox	27,024	27,024	27,024	27,024	27,024	27,024	27,024
Neches & Trinity Valleys GCD	Cherokee	Carrizo-Wilcox	15,241	15,241	15,241	15,241	15,241	15,241	15,241
Neches & Trinity Valleys GCD	Henderson	Carrizo-Wilcox	7,222	7,222	7,222	7,222	7,222	7,222	7,222
Neches & Trinity Valleys GCD Total		**Carrizo-Wilcox**	**49,488**	**49,488**	**49,488**	**49,488**	**49,488**	**49,488**	**49,488**
Panola County GCD	Panola	**Carrizo-Wilcox**	**4,999**	**4,999**	**4,999**	**4,999**	**4,999**	**4,999**	**4,999**
Pineywoods GCD	Angelina	Carrizo-Wilcox	27,611	27,611	27,611	27,611	27,611	27,611	27,611
Pineywoods GCD	Nacogdoches	Carrizo-Wilcox	20,859	20,859	20,859	20,859	20,859	20,859	20,859
Pineywoods GCD Total		**Carrizo-Wilcox**	**48,470**	**48,470**	**48,470**	**48,470**	**48,470**	**48,470**	**48,470**
Rusk County GCD Total	Rusk	**Carrizo-Wilcox**	**14,019**	**14,019**	**14,019**	**14,019**	**14,019**	**14,019**	**14,019**
Total (GCDs)		**Carrizo-Wilcox**	**116,975**	**116,975**	**116,975**	**116,975**	**116,975**	**116,975**	**116,975**
No District-County	Bowie	Carrizo-Wilcox	9,645	9,645	9,645	9,645	9,645	9,645	9,645
No District-County	Camp	Carrizo-Wilcox	3,862	3,862	3,862	3,862	3,862	3,862	3,862
No District-County	Cass	Carrizo-Wilcox	13,642	13,642	13,642	13,642	13,642	13,642	13,642
No District-County	Franklin	Carrizo-Wilcox	5,732	5,732	5,732	5,732	5,732	5,732	5,732
No District-County	Gregg	Carrizo-Wilcox	6,072	6,072	6,072	6,072	6,072	6,072	6,072
No District-County	Harrison	Carrizo-Wilcox	9,096	9,096	9,096	9,096	9,096	9,096	9,096
No District-County	Hopkins	Carrizo-Wilcox	4,753	4,753	4,753	4,752	4,752	4,752	4,752
No District-County	Houston	Carrizo-Wilcox	2,356	2,356	2,356	2,356	2,356	2,356	2,356
No District-County	Marion	Carrizo-Wilcox	1,966	1,966	1,966	1,966	1,966	1,966	1,966

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District-County	Morris	Carrizo-Wilcox	2,570	2,570	2,570	2,570	2,570	2,570	2,570
No District-County	Rains	Carrizo-Wilcox	1,411	1,411	1,411	1,411	1,411	1,411	1,411
No District-County	Red River	Carrizo-Wilcox	NR[1]	NR[1]	NR[1]	NR[1]	NR[1]	NR[1]	NR[1]
No District-County	Sabine	Carrizo-Wilcox	1,388	1,388	1,388	1,388	1,388	1,388	1,388
No District-County	San Augustine	Carrizo-Wilcox	587	587	587	587	587	587	587
No District-County	Shelby	Carrizo-Wilcox	6,319	6,319	6,319	6,319	6,319	6,319	6,319
No District-County	Smith	Carrizo-Wilcox	25,547	25,547	25,547	25,547	25,547	25,547	25,547
No District-County	Titus	Carrizo-Wilcox	7,536	7,536	7,536	7,536	7,536	7,536	7,536
No District-County	Trinity	Carrizo-Wilcox	267	267	267	267	267	267	267
No District-County	Upshur	Carrizo-Wilcox	6,658	6,658	6,658	6,658	6,658	6,658	6,658
No District-County	Van Zandt	Carrizo-Wilcox	6,932	6,932	6,932	6,932	6,932	6,932	6,932
No District-County	Wood	Carrizo-Wilcox	17,902	17,902	17,902	17,902	17,902	17,902	17,902
No District-County Total		**Carrizo-Wilcox**	**134,241**	**134,241**	**134,241**	**134,241**	**134,241**	**134,241**	**134,240**
Total for GMA 11		**Carrizo-Wilcox**	**251,217**	**251,217**	**251,217**	**251,216**	**251,216**	**251,216**	**251,215**

[1]A desired future condition was not specified for the Carrizo-Wilcox Aquifer in Red River County and was declared as not relevant (NR) in a clarification.

TABLE 3. 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 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Neches & Trinity Valleys GCD	Anderson	Queen City	16,591	16,591	16,591	16,591	16,591	16,591	16,591
Neches & Trinity Valleys GCD	Cherokee	Queen City	8,812	8,812	8,812	8,812	8,812	8,812	8,812
Neches & Trinity Valleys GCD	Henderson	Queen City	10,671	10,671	10,671	10,670	10,670	10,670	10,670
Neches & Trinity Valleys GCD Total		**Queen City**	36,073	36,073	36,073	36,073	36,073	36,073	36,073
Pineywoods GCD	Angelina	Queen City	1,095	1,095	1,095	1,095	1,095	1,095	1,095
Pineywoods GCD	Nacogdoches	Queen City	2,946	2,946	2,946	2,946	2,946	2,946	2,946
Pineywoods GCD Total		**Queen City**	**4,041**	**4,041**	**4,041**	**4,041**	**4,041**	**4,041**	**4,041**
Rusk County GCD Total	**Rusk**	**Queen City**	**59**	**59**	**59**	**59**	**59**	**59**	**59**
Total (GCDs)		**Queen City**	**40,173**	**40,173**	**40,173**	**40,173**	**40,173**	**40,173**	**40,172**
No District-County	Camp	Queen City	1,594	1,594	1,594	1,594	1,594	1,594	1,594
No District-County	Cass	Queen City	16,479	16,479	16,479	16,479	16,479	16,479	16,479
No District-County	Gregg	Queen City	2,511	2,511	2,511	2,511	2,511	2,511	2,511
No District-County	Harrison	Queen City	3,537	3,537	3,537	3,537	3,537	3,537	3,537
No District-County	Houston	Queen City	2,295	2,295	2,295	2,295	2,295	2,295	2,295
No District-County	Marion	Queen City	7,389	7,389	7,389	7,389	7,389	7,389	7,389
No District-County	Morris	Queen City	3,278	3,278	3,278	3,278	3,278	3,278	3,278
No District-County	Sabine	Queen City	0[5]	0	0	0	0	0	0

[5] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District-County	San Augustine	Queen City	0[6]	0	0	0	0	0	0
No District-County	Shelby	Queen City	0	0	0	0	0	0	0
No District-County	Smith	Queen City	32,578	32,578	32,578	32,578	32,578	32,578	32,578
No District-County	Titus	Queen City	0	0	0	0	0	0	0
No District-County	Trinity	Queen City	0	0	0	0	0	0	0
No District-County	Upshur	Queen City	12,165	12,165	12,165	12,165	12,165	12,165	12,164
No District-County	Van Zandt	Queen City	2,343	2,343	2,343	2,343	2,343	2,343	2,343
No District-County	Wood	Queen City	6,510	6,510	6,510	6,510	6,510	6,510	6,510
No District-County Total		**Queen City**	**90,681**	**90,681**	**90,680**	**90,680**	**90,680**	**90,680**	**90,679**
Total for GMA 11		**Queen City**	**130,854**	**130,854**	**130,853**	**130,853**	**130,853**	**130,852**	**130,852**

[6] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 4. MODELED AVAILABLE GROUNDWATER FOR THE SPARTA AQUIFER IN GROUNDWATER MANAGEMENT AREA 11 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Neches & Trinity Valleys GCD	Anderson	Sparta	307	307	307	307	307	307	307
Neches & Trinity Valleys GCD	Cherokee	Sparta	352	352	352	352	352	352	352
Neches & Trinity Valleys GCD Total		**Sparta**	**658**	**658**	**658**	**658**	**658**	**658**	**658**
Pineywoods GCD	Angelina	Sparta	390	390	390	390	390	390	390
Pineywoods GCD	Nacogdoches	Sparta	362	362	362	362	362	362	362
Pineywoods GCD Total		**Sparta**	**752**	**752**	**752**	**752**	**752**	**752**	**752**
Total (GCDs)		**Sparta**	**1,410**	**1,410**	**1,410**	**1,410**	**1,410**	**1,410**	**1,410**
No District-County	Cass	Sparta	0[7]	0	0	0	0	0	0
No District-County	Houston	Sparta	1,482	1,482	1,482	1,482	1,482	1,482	1,482
No District-County	Marion	Sparta	0	0	0	0	0	0	0
No District-County	Sabine	Sparta	49	49	49	49	49	49	49
No District-County	San Augustine	Sparta	166	166	166	166	166	166	166
No District-County	Shelby	Sparta	0	0	0	0	0	0	0
No District-County	Smith	Sparta	0	0	0	0	0	0	0
No District-County	Trinity	Sparta	152	152	152	152	152	152	152
No District-County	Upshur	Sparta	0	0	0	0	0	0	0
No District-County	Wood	Sparta	0	0	0	0	0	0	0
No District-County Total		**Sparta**	**1,848**	**1,848**	**1,848**	**1,848**	**1,848**	**1,848**	**1,848**
Total for GMA 11		**Sparta**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**

[7] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 5. 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	2080
Anderson	I	Neches	Carrizo-Wilcox	21,958	21,958	21,958	21,958	21,958	21,958	21,958
Anderson	I	Trinity	Carrizo-Wilcox	5,066	5,066	5,066	5,066	5,066	5,066	5,066
Angelina	I	Neches	Carrizo-Wilcox	27,611	27,611	27,611	27,611	27,611	27,611	27,611
Bowie	D	Sulphur	Carrizo-Wilcox	9,645	9,645	9,645	9,645	9,645	9,645	9,645
Camp	D	Cypress	Carrizo-Wilcox	3,862	3,862	3,862	3,862	3,862	3,862	3,862
Cass	D	Cypress	Carrizo-Wilcox	12,865	12,865	12,865	12,865	12,865	12,865	12,865
Cass	D	Sulphur	Carrizo-Wilcox	777	777	777	777	777	777	777
Cherokee	I	Neches	Carrizo-Wilcox	15,241	15,241	15,241	15,241	15,241	15,241	15,241
Franklin	D	Cypress	Carrizo-Wilcox	5,334	5,334	5,334	5,334	5,334	5,334	5,334
Franklin	D	Sulphur	Carrizo-Wilcox	398	398	398	398	398	398	398
Gregg	D	Cypress	Carrizo-Wilcox	726	726	726	726	726	726	726
Gregg	D	Sabine	Carrizo-Wilcox	5,346	5,346	5,346	5,346	5,346	5,346	5,346
Harrison	D	Cypress	Carrizo-Wilcox	4,636	4,636	4,636	4,636	4,636	4,636	4,636
Harrison	D	Sabine	Carrizo-Wilcox	4,460	4,460	4,460	4,460	4,460	4,460	4,460
Henderson	C	Trinity	Carrizo-Wilcox	3,226	3,226	3,226	3,226	3,226	3,226	3,226
Henderson	I	Neches	Carrizo-Wilcox	3,996	3,996	3,996	3,996	3,996	3,996	3,996
Hopkins	D	Cypress	Carrizo-Wilcox	309	309	309	309	309	309	309
Hopkins	D	Sabine	Carrizo-Wilcox	2,426	2,426	2,426	2,426	2,426	2,426	2,426
Hopkins	D	Sulphur	Carrizo-Wilcox	2,017	2,017	2,017	2,017	2,017	2,017	2,017
Houston	I	Neches	Carrizo-Wilcox	1,721	1,721	1,721	1,721	1,721	1,721	1,721
Houston	I	Trinity	Carrizo-Wilcox	634	634	634	634	634	634	634
Marion	D	Cypress	Carrizo-Wilcox	1,966	1,966	1,966	1,966	1,966	1,966	1,966
Morris	D	Cypress	Carrizo-Wilcox	2,156	2,156	2,156	2,156	2,156	2,156	2,156
Morris	D	Sulphur	Carrizo-Wilcox	415	415	415	415	415	415	415
Nacogdoches	I	Neches	Carrizo-Wilcox	20,859	20,859	20,859	20,859	20,859	20,859	20,859

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070	2080
Panola	I	Cypress	Carrizo-Wilcox	0[8]	0	0	0	0	0	0
Panola	I	Sabine	Carrizo-Wilcox	4,999	4,999	4,999	4,999	4,999	4,999	4,999
Rains	D	Sabine	Carrizo-Wilcox	1,411	1,411	1,411	1,411	1,411	1,411	1,411
Red River	D	Sulphur	Carrizo-Wilcox	NULL[1]	NULL[1]	NULL[1]	NULL[1]	NULL[1]	NULL[1]	NULL[1]
Rusk	I	Neches	Carrizo-Wilcox	7,111	7,111	7,111	7,111	7,111	7,111	7,111
Rusk	I	Sabine	Carrizo-Wilcox	6,907	6,907	6,907	6,907	6,907	6,907	6,907
Sabine	I	Neches	Carrizo-Wilcox	356	356	356	356	356	356	356
Sabine	I	Sabine	Carrizo-Wilcox	1,032	1,032	1,032	1,032	1,032	1,032	1,032
San Augustine	I	Neches	Carrizo-Wilcox	303	303	303	303	303	303	303
San Augustine	I	Sabine	Carrizo-Wilcox	284	284	284	284	284	284	284
Shelby	I	Neches	Carrizo-Wilcox	2,621	2,621	2,621	2,621	2,621	2,621	2,621
Shelby	I	Sabine	Carrizo-Wilcox	3,698	3,698	3,698	3,698	3,698	3,698	3,698
Smith	D	Sabine	Carrizo-Wilcox	7,939	7,939	7,939	7,939	7,939	7,939	7,939
Smith	I	Neches	Carrizo-Wilcox	17,607	17,607	17,607	17,607	17,607	17,607	17,607
Titus	D	Cypress	Carrizo-Wilcox	5,594	5,594	5,594	5,594	5,594	5,594	5,594
Titus	D	Sulphur	Carrizo-Wilcox	1,942	1,942	1,942	1,942	1,942	1,942	1,942
Trinity	H	Trinity	Carrizo-Wilcox	1	1	1	1	1	1	1
Trinity	I	Neches	Carrizo-Wilcox	266	266	266	266	266	266	266
Upshur	D	Cypress	Carrizo-Wilcox	5,107	5,107	5,107	5,107	5,107	5,107	5,107
Upshur	D	Sabine	Carrizo-Wilcox	1,550	1,550	1,550	1,550	1,550	1,550	1,550
Van Zandt	D	Neches	Carrizo-Wilcox	2,616	2,616	2,616	2,616	2,616	2,616	2,616
Van Zandt	D	Sabine	Carrizo-Wilcox	3,286	3,286	3,286	3,286	3,286	3,286	3,286
Van Zandt	D	Trinity	Carrizo-Wilcox	1,030	1,030	1,030	1,030	1,030	1,030	1,030
Wood	D	Cypress	Carrizo-Wilcox	925	925	925	925	925	925	925
Wood	D	Sabine	Carrizo-Wilcox	16,977	16,977	16,977	16,977	16,977	16,977	16,977
GMA 11 Total			**Carrizo-Wilcox**	251,217	251,217	251,217	251,216	251,216	251,216	251,215

[8] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 6. 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	2080
Anderson	I	Neches	Queen City	11,489	11,489	11,489	11,488	11,488	11,488	11,488
Anderson	I	Trinity	Queen City	5,102	5,102	5,102	5,102	5,102	5,102	5,102
Angelina	I	Neches	Queen City	1,095	1,095	1,095	1,095	1,095	1,095	1,095
Camp	D	Cypress	Queen City	1,594	1,594	1,594	1,594	1,594	1,594	1,594
Cass	D	Cypress	Queen City	15,855	15,855	15,855	15,855	15,855	15,855	15,855
Cass	D	Sulphur	Queen City	624	624	624	624	624	624	624
Cherokee	I	Neches	Queen City	8,812	8,812	8,812	8,812	8,812	8,812	8,812
Gregg	D	Cypress	Queen City	456	456	456	456	456	456	456
Gregg	D	Sabine	Queen City	2,056	2,056	2,056	2,056	2,056	2,056	2,055
Harrison	D	Cypress	Queen City	2,976	2,976	2,976	2,976	2,976	2,976	2,976
Harrison	D	Sabine	Queen City	561	561	561	561	561	561	561
Henderson	C	Trinity	Queen City	154	154	154	154	154	154	154
Henderson	I	Neches	Queen City	10,516	10,516	10,516	10,516	10,516	10,516	10,516
Houston	I	Neches	Queen City	2,080	2,080	2,080	2,080	2,080	2,080	2,080
Houston	I	Trinity	Queen City	216	216	216	216	216	216	216
Marion	D	Cypress	Queen City	7,389	7,389	7,389	7,389	7,389	7,389	7,389
Morris	D	Cypress	Queen City	3,278	3,278	3,278	3,278	3,278	3,278	3,278
Nacogdoches	I	Neches	Queen City	2,946	2,946	2,946	2,946	2,946	2,946	2,946
Rusk	I	Neches	Queen City	39	39	39	39	39	39	39
Rusk	I	Sabine	Queen City	20	20	20	20	20	20	20
Sabine	I	Neches	Queen City	0[9]	0	0	0	0	0	0
Sabine	I	Sabine	Queen City	0	0	0	0	0	0	0
San Augustine	I	Neches	Queen City	0	0	0	0	0	0	0
Shelby	I	Sabine	Queen City	0	0	0	0	0	0	0

[9] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

County	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070	2080
Smith	D	Sabine	Queen City	12,457	12,457	12,457	12,457	12,457	12,457	12,457
Smith	I	Neches	Queen City	20,121	20,121	20,121	20,121	20,121	20,121	20,121
Titus	D	Cypress	Queen City	0[10]	0	0	0	0	0	0
Trinity	H	Trinity	Queen City	0	0	0	0	0	0	0
Trinity	I	Neches	Queen City	0	0	0	0	0	0	0
Upshur	D	Cypress	Queen City	6,216	6,215	6,215	6,215	6,215	6,215	6,215
Upshur	D	Sabine	Queen City	5,949	5,949	5,949	5,949	5,949	5,949	5,949
Van Zandt	D	Neches	Queen City	2,343	2,343	2,343	2,343	2,343	2,343	2,343
Wood	D	Cypress	Queen City	779	779	779	779	779	779	779
Wood	D	Sabine	Queen City	5,731	5,731	5,731	5,731	5,731	5,731	5,731
GMA 11 Total			**Queen City**	**130,854**	**130,854**	**130,853**	**130,853**	**130,853**	**130,852**	**130,852**

[10] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

TABLE 7. 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	RWPA	River Basin	Aquifer	2020	2030	2040	2050	2060	2070	2080
Anderson	I	Neches	Sparta Aquifer	109	109	109	109	109	109	109
Anderson	I	Trinity	Sparta Aquifer	198	198	198	198	198	198	198
Angelina	I	Neches	Sparta Aquifer	390	390	390	390	390	390	390
Cass	D	Cypress	Sparta Aquifer	0[11]	0	0	0	0	0	0
Cherokee	I	Neches	Sparta Aquifer	352	352	352	352	352	352	352
Houston	I	Neches	Sparta Aquifer	505	505	505	505	505	505	505
Houston	I	Trinity	Sparta Aquifer	977	977	977	977	977	977	977
Marion	D	Cypress	Sparta Aquifer	0	0	0	0	0	0	0
Nacogdoches	I	Neches	Sparta Aquifer	362	362	362	362	362	362	362
Rusk	I	Neches	Sparta Aquifer	0	0	0	0	0	0	0
Sabine	I	Neches	Sparta Aquifer	36	36	36	36	36	36	36
Sabine	I	Sabine	Sparta Aquifer	13	13	13	13	13	13	13
San Augustine	I	Neches	Sparta Aquifer	163	163	163	163	163	163	163
San Augustine	I	Sabine	Sparta Aquifer	3	3	3	3	3	3	3
Shelby	I	Sabine	Sparta Aquifer	0	0	0	0	0	0	0
Smith	D	Sabine	Sparta Aquifer	0	0	0	0	0	0	0
Smith	I	Neches	Sparta Aquifer	0	0	0	0	0	0	0
Trinity	H	Trinity	Sparta Aquifer	0	0	0	0	0	0	0
Trinity	I	Neches	Sparta Aquifer	152	152	152	152	152	152	152
Upshur	D	Sabine	Sparta Aquifer	0	0	0	0	0	0	0
Wood	D	Sabine	Sparta Aquifer	0	0	0	0	0	0	0
GMA 11 Total			**Sparta Aquifer**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**	**3,259**

[11] A zero value indicates the groundwater availability model pumping scenario did not include any pumping in the aquifer.

LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

> "Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results."

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and groundwater levels in the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

REFERENCES:

Hutchison, W.R., 2021, GMA 11 Technical Memorandum 21-01, Adjusted Pumping Simulations for Joint Planning with Updated Groundwater Availability Model for the Sparta, Queen City, and Carrizo-Wilcox Aquifers, 31p.

Langevin, C.D., Hughes, J.D., Banta, E.R., Niswonger, R.G., Panday, Sorab, and Provost, A.M., 2017, Documentation for the MODFLOW 6 Groundwater Flow (GWF) Model: U.S. Geological Survey Techniques and Methods, book 6, chap. A55, 197 p., accessed August 4, 2017, at https://doi.org/10.3133/tm6A55

National Research Council, 2007, Models in Environmental Regulatory Decision Making Committee on Models in the Regulatory Decision Process, National Academies Press, Washington D.C., 287 p., http://www.nap.edu/catalog.php?record_id=11972.

Panday, S., Rumbaugh, J., Hutchison, W.R., and Schorr, S., 2020, Numerical Model Report: Groundwater Availability Model for the Northern Portion of the Queen City, Sparta, and Carrizo-Wilcox Aquifers. Final Report prepared for Texas Water Development Board, Contact Number #1648302063, 198p.

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GAM RUN 21-019 MAG: MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14

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Texas Water Development Board
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Groundwater Modeling Department
512-936-0883

September 8, 2022

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10/6/2022

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MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14

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EXECUTIVE SUMMARY:

The combined value of modeled available groundwater in Groundwater Management Area 14 and the projected groundwater pumpage in subsidence districts in Groundwater Management Area 14 for the Gulf Coast Aquifer System ranges from a maximum of 1,327,135 acre-feet per year in 2020 to a minimum of 1,107,263 acre-feet per year in 2040 (Tables 1 and 2). Table 1 presents the modeled available groundwater summarized by decade from 2020 to 2080 for groundwater conservation districts. Table 2 presents the projected groundwater pumpage in regulatory plans adopted by subsidence districts and factored into the development of desired future conditions adopted by groundwater conservation districts. Table 3 summarizes the modeled available groundwater (for groundwater conservation district and non-district counties) and the projected groundwater pumpage (for subsidence district counties) by decade from 2030 to 2080 and by county, regional water planning area, and river basin for use in the regional water planning process. The estimates are based on the desired future conditions for the Gulf Coast Aquifer System adopted by groundwater conservation districts in Groundwater Management Area 14 on January 5, 2022. The explanatory report and other materials submitted to the Texas Water Development Board (TWDB) were determined to be administratively complete on June 15, 2022.

REQUESTOR:

Mr. John Martin, chair and technical coordinator of Groundwater Management Area 14.

DESCRIPTION OF REQUEST:

Mr. John Martin provided the TWDB with the desired future conditions of the Gulf Coast Aquifer System on behalf of Groundwater Management Area (GMA) 14. These desired future conditions were adopted by the groundwater conservation districts in Groundwater

Management Area 14 on January 5, 2022. The desired future conditions, as described in Resolution 2021-10-5 (GMA 14 and Oliver, 2022; Appendix G) are:

- “In each county in GMA 14, no less than 70 percent median available drawdown remaining in 2080 or no more than an average of 1.0 additional foot of subsidence between 2009 and 2080.”

The Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson, and Brazos River Alluvium aquifers were declared not relevant for purposes of joint planning by Groundwater Management Area 14 in Resolution 2021-10-5 (GMA 14 and Oliver, 2022; Appendix G).

On March 4, 2022, Mr. John Martin, technical coordinator of Groundwater Management Area 14, submitted the desired future conditions packet for Groundwater Management Area 14. TWDB staff reviewed the model files associated with the desired future conditions and received clarification on assumptions from the Groundwater Management Area 14 technical coordinator on March 23, 2022. In Resolution 2021-10-5, the desired future condition is defined for “each county in GMA 14”; however, Groundwater Management Area 14 clarified that it is their intent per pages 15 and 38 of the explanatory report that the subsidence district counties are not to be included in the county-specific desired future condition definition. For this reason, the TWDB did not consider subsidence district counties during the desired future conditions evaluation. An additional clarification from Groundwater Management Area 14 was a request that the modeled available groundwater values and modeled pumping values be provided by model aquifer layer in addition to the total values for the entire Gulf Coast Aquifer System. These additional splits are included in the current report in Appendix A.

Harris, Galveston, and Fort Bend counties (Subsidence Districts)

Harris-Galveston Subsidence District and Fort Bend Subsidence District are not subject to the provisions of Section 36.108 of the Texas Water Code and, therefore, have not specified desired future conditions. Because desired future conditions were not adopted for the counties in the subsidence districts, the TWDB does not provide “modeled available groundwater” values for those counties. However, the districts in Groundwater Management Area 14 incorporated the groundwater pumpage projections made by the subsidence districts in their regulatory plans so that all known regional groundwater pumping was factored into the joint planning process. Therefore, the subsidence district “groundwater pumpage projections” are still provided in this report (Table 2 and Table 3) even though these values are not official “modeled available groundwater” values.

METHODS:

The TWDB ran the groundwater availability model (version 3.01; Kasmarek, 2013) for the northern part of the Gulf Coast Aquifer System (Figure 1) using the predictive model files submitted with the explanatory report (GMA 14 and Oliver, 2022; Appendix R) on March 4, 2022. The modeled available groundwater values were determined by extracting pumping rates by decade from the model results using ZONEBUDGET Version 3.01 (Harbaugh, 2009). Annual pumping rates were divided by county, river basin, regional water planning area, and groundwater conservation district within Groundwater Management Area 14 (Figures 1 and 2; Tables 1 through 3).

As part of the process to calculate modeled available groundwater, the TWDB checked the model files submitted by Groundwater Management Area 14 to determine if the groundwater pumping scenario was compatible with the adopted desired future conditions. The TWDB used these model files to extract model-calculated water levels for 2009 (stress period 78) and 2080 (stress period 149), and to calculate the available drawdown according to the methodology described in the explanatory report (GMA 14 and Oliver, 2022; Appendix R). The TWDB applied this methodology to a dataset submitted as part of the explanatory report, which contained well locations and well depths for 61,880 wells. The ratio of available drawdown in 2080 to available drawdown in 2009 was calculated for each well and the median was determined for each county. As specified in the explanatory report (GMA 14 and Oliver, 2022; Appendix R), if the water level in a model cell dropped below the base of the cell the available drawdown for wells located in that model cell was set to zero.

The subsidence values were also extracted from the model results for 2009 (stress period 78) and 2080 (stress period 149) and average change in subsidence was calculated for each county. The median percent available drawdown and average change in subsidence for each county were compared to the desired future conditions to confirm that the model scenario was compatible with the desired future conditions.

Modeled Available Groundwater and Permitting

As defined in Chapter 36 of the Texas Water Code (2011), “modeled available groundwater” is the estimated average amount of water that may be produced annually to achieve a desired future condition. 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.

PARAMETERS AND ASSUMPTIONS:

The parameters and assumptions for the modeled available groundwater estimates are described below:

- Version 3.01 of the groundwater availability model for the northern portion of the Gulf Coast Aquifer System was used for this analysis. See Kasmarek (2013) for assumptions and limitations of the model.
- The model has four layers which represent the Chicot aquifer (Layer 1), the Evangeline aquifer (Layer 2), the Burkeville Confining Unit (Layer 3), and the Jasper aquifer and parts of the Catahoula Formation in direct hydrologic communication with the Jasper aquifer (Layer 4).
- The model was run with MODFLOW-2000 (Harbaugh and others, 2000).
- Available drawdown for cells with water levels below the base elevation of the cell ("dry" cells) was set to zero for the analysis.
- Cells with water levels below the base are "dry" in terms of water level. However, the transmissivity of those cells remains constant and pumping from those cells continues. Therefore, pumping is included in the modeled available groundwater values for those cells.
- The subsidence district counties (Harris, Galveston, and Fort Bend) were not included in the evaluation of the desired future condition.
- The evaluation of the desired future condition for available drawdown was based on the 61,880 observation well locations and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The evaluation of the desired future condition for subsidence was based on the extent of the official TWDB boundary for the Gulf Coast Aquifer System within the groundwater model and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The calculation of modeled available groundwater values was based on the extent of the official TWDB boundary for the Gulf Coast Aquifer System within the groundwater model and the MODFLOW pumping file submitted by Groundwater Management Area 14.
- The most recent TWDB model grid file dated June 10, 2020 (glfc_n_01062020.csv), was used to determine model cell entity assignment (county, groundwater management area, groundwater conservation district, river basin, regional water planning area).

- Estimates of modeled available groundwater from the model simulation were rounded to the nearest whole number.

RESULTS:

The modeled available groundwater for the Gulf Coast Aquifer System that achieves the desired future conditions adopted by Groundwater Management Area 14 ranges from 781,781 to 781,753 acre-feet per year between 2020 and 2080 (Table 1). Projected Gulf Coast Aquifer System groundwater pumpage from the three counties in the Harris Galveston Subsidence District and Fort Bend Subsidence District ranges between 545,354 and 325,510 acre-feet per year during the period 2020 to 2080 (Table 2). The combination of modeled available groundwater and projected groundwater pumpage values in the Gulf Coast Aquifer System has also been summarized by county, river basin, and regional water planning area in order to be consistent with the format used in the regional water planning process. (Table 3).

The modeled available groundwater values and projected groundwater pumpage values are also tabulated by model aquifer layer in Appendix A.

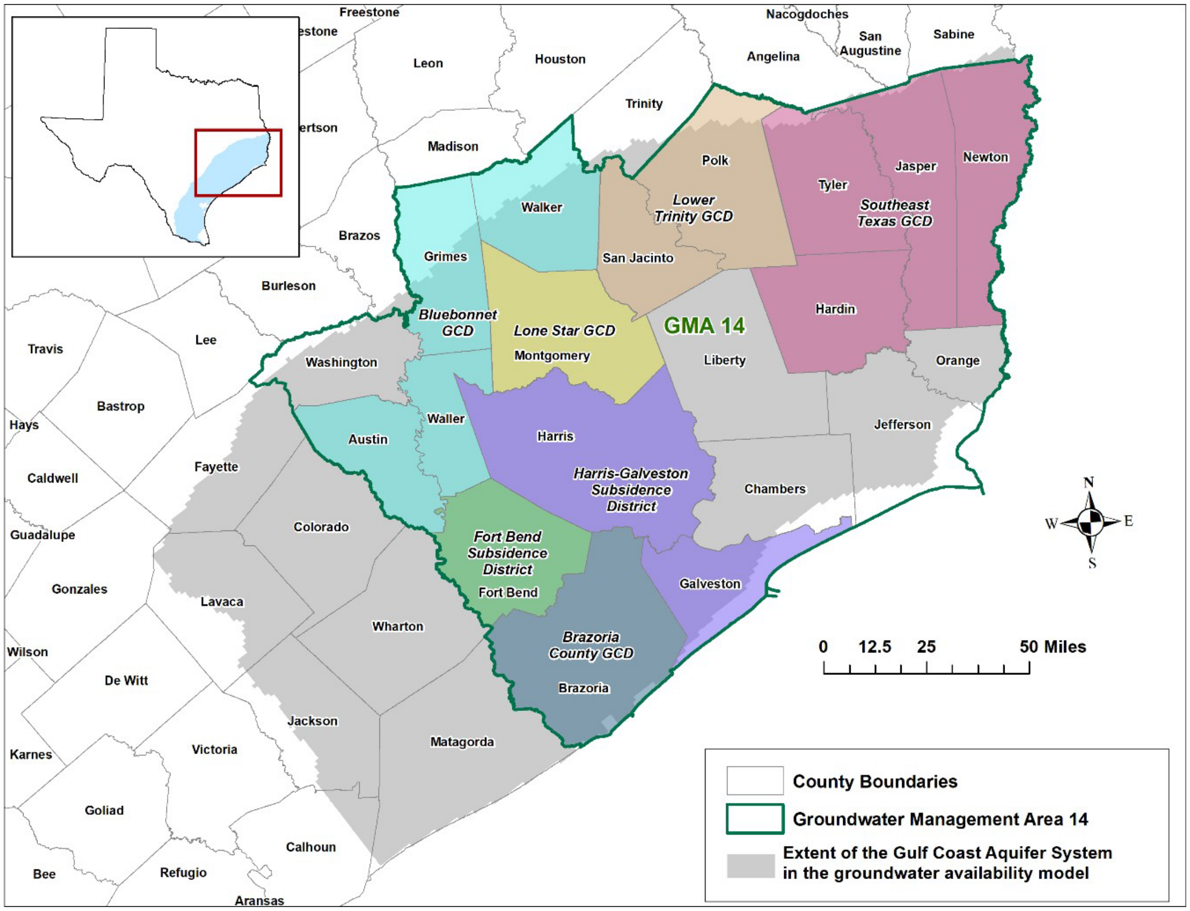

FIGURE 1. THE EXTENT OF THE GULF COAST AQUIFER SHOWN WITH GROUNDWATER CONSERVATION DISTRICTS AND SUBSIDENCE DISTRICTS IN GROUNDWATER MANAGEMENT AREA 14.

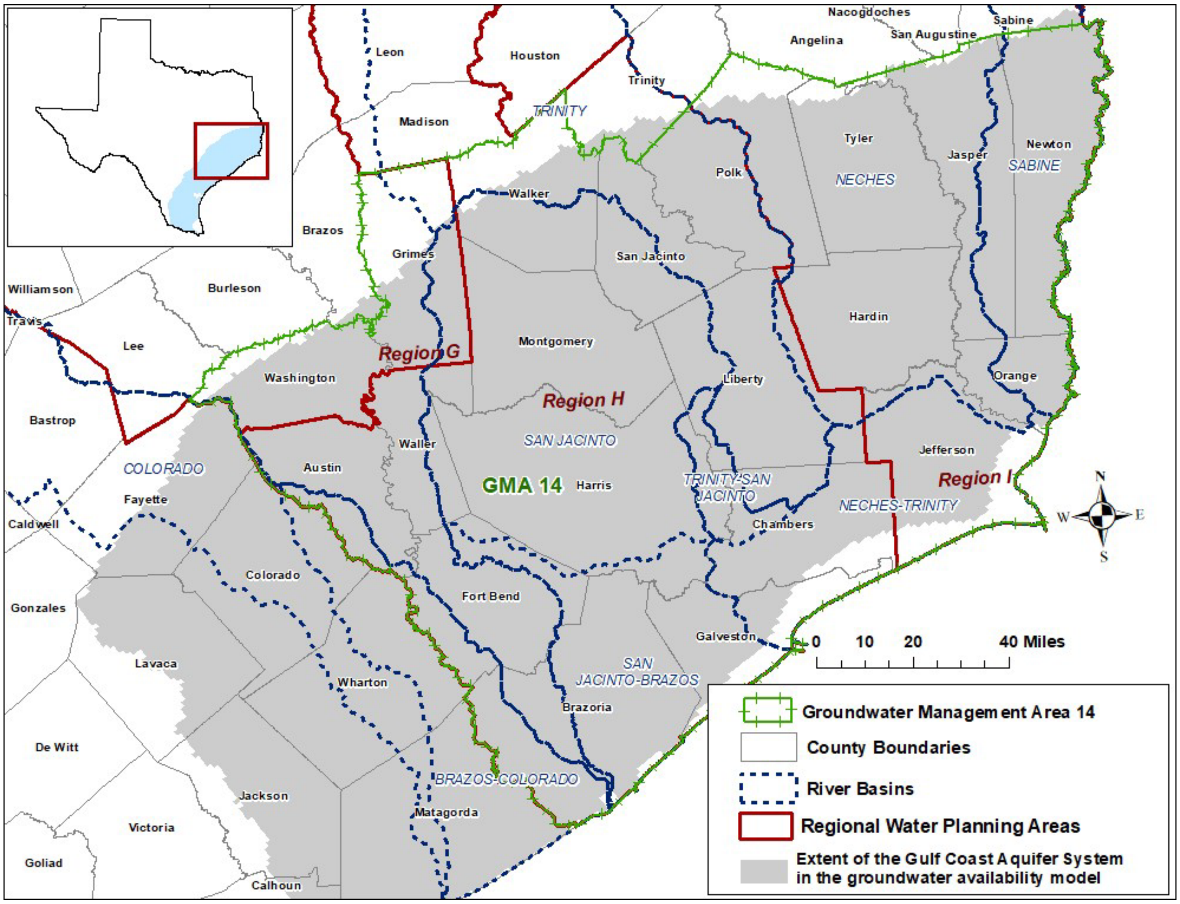

FIGURE 2. **LOCATION OF REGIONAL WATER PLANNING AREAS AND RIVER BASINS IN GROUNDWATER MANAGEMENT AREA 14.**

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES EXCLUDE SUBSIDENCE DISTRICTS. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Bluebonnet GCD	Austin	Gulf Coast Aquifer	46,560	46,560	46,560	46,560	46,560	46,560	46,560
Bluebonnet GCD	Grimes	Gulf Coast Aquifer	51,487	51,487	51,487	51,487	51,487	51,487	51,487
Bluebonnet GCD	Walker	Gulf Coast Aquifer	42,504	42,504	42,504	42,504	42,504	42,504	42,504
Bluebonnet GCD	Waller	Gulf Coast Aquifer	55,533	55,533	55,533	55,533	55,533	55,533	55,533
Bluebonnet GCD Total		**Gulf Coast Aquifer System**	**196,084**	**196,084**	**196,084**	**196,084**	**196,084**	**196,084**	**196,084**
Brazoria County	Brazoria	Gulf Coast Aquifer	54,955	54,930	54,908	54,895	54,888	54,886	54,886
Brazoria County GCD Total		**Gulf Coast Aquifer System**	**54,955**	**54,930**	**54,908**	**54,895**	**54,888**	**54,886**	**54,886**
Lone Star GCD	Montgomery	Gulf Coast Aquifer	96,965	96,954	96,945	96,930	96,916	96,873	96,873
Lone Star GCD Total		**Gulf Coast Aquifer System**	**96,965**	**96,954**	**96,945**	**96,930**	**96,916**	**96,873**	**96,873**
Lower Trinity GCD	Polk	Gulf Coast Aquifer	40,746	40,746	40,746	40,746	40,746	40,746	40,746
Lower Trinity GCD	San Jacinto	Gulf Coast Aquifer	35,037	35,048	35,057	35,071	35,086	35,128	35,128
Lower Trinity GCD Total		**Gulf Coast Aquifer System**	**75,783**	**75,794**	**75,803**	**75,817**	**75,832**	**75,874**	**75,874**

TABLE 1 (CONTINUED). MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES EXCLUDE SUBSIDENCE DISTRICTS. VALUES ARE IN ACRE-FEET PER YEAR.

Groundwater Conservation District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Southeast Texas	Hardin	Gulf Coast Aquifer System	37,721	37,721	37,721	37,721	37,721	37,721	37,721
Southeast Texas	Jasper	Gulf Coast Aquifer System	73,365	73,365	73,365	73,365	73,365	73,365	73,365
Southeast Texas	Newton	Gulf Coast Aquifer System	37,508	37,508	37,508	37,508	37,508	37,508	37,508
Southeast Texas	Tyler	Gulf Coast Aquifer System	34,390	34,390	34,390	34,390	34,390	34,390	34,390
Southeast Texas GCD Total		**Gulf Coast Aquifer System**	**182,984**	**182,984**	**182,984**	**182,984**	**182,984**	**182,984**	**182,984**
All District Total		**Gulf Coast Aquifer System**	**606,771**	**606,746**	**606,724**	**606,710**	**606,704**	**606,701**	**606,701**
No District-County	Chambers	Gulf Coast Aquifer System	22,321	22,332	22,343	22,352	22,353	22,355	22,355
No District-County	Jefferson	Gulf Coast Aquifer System	15,425	15,425	15,425	15,425	15,425	15,425	15,425
No District-County	Liberty	Gulf Coast Aquifer System	71,661	71,660	71,658	71,659	71,660	71,660	71,660
No District-County	Orange	Gulf Coast Aquifer System	25,205	25,205	25,205	25,205	25,205	25,205	25,205
No District-County	Washington	Gulf Coast Aquifer System	40,398	40,398	40,398	40,398	40,398	40,398	40,398
No District Total		**Gulf Coast Aquifer System**	**175,010**	**175,020**	**175,029**	**175,039**	**175,041**	**175,043**	**175,043**
GMA 14	**Total**	**Gulf Coast Aquifer System**	**781,781**	**781,766**	**781,753**	**781,749**	**781,745**	**781,744**	**781,744**

TABLE 2. GROUNDWATER PUMPAGE PROJECTIONS FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 FOR SUBSIDENCE DISTRICT COUNTIES FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Subsidence District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Fort Bend	Fort Bend	Gulf Coast Aquifer System	129,845	103,942	119,557	135,158	151,334	169,347	169,347
Fort Bend Subsidence District Total		**Gulf Coast Aquifer System**	**129,845**	**103,942**	**119,557**	**135,158**	**151,334**	**169,347**	**169,347**
Harris-Galveston	Galveston	Gulf Coast Aquifer System	6,032	6,788	7,435	8,060	8,646	9,181	9,181
Harris-Galveston	Harris	Gulf Coast Aquifer System	409,477	290,583	198,518	211,370	220,049	228,828	228,828
Harris-Galveston Subsidence District Total		**Gulf Coast Aquifer System**	**415,509**	**297,371**	**205,953**	**219,430**	**228,695**	**238,009**	**238,009**
GMA 14	**Total**	**Gulf Coast Aquifer System**	**545,354**	**401,313**	**325,510**	**354,588**	**380,029**	**407,356**	**407,356**

TABLE 3. MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Austin	H	Brazos-Colorado	Gulf Coast	20,652	20,652	20,652	20,652	20,652	20,652
Austin	H	Brazos	Gulf Coast	25,243	25,243	25,243	25,243	25,243	25,243
Austin	H	Colorado	Gulf Coast	665	665	665	665	665	665
Brazoria	H	Brazos-Colorado	Gulf Coast	10,049	9,846	9,582	9,324	9,072	9,072
Brazoria	H	Brazos	Gulf Coast	3,641	3,578	3,510	3,454	3,407	3,407
Brazoria	H	San Jacinto-Brazos	Gulf Coast	41,240	41,483	41,803	42,110	42,408	42,408
Chambers	H	Neches-Trinity	Gulf Coast	9,968	9,968	9,968	9,968	9,968	9,968
Chambers	H	Trinity-San Jacinto	Gulf Coast	2,142	2,152	2,161	2,163	2,164	2,164
Chambers	H	Trinity	Gulf Coast	10,222	10,222	10,222	10,222	10,222	10,222
Fort Bend	*H*	*Brazos-Colorado*	*Gulf Coast*	*7,891*	*9,586*	*12,056*	*15,660*	*20,927*	*20,927*
Fort Bend	*H*	*Brazos*	*Gulf Coast*	*37,845*	*46,525*	*55,134*	*64,011*	*73,732*	*73,732*
Fort Bend	*H*	*San Jacinto-Brazos*	*Gulf Coast*	*40,844*	*45,913*	*50,471*	*54,218*	*57,258*	*57,258*
Fort Bend	*H*	*San Jacinto*	*Gulf Coast*	*17,362*	*17,532*	*17,497*	*17,445*	*17,430*	*17,430*
Galveston	*H*	*Neches-Trinity*	*Gulf Coast*	*0*[1]	*0*	*0*	*0*	*0*	*0*
Galveston	*H*	*San Jacinto-Brazos*	*Gulf Coast*	*6,788*	*7,435*	*8,060*	*8,646*	*9,181*	*9,181*
Grimes	G	Brazos	Gulf Coast	31,117	31,117	31,117	31,117	31,117	31,117
Grimes	G	San Jacinto	Gulf Coast	19,087	19,087	19,087	19,087	19,087	19,087
Grimes	G	Trinity	Gulf Coast	1,283	1,283	1,283	1,283	1,283	1,283
Hardin	I	Neches	Gulf Coast	37,571	37,571	37,571	37,571	37,571	37,571
Hardin	I	Trinity	Gulf Coast	150	150	150	150	150	150
Harris	*H*	*San Jacinto-Brazos*	*Gulf Coast*	*6,956*	*7,617*	*8,282*	*8,819*	*9,463*	*9,463*
Harris	*H*	*San Jacinto*	*Gulf Coast*	*280,676*	*187,992*	*199,990*	*208,033*	*216,067*	*216,067*

[1] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE 3 (CONTINUED). MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Harris	*H*	*Trinity-San Jacinto*	*Gulf Coast*	*2,952*	*2,909*	*3,097*	*3,198*	*3,297*	*3,297*
Jasper	I	Neches	Gulf Coast	40,821	40,821	40,821	40,821	40,821	40,821
Jasper	I	Sabine	Gulf Coast	32,544	32,544	32,544	32,544	32,544	32,544
Jefferson	I	Neches-Trinity	Gulf Coast	13,571	13,571	13,571	13,571	13,571	13,571
Jefferson	I	Neches	Gulf Coast	1,853	1,853	1,853	1,853	1,853	1,853
Liberty	H	Neches-Trinity	Gulf Coast	2,053	2,053	2,053	2,053	2,053	2,053
Liberty	H	Neches	Gulf Coast	8,732	8,732	8,732	8,732	8,732	8,732
Liberty	H	San Jacinto	Gulf Coast	11,299	11,299	11,299	11,299	11,299	11,299
Liberty	H	Trinity-San Jacinto	Gulf Coast	10,544	10,543	10,543	10,544	10,544	10,544
Liberty	H	Trinity	Gulf Coast	39,032	39,031	39,032	39,032	39,032	39,032
Montgomery	H	San Jacinto	Gulf Coast	96,954	96,945	96,930	96,916	96,873	96,873
Newton	I	Neches	Gulf Coast	199	199	199	199	199	199
Newton	I	Sabine	Gulf Coast	37,309	37,309	37,309	37,309	37,309	37,309
Orange	I	Neches-Trinity	Gulf Coast	280	280	280	280	280	280
Orange	I	Neches	Gulf Coast	6,266	6,266	6,266	6,266	6,266	6,266
Orange	I	Sabine	Gulf Coast	18,659	18,659	18,659	18,659	18,659	18,659
Polk	I	Neches	Gulf Coast	16,765	16,765	16,765	16,765	16,765	16,765
Polk	H	Trinity	Gulf Coast	23,981	23,981	23,981	23,981	23,981	23,981
San Jacinto	H	San Jacinto	Gulf Coast	18,443	18,452	18,467	18,482	18,524	18,524
San Jacinto	H	Trinity	Gulf Coast	16,604	16,604	16,604	16,604	16,604	16,604
Tyler	I	Neches	Gulf Coast	34,390	34,390	34,390	34,390	34,390	34,390
Walker	H	San Jacinto	Gulf Coast	26,622	26,622	26,622	26,622	26,622	26,622
Walker	H	Trinity	Gulf Coast	15,881	15,881	15,881	15,881	15,881	15,881

TABLE 3 (CONTINUED). MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	Aquifer	2030	2040	2050	2060	2070	2080
Waller	H	Brazos	Gulf Coast	23,397	23,397	23,397	23,397	23,397	23,397
Waller	H	San Jacinto	Gulf Coast	32,136	32,136	32,136	32,136	32,136	32,136
Washington	G	Brazos	Gulf Coast	40,164	40,164	40,164	40,164	40,164	40,164
Washington	G	Colorado	Gulf Coast	233	233	233	233	233	233
GMA 14 Total			**Gulf Coast Aquifer System**	**1,183,076**	**1,107,256**	**1,136,332**	**1,161,772**	**1,189,096**	**1,189,096**

LIMITATIONS:

The groundwater model used in completing this analysis is the best available scientific tool that can be used to meet the stated objectives. To the extent that this analysis will be used for planning purposes and/or regulatory purposes related to pumping in the past and into the future, it is important to recognize the assumptions and limitations associated with the use of the results. In reviewing the use of models in environmental regulatory decision making, the National Research Council (2007) noted:

> *"Models will always be constrained by computational limitations, assumptions, and knowledge gaps. They can best be viewed as tools to help inform decisions rather than as machines to generate truth or make decisions. Scientific advances will never make it possible to build a perfect model that accounts for every aspect of reality or to prove that a given model is correct in all respects for a particular regulatory application. These characteristics make evaluation of a regulatory model more complex than solely a comparison of measurement data with model results."*

A key aspect of using the groundwater model to evaluate historic groundwater flow conditions includes the assumptions about the location in the aquifer where historic pumping was placed. Understanding the amount and location of historic pumping is as important as evaluating the volume of groundwater flow into and out of the district, between aquifers within the district (as applicable), interactions with surface water (as applicable), recharge to the aquifer system (as applicable), and other metrics that describe the impacts of that pumping. In addition, assumptions regarding precipitation, recharge, and streamflow are specific to a particular historic time period.

Because the application of the groundwater model was designed to address regional scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations relating to the actual conditions of any aquifer at a particular location or at a particular time.

It is important for groundwater conservation districts to monitor groundwater pumping and groundwater levels in the aquifer. Because of the limitations of the groundwater model and the assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine this analysis in the future given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future. Historic precipitation patterns also need to be placed in context as future climatic conditions, such as dry and wet year precipitation patterns, may differ and affect groundwater flow conditions.

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APPENDIX A

Total Pumping Associated with Modeled Available Groundwater Run for the Gulf Coast Aquifer System Split by Model Layers for Groundwater Management Area 14

TABLE A.1. MODELED AVAILABLE GROUNDWATER FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER AND SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Bluebonnet GCD	Austin	Chicot aquifer	2,894	2,894	2,894	2,894	2,894	2,894	2,894
Bluebonnet GCD	Austin	Evangeline aquifer	41,695	41,695	41,695	41,695	41,695	41,695	41,695
Bluebonnet GCD	Austin	Burkeville confining	0[2]	0	0	0	0	0	0
Bluebonnet GCD	Austin	Jasper aquifer	1,972	1,972	1,972	1,972	1,972	1,972	1,972
Bluebonnet GCD	Grimes	Chicot aquifer	0	0	0	0	0	0	0
Bluebonnet GCD	Grimes	Evangeline aquifer	15,917	15,917	15,917	15,917	15,917	15,917	15,917
Bluebonnet GCD	Grimes	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Grimes	Jasper aquifer	35,570	35,570	35,570	35,570	35,570	35,570	35,570
Bluebonnet GCD	Walker	Chicot aquifer	0	0	0	0	0	0	0
Bluebonnet GCD	Walker	Evangeline aquifer	3,143	3,143	3,143	3,143	3,143	3,143	3,143
Bluebonnet GCD	Walker	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Walker	Jasper aquifer	39,361	39,361	39,361	39,361	39,361	39,361	39,361
Bluebonnet GCD	Waller	Chicot aquifer	791	791	791	791	791	791	791
Bluebonnet GCD	Waller	Evangeline aquifer	54,413	54,413	54,413	54,413	54,413	54,413	54,413
Bluebonnet GCD	Waller	Burkeville confining	0	0	0	0	0	0	0
Bluebonnet GCD	Waller	Jasper aquifer	329	329	329	329	329	329	329
Bluebonnet GCD Total		**Gulf Coast Aquifer System**	**196,085**	**196,085**	**196,085**	**196,085**	**196,085**	**196,085**	**196,085**
Brazoria County	Brazoria	Chicot aquifer	43,086	43,060	43,040	43,027	43,021	43,018	43,018
Brazoria County	Brazoria	Evangeline aquifer	11,869	11,870	11,868	11,868	11,868	11,868	11,868

[2] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1. (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Brazoria County GCD Total		**Gulf Coast Aquifer System**	**54,955**	**54,930**	**54,908**	**54,895**	**54,889**	**54,886**	**54,886**
Lone Star GCD	Montgomery	Chicot aquifer	20,868	22,117	22,136	23,202	22,878	21,030	21,030
Lone Star GCD	Montgomery	Evangeline aquifer	41,172	41,160	41,397	40,200	40,269	39,815	39,815
Lone Star GCD	Montgomery	Burkeville confining	0[3]	0	0	0	0	0	0
Lone Star GCD	Montgomery	Jasper aquifer	34,925	33,676	33,412	33,527	33,769	36,028	36,028
Lone Star GCD Total		**Gulf Coast Aquifer System**	**96,965**	**96,953**	**96,945**	**96,929**	**96,916**	**96,873**	**96,873**
Lower Trinity GCD	Polk	Chicot aquifer	0	0	0	0	0	0	0
Lower Trinity GCD	Polk	Evangeline aquifer	9,486	9,486	9,486	9,486	9,486	9,486	9,486
Lower Trinity GCD	Polk	Burkeville confining	828	828	828	828	828	828	828
Lower Trinity GCD	Polk	Jasper aquifer	30,432	30,432	30,432	30,432	30,432	30,432	30,432
Lower Trinity GCD	San Jacinto	Chicot aquifer	0	0	0	0	0	0	0
Lower Trinity GCD	San Jacinto	Evangeline aquifer	15,110	15,116	15,120	15,127	15,135	15,156	15,156
Lower Trinity GCD	San Jacinto	Burkeville confining	2,762	2,762	2,762	2,762	2,762	2,762	2,762
Lower Trinity GCD	San Jacinto	Jasper aquifer	17,164	17,170	17,174	17,182	17,189	17,210	17,210
Lower Trinity GCD Total		**Gulf Coast Aquifer System**	**75,782**	**75,794**	**75,802**	**75,817**	**75,832**	**75,874**	**75,874**
Southeast Texas	Hardin	Chicot aquifer	1,492	1,492	1,492	1,492	1,492	1,492	1,492
Southeast Texas	Hardin	Evangeline aquifer	36,229	36,229	36,229	36,229	36,229	36,229	36,229
Southeast Texas	Hardin	Burkeville confining	0	0	0	0	0	0	0
Southeast Texas	Hardin	Jasper aquifer	0	0	0	0	0	0	0
Southeast Texas	Jasper	Chicot aquifer	10,858	10,858	10,858	10,858	10,858	10,858	10,858
Southeast Texas	Jasper	Evangeline aquifer	43,842	43,842	43,842	43,842	43,842	43,842	43,842
Southeast Texas	Jasper	Burkeville confining	8	8	8	8	8	8	8

[3] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Southeast Texas	Jasper	Jasper aquifer	18,657	18,657	18,657	18,657	18,657	18,657	18,657
Southeast Texas	Newton	Chicot aquifer	547	547	547	547	547	547	547
Southeast Texas	Newton	Evangeline aquifer	23,162	23,162	23,162	23,162	23,162	23,162	23,162
Southeast Texas	Newton	Burkeville confining	0[4]	0	0	0	0	0	0
Southeast Texas	Newton	Jasper aquifer	13,800	13,800	13,800	13,800	13,800	13,800	13,800
Southeast Texas	Tyler	Chicot aquifer	0	0	0	0	0	0	0
Southeast Texas	Tyler	Evangeline aquifer	18,519	18,519	18,519	18,519	18,519	18,519	18,519
Southeast Texas	Tyler	Burkeville confining	0	0	0	0	0	0	0
Southeast Texas	Tyler	Jasper aquifer	15,871	15,871	15,871	15,871	15,871	15,871	15,871
Southeast Texas GCD Total		**Gulf Coast Aquifer System**	**182,985**	**182,985**	**182,985**	**182,985**	**182,985**	**182,985**	**182,985**
District Total		**Gulf Coast Aquifer System**	**606,772**	**606,747**	**606,725**	**606,711**	**606,707**	**606,703**	**606,703**
No District-County	Chambers	Chicot aquifer	21,935	21,946	21,957	21,966	21,967	21,968	21,968
No District-County	Chambers	Evangeline aquifer	386	386	386	386	386	386	386
No District-County	Jefferson	Chicot aquifer	15,214	15,214	15,214	15,214	15,214	15,214	15,214
No District-County	Jefferson	Evangeline aquifer	211	211	211	211	211	211	211
No District-County	Liberty	Chicot aquifer	18,594	18,594	18,593	18,594	18,594	18,594	18,594
No District-County	Liberty	Evangeline aquifer	51,924	51,923	51,922	51,922	51,923	51,924	51,924
No District-County	Liberty	Burkeville confining	243	243	243	243	243	243	243
No District-County	Liberty	Jasper aquifer	900	900	900	900	900	900	900
No District-County	Orange	Chicot aquifer	22,854	22,854	22,854	22,854	22,854	22,854	22,854

[4] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.1 (CONTINUED)

GCD	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
No District-County	Orange	Evangeline aquifer	2,351	2,351	2,351	2,351	2,351	2,351	2,351
No District-County	Washington	Evangeline aquifer	11,231	11,231	11,231	11,231	11,231	11,231	11,231
No District-County	Washington	Burkeville confining	421	421	421	421	421	421	421
No District-County	Washington	Jasper aquifer	28,746	28,746	28,746	28,746	28,746	28,746	28,746
No District Total		**Gulf Coast Aquifer System**	**175,010**	**175,020**	**175,029**	**175,039**	**175,041**	**175,043**	**175,043**
GMA 14	**Total**	**Gulf Coast Aquifer System**	**781,782**	**781,767**	**781,754**	**781,750**	**781,748**	**781,746**	**781,746**

TABLE A. GROUNDWATER PUMPAGE PROJECTIONS FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER FOR SUBSIDENCE DISTRICT COUNTIES FOR EACH DECADE BETWEEN 2020 AND 2080. VALUES ARE IN ACRE-FEET PER YEAR.

Subsidence District	County	Aquifer	2020	2030	2040	2050	2060	2070	2080
Fort Bend	Fort Bend	Chicot aquifer	58,273	52,870	62,897	73,277	84,381	97,154	97,154
Fort Bend	Fort Bend	Evangeline aquifer	71,572	51,072	56,659	61,881	66,953	72,193	72,193
Fort Bend	Fort Bend	Burkeville confining	0[5]	0	0	0	0	0	0
Fort Bend	Fort Bend	Jasper aquifer	0	0	0	0	0	0	0
Fort Bend Subsidence District Total		**Gulf Coast Aquifer System**	**129,845**	**103,942**	**119,556**	**135,158**	**151,334**	**169,347**	**169,347**
Harris-Galveston	Galveston	Chicot aquifer	5,817	6,535	7,151	7,746	8,301	8,807	8,807
Harris-Galveston	Galveston	Evangeline aquifer	215	254	284	314	346	373	373
Harris-Galveston	Harris	Chicot aquifer	136,644	108,688	80,496	86,816	90,263	93,781	93,781
Harris-Galveston	Harris	Evangeline aquifer	264,622	176,464	114,859	121,185	126,268	131,389	131,389
Harris-Galveston	Harris	Burkeville confining	0	0	0	0	0	0	0
Harris-Galveston	Harris	Jasper aquifer	8,212	5,432	3,164	3,368	3,519	3,658	3,658
Harris-Galveston Subsidence District Total		**Gulf Coast Aquifer System**	**415,510**	**297,373**	**205,954**	**219,429**	**228,697**	**238,008**	**238,008**
GMA 14	**Total**	**Gulf Coast Aquifer System**	**545,355**	**401,315**	**325,510**	**354,587**	**380,031**	**407,355**	**407,355**

[5] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3. MODELED AVAILABLE GROUNDWATER AND PROJECTED GROUNDWATER PUMPAGE VALUES (*IN ITALICS*) BY DECADE FOR THE GULF COAST AQUIFER SYSTEM IN GROUNDWATER MANAGEMENT AREA 14 SPLIT BY MODEL LAYER. 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	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Austin	H	Brazos-Colorado	Chicot aquifer	1,432	1,432	1,432	1,432	1,432	1,432
Austin	H	Brazos-Colorado	Evangeline aquifer	19,027	19,027	19,027	19,027	19,027	19,027
Austin	H	Brazos-Colorado	Burkeville confining unit	0[6]	0	0	0	0	0
Austin	H	Brazos-Colorado	Jasper aquifer	192	192	192	192	192	192
Austin	H	Brazos	Chicot aquifer	1,462	1,462	1,462	1,462	1,462	1,462
Austin	H	Brazos	Evangeline aquifer	22,217	22,217	22,217	22,217	22,217	22,217
Austin	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Austin	H	Brazos	Jasper aquifer	1,565	1,565	1,565	1,565	1,565	1,565
Austin	H	Colorado	Chicot aquifer	0	0	0	0	0	0
Austin	H	Colorado	Evangeline aquifer	450	450	450	450	450	450
Austin	H	Colorado	Burkeville confining unit	0	0	0	0	0	0
Austin	H	Colorado	Jasper aquifer	214	214	214	214	214	214
Brazoria	H	Brazos-Colorado	Chicot aquifer	10,044	9,842	9,577	9,319	9,066	9,066
Brazoria	H	Brazos-Colorado	Evangeline aquifer	4	5	5	5	5	5
Brazoria	H	Brazos	Chicot aquifer	3,641	3,578	3,510	3,454	3,407	3,407
Brazoria	H	Brazos	Evangeline aquifer	0	0	0	0	0	0
Brazoria	H	San Jacinto-Brazos	Chicot aquifer	29,375	29,620	29,940	30,248	30,545	30,545
Brazoria	H	San Jacinto-Brazos	Evangeline aquifer	11,865	11,863	11,863	11,863	11,863	11,863
Chambers	H	Neches-Trinity	Chicot aquifer	9,968	9,968	9,968	9,968	9,968	9,968
Chambers	H	Neches-Trinity	Evangeline aquifer	0	0	0	0	0	0
Chambers	H	Trinity-San Jacinto	Chicot aquifer	1,756	1,766	1,775	1,777	1,778	1,778
Chambers	H	Trinity-San Jacinto	Evangeline aquifer	386	386	386	386	386	386
Chambers	H	Trinity	Chicot aquifer	10,222	10,222	10,222	10,222	10,222	10,222

[6] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Chambers	H	Trinity	Evangeline aquifer	0[7]	0	0	0	0	0
Fort Bend	H	Brazos-Colorado	Chicot aquifer	7,162	8,504	10,466	13,339	17,547	17,547
Fort Bend	H	Brazos-Colorado	Evangeline aquifer	729	1,082	1,590	2,321	3,380	3,380
Fort Bend	H	Brazos-Colorado	Burkeville confining unit	0[i]	0	0	0	0	0
Fort Bend	H	Brazos-Colorado	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	Brazos	Chicot aquifer	24,308	30,446	36,552	42,837	49,691	49,691
Fort Bend	H	Brazos	Evangeline aquifer	13,537	16,080	18,582	21,174	24,041	24,041
Fort Bend	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	Brazos	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	San Jacinto-Brazos	Chicot aquifer	15,320	17,795	20,101	22,054	23,759	23,759
Fort Bend	H	San Jacinto-Brazos	Evangeline aquifer	25,524	28,118	30,370	32,165	33,499	33,499
Fort Bend	H	San Jacinto-Brazos	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	San Jacinto-Brazos	Jasper aquifer	0	0	0	0	0	0
Fort Bend	H	San Jacinto	Chicot aquifer	6,081	6,153	6,157	6,151	6,156	6,156
Fort Bend	H	San Jacinto	Evangeline aquifer	11,282	11,379	11,340	11,293	11,273	11,273
Fort Bend	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Fort Bend	H	San Jacinto	Jasper aquifer	0	0	0	0	0	0
Galveston	H	Neches-Trinity	Chicot aquifer	0	0	0	0	0	0
Galveston	H	Neches-Trinity	Evangeline aquifer	0	0	0	0	0	0
Galveston	H	San Jacinto-Brazos	Chicot aquifer	6,535	7,151	7,746	8,301	8,807	8,807
Galveston	H	San Jacinto-Brazos	Evangeline aquifer	254	284	314	346	373	373
Grimes	G	Brazos	Chicot aquifer	0	0	0	0	0	0
Grimes	G	Brazos	Evangeline aquifer	8,670	8,670	8,670	8,670	8,670	8,670
Grimes	G	Brazos	Burkeville confining unit	0	0	0	0	0	0
Grimes	G	Brazos	Jasper aquifer	22,446	22,446	22,446	22,446	22,446	22,446

[7] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Grimes	G	San Jacinto	Chicot aquifer	0[8]	0	0	0	0	0
Grimes	G	San Jacinto	Evangeline aquifer	7,247	7,247	7,247	7,247	7,247	7,247
Grimes	G	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Grimes	G	San Jacinto	Jasper aquifer	11,840	11,840	11,840	11,840	11,840	11,840
Grimes	G	Trinity	Jasper aquifer	1,283	1,283	1,283	1,283	1,283	1,283
Hardin	I	Neches	Chicot aquifer	1,492	1,492	1,492	1,492	1,492	1,492
Hardin	I	Neches	Evangeline aquifer	36,079	36,079	36,079	36,079	36,079	36,079
Hardin	I	Neches	Burkeville confining unit	0	0	0	0	0	0
Hardin	I	Neches	Jasper aquifer	0	0	0	0	0	0
Hardin	I	Trinity	Chicot aquifer	0	0	0	0	0	0
Hardin	I	Trinity	Evangeline aquifer	150	150	150	150	150	150
Hardin	I	Trinity	Burkeville confining unit	0	0	0	0	0	0
Hardin	I	Trinity	Jasper aquifer	0	0	0	0	0	0
Harris	*H*	*San Jacinto-Brazos*	*Chicot aquifer*	*4,859*	*5,406*	*5,959*	*6,383*	*6,906*	*6,906*
Harris	*H*	*San Jacinto-Brazos*	*Evangeline aquifer*	*2,097*	*2,212*	*2,323*	*2,436*	*2,557*	*2,557*
Harris	*H*	*San Jacinto*	*Chicot aquifer*	*101,266*	*72,533*	*78,138*	*81,077*	*83,988*	*83,988*
Harris	*H*	*San Jacinto*	*Evangeline aquifer*	*173,978*	*112,296*	*118,483*	*123,437*	*128,422*	*128,422*
Harris	*H*	*San Jacinto*	*Burkeville confining unit*	*0*	*0*	*0*	*0*	*0*	*0*
Harris	*H*	*San Jacinto*	*Jasper aquifer*	*5,432*	*3,164*	*3,368*	*3,519*	*3,658*	*3,658*
Harris	*H*	*Trinity-San Jacinto*	*Chicot aquifer*	*2,563*	*2,557*	*2,718*	*2,803*	*2,887*	*2,887*
Harris	*H*	*Trinity-San Jacinto*	*Evangeline aquifer*	*389*	*351*	*379*	*395*	*410*	*410*
Harris	*H*	*Trinity-San Jacinto*	*B Burkeville confining unit*	*0*	*0*	*0*	*0*	*0*	*0*
Harris	*H*	*Trinity-San Jacinto*	*Jasper aquifer*	*0*	*0*	*0*	*0*	*0*	*0*
Jasper	I	Neches	Chicot aquifer	7,740	7,740	7,740	7,740	7,740	7,740
Jasper	I	Neches	Evangeline aquifer	18,534	18,534	18,534	18,534	18,534	18,534

[8] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Jasper	I	Neches	Burkeville confining unit	0[9]	0	0	0	0	0
Jasper	I	Neches	Jasper aquifer	14,546	14,546	14,546	14,546	14,546	14,546
Jasper	I	Sabine	Chicot aquifer	3,118	3,118	3,118	3,118	3,118	3,118
Jasper	I	Sabine	Evangeline aquifer	25,308	25,308	25,308	25,308	25,308	25,308
Jasper	I	Sabine	Burkeville confining unit	8	8	8	8	8	8
Jasper	I	Sabine	Jasper aquifer	4,111	4,111	4,111	4,111	4,111	4,111
Jefferson	I	Neches-Trinity	Chicot aquifer	13,571	13,571	13,571	13,571	13,571	13,571
Jefferson	I	Neches-Trinity	Evangeline aquifer	0	0	0	0	0	0
Jefferson	I	Neches	Chicot aquifer	1,643	1,643	1,643	1,643	1,643	1,643
Jefferson	I	Neches	Evangeline aquifer	211	211	211	211	211	211
Liberty	H	Neches-Trinity	Chicot aquifer	1,397	1,397	1,397	1,397	1,397	1,397
Liberty	H	Neches-Trinity	Evangeline aquifer	656	656	656	656	656	656
Liberty	H	Neches	Chicot aquifer	2,860	2,860	2,860	2,860	2,860	2,860
Liberty	H	Neches	Evangeline aquifer	5,872	5,872	5,872	5,872	5,872	5,872
Liberty	H	Neches	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Neches	Jasper aquifer	0	0	0	0	0	0
Liberty	H	San Jacinto	Chicot aquifer	973	973	973	973	973	973
Liberty	H	San Jacinto	Evangeline aquifer	9,183	9,183	9,183	9,183	9,184	9,184
Liberty	H	San Jacinto	Burkeville confining unit	243	243	243	243	243	243
Liberty	H	San Jacinto	Jasper aquifer	900	900	900	900	900	900
Liberty	H	Trinity-San Jacinto	Chicot aquifer	3,330	3,329	3,330	3,330	3,330	3,330
Liberty	H	Trinity-San Jacinto	Evangeline aquifer	7,214	7,213	7,214	7,214	7,215	7,215
Liberty	H	Trinity-San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Trinity-San Jacinto	Jasper aquifer	0	0	0	0	0	0
Liberty	H	Trinity	Chicot aquifer	10,034	10,034	10,034	10,034	10,034	10,034

[9] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Liberty	H	Trinity	Evangeline aquifer	28,997	28,997	28,997	28,997	28,997	28,997
Liberty	H	Trinity	Burkeville confining unit	0	0	0	0	0	0
Liberty	H	Trinity	Jasper aquifer	0	0	0	0	0	0
Montgomery	H	San Jacinto	Chicot aquifer	22,117	22,136	23,202	22,878	21,030	21,030
Montgomery	H	San Jacinto	Evangeline aquifer	41,160	41,397	40,200	40,269	39,815	39,815
Montgomery	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
Montgomery	H	San Jacinto	Jasper aquifer	33,676	33,412	33,527	33,769	36,028	36,028
Newton	I	Neches	Jasper aquifer	199	199	199	199	199	199
Newton	I	Sabine	Chicot aquifer	547	547	547	547	547	547
Newton	I	Sabine	Evangeline aquifer	23,162	23,162	23,162	23,162	23,162	23,162
Newton	I	Sabine	Burkeville confining unit	0	0	0	0	0	0
Newton	I	Sabine	Jasper aquifer	13,600	13,600	13,600	13,600	13,600	13,600
Orange	I	Neches-Trinity	Chicot aquifer	280	280	280	280	280	280
Orange	I	Neches-Trinity	Evangeline aquifer	0[10]	0	0	0	0	0
Orange	I	Neches	Chicot aquifer	4,039	4,039	4,039	4,039	4,039	4,039
Orange	I	Neches	Evangeline aquifer	2,228	2,228	2,228	2,228	2,228	2,228
Orange	I	Sabine	Chicot aquifer	18,535	18,535	18,535	18,535	18,535	18,535
Orange	I	Sabine	Evangeline aquifer	124	124	124	124	124	124
Polk	I	Neches	Chicot aquifer	0	0	0	0	0	0
Polk	I	Neches	Evangeline aquifer	4,247	4,247	4,247	4,247	4,247	4,247
Polk	I	Neches	Burkeville confining unit	142	142	142	142	142	142
Polk	I	Neches	Jasper aquifer	12,376	12,376	12,376	12,376	12,376	12,376
Polk	H	Trinity	Chicot aquifer	0	0	0	0	0	0
Polk	H	Trinity	Evangeline aquifer	5,239	5,239	5,239	5,239	5,239	5,239
Polk	H	Trinity	Burkeville confining unit	687	687	687	687	687	687

[10] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer System	2030	2040	2050	2060	2070	2080
Polk	H	Trinity	Jasper aquifer	18,055	18,055	18,055	18,055	18,055	18,055
San Jacinto	H	San Jacinto	Chicot aquifer	0	0	0	0	0	0
San Jacinto	H	San Jacinto	Evangeline aquifer	10,472	10,476	10,484	10,491	10,512	10,512
San Jacinto	H	San Jacinto	Burkeville confining unit	0	0	0	0	0	0
San Jacinto	H	San Jacinto	Jasper aquifer	7,972	7,976	7,983	7,991	8,012	8,012
San Jacinto	H	Trinity	Chicot aquifer	0	0	0	0	0	0
San Jacinto	H	Trinity	Evangeline aquifer	4,644	4,644	4,644	4,644	4,644	4,644
San Jacinto	H	Trinity	Burkeville confining unit	2,762	2,762	2,762	2,762	2,762	2,762
San Jacinto	H	Trinity	Jasper aquifer	9,198	9,198	9,198	9,198	9,198	9,198
Tyler	I	Neches	Chicot aquifer	0	0	0	0	0	0
Tyler	I	Neches	Evangeline aquifer	18,519	18,519	18,519	18,519	18,519	18,519
Tyler	I	Neches	Burkeville confining unit	0	0	0	0	0	0
Tyler	I	Neches	Jasper aquifer	15,871	15,871	15,871	15,871	15,871	15,871
Walker	H	San Jacinto	Chicot aquifer	0	0	0	0	0	0
Walker	H	San Jacinto	Evangeline aquifer	3,143	3,143	3,143	3,143	3,143	3,143
Walker	H	San Jacinto	Burkeville confining unit	0[11]	0	0	0	0	0
Walker	H	San Jacinto	Jasper aquifer	23,479	23,479	23,479	23,479	23,479	23,479
Walker	H	Trinity	Jasper aquifer	15,881	15,881	15,881	15,881	15,881	15,881
Waller	H	Brazos	Chicot aquifer	632	632	632	632	632	632
Waller	H	Brazos	Evangeline aquifer	22,437	22,437	22,437	22,437	22,437	22,437
Waller	H	Brazos	Burkeville confining unit	0	0	0	0	0	0
Waller	H	Brazos	Jasper aquifer	329	329	329	329	329	329
Waller	H	San Jacinto	Chicot aquifer	159	159	159	159	159	159

[11] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.

TABLE A.3 (CONTINUED)

County	RWPA	River Basin	Gulf Coast Aquifer	2030	2040	2050	2060	2070	2080
Waller	H	San Jacinto	Evangeline aquifer	31,976	31,976	31,976	31,976	31,976	31,976
Waller	H	San Jacinto	Burkeville confining unit	0[12]	0	0	0	0	0
Waller	H	San Jacinto	Jasper aquifer	0	0	0	0	0	0
Washington	G	Brazos	Evangeline aquifer	11,231	11,231	11,231	11,231	11,231	11,231
Washington	G	Brazos	Burkeville confining unit	421	421	421	421	421	421
Washington	G	Brazos	Jasper aquifer	28,512	28,512	28,512	28,512	28,512	28,512
Washington	G	Colorado	Jasper aquifer	233	233	233	233	233	233
GMA 14 Total			**Gulf Coast Aquifer System**	**1,183,076**	**1,107,258**	**1,136,330**	**1,161,773**	**1,189,095**	**1,189,095**

[12] A zero value in the table indicates the groundwater availability model pumping scenario did not include any pumping in that part of the aquifer.