### Middle Trinity Groundwater Conservation District

### Groundwater Management Plan

Originally Adopted - April 29, 2004

Approved by Texas Water Development Board - July 1, 2004 Re-

Adopted – April 2, 2009

Approved by Texas Water Development Board - May 5, 2009 Re-

Adopted – March 5, 2012

Approved by Texas Water Development Board – May 14, 2012 Re-

Adopted – October 6, 2016 and March 9, 2017

Approved by Texas Water Development Board – April 20, 2017

Amended – October 4, 2018

Approved by Texas Water Development Board - February 8, 2019

### **Middle Trinity Groundwater Conservation District**

### **Groundwater Management Plan**

#### I. District Mission

The mission of the Middle Trinity Groundwater Conservation District is to conserve, preserve and protect the quality and quantity of the groundwater resources for the citizens of Comanche, Erath, Bosque, and Coryell Counties. To accomplish its mission, the District will work to minimize the drawdown of the water table, prevent the waste of groundwater, prevent interference between wells, protect the existing and historic use of groundwater, prevent the degradation of the quality of groundwater, use public education to promote water conservation, give consideration to the service needs of municipal water utilities and the agricultural community, and carry out the powers and duties conferred under Chapter 36 of the Texas Water Code. The District believes that the economy, environment, and quality of life will all be positively impacted by the achievement of its mission.

#### II. Purpose of Management Plan

The 75<sup>th</sup> Texas Legislature in 1997 enacted Senate Bill 1 ("SB 1")<sup>1</sup> to establish a comprehensive statewide water planning process. In particular, SB 1 contained provisions that required groundwater conservation districts to prepare management plans to identify the water supply resources and water demands that will shape the decisions of each district. SB 1 designed the management plans to include management goals for each district to manage and conserve the groundwater resources within their boundaries. In 2001, the Texas Legislature enacted Senate Bill 2 ("SB 2")<sup>2</sup> to build on the planning requirements of SB 1 and to further clarify the actions necessary for districts to manage and conserve the groundwater resources of the state of Texas.

The Texas Legislature enacted significant changes to the management of groundwater resources in Texas with the passage of House Bill 1763 ("HB 1763")<sup>3</sup> in 2005 and Senate Bill 660 ("SB 660") in 2011.<sup>4</sup> Both HB 1763 and SB 660 made significant revisions to the existing long-term planning process known as the Groundwater Management Area ("GMA") process. Based on the language established in Chapter 36 by HB 1763 and SB 660, groundwater conservation districts ("GCDs") in each GMA were required to meet and determine the Desired Future Conditions ("DFCs") for the groundwater resources within their boundaries by September 1, 2010 and to propose for re-adoption the desired future conditions for the relevant aquifers every five years.

<sup>&</sup>lt;sup>1</sup> Act of June 2, 1997, 75<sup>th</sup> Leg., R.S., ch. 1010, 1997 Tex. Gen. Laws 3610.

<sup>&</sup>lt;sup>2</sup> Act of May 27, 2001, 77th Leg., R.S., ch. 966, 2001 Tex. Gen. Laws 1991.

<sup>&</sup>lt;sup>3</sup> Act of May 30, 2005, 79<sup>th</sup> Leg., R.S. ch. 970, 2005 Tex. Gen. Laws 3247.

<sup>&</sup>lt;sup>4</sup> Act of May 29, 2011, 82<sup>nd</sup> Leg., R.S. ch. 1233, 2011 Tex. Gen. Laws 3287.

In addition, HB 1763 required GCDs, like the District, to provide each GCDs' management plans to the other GCDs in the GMA for review by the other GCDs.

The Middle Trinity Groundwater Conservation District's management plan satisfies the requirements of SB 1, SB 2, HB 1763, SB 660, and the statutory requirements of Chapter 36 of the Texas Water Code, and the administrative requirements of the Texas Water Development Board's ("TWDB") rules.

#### **III.** District Information

#### A. Creation of District and Annexation of Bosque and Coryell Counties

The District was created in 2001 pursuant to the authorization provided by the 77th Texas Legislature in House Bill 3665.<sup>5</sup> The voters of both Comanche and Erath Counties confirmed the creation of the District on May 4, 2002. Bosque and Coryell Counties were later added to the District through the annexation process provided in Subchapter J, Chapter 36 of the Texas Water Code. The District received a petition requesting the annexation of Bosque County on June 30, 2008, and the District Board of Directors (Board) voted to add Bosque County to the territory of the District on March 5, 2009. The voters of Bosque County approved annexation into the District on May 9, 2009. The District received a petition requesting the annexation of Coryell County on June 29, 2009, and the Board voted to add Coryell County to the territory of the District on August 6, 2009. The voters of Coryell County approved annexation into the District on November 3, 2009. In compliance with Section 36.1072(e) of the Texas Water Code and 31 TAC § 356.3, this management plan was re-adopted on April 2, 2009 within five years of the original adoption of the management plan and again reviewed and re-adopted on March 5, 2012, and then again on October 6, 2016 and March 9, 2017. This management plan has also been updated within two years of the adoption of DFCs by GMA 8 pursuant to Section 36.3011(h)(5) of the Texas Water Code.<sup>8</sup>

#### **B.** Location and Extent

The District is located in the North Central Texas counties of Comanche, Erath, Bosque, and Coryell Counties. The boundaries of the District are coterminous with the boundaries of Comanche, Erath, Bosque, and Coryell Counties. The District is bordered by Palo Pinto County on the north, Hood, Somervell, Johnson, Hill, and McLennan Counties on the east, Mills and Bell Counties on the south and Brown, Hamilton, Lampasas, and Eastland Counties on the west. The District covers an area of approximately 4,079 square miles.<sup>9</sup>

<sup>&</sup>lt;sup>5</sup> Act of May 25, 2001, 77<sup>th</sup> Leg. R.S., ch. 1362, 2001 Tex. Gen. Laws 3371.

<sup>&</sup>lt;sup>6</sup> TEX. WATER CODE ANN. §§36.321-.331 (West 2008).

<sup>&</sup>lt;sup>7</sup> TEX. WATER CODE §36.1072(e).

<sup>&</sup>lt;sup>8</sup> TEX. WATER CODE §36.3011(h)(5).

<sup>&</sup>lt;sup>9</sup> Texas Almanac, 2008-2009, The Dallas Morning News.

#### C. Background

The Board currently consists of 12 (twelve) members. The existing Board is made up of 3 (three) directors from each of the counties in the District.

#### D. Authority / Regulatory Framework

In the process of creating and re-adopting its management plan, the District has complied with all procedures and met all requirements established by Chapter 36 of the Texas Water Code and Chapter 356 of the TWDB rules contained in Title 31 of the Texas Administrative Code. <sup>10</sup> The District exercises the authority and powers that it was granted by and through the special and general laws that govern it, including Chapter 8862 of the Texas Special District Local Laws Code and Chapter 36 of the Texas Water Code.

#### E. Groundwater Resources of the District

Comanche and Erath Counties are located primarily over the outcrop of the Trinity Aquifer while Bosque and Coryell Counties are located over both the outcrop and the subcrop of the Trinity Aquifer. A Texas Water Development Board diagram of the Trinity Aquifer can be found at Appendix A. The Texas Water Development Board describes the groundwater resources of the Trinity Aquifer as follows:

"The Trinity aquifer consists of early Cretaceous age formations of the Trinity Group where they occur in a band extending through the central part of the state in all or parts of 55 counties, from the Red River in North Texas to the Hill Country of South-Central Texas. Trinity Group deposits also occur in the Panhandle and Edwards Plateau regions where they are included as part of the Edwards-Trinity (High Plains and Plateau) aquifers.

Formations comprising the Trinity Group are (from youngest to oldest) the Paluxy, Glen Rose, and Twin Mountains-Travis Peak. Updip, where the Glen Rose thins or is missing, the Paluxy and Twin Mountains coalesce to form the Antlers Formation. The Antlers consists of up to 900 feet of sand and gravel, with clay beds in the middle section. Water from the Antlers is mainly used for irrigation in the outcrop area of North and Central Texas.

Forming the upper unit of the Trinity Group, the Paluxy Formation consists of up to 400 feet of predominantly fine-to-coarse-gained sand interbedded with clay and shale. The formation pinches out downdip and does not occur south of the Colorado River.

Underlying the Paluxy, the Glen Rose Formation forms a gulfward-thickening wedge of marine carbonates consisting primarily of limestone. South of the Colorado River, the Glen Rose is the upper unit of the Trinity Group and is divisible into an upper and lower member. In the north, the downdip portion of the aquifer becomes highly mineralized

<sup>&</sup>lt;sup>10</sup> 31 TEX. ADMIN. CODE §§ 356.

and is a source of contamination to wells that are drilled into the underlying Twin Mountains.

The basal unit of the Trinity Group consists of the Twin Mountains and Travis Peak formations, which are laterally separated by a facies change. To the north, the Twin Mountains formation consists mainly of medium- to coarse-grained sands, silty clays, and conglomerates. The Twin Mountains is the most prolific of the Trinity aquifers in North-Central Texas; however, the quality of the water is generally not as good as that from the Paluxy or Antlers Formations. To the south, the Travis Peak Formation contains calcareous sands and silts, conglomerates, and limestones. The formation is subdivided into the following members in descending order: Hensell, Pearsall, Cow Creek, Hammett, Sligo, Hosston, and Sycamore.

Extensive development of the Trinity aquifer has occurred in the Fort Worth-Dallas region where water levels have historically dropped as much as 550 feet. Since the mid-1970s, many public supply wells have been abandoned in favor of a surface-water supply, and water levels have responded with slight rises. Water-level declines of as much as 100 feet are still occurring in Denton and Johnson counties. The Trinity aquifer is most extensively developed from the Hensell and Hosston members in the Waco area, where the water level has declined by as much as 400 feet."

### IV. Technical District Information Required by Texas Water Development Board Rules and Chapter 36 of the Texas Water Code

### A. Estimate of Modeled Available Groundwater in District Based on Desired Future Conditions – 31 TAC § 356.52(a)(5)(A) / TWC § 36.1071(e)(3)(A)

Section 36.001 of the Texas Water Code defines modeled available groundwater ("MAG") as "the amount of water that the executive administrator determines may be produced on an average annual basis to achieve a desired future condition established under Section 36.108." HB 1763 adopted by the 79th Legislature in 2005 provided that the DFCs of the aquifer may only be determined through the joint planning process and must be adopted prior to the statutory deadline of September 1, 2010, and every five years thereafter.

The joint planning process set forth in Texas Water Code § 36.108 must be collectively conducted by all groundwater conservation districts within the same GMA. The District is a member of GMA 8. GMA 8 last adopted DFCs for the northern segment of the Trinity Aquifer that were approved by the TWDB on January 31, 2017. The DFCs adopted for the northern segment of the Trinity Aquifer within the District are described in Table 1 below, and are based on the TWDB GAM Run 10-063. The MAG estimates associated with these DFCs that apply to the District are described in Table 2 below.

<sup>&</sup>lt;sup>11</sup> Aquifers of Texas, Texas Water Development Board, Report 345, by Ashworth and Hopkins, November 1995.

The District received MAG values for the Brazos River Alluvium Aquifer on December 9, 2011 after adopting DFCs for the Brazos River Alluvium Aquifer on April 27, 2011. Of the four counties located within the District's jurisdiction, only Bosque County contains a portion of the Brazos River Alluvium Aquifer. The DFC for this aquifer in Bosque County is expressed in terms of remaining percentage of saturated thickness after 50 years and the DFC that was adopted would maintain approximately ninety (90) percent of the estimated saturated thickness over 50 years in Bosque County. The DFC for the Brazos River Alluvium Aquifer remains unchanged from the 2007 Joint Planning Process, and thus the MAG from TWDB for the Brazos River Alluvium Aquifer remains the same at 830 acre-feet per year. <sup>12</sup> See Appendix K.

The DFCs adopted by the District and GMA 8 represent the quantified, measurable conditions of the groundwater resources of the District in 50 years. Section 36.001(30) defines desired future condition as "a quantitative description, adopted in accordance with Section 36.108, of the desired condition of the groundwater resources in a management area at one or more specified future times." The District's DFCs are comprehensive tools that indicate how the District intends to monitor and manage its groundwater resources. Overall, the District's DFCs give the amount of water level declines that the District does not want to exceed over a 50 year planning period.

As additional technical and hydrogeological information is gathered by the District, the District will revise and update its management plan and the information contained therein to include the most up-to-date data available.

TABLE 1: DESIRED FUTURE CONDITIONS SUBMITTED TO TEXAS WATER DEVELOPMENT BOARD MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT <sup>13</sup>

#### **BOSQUE COUNTY**

Aquifer (Trinity subdivisions)	Amount average draw down should not exceed after 50 years (in ft.)
Paluxy	6
Glen Rose	49
Travis Peak	167
Hensell	129
Hosston	201

\_

<sup>&</sup>lt;sup>12</sup> GTA Aquifer Assessment 10-18 MAG, TWDB, Bradley, December 9, 2011 (Appendix K).

<sup>&</sup>lt;sup>13</sup> GAM Run 17-029 MAG, TWDB, Shi, January 19, 2018 (Appendix L).

#### COMANCHE COUNTY

Aquifer (Trinity subdivisions)	Amount average draw down should not exceed after 50 years (in ft.)
Glen Rose	1
Travis Peak	2
Hensell	2
Hosston	3
Antlers	9

#### CORYELL COUNTY

Aquifer (Trinity subdivisions)	Amount average draw down should not exceed after 50 years (in ft.)
Paluxy	7
Glen Rose	14
Travis Peak	99
Hensell	66
Hosston	130

#### **ERATH COUNTY**

Aquifer (Trinity subdivisions)	Amount average draw down should not exceed after 50 years (in ft.)
Paluxy	1
Glen Rose	5
Twin Mountains	6
Travis Peak	19
Hensell	11
Hosston	31
Antlers	12

Based on the DFC estimates submitted to the Texas Water Development Board, the MAG estimates represent the amount of groundwater that is available from the aquifers located within the District's boundaries in terms of acre-feet per year.

TABLE 2: MODELED AVAILABLE GROUNDWATER ESTIMATES (IN ACRE-FEET PER YEAR) MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT  $^{14}$ 

#### **BOSQUE COUNTY**

Aquifer (Trinity subdivisions)	2010	2020	2030	2040	2050	2060	2070
Paluxy	356	358	356	358	356	358	356
Glen Rose	728	731	728	731	728	731	728
Travis Peak	7,678	7,699	7,678	7,699	7,678	7,699	7,678
Hensell	3,835	3,845	3,835	3,845	3,835	3,845	3,835
Hosston	3,762	3,772	3,762	3,772	3,762	3,772	3,762
Total	16,359	16,405	16,359	16,405	16,359	16,405	16,359

#### COMANCHE COUNTY

Aquifer (Trinity subdivisions)	2010	2020	2030	2040	2050	2060	2070
Glen Rose	41	41	41	41	41	41	41
Travis Peak	6,160	6,177	6,160	6,177	6,160	6,177	6,160
Hensell	204	204	204	204	204	204	204
Hosston	5,864	5,881	5,864	5,881	5,864	5,881	5,864
Antlers	5,839	5,855	5,839	5,855	5,839	5,855	5,839
Total	18,108	18,158	18,108	18,158	18,108	18,158	18,108

7

<sup>&</sup>lt;sup>14</sup>GAM Run 17-029 MAG, TWDB, Shi, January 19, 2018 (**Appendix L**).

#### CORYELL COUNTY

Aquifer (Trinity subdivisions)	2010	2020	2030	2040	2050	2060	2070
Paluxy	0	0	0	0	0	0	0
Glen Rose	120	120	120	120	120	120	120
Travis Peak	4,371	4,383	4,371	4,383	4,371	4,383	4,371
Hensell	2,196	2,202	2,196	2,202	2,196	2,202	2,196
Hosston	2,161	2,167	2,161	2,167	2,161	2,167	2,161
Total	8,848	8,872	8,848	8,872	8,848	8,872	8,848

#### ERATH COUNTY

Aquifer (Trinity subdivisions)	2010	2020	2030	2040	2050	2060	2070
Paluxy	61	61	61	61	61	61	61
Glen Rose	1,078	1,081	1,078	1,081	1,078	1,081	1,078
Twin Mountains	5,017	5,031	5,017	5,031	5,017	5,031	5,017
Travis Peak	11,815	11,849	11,815	11,849	11,815	11,849	11,815
Hensell	5,137	5,151	5,137	5,151	5,137	5,151	5,137
Hosston	6,383	6,400	6,383	6,400	6,383	6,400	6,383
Antlers	2,628	2,636	2,628	2,636	2,628	2,636	2,628
Total	32,119	32,209	32,119	32,209	32,119	32,209	32,119

#### MODELED AVAILABLE GROUNDWATER TOTALS FOR ALL FOUR COUNTIES (IN ACRE-FEET PER YEAR)

Aquifer (Trinity subdivisions)	2010	2020	2030	2040	2050	2060	2070
Paluxy	417	419	417	419	417	419	417
Glen Rose	1,967	1,973	1,967	1,973	1,967	1,973	1,967
Twin Mountains	5,017	5,031	5,017	5,031	5,017	5,031	5,017
Travis Peak	30,024	30,108	30,024	30,108	30,024	30,108	30,024
Hensell	11,372	11,402	11,372	11,402	11,372	11,402	11,372
Hosston	18,170	18,220	18,170	18,220	18,170	18,220	18,170
Antlers	8,467	8,491	8,467	8,491	8,467	8,491	8,467
Total	75,434	75,644	75,434	75,644	75,434	75,644	75,434

### B. Amount of Groundwater Being Used within the District on an Annual Basis - 31 TAC § 356.52(a)(5)(B) / TWC § 36.1071(e)(3)(B)

To estimate the annual amount of groundwater being used in the District, the District relies on TWDB's Estimated Historical Water Use Survey Data. Details on the total amount of groundwater use for years 2000 through 2014 based on TWDB Water Use Survey Data are attached as Appendix B.

#### See Appendix B

## C. Annual Amount of Recharge From Precipitation to the Groundwater Resources within the District – 31 TAC § 356.52(a)(5)(C) / TWC § 36.1071(e)(3)(C)

The estimated total amount of annual recharge from precipitation within the District from the Trinity Aquifer is 74,335 acre-feet. The estimated amount of recharge was derived from information provided in the Texas Water Development Board GAM Run 17-026. As additional technical and hydrogeological information is gathered by the District, the District will revise and update its management plan and the information contained therein to include the most up-to-date data available. Texas Water Development Board GAM Run 17-026 is attached as Appendix J.

#### See Appendix J

#### D. Water Supply Needs - TWC § 36.1071(e)(4)

The District has reviewed the 2017 State Water Plan data on water supply needs within the District. TWDB defines "water supply needs" as the projected water demands that are in excess of existing water supplies for a water user group or wholesale water provider. The 2017 State

Water Plan projects a total water supply need across all user groups in the District of 7,410 acrefeet by 2020, rising to 21,182 acre-feet by 2070. More detailed data from the 2017 State Water Plan on projected water supply needs within the District is attached as Appendix C.

#### See Appendix C

### E. Projected Surface Water Supply within the District - 31 TAC § 356.52(a)(5)(F) / TWC § 36.1071(e)(3)(F)

The 2017 State Water Plan indicates a projected surface water supply for the District of approximately 50,528 acre-feet per year in 2020, decreasing to approximately 45,844 acre-feet per year in 2070. Data from the TWDB on the projected amount of surface water supply in the District is attached as Appendix D.

#### See Appendix D

### F. Projected Water Demand within the District -31 TAC § 356.52(a)(5)(G) / TWC § 36.1071(e)(3)(G)

The 2017 State Water Plan indicates a projected total water demand for the area within the District of 103,849 acre-feet per year for year 2070. Details on the total demand for water in the District based on the 2017 State Water Plan are attached as Appendix E.

### See Appendix E

### G. Annual Volume of Water that Discharges from the Aquifer to Springs and Surface Water Bodies – 31 TAC § 356.52(a)(5)(D) / TWC § 36.1071(e)(3)(D)

The estimated total annual volume of water that discharges to springs and any surface water body including lakes, streams, and rivers is 98,449 acre-feet per year from the Trinity Aquifer and 845 acre-feet per year from the Brazos River Alluvium Aquifer. These amounts were derived from GAM Run 17-026 provided to the District by TWDB staff.

#### See Appendix J

# H. Estimate of the Annual Volume of Flow into the District, out of the District, and Between Aquifers in the District – 31 TAC § 356.5(a)(5)(E) / TWC § 36.1071(e)(3)(E)

- Per GAM Run 17-026, the estimate of the Annual Volume of Flow in the District is 29,682 acre-feet from the Trinity Aquifer and 236 acre-feet from the Brazos River Alluvium Aquifer.
- Per GAM Run 17-026, the estimate of the Annual Volume of Flow out of the District is 33,741 acre-feet from the Trinity Aquifer and 238 acre-feet from the Brazos River Alluvium Aquifer.
- Per GAM Run 17-026, the estimate of the Net Annual Volume of Flow is 29,006 acre-feet from the Washita Group of the Cretaceous System to the Trinity Aquifer and 82 acre-feet from the Washita Group of the Cretaceous System to the Brazos River Alluvium Aquifer.

**NOTE:** The amounts provided in Section H reflect the most recent information available from the Texas Water Development Board. As additional technical and hydrogeological information is gathered by the District, the District will revise and update its management plan and the information contained therein to include the most up-to-date data available.

#### See Appendix J

#### I. Projected Water Management Strategies – TWC § 36.1071(e)(4)

#### See Appendix F

#### V. Management of Groundwater Supplies –TWC § 36.1071(e)(4)

The Texas Legislature has established that groundwater conservation districts ("GCDs"), such as the Middle Trinity Groundwater Conservation District ("District"), are the state's preferred method of groundwater management. The Texas Legislature codified its policy decision in Section 36.0015 of the Texas Water Code, which establishes that GCDs will manage groundwater resources through rules developed and implemented in accordance with Chapter 36 of the Texas Water Code ("Chapter 36"). Chapter 36 gives directives to GCDs and the statutory authority to carry out such directives, so that GCDs are given the proper tools to protect and manage the groundwater resources within their boundaries.

The District has used and will continue to use in the future the regulatory tools it has been provided by Chapter 36 and the Texas Legislature to address the many challenges facing the District including the significant threats to the water quality of the groundwater resources of the District. The District places a major priority on prevention of the contamination of its groundwater resources through abandoned and deteriorated water wells. Wells that have been abandoned or not properly maintained provide direct conduits or pathways that allow

contamination from the surface to quickly reach the groundwater resources of the District. To address the threats to the water quality of its groundwater resources, the District has taken steps to increase the number of abandoned or deteriorated water wells that are plugged and intends to take additional action to plug wells in the future. The District has created a well plugging grant program with District funds which provides funding on an as-available basis for residents of the District to plug the abandoned and deteriorated wells that are located on their property. In addition, the District requires, through the District's rules that all abandoned, deteriorated, or replaced wells be plugged in compliance with the Water Well Drillers and Pump Installers Rules of the Texas Department of Licensing and Regulation. The District has also places a priority on the capping of water wells which will be used a later date in order to eliminate waste, prevent pollution, and prevent further deterioration of the well casing.

It has also been the practice of the District to use the regulatory tools granted to GCDs by Chapter 36 to preserve and protect the existing and historic users of groundwater in the District. The legislature empowered the District to protect existing users of groundwater, which are those individuals or entities currently invested in and using groundwater or the groundwater resources within the District for a beneficial purpose, and preserve historic use by historic users, which are those individuals or entities who used groundwater beneficially in the past. The District strives to protect and preserve such use to the extent practicable under the goals and objectives of this management plan.

The District has created a permitting process for groundwater use that preserves and protects the existing and historic use of groundwater in the District. Pursuant to legislative authority, such as Section 36.113(e) of the Texas Water Code, the District protects existing use by imposing more restrictive permit conditions on new permit applications and increased use by historic users. In protecting existing users, the District has established limitations that apply to all subsequent new permit applications and increased use by historic users, regardless of type or location of use, which bear a reasonable relationship to this management plan; and are reasonably necessary to protect existing use. In accordance with Section 36.116(b), Water Code, the District has also preserved historic use when developing and implementing rules which limit groundwater production to the maximum extent practicable consistent with this management plan. Under the District's permitting process, non-exempt groundwater users who have existing or historic use receive Grandfather Permits, while all new groundwater users and those existing and historic users who need an increased amount of groundwater production through new wells or modifications to existing wells obtain Operating Permits.

The Grandfather Permits issued by the District under the District's rules have an important role as part of the District's overall permitting process because those wells that operate under Grandfather Permits issued by the District are authorized to produce water in an amount that the well was capable of producing before May 11, 2004 for Comanche and Erath Counties, which was the date of the original adoption of the District rules, before November 19, 2009, for wells located in Bosque County, and before June 15, 2010 for wells located in Coryell County. The District's rules provide that the District can only reduce the amount of groundwater allocated to Grandfather Permits after groundwater allocated to Operating Permits has been reduced and further reduction is required to achieve the goals and objectives of the District management plan

or to make water available for the issuance of new Operating Permits or to account for groundwater use from exempt wells.

The District issues Operating Permits for the water wells in the District that are considered to be non-exempt, including those non-exempt wells that have not received a Grandfather Permit. In accordance with Section 36.116 of the Texas Water Code, the rules of the District regulate the production of groundwater under Operating Permits issued by the District through spacing and production limits.

The District also has the authority in its rules to establish management zones by resolution of the District Board if, using the best hydrogeologic and geographic data available, the Board determines that management zones are necessary for the administration of groundwater management and regulation in the District. Any management zones created by the District will serve as areas for which the District will determine water availability if necessary to avoid impairment of and consistency with the achievement of the applicable Desired Future Conditions established for the aquifers located in whole or in part within the boundaries of the District, authorize total production, establish proportional reduction of production amongst classes of permittees, and within which the District may allow the transfer of wells and/or the right to produce groundwater. If the District creates management zones, the District's rules provide that the management zones will be delineated along boundaries that, to the extent practicable, will promote fairness and efficiency in the management of groundwater resources, while considering hydrogeologic conditions, and the ability of the public to identify the boundaries based upon land surface features.

In managing its groundwater supplies, the District has taken into account the water management strategies contained in the 2017 State Water Plan which can be found in Appendix F. There are nineteen strategies for Bosque County, six strategies for Comanche County, thirteen strategies for Coryell County, and two strategies for Erath County. These strategies include development of surface water supplies, voluntary re-distribution of surface water supplies, aquifer storage and recovery, and water conservation.

### VI. Methodology to Track District Progress in Achieving Management Goals – 31 TAC § 356.52(a)(4)

An annual report ("Annual Report") is created by the General Manager and staff of the District and provided to the members of the Board of the District. The Annual Report covers the activities of the District including information on the District's performance in regards to achieving the District's management goals and objectives. The Annual Report is delivered to the Board within ninety (90) days following the completion of the District's fiscal year, and began with the fiscal year that started on January 1, 2005. A copy of the Annual Report is kept on file and available for public inspection at the District's offices upon adoption.

# VII. Actions, Procedures, Performance, and Avoidance for District Implementation of Management Plan – 31 TAC § 356.52(a)(2); 31 TAC § 356.52(a)(3); 31 TAC § 356.52(a)(4) / TWC § 36.1071(e)(1) and TWC § 36.1071(e)(2)

The District has acted on the goals and directives established in this management plan. The District has also used the objectives and provisions of the management plan as a guideline in its policy-implementation and decision-making. In both its daily operations and long term planning efforts, the District continuously strives to comply with the initiatives and standards created by the management plan for the District.

After receiving public input, the District adopted rules in accordance with Chapter 36 of the Texas Water Code and all rules must be followed and enforced. The District may amend the District rules as necessary to comply with changes to Chapter 36 of the Texas Water Code and to insure the best management of the groundwater within the District. The continued development and enforcement of the rules of the District has been and will continue to be based on the best scientific and technical evidence available to the District. A copy of the District's rules can be found at <a href="https://www.middletrinitygcd.org/rules/">https://www.middletrinitygcd.org/rules/</a>.

The District has encouraged and will continue to encourage public cooperation and coordination in the implementation of the management plan for the District, as it is amended. All operations and activities of the District have been and will be performed in a manner that best encourages cooperation with the appropriate state, regional or local water entity. The meetings of the Board of the District are noticed and conducted at all times in accordance with the Texas Open Meetings Law. The District has also made available for public inspection all official documents, reports, records and minutes of the District pursuant with the Texas Public Information Act and will continue to do so in the future.

#### **VIII.** Management Goals

## A. Providing the Most Efficient Use of Groundwater – 31 TAC § 356.52(a)(1)(A) / TWC § 36.1071(a)(1)

- **A. 1.** <u>Objective</u> Annually, the District will require all new water wells that are constructed within the boundaries of the District to be registered with the District pursuant to the District rules.
- **A. 1.** Performance Standard The number of water wells registered by the District for each year will be included in the Annual Report submitted to the Board of Directors of the District.
- **A. 2.** <u>Objective</u> The District will annually require all water wells subject to the District's permitting requirements to be permitted pursuant to the District rules.

- **A. 2.** Performance Standard The number of water wells permitted by the District for each year will be included in the Annual Report submitted to the Board of Directors of the District.
- **A. 3.** Objective The District will annually regulate the production of groundwater by maintaining a system of permitting which authorizes the use and production of groundwater within the boundaries of the District pursuant to the District rules.
- **A. 3.** Performance Standard The District will annually accept and process applications for the permitted use of groundwater in the District in accordance with the permitting system established by the District rules. The number and type of applications made for the permitted use of groundwater in the District, and the number and type of permits issued by the District, will be included in the Annual Report given to the Board of Directors.
- **A.4.** Objective The District will annually attempt to increase the public awareness regarding the purpose, objectives, and mission of the District.
- **A.4.** Performance Standard The District will provide at least two of the following on annual basis: informational presentations to public service organizations or community groups; informational radio spots; or manned kiosks at public expositions.

## B. Controlling and Preventing Waste of Groundwater – 31 TAC § 356.52(a)(1)(B) / TWC § 36.1071(a)(2)

- **B. 1.** Objective At least once each year, the District will evaluate the District rules to identify whether any amendments are needed to reduce the amount of waste of groundwater within the boundaries of the District.
- **B. 1.** Performance Standard The District will include a discussion of the annual evaluation of the District rules and the determination of whether any amendments to the rules are needed to prevent the waste of groundwater in the Annual Report of the District provided to the Board of Directors.
- **B. 2.** Objective The District will annually provide information to the public on eliminating and reducing wasteful practices in the use of groundwater by publishing information on groundwater waste reduction on the District's website at least once a year.
- **B. 2.** Performance Standard A copy of the information on groundwater waste reduction will be provided on the District's website and the information on the published on the website will be included in the

- District's Annual Report to be provided to the District's Board of Directors.
- **B.3.** Objective The District will require the plugging of at least one (1) deteriorated or abandoned well identified by the District in accordance with the Texas Department of Licensing and Regulation, Water Well Drillers and Pump Installers Rules (16 Texas Administrative Code, Chapter 76).
- **B.3.** Performance Standard At least once each year, the District will produce a report that describes the activities of the District in plugging a deteriorated or abandoned water well identified by the District and the report will be included in the Annual Report given to the Board of Directors of the District. If the District is not able to identify a deteriorated or abandoned well within its boundaries in a particular year, the District will include a discussion in the Annual Report that no deteriorated or abandoned well was identified in the District for the applicable year.
- **B.4.** Objective The District will provide at least one request each year to the Texas Railroad Commission which asks whether any new salt water or waste disposal injection wells have been permitted by the Texas Railroad Commission to operate within the District within the most recent fiscal year.
- **B.4.** Performance Standard A copy of each request provided to the Texas Railroad Commission each year requesting information regarding the location of any new salt water or waste disposal wells permitted to operate within the District will be included in the Annual Report submitted to the Board of Directors of the District.
- **B.5.** Objective The District will transmit at least one request each year to the Texas Railroad Commission which asks that the Commission provide a copy of the results of integrity tests performed on salt water or waste disposal injection wells permitted by the Texas Railroad Commission to operate within the District.
- **B.5.** Performance Standard A copy of each letter sent to the Texas Railroad Commission each year requesting the results of the integrity testing performed on salt water or waste disposal injection wells permitted by the Texas Railroad Commission to operate within the District will be included in the Annual Report submitted to the Board of Directors of the District.

### C. Addressing Conjunctive Surface Water Management Issues – 31 TAC § 356.52(a)(1)(D) / TWC § 36.1071(a)(4)

- C. 1. Objective Each year, the District will participate in the regional planning process by attending at least 25 percent of the Region G (Brazos G) Regional Water Planning Group meetings to encourage the development of surface water supplies to meet the needs of water user groups in the District.
- **C. 1.** Performance Standard The attendance of a District representative at the Region G Regional Water Planning Group meeting(s) will be noted in the Annual Report presented to the District Board of Directors and will provide the total number of meetings conducted by the Region G Regional Water Planning Group for that year and will indicate how many of the meetings were attended by the District.

### <u>D.</u> Addressing Natural Resource Issues – 31 TAC § 356.52(a)(1)(E) / TWC § 36.1071(a)(5)

- **D. 1.** Objective The District will monitor water quality on an annual basis within the District by obtaining water quality samples from at least one well in each of the counties in the District.
- **D. 1.** Performance Standard The District's Annual Report will include a summary of the number of water quality samples obtained and the results of the water quality tests for each well sampled.

### <u>E. Addressing Drought Conditions - 31 TAC § 356.5(a)(1)(F) / TWC § 36.1071(a)(6)</u>

- **E. 1.** Objective The District will monitor drought conditions in the Trinity Aquifer each year through the process established in the District's Drought Contingency Plan adopted by the District Board of Directors.
- **E. 1.** Performance Standard The District's Annual Report will include a summary of the District's monitoring of drought conditions in the Trinity Aquifer and any implementation measures taken in accordance with the District's Drought Contingency Plan. The District will make an assessment of the status of drought and will prepare a quarterly briefing to the Board of Directors that includes a discussion of whether the District has declared any drought stages set forth in its Drought Contingency Plan for the previous quarter.
- **E. 2.** Objective The District will download the updated Palmer Drought Severity Index (PDSI) maps and review soil moisture index readings for the area within the District's boundaries on a quarterly basis.

**E. 2.** Performance Standard – The District will review the PDSI maps and soil moisture index readings and will prepare a quarterly briefing to the Board of Directors that includes a discussion of the PDSI maps and soil moisture index readings. The downloaded PDSI maps and soil moisture index readings will be included with copies of the quarterly briefing in the District's Annual Report.

### F. Conservation, Recharge Enhancement, Rainwater Harvesting, and Brush Control – 31 TAC § 356.5(a)(1)(G) / TWC § 36.1071(a)(7)

- **F. 1.** Objective The District will submit at least one article regarding water conservation for publication each year to at least one newspaper of general circulation in the District.
- **F. 1.** <u>Performance Standard</u> A copy of the article submitted by the District for publication to a newspaper of general circulation in the District regarding water conservation will be included in the Annual Report given to the Board of Directors.
- **F. 2.** Objective The District will present a pre-existing educational program for use in public or private schools in the District at least once each year to educate students on the importance of water conservation.
- **F. 2.** Performance Standard A description of the educational program presentation(s) by the District for use in the public and private schools in the District will be included in the Annual Report to the Board of Directors each year.
- **F. 3.** Objective On an annual basis, the District will distribute an informational flier on water conservation during at least two public events that occur within the District's boundaries..
- **F. 3.** Performance Standard The District's Annual Report will include a copy of the most recent informational flier on water conservation and will also include information on the public events where the flier was distributed.
- **F. 4.** Objective The District will provide information relating to recharge enhancement on the District web site at least once each year.
- **F. 4.** <u>Performance Standard</u> The District's Annual Report will include a copy of the information provided on the District web site related to recharge enhancement.

- **F. 5.** Objective The District will provide information on rainwater harvesting each year by offering new information about rainwater harvesting on the District web site at least once each year.
- **F. 5.** Performance Standard The District's Annual Report will provide a copy of the information on rainwater harvesting which has been posted on the District web site in the previous year.
- **F. 6.** Objective The District will evaluate the State Brush Control Plan as it is revised from time to time at least once each year to determine whether projects within the District will increase the groundwater resources of the District.
- **F. 6.** Performance Standard Upon review of a newly revised State Brush Control Plan, the District's Annual Report will include a copy of the most recent brush control information pertaining to the District.

### G. Addressing the Desired Future Conditions – 31 TAC § 356.5(a)(1)(H) / TWC § 36.1071(a)(8)

- **G. 1.** <u>Objective</u> The District will review and calculate its permit and well registration totals in light of the Desired Future Conditions of the groundwater resources within the boundaries of the District to assess whether the District is on target to meet the Desired Future Conditions estimates submitted to the TWDB.
- **G. 1.** Performance Standard The District's Annual Report will include a discussion of the District's permit and well registration totals and will evaluate the District's progress in achieving the Desired Future Conditions of the groundwater resources within the boundaries of the District and whether the District is on track to maintain the Desired Future Conditions estimates over the 50 year planning period.
- **G. 2.** Objective The District will annually measure the water levels in at least five monitoring wells in each of the counties within the District and will determine the five-year water level averages based on the measurements taken. The District will compare the five-year water level averages to the corresponding five-year increment of its Desired Future Conditions in order to track its progress in achieving the Desired Future Conditions.
- **G. 2.** Performance Standard The District's Annual Report will include the water level measurements taken each year for the purpose of monitoring water levels to assess the District's progress towards achieving its Desired Future Conditions. Once the District has obtained water level measurements for five consecutive years and is able to calculate water level averages over five-year periods thereafter, the District will include a

discussion of its comparison of water level averages to the corresponding five-year increment of its Desired Future Conditions in order to track its progress in achieving its Desired Future Conditions.

#### IX. Management Goals Not Applicable to District

- A. Controlling and Preventing Subsidence 31 TAC § 356.5(a)(1)(C) / TWC § 36.1071(a)(3) The District has reviewed the TWDB Report on Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping. The subsidence risk vulnerability of the Trinity Aquifer within the District is indicated as low to medium risk. Land surface subsidence has not been observed in the Trinity Aquifer despite significant water level declines. Therefore, this management goal is not applicable. The District will continue to review the most current research on subsidence risk vulnerability and may determine this management goal to be applicable in the future.
- B. Addressing Precipitation Enhancement 31 TAC § 356.5(a)(1)(G) / TWC § 36.1071(a)(7) Precipitation enhancement is not a cost effective or appropriate program for the District at this time since there are no precipitation enhancement programs in nearby counties or groundwater conservation districts that the District could participate with and allocate expenses for precipitation enhancement projects. Therefore, this management goal is not applicable.

### X. Action Required for Plan Approval – 31 TAC § 356.53

### A. Certified Copy of District's Resolution Re-Adopting Management Plan – 31 TAC § 356.53(a)(3)

A certified copy of the District's resolution re-adopting the plan is located in Appendix G – District Resolution.

### B. Evidence of Management Plan Adoption After Notice and Hearing – 31 TAC § 356.52(a)(3) / TWC § 36.1071(a)

Evidence, such as public notices, that the management plan was re-adopted following applicable public meetings and hearings is located in Appendix H - Notice of Meetings.

20

\_

<sup>&</sup>lt;sup>15</sup> Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping, Texas Water Development Board Report, by Furnans, et. al., March 2017.

## C. Coordination with Surface Water Management Entities – 31 TAC § 356.6(a)(4) / TWC § 36.1071(a)

Evidence, such as correspondence with regional water planning groups and/or other surface water authorities or management entities, which demonstrates that the District coordinated with surface water management entities in regards to re-adopting the District's management plan is located in Appendix I.

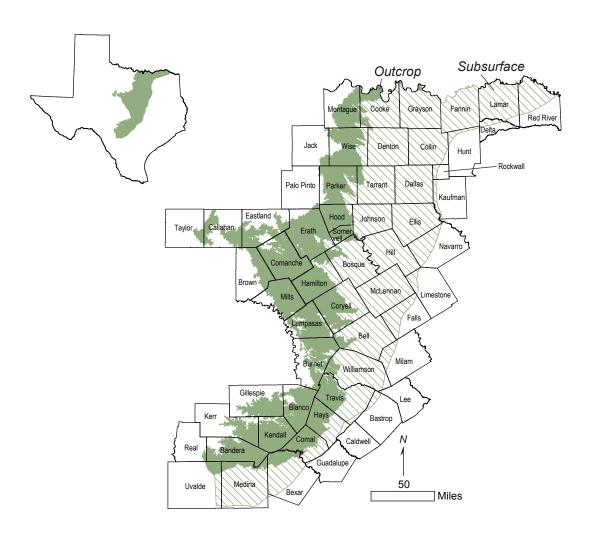
#### **References**

- 1. 2017 State Water Planning Database. Contact Wendy Barron (wendy.barron@twdb.texas.gov or 512-936-0886).
- 2. Aquifers of Texas, Texas Water Development Board, Report 380, by George, Mace and Petrossian, July 2011.
- 3. Texas Almanac 2008-2009, The Dallas Morning News.
- 4. Identification of the Vulnerability of the Major and Minor Aquifers of Texas to Subsidence with Regard to Groundwater Pumping, Texas Water Development Board Report, by Furnans, et. al., March 2017.

### APPENDIX A

### **Trinity Aquifer Diagram**

### Trinity Aquifer



### APPENDIX B

### Amount of Groundwater Being Used within the District on an Annual Basis

### Estimated Historical Water Use TWDB Historical Water Use Survey (WUS) Data

Groundwater and surface water historical use estimates are currently unavailable for calendar year 2015. TWDB staff anticipates the calculation and posting of these estimates at a later date.

### **BOSQUE COUNTY**

All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2014	GW	2,546	2	0	0	1,431	219	4,198
	SW	313		0		1,934	511	2,765
2013	GW	2,887	2	0	0	650	205	3,744
	SW	284	6	0		2,473	479	3,242
2012	GW	3,043	2	1	0	1,937	218	5,201
	SW	314		3		2,668	509	3,499
2011	GW	3,388	1	647	0	0	419	4,455
	SW	454	5	677		3,500	976	5,612
2010	GW	2,735	1	1,166	0	458	407	4,767
	SW	433	4	1,221		2,836	950	5,444
2009	GW	2,488	250	877	0	56	285	3,956
	SW	283	704	919	1,589	2,054	665	6,214
2008	GW	2,293	251	589	0	1,334	269	4,736
	SW	295	703	617	1,589	1,151	628	4,983
2007	GW	2,391	252	0	0	321	317	3,281
	SW	244	705	0	1,589	2,362	741	5,641
2006	GW	2,626	253	0	0	687	319	3,885
	SW	473	703	0	1,589	1,500	744	5,009
2005	GW	3,436	704	0	0	625	293	5,058
	SW	365	3_	0	2,106	713	683	3,870
2004	GW	2,749	704	0	0	615	499	4,567
	SW	255	3	0	1,603	1,823	499	4,183
2003	GW	2,804	704	0	0	100	503	4,111
	SW	528	3_	0	1,871	2,451	503	5,356
2002	GW	2,932	728	0	0	66	522	4,248
	SW	616	4	0	2,185	2,149	522	5,476
2001	GW	2,691	732	0	41	50	533	4,047
	SW	3	0	0	772	1,623	533	2,931
2000	GW	2,777		0		73	524	4,168
	SW	2	0	0	0	2,470	524	2,996

### COMANCHE COUNTY All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2014	GW	438	3	0	0	23,785	786	25,012
	SW	707	14	0	0	5,524	2,358	8,603
2013	GW	516	7	0	0	23,598	747	24,868
	SW	736		0	0	7,845	2,244	10,832
2012	GW	638	5	0	0	25,815	827	27,285
	SW	744		0		12,788	2,481	16,020
2011	GW	699	7	90	0	25,617	852	27,265
	SW	820		23		10,413	2,555	13,822
2010	GW	686	4	475	0	10,278	840	12,283
	SW	748	8	120		14,923	2,521	18,320
2009	GW	603	6	238	0	19,620	979	21,446
	SW	759	13	60		8,798	2,937	12,567
2008	GW	535	8	1	0	17,077	962	18,583
	SW	827		0		11,068	2,888	14,790
2007	GW	516	3	0	0	18,013	855	19,387
	SW	769	23	0		4,373	2,566	7,731
2006	GW	609	3	0	0	18,931	1,053	20,596
	SW	894	23	0		12,010	3,159	16,086
2005	GW	566	4	0	0	16,853	1,020	18,443
	SW	849	22	0	0	11,984	3,058	15,913
2004	GW	534	3	0	0	16,455	700	17,692
	SW	665	18	0		8,168	3,006	11,857
2003	GW	574	3	0	0	14,104	690	15,371
	SW	875	17	0	0	11,466	2,961	15,319
2002	GW	599	3	0	0	12,254	689	13,545
	SW	891		0		19,994	2,956	23,860
2001	GW	583	2	0	0	17,265	746	18,596
	SW	912	21	0	0	28,168	3,201	32,302
2000	GW	610	2	0	0	13,515	851	14,978
	SW	883	24	0	0	22,454	3,403	26,764

CORYELL COUNTY

All values are in acre-feet

	Livestock	Irrigation	Steam Electric	Mining	Manufacturing	Municipai	Source	Year
815	170	215	0	0	0	430	GW	2014
10,933	965			0		9,966	SW	
1,630	168	254	0	0	0	1,208	GW	2013
12,500	957	5		0		11,536	SW	
2,450	146	516	0	0	0	1,788	GW	2012
12,812	829			0	4	11,979	SW	
2,153	184	89	0	163	0	1,717	GW	2011
13,567	1,044	56		168	4	12,295	SW	
2,575	180	144	0	195	0	2,056	GW	2010
13,810	1,023			202	3	12,311	SW	
2,287	134	238	0	150	0	1,765	GW	2009
14,260	759	8		155		13,338	SW	
1,901	183	240	0	105	0	1,373	GW	2008
14,693	1,034	33		108		13,518	SW	
1,563	232	46	0	0	0	1,285	GW	2007
13,608	1,312			0		12,196	SW	
1,876	291	154	0	0	0	1,431	GW	2006
13,703	1,651	28	0	0		12,024	SW	
1,799	264	171	0	0	0	1,364	GW	2005
13,279	1,494	50	0	0	0	11,735	SW	
2,143	683	188	0	0	0	1,272	GW	2004
12,797	683	0		0		12,114	SW	
2,167	725	117	0	0	0	1,325	GW	2003
12,566	725	279	0	0	0	11,562	SW	
1,964	657	0	0	0	0	1,307	GW	2002
11,482	657	0	0	0	0	10,825	SW	
1,444	645		0	0	0		GW	2001
11,073	645	0	0	0	0	10,428	SW	
1,497	670		0		0	827	GW	2000
12,093	670	0	0	0	0	11,423	SW	

**ERATH COUNTY**All values are in acre-feet

Year	Source	Municipal	Manufacturing	Mining	Steam Electric	Irrigation	Livestock	Total
2014	GW	4,236	54	0	0	7,245	1,507	13,042
	SW	637		0	0	156	3,516	4,309
2013	GW	4,305	57	0	0	6,396	1,583	12,341
	SW	665		0	0	396	3,694	4,755
2012	GW	4,468	74	5	0	6,881	1,791	13,219
	SW	693		4		582	4,180	5,459
2011	GW	4,952	69	125	0	7,288	1,885	14,319
	SW	629		149	0	750	4,397	5,926
2010	GW	4,188	60	1,007	0	4,867	1,842	11,964
	SW	447		1,205	0	571	4,298	6,522
2009	GW	3,998	38	579	0	4,608	2,021	11,244
	SW	439	8	693	0	406	4,717	6,263
2008	GW	3,967	69	151	0	6,177	1,981	12,345
	SW	444	9	180	0	859	4,623	6,115
2007	GW	3,583	69	0	0	4,829	1,650	10,131
	SW	427	5	0	0	276	3,849	4,557
2006	GW	4,218	40	0	0	6,923	2,267	13,448
	SW	413	30	0	0	766	5,290	6,499
2005	GW	4,048	31	0	0	6,988	2,134	13,201
	SW	417	27	0	0	559	4,978	5,981
2004	GW	3,811	31	0	0	6,395	3,604	13,841
	SW	434	19	0	0	969	3,604	5,026
2003	GW	4,022	26	0	0	6,407	3,686	14,141
	SW	474	6	0	0	881	3,686	5,047
2002	GW	3,972	28	0	0	9,578	3,908	17,486
	SW	464	6	0	0	504	3,908	4,882
2001	GW	4,291	39	0	0	6,739	4,470	15,539
	SW	581	7	0	0	355	4,470	5,413
2000	GW	4,339	43	0		10,261	4,660	19,303
	SW	579	9	0	0	555	4,660	5,803
				<del>-</del> -	<del>'</del>			

### APPENDIX C

### **Water Supply Needs**

### Projected Water Supply Needs TWDB 2017 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

BOSC	QUE COUNTY					All valu	ues are in	acre-feet
RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	CHILDRESS CREEK WSC	BRAZOS	38	12	2	-5	-11	-16
G	CLIFTON	BRAZOS	334	289	271	259	248	206
G	COUNTY-OTHER, BOSQUE	BRAZOS	248	162	124	99	79	66
G	CROSS COUNTRY WSC	BRAZOS	37	29	26	-127	-132	-138
G	IRRIGATION, BOSQUE	BRAZOS	-536	-502	-468	-438	-407	-377
G	LIVESTOCK, BOSQUE	BRAZOS	0	0	0	0	0	0
G	MANUFACTURING, BOSQUE	BRAZOS	-1,868	-2,187	-2,501	-2,772	-3,088	-3,431
G	MERIDIAN	BRAZOS	265	253	249	246	243	241
G	MINING, BOSQUE	BRAZOS	-1,843	-1,942	-1,763	-1,743	-1,704	-1,692
G	STEAM ELECTRIC POWER, BOSQUE	BRAZOS	312	-861	-2,262	-3,943	-5,965	-8,344
G	VALLEY MILLS	BRAZOS	41	22	14	8	2	-2
G	WALNUT SPRINGS	BRAZOS	98	94	93	92	90	89
	Sum of Projected V	Vater Supply Needs (acre-feet)	-4,247	-5,492	-6,994	-9,028	-11,307	-14,000

#### All values are in acre-feet **COMANCHE COUNTY** RWPG WUG **WUG Basin** 2020 2030 2040 2050 2060 2070 G **BRAZOS** 152 70 38 **COMANCHE** 159 147 96 G COUNTY-OTHER, COMANCHE **BRAZOS** -149 -144 -183 -135 -144 -163 G COUNTY-OTHER, COMANCHE **COLORADO** 0 0 DE LEON G **BRAZOS** 42 84 85 85 64 55 -893 G IRRIGATION, COMANCHE **BRAZOS** -1,962 -1,823 -463 -757 -968 G LIVESTOCK, COMANCHE **BRAZOS** 0 G LIVESTOCK, COMANCHE 0 0 0 0 **COLORADO** 0 0 G 0 MANUFACTURING, COMANCHE BRAZOS 0 0 0 0 0 G MINING, COMANCHE **BRAZOS** -418 -499 -337 -250 -162 -102 **Sum of Projected Water Supply Needs (acre-feet)** -1,460 -2,605 -2,295 -857

### Projected Water Supply Needs TWDB 2017 State Water Plan Data

Negative values (in red) reflect a projected water supply need, positive values a surplus.

CORY	YELL COUNTY					All valu	es are in a	acre-feet
RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COPPERAS COVE	BRAZOS	4,550	4,039	3,444	2,528	1,867	1,145
G	CORYELL CITY WATER SUPPLY DISTRICT	BRAZOS	203	211	219	214	211	206
G	COUNTY-OTHER, CORYELL	BRAZOS	870	594	234	-93	-171	-515
G	ELM CREEK WSC	BRAZOS	13	8	2	-5	-12	-19
G	FORT HOOD	BRAZOS	1,652	1,530	1,403	1,228	1,054	875
G	GATESVILLE	BRAZOS	28	-629	-1,406	-2,356	-3,152	-3,995
G	IRRIGATION, CORYELL	BRAZOS	556	556	556	556	556	556
G	KEMPNER WSC	BRAZOS	-113	-173	-236	-298	-365	-431
G	LIVESTOCK, CORYELL	BRAZOS	0	0	0	0	0	0
G	MANUFACTURING, CORYELL	BRAZOS	0	0	0	0	0	0
G	MINING, CORYELL	BRAZOS	-1,510	-1,072	-491	-363	-398	-437
G	MULTI-COUNTY WSC	BRAZOS	-80	-100	-127	-153	-184	-217
	Sum of Projected Wa	ater Supply Needs (acre-feet)	-1.703	-1.974	-2.260	-3.268	-4.282	-5.614

<b>ERAT</b>	TH COUNTY					All value	es are in a	cre-feet
RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, ERATH	BRAZOS	692	477	291	93	-116	-315
G	DUBLIN	BRAZOS	139	116	97	73	44	15
G	IRRIGATION, ERATH	BRAZOS	641	733	825	915	1,004	1,088
G	LIVESTOCK, ERATH	BRAZOS	0	0	0	0	0	0
G	MANUFACTURING, ERATH	BRAZOS	0	0	0	0	0	1
G	MINING, ERATH	BRAZOS	6	-25	135	207	279	334
G	STEPHENVILLE	BRAZOS	3,522	3,293	3,085	2,776	2,535	2,285
	Sum of Projected \	Water Supply Needs (acre-feet)	0	-25	0	0	-116	-315

### APPENDIX D

### **Projected Surface Water Supply within the District**

### Projected Surface Water Supplies TWDB 2017 State Water Plan Data

BOS	QUE COUNTY						All valu	es are in a	icre-feet
RWPG	WUG	<b>WUG Basin</b>	Source Name	2020	2030	2040	2050	2060	2070
G	CLIFTON	BRAZOS	CLIFTON LAKE/RESERVOIR	565	565	565	565	565	565
G	IRRIGATION, BOSQUE	BRAZOS	BRAZOS RUN-OF- RIVER	132	132	132	131	131	131
G	LIVESTOCK, BOSQUE	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	989	989	989	989	989	989
G	MANUFACTURING, BOSQUE	BRAZOS	CLIFTON LAKE/RESERVOIR	1	1	1	1	1	1
G	STEAM ELECTRIC POWER, BOSQUE	BRAZOS	BRAZOS RIVER AUTHORITY MAIN STEM LAKE/RESERVOIR SYSTEM	6,500	6,374	6,248	6,122	5,996	5,870
	Sum of Projecte	d Surface Wate	er Supplies (acre-feet)	8,187	8,061	7,935	7,808	7,682	7,556
СОМ	ANCHE COUNT	Y					All valu	es are in a	ıcre-feet
RWPG	WUG	<b>WUG Basin</b>	Source Name	2020	2030	2040	2050	2060	2070
G	COMANCHE	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	680	671	662	618	605	586
G	COUNTY-OTHER, COMANCHE	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	9	9	9	9	9	9
G	DE LEON	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	307	305	301	283	279	272
G	IRRIGATION, COMANCHE	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	4,968	3,616	3,474	4,557	3,988	3,511
G	LIVESTOCK, COMANCHE	BRAZOS	BRAZOS LIVESTOCK LOCAL SUPPLY	3,774	3,774	3,774	3,774	3,774	3,774
G	LIVESTOCK, COMANCHE	COLORADO	COLORADO LIVESTOCK LOCAL	121	121	121	121	121	121

Estimated Historical Water Use and 2017 State Water Plan Dataset: Middle Trinity Groundwater Conservation District October 19, 2016 Page 7 of 18

SUPPLY

### Projected Surface Water Supplies TWDB 2017 State Water Plan Data

RWPG	WUG	<b>WUG Basin</b>	Source Name	2020	2030	2040	2050	2060	2070
G	MANUFACTURING, COMANCHE	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	26	29	31	33	36	39
	Sum of Projecte	ed Surface Wate	r Supplies (acre-feet)	9,885	8,525	8,372	9,395	8,812	8,312

#### All values are in acre-feet **CORYELL COUNTY RWPG** WUG **WUG Basin** 2020 2040 2050 2060 2070 **Source Name** 2030 G COPPERAS COVE **BRAZOS RIVER** 8,816 8,577 7,989 7,811 **BRAZOS** 8,694 8,114 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G CORYELL CITY WATER BRAZOS **BRAZOS RIVER** 1,012 1,110 1,225 1,315 1,419 1,522 SUPPLY DISTRICT **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM COUNTY-OTHER, **BRAZOS BRAZOS RIVER** 820 818 815 800 1,055 G 1,043 **CORYELL AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G ELM CREEK WSC **BRAZOS BRAZOS RIVER** 57 56 56 53 52 51 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G FORT HOOD **BRAZOS BRAZOS RUN-OF-**5,030 5,324 5,209 4,850 4,671 4,491 **RIVER** G **GATESVILLE BRAZOS BRAZOS RIVER** 4,452 4,310 4,126 3,710 3,506 3,258 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM **BRAZOS RUN-OF-**G IRRIGATION, CORYELL BRAZOS 530 530 530 530 530 530 **RIVER** G KEMPNER WSC **BRAZOS BRAZOS RIVER** 428 429 438 440 445 451 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G LIVESTOCK, CORYELL **BRAZOS BRAZOS LIVESTOCK** 1,471 1,471 1,471 1,471 1,471 1,471 LOCAL SUPPLY

### Projected Surface Water Supplies TWDB 2017 State Water Plan Data

RWPG	WUG	<b>WUG Basin</b>	Source Name	2020	2030	2040	2050	2060	2070
G	MANUFACTURING, CORYELL	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	10	11	12	13	14	15
G	MULTI-COUNTY WSC	BRAZOS	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM	198	202	206	209	212	214
	Sum of Projecte	d Surface Wate	r Supplies (acre-feet)	23,118	22,840	22,486	21,505	21,364	20,857

#### All values are in acre-feet **ERATH COUNTY** RWPG WUG 2050 **WUG Basin** 2020 2030 2040 2060 2070 **Source Name** G COUNTY-OTHER, **BRAZOS BRAZOS RIVER** 72 72 72 72 72 72 **ERATH AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G COUNTY-OTHER, PALO PINTO 75 75 75 75 75 75 **BRAZOS ERATH** LAKE/RESERVOIR G **DUBLIN BRAZOS BRAZOS RIVER** 521 519 518 517 516 514 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G IRRIGATION, ERATH **BRAZOS BRAZOS RUN-OF-**101 100 100 99 99 98 **RIVER** G LIVESTOCK, ERATH **BRAZOS** BRAZOS LIVESTOCK 6,702 6,702 6,702 6,702 6,702 6,702 LOCAL SUPPLY G MANUFACTURING, **BRAZOS BRAZOS RIVER** 5 8 9 10 12 **ERATH AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM G **STEPHENVILLE BRAZOS BRAZOS RIVER** 1,862 1,847 1,826 1,717 1,690 1,646 **AUTHORITY LITTLE RIVER** LAKE/RESERVOIR SYSTEM **Sum of Projected Surface Water Supplies (acre-feet)** 9,338 9,322 9,301 9,191 9,164 9,119

### APPENDIX E

### **Projected Water Demand within the District**

# Projected Water Demands TWDB 2017 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

### BOSQUE COUNTYAll values are in acre-feetRWPGWUGWUG Basin202020302040205020602070

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	CHILDRESS CREEK WSC	BRAZOS	410	436	446	453	459	464
G	CLIFTON	BRAZOS	700	745	763	775	786	793
G	COUNTY-OTHER, BOSQUE	BRAZOS	1,271	1,357	1,395	1,420	1,440	1,453
G	CROSS COUNTRY WSC	BRAZOS	124	132	135	138	139	141
G	IRRIGATION, BOSQUE	BRAZOS	2,128	2,094	2,060	2,029	1,998	1,968
G	LIVESTOCK, BOSQUE	BRAZOS	989	989	989	989	989	989
G	MANUFACTURING, BOSQUE	BRAZOS	2,739	3,058	3,372	3,643	3,959	4,302
G	MERIDIAN	BRAZOS	222	234	238	241	244	246
G	MINING, BOSQUE	BRAZOS	1,972	2,071	1,892	1,872	1,833	1,821
G	STEAM ELECTRIC POWER, BOSQUE	BRAZOS	6,188	7,235	8,510	10,065	11,961	14,214
G	VALLEY MILLS	BRAZOS	259	276	284	288	293	295
G	WALNUT SPRINGS	BRAZOS	97	101	102	103	105	106
	Sum of Project	ed Water Demands (acre-feet)	17,099	18,728	20,186	22,016	24,206	26,792

#### COMANCHE COUNTY All values are in acre-feet

RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COMANCHE	BRAZOS	521	519	515	522	535	548
G	COUNTY-OTHER, COMANCHE	BRAZOS	795	790	781	790	808	828
G	COUNTY-OTHER, COMANCHE	COLORADO	10	10	10	10	11	11
G	DE LEON	BRAZOS	223	220	216	219	224	230
G	IRRIGATION, COMANCHE	BRAZOS	27,458	27,175	26,894	26,617	26,342	26,076
G	LIVESTOCK, COMANCHE	BRAZOS	3,774	3,774	3,774	3,774	3,774	3,774
G	LIVESTOCK, COMANCHE	COLORADO	121	121	121	121	121	121
G	MANUFACTURING, COMANCHE	BRAZOS	36	39	41	43	46	49
G	MINING, COMANCHE	BRAZOS	444	525	363	276	188	128
	Sum of Projecte	d Water Demands (acre-feet)	33,382	33,173	32,715	32,372	32,049	31,765

# Projected Water Demands TWDB 2017 State Water Plan Data

Please note that the demand numbers presented here include the plumbing code savings found in the Regional and State Water Plans.

CORY	YELL COUNTY					All valu	es are in a	cre-feet
RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COPPERAS COVE	BRAZOS	4,266	4,655	5,133	5,586	6,122	6,666
G	CORYELL CITY WATER SUPPLY DISTRICT	BRAZOS	809	899	1,006	1,101	1,208	1,316
G	COUNTY-OTHER, CORYELL	BRAZOS	564	838	1,195	1,507	1,840	2,172
G	ELM CREEK WSC	BRAZOS	44	48	54	58	64	70
G	FORT HOOD	BRAZOS	3,672	3,679	3,627	3,622	3,617	3,616
G	GATESVILLE	BRAZOS	4,424	4,939	5,532	6,066	6,658	7,253
G	IRRIGATION, CORYELL	BRAZOS	214	214	214	214	214	214
G	KEMPNER WSC	BRAZOS	541	602	674	738	810	882
G	LIVESTOCK, CORYELL	BRAZOS	1,471	1,471	1,471	1,471	1,471	1,471
G	MANUFACTURING, CORYELL	BRAZOS	10	11	12	13	14	15
G	MINING, CORYELL	BRAZOS	1,510	1,072	491	363	398	437
G	MULTI-COUNTY WSC	BRAZOS	278	302	333	362	396	431

<b>ERAT</b>	TH COUNTY		All values are in acre-fee					acre-feet
RWPG	WUG	WUG Basin	2020	2030	2040	2050	2060	2070
G	COUNTY-OTHER, ERATH	BRAZOS	2,665	2,880	3,066	3,264	3,472	3,671
G	DUBLIN	BRAZOS	382	403	421	444	472	499
G	IRRIGATION, ERATH	BRAZOS	6,383	6,290	6,198	6,107	6,018	5,933
G	LIVESTOCK, ERATH	BRAZOS	6,702	6,702	6,702	6,702	6,702	6,702
G	MANUFACTURING, ERATH	BRAZOS	80	88	96	103	112	122
G	MINING, ERATH	BRAZOS	505	536	376	304	232	177
G	STEPHENVILLE	BRAZOS	2,659	2,867	3,047	3,241	3,448	3,645
	Sum of Project	ted Water Demands (acre-feet)	19.376	19.766	19.906	20.165	20.456	20.749

18,730

19,742

21,101

22,812

24,543

Sum of Projected Water Demands (acre-feet) 17,803

### APPENDIX F

### **Projected Water Management Strategies**

#### **BOSQUE COUNTY**

VUG, Basin (RWPG)					All valu	es are in a	cre-feet
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
HILDRESS CREEK WSC, BRAZOS (G )							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	203	203	203	203	203	203
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [BOSQUE]	0	0	0	161	161	161
		203	203	203	364	364	364
LIFTON, BRAZOS (G )							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	397	397	397	397	397	397
MUNICIPAL WATER CONSERVATION (URBAN) - CLIFTON	DEMAND REDUCTION [BOSQUE]	21	74	77	71	71	71
		418	471	474	468	468	468
ROSS COUNTRY WSC, BRAZOS (G )							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - CROSS COUNTRY WSC	DEMAND REDUCTION [BOSQUE]	5	6	4	3	2	2
TRINITY - MCLENNAN COUNTY ASR	TRINITY AQUIFER ASR [MCLENNAN]	0	0	0	124	130	136
		5	6	4	127	132	138
RRIGATION, BOSQUE, BRAZOS (G )							
IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [BOSQUE]	64	105	144	142	140	138
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [BOSQUE]	475	475	475	475	475	475
		539	580	619	617	615	613
IANUFACTURING, BOSQUE, BRAZOS (G							
BRA SYSTEM OPERATION MAIN STEM	BRAZOS RIVER AUTHORITY MAIN STEM LAKE/RESERVOIR SYSTEM [RESERVOIR]	1,035	1,280	1,510	1,765	2,060	2,375
CLIFTON REDUCTION TO BOSQUE MANUFACTURING	TRINITY AQUIFER [BOSQUE]	426	426	426	426	426	426
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [BOSQUE]	82	153	236	255	277	301
MERIDIAN REDUCTION TO BOSQUE MANUFACTURING	TRINITY AQUIFER [BOSQUE]	330	330	330	330	330	330
		1,873	2,189	2,502	2,776	3,093	3,432

WUG, Basin (RWPG)					All valu	ies are in a	acre-teet
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
MERIDIAN, BRAZOS (G )							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	224	224	224	224	224	224
		224	224	224	224	224	224
MINING, BOSQUE, BRAZOS (G )							
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [BOSQUE]	59	104	132	131	128	127
		59	104	132	131	128	127
STEAM ELECTRIC POWER, BOSQUE, BRAZ	OS (G )						
BRA SYSTEM OPERATION MAIN STEM	BRAZOS RIVER AUTHORITY MAIN STEM LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	500	1,670	3,240	5,130	7,350
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [BOSQUE]	0	362	596	705	837	995
		0	862	2,266	3,945	5,967	8,345
VALLEY MILLS, BRAZOS (G )							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	179	177	177	176	175	174
MUNICIPAL WATER CONSERVATION (URBAN) - VALLEY MILLS	DEMAND REDUCTION [BOSQUE]	10	30	47	45	46	46
		189	207	224	221	221	220
WALNUT SPRINGS, BRAZOS (G )							
BOSQUE COUNTY REGIONAL PROJECT	CLIFTON LAKE/RESERVOIR [RESERVOIR]	64	64	64	64	64	64
		64	64	64	64	64	64
Sum of Projected Water Manageme	ent Strategies (acre-feet)	3,574	4,910	6,712	8,937	11,276	13,995
COMANCHE COUNTY							
WUG, Basin (RWPG)					All valu	ies are in a	acre-feet
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
COUNTY-OTHER, COMANCHE, BRAZOS (G	)						
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [COMANCHE]	159	159	159	159	239	239
		159	159	159	159	239	239

/UG, Basin (RWPG)					All valu	es are in a	cre-fee
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
OUNTY-OTHER, COMANCHE, COLORADO	) (G )						
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [COMANCHE]	2	2	2	2	3	
		2	2	2	2	3	3
RRIGATION, COMANCHE, BRAZOS (G)							
IRRIGATION WATER CONSERVATION	DEMAND REDUCTION [COMANCHE]	824	1,359	1,883	1,863	1,844	1,825
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [COMANCHE]	69	603	0	0	0	(
		893	1,962	1,883	1,863	1,844	1,825
INING, COMANCHE, BRAZOS (G )							
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [COMANCHE]	14	26	26	19	13	g
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [COMANCHE]	404	473	311	320	149	93
		418	499	337	339	162	102
Sum of Projected Water Manageme	ent Strategies (acre-feet)	418 1,472	499 2,622	337 2,381	339 2,363	162 2,248	
Sum of Projected Water Manageme CORYELL COUNTY (UG, Basin (RWPG)	ent Strategies (acre-feet)				2,363		2,169
CORYELL COUNTY	ent Strategies (acre-feet)  Source Name [Origin]				2,363	2,248	<b>2,169</b>
CORYELL COUNTY /UG, Basin (RWPG) Water Management Strategy	Source Name [Origin]	1,472	2,622	2,381	<b>2,363</b> All valu	<b>2,248</b> es are in a	<b>2,16</b> 9
CORYELL COUNTY VUG, Basin (RWPG)	Source Name [Origin]	1,472	2,622	2,381	<b>2,363</b> All valu	<b>2,248</b> es are in a	2,169

0

100

100

200

200

12

12

525

525

19

19

TRINITY AQUIFER

[CORYELL]

**BRAZOS RIVER** 

[RESERVOIR]

AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM

TRINITY AQUIFER DEVELOPMENT

BRA SYSTEM OPERATIONS-LITTLE

**ELM CREEK WSC, BRAZOS (G)** 

**RIVER** 

WUG, Basin (RWPG)					All valu	es are in a	acre-feet
Water Management Strategy	Source Name [Origin]	2020	2030	2040	2050	2060	2070
FORT HOOD, BRAZOS (G )							
MUNICIPAL WATER CONSERVATION (SUBURBAN) - FORT HOOD	DEMAND REDUCTION [CORYELL]	141	410	671	948	1,040	1,039
		141	410	671	948	1,040	1,039
GATESVILLE, BRAZOS (G )							
BRA SYSTEM OPERATIONS-LITTLE RIVER	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	0	29	86	386	461	580
CORYELL COUNTY OCR	CORYELL COUNTY OFF- CHANNEL LAKE/RESERVOIR [RESERVOIR]	0	2,835	2,835	2,835	2,835	2,835
MUNICIPAL WATER CONSERVATION (SUBURBAN) - GATESVILLE	DEMAND REDUCTION [CORYELL]	208	610	1,097	1,644	2,261	2,462
		208	3,474	4,018	4,865	5,557	5,877
KEMPNER WSC, BRAZOS (G )							
BRA SYSTEM OPERATIONS-LITTLE RIVER	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	855	864	882	926	936	955
MUNICIPAL WATER CONSERVATION (SUBURBAN) - KEMPNER WSC	DEMAND REDUCTION [CORYELL]	21	51	49	49	53	57
		876	915	931	975	989	1,012
MINING, CORYELL, BRAZOS (G )							
INDUSTRIAL WATER CONSERVATION	DEMAND REDUCTION [CORYELL]	45	54	34	25	28	31
TRINITY AQUIFER DEVELOPMENT	TRINITY AQUIFER [CORYELL]	1,500	1,500	500	500	500	500
		1,545	1,554	534	525	528	531
MULTI-COUNTY WSC, BRAZOS (G )							
CORYELL COUNTY OCR	CORYELL COUNTY OFF- CHANNEL LAKE/RESERVOIR [RESERVOIR]	0	247	252	256	259	262
HAMILTON REDUCTION TO MULTI WSC	BRAZOS RIVER AUTHORITY LITTLE RIVER LAKE/RESERVOIR SYSTEM [RESERVOIR]	81	82	0	0	0	0
		81	329	252	256	259	262

#### **ERATH COUNTY**

WUG, Basin (RWPG)					All value	es are in a	cre-feet
Water Management Strategy Sou	ırce Name [Origin]	2020	2030	2040	2050	2060	2070
COUNTY-OTHER, ERATH, BRAZOS (G )							
•	NITY AQUIFER ATH]	0	0	0	0	121	363
		0	0	0	0	121	363
MINING, ERATH, BRAZOS (G )							
	MAND REDUCTION ATH]	0	27	0	0	0	0
		0	27	0	0	0	0
Sum of Projected Water Management S	trategies (acre-feet)	0	27	0	0	121	363

### **APPENDIX G**

# District Resolution of Adoption and Minutes Amending Management Plan

#### MINUTES OF THE PUBLIC HEARING ON PROPOSED ADOPTION OF AMENDMENTS TO DISTRICT MANAGEMENT PLAN MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT HELD: October 4, 2018

THE STATE OF TEXAS COUNTY OF ERATH

On this 4<sup>th</sup> day of October 2018 the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a PUBLIC HEARING ON PROPOSED ADOPTION OF AMENDMENTS TO DISTRICT MANAGEMENT PLAN at 930 Wolfe Nursery Rd, Stephenville, Texas immediately preceding the 1:00 PM Board Meeting with the following members present:

Barbara Domel – Vice-President Jerry Hinshaw – Director Shane Tucker - Director Gary Kafer – Director Kenneth Bullington – Director Fred Parker - Secretary W.B. Maples - Director Frank Volleman - Director Charles Ferguson - Director

Members absent were Rodney Stephens, Robert Payne, and Joe Altebaumer Also present were Joe Cooper, Johnnie Wells, Crystal Eberhart, Stephanie Keith, and Debbie Montgomery.

Vice-President Barbara Domel called the hearing to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- Meeting called to order by Barbara Domel.
- 2. Ty Embrey, of Lloyd Gosselink Law Firm, gave a summary presentation of the proposed amendments to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the TWDB rules contained in Title 30 of the Texas Administrative Code. He recommended adoption of the amendments.
- 3 There was no public comment.
- Motion made by Frank Volleman to adjourn the hearing, second by Fred Parker. Barbara Domel adjourned the public hearing.

MINUTES approved this 1st day of November 2018.

Joe Altebaumer/Erath Co

led Darlen

Fred Parker/Erath Co

Jerry Hinshaw/ Erath Co.

Shane Tucker /Comanche Co.

	Frank Volleman/Comanche Co
Seed	1/2
	Rodue Stephens/Comanche Co
Char	A human
	Charles E. Ferromono Bosque Co
Burken	David .
	Barbara Domel/Busque Co
	Robert Payne/Bosque Co
	Robert Payne/Bosque Co
K	Robert Payne/Bosque Co
	Robert Payne/Bosque Co
K W.S.	Robert Payne/Bosque Co

# MINUTES OF THE PERMIT HEARING AND MEETING OF THE BOARD OF DIRECTORS OF THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT HELD: October 4, 2018

THE STATE OF TEXAS COUNTY OF ERATH

On this 4<sup>th</sup> day of October 2018 the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a PERMIT HEARING at 930 Wolfe Nursery Rd, Stephenville, Texas at 1:00 PM with the following members present:

Barbara Domel – Vice-President Jerry Hinshaw – Director Shane Tucker - Director Gary Kafer – Director Kenneth Bullington – Director

Fred Parker - Secretary W.B. Maples - Director Frank Volleman - Director Charles Ferguson - Director

Members absent were Rodney Stephens, Robert Payne, and Joe Altebaumer. Also present were Joe Cooper, Johnny Wells, Crystal Eberhart, Stephanie Keith, and Debbie Montgomery.

Vice-President Barbara Domel called the hearing to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- 1 Roll Call of members was given by Debbie Montgomery
- Permit applications are ready for review. Joe Cooper stated that all operating permits, except Monty Stewart, were administratively complete and ready to be heard.
- Motion was made by Frank Volleman and second by Shane Tucker to approve all operating permits except for Monty Stewart. All members present voted yes. All permits, except Monty Stewart, were approved.
- 4 Motion to adjourn permit hearing made by Frank Volleman. Second by Fred Parker. All members present voted yes.
- 5 Barbara Domel adjourned the permit hearing.

### THE STATE OF TEXAS COUNTY OF ERATH

On this 4<sup>th</sup> day of October 2018, the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a STATED SESSION at 930 Wolfe Nursery Rd, Stephenville, Texas at 1:00 PM with the following members present:

Barbara Domel – Vice-President Jerry Hinshaw - Director Shane Tucker - Director Gary Kafer – Director Kenneth Bullington – Director Fred Parker - Secretary W.B. Maples - Director Frank Volleman - Director Charles Ferguson - Director

Members absent were Rodney Stephens, Robert Payne, and Joe Altebaumer Also present were Joe Cooper, Johnny Wells, Crystal Eberhart, Stephanie Keith, and Debbie Montgomery.

Vice-President Barbara Domel called the meeting to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- 1. Meeting called to order by Barbara Domel.
- 2. Invocation was given by Jerry Hinshaw.
- Roll call of members given by Debbie Montgomery
- 4. Pledge of allegiance was conducted
- 5. Board recognized Paul Gaudette as guest present.
- 6. No public comments received
- 7. There was a review of the Minutes of the September 6<sup>th</sup>, 2018 Board Meeting. W.B. Maples made a motion to accept the minutes. Second made by Gary Kafer. All members present voted yes to accept.
- 8. Check Detail Report reviewed for dates 9/1/2018 through 10/1/2018, beginning with check number 9517 and ending with check number 9576, and including electronic checks numbers 91418, 91419. 100118, and 1012018. Motion was made by Shane Tucker, second by Jerry Hinshaw, to approve and ratify the payment of the bills. All members present voted yes.
- 9. Board reviewed Income/Expense Comparison
- Office Manager Report given by Crystal Eberhart and Debbie Montgomery. In addition to the Permit applications, there were 17 exempt well registrations from 8/24/2018 to 9/21/2018.
- Field Tech report was given by Johnny Wells. Two wells were plugged, both in Comanche County. One water quality test was completed, in Erath County and the well tested good. Erath County wells were monitored in the month of September and Comanche County wells will be monitored in October.
- 12. Education/Public Relations Report was given by Stephanie Keith.
- 13. Manager's Report was given by Joe Cooper.
- 14. Joe Cooper went over the Quarterly Report of Investment of Public Funds.
- 15. Quarterly Drought Report was given by Joe Cooper.
- 16. Jerry Hinshaw made a motion to adopt the Amendments to the District Management Plan with the new Desired Future Conditions of Aquifers and Modeled Available Groundwater. Second by Shane Tucker. All members present voted yes to adopt the amendments.
- There was discussion on the registration/permitting of irrigation wells. Rule 5.4 states that the District's permit requirements do not apply to "Drilling or operating a well used solely for domestic use or livestock use if the well is located or to be located on a tract of land larger than 10 (ten) acres and drilled, equipped or completed so that the well is incapable of producing more than 25,000 gallons of groundwater per day." It was clarified that all irrigation wells, regardless of gallons per minute, are required to be permitted.
- 18. Ty Embrey, of Lloyd Gosselink Law Firm, discussed groundwater issues for the regular session of the 86<sup>th</sup> Texas Legislature.
- Joe Cooper discussed Hamilton County's interest in annexation by MTGCD. He also went over the process of annexation.
- Agenda items for the November Board Meeting were discussed, which include Coryell CAD Board nominations and one-time salary adjustment for MTGCD employees.
- 21. Motion to adjourn was made by Charles Ferguson and second by Fred Parker. Meeting adjourned.

Joe Altebaumer/Erath Co
Jud Darker
Fred Parker/Erath Co
Fred Farker/Erain CC
Jerry Hinshaw/ Erath Co
Shane Tucker /Comanche Co
41/10
Frank Volleman/Comanche Co
Train Vollement Commence Co
1112
Trans.
Rodney Stephens/Comanche Co
00 2%
Kerly Henry
Charles E. Furgusany Bosque Lo
11 70 1
molars 1/ 1000
Baroura Domel/Bosque Co
2 sines 2 sique co
Dohort Dormo/Doggue Co
Robert Payne/Bosque Co.
Se 4 6
1 / Office
Gary Kafer/Coryell Co
V Day
Newsto Dulleston
Kenneth Bullington/Corvell Co
1/1 / 1 /
W. B. Mile
W.B. Maples/ Coryell Co.
.b. Maples/ Coryell Co.

# RESOLUTION OF THE BOARD OF DIRECTORS OF THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT READOPTING DISTRICT GROUNDWATER MANAGEMENT PLAN

THE STATE OF TEXAS	•
MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT	į

WHEREAS, the Middle Trinity Groundwater Conservation District ("District") was created by the Texas Legislature, pursuant to the authority of Article XVI, § 59 of the Texas Constitution, through Act of May 25, 2001, 77<sup>th</sup> Leg., R.S., ch. 1362, 2001 Tex. Gen. Laws 3371, as amended ("the Act"), as a groundwater conservation district operating under Chapter 36, Texas Water Code, Section 59, Article XVI of the Texas Constitution, and the Act;

WHEREAS, the Board of Directors of the District ("Board") originally adopted its Management Plan in accordance with Sections 36.1071 and 36.1072 of the Texas Water Code and 31 Texas Administrative Code Chapter 356, on April 29, 2004, which was approved by the Texas Water Development Board ("TWDB") on July 1, 2004, and thereafter revised and readopted its Management Plan within five years as required by Section 36.1072(c) of the Texas Water Code on April 2, 2009, which was then approved by TWDB on June 5, 2009;

WHEREAS, as Bosque and Coryell counties were added to the District's territory in May and November of 2009 through the annexation process provided under Subchapter J, Chapter 36 of the Texas Water Code, the District found it necessary to add technical information for Bosque and Coryell Counties into the District's Management Plan, and thus the District added this technical information and other certain updates to the District's Management Plan by resolution on March 5, 2012, which was then approved by TWDB on May 14, 2012.

WHEREAS, pursuant to Section 36.1072 of the Texas Water Code and 31 Texas Administrative Code Section 356.51, the District is required to re-adopt its Management Plan, with or without revisions, at least once every five years and must thereafter re-submit the revised plan for TWDB approval pursuant to 31 Texas Administrative Code Sections 356.52 and 356.53;

WHEREAS, the District has made timely revisions to its Management Plan for readoption by the Board prior to the expiration of the five-year period;

WHEREAS, as part of the process of re-adopting its Management Plan, the District requested and received the assistance of the TWDB and worked with the TWDB staff to obtain the staff's recommendations and comments on the revisions to its Management Plan;

WHEREAS, the Board and the staff of the District, as well as the District's legal counsel and geoscientist, reviewed and analyzed the District's revised Management Plan and the technical information received from TWDB related to the Management Plan;

WHEREAS, the District issued notice in the manner required by state law and held a public hearing on October 6, 2016, to receive public and written comments on the Management Plan at the District's office located at 930 N Wolfe Nursery Rd, Stephenville, Texas;

WHEREAS, the District will coordinate with the appropriate surface water management entities after the public hearing and re-adoption of its Management Plan to afford surface water management entities within the boundaries of the District the opportunity to review and provide comments to the District on its Management Plan;

WHEREAS, the Board finds that the revised Management Plan meets all of the requirements of Chapter 36, Texas Water Code, and 31 Texas Administrative Code Chapter 356;

WHEREAS, while the Board finds that the readoption of the District's Management Plan at its October 6, 2016 meeting will restart the five-year statutory time period by which the District must readopt its Management Plan, the District intends to revise its Management Plan in 2017 when TWDB releases the latest technical data and modeled available groundwater upon the adoption of the Desired Future Conditions by Groundwater Management Area 8; and

WHEREAS, the Board of Directors met in a public meeting on October 6, 2016, properly noticed in accordance with appropriate law, after holding a public hearing on the attached revised Management Plan, considered the re-adoption of the Management Plan, and considered approval of this resolution.

### NOW, THEREFORE, BE IT ORDERED BY THE BOARD OF DIRECTORS OF MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT THAT:

- 1. The above recitals are true and correct.
- 2. The Board of Directors hereby re-adopts the attached Management Plan as the Management Plan of the District, including any revisions made based on comments received from the public at the public hearing or Board meeting, or based on recommendations from the District Board, staff, legal counsel, geoscientist, or TWDB;
- 3. The Board of Directors, the District staff, and the District's legal counsel are further authorized to take all steps necessary to implement this resolution and submit the revised Management Plan to the TWDB for its approval; and
- 4. The Board of Directors, the District staff, and the District's legal counsel and geoscientist are further authorized to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

#### AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 6 day of October, 2016.

MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT

ATTEST:

Source Board Secretary

## RESOLUTION OF THE BOARD OF DIRECTORS OF THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT READOPTING DISTRICT GROUNDWATER MANAGEMENT PLAN

§ § §

THE STATE OF TEXAS	
MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT	

WHEREAS, the Middle Trinity Groundwater Conservation District ("District") was created by the Texas Legislature, pursuant to the authority of Article XVI, § 59 of the Texas Constitution, through Act of May 25, 2001, 77<sup>th</sup> Leg., R.S., ch. 1362, 2001 Tex. Gen. Laws 3371, as amended ("the Act"), as a groundwater conservation district operating under Chapter 36, Texas Water Code, Section 59, Article XVI of the Texas Constitution, and the Act;

WHEREAS, the Board of Directors of the District ("Board") originally adopted its Management Plan in accordance with Sections 36.1071 and 36.1072 of the Texas Water Code and 31 Texas Administrative Code Chapter 356, on April 29, 2004, which was approved by the Texas Water Development Board ("TWDB") on July 1, 2004, and thereafter revised and readopted its Management Plan within five years as required by Section 36.1072(c) of the Texas Water Code on April 2, 2009, which was then approved by TWDB on June 5, 2009;

WHEREAS, as Bosque and Coryell counties were added to the District's territory in May and November of 2009 through the annexation process provided under Subchapter J, Chapter 36 of the Texas Water Code, the District found it necessary to add technical information for Bosque and Coryell Counties into the District's Management Plan, and thus the District added this technical information and other certain updates to the District's Management Plan by resolution on March 5, 2012, which was then approved by TWDB on May 14, 2012.

WHEREAS, pursuant to Section 36.1072 of the Texas Water Code and 31 Texas Administrative Code Section 356.51, the District is required to re-adopt its Management Plan, with or without revisions, at least once every five years and must thereafter re-submit the revised plan for TWDB approval pursuant to 31 Texas Administrative Code Sections 356.52 and 356.53;

WHEREAS, the District has made timely revisions to its Management Plan for readoption by the Board prior to the expiration of the five-year period;

WHEREAS, as part of the process of re-adopting its Management Plan, the District requested and received the assistance of the TWDB and worked with the TWDB staff to obtain the staff's recommendations and comments on the revisions to its Management Plan;

WHEREAS, the Board and the staff of the District, as well as the District's legal counsel and geoscientist, reviewed and analyzed the District's revised Management Plan and the technical information received from TWDB related to the Management Plan;

WHEREAS, the District issued notice in the manner required by state law and held a public hearing on October 6, 2016, to receive public and written comments on the Management Plan at the District's office located at 930 N Wolfe Nursery Rd, Stephenville, Texas;

WHEREAS, the Board of Directors met in a public meeting on October 6, 2016, properly noticed in accordance with appropriate law, after holding a public hearing on the attached revised Management Plan, considered the re-adoption of the Management Plan, and approved a resolution to re-adopt the Management Plan;

WHEREAS, since the date of the October hearing, the District's General Manager and legal counsel submitted the re-approved plant to the TWDB and have had continued correspondence with TWDB staff;

WHEREAS, upon final review of the District's Management Plan, TWDB staff realized that one of the aquifer models used to provide technical data in support of the Manager Plan had a minor, but important, omission;

WHEREAS, TWDB staff were immediately directed to provide an updated and corrected model, and have submitted that new model to the District so as to allow the Board of Directors to approve the insertion of the new model into the Management Plan and take action to signify their final approval of the Management Plan;

WHEREAS, the District will coordinate with the appropriate surface water management entities after the public hearing and re-adoption of its Management Plan to afford surface water management entities within the boundaries of the District the opportunity to review and provide comments to the District on its Management Plan;

WHEREAS, the Board finds that the revised Management Plan meets all of the requirements of Chapter 36, Texas Water Code, and 31 Texas Administrative Code Chapter 356;

WHEREAS, while the Board finds that the readoption of the District's Management Plan at its March 9, 2017 meeting will restart the five-year statutory time period by which the District must readopt its Management Plan, the District intends to revise its Management Plan again at some point before that five-year timeline when TWDB releases the latest technical data and modeled available groundwater upon the adoption of the Desired Future Conditions by Groundwater Management Area 8; and

WHEREAS, the Board of Directors met in a public meeting on March 9, 2017, properly noticed in accordance with appropriate law, after holding a public hearing on the attached revised Management Plan, considered the re-adoption of the Management Plan including the most recent and correct TWDB aquifer model reflecting the inclusion of a part of the Brazos River aquifer, and approved a resolution to finally re-adopt the Management Plan;

NOW, THEREFORE, BE IT ORDERED BY THE BOARD OF DIRECTORS OF MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT THAT:

- 1. The above recitals are true and correct.
- 2. The Board of Directors hereby re-adopts the attached Management Plan as the Management Plan of the District, including any revisions made based on comments received from the public at the public hearing or Board meeting, or based on recommendations from the District Board, staff, legal counsel, geoscientist, or TWDB;
- 3. The Board of Directors, the District staff, and the District's legal counsel are further authorized to take all steps necessary to implement this resolution and submit the revised Management Plan to the TWDB for its approval; and
- 4. The Board of Directors, the District staff, and the District's legal counsel and geoscientist are further authorized to take any and all action necessary to coordinate with the TWDB as may be required in furtherance of TWDB's approval pursuant to the provisions of Section 36.1072 of the Texas Water Code.

#### AND IT IS SO ORDERED.

PASSED AND ADOPTED on this 97th day of March, 2017.

MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT

Board President

ATTEST:

Board Secretary

### **APPENDIX H**

### **Notice of Meetings**

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on proposed amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

The proposed amendments address the updated Desired Future Conditions and Managed Available Groundwater information that resulted from the work of Groundwater Management Area 8, and land subsidence issues.

At the conclusion of the hearing or any time or date thereafter, the proposed amendments to the Management Plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice. Any person who desires to appear at the hearing and present comment or other information on the proposed amendments may do so in person, by counsel, or both. Comments may be presented verbally or in written form.

Copies of the proposed Management Plan will be available as of September 14, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705



The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on proposed amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

The proposed amendments address the updated Desired Future Conditions and Managed Available Groundwater information that resulted from the work of Groundwater Management Area 8, and land subsidence issues.

At the conclusion of the hearing or any time or date thereafter, the proposed amendments to the Management Plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice. Any person who desires to appear at the hearing and present comment or other information on the proposed amendments may do so in person, by counsel, or both. Comments may be presented verbally or in written form.

Copies of the proposed Management Plan will be available as of September 14, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

1018 SEP 10 PH 4: 3-

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on proposed amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend

The proposed amendments address the updated Desired Future Conditions and Managed Available Groundwater information that resulted from the work of Groundwater Management Area 8, and land subsidence issues.

At the conclusion of the hearing or any time or date thereafter, the proposed amendments to the Management Plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice. Any person who desires to appear at the hearing and present comment or other information on the proposed amendments may do so in person, by counsel, or both. Comments may be presented verbally or in written form.

Copies of the proposed Management Plan will be available as of September 14, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

SEP 102018

COUNTY CLERK CORVELL CO., TEXAS

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on proposed amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

The proposed amendments address the updated Desired Future Conditions and Managed Available Groundwater information that resulted from the work of Groundwater Management Area 8, and land subsidence issues.

At the conclusion of the hearing or any time or date thereafter, the proposed amendments to the Management Plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice. Any person who desires to appear at the hearing and present comment or other information on the proposed amendments may do so in person, by counsel, or both. Comments may be presented verbally or in written form.

Copies of the proposed Management Plan will be available as of September 14, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

AT\_\_O'CLOCK\_\_M

SEP 1 0 2018

Clerk, County Court Comenche Co., Texas

# NOTICE OF PUBLIC HEARING and DISTRICT BOARD MEETING

The Middle Trinity Groundwater Conservation District Board of Directors will hold a PERMIT HEARING and BOARD MEETING on Thursday, October 4<sup>th</sup>, 2018 at 1:00 p.m. at 930 Wolfe Nursery Rd, Stephenville, Texas. The Board Meeting will begin immediately upon adjournment of the Permit Hearing. All interested parties are invited to attend.

#### **PERMIT HEARING AGENDA:**

- 1. Call to Order
- 2. Roll Call
- 3. Operating Permits to Be Heard:

Carl Adams
PO Box 0197
Dublin, TX 76446
Well Site:
1500 CR 278
Gustine, TX 76455

Jeff Beuck GPM: 10 Acres: 5.9 Use: Domestic

GPM: 125

Acres: 177.4

Use: Irrigation

657 Goforth Rd Fort Worth, TX 76120 **Well Site:** 225 Peninsula Dr Bluff Dale, TX 76433

DeJong Hidden View Dairy LLC GPM: 85 Acres: 387 Use: Livestock Watering

1684 PR 1401 Dublin, TX 76446 **Well Site:** 

1684 PR 1401 Dublin, TX 76446 John Marshall 8338 CR 365 Dublin, TX 76446 **Well Site:** 8338 CR 365 Dublin, TX 76446 GPM: 35 Acres: 26 Use: Irrigation

Monty Stewart 1151 CR 4980 Desdemona, TX 76445 **Well Site:** CR 362 Desdemona, TX 76445 GPM: 40 Acres: 182 Use: Irrigation

#### Adjourn permit hearing

#### **BOARD MEETING AGENDA:**

The following agenda items will be discussed.

- 1. Call to Order
- 2. Invocation
- 3. Roll Call of Members
- 4. Pledge of Allegiance
- 5. Recognize Guests
- 6. Public Comments
- 7. Approve/Ratify Minutes
- 8. Approve/Ratify Payment of Bills
- 9. Income/Expense Comparison
- 10. Office Manager Report- Crystal Eberhart/Debbie Montgomery
- 11. Field Tech Report- Johnny Wells

- 12. Education/PR Report-Stephanie Keith
- Manager's Report- Joe Cooper
- 14 Quarterly Report of Investment of Public Funds
- 15 Quarterly Drought Report
- 16. Possible Adoption of Amendments to District Management Plan with new Desired Future Conditions of Aquifers and Modeled Available Groundwater
- 17 Discussion/Possible Action on Registration/Permitting of Irrigation Wells
- 18. Discussion on Groundwater Issues for Regular Session of 86<sup>th</sup> Texas Legislature
- 19 Discussion of Hamilton County's Interest in Annexation by MTGCD
- 20. Agenda Items for November Board Meeting
- 21. Adjourn

#### CERTIFICATION

I, the undersigned authority, do hereby certify that on September 24<sup>th</sup>, 2018 before 1:00 PM, I posted and filed the above notice of meeting on the MTGCD website, Texas Secretary of State website, and on the door of the MTGCD office in Erath County in a place convenient and readily accessible to the general public at all times and that it will remain so posted continuously for at least 72 hours preceding the scheduled time of said board meeting, and 10 business days prior to aid time of permit hearing in accordance with the Texas Government Code, Chapter 551

Joe Cooper, MTGCD General Manager

The Middle Trinity Groundwater Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the President of the District at 254-965-6705 at least 24 hours in advance if accommodation is needed.

At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Middle Trinity Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gift (§551.073); personnel matters (§551.074); and deliberation regarding security devises (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

For more information about the public hearing on the Management Plan, permit hearing,
Board meeting or the Middle Trinity Groundwater
Conservation District contact:

JOE B. COOPER, GENERAL MANAGER
254-965-6705

The **Middle Trinity Groundwater Conservation District** (MTGCD) will hold a public hearing on the proposed adoption of amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018, at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- 2. Summary presentation of the proposed amendments to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- 3. Public Comment on the Groundwater Management Plan proposed for adoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed amended MTGCD Management Plan will be available as of September 10, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

JUN 05 2018

### NOTICE OF MEETING GROUNDWATER MANAGEMENT AREA 8

GWINDA JONES, COUNTY CLERK ERATH COUNTY, JEXAS

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Post Oak Savannah Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a Joint Planning Meeting at 10:00 A.M. on June 27, 2018, at the Cleburne Conference Center located at 1501 W. Henderson, Cleburne, TX 76033. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

- 1. Invocation.
- 2. Call meeting to order and establish quorum.
- Welcome and introductions.
- Public comment.
- 5. Consider and act upon approval of minutes from the January 31, 2017, GMA 8 meeting.
- 6. Consider and act upon election of officers for GMA 8.
- 7. Consider and act upon Resolution of Appreciation for Eddy Daniel.
- 8. Consider and act upon appointing a representative to Region F Regional Water Planning Group.
- 9. Consider and act upon appointing a representative to Region G Regional Water Planning Group.
- 10. Consider and act upon appointing a representative to Region K Regional Water Planning Group.
- 11. Consider and act upon path forward for selecting a consultant for next round of Desired Future Conditions joint planning.
- 12. Consider and act upon status of groundwater conservation district creation within GMA 8, including possible inquiry to Texas Commission on Environmental Quality.
- 13. Discussion of GMA 8 District Management Plans and Rules.
- 14. Discussion of possible agenda items and dates for next GMA 8 meeting.
- 15. Closing comments.
- 16. Adjourn.

Dated this 5<sup>th</sup> day of June, 2018

Joe Cooper, Vice Chair Groundwater Management Area 8 The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, requests for additional information, or to submit comments, please contact Velma Starks at (855) 426-4433, at <a href="https://doi.org/10.2016/northexas.gov/nort

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, the Groundwater Management Area 8 may meet in executive session on any of the above agenda items or other lawful items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gifts (§551.073); personnel matters (§551.074); deliberation regarding security devices (§551.076); and deliberation regarding cybersecurity (§551.089). Any subject discussed in executive session may be subject to action during an open meeting.



### **Open Meeting Submission**

**TRD:** 2018008197

Date Posted:

09/24/2018

Status: Accepted

Agency Id: 0365

Date of

09/24/2018

Submission:

Agency Name:

Middle Trinity Groundwater Conservation District

Board:

**Board of Directors** 

Date of

10/04/2018

**Meeting:** Time of

01:00 PM ( ##:## AM Local Time)

Meeting: Street

930 Wolfe Nursery Rd

Location:

City:

Stephenville

State: TX

Liaison Name:

Debbie Montgomery

Liaison Id: 2

**Additionar** 254-965-6705

Information

Obtained From:

Agenda:

NOTICE OF

**PUBLIC HEARING** 

and

DISTRICT BOARD MEETING

The Middle Trinity Groundwater Conservation District Board of Directors will hold a PERMIT HEARING and BOARD MEETING on Thursday, October 4th, 2018 at 1:00 p.m. at 930 Wolfe Nursery Rd, Stephenville, Texas. The Board Meeting will begin immediately upon adjournment of the Permit Hearing. All interested parties are invited to attend.

#### PERMIT HEARING AGENDA:

- 1. Call to Order
- 2. Roll Call
- 3. Operating Permits to Be Heard:

Carl Adams GPM: 125 Acres: 177.4 Use: Irrigation

PO Box 0197

Dublin, TX 76446

Well Site:

1500 CR 278

Gustine, TX 76455

Jeff Beuck GPM: 10 Acres: 5.9 Use: Domestic

657 Goforth Rd

Fort Worth, TX 76120

Well Site:

225 Peninsula Dr

Bluff Dale, TX 76433

DeJong Hidden View Dairy LLC GPM: 85 Acres: 387 Use: Livestock Watering

1684 PR 1401

Dublin, TX 76446

Well Site:

1684 PR 1401

Dublin, TX 76446

John Marshall GPM: 35 Acres: 26 Use: Irrigation

8338 CR 365

Dublin, TX 76446

Well Site:

8338 CR 365

Dublin, TX 76446

Monty Stewart GPM: 40 Acres: 182 Use: Irrigation

1151 CR 4980

Desdemona, TX 76445

Well Site:

CR 362

Desdemona, TX 76445

Adjourn permit hearing

#### **BOARD MEETING AGENDA:**

The following agenda items will be discussed.

1. Call to Order

- 2. Invocation
- 3. Roll Call of Members
- 4. Pledge of Allegiance
- 5. Recognize Guests
- 6. Public Comments
- 7. Approve/Ratify Minutes
- 8. Approve/Ratify Payment of Bills
- 9. Income/Expense Comparison
- 10. Office Manager Report- Crystal Eberhart/Debbie Montgomery
- 11. Field Tech Report- Johnny Wells
- 12. Education/PR Report-Stephanie Keith
- 13. Manager's Report- Joe Cooper
- 14. Quarterly Report of Investment of Public Funds
- 15. Quarterly Drought Report
- 16. Possible Adoption of Amendments to District Management Plan with new Desired Future Conditions of Aquifers and Modeled Available Groundwater
- 17. Discussion/Possible Action on Registration/Permitting of Irrigation Wells
- 18. Discussion on Groundwater Issues for Regular Session of 86th Texas Legislature
- 19. Discussion of Hamilton County's Interest in Annexation by MTGCD

20. Agenda Items for November Board Meeting

21. Adjourn

#### **CERTIFICATION**

I, the undersigned authority, do hereby certify that on September 24th, 2018 before 1:00 PM, I posted and filed the above notice of meeting on the MTGCD website, Texas Secretary of State website, and on the door of the MTGCD office in Erath County in a place convenient and readily accessible to the general public at all times and that it will remain so posted continuously for at least 72 hours preceding the scheduled time of said board meeting, and 10 business days prior to aid time of permit hearing in accordance with the Texas Government Code, Chapter 551.

By:	
Joe Cooper, MTGCD	General Manager

The Middle Trinity Groundwater Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the President of the District at 254-965-6705 at least 24 hours in advance if accommodation is needed.

At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernon's Texas Codes, Annotated, the Middle Trinity Groundwater Conservation District Board may meet in executive session on any of the above agenda items for consultation concerning attorney-client matters (§551.071); deliberation regarding real property (§551.072); deliberation regarding prospective gift (§551.073); personnel matters (§551.074); and deliberation regarding security devises (§551.076). Any subject discussed in executive session may be subject to action during an open meeting.

For more information about the public hearing on the Management Plan, permit hearing, Board meeting or the Middle Trinity Groundwater
Conservation District contact:

JOE B. COOPER, GENERAL MANAGER
254-965-6705



Log Off **Debbie Montgomery** 

#### **Open Meeting Submission**

TRD: 2018008200

**Date Posted:** 09/24/2018

**Status:** Accepted

0365 **Agency Id:** 

Date of

**Submission:** 

09/24/2018

**Agency** 

Middle Trinity Groundwater Conservation District

Name:

Board: **Board of Directors** 

Date of

10/04/2018

**Meeting:** Time of

01:00 PM (##:## AM Local Time)

**Meeting:** Street

930 Wolfe Nursery Rd

Location:

Stephenville

State: TX

Liaison Name:

City:

Debbie Montgomery

Liaison Id:

**Additional** 254-965-6705 Information Obtained From:

Agenda:

MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED ADOPTION OF AMENDMENTS TO DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed adoption of amendments to the MTGCD's Groundwater Management Plan on Thursday, October 4, 2018, at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- 2. Summary presentation of the proposed amendments to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- 3. Public Comment on the Groundwater Management Plan proposed for adoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed amended MTGCD Management Plan will be available as of September 10, 2018 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

**New Submission** 

HOME TEXAS REGISTER TEXAS ADMINISTRATIVE CODE OPEN MEETINGS

#### **Debbie Montgomery**

From: TexReg@sos.texas.gov

Sent: Monday, September 24, 2018 11:03 AM

To: mtgcd5@centurylink.net

**Subject:** S.O.S. Acknowledgment of Receipt

Acknowledgment of Receipt

Agency: Middle Trinity Groundwater Conservation District

Liaison: Debbie Montgomery

The Office of the Secretary of State has posted

notice of the following meeting:

**Board: Board of Directors** 

Committee:

Date: 10/04/2018 01:00 PM "TRD# 2018008197"

Notice posted: 09/24/18 11:03 AM

Proofread your current open meeting notice at:

http://texreg.sos.state.tx.us/public/pub\_om\_lookup\$.startup?Z\_TRD=2018008197

Pages

Groundwater Conse...

ALL DRAFTS

REVIEW

**SCHEDULED** 

Notice of Public Hearing on Proposed Re-Am

Yoday 11 39am

Notice of Public Hearing and Board Meet

Topay 11:57am

**GMA8 RFC** 

Aug D

Notice of Public Hearing and Boar

Jul 23

EDIT

DELETE

SELECT ALL

REMOVE

Middle Trinity Groundwater Conservation District (/)

Notice of Public Hearing and Board Meeting, August 2018 (/blog/2018/7/23/ of-public-hearingand-board-meetingaugust-2018)

## Notice of Public Hearing on Proposed Re-Adoption of District Management Plan (/blog/2018/9/24/notice-ofpublic-hearing-on-proposed-readoption-of-district-managementplan

Debbie Montgomery (/blog/?author=5a43c4425ce350e83e80b441) · September 24, 2018 (/blog/2018/9/24/notice-of-public-hearing-on-proposed-re-adoption-of-district-management-plan)

Download a copy of the agenda here (/s/Management-Plan-Agenda.pdf)

# Notice of Public hearing and Board Meeting (/blog/2018/9/24/notice-ofpublic-hearing-and-board-meeting)

Debbie Montgomery (/blog/?author=5a43c4425ce350e83e80b441) · September 24, 2018 (/blog/2018/9/24/notice-of-public-hearing-and-board-meeting)

Download a copy of the agenda here (/s/October-2018-Agenda.pdf)

GMA8 RFC (/blog/2018/8/10/gma8-rfc)

Crystal Eberhart (/blog/?author=5a4e613d6f935edd34bfb097) · August 10, 2018 (/blog/2018/8/10/gma8-rfc)

#### **Debbie Montgomery**

From:

TexReg@sos.texas.gov

Sent:

Monday, September 24, 2018 11:22 AM

To:

mtgcd5@centurylink.net

Subject:

S.O.S. Acknowledgment of Receipt

Acknowledgment of Receipt

Agency: Middle Trinity Groundwater Conservation District

Liaison: Debbie Montgomery

The Office of the Secretary of State has posted

notice of the following meeting:

**Board: Board of Directors** 

Committee:

Date: 10/04/2018 01:00 PM "TRD# 2018008200"

Notice posted: 09/24/18 11:22 AM

Proofread your current open meeting notice at:

http://texreg.sos.state.tx.us/public/pub\_om\_lookup\$.startup?Z\_TRD=2018008200

#### MTGCD WEBSITE POSTING OF MEETING AGENDA

(see agenda item # 16)

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA), Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

> For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

#### **NOTICE OF PUBLIC HEARING**

#### and

#### **DISTRICT BOARD MEETING**

The Middle Trinity Groundwater Conservation District, Board of Directors will hold a PERMIT HEARING and Board Meeting on Thursday October 6, 2016 at 930 N. Wolfe Nursery Rd, Stephenville, Texas. Permit Hearing begins after the Hearing on Proposed re-adoption of the Management plan which starts at 1:00 p.m. The Board Meeting will begin immediately upon adjournment of the Permit Hearing. All interested parties are invited to attend.

PERMIT HEARING AGENDA:

Adam Hampton (2 wells)

GPM 50 ea.

Acres 200 Use: Irrigation

1121 CR 486

DeLeon, TX 76444

Well Site

1121 CR 486

DeLeon, TX 76444

David Spatieier

GPM 20-24

Acres 150 Use: Irrigation

5140 CR 127

Gatesville, TX 76528

Well Site

5140 CR 127

Gatesville, TX 76528

Adjourn permit hearing.

The following agenda items will be discussed.

- Call to order
- Invocation

3.	Roll Call of Members
4.	Pledge of Allegiance
5.	Recognize Guests
6.	Public Comments
7.	Approve/Ratify Minutes
8.	Approve/Ratify Payment of Bills
9.	Income/Expense Comparison
10.	Office Manager Report-Sharon West. Office updates.
11.	Field Tech Report- Johnny Wells - water levels, reports on wells plugged, water tests and water meter reading
12.	Managerýs Report- Joe Cooper
13.	Quarterly Drought Report
14.	Quarterly Investment Report
15.	GMA 8 Update
16.	Discussion / possible approval of re- adoption of District Management Plan
17.	Discussion/possible action on hiring of new office employee
18.	Agenda items for November Board meeting
19.	Adjourn
	CERTIFICATION
meeti:	undersigned authority, do hereby certify that on September 26, 2016 before 5:00PM, I posted and filed the above notice of any on the MTGCD website and on the doors of the MTGCD office in Erath Counties in a place convenient and readily ible to the general public at all times and that it will remain so posted continuously for at least 72 hours preceding the alled time of said meeting in accordance with the Texas Government Code. Chapter 551.
	Ву:

Joe Cooper, MTGCD General Manager

The Middle Trinity Groundwater Conservation District is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please contact the President of the District at 254-963-6705 at least 24 hours in advance if accommodation is needed.

At any time during the meeting and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernony's Texas Codes. Annotated, the Middle Trimity Groundwater Conservation District Board may meet in executive session on any of the above agends items for consultation concerning attorney-client matters (9551 071); deliberation regarding real property (9551 072); deliberation regarding prospective gift (9551 073), personnel matters (9551 074); and deliberation regarding security devises (9551 076). Any subject discussed in executive session may be subject to action during an open meeting.

For more information about the public hearing on the Management Plan, permit hearing, Board meeting or the Middle Trinity Groundwater

Conservation District contact:

JOE B. COOPER, GENERAL MANAGER 254-965-6705

Bosci of Director/Staff | Side Pane | MTGCO Rules (United 8-5-2015) | Management Plan (2012 societa) |
Forms | Public Notices | Management | Management Pane (2012 societa) | Exemp | Public Notices | Management | Management Pane (2012 societa) | September | Management Pane (2012 societa) | September | Management Pane (2012 societa) | Management Pane (2012 societ

#### MTGCD WEBSITE POSTING OF HEARING NOTICE



# Influence Actor Ac

#### **Public Notices**

POSTING	DEADL	NES FOR	2016
MEETING	TA THE	A C	Cair

MEETING DATE	AGENDA ITEMS DUE	POSTING DEADLIN
October 6, 2016	September 23, 2016	September 26, 2016
November 3, 2016	October 21, 2016	October 23, 2016
December 8, 2016	November 23, 2016	November 28, 2016
January 5, 2017	December 22, 2016	December 23, 2016

\*\*\*ALL POSTING DEADLINES AND MEETING DATES ARE SUBJECT TO CHANGE DUE TO THE AVAILABILITY OF THE BOARD. PLEASE CHECK BACK PERIODICALLY FOR ANY CHANGES. UPDATES WILL BE HIGHLIGHTED IN YELLOW.

Dates of District closings Monday, January 18 Monday, January 18 Monday, February, 15 Monday, March 25 Monday, May 30 Monday, July 4 Monday, September 5 Firday, November 11 Thursday, November 24 Firday, November 25 Firday, December 23 Monday, December 28

New Year's Day
MLK Day
President's Day
Good Friday
Memorial Day
Independence Day
Labor Day
Veterans Day
Thanksgiving Holiday
Christmas Holiday
Christmas Holiday
Christmas Holiday

#### NOTICE OF MEETING

#### **GROUNDWATER MANAGEMENT AREA 8**

Notice is hereby given that the groundwater conservation districts located wholly or partially within Groundwater Management Area (GMA) 8, as designated by the Texas Water Development Board (TWDB), consisting of the Central Texas Groundwater Conservation District, District, Clearwater Underground Water Conservation District, Middle Trinity Groundwater Conservation District, North Texas Groundwater Conservation District, Northern Trinity Groundwater Conservation District, Prairielands Groundwater Conservation District, Prairielands Groundwater Conservation District, Red River Groundwater Conservation District, Saratoga Underground Water Conservation District, Southern Trinity Groundwater Conservation District, and Upper Trinity Groundwater Conservation District will hold a Joint Planning meeting at 10:00 A.M. on Thursday, September 29, 2016, at the Liberty Event Center located at 305 S. Anglin, Cleburne, TX 76033. The meeting will be open to the public. The following items of business will be discussed and potentially acted upon:

- 1 Invocation
- 2. Call meeting to order and establish quorum.
- 3. Welcome and introductions.
- 4. Public comment.
- 5. Approve minutes of April 1, 2016, GMA 8 meeting.
- 6. Presentation of DFC summary reports by each district representative.

- 7. Discussion and consideration of any changes requested to proposed DFC.
- Consider and act upon authorizing LBG Guyton Associates to perform work associated with drafting memo for Model Run 10 for inclusion in explanatory report.
- 9. Discussion and consideration of authorizing GMA 8 consultant to continue drafting explanatory report.
- 10. Discussion of possible agenda items and dates for next GMA 8 meeting.
- 11. Closing comments.
- 12. Adjourn.

Dated this 1st day of September, 2016.

Eddy Daniel, Chair Groundwater Management Area 8

The above agenda schedules represent an estimate of the order for the indicated items and is subject to change at any time. These public meetings are available to all persons regardless of disability. If you require special assistance to attend the meeting, please call (855) 426-4433 at least 24 hours in advance of the meeting to coordinate any special physical access arrangements.

For questions regarding this notice, please contact Velma Starks at (\$55) 626-6433, ut about Month trained and, or at 5100 Airport Orive, Denisor, TX 75020.

At any time during the meeting or work session and in compliance with the Texas Open Meetings Act, Chapter 551, Government Code, Vernony's Texas Codes, Annotated, the Groundwater Management Area 8 may meet in executive session on any of the above agenda stems or other lawful items for consultation concerning attorney-client matters (951.071); either interesting real property (955.072); between regarding respective gifts (952.072); personnel matters (951.074); and deliberation regarding security devices (951.076). Any subject discussed in executive session may be subject to exclude our during an open meeting.

#### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT

#### NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- 3. Public Comment on the Groundwater Management Plan proposed for re-adoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N Wolfe Nursery Road, Stephenville, Texas or on the MTGCDy's website at www.middletrinitygcd.org.

#### **FILE MARKED POSTINGS**

#### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for readoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

SEP 8 2016

ATD: 450'CLOCK / M

Cierk County Court Comenthe Co. Texas

#### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for readoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

POSTED

A.M. 2:20 P.M.

SEP 66 2016

GWINCA JONES, GOUNTY CLERK
EPATH COUNTY, TEXAS
BY 044 DECOUNTY

#### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for readoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

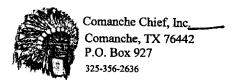
For more information about the public bearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

SEP 06 2016

COUNTY CLERK CORVELL CO., TEXAS

#### PROOF OF NEWSPSPER POSTINGS

(Comanche Chief, Gatesville Messenger, Dublin Citizen, Meridian Messenger & Clifton Record)



#### **Statement**

Date 9/30/2016

Middle Trinity Grnd Conservation Dist 930 N. Wolfe Nursery Rd Stephenville, TX 76401

www.thecomanchechief.com

Amount Due

Amount Enc.

\$135.00

\$135.00

	3155.00		
Date	Transaction	Amount	Balance
08/31/2016 09/08/2016 09/09/2016	Balance forward Display ad - 3x7.5 Hearing Readoption Management Plan PMT #8412.	135.00 -390.00	390.0 525.0 135.0
	necomanchechief.com		Amount Due

De

Thank you for your business

#### PROCTOR FISHING REPORT



TEXAS PARKS & WILDLIFE

degrees; 0.68" low. Black bass slow. are slow. Striped bass are fair on chartreuse striper jigs. White

Water murky; 85-89 stinkbait. Yellow catfish are secondary points. Largemouth

bass are good on slabs and pet. Proctor Lake at 48 degree water. warm afternoons its a great time spoons. Crappie are fair on temperature this is a great time to throw a crank bait, jigs or

Reported August 31, 2016 catfish are fair on shrimp and hitting some deeper primary and bass will be feeding at this Tips for Current Conditions water temperature but will be Largemouth Bass: With much harder to catch. On Sunny minnows. Channel and blue to get out on the water and try slow roll a spinnerbait at 5-10

#### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to 

#### PUBLIC HEARING AGENDA:

- Call to Order.
- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for readoption.

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

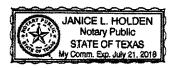
Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Additions and equal opportunity for effective

## THE STATE OF TEXAS COUNTY OF CORYELL

Before me, the undersigned authority, on this date, personally appeared Marshall Day, known to me, being by me duly sworn, on his oath deposes and says that he is the assistant publisher of THE GATESVILLE MESSENGER & STAR FORUM, a newspaper in said county; and that a copy of the hereunto attached notice was printed in said newspaper on the following dates:

Septen	ber 10, 2016
	*
	Marshall Day
Sworn to and subscribed before me, thi	is 30 day of <u>lept</u> , A.D., 20/6
U	Janice LeeAnn Holden Gatesville, Coryell County, Texas



se past Jonesboro ISD. d Saturday.

rand womens, mens girls clothing & shoes. sets, 2 dining room ed. 0002490)

rw, Sat., Sept. 10, 8amwhom baby clothes, I new, girls & boys ) to 8 years old, a little rything. After 12, a lot /2 price. 00024904

#### US

HER'S NOTICE: al estate advertising ewspaper is subject Pair Housing Act akes it illegal to ad-"any preference. n or discrimination a race, color, relihandicap, familial national origin, or tion, to make any ference, limitation mination." Familial cludes children unge of 18 living with or legal custodians, women and people custody of children

wwspaper will not ly accept any adverreal estate which tion of the law. Our te hereby informed wellings advertised wspaper are availa equal opportunity

lain of discrimina-JUD toll-free at 1-9777. The tell-free e number for the mpaired is I-800-



house, 3 bedroom, π home with 35x45 Levita, Texas.

#### **LPARTHEUS**

ZBR, IBA, stove, refrigerator. CH/A, water paid. \$525/mo., \$425 deposit. 301 Regal #8. No pets. 254-865-8779.

2 & 3 Bedroom town homes and houses for rent, Call RealSmart Inc. 254-865-4100. 00024855

#### COUNTRICAL FOR MAIN

Commercial building for rent, \$1,200 rent with \$1,000 deposit. Located at 105 Memorial Dr. 2,400 sq. ft. Call RealSmart, Inc. at 254-865-4100. 00024814

#### PER LE HOTELS

Notice is hereby given by 116 Storage of the sale of contents, by public anction, of the followinf units, pursuant to the assertion of a manager's possessory lien against them in order to collect the amounts due on them:

Unit 30 Cory Currence Unit 32 Tiffany Boyd Unit 33 Janice Campbell Unit 76 All State Medical Unit 78 All State Medical Unit 88 All State Medical

The auction will be held at 10:00. a.m. Saturday, September 10, 2016 (weather permitting) at 116 Storage, 244 S. Hwy. 116, Gatesville TX

ANTIQUES + ART + DESIGN SHOW

SEPTEMBER 9-11, 2016

PREVIEW PARTY BENEFITIN

Terms: Cash

#### ELE LOTES

#### **MILLIC HOTICES**

MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MT-GCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday,October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401, All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- 2. Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code,
- Public Comment on the Groundwater Management Plan proposed for re-adoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the projected management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, greeciestists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road, Stephenville, Texas or on the MTGCD's website at www.middletrinityged.org.

The MIGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public bearing or a MTGCD Contact: Joe Cooper, General Manager at 254-965-6705



You never know what you might

rommercial Ru 36,000 sq. ft. of st 3/2 Brick House, .514 ac on Leon F get-away. Some o 1.21 ac. lot on W 1.306 ac, 3/2 Bric workshop/garage, ▶1.391 ac., 2/1 Ho barn, pole barn, ba ▶4.522 ac. 4/4 2-st 2 gas fireplaces, la \$10 ac. 3/2 brick large porch. Some 112 ac. Lampasas rolling terrain with through property. A 145 ac. Gatasville space, 45 ft. x 60 fbam, 1 tank and 1 148,144 ac. near P views, rolling terrai 148 ac. 3/1 home, south of Evant on C 150 ac. 3/2 brick ho and storage buildin \$445,000

959 ac. 4/4 2-story scattered tree cove 188 ac. Hamilton C \$2975/ac. \$90 ac. Hemilton C

\$2975/ac. ₱98 ac. with 3/2 roc 2 tanks, workshop loss of change in eli ₱102 ac. Coryell C cover, 1 stock tank. 1104 ac. Convell Co over, 1 tank. \$309. 1130 ac. Hamilton ( good fences, Multi-1157 ac. Purmela, T er. \$3275/ac. 184 +/-ac. Hamilto

land, rolling terrain w \$198 sc. Hamilton C coastal field, 48 acri #209.49 ac. 3/2 Roc sonal creek, pipe ca 210,544 ac. Hami



may occur 30 to 60 posure to asbesto ers were exposed through the 1970s construction work their families (seco sure) are among ti



#### AFFIDAVIT OF PUBLICATION

#### THE STATE OF TEXAS: COUNTY OF ERATH:

BEFORE ME, a notary public in and for the above named County, on this day personally appeared the person whose name is subscribed below, who having been duly sworn, says upon oath that he or she is a duly authorized office or employee of *The Dublin Citizen*, which is a newspaper of general circulation in the above named County, devoting no less that 25% of its total column lineage to the carrying of items of general interest, published, and having been published regularly and continuously for not less than 12 months prior to the making of any publication; and that a true and correct copy of the NOTICE TO THE PUBLIC a clipping of which is attached to the affidavit, was published in said Newspaper on September 2016.

J. Scott Dykowski Publisher

SUBSCRIBED AND SWORN TO BEFORE ME on the day of 52pt sm 52x, 2016.

CINDY LEIGH COMBS Notary Public STATE OF TEXAS My Corro. Exp. June 4, 2017

Cindy Leigh Combre
Notary Public

They want

Advortise your Business of Event Statebuilds in OVER 240 Newspapers
ONE CALL
ONE CALL
ONE CALL
ONE CALL
Contact the remainder

food and housing. Litt said the average annual moorne of a payday loan customer is about \$27,000.

"We're talking about people who are already working to make ends meet and then, they get stuck in a debt trap," he added.

The public comment period on the new rule ends on October 7.

## Pub∥ic Notice

# MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1.00 p.m. at the District Office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401. All interested parties are invited to strend.

# PUBLIC HEARING AGENDA:

. Call to Order.

- Summary presentation of the proposed revisions to the MTGCD Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's (TWDB) rules contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for readoption
- Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attenties, geoscientists, or members of the Board of Directors without any additional arrives.

Conies of the proposed MTGCD Management Plan will be available as of

#### **PUBLISHER'S AFFIDAVIT**

#### THE STATE OF TEXAS}

#### **COUNTY OF BOSQUE**}

Before me, the undersigned authority, this day personally appeared Laura Yeakey after being by me duly sworn, says that she is office assistant in charge of tearsheets and affidavits of the Meridian Tribune and The Clifton Record, newspapers published in Bosque County, Texas and that the Hearing for Middle Trinity Ground Water Conservation District of which is hereto a Copy attach, was published in Said Newspapers on the following

Date(s): September 14th, 2016

SUBSCRIBED AND SWORN before me, this | 2 day of \_\_\_\_\_\_, 2017.

#### SEMPLEMENTO PROPERTY OF A STREET

**PUBLISHER'S AFFIDAVIT** 

#### THE STATE OF TEXAS}

#### **COUNTY OF BOSQUE**}

Before me, the undersigned authority, this day personally appeared <u>Laura Yeakey</u> after being by me duly sworn, says that she is <u>office assistant in charge of tearsheets and affidavits</u> of the Meridian Tribune, a newspaper published in Bosque County, Texas and that the <u>Hearing for Middle Trinity Ground Water Conservation District</u> of which is hereto a Copy attach, was published in Said Newspaper on the following

Date(s):

September 14th, 2016

SUBSCRIBED AND SWORN before me, this \_\_\_\_\_\_ day of \_\_\_\_\_\_, 2016.

Notary Public

NAMINATION ON THE PROPERTY OF THE PROPERTY OF

#### PUBLIC HEARING NOTICE AS COMMUNITY DEVELOPMENT BLOCK GRANT PROGRAM

City of Clifton will hold a public hearing at 5:05 p.m. on September 19, 2016 at Clifton City all, 403 W. Third, regarding the submission of an application to the Texas Department of Agriculture for a Texas Community Development Block Grant Program (TxCDBG) grant. The purpose of this meeting is to allow citizens an opportunity to discuss the citizen participation plan, the development of local housing and community development needs, the amount of TxCDBG funding available, all eligible TxCDBG activities, and the use of past TxCDBG funds. The County encourages citizens to participate in the development of this TxCDBG application and to make their views known at this public hearing. Citizens unable to attend this meeting may submit their views and proposals to the City Administrator at Clifton City Hall. Persons with disabilities that wish to attend this meeting should contact City Hall to arrange for assistance, individuals who require auxiliary aids or services for this meeting should contact City Hall at least two days before the meeting so that appropriate arrangements can be made. Para mas información en español, comuniquese con administrador de la ciudad al 254-675-8337

### MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT NOTICE OF PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

The Middle Trinity Groundwater Conservation District (MTGCD) will hold a public hearing on the proposed re-adoption of the MTGCD's Groundwater Management Plan on Thursday, October 6, 2016 at 1:00 p.m. at the District office located at 930 N. Wolfe Nursery Road, Stephenville, Texas 76401, All interested parties are invited to attend.

#### PUBLIC HEARING AGENDA:

- 1. Call to Order.
- Summary presentation of the proposed revisions to the MTGCD
  Management Plan as required by Chapter 36 of the Texas Water Code and
  Chapter 356 of the Texas Water Development Board's (TWDB) rules
  contained in Title 30 of the Texas Administrative Code.
- Public Comment on the Groundwater Management Plan proposed for resdoption.
- 4. Adjourn

At the conclusion of the hearing or any time or date thereafter, the proposed management plan may be adopted in the form presented or as amended based upon comments received from the public, the Texas Water Development Board, District staff, attorneys, geoscientists, or members of the Board of Directors without any additional notice.

Copies of the proposed MTGCD Management Plan will be available as of September 12, 2016 at the MTGCD office located at 930 N. Wolfe Nursery Road Stephenville, Texas or on the MTGCD's website at www.middletrinitygcd.org.

The MTGCD is committed to compliance with the Americans with Disabilities Act (ADA). Reasonable accommodations and equal opportunity for effective communications will be provided upon request. Please call 254-965-6705 at least 24 hours in advance if accommodation is needed.

For more information about the public hearing or the MTGCD Contact: Joe Cooper, General Manager at 254-965-6705

#### OFFICIAL MINUTES OF HEARING

#### MINUTES OF THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT PUBLIC HEARING ON PROPOSED RE-ADOPTION OF DISTRICT MANAGEMENT PLAN

HELD: October 6, 2016

#### THE STATE OF TEXAS COUNTY OF ERATH

On this the 6th day of October 2016, the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a PERMIT HEARING at 930 Wolfe Nursery Rd. Stephenville, Texas at 1:00 p.m. with the following members present:

Rodney Stephens- Chairman Fred Parker- Director/Secretary Barbara Domel- Vice Chairman W.B. Maples- Director

Kenneth Bullington- Director Jerry Hinshaw- Director Charles Ferguson- Director Shane Tucker- Director

Members absent - Four were absent Frank Volleman, Robert Payne, Gary Kafer and Joe Altebaumer. The District Manager Joe Cooper was also absent

Also present were Sharon West, Johnny Wells, and audience members

Chairman Rodney Stephens called the hearing to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- 1. Roll Call of members was given -4 were absent
- Troupe Brewer reviewed the changes that had been made to the District Management plan and requested a motion to approve
- After a brief discussion, motion was made by W.B. Maples, second by Jerry Hinshaw to approve the re-adoption of the District Management Plan with proposed revisions. All members present voted yes. Plan was re-adopted
- Motion to adjourn permit hearing made by Fred Parker, second by Charles Ferguson. All members present voted yes.
- 5. Chairman Stephens adjourned the hearing.

MINUTES approved this 3rd day of November 2016.

Romey P. Stephens, Chairman Comanche Co.

Joe Altebaumer

Fred Parker, Secretary-Treasurer

Jerry Hinshaw, Director -

Erath Co.

Erath Co.

Shane Tucker, Comanche Co.

Tible.
Frank Volleman-
Comanche Co.
10.7
(harlet egue
Charles E. Ferguson
Bosque Co.
_ Sarlara (1) on
Barbara Domel- Vice Chairman
Bosque Co.
Robert Payne
Robert Payne
Bosque Co.
W.B. Maples
Coryell Co.
Gary Kafer
Coryell Co.
Kenneth Lieblington Kenneth Bullington
Coryell Co.

.

#### OFFICIAL MINUTES OF MEETING

## MINUTES OF THE PERMIT HEARING AND MEETING OF THE BOARD OF DIRECTORS OF THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT HELD: October 6, 2016

#### THE STATE OF TEXAS COUNTY OF ERATH

On this the 6th day of October 2016, the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a PERMIT HEARING at 930 Wolfe Nursery Rd. Stephenville, Texas at 1:00 p.m. with the following members present:

Rodney Stephens- Chairman Fred Parker- Director/Secretary Barbara Domel- Vice Chairman Shane Tucker- Director

Kenneth Bullington- Director Jerry Hinshaw- Director Charles Ferguson- Director W.B. Maples- Director

Members absent - Four were absent members- Frank Volleman, Robert Payne, Gary Kafer and Joe Altebaumer. The District Manager Joe Cooper was also absent

Also present were Sharon West, Johnny Wells, and audience members

Chairman Rodney Stephens called the hearing to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- 1. Roll Call of members was given -4 were absent
- Sharon West stated that all operating permits were administratively complete and ready to be heard.
- After a brief discussion, motion was made by Charles Ferguson second by Kenneth Bullington to approve all operating permits. All members present voted yes. Permits were approved
- Motion to adjourn permit hearing made by Fred Parker, second by Charles Ferguson. All members present voted yes.
- 5. Chairman Stephens adjourned the permit hearing.

#### THE STATE OF TEXAS COUNTY OF ERATH

On this the 6th day of October 2016, the Board of Directors of the Middle Trinity Groundwater Conservation District convened in a STATED SESSION at 930 Wolfe Nursery Rd. Stephenville, Texas, with the following members present:

Rodney Stephens- Chairman Jerry Hinshaw- Director Barbara Domel- Vice Chairman Charles Ferguson- Director Kenneth Bullington- Director Fred Parker- Director/Secretary Shane Tucker- Director W.B. Maples-Director

Members absent - 4 members were absent Frank Volleman, Robert Payne, Gary Kafer, and Joe Altebaumer. The District Manager, Joe Cooper was also absent

Also present were Sharon West, Johnny Wells, and audience members

Chairman Stephens called the meeting to order declared a quorum present and that the hearing was duly convened and ready to transact business.

Notice of the hearing was given, stating the time, place and purpose, all as required by Chapter 551 of the Government Code.

- Invocation was given by Jerry Hinshaw
- Pledge of Allegiance was conducted
- 3. Board recognized Troupe Brewer as a guest

- 4. After reviewing minutes from the September 1st Board meetings, motion was made by Barbara Domel second by Jerry Hinshaw to accept minutes with one correction to the number of members who were absent, changing the word two to three. All members present voted yes. Minutes were approved.
- 5. After reviewing the check detail report motion was made by Charles Ferguson, second by Shane Tucker to ratify the payment of the bills. All members present voted yes.
- 6. Board reviewed Income Expense Comparison - no action taken
- 7. Office Manager Report was given by Sharon West
- 8. Field Tech report was given by Johnny Wells
- 9. Managers Report was given by Sharon West in the absence of Joe Cooper
- 10. Quarterly Drought Report was given by Sharon West
- Quarterly Investment report given by Sharon West 11.
- 12. Charles Ferguson and Troupe Brewer gave a brief update on the GMA 8 meeting
- 13. Board retired into executive session at 1:34 to discuss personnel matters.
- 14. Board reconvened at 2:42. Motion was made by Barbara Domel, second by Kenneth Bullington to hire Crystal Eberhart as the new Office Assistant. She will begin work with the District on November 1st 2016 with her rate of pay to be set by the District Manager, Joe Cooper at a later date. All members present voted yes. Crystal will be notified by Rodney Stephens of the decision.
- 15. Agenda topics for next month will include all regular agenda items, discussion/approval of one-time salary treatment for employees, December meeting/dinner
- 16. Motion made by Fred Parker to adjourn, second by Charles Ferguson. All members voted
- 17. Chairman Stephens adjourned the meeting.

MINUTES approved this 3rd day of November 2016.

Rodnéy P. Stephens, Chairman Comanche Co.

Joe Altebaumer Erath Co.

Fred Parker, Secretary-Treasurer

Erath Co.

Jerry Hinshaw, Director -

Erath Co.

Shane Tucker.

Comanche Co.

Frank Volleman-Comanche Co. Charles E. Ferguson
Bosque Co.

Davian

Barbara Domel- Vice Chairman
Bosque Co.

Robert Payne
Robert Payne
Bosque Co.

W.B. Maples
Coryell Co.

Kenneth Bullington
Coryell Co.

## APPENDIX I

**Evidence of Coordination with Surface Water Management Entities** 

From: Ty Embrey

Sent: Monday, December 3, 2018 5:40 PM

**To:** 'davidc@brazos.org'; 'ksorrels@cctc.net'; 'office@ulrmwd.com';

'billing@highlandparkwsc.com'; 'info@kempnerwsc.com';

'karen@mustangvalleywater.org'; 'cliftoncity@cliftontexas.us'; 'ddickerson@ci.comanche.tx.us'; 'lwilson@copperascovetx.gov'; 'cranfillsgap@amaonline.com'; 'mkharbour@cityofdeleon.org';

'dublin.pw@ci.dublin.tx.us'; 'coevant@centex.net'; 'wendy.cole@ci.gatesville.tx.us';

'cityofgordon@sbcglobal.net'; 'cityofgustine@verizon.net';

'cityofiredell@windstream.net'; 'marie.garland@meridiantexas.us'; 'cityofmorgan@valornet.com'; 'jthompson@oglesby-texas.com';

'slking@stephenvilletx.gov'; 'citysec@vmtx.us'; 'cityofws@windstream.net'

**Cc:** 'Joe Cooper'

**Subject:** MTGCD Groundwater Management Plan

Attachments: MTGCD Management Plan amended 2018.10.04 clean redcd.pdf

Dear Surface Water Management Entity,

Attached please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the attached amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with you to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely, Ty Embrey

Attorney for Middle Trinity Groundwater Conservation District

TY EMBREY



Principal
512-322-5829 Direct
512-914-7971 Cell
Lloyd Gosselink Rochelle & Townsend, P.C.
816 Congress Ave., Suite 1900, Austin, TX 78701
www.lglawfirm.com | 512-322-5800
News | vCard | LinkedIn | Bio



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Coryell City Water Supply District 9440 FM 929 Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Coryell City Water Supply District:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Coryell City Water Supply District to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Lakeside Water Supply District 128 County Road 1275 Morgan, Texas 76671

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Lakeside Water Supply District:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Lakeside Water Supply District to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely.

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Barton Water Supply Corporation 101 Mt Zion Rd Gordon, Texas 76453

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Barton Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Barton Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Childress Creek Water Supply Corporation 255 County Road 3405 Clifton, Texas 76634

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Childress Creek Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Childress Creek Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely.

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Comanche County Water Supply Corporation P.O. Box 282 De Leon, Texas 76444

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Comanche County Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Comanche County Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Elm Creek Water Supply Corporation 603 Avenue E Moody, Texas 76557

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Elm Creek Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Elm Creek Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Flat Water Supply Corporation 110 North 8th Street Gatesville, Texas 76528

> Middle Trinity Groundwater Conservation District's Amended Management Plan RE:

Dear Flat Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Flat Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Fort Gates Water Supply Corporation 103 Gateway Circle Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Fort Gates Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Fort Gates Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile (512) 472-0532

www.lglawfirm.com

November 30, 2018

Green Creek Water Supply Corporation 316 North Patrick Street Dublin, Texas 76446

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Green Creek Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Green Creek Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

King Creek Water Supply Corporation P.O. Box 5459 Laguna Park, Texas 76644

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear King Creek Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the King Creek Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Leon Junction Water Supply Corporation 2545 East FM 931 Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Leon Junction Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Leon Junction Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800

Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Morgan Mill Water Supply Corporation P.O. Box 7 Morgan Mill, Texas 76465

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Morgan Mill Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Morgan Mill Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



Austin, Texas 78701

Telephone: (512) 322-5800 Facsimile: (512) 472-0532

816 Congress Avenue, Suite 1900

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Mosheim Water Supply Corporation 3067 FM 217 Valley Mills, Texas 76689

> Middle Trinity Groundwater Conservation District's Amended Management Plan RE:

Dear Mosheim Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Mosheim Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



Mr. Embrey's Direct Line: (512) 322-5829

Email: tembrey@lglawfirm.com

816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Mountain Water Supply Corporation P.O. Box 1045 Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Mountain Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Mountain Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



Facs

Austin, Texas 7870 | Telephone: (512) 322-5800 Facsimile: (512) 472-0532

816 Congress Avenue, Suite 1900

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Multi County Water Supply Corporation P.O. Box 1006 Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Multi County Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Multi County Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900 Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

November 30, 2018

Smith Bend Water Supply Corporation P.O. Box 207 Valley Mills, Texas 76689

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Smith Bend Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Smith Bend Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



816 Congress Avenue, Suite 1900. Austin, Texas 78701 Telephone: (512) 322-5800 Facsimile: (512) 472-0532

www.lglawfirm.com

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

The Grove Water Supply Corporation 1903 Straws Mill Road Gatesville, Texas 76528

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear The Grove Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the The Grove Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

cc: Mr. Joe B. Cooper, General Manager



Telephone: (512) 322-5800 Facsimile: (512) 472-0532

816 Congress Avenue, Suite 1900

www.lglawfirm.com

Austin, Texas 78701

Mr. Embrey's Direct Line: (512) 322-5829 Email: tembrey@lglawfirm.com

November 30, 2018

Topsey Water Supply Corporation 4371 FM 1113 Copperas Cove, Texas 76522

RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Topsey Water Supply Corporation:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Corvell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Topsey Water Supply Corporation to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.

Sincerely,

Ty H. Embrey

Attorney for the District

Enclosure

Mr. Joe B. Cooper, General Manager cc:

November 30, 2018

Lake Proctor Irrigation Authority P.O. Box 203 Stephenville, Texas 76401

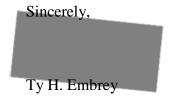
RE: Middle Trinity Groundwater Conservation District's Amended Management Plan

Dear Lake Proctor Irrigation Authority:

Enclosed please find a copy of the amended Management Plan of the Middle Trinity Groundwater Conservation District (the "District"). The District's mission is to conserve, preserve, and protect the quality and quantity of groundwater resources for the citizens within its boundaries, which include Bosque, Comanche, Coryell, and Erath Counties.

The District has adopted amendments to its Management Plan as required by Chapter 36 of the Texas Water Code and Chapter 356 of the Texas Water Development Board's ("TWDB's") rules contained in Title 30 of the Texas Administrative Code. The District submits the enclosed amended Management Plan to you pursuant to Section 36.1071(a) of the Texas Water Code and the TWDB's rules. The District asks for your review and comment as part of the District's effort to coordinate and seek input on its comprehensive groundwater management goals. The District's Board of Directors (the "Board") held a public hearing and subsequently adopted the enclosed amended Management Plan at its Board meeting on October 4, 2018.

The District is committed to working with the Lake Proctor Irrigation Authority to manage the groundwater resources within its boundaries. Please contact the District's General Manager Joe Cooper at (254) 965-6705 if you have any questions.



**Enclosure** 

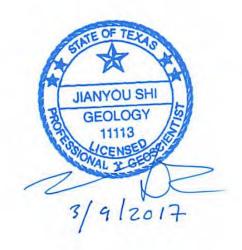
cc: Mr. Joe B. Cooper, General Manager
Middle Trinity Groundwater Conservation District

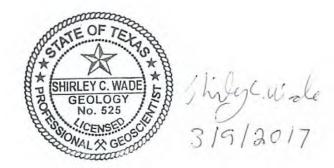
## **APPENDIX J**

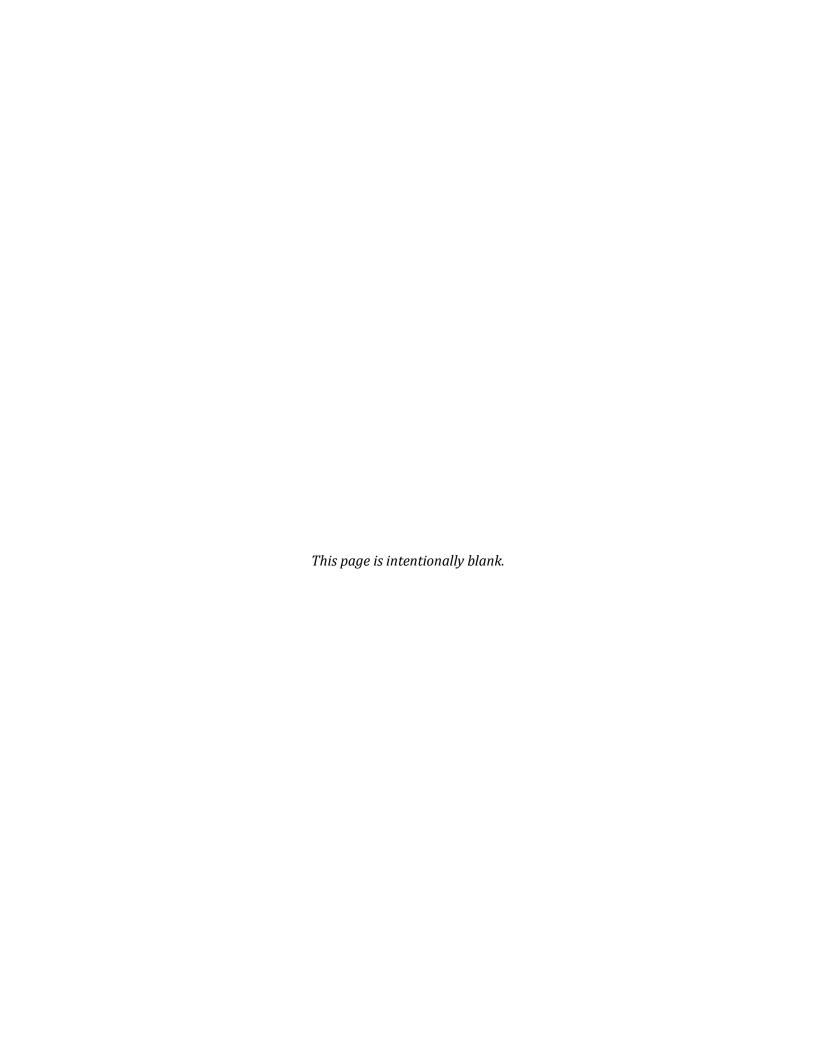
## **Groundwater Availability Model Run 17-026**

# GAM Run 17-026: MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT GROUNDWATER MANAGEMENT PLAN

by Jerry Jianyou Shi, Ph.D., P.G. and Shirley C. Wade, Ph.D., P.G. Texas Water Development Board Groundwater Division Groundwater Availability Modeling Section 512-936-0883 March 9, 2017







## GAM Run 17-026: MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT MANAGEMENT PLAN

by Jerry Jianyou Shi, Ph.D., P.G. and Shirley C. Wade, Ph.D., P.G. Texas Water Development Board Groundwater Division Groundwater Availability Modeling Section 512-936-0883 March 9, 2017

#### **EXECUTIVE SUMMARY:**

Texas State Water Code, Section 36.1071, Subsection (h) (Texas Water Code, 2015), states that, in developing its groundwater management plan, a groundwater conservation district shall use groundwater availability modeling information provided by the Executive Administrator of the Texas Water Development Board (TWDB) in conjunction with any available site-specific information provided by the district for review and comment to the Executive Administrator. Information derived from groundwater availability models that shall be included in the groundwater management plan includes:

- the annual amount of recharge from precipitation, if any, to the groundwater resources within the district;
- for each aquifer within the district, the annual volume of water that discharges from the aquifer to springs and any surface water bodies, including lakes, streams, and rivers; and
- the annual volume of flow into and out of the district within each aquifer and between aquifers in the district.

This report—Part 2 of a two-part package of information from the TWDB to the Middle Trinity Groundwater Conservation District—fulfills the requirements noted above. Part 1 of the two-part package is the Estimated Historical Water Use/State Water Plan data report. The district will receive this data report from the TWDB Groundwater Technical Assistance Section. Questions about the data report can be directed to Mr. Stephen Allen at <a href="mailto:stephen.allen@twdb.texas.gov">stephen.allen@twdb.texas.gov</a> or 512-463-7317.

GAM Run 17-026: Middle Trinity Groundwater Conservation District Management Plan March 9, 2017 Page 4 of 12

The groundwater management plan for the Middle Trinity Groundwater Conservation District should be adopted by the district on or before February 13, 2017, and submitted to the Executive Administrator of the TWDB on or before March 15, 2017. The current management plan for the Middle Trinity Groundwater Conservation District expires on May 14, 2017.

This report discusses the methods, assumptions, and results from model runs using version 2.01 of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Kelley and others, 2014) and version 1.01 of the groundwater availability model for the Brazos River Alluvium Aquifer (Ewing and Jigmond, 2016). This model run replaces the results of GAM Run 16-002 (Shi, 2016) and includes results from the newly released groundwater availability model for the Brazos River Alluvium Aquifer. Tables 1 and 2 summarize the groundwater availability model data required by statute. Figures 1 and 2 show the areas of the models from which the values in the tables were extracted. If after review of the figures, Middle Trinity Groundwater Conservation District determines that the district boundaries used in the assessment do not reflect current conditions, please notify the TWDB at your earliest convenience.

#### **METHODS:**

In accordance with the provisions of the Texas State Water Code, Section 36.1071, Subsection (h), the groundwater availability models for the northern portion of the Trinity and Woodbine aquifers and the Brazos River Alluvium Aquifer were used for this analysis. The water budget for the Middle Trinity Groundwater Conservation District was extracted for selected years of the historical model period (1980 to 2012) using ZONEBUDGET Version 3.01 (Harbaugh, 2009) for the Trinity and Woodbine aquifers and ZONEBUDGET-USG (Panday and others, 2013) for the Brazos River Alluvium Aquifer. The average annual water budget values for recharge, surface water outflow, inflow to the district, and outflow from the district for the Trinity and Brazos River Alluvium aquifers within the district are summarized in this report.

#### PARAMETERS AND ASSUMPTIONS:

#### **Trinity Aquifer**

- We used version 2.01 of the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers. See Kelley and others (2014) for assumptions and limitations of the model.
- The groundwater availability model for the northern portion of the Trinity and Woodbine aquifers contains eight layers that generally represent the following:

Layer 1 (the surficial outcrop area of the units in layers 2 through 8 and units younger than Woodbine Aquifer), Layer 2 (Woodbine Aquifer), Layer 3 (Washita and Fredericksburg Groups, and the Edwards (Balcones Fault Zone) Aquifer), and Layers 4 through 8 (Trinity Aquifer). Layers 2 through 7 also include pass-through cells.

- Perennial rivers and reservoirs were simulated using the MODFLOW River package. Ephemeral streams, flowing wells, springs, and evapotranspiration in riparian zones along perennial rivers were simulated using the MODFLOW Drain package. For this management plan, groundwater discharge to surface water includes groundwater leakage to all of the river and drain boundaries except for the groundwater loss along the riparian zone.
- The model was run using MODFLOW-NWT (Niswonger and others, 2011).

#### Brazos River Alluvium Aquifer

- We used version 1.01 of the groundwater availability model for the Brazos River Alluvium Aquifer released on December 16, 2016. See Ewing and Jigmond (2016) for assumptions and limitations of the model.
- The groundwater availability model for the Brazos River Alluvium Aquifer contains three layers. Layers 1 and 2 represent the Brazos River Alluvium Aquifer and Layer 3 represents the surficial portions of the Carrizo-Wilcox, Queen City, Sparta, Yegua-Jackson, and Gulf Coast aquifers as well as various geologic units of the Cretaceous System.
- Perennial rivers and streams were simulated using the MODFLOW Streamflow-Routing package and ephemeral streams, were simulated using the MODFLOW River package. Springs were simulated using the MODFLOW Drain package.
- The model was run with MODFLOW-USG (unstructured grid; Panday and others, 2013).

#### **RESULTS:**

A groundwater budget summarizes the amount of water entering and leaving the aquifer according to the groundwater availability model. Selected groundwater budget components listed below were extracted from the model results for the Trinity and Brazos River Alluvium aquifers located within the district and averaged over the duration of the calibration and verification portion of the model run in the district, as shown in Tables 1 and 2.

- Precipitation recharge—The areally distributed recharge sourced from precipitation falling on the outcrop areas of the aquifers—where the aquifer is exposed at land surface—within the district.
- Surface water outflow—The total water discharging from the aquifer (outflow) to surface water features such as streams, reservoirs, and drains (springs).
- Flow into and out of district—The lateral flow within the aquifer between the district and adjacent counties.
- Flow between aquifers—The net vertical flow between aquifers or confining units. This flow is controlled by the relative water levels in each aquifer or confining unit and aquifer properties of each aquifer or confining unit that define the amount of leakage that occurs.

The information needed for the district's management plan is summarized in Tables 1 and 2. It is important to note that sub-regional water budgets are not exact. This is due to the size of the model cells and the approach used to extract data from the model. To avoid double accounting, a model cell that straddles a political boundary, such as a district or county boundary, is assigned to one side of the boundary based on the location of the centroid of the model cell. For example, if a cell contains two counties, the cell is assigned to the county where the centroid of the cell is located.

TABLE 1: SUMMARIZED INFORMATION FOR THE TRINITY AQUIFER THAT IS NEEDED FOR MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED TO THE NEAREST 1 ACRE-FOOT.

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Trinity Aquifer	74,335
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, rivers, springs, and flowing wells	Trinity Aquifer	98,449
Estimated annual volume of flow into the district within each aquifer in the district	Trinity Aquifer	29,682
Estimated annual volume of flow out of the district within each aquifer in the district	Trinity Aquifer	33,741
Estimated net annual volume of flow between each aquifer in the district	From the Washita Group of the Cretaceous System to the Trinity Aquifer	29,006

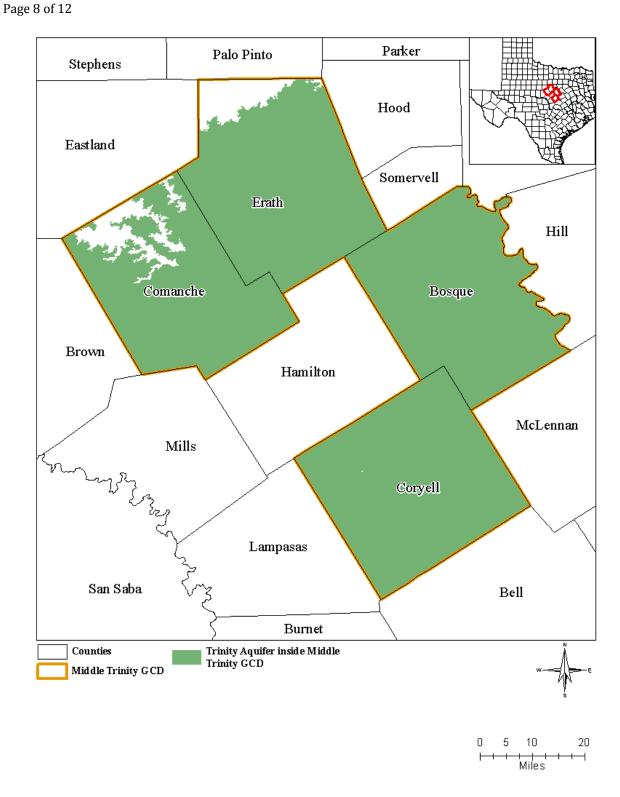


FIGURE 1. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE TRINITY AQUIFER FROM WHICH THE INFORMATION IN TABLE 1 WAS EXTRACTED FOR THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT (GCD).

GAM Run 17-026: Middle Trinity Groundwater Conservation District Management Plan March 9, 2017 Page 9 of 12

TO THE NEAREST 1 ACRE-FOOT.

TABLE 2: SUMMARIZED INFORMATION FOR THE BRAZOS RIVER ALLUVIUM AQUIFER THAT IS NEEDED FOR MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT'S GROUNDWATER MANAGEMENT PLAN. ALL VALUES ARE REPORTED IN ACRE-FEET PER YEAR AND ROUNDED

Management Plan requirement	Aquifer or confining unit	Results
Estimated annual amount of recharge from precipitation to the district	Brazos River Alluvium Aquifer	516
Estimated annual volume of water that discharges from the aquifer to springs and any surface water body including lakes, streams, rivers, springs, and flowing wells	Brazos River Alluvium Aquifer	845
Estimated annual volume of flow into the district within each aquifer in the district	Brazos River Alluvium Aquifer	236
Estimated annual volume of flow out of the district within each aquifer in the district	Brazos River Alluvium Aquifer	238
Estimated net annual volume of flow between each aquifer in the district	From the Washita Group of the Cretaceous System to the Brazos River Alluvium Aquifer	82

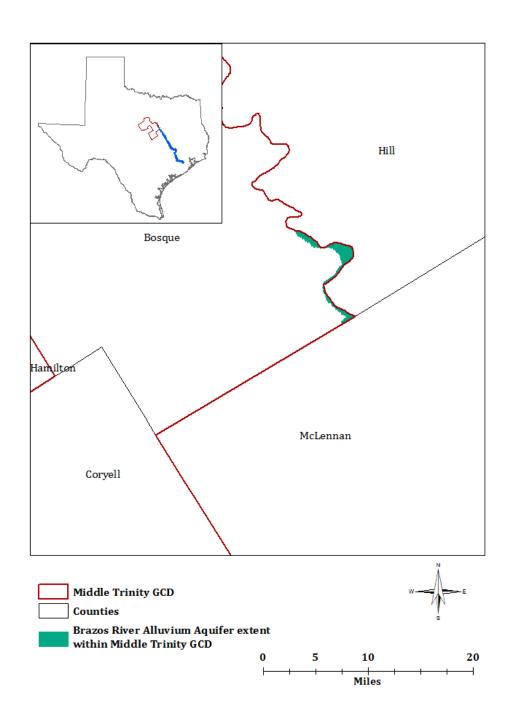


FIGURE 2. AREA OF THE GROUNDWATER AVAILABILITY MODEL FOR THE BRAZOS RIVER ALLUVIUM AQUIFER FROM WHICH THE INFORMATION IN TABLE 2 WAS EXTRACTED FOR THE MIDDLE TRINITY GROUNDWATER CONSERVATION DISTRICT (GCD).

GAM Run 17-026: Middle Trinity Groundwater Conservation District Management Plan March 9, 2017 Page 11 of 12

#### LIMITATIONS:

The groundwater models used in completing this analysis are the best available scientific tools 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 interaction with streams are specific to particular historic time periods.

Because the application of the groundwater models was designed to address regional-scale questions, the results are most effective on a regional scale. The TWDB makes no warranties or representations related 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 overall conditions of 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.

GAM Run 17-026: Middle Trinity Groundwater Conservation District Management Plan March 9, 2017 Page 12 of 12

#### REFERENCES:

- Harbaugh, A. W., 2009, Zonebudget Version 3.01, A computer program for computing subregional water budgets for MODFLOW ground-water flow models: U.S. Geological Survey Groundwater Software.
- Kelley, V.A., Ewing, J., Jones, T.L., Young, S.C., Deeds, N., and Hamlin, S., 2014, Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers Final Model Report, 984 p., <a href="http://www.twdb.texas.gov/groundwater/models/gam/trnt\_n/Final\_NTGAM\_Vol%2014/20Aug%202014\_Report.pdf">http://www.twdb.texas.gov/groundwater/models/gam/trnt\_n/Final\_NTGAM\_Vol%2014/20Aug%202014\_Report.pdf</a>
- 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., <a href="http://www.nap.edu/catalog.php?record\_id=11972">http://www.nap.edu/catalog.php?record\_id=11972</a>.
- Niswonger, R.G., Panday, S., and Ibaraki, M., 2011, MODFLOW-NWT, a Newton formulation for MODFLOW-2005: USGS, Techniques and Methods 6-A37, 44 p.
- Panday, S., Langevin, C.D., Niswonger, R.G., Ibaraki, M., and Hughes, J.D., 2013, MODFLOW-USG version 1: An unstructured grid version of MODFLOW for simulating groundwater flow and tightly coupled processes using a control volume finite-difference formulation: U.S. Geological Survey Techniques and Methods, book 6 chap. A45, 66 p.
- Shi, J., 2016, GAM Run 16-002: Middle Trinity Groundwater Conservation District Management Plan, Texas Water Development Board, GAM Run 16-002 Report, 10 p., <a href="http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-14.pdf">http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR10-14.pdf</a>

Texas Water Code, 2015, <a href="http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf">http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf</a>.

# APPENDIX K

# TWDB GTA Aquifer Assessment 10-18 MAG

# GTA Aquifer Assessment 10-18 MAG

by Robert G. Bradley, P.G.

Texas Water Development Board Groundwater Technical Assistance Section (512) 936-0870



Robert G. Bradley, P.G. 707, authorized the seal appearing on this document on December 9, 2011

This page is intentionally blank

### **EXECUTIVE SUMMARY:**

The estimated modeled available groundwater from the Brazos River Alluvium Aquifer that achieves the desired future condition adopted by members of Groundwater Management Area 8 is approximately 33,169 acre-feet per year and is summarized by county, regional water planning area, and river basin as shown in Tables 1-5. The modeled available groundwater estimates for the groundwater conservation districts within Groundwater Management Area 8 for the aquifer is approximately 16,485 acre-feet per year between 2010 and 2060 and are shown in Table 5.

### REQUESTOR:

Mr. Eddy Daniel of the North Texas Groundwater Conservation District acting on the behalf of Groundwater Management Area 8.

### **DESCRIPTION OF REQUEST:**

In a letter dated August 31, 2011, Mr. Eddy Daniel provided the Texas Water Development Board (TWDB) with the desired future condition of the Brazos River Alluvium Aquifer that were adopted in a resolution, dated April 27, 2011, by the members of Groundwater Management Area 8. This resolution referenced the previously adopted desired future conditions for Brazos River Alluvium Aquifer, as described in a resolution adopted December 17, 2007 by the groundwater conservation districts in Groundwater Management Area 8.

However, following readopting the previous desired future conditions, the Groundwater Management area 8 representatives, in a resolution dated June 23, 2011, made that the portion of the Brazos River Alluvium Aquifer in Milam County non-relevant for joint planning purposes. Therefore, the current desired future conditions are:

- Maintain approximately 100 percent of the saturated thickness after 50 years in Falls County.
- Maintain approximately 82 percent of the estimated saturated thickness after 50 years in McLennan County.
- Maintain approximately 90 percent of the estimated saturated thickness after 50 years in Hill and Bosque counties.

Because the desired future conditions were identical to the previous submission, the modeled available groundwater estimates in this report are identical to the previously released "managed available groundwater" estimates that were in GTA Aquifer Assessment 07-05mag.

### **METHODS:**

Groundwater Management Area 8, located in central Texas, includes part of the Brazos River Alluvium Aquifer (Figure 1). The desired future condition requested for the Brazos River Alluvium Aquifer was based on the desired future condition adopted by Groundwater Management Area 8. The pumping results presented here for Groundwater Management Area 8 are taken directly from GTA Aquifer Assessment 07-05mag.

# PARAMETERS AND ASSUMPTIONS:

 Parameters, assumptions, volumetric calculations, and areas were obtained from GTA Aquifer Assessment 07-05mag (Bradley, 2008).

## **MODELED AVAILABLE GROUNDWATER AND PERMITTING:**

As defined in Chapter 36 of the Texas Water Code, "modeled available groundwater" is the estimated average amount of water that may be produced annually to achieve a desired future condition. This is distinct from "managed available groundwater," shown in the draft version of this report dated January 25, 2011, which was a permitting value and accounted for the estimated use of the aquifer exempt from permitting. This change was made to reflect changes in statute by the 82<sup>nd</sup> Texas Legislature, effective September 1, 2011. The previous version of this report was completed prior to the readopting of the desired future conditions.

Groundwater conservation districts are required to consider modeled available groundwater, along with several other factors, when issuing permits in order to manage groundwater production to achieve the desired future condition(s). The other factors districts must consider include annual precipitation and production patterns, the estimated amount of pumping exempt from permitting, existing permits, and a reasonable estimate of actual groundwater production under existing permits. The estimated amount of pumping exempt from permitting, which the Texas Water Development Board is now required to develop after soliciting input from applicable groundwater conservation districts, will be provided in a separate report.

### **RESULTS:**

The estimated modeled available groundwater from the Brazos River Alluvium Aquifer in Groundwater Management Area 8 that achieves the adopted desired future condition is approximately 33,169 acre-feet per year. This pumping has been divided by county, regional water planning area, and river basin for each decade between 2010 and 2060 for use in the regional water planning process (Table 1).

The modeled available groundwater estimates are also summarized by county, regional water planning area, river basin, and groundwater conservation district and are shown in tables 2, 3, 4, and 5, respectively.

Table 1. Estimated modeled available groundwater by decade for the Brazos River Alluvium Aquifer in Groundwater Management Area 8. Results are in acre-feet per year and are divided by county, regional water planning area, and river basin.

	Regional		Year						
County	Water Planning Area	River Basin	2010	2020	2030	2040	2050	2060	
Bosque	G	Brazos	830	830	830	830	830	830	
Falls	G	Brazos	16,684	16,684	16,684	16,684	16,684	16,684	
Hill	G	Brazos	632	632	632	632	632	632	
McLennan	G	Brazos	15,023	15,023	15,023	15,023	15,023	15,023	
		Total	33,169	33,169	33,169	33,169	33,169	33,169	

Table 2. Estimated modeled available groundwater for the Brazos River Alluvium Aquifer summarized by county in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

County			Ye	ar	_	
County	2010	2020	2030	2040	2050	2060
Bosque	830	830	830	830	830	830
Falls	16,684	16,684	16,684	16,684	16,684	16,684
Hill	632	632	632	632	632	632
McLennan	15,023	15,023	15,023	15,023	15,023	15,023
Total	33,169	33,169	33,169	33,169	33,169	33,169

Table 3. Estimated modeled available groundwater for the Brazos River Alluvium Aquifer summarized by regional water planning area in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Regional Water	Year							
Planning Area	2010	2020	2030	2040	2050	2060		
G	33,169	33,169	33,169	33,169	33,169	33,169		

Table 4. Estimated modeled available groundwater for the Brazos River Alluvium Aquifer summarized by river basin in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Basin			Ye	ar		
Dasiii	2010	2020	2030	2040	2050	2060
Brazos	33,169	33,169	33,169	33,169	33,169	33,169

Table 5. Estimated modeled available groundwater for the Brazos River Alluvium Aquifer summarized by groundwater conservation district in Groundwater Management Area 8 for each decade between 2010 and 2060. Results are in acre-feet per year.

Groundwater	Year						
Conservation District	2010	2020	2030	2040	2050	2060	
Middle Trinity GCD	830	830	830	830	830	830	
Prairielands GCD	632	632	632	632	632	632	
Southern Trinity GCD	15,023	15,023	15,023	15,023	15,023	15,023	
Total (excluding non-district areas)	16,485	16,485	16,485	16,485	16,485	16,485	
No district	16,684	16,684	16,684	16,684	16,684	16,684	
Total (including non-district areas)	33,169	33,169	33,169	33,169	33,169	33,169	

# **LIMITATIONS:**

The water budget used by Bradley (2008) was determined to be the best method to calculate estimates of modeled available groundwater; however, this method has limitations and should be replaced with better tools, including groundwater models and additional data that are not currently available, whenever possible.

This analysis assumes homogeneous and isotropic aquifers; however, aquifer conditions may not be uniform. The analysis further assumes that precipitation is the only source of aquifer recharge that lateral inflow to the aquifer is equal to lateral outflow from the aquifer, and that future pumping will not alter this balance. In addition, certain assumptions have been made regarding future precipitation, recharge, and streamflow in developing modeled available groundwater estimates. These assumptions need to be considered and compared to actual future data when evaluating achievement of the desired future condition.

Given these limitations, users of this information are cautioned that the modeled available groundwater numbers should not be considered a definitive, permanent description of the amount of groundwater that can be pumped to meet the adopted desired future condition. 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 future groundwater pumping and water levels to know if they are achieving their desired future conditions. Because of the limitations and assumptions in this analysis, it is important that the groundwater conservation districts work with the TWDB to refine these modeled available groundwater numbers given the reality of how the aquifer responds to the actual amount and location of pumping now and in the future.

## REFERENCES:

Bradley, R. G., 2008, GTA Aquifer Assessment 07-05mag: Texas Water Development Board, GTA Aquifer Assessment Report, 8 p.

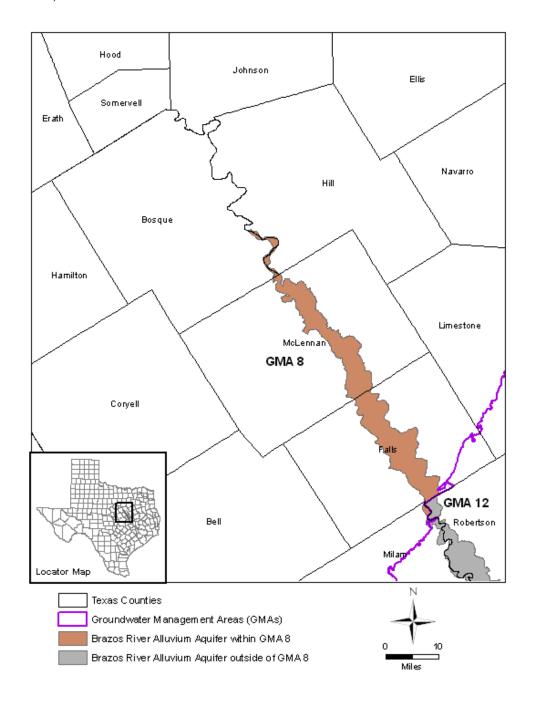


Figure 1. Map showing the area covered by the Brazos River Alluvium Aquifer in Groundwater Management Area 8.

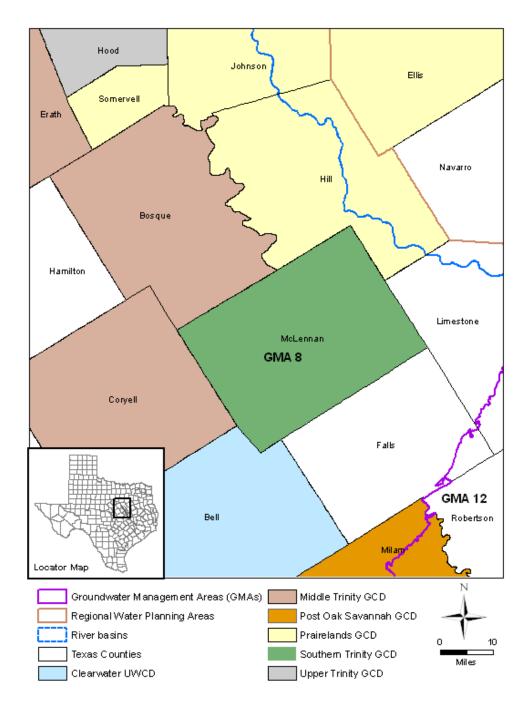
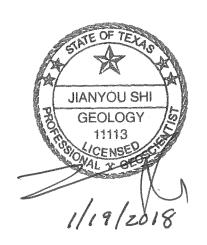


Figure 2. Map showing regional water planning areas, river basins, groundwater conservation districts and counties in and neighboring the Groundwater Management Area 8 assessment area. GCD = Groundwater Conservation District, UWCD = Underground Water Conservation District.

# APPENDIX L

# **Groundwater Availability Model Run 17-029 MAG**

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 463-5076
January 19, 2018



This page is intentionally left blank.

# **GAM RUN 17-029 MAG:**

# Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Groundwater Management Area 8

Jerry Shi, Ph.D., P.G.
Texas Water Development Board
Groundwater Division
Groundwater Availability Modeling Department
(512) 463-5076
January 19, 2018

# **EXECUTIVE SUMMARY:**

The Texas Water Development Board (TWDB) has calculated the modeled available groundwater estimates for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Groundwater Management Area 8. The modeled available groundwater estimates are based on the desired future conditions for these aquifers adopted by groundwater conservation district representatives in Groundwater Management Area 8 on January 31, 2017. The district representatives declared the Nacatoch, Blossom, and Brazos River Alluvium aquifers to be non-relevant for purposes of joint planning. The TWDB determined that the explanatory report and other materials submitted by the district representatives were administratively complete on November 2, 2017.

The modeled available groundwater values for the following relevant aquifers in Groundwater Management Area 8 are summarized below:

• Trinity Aquifer (Paluxy) – The modeled available groundwater ranges from approximately 24,500 to 24,600 acre-feet per year between 2010 and 2070, and is

summarized by groundwater conservation districts and counties in <u>Table 1</u>, and by river basins, regional planning areas, and counties in <u>Table 13</u>.

- Trinity Aquifer (Glen Rose) The modeled available groundwater is approximately 12,700 acre-feet per year between 2010 and 2070, and is summarized by groundwater conservation districts and counties in <u>Table 2</u>, and by river basins, regional planning areas, and counties in <u>Table 14</u>.
- Trinity Aquifer (Twin Mountains) The modeled available groundwater ranges from approximately 40,800 to 40,900 acre-feet per year between 2010 and 2070, and is summarized by groundwater conservation districts and counties in <u>Table 3</u>, and by river basins, regional planning areas, and counties in <u>Table 15</u>.
- Trinity Aquifer (Travis Peak) The modeled available groundwater ranges from approximately 93,800 to 94,000 acre-feet per year between 2010 and 2070, and is summarized by groundwater conservation districts and counties in in <u>Table 4</u>, and by river basins, regional planning areas, and counties in <u>Table 16</u>.
- Trinity Aquifer (Hensell) The modeled available groundwater is approximately 27,300 acre-feet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in <u>Table 5</u>, and by river basins, regional planning areas, and counties in <u>Table 17</u>.
- Trinity Aquifer (Hosston) The modeled available groundwater ranges from approximately 64,900 to 65,100 acre-feet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in <a href="Table 6">Table 6</a>, and by river basins, regional planning areas, and counties in <a href="Table 18">Table 18</a>.
- Trinity Aquifer (Antlers) The modeled available groundwater ranges from approximately 74,500 to 74,700 acre-feet per year between 2010 and 2070, and is summarized by groundwater conservation districts and counties in <u>Table 7</u>, and by river basins, regional planning areas, and counties in <u>Table 19</u>.
- Woodbine Aquifer The modeled available groundwater is approximately 30,600 acre-feet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in <u>Table 8</u>, and by river basins, regional planning areas, and counties in <u>Table 20</u>.
- Edwards (Balcones Fault Zone) Aquifer The modeled available groundwater is 15,168 acre-feet per year from 2010 to 2060, and is summarized by groundwater conservation districts and counties in <u>Table 9</u>, and by river basins, regional planning areas, and counties in <u>Table 21</u>.

January 19, 2018 Page 5 of 102

- Marble Falls Aquifer The modeled available groundwater is approximately 5,600 acre-feet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in <u>Table 10</u>, and by river basins, regional planning areas, and counties in <u>Table 22</u>.
- Ellenburger-San Saba Aquifer The modeled available groundwater is approximately 14,100 acre-feet per year between 2010 and 2070, and is summarized by groundwater conservation districts and counties in <a href="Table 11">Table 11</a>, and by river basins, regional planning areas, and counties in <a href="Table 23">Table 23</a>.
- Hickory Aquifer The modeled available groundwater is approximately 3,600 acrefeet per year from 2010 to 2070, and is summarized by groundwater conservation districts and counties in <u>Table 12</u>, and by river basins, regional planning areas, and counties in <u>Table 24</u>.

The modeled available groundwater values for the Trinity Aquifer (Paluxy, Glen Rose, Twin Mountains, Travis Peak, Hensell, Hosston, and Antlers subunits), Woodbine Aquifer, and Edwards (Balcones Fault Zone) Aquifer are based on the official aquifer boundaries defined by the TWDB. The modeled available groundwater values for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers are based on the modeled extent, as clarified by Groundwater Management Area 8 on October 9, 2017.

The modeled available groundwater values estimated for counties may be slightly different from those estimated for groundwater conservation districts because of the process for rounding the values. The modeled available groundwater values for the longer leap years (2020, 2040, and 2060) are slightly higher than shorter non-leap years (2010, 2030, 2050, and 2070).

# **REQUESTOR:**

Mr. Drew Satterwhite, General Manager of North Texas Groundwater Conservation District and Groundwater Management Area 8 Coordinator.

# **DESCRIPTION OF REQUEST:**

In a letter dated February 17, 2017, Mr. Drew Satterwhite provided the TWDB with the desired future conditions of the Trinity (Paluxy), Trinity (Glen Rose), Trinity (Twin Mountains), Trinity (Travis Peak), Trinity (Hensell), Trinity (Hosston), Trinity (Antlers), Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory aquifers. The desired future conditions were adopted as Resolution No. 2017-01 on January 31, 2017 by the groundwater conservation district representatives in

January 19, 2018 Page 6 of 102

Groundwater Management Area 8. The following sections present the adopted desired future conditions for these aquifers:

# **Trinity and Woodbine Aquifers**

The desired future conditions for the Trinity and Woodbine aquifers are expressed as water level decline or drawdown in feet over the planning period 2010 to 2070 relative to the baseline year 2009, based on a predictive simulation by Beach and others (2016).

The county-based desired future conditions for the Trinity Aquifer subunits, excluding counties in the Upper Trinity Groundwater Conservation District, are listed below (dashes indicate areas where the subunits do not exist and therefore no desired future condition was proposed):

	Adopted Desired Future Condition (feet of drawdown below 2009 levels)							s)
County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Bell	_	19	83	_	300	137	330	_
Bosque	_	6	49	_	167	129	201	_
Brown	_	_	2	_	1	1	1	2
Burnet	_	_	2	_	16	7	20	_
Callahan	_	_	_	_	_	_	_	1
Collin	459	705	339	526	_	_	_	570
Comanche	_	_	1	_	2	2	3	9
Cooke	2		_	_	_		_	176
Coryell	_	7	14	_	99	66	130	_
Dallas	123	324	263	463	348	332	351	_
Delta	_	264	181	_	186	_	_	_
Denton	22	552	349	716	_	_	_	395
Eastland	_	_	_	_	_	_	_	3
Ellis	61	107	194	333	301	263	310	_
Erath	_	1	5	6	19	11	31	12
Falls	_	144	215	_	462	271	465	_
Fannin	247	688	280	372	269	_	_	251
Grayson	160	922	337	417	_	_	_	348
Hamilton	_	2	4	_	24	13	35	_
Hill	20	38	133	_	298	186	337	_
Hunt	598	586	299	370	324	_	_	_

January 19, 2018 Page 7 of 102

	Adoj	oted Desir	ed Future	Condition (feet	of drawdo	wn below 2	2009 levels	s)
County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Johnson	2	-61	58	156	179	126	235	_
Kaufman	208	276	269	381	323	309	295	_
Lamar	38	93	97	_	114	_	_	122
Lampasas	_	_	1	_	6	1	11	_
Limestone	_	178	271	_	392	183	404	_
McLennan	6	35	133	_	471	220	542	_
Milam	_	_	212	_	345	229	345	_
Mills	_	1	1	_	7	2	13	_
Navarro	92	119	232	_	290	254	291	_
Red River	2	21	36	_	51	_	_	13
Rockwall	243	401	311	426	_	_	_	_
Somervell	_	1	4	31	51	26	83	_
Tarrant	7	101	148	315	_	_	_	148
Taylor	_	_	_	_	_	_	_	0
Travis	_	_	85	_	141	50	146	_
Williamson	_	_	77	_	173	74	177	_

The desired future conditions for the counties in the Upper Trinity Groundwater Conservation District are further divided into outcrop and downdip areas, and are listed below (dashes indicate areas where the subunits do not exist):

Upper Trinity GCD	Adopted Desired Future Conditions (feet of drawdown below 2009 levels)							
County (crop)	Antlers	Antlers Paluxy		Twin Mountains				
Hood (outcrop)	_	5	7	4				
Hood (downdip)	_	_	28	46				
Montague (outcrop)	18	_	_	_				
Montague (downdip)	_	_	_	_				
Parker (outcrop)	11	5	10	1				
Parker (downdip)	_	1	28	46				
Wise (outcrop)	34	_	_	_				
Wise (downdip)	142	_	_	_				

January 19, 2018 Page 8 of 102

# **Edwards (Balcones Fault Zone) Aquifer**

The desired future conditions adopted by Groundwater Management Area 8 for the Edwards (Balcones Fault Zone) Aquifer are intended to maintain minimum stream and spring flows under the drought of record in Bell, Travis, and Williamson counties over the planning period 2010 to 2070. The desired future conditions are listed below:

County	Adopted Desired Future Condition
Bell	Maintain at least 100 acre-feet per month of stream/spring flow in Salado Creek during a repeat of the drought of record
Travis	Maintain at least 42 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record
Williamson	Maintain at least 60 acre-feet per month of aggregated stream/spring flow during a repeat of the drought of record

# Marble Falls, Ellenburger-San Saba, and Hickory Aquifers

The desired future conditions for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Brown, Burnet, Lampasas, and Mills counties are intended to maintain 90 percent of the aquifer saturated thickness over the planning period 2010 to 2070 relative to the baseline year 2009.

# Supplemental Information from Groundwater Management Area 8

After review of the explanatory report and model files, the TWDB emailed a request for clarifications to Mr. Drew Satterwhite on August 7, 2017. On September 8, 2017, Mr. Satterwhite provided the TWDB with a technical memorandum from James Beach, Jeff Davis, and Brant Konetchy of LBG-Guyton Associates. On October 9, 2017, Mr. Satterwhite sent the TWDB two emails with additional information and clarifications. The information and clarifications are summarized below:

a. For the Trinity and Woodbine aquifers, an additional error tolerance defined as five feet of drawdown between the adopted desired future condition and the simulated drawdown is included with the original error tolerance of five percent. Thus, if the drawdown from the predictive simulation is within five feet or five percent from the desired future condition, then the predictive simulation is considered to meet the desired future condition.

Groundwater Management Area 8 provided a new MODFLOW-NWT well package, simulated head file, and simulated budget file on October 9, 2017. The TWDB determined that the distribution of pumping in the new model files was consistent with the explanatory report.

January 19, 2018 Page 9 of 102

The TWDB evaluates if the simulated drawdown from the predictive simulation meets the desired future condition by county. However, Groundwater Management Area 8 also provided desired future conditions based on groundwater conservation district and the whole groundwater management area.

- b. For the Edwards (Balcones Fault Zone) Aquifer in Bell, Travis, and Williamson counties, the coordinator for Groundwater Management Area 8 clarified that TWDB uses GAM Run 08-010 MAG by Anaya (2008) from the last cycle of desired future conditions with all associated assumptions including a baseline year of 2000.
- c. For the Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Brown, Burnet, Lampasas, and Mills counties, Groundwater Management Area 8 adjusted the desired future condition from "maintain 90 percent of the saturated thickness" to "maintain *at least* 90 percent of the saturated thickness". Groundwater Management Area 8 also provided estimated pumping to use for the predictive simulation by TWDB.
- d. The Trinity, Woodbine, and Edwards (Balcones Fault Zone) aquifers are based on the official aquifer boundary while the Marble Falls, Ellenburger-San Saba, and Hickory aquifers include the portions both inside and outside the official aquifer boundaries (modeled extent).
- e. The sliver of the Edwards-Trinity (Plateau) Aquifer was declared to be non-relevant by Groundwater Management Area 8.

# **METHODS:**

The desired future conditions for Groundwater Management Area 8 are based on multiple criteria. For the Trinity and Woodbine aquifers, the desired future conditions are defined as water-level declines or drawdowns over the course of the planning period 2010 through 2070 relative to the baseline year 2009. The desired future conditions for the Edwards (Balcones Fault Zone) Aquifer are based on stream and spring flows under the drought of record over the planning period 2010 to 2070. For the Marble Falls, Ellenburger-San Saba, and Hickory aquifers, the desired future conditions are to maintain aquifer saturated thickness between 2010 and 2070 relative to the baseline year 2009. The methods to calculate the desired future conditions are discussed below.

January 19, 2018 Page 10 of 102

# **Trinity and Woodbine Aquifers**

The desired future conditions for the Trinity and Woodbine aquifers in Groundwater Management Area 8 are based on a predictive simulation by Beach and others (2016), which used the groundwater availability model for the northern portion of the Trinity and Woodbine aquifers (Kelley and others, 2014). The predictive simulation contained 61 annual stress periods corresponding to 2010 through 2070, with an initial head equal to 2009 of the calibrated groundwater availability model. The desired future conditions are the drawdowns between 2009 and 2070.

Because the baseline year 2009 for the desired future conditions falls within the calibration period 1890 to 2012 of the groundwater availability model, the water levels for the baseline year have been calibrated to observed data and, thus, they were directly used as the initial water level (head) condition of the predictive simulation.

The drawdowns between 2009 and 2070 are calculated from composite heads. <u>Appendix A</u> presents additional details on methods used to calculate composite head and associated average drawdown values for the Trinity and Woodbine aquifers.

# **Edwards (Balcones Fault Zone) Aquifer**

Per Groundwater Management Area 8 (clarification dated September 1, 2017), the results from GAM Run 08-010 MAG by Anaya (2008) are used for the current round of joint planning. The following summarizes the approach used:

- Ran the model for 141 years, starting with a 100-year initial stress period (pre-1980) followed by 21 years of historical monthly stress periods (1980 to 2000), then 10 years of predictive annual stress periods (2001 to 2010), and ending with 10 years of predictive monthly stress periods (2011 to 2020) to represent a simulated repeat of the 1950s' drought of record.
- Used pumpage and recharge distributions provided to TWDB by the Groundwater Management Area 8 consultant.
- Adjusted pumpage in Williamson County to meet the desired future conditions.
- Extracted projected discharge for drain cells representing Salado Creek in Bell County and drain cells representing aggregated springs and streams in Williamson and Travis counties, respectively, for each of the stress periods from 2011 through 2020 to verify that the desired future conditions were met.

January 19, 2018 Page 11 of 102

- Determined which stress period reflected the worst case monthly scenario for Salado Springs during a repeat of the 1950s' drought of record.
- Generated modeled available groundwater for all three desired future conditions based on the lowest monthly springflow volume for Salado Springs during a simulated repeat of the 1950s' drought of record.

# Marble Falls, Ellenburger-San Saba, and Hickory Aquifers

The TWDB constructed a predictive simulation to analyze the desired future conditions for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Brown, Burnet, Lampasas, and Mills counties within Groundwater Management Area 8. This simulation used the groundwater availability model for the minor aquifers in the Llano Uplift region by Shi and others (2016). The predictive simulation contains 61 annual stress periods corresponding to the planning period 2010 through 2070 with an initial head condition from 2009.

Because the baseline year 2009 for the desired future conditions falls within the model calibration period 1980 to 2010, and the water levels for the baseline year have been calibrated to observed data, the simulated head from 2009 of the calibrated groundwater availability model was directly used as the initial water level (head) condition of the predictive simulation.

Additional details on the predictive simulation and methods to estimate the drawdowns between 2009 and 2070 are described in Appendix B.

# **Modeled Available Groundwater**

Once the predictive simulations met the desired future conditions, the modeled available groundwater values were extracted from the MODFLOW cell-by-cell budget files. Annual pumping rates were then divided by county, river basin, regional water planning area, and groundwater conservation district within Groundwater Management Area 8 (Figures 1 through 13 and Tables 1 through 24).

# **Modeled Available Groundwater and Permitting**

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

January 19, 2018 Page 12 of 102

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 groundwater availability simulations are described below:

# **Trinity and Woodbine Aquifers**

- Version 2.01 of the updated groundwater availability model for the northern Trinity and Woodbine aquifers by Kelley and others (2014) was used to construct the predictive model simulation for this analysis (Beach and others, 2016).
- The predictive model was run with MODFLOW-NWT (Niswonger and others, 2011).
- The model has eight layers that represent units younger than the Woodbine Aquifer and the shallow outcrop of all aquifers (Layer 1), the Woodbine Aquifer (Layer 2), the Fredericksburg and Washita units (Layer 3), and various combinations of the subunits that comprise the Trinity Aquifer (Layers 4 to 8).
- Multiple model layers could represent an aquifer where it outcrops. For example, the Woodbine Aquifer could span Layers 1 to 2 and the Trinity Aquifer (Hosston) could contain Layers 1 through 8. The aquifer designation in model layers was defined in the model grid files produced by TWDB.
- The predictive model simulation contains 61 transient annual stress periods with an initial head equal to 2009 of the calibrated groundwater availability model.
- The predictive simulation had the same hydrogeological properties and hydraulic boundary conditions as the calibrated groundwater availability model except groundwater recharge and pumping.
- The groundwater recharge for the predictive model simulation was the same as stress period 1 of the calibrated groundwater availability model (steady state period) except stress periods representing 2058 through 2060, which contained lower recharge representing severe drought conditions.
- In the predictive simulation, additional pumping was added to certain counties and some pumping in Layer 1 was moved to lower layer(s) to avoid the automatic pumping reduction enacted by the MODFLOW-NWT code (Beach and others, 2016).

January 19, 2018 Page 13 of 102

- During the predictive simulation model run, some model cells went dry (<u>Appendix</u> <u>C</u>). Dry cells occur during a model run when the simulated water level in a cell falls below the bottom of the cell.
- Estimates of modeled drawdown and available groundwater from the model simulation were rounded to whole numbers.

# **Edwards (Balcones Fault Zone) Aquifer**

- Version 1.01 of the groundwater availability model for the northern segment of the Edwards (Balcones Fault Zone) Aquifer (Jones, 2003) was used to construct the predictive model simulation for the analysis by Anaya (2008).
- The model has one layer that represents the Edwards (Balcones Fault Zone) Aquifer.
- The model was run with MODFLOW-96 (Harbaugh and McDonald, 1996).
- The predictive model simulation contains the calibrated groundwater availability model (253 monthly stress periods), stabilization (10 annual stress periods), and drought conditions (120 monthly stress periods).
- The boundary conditions for the stabilization and drought periods (except recharge and pumping) were the same in the predictive simulation as the last stress period (stress period 253) of the calibrated groundwater availability model.
- The groundwater recharge for the stabilization and drought periods and pumping information were from Groundwater Management Area 8 consultant.
- The groundwater pumping in Williamson County was adjusted as needed during the predictive model run simulation to match the desired future conditions.
- Estimates of modeled spring and stream flows from the model simulation were rounded to whole numbers.

# Marble Falls, Ellenburger-San Saba, and Hickory Aquifers

- Version 1.01 of the groundwater availability model for the minor aquifers in Llano Uplift region by Shi and others (2016) was used to develop the predictive model simulation used for this analysis.
- The model has eight layers: Layer 1 (the Trinity Aquifer, Edwards-Trinity (Plateau) Aquifer, and younger alluvium deposits), Layer 2 (confining units), Layer 3 (the Marble Falls Aquifer and equivalent unit), Layer 4 (confining units), Layer 5 (Ellenburger-San Saba Aquifer and equivalent unit), Layer 6 (confining units), Layer 7 (the Hickory Aquifer and equivalent unit), and Layer 8 (Precambrian units).

January 19, 2018 Page 14 of 102

- The model was run with MODFLOW-USG beta (development) version (Panday and others, 2013).
- The predictive model simulation contains 61 annual stress periods (2010 to 2070) with the initial head equal to 2009 of the calibrated groundwater availability model.
- The boundary conditions for the predictive model except recharge and pumping were the same in the predictive simulation of the last stress period of the calibrated groundwater availability model.
- The groundwater recharge for the predictive model simulation was set equal to the average of all stress periods (1982 to 2010) of the calibrated model except the first stress period.
- The groundwater pumping was initially set to the last stress period of the calibrated groundwater availability model. Additional pumping per county was then added to the model cells of the three aquifers based on the modeled extent to match the total pumping data for each aquifer provided by Groundwater Management area 8.
- During the predictive model run, some active model cells went dry (<u>Appendix D</u>).
   Dry cells occur during a model run when the simulated water level in a cell falls below the bottom of the cell.
- Estimates of modeled saturated aquifer thickness values were rounded to one decimal point.

# **RESULTS:**

The modeled available groundwater for the Trinity Aquifer (Paluxy) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 24,499 acre-feet per year for the non-leap (shorter) years (2010, 2030, 2050, and 2070) to 24,565 acre-feet per year for the leap (longer) years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in Table 1. Table 13 summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Glen Rose) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 12,701 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 12,736 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <u>Table 2</u>. <u>Table 14</u>

January 19, 2018 Page 15 of 102

summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Twin Mountains) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 40,827 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 40,939 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 15">Table 15</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Travis Peak) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 93,757 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 94,016 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 4">Table 4</a>. <a href="Table 4">Table 16</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Hensell) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 27,257 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 27,331 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 5">Table 17</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Hosston) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 64,922 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 65,098 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 6">Table 18</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Trinity Aquifer (Antlers) that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 74,471 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 74,677 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is

January 19, 2018 Page 16 of 102

summarized by groundwater conservation district and county in <u>Table 7</u>. <u>Table 19</u> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Woodbine Aquifer that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 30,554 acrefeet per year for the non-leap years (2010, 2030, 2050, and 2070) to 30,636 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 8">Table 20</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Edwards (Balcones Fault Zone) Aquifer that achieves the desired future condition adopted by Groundwater Management Area 8 remains at 15,168 acre-feet per year from 2010 to 2060. The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 9">Table 21</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Marble Falls Aquifer that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 5,623 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 5,639 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 10">Table 10</a>. <a href="Table 22">Table 22</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Ellenburger-San Saba Aquifer that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 14,050 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 14,089 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is summarized by groundwater conservation district and county in <a href="Table 11">Table 23</a> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

The modeled available groundwater for the Hickory Aquifer that achieves the desired future condition adopted by Groundwater Management Area 8 ranges from 3,574 acre-feet per year for the non-leap years (2010, 2030, 2050, and 2070) to 3,585 acre-feet per year for the leap years (2020, 2040, and 2060). The modeled available groundwater is

January 19, 2018 Page 17 of 102

summarized by groundwater conservation district and county in <u>Table 12</u>. <u>Table 24</u> summarizes the modeled available groundwater by county, river basin, and regional water planning area for use in the regional water planning process.

January 19, 2018 Page 18 of 102

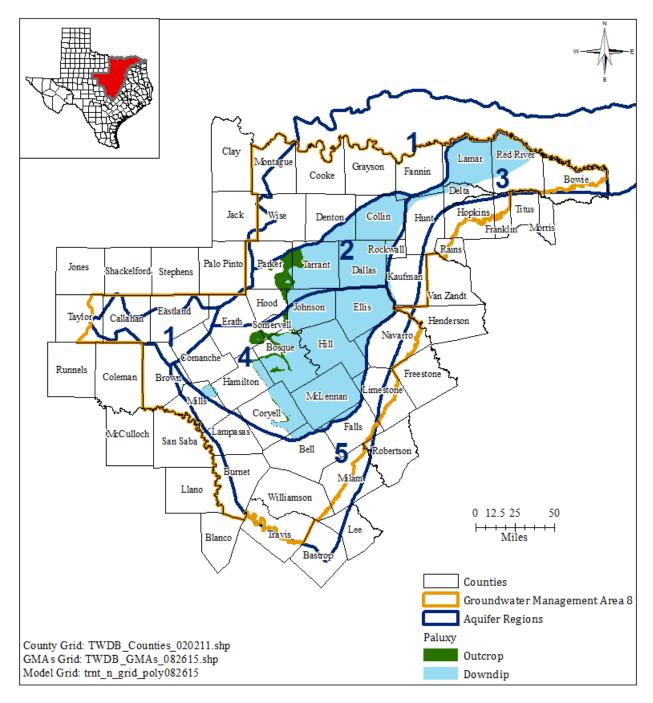


FIGURE 1. MAP SHOWING THE TRINITY AQUIFER (PALUXY) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 19 of 102

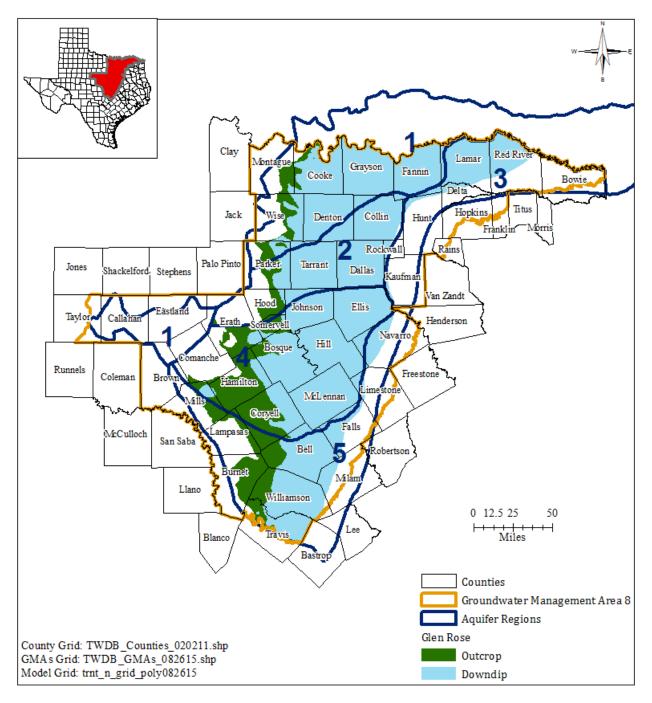


FIGURE 2. MAP SHOWING THE TRINITY AQUIFER (GLEN ROSE) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 20 of 102

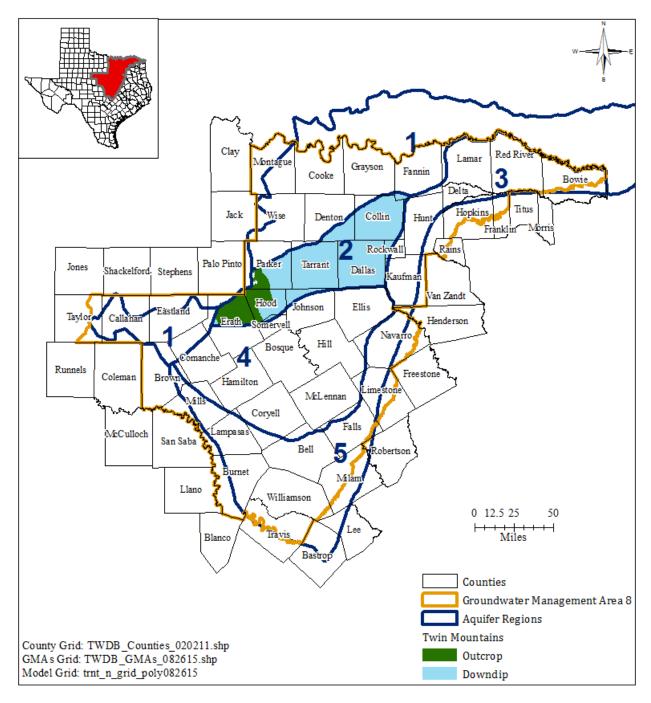


FIGURE 3. MAP SHOWING THE TRINITY AQUIFER (TWIN MOUNTAINS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 21 of 102

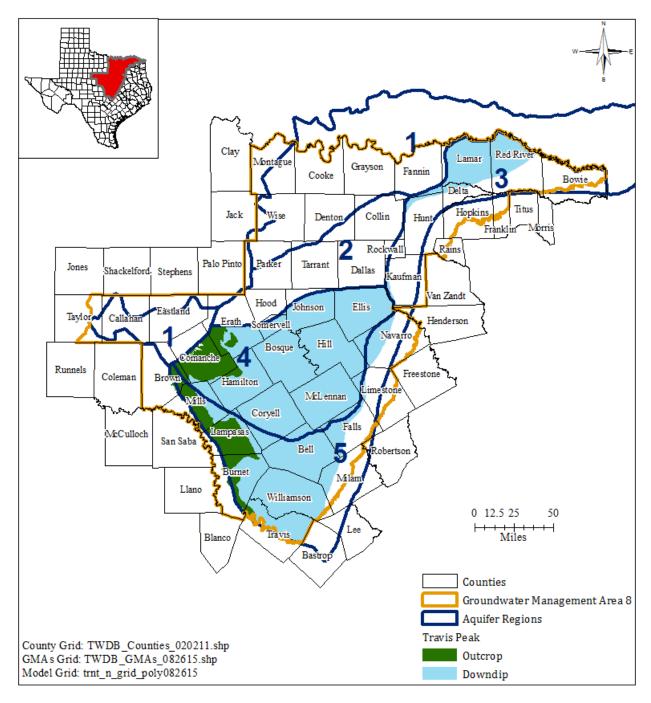


FIGURE 4. MAP SHOWING THE TRINITY AQUIFER (TRAVIS PEAK) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 22 of 102

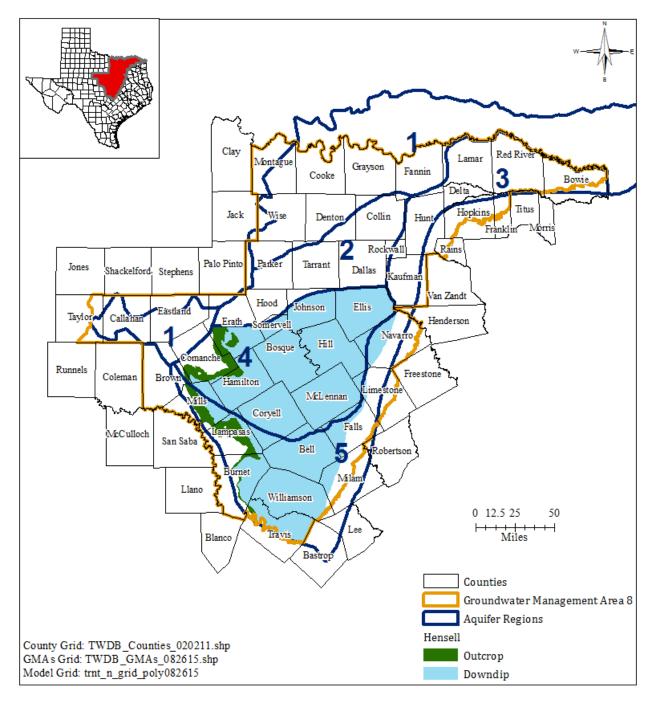


FIGURE 5. MAP SHOWING THE TRINITY AQUIFER (HENSELL) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 23 of 102

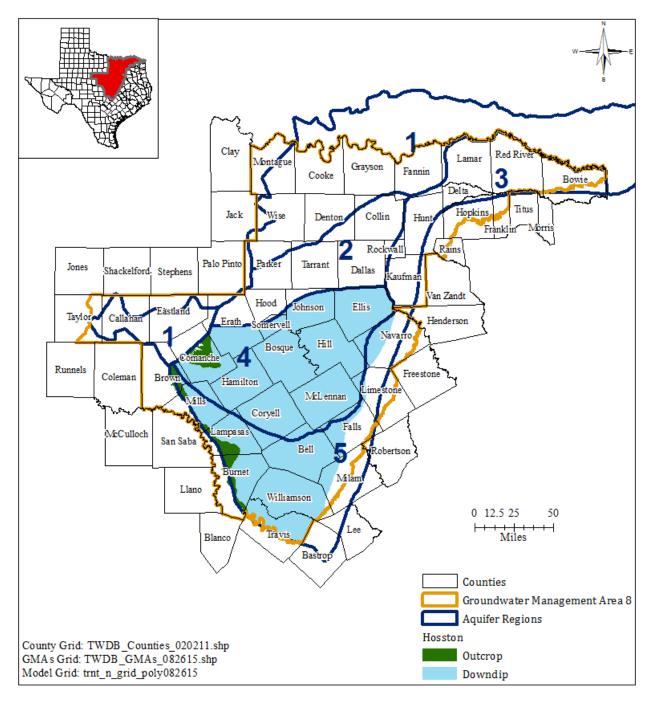


FIGURE 6. MAP SHOWING THE TRINITY AQUIFER (HOSSTON) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 24 of 102

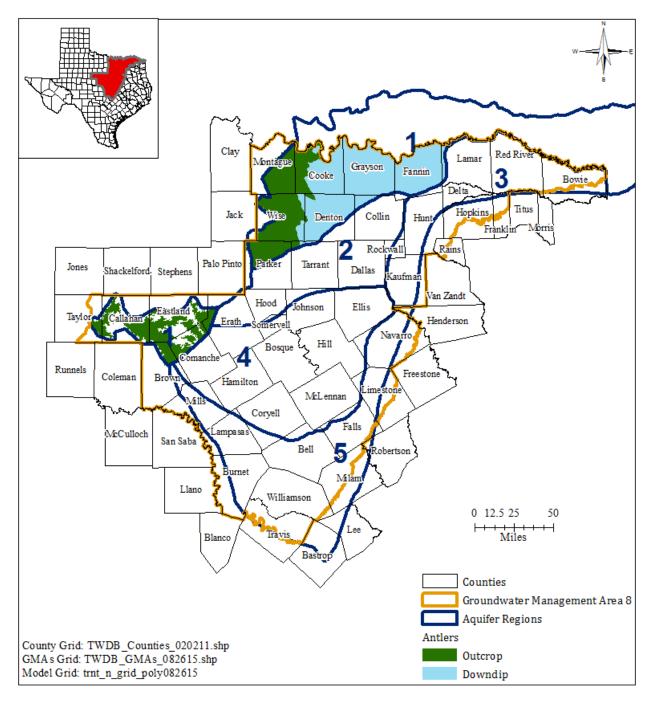


FIGURE 7. MAP SHOWING THE TRINITY AQUIFER (ANTLERS) WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 25 of 102

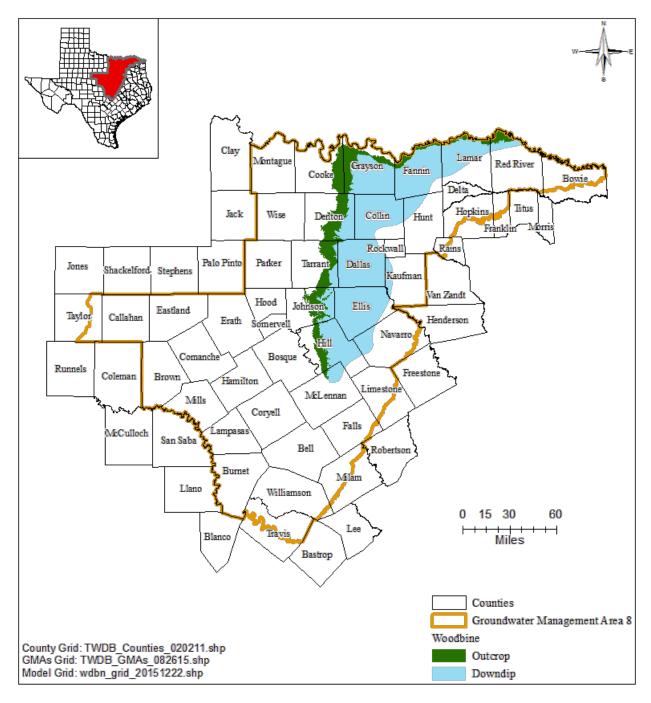


FIGURE 8. MAP SHOWING THE WOODBINE AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN PORTION OF THE TRINITY AND WOODBINE AQUIFERS.

January 19, 2018 Page 26 of 102

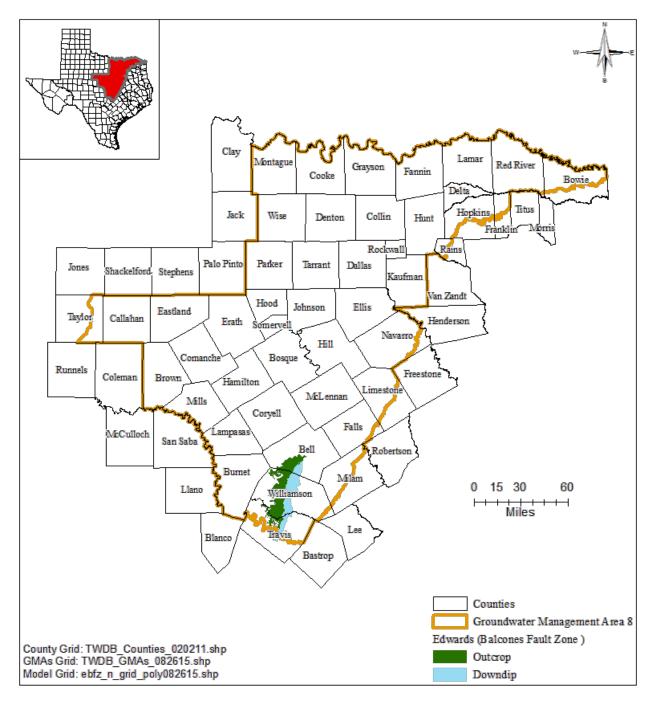


FIGURE 9. MAP SHOWING THE EDWARDS (BALCONES FAULT ZONE) AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE NORTHERN SEGMENT OF THE EDWARDS (BALCONES FAULT ZONE) AQUIFER.

January 19, 2018 Page 27 of 102

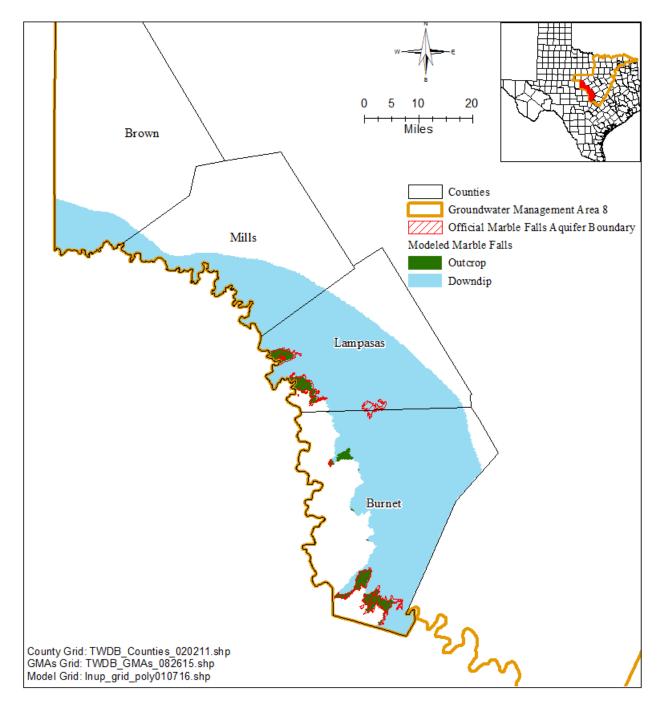


FIGURE 10. MAP SHOWING THE MARBLE FALLS AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

January 19, 2018 Page 28 of 102

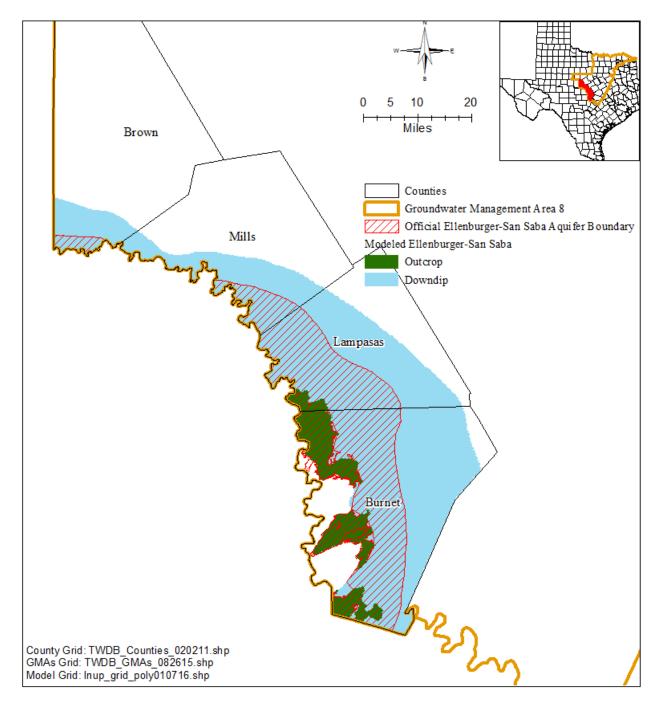


FIGURE 11. MAP SHOWING THE ELLENBURGER-SAN SABA AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

January 19, 2018 Page 29 of 102

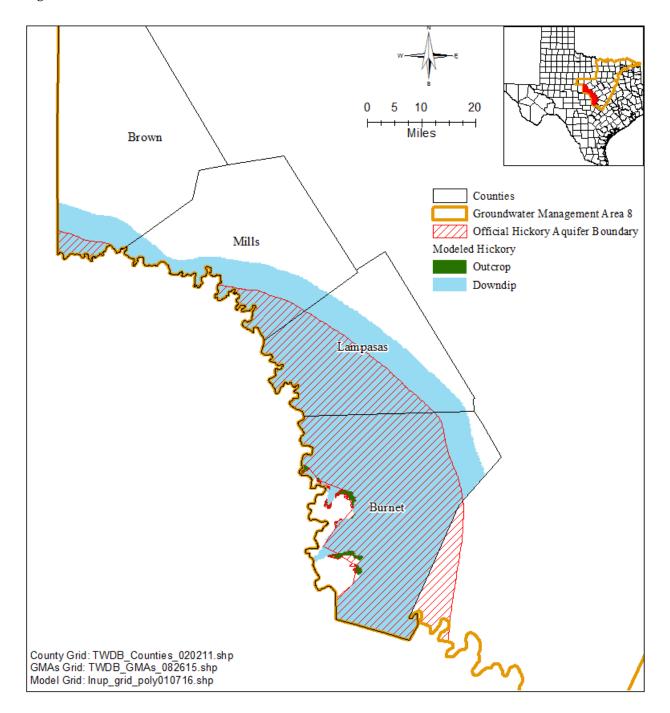


FIGURE 12. MAP SHOWING THE HICKORY AQUIFER WITHIN GROUNDWATER MANAGEMENT AREA 8 FROM THE GROUNDWATER AVAILABILITY MODEL FOR THE MINOR AQUIFERS IN LLANO UPLIFT REGION.

January 19, 2018 Page 30 of 102

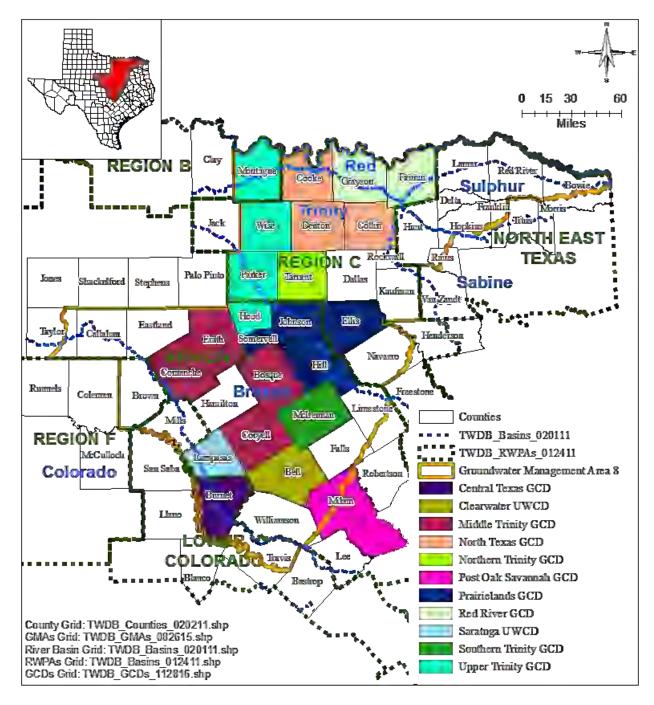


FIGURE 13. MAP SHOWING REGIONAL WATER PLANNING AREAS (RWPAS), GROUNDWATER CONSERVATION DISTRICTS (GCDS), AND RIVER BASINS ASSOCIATED WITH GROUNDWATER MANAGEMENT AREA 8.

January 19, 2018 Page 31 of 102

TABLE 1. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Clearwater UWCD	Bell	0	0	0	0	0	0	0	0
Middle Trinity GCD	Bosque	204	356	358	356	358	356	358	356
Middle Trinity GCD	Coryell	0	0	0	0	0	0	0	0
Middle Trinity GCD	Erath	38	61	61	61	61	61	61	61
Middle Trinity GCD Total		242	417	419	417	419	417	419	417
North Texas GCD	Collin	616	1,547	1,551	1,547	1,551	1,547	1,551	1,547
North Texas GCD	Denton	1,532	4,819	4,832	4,819	4,832	4,819	4,832	4,819
North Texas GCD Total		2,148	6,366	6,383	6,366	6,383	6,366	6,383	6,366
Northern Trinity GCD	Tarrant	11,285	8,957	8,982	8,957	8,982	8,957	8,982	8,957
Prairielands GCD	Ellis	510	442	443	442	443	442	443	442
Prairielands GCD	Hill	400	352	353	352	353	352	353	352
Prairielands GCD	Johnson	4,851	2,440	2,447	2,440	2,447	2,440	2,447	2,440
Prairielands GCD	Somervell	3	14	14	14	14	14	14	14
Prairielands GCD Total		5,764	3,248	3,257	3,248	3,257	3,248	3,257	3,248
Red River GCD	Fannin	389	2,087	2,092	2,087	2,092	2,087	2,092	2,087
Red River GCD	Grayson	0	0	0	0	0	0	0	0
Red River GCD Total		389	2,087	2,092	2,087	2,092	2,087	2,092	2,087
Southern Trinity GCD	McLennan	319	0	0	0	0	0	0	0
Upper Trinity GCD	Hood (outcrop)	106	159	159	159	159	159	159	159
Upper Trinity GCD	Parker (outcrop)	2,100	2,607	2,614	2,607	2,614	2,607	2,614	2,607
Upper Trinity GCD	Parker (downdip)	221	50	50	50	50	50	50	50
Upper Trinity GCD Total		2,427	2,816	2,823	2,816	2,823	2,816	2,823	2,816
No District	Dallas	231	358	359	358	359	358	359	358
No District	Delta	56	56	56	56	56	56	56	56
No District	Falls	0	0	0	0	0	0	0	0
No District	Hamilton	0	0	0	0	0	0	0	0
No District	Hunt	3	3	3	3	3	3	3	3
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Lamar	16	8	8	8	8	8	8	8

January 19, 2018 Page 32 of 102

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
No District	Limestone	0	0	0	0	0	0	0	0
No District	Mills	3	6	6	6	6	6	6	6
No District	Navarro	0	0	0	0	0	0	0	0
No District	Red River	190	177	177	177	177	177	177	177
No District	Rockwall	0	0	0	0	0	0	0	0
No District Total		499	608	609	608	609	608	609	608
Groundwater Management Area 8		23,073	24,499	24,565	24,499	24,565	24,499	24,565	24,499

January 19, 2018 Page 33 of 102

TABLE 2. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	35	423	425	423	425	423	425	423
Clearwater UWCD	Bell	775	971	974	971	974	971	974	971
Middle Trinity GCD	Bosque	576	728	731	728	731	728	731	728
Middle Trinity GCD	Comanche	3	41	41	41	41	41	41	41
Middle Trinity GCD	Coryell	0	120	120	120	120	120	120	120
Middle Trinity GCD	Erath	263	1,078	1,081	1,078	1,081	1,078	1,081	1,078
Middle Trinity GCD Total		842	1,967	1,973	1,967	1,973	1,967	1,973	1,967
North Texas GCD	Collin	84	83	83	83	83	83	83	83
North Texas GCD	Denton	121	338	339	338	339	338	339	338
North Texas GCD Total		205	421	422	421	422	421	422	421
Northern Trinity GCD	Tarrant	1,070	793	795	793	795	793	795	793
Post Oak Savannah GCD	Milam	0	0	0	0	0	0	0	0
Prairielands GCD	Ellis	58	50	50	50	50	50	50	50
Prairielands GCD	Hill	116	115	115	115	115	115	115	115
Prairielands GCD	Johnson	1,780	1,632	1,636	1,632	1,636	1,632	1,636	1,632
Prairielands GCD	Somervell	81	146	146	146	146	146	146	146
Prairielands GCD Total		2,035	1,943	1,947	1,943	1,947	1,943	1,947	1,943
Red River GCD	Fannin	0	0	0	0	0	0	0	0
Red River GCD	Grayson	0	0	0	0	0	0	0	0
Red River GCD Total		0	0	0	0	0	0	0	0
Saratoga UWCD	Lampasas	65	68	68	68	68	68	68	68
Southern Trinity GCD	McLennan	845	0	0	0	0	0	0	0
Upper Trinity GCD	Hood (outcrop)	483	653	655	653	655	653	655	653
Upper Trinity GCD	Hood (downdip)	81	103	103	103	103	103	103	103
Upper Trinity GCD	Parker (outcrop)	2,593	2,289	2,295	2,289	2,295	2,289	2,295	2,289
Upper Trinity GCD	Parker (downdip)	1,063	873	876	873	876	873	876	873
Upper Trinity GCD Total		4,220	3,918	3,929	3,918	3,929	3,918	3,929	3,918

January 19, 2018 Page 34 of 102

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
No District	Brown	0	0	0	0	0	0	0	0
No District	Dallas	135	131	132	131	132	131	132	131
No District	Delta	0	0	0	0	0	0	0	0
No District	Falls	0	0	0	0	0	0	0	0
No District	Hamilton	168	218	218	218	218	218	218	218
No District	Hunt	0	0	0	0	0	0	0	0
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Lamar	0	0	0	0	0	0	0	0
No District	Limestone	0	0	0	0	0	0	0	0
No District	Mills	12	189	189	189	189	189	189	189
No District	Navarro	0	0	0	0	0	0	0	0
No District	Red River	0	0	0	0	0	0	0	0
No District	Rockwall	0	0	0	0	0	0	0	0
No District	Travis	898	971	974	971	974	971	974	971
No District	Williamson	695	688	690	688	690	688	690	688
No District Total		1,908	2,197	2,203	2,197	2,203	2,197	2,203	2,197
Groundwater Mana Area 8	igement	12,000	12,701	12,736	12,701	12,736	12,701	12,736	12,701

January 19, 2018 Page 35 of 102

TABLE 3. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Middle Trinity GCD	Erath	3,443	5,017	5,031	5,017	5,031	5,017	5,031	5,017
North Texas GCD	Collin	163	2,201	2,207	2,201	2,207	2,201	2,207	2,201
North Texas GCD	Denton	997	8,366	8,389	8,366	8,389	8,366	8,389	8,366
North Texas GCD Total		1,160	10,567	10,596	10,567	10,596	10,567	10,596	10,567
Northern Trinity GCD	Tarrant	7,329	6,917	6,936	6,917	6,936	6,917	6,936	6,917
Prairielands GCD	Ellis	0	0	0	0	0	0	0	0
Prairielands GCD	Johnson	539	384	385	384	385	384	385	384
Prairielands GCD	Somervell	150	174	174	174	174	174	174	174
Prairielands GCD Total		689	558	559	558	559	558	559	558
Red River GCD	Fannin	0	0	0	0	0	0	0	0
Red River GCD	Grayson	0	0	0	0	0	0	0	0
Red River GCD Total		0	0	0	0	0	0	0	0
Upper Trinity GCD	Hood (outcrop)	3,379	3,662	3,672	3,662	3,672	3,662	3,672	3,662
Upper Trinity GCD	Hood (downdip)	7,143	7,759	7,780	7,759	7,780	7,759	7,780	7,759
Upper Trinity GCD	Parker (outcrop)	1,600	1,066	1,069	1,066	1,069	1,066	1,069	1,066
Upper Trinity GCD	Parker (downdip)	3,459	2,082	2,088	2,082	2,088	2,082	2,088	2,082
Upper Trinity GCD Total		15,581	14,569	14,609	14,569	14,609	14,569	14,609	14,569
No District	Dallas	2,282	3,199	3,208	3,199	3,208	3,199	3,208	3,199
No District	Hunt	0	0	0	0	0	0	0	0
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Rockwall	0	0	0	0	0	0	0	0
No District Total		2,282	3,199	3,208	3,199	3,208	3,199	3,208	3,199
Groundwater Mana Area 8	igement	30,484	40,827	40,939	40,827	40,939	40,827	40,939	40,827

January 19, 2018 Page 36 of 102

TABLE 4. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	1,906	3,464	3,474	3,464	3,474	3,464	3,474	3,464
Clearwater UWCD	Bell	1,957	8,270	8,293	8,270	8,293	8,270	8,293	8,270
Middle Trinity GCD	Bosque	5,255	7,678	7,699	7,678	7,699	7,678	7,699	7,678
Middle Trinity GCD	Comanche	9,793	6,160	6,177	6,160	6,177	6,160	6,177	6,160
Middle Trinity GCD	Coryell	3,350	4,371	4,383	4,371	4,383	4,371	4,383	4,371
Middle Trinity GCD	Erath	8,263	11,815	11,849	11,815	11,849	11,815	11,849	11,815
Middle Trinity GCD Total		26,661	30,024	30,108	30,024	30,108	30,024	30,108	30,024
Post Oak Savannah GCD	Milam	0	0	0	0	0	0	0	0
Prairielands GCD	Ellis	5,583	5,032	5,046	5,032	5,046	5,032	5,046	5,032
Prairielands GCD	Hill	3,700	3,550	3,559	3,550	3,559	3,550	3,559	3,550
Prairielands GCD	Johnson	5,602	4,941	4,955	4,941	4,955	4,941	4,955	4,941
Prairielands GCD	Somervell	2,560	2,847	2,854	2,847	2,854	2,847	2,854	2,847
Prairielands GCD Total		17,445	16,370	16,414	16,370	16,414	16,370	16,414	16,370
Red River GCD	Fannin	0	0	0	0	0	0	0	0
Saratoga UWCD	Lampasas	1,669	1,599	1,603	1,599	1,603	1,599	1,603	1,599
Southern Trinity GCD	McLennan	13,252	20,635	20,691	20,635	20,691	20,635	20,691	20,635
Upper Trinity GCD	Hood (downdip)	70	89	89	89	89	89	89	89
No District	Brown	680	394	395	394	395	394	395	394
No District	Dallas	0	0	0	0	0	0	0	0
No District	Delta	0	0	0	0	0	0	0	0
No District	Falls	1,158	1,434	1,438	1,434	1,438	1,434	1,438	1,434
No District	Hamilton	1,685	2,207	2,213	2,207	2,213	2,207	2,213	2,207
No District	Hunt	0	0	0	0	0	0	0	0
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Lamar	0	0	0	0	0	0	0	0
No District	Limestone	0	0	0	0	0	0	0	0
No District	Mills	1,011	2,275	2,282	2,275	2,282	2,275	2,282	2,275
No District	Navarro	0	0	0	0	0	0	0	0
No District	Red River	0	0	0	0	0	0	0	0
No District	Travis	3,442	4,113	4,125	4,113	4,125	4,113	4,125	4,113

January 19, 2018 Page 37 of 102

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
No District Total		11,002	13,306	13,344	13,306	13,344	13,306	13,344	13,306
Groundwater Mana Area 8	gement	73,962	93,757	94,016	93,757	94,016	93,757	94,016	93,757

January 19, 2018 Page 38 of 102

TABLE 5. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	51	1,888	1,894	1,888	1,894	1,888	1,894	1,888
Clearwater UWCD	Bell	355	1,096	1,099	1,096	1,099	1,096	1,099	1,096
Middle Trinity GCD	Bosque	2,909	3,835	3,845	3,835	3,845	3,835	3,845	3,835
Middle Trinity GCD	Comanche	188	204	204	204	204	204	204	204
Middle Trinity GCD	Coryell	1,679	2,196	2,202	2,196	2,202	2,196	2,202	2,196
Middle Trinity GCD	Erath	3,446	5,137	5,151	5,137	5,151	5,137	5,151	5,137
Middle Trinity GCD Total		8,222	11,372	11,402	11,372	11,402	11,372	11,402	11,372
Post Oak Savannah GCD	Milam	0	0	0	0	0	0	0	0
Prairielands GCD	Ellis	0	0	0	0	0	0	0	0
Prairielands GCD	Hill	237	225	226	225	226	225	226	225
Prairielands GCD	Johnson	1,530	1,083	1,086	1,083	1,086	1,083	1,086	1,083
Prairielands GCD	Somervell	1,822	1,973	1,978	1,973	1,978	1,973	1,978	1,973
Prairielands GCD Total		3,589	3,281	3,290	3,281	3,290	3,281	3,290	3,281
Saratoga UWCD	Lampasas	730	712	715	712	715	712	715	712
Southern Trinity GCD	McLennan	3,018	4,698	4,711	4,698	4,711	4,698	4,711	4,698
Upper Trinity GCD	Hood (downdip)	45	36	36	36	36	36	36	36
No District	Brown	6	4	4	4	4	4	4	4
No District	Dallas	0	0	0	0	0	0	0	0
No District	Falls	0	0	0	0	0	0	0	0
No District	Hamilton	1,221	1,671	1,675	1,671	1,675	1,671	1,675	1,671
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Limestone	0	0	0	0	0	0	0	0
No District	Mills	224	607	608	607	608	607	608	607
No District	Navarro	0	0	0	0	0	0	0	0
No District	Travis	919	1,141	1,144	1,141	1,144	1,141	1,144	1,141
No District	Williamson	772	751	753	751	753	751	753	751
No District Total		3,142	4,174	4,184	4,174	4,184	4,174	4,184	4,174
Groundwater Mana Area 8	Groundwater Management		27,257	27,331	27,257	27,331	27,257	27,331	27,257

January 19, 2018 Page 39 of 102

TABLE 6. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	1,799	1,379	1,382	1,379	1,382	1,379	1,382	1,379
Clearwater UWCD	Bell	1,375	7,174	7,193	7,174	7,193	7,174	7,193	7,174
Middle Trinity GCD	Bosque	2,289	3,762	3,772	3,762	3,772	3,762	3,772	3,762
Middle Trinity GCD	Comanche	9,504	5,864	5,881	5,864	5,881	5,864	5,881	5,864
Middle Trinity GCD	Coryell	1,661	2,161	2,167	2,161	2,167	2,161	2,167	2,161
Middle Trinity GCD	Erath	4,637	6,383	6,400	6,383	6,400	6,383	6,400	6,383
Middle Trinity GCD Total		18,091	18,170	18,220	18,170	18,220	18,170	18,220	18,170
Post Oak Savannah GCD	Milam	0	0	0	0	0	0	0	0
Prairielands GCD	Ellis	5,575	5,026	5,040	5,026	5,040	5,026	5,040	5,026
Prairielands GCD	Hill	3,413	3,272	3,281	3,272	3,281	3,272	3,281	3,272
Prairielands GCD	Johnson	4,061	3,853	3,863	3,853	3,863	3,853	3,863	3,853
Prairielands GCD	Somervell	736	843	845	843	845	843	845	843
Prairielands GCD Total		13,785	12,994	13,029	12,994	13,029	12,994	13,029	12,994
Saratoga UWCD	Lampasas	907	857	859	857	859	857	859	857
Southern Trinity GCD	McLennan	10,212	15,937	15,980	15,937	15,980	15,937	15,980	15,937
Upper Trinity GCD	Hood (downdip)	25	53	53	53	53	53	53	53
No District	Brown	624	356	358	356	358	356	358	356
No District	Dallas	0	0	0	0	0	0	0	0
No District	Falls	1,157	1,434	1,438	1,434	1,438	1,434	1,438	1,434
No District	Hamilton	325	385	386	385	386	385	386	385
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Limestone	0	0	0	0	0	0	0	0
No District	Mills	650	1,467	1,471	1,467	1,471	1,467	1,471	1,467
No District	Navarro	0	0	0	0	0	0	0	0
No District	Travis	2,357	2,783	2,791	2,783	2,791	2,783	2,791	2,783
No District	Williamson	2,050	1,933	1,938	1,933	1,938	1,933	1,938	1,933
No District Total		7,163	8,358	8,382	8,358	8,382	8,358	8,382	8,358
Groundwater Mana Area 8	Groundwater Management		64,922	65,098	64,922	65,098	64,922	65,098	64,922

January 19, 2018 Page 40 of 102

TABLE 7. MODELED AVAILABLE GROUNDWATER FOR THE TRINITY AQUIFER (ANTLERS) IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Middle Trinity GCD	Comanche	9,320	5,839	5,855	5,839	5,855	5,839	5,855	5,839
Middle Trinity GCD	Erath	1,663	2,628	2,636	2,628	2,636	2,628	2,636	2,628
Middle Trinity GCD Total		10,983	8,467	8,491	8,467	8,491	8,467	8,491	8,467
North Texas GCD	Collin	629	1,961	1,966	1,961	1,966	1,961	1,966	1,961
North Texas GCD	Cooke	4,117	10,514	10,544	10,514	10,544	10,514	10,544	10,514
North Texas GCD	Denton	11,427	16,545	16,591	16,545	16,591	16,545	16,591	16,545
North Texas GCD Total		16,173	29,020	29,101	29,020	29,101	29,020	29,101	29,020
Northern Trinity GCD	Tarrant	1,908	1,248	1,251	1,248	1,251	1,248	1,251	1,248
Red River GCD	Fannin	0	0	0	0	0	0	0	0
Red River GCD	Grayson	6,872	10,708	10,738	10,708	10,738	10,708	10,738	10,708
Red River GCD Total		6,872	10,708	10,738	10,708	10,738	10,708	10,738	10,708
Upper Trinity GCD	Montague (outcrop)	1,421	3,875	3,886	3,875	3,886	3,875	3,886	3,875
Upper Trinity GCD	Parker (outcrop)	3,321	2,897	2,905	2,897	2,905	2,897	2,905	2,897
Upper Trinity GCD	Wise (outcrop)	9,080	7,677	7,698	7,677	7,698	7,677	7,698	7,677
Upper Trinity GCD	Wise (downdip)	3,699	2,057	2,062	2,057	2,062	2,057	2,062	2,057
Upper Trinity GCD Total		17,521	16,506	16,551	16,506	16,551	16,506	16,551	16,506
No District	Brown	1,743	1,052	1,055	1,052	1,055	1,052	1,055	1,052
No District	Callahan	1,804	1,725	1,730	1,725	1,730	1,725	1,730	1,725
No District	Eastland	5,613	5,732	5,747	5,732	5,747	5,732	5,747	5,732
No District	Lamar	0	0	0	0	0	0	0	0
No District	Red River	0	0	0	0	0	0	0	0
No District	Taylor	17	13	13	13	13	13	13	13
No District Total		9,177	8,522	8,545	8,522	8,545	8,522	8,545	8,522
Groundwater Mana Area 8	gement	62,634	74,471	74,677	74,471	74,677	74,471	74,677	74,471

January 19, 2018 Page 41 of 102

TABLE 8. MODELED AVAILABLE GROUNDWATER FOR THE WOODBINE AQUIFER IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
North Texas GCD	Collin	2,427	4,251	4,263	4,251	4,263	4,251	4,263	4,251
North Texas GCD	Cooke	1,646	800	802	800	802	800	802	800
North Texas GCD	Denton	3,797	3,607	3,616	3,607	3,616	3,607	3,616	3,607
North Texas GCD Total		7,870	8,658	8,681	8,658	8,681	8,658	8,681	8,658
Northern Trinity GCD	Tarrant	2,646	1,138	1,141	1,138	1,141	1,138	1,141	1,138
Prairielands GCD	Ellis	2,471	2,073	2,078	2,073	2,078	2,073	2,078	2,073
Prairielands GCD	Hill	752	586	588	586	588	586	588	586
Prairielands GCD	Johnson	3,880	1,980	1,985	1,980	1,985	1,980	1,985	1,980
Prairielands GCD Total		7,103	4,639	4,651	4,639	4,651	4,639	4,651	4,639
Red River GCD	Fannin	5,495	4,920	4,934	4,920	4,934	4,920	4,934	4,920
Red River GCD	Grayson	5,056	7,521	7,541	7,521	7,541	7,521	7,541	7,521
Red River GCD Total		10,551	12,441	12,475	12,441	12,475	12,441	12,475	12,441
Southern Trinity GCD	McLennan	0	0	0	0	0	0	0	0
No District	Dallas	1,957	2,796	2,804	2,796	2,804	2,796	2,804	2,796
No District	Hunt	463	763	765	763	765	763	765	763
No District	Kaufman	0	0	0	0	0	0	0	0
No District	Lamar	61	49	49	49	49	49	49	49
No District	Navarro	65	68	68	68	68	68	68	68
No District	Red River	3	2	2	2	2	2	2	2
No District	Rockwall	0	0	0	0	0	0	0	0
No District Total		2,549	3,678	3,688	3,678	3,688	3,678	3,688	3,678
Groundwater Mana Area 8	ngement	30,719	30,554	30,636	30,554	30,636	30,554	30,636	30,554

January 19, 2018 Page 42 of 102

TABLE 9. MODELED AVAILABLE GROUNDWATER FOR THE EDWARDS (BALCONES FAULT ZONE)
AQUIFER IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY
GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE
BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET
PER YEAR.

GCD	County	2000	2010	2020	2030	2040	2050	2060	2070
Clearwater UWCD	Bell	949	6,469	6,469	6,469	6,469	6,469	6,469	6,469
No District	Travis	1,201	5,237	5,237	5,237	5,237	5,237	5,237	5,237
No District	Williamson	13,813	3,462	3,462	3,462	3,462	3,462	3,462	3,462
Groundwate Managemen	· <del>-</del>	15,981	15,168	15,168	15,168	15,168	15,168	15,168	15,168

UWCD: Underground Water Conservation District.

TABLE 10. MODELED AVAILABLE GROUNDWATER FOR THE MARBLE FALLS AQUIFER IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	2,220	2,736	2,744	2,736	2,744	2,736	2,744	2,736
Saratoga UWCD	Lampasas	363	2,837	2,845	2,837	2,845	2,837	2,845	2,837
No District	Brown	0	25	25	25	25	25	25	25
No District	Mills	20	25	25	25	25	25	25	25
No District Total		20	50	50	50	50	50	50	50
Groundwater Management Area 8		2,603	5,623	5,639	5,623	5,639	5,623	5,639	5,623

January 19, 2018 Page 43 of 102

TABLE 11. MODELED AVAILABLE GROUNDWATER FOR THE ELLENBURGER-SAN SABA AQUIFER IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	5,256	10,827	10,857	10,827	10,857	10,827	10,857	10,827
Saratoga UWCD	Lampasas	351	2,593	2,601	2,593	2,601	2,593	2,601	2,593
No District	Brown	1	131	131	131	131	131	131	131
No District	Mills	0	499	500	499	500	499	500	499
No District	t Total	1	630	631	630	631	630	631	630
Groundwa Manageme		5,608	14,050	14,089	14,050	14,089	14,050	14,089	14,050

UWCD: Underground Water Conservation District.

TABLE 12. MODELED AVAILABLE GROUNDWATER FOR THE HICKORY AQUIFER IN GROUNDWATER MANAGEMENT AREA 8 SUMMARIZED BY GROUNDWATER CONSERVATION DISTRICT (GCD) AND COUNTY FOR EACH DECADE BETWEEN 2010 AND 2070 WITH BASELINE YEAR 2009. VALUES ARE IN ACRE-FEET PER YEAR.

GCD	County	2009	2010	2020	2030	2040	2050	2060	2070
Central Texas GCD	Burnet	1,088	3,413	3,423	3,413	3,423	3,413	3,423	3,413
Saratoga UWCD	Lampasas	0	113	114	113	114	113	114	113
No District	Brown	0	12	12	12	12	12	12	12
No District	Mills	0	36	36	36	36	36	36	36
No Distric	t Total	0	48	48	48	48	48	48	48
Groundwa Managem	ater ent Area 8	1,088	3,574	3,585	3,574	3,585	3,574	3,585	3,574

January 19, 2018 Page 44 of 102

TABLE 13. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (PALUXY) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counti	es Not in U	Jpper Trini	ity GCD			
Bell	Region G	Brazos	0	0	0	0	0	0
Bosque	Region G	Brazos	358	356	358	356	358	356
Collin	Region C	Sabine	0	0	0	0	0	0
Collin	Region C	Trinity	1,551	1,547	1,551	1,547	1,551	1,547
Coryell	Region G	Brazos	0	0	0	0	0	0
Dallas	Region C	Trinity	359	358	359	358	359	358
Delta	Northeast Texas	Sulphur	56	56	56	56	56	56
Denton	Region C	Trinity	4,832	4,819	4,832	4,819	4,832	4,819
Ellis	Region C	Trinity	443	442	443	442	443	442
Erath	Region G	Brazos	61	61	61	61	61	61
Falls	Region G	Brazos	0	0	0	0	0	0
Fannin	Region C	Sulphur	2,092	2,087	2,092	2,087	2,092	2,087
Fannin	Region C	Trinity	0	0	0	0	0	0
Grayson	Region C	Trinity	0	0	0	0	0	0
Hamilton	Region G	Brazos	0	0	0	0	0	0
Hill	Region G	Brazos	348	347	348	347	348	347
Hill	Region G	Trinity	5	5	5	5	5	5
Hunt	Northeast Texas	Sabine	0	0	0	0	0	0
Hunt	Northeast Texas	Sulphur	3	3	3	3	3	3
Hunt	Northeast Texas	Trinity	0	0	0	0	0	0
Johnson	Region G	Brazos	880	878	880	878	880	878
Johnson	Region G	Trinity	1,567	1,562	1,567	1,562	1,567	1,562
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lamar	Northeast Texas	Red	0	0	0	0	0	0
Lamar	Northeast Texas	Sulphur	8	8	8	8	8	8
Limestone	Region G	Brazos	0	0	0	0	0	0
Limestone	Region G	Trinity	0	0	0	0	0	0
McLennan	Region G	Brazos	0	0	0	0	0	0
Mills	Lower Colorado	Brazos	6	6	6	6	6	6
Mills	Lower Colorado	Colorado	0	0	0	0	0	0
Navarro	Region C	Trinity	0	0	0	0	0	0
Red River	Northeast Texas	Red	52	52	52	52	52	52
Red River	Northeast Texas	Sulphur	125	125	125	125	125	125

January 19, 2018 Page 45 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Rockwall	Region C	Trinity	0	0	0	0	0	0
Somervell	Region G	Brazos	14	14	14	14	14	14
Tarrant	Region C	Trinity	8,982	8,957	8,982	8,957	8,982	8,957
	Subtotal		21,742	21,683	21,742	21,683	21,742	21,683
		Cou	nties in Up	per Trinity	GCD			
Hood (outcrop)	Region G	Brazos	159	158	159	158	159	158
Hood (outcrop)	Region G	Trinity	0	0	0	0	0	0
Parker (outcrop)	Region C	Brazos	34	34	34	34	34	34
Parker (outcrop)	Region C	Trinity	2,580	2,573	2,580	2,573	2,580	2,573
Parker (downdip)	Region C	Trinity	50	50	50	50	50	50
	Subtotal			2,815	2,823	2,815	2,823	2,815
Groundwat	Groundwater Management Area 8			24,498	24,565	24,498	24,565	24,498

January 19, 2018 Page 46 of 102

TABLE 14. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (GLEN ROSE) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counti	es Not in U	pper Trini	ty GCD			
Bell	Region G	Brazos	974	971	974	971	974	971
Bosque	Region G	Brazos	731	728	731	728	731	728
Brown	Region F	Colorado	0	0	0	0	0	0
Burnet	Lower Colorado	Brazos	188	188	188	188	188	188
Burnet	Lower Colorado	Colorado	236	235	236	235	236	235
Collin	Region C	Sabine	0	0	0	0	0	0
Collin	Region C	Trinity	83	83	83	83	83	83
Comanche	Region G	Brazos	22	22	22	22	22	22
Comanche	Region G	Colorado	18	18	18	18	18	18
Coryell	Region G	Brazos	120	120	120	120	120	120
Dallas	Region C	Trinity	132	131	132	131	132	131
Delta	Northeast Texas	Sulphur	0	0	0	0	0	0
Denton	Region C	Trinity	339	338	339	338	339	338
Ellis	Region C	Trinity	50	50	50	50	50	50
Erath	Region G	Brazos	1,081	1,078	1,081	1,078	1,081	1,078
Falls	Region G	Brazos	0	0	0	0	0	0
Fannin	Region C	Sulphur	0	0	0	0	0	0
Fannin	Region C	Trinity	0	0	0	0	0	0
Grayson	Region C	Trinity	0	0	0	0	0	0
Hamilton	Region G	Brazos	218	218	218	218	218	218
Hill	Region G	Brazos	115	114	115	114	115	114
Hill	Region G	Trinity	1	1	1	1	1	1
Hunt	Northeast Texas	Sabine	0	0	0	0	0	0
Hunt	Northeast Texas	Sulphur	0	0	0	0	0	0
Hunt	Northeast Texas	Trinity	0	0	0	0	0	0
Johnson	Region G	Brazos	953	950	953	950	953	950
Johnson	Region G	Trinity	683	681	683	681	683	681
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lamar	Northeast Texas	Red	0	0	0	0	0	0
Lamar	Northeast Texas	Sulphur	0	0	0	0	0	0
Lampasas	Region G	Brazos	68	68	68	68	68	68
Limestone	Region G	Brazos	0	0	0	0	0	0
Limestone	Region G	Trinity	0	0	0	0	0	0

January 19, 2018 Page 47 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
McLennan	Region G	Brazos	0	0	0	0	0	0
Milam	Region G	Brazos	0	0	0	0	0	0
Mills	Lower Colorado	Brazos	96	96	96	96	96	96
Mills	Lower Colorado	Colorado	93	93	93	93	93	93
Navarro	Region C	Trinity	0	0	0	0	0	0
Red River	Northeast Texas	Red	0	0	0	0	0	0
Red River	Northeast Texas	Sulphur	0	0	0	0	0	0
Rockwall	Region C	Trinity	0	0	0	0	0	0
Somervell	Region G	Brazos	146	146	146	146	146	146
Tarrant	Region C	Trinity	795	793	795	793	795	793
Travis	Lower Colorado	Brazos	0	0	0	0	0	0
Travis	Lower Colorado	Colorado	974	971	974	971	974	971
Williamson	Region G	Brazos	623	621	623	621	623	621
Williamson	Region G	Colorado	0	0	0	0	0	0
Williamson	Lower Colorado	Brazos	0	0	0	0	0	0
Williamson	Lower Colorado	Colorado	67	67	67	67	67	67
	Subtotal		8,806	8,781	8,806	8,781	8,806	8,781
		Coun	ties in Upp	er Trinity	GCD			
Hood (outcrop)	Region G	Brazos	655	653	655	653	655	653
Hood (downdip)	Region G	Brazos	83	83	83	83	83	83
Hood (downdip)	Region G	Trinity	20	20	20	20	20	20
Parker (outcrop)	Region C	Brazos	87	87	87	87	87	87
Parker (downdip)	Region C	Brazos	7	7	7	7	7	7
Parker (outcrop)	Region C	Trinity	2,208	2,202	2,208	2,202	2,208	2,202
Parker (downdip)	Region C	Trinity	869	866	869	866	869	866
	Subtotal		3,929	3,918	3,929	3,918	3,929	3,918
Groundwate	roundwater Management Area 8			12,699	12,735	12,699	12,735	12,699

January 19, 2018 Page 48 of 102

TABLE 15. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Count	ies Not in U	Ipper Trini	ty GCD			
Collin	Region C	Sabine	0	0	0	0	0	0
Collin	Region C	Trinity	2,207	2,201	2,207	2,201	2,207	2,201
Dallas	Region C	Trinity	3,208	3,199	3,208	3,199	3,208	3,199
Denton	Region C	Trinity	8,389	8,366	8,389	8,366	8,389	8,366
Ellis	Region C	Trinity	0	0	0	0	0	0
Erath	Region G	Brazos	5,031	5,017	5,031	5,017	5,031	5,017
Fannin	Region C	Sulphur	0	0	0	0	0	0
Fannin	Region C	Trinity	0	0	0	0	0	0
Grayson	Region C	Trinity	0	0	0	0	0	0
Hunt	Northeast Texas	Sabine	0	0	0	0	0	0
Hunt	Northeast Texas	Trinity	0	0	0	0	0	0
Johnson	Region G	Brazos	133	133	133	133	133	133
Johnson	Region G	Trinity	252	251	252	251	252	251
Kaufman	Region C	Trinity	0	0	0	0	0	0
Rockwall	Region C	Trinity	0	0	0	0	0	0
Somervell	Region G	Brazos	174	174	174	174	174	174
Tarrant	Region C	Trinity	6,936	6,917	6,936	6,917	6,936	6,917
	Subtotal		26,330	26,258	26,330	26,258	26,330	26,258
		Cou	nties in Up	per Trinity	GCD			
Hood (outcrop)	Region G	Brazos	3,672	3,662	3,672	3,662	3,672	3,662
Hood (downdip)	Region G	Brazos	7,761	7,740	7,761	7,740	7,761	7,740
Hood (downdip)	Region G	Trinity	19	19	19	19	19	19
Parker (outcrop)	Region C	Brazos	1,069	1,066	1,069	1,066	1,069	1,066
Parker (downdip)	Region C	Brazos	778	776	778	776	778	776
Parker (downdip)	Region C	Trinity	1,310	1,306	1,310	1,306	1,310	1,306
	Subtotal		14,609	14,569	14,609	14,569	14,609	14,569
Groundwate	Groundwater Management Area 8			40,827	40,939	40,827	40,939	40,827

January 19, 2018 Page 49 of 102

TABLE 16. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (TRAVIS PEAK) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACREFEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counties	s Not in Up	per Trinit	y GCD			
Bell	Region G	Brazos	8,293	8,270	8,293	8,270	8,293	8,270
Bosque	Region G	Brazos	7,699	7,678	7,699	7,678	7,699	7,678
Brown	Region F	Brazos	3	3	3	3	3	3
Brown	Region F	Colorado	392	391	392	391	392	391
Burnet	Lower Colorado	Brazos	2,950	2,943	2,950	2,943	2,950	2,943
Burnet	Lower Colorado	Colorado	523	521	523	521	523	521
Comanche	Region G	Brazos	6,128	6,111	6,128	6,111	6,128	6,111
Comanche	Region G	Colorado	49	49	49	49	49	49
Coryell	Region G	Brazos	4,383	4,371	4,383	4,371	4,383	4,371
Dallas	Region C	Trinity	0	0	0	0	0	0
Delta	Northeast Texas	Sulphur	0	0	0	0	0	0
Ellis	Region C	Trinity	5,046	5,032	5,046	5,032	5,046	5,032
Erath	Region G	Brazos	11,849	11,815	11,849	11,815	11,849	11,815
Falls	Region G	Brazos	1,438	1,434	1,438	1,434	1,438	1,434
Fannin	Region C	Sulphur	0	0	0	0	0	0
Fannin	Region C	Trinity	0	0	0	0	0	0
Hamilton	Region G	Brazos	2,213	2,207	2,213	2,207	2,213	2,207
Hill	Region G	Brazos	3,304	3,295	3,304	3,295	3,304	3,295
Hill	Region G	Trinity	256	255	256	255	256	255
Hunt	Northeast Texas	Sabine	0	0	0	0	0	0
Hunt	Northeast Texas	Sulphur	0	0	0	0	0	0
Hunt	Northeast Texas	Trinity	0	0	0	0	0	0
Johnson	Region G	Brazos	1,932	1,927	1,932	1,927	1,932	1,927
Johnson	Region G	Trinity	3,022	3,014	3,022	3,014	3,022	3,014
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lamar	Northeast Texas	Red	0	0	0	0	0	0
Lamar	Northeast Texas	Sulphur	0	0	0	0	0	0
Lampasas	Region G	Brazos	1,528	1,523	1,528	1,523	1,528	1,523
Lampasas	Region G	Colorado	76	75	76	75	76	75
Limestone	Region G	Brazos	0	0	0	0	0	0
Limestone	Region G	Trinity	0	0	0	0	0	0
McLennan	Region G	Brazos	20,691	20,635	20,691	20,635	20,691	20,635
Milam	Region G	Brazos	0	0	0	0	0	0

January 19, 2018 Page 50 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Mills	Lower Colorado	Brazos	706	703	706	703	706	703
Mills	Lower Colorado	Colorado	1,576	1,572	1,576	1,572	1,576	1,572
Navarro	Region C	Trinity	0	0	0	0	0	0
Red River	Northeast Texas	Red	0	0	0	0	0	0
Red River	Northeast Texas	Sulphur	0	0	0	0	0	0
Somervell	Region G	Brazos	2,854	2,847	2,854	2,847	2,854	2,847
Travis	Lower Colorado	Brazos	1	1	1	1	1	1
Travis	Lower Colorado	Colorado	4,124	4,112	4,124	4,112	4,124	4,112
Williamson	Region G	Brazos	2,885	2,877	2,885	2,877	2,885	2,877
Williamson	Region G	Colorado	5	5	5	5	5	5
Williamson	Lower Colorado	Brazos	0	0	0	0	0	0
Williamson	Lower Colorado	Colorado	0	0	0	0	0	0
	Subtotal		93,926	93,666	93,926	93,666	93,926	93,666
		Count	ies in Uppe	er Trinity (	GCD			
Hood (downdip)	Region (+   Brazos			89	89	89	89	89
	Subtotal			89	89	89	89	89
Groundwate	roundwater Management Area 8		94,015	93,755	94,015	93,755	94,015	93,755

January 19, 2018 Page 51 of 102

TABLE 17. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HENSELL) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counti	es Not in U	pper Trini	ty GCD			
Bell	Region G	Brazos	1,099	1,096	1,099	1,096	1,099	1,096
Bosque	Region G	Brazos	3,845	3,835	3,845	3,835	3,845	3,835
Brown	Region F	Colorado	4	4	4	4	4	4
Burnet	Lower Colorado	Brazos	1,761	1,757	1,761	1,757	1,761	1,757
Burnet	Lower Colorado	Colorado	133	132	133	132	133	132
Comanche	Region G	Brazos	181	180	181	180	181	180
Comanche	Region G	Colorado	24	24	24	24	24	24
Coryell	Region G	Brazos	2,202	2,196	2,202	2,196	2,202	2,196
Dallas	Region C	Trinity	0	0	0	0	0	0
Ellis	Region C	Trinity	0	0	0	0	0	0
Erath	Region G	Brazos	5,151	5,137	5,151	5,137	5,151	5,137
Falls	Region G	Brazos	0	0	0	0	0	0
Hamilton	Region G	Brazos	1,675	1,671	1,675	1,671	1,675	1,671
Hill	Region G	Brazos	225	224	225	224	225	224
Hill	Region G	Trinity	1	1	1	1	1	1
Johnson	Region G	Brazos	618	616	618	616	618	616
Johnson	Region G	Trinity	468	467	468	467	468	467
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lampasas	Region G	Brazos	713	711	713	711	713	711
Lampasas	Region G	Colorado	1	1	1	1	1	1
Limestone	Region G	Brazos	0	0	0	0	0	0
Limestone	Region G	Trinity	0	0	0	0	0	0
McLennan	Region G	Brazos	4,711	4,698	4,711	4,698	4,711	4,698
Milam	Region G	Brazos	0	0	0	0	0	0
Mills	Lower Colorado	Brazos	172	172	172	172	172	172
Mills	Lower Colorado	Colorado	436	435	436	435	436	435
Navarro	Region C	Trinity	0	0	0	0	0	0
Somervell	Region G	Brazos	1,978	1,973	1,978	1,973	1,978	1,973
Travis	Lower Colorado	Brazos	1	1	1	1	1	1
Travis	Lower Colorado	Colorado	1,144	1,141	1,144	1,141	1,144	1,141
Williamson	Region G	Brazos	753	751	753	751	753	751
Williamson	Region G	Colorado	0	0	0	0	0	0
Williamson	Lower Colorado	Brazos	0	0	0	0	0	0

January 19, 2018 Page 52 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Williamson	Lower Colorado	Colorado	0	0	0	0	0	0
	Subtotal			27,223	27,296	27,223	27,296	27,223
		Coun	ties in Upp	er Trinity	GCD			
Hood (downdip)	Region G   Brazos			36	36	36	36	36
Subtotal			36	36	36	36	36	36
Groundwater Management Area 8			27,332	27,259	27,332	27,259	27,332	27,259

January 19, 2018 Page 53 of 102

TABLE 18. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (HOSSTON) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counti	es Not in U	pper Trini	ty GCD			
Bell	Region G	Brazos	7,193	7,174	7,193	7,174	7,193	7,174
Bosque	Region G	Brazos	3,772	3,762	3,772	3,762	3,772	3,762
Brown	Region F	Brazos	3	3	3	3	3	3
Brown	Region F	Colorado	355	353	355	353	355	353
Burnet	Lower Colorado	Brazos	1,027	1,025	1,027	1,025	1,027	1,025
Burnet	Lower Colorado	Colorado	355	354	355	354	355	354
Comanche	Region G	Brazos	5,875	5,858	5,875	5,858	5,875	5,858
Comanche	Region G	Colorado	6	6	6	6	6	6
Coryell	Region G	Brazos	2,167	2,161	2,167	2,161	2,167	2,161
Dallas	Region C	Trinity	0	0	0	0	0	0
Ellis	Region C	Trinity	5,040	5,026	5,040	5,026	5,040	5,026
Erath	Region G	Brazos	6,400	6,383	6,400	6,383	6,400	6,383
Falls	Region G	Brazos	1,438	1,434	1,438	1,434	1,438	1,434
Hamilton	Region G	Brazos	386	385	386	385	386	385
Hill	Region G	Brazos	3,026	3,018	3,026	3,018	3,026	3,018
Hill	Region G	Trinity	255	254	255	254	255	254
Johnson	Region G	Brazos	1,311	1,307	1,311	1,307	1,311	1,307
Johnson	Region G	Trinity	2,553	2,546	2,553	2,546	2,553	2,546
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lampasas	Region G	Brazos	786	783	786	783	786	783
Lampasas	Region G	Colorado	72	72	72	72	72	72
Limestone	Region G	Brazos	0	0	0	0	0	0
Limestone	Region G	Trinity	0	0	0	0	0	0
McLennan	Region G	Brazos	15,980	15,937	15,980	15,937	15,980	15,937
Milam	Region G	Brazos	0	0	0	0	0	0
Mills	Lower Colorado	Brazos	376	375	376	375	376	375
Mills	Lower Colorado	Colorado	1,096	1,093	1,096	1,093	1,096	1,093
Navarro	Region C	Trinity	0	0	0	0	0	0
Somervell	Region G	Brazos	845	843	845	843	845	843
Travis	Lower Colorado	Brazos	0	0	0	0	0	0
Travis	Lower Colorado	Colorado	2,791	2,783	2,791	2,783	2,791	2,783
Williamson	Region G	Brazos	1,933	1,928	1,933	1,928	1,933	1,928
Williamson	Region G	Colorado	5	5	5	5	5	5

January 19, 2018 Page 54 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Williamson	Lower Colorado	Brazos	0	0	0	0	0	0
Williamson	Lower Colorado	Colorado	0	0	0	0	0	0
Subtotal			65,046	64,868	65,046	64,868	65,046	64,868
		Coun	ties in Upp	er Trinity	GCD			
Hood (downdip)	Region G	Brazos	53	53	53	53	53	53
Subtotal			53	53	53	53	53	53
Groundwater Management Area 8			65,099	64,921	65,099	64,921	65,099	64,921

January 19, 2018 Page 55 of 102

TABLE 19. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE TRINITY AQUIFER (ANTLERS) IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
		Counti	es Not in U	pper Trini	ty GCD			
Brown	Region F	Brazos	48	48	48	48	48	48
Brown	Region F	Colorado	1,007	1,004	1,007	1,004	1,007	1,004
Callahan	Region G	Brazos	444	443	444	443	444	443
Callahan	Region G	Colorado	1,285	1,282	1,285	1,282	1,285	1,282
Collin	Region C	Trinity	1,966	1,961	1,966	1,961	1,966	1,961
Comanche	Region G	Brazos	5,855	5,839	5,855	5,839	5,855	5,839
Cooke	Region C	Red	2,191	2,184	2,191	2,184	2,191	2,184
Cooke	Region C	Trinity	8,353	8,330	8,353	8,330	8,353	8,330
Denton	Region C	Trinity	16,591	16,545	16,591	16,545	16,591	16,545
Eastland	Region G	Brazos	5,194	5,180	5,194	5,180	5,194	5,180
Eastland	Region G	Colorado	553	552	553	552	553	552
Erath	Region G	Brazos	2,636	2,628	2,636	2,628	2,636	2,628
Fannin	Region C	Red	0	0	0	0	0	0
Fannin	Region C	Sulphur	0	0	0	0	0	0
Fannin	Region C	Trinity	0	0	0	0	0	0
Grayson	Region C	Red	6,678	6,660	6,678	6,660	6,678	6,660
Grayson	Region C	Trinity	4,059	4,048	4,059	4,048	4,059	4,048
Lamar	Northeast Texas	Red	0	0	0	0	0	0
Lamar	Northeast Texas	Sulphur	0	0	0	0	0	0
Red River	Northeast Texas	Red	0	0	0	0	0	0
Tarrant	Region C	Trinity	1,251	1,248	1,251	1,248	1,251	1,248
Taylor	Region G	Brazos	5	5	5	5	5	5
Taylor	Region G	Colorado	9	9	9	9	9	9
	Subtotal		58,125	57,966	58,125	57,966	58,125	57,966
		Coun	ties in Upp	er Trinity	GCD			
Montague (outcrop)	Region B	Red	154	154	154	154	154	154
Montague (outcrop)	Region B	Trinity	3,732	3,721	3,732	3,721	3,732	3,721
Parker (outcrop)	Region C	Brazos	257	256	257	256	257	256
Parker (outcrop)	Region C	Trinity	2,648	2,640	2,648	2,640	2,648	2,640
Wise (outcrop)	Region C	Trinity	7,698	7,677	7,698	7,677	7,698	7,677

January 19, 2018 Page 56 of 102

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Wise (downdip)	Region C	Trinity	2,062	2,057	2,062	2,057	2,062	2,057
	Subtotal			16,505	16,551	16,505	16,551	16,505
Groundwater Management Area 8		74,676	74,471	74,676	74,471	74,676	74,471	

January 19, 2018 Page 57 of 102

TABLE 20. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE WOODBINE AQUIFER IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Collin	Region C	Sabine	0	0	0	0	0	0
Collin	Region C	Trinity	4,263	4,251	4,263	4,251	4,263	4,251
Cooke	Region C	Red	262	261	262	261	262	261
Cooke	Region C	Trinity	540	538	540	538	540	538
Dallas	Region C	Trinity	2,804	2,796	2,804	2,796	2,804	2,796
Denton	Region C	Trinity	3,616	3,607	3,616	3,607	3,616	3,607
Ellis	Region C	Trinity	2,078	2,073	2,078	2,073	2,078	2,073
Fannin	Region C	Red	3,553	3,544	3,553	3,544	3,553	3,544
Fannin	Region C	Sulphur	551	550	551	550	551	550
Fannin	Region C	Trinity	829	827	829	827	829	827
Grayson	Region C	Red	5,615	5,599	5,615	5,599	5,615	5,599
Grayson	Region C	Trinity	1,926	1,922	1,926	1,922	1,926	1,922
Hill	Region G	Brazos	285	284	285	284	285	284
Hill	Region G	Trinity	303	302	303	302	303	302
Hunt	Northeast Texas	Sabine	269	268	269	268	269	268
Hunt	Northeast Texas	Sulphur	165	165	165	165	165	165
Hunt	Northeast Texas	Trinity	330	329	330	329	330	329
Johnson	Region G	Brazos	24	24	24	24	24	24
Johnson	Region G	Trinity	1,961	1,956	1,961	1,956	1,961	1,956
Kaufman	Region C	Trinity	0	0	0	0	0	0
Lamar	Northeast Texas	Red	0	0	0	0	0	0
Lamar	Northeast Texas	Sulphur	49	49	49	49	49	49
McLennan	Region G	Brazos	0	0	0	0	0	0
Navarro	Region C	Trinity	68	68	68	68	68	68
Red River	Northeast Texas	Red	2	2	2	2	2	2
Rockwall	Region C	Trinity	0	0	0	0	0	0
Tarrant	Region C	Trinity	1,141	1,138	1,141	1,138	1,141	1,138
Groundwa	ter Management Ar	ea 8	30,634	30,553	30,634	30,553	30,634	30,553

January 19, 2018 Page 58 of 102

TABLE 21. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE EDWARDS (BALCONES FAULT ZONE) AQUIFER IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN. MODELED AVAILABLE GROUNDWATER VALUES ARE FROM GAM RUN 08-010MAG BY ANAYA (2008).

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Bell	Region G	Brazos	6,469	6,469	6,469	6,469	6,469	6,469
Travis	Lower Colorado	Brazos	275	275	275	275	275	275
Travis	Lower Colorado	Colorado	4,962	4,962	4,962	4,962	4,962	4,962
Williamson	Region G	Brazos	3,351	3,351	3,351	3,351	3,351	3,351
Williamson	Region G	Colorado	101	101	101	101	101	101
Williamson	Lower Colorado	Brazos	6	6	6	6	6	6
Williamson	Lower Colorado	Colorado	4	4	4	4	4	4
Groundwater Management Area 8		15,168	15,168	15,168	15,168	15,168	15,168	

TABLE 22. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE MARBLE FALLS AQUIFER IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Brown	Region F	Colorado	25	25	25	25	25	25
Burnet	Lower Colorado	Brazos	1,387	1,383	1,387	1,383	1,387	1,383
Burnet	Lower Colorado	Colorado	1,357	1,353	1,357	1,353	1,357	1,353
Lampasas	Region G	Brazos	1,958	1,952	1,958	1,952	1,958	1,952
Lampasas	Region G	Colorado	887	885	887	885	887	885
Mills	Lower Colorado	Brazos	1	1	1	1	1	1
Mills	Lower Colorado	Colorado	24	24	24	24	24	24
Groundwater Management Area 8			5,639	5,623	5,639	5,623	5,639	5,623

January 19, 2018 Page 59 of 102

TABLE 23. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE ELLENBURGER-SAN SABA AQUIFER IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Brown	Region F	Colorado	131	131	131	131	131	131
Burnet	Lower Colorado	Brazos	3,833	3,822	3,833	3,822	3,833	3,822
Burnet	Lower Colorado	Colorado	7,024	7,005	7,024	7,005	7,024	7,005
Lampasas	Region G	Brazos	1,685	1,680	1,685	1,680	1,685	1,680
Lampasas	Region G	Colorado	916	913	916	913	916	913
Mills	Lower Colorado	Brazos	93	93	93	93	93	93
Mills	Lower Colorado	Colorado	407	406	407	406	407	406
Groundwater Management Area 8			14,089	14,050	14,089	14,050	14,089	14,050

TABLE 24. MODELED AVAILABLE GROUNDWATER BY DECADE FOR THE HICKORY AQUIFER IN GROUNDWATER MANAGEMENT AREA 8. RESULTS ARE IN ACRE-FEET PER YEAR AND ARE SUMMARIZED BY COUNTY, REGIONAL WATER PLANNING AREA (RWPA), AND RIVER BASIN.

County	RWPA	River Basin	2020	2030	2040	2050	2060	2070
Brown	Region F	Colorado	12	12	12	12	12	12
Burnet	Lower Colorado	Brazos	1,240	1,236	1,240	1,236	1,240	1,236
Burnet	Lower Colorado	Colorado	2,183	2,177	2,183	2,177	2,183	2,177
Lampasas	Region G	Brazos	80	79	80	79	80	79
Lampasas	Region G	Colorado	34	34	34	34	34	34
Mills	Lower Colorado	Brazos	7	7	7	7	7	7
Mills	Lower Colorado	Colorado	29	29	29	29	29	29
Groundwater Management Area 8			3,585	3,574	3,585	3,574	3,585	3,574

January 19, 2018 Page 60 of 102

## **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.

January 19, 2018 Page 61 of 102

## **REFERENCES:**

- Anaya, R., 2008, Gam Run 08-010mag: Managed available groundwater for the Edwards (Balcones Fault Zone) Aquifer in Bell, Travis, and Williamson counties, 7 p., <a href="http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR08-10mag\_final.pdf?d=16598.495">http://www.twdb.texas.gov/groundwater/docs/GAMruns/GR08-10mag\_final.pdf?d=16598.495</a>
- Beach, J., Keester, M., and Konetchy, B, 2016, LBG-Guyton Associates Technical Memorandum: Results of Predictive Simulation in Support of GMA 8 Joint Planning NTGCD GMA 8 Run 10 (January 14, 2016).
- Harbaugh, A. W., and McDonald, M. G., 1996, User's documentation for MODFLOW-96, an update to the U.S. Geological Survey modular finite-difference ground-water flow model: U.S. Geological Survey Open-File Report 96-485, 56 p.
- Jones, I., 2003, Groundwater Availability Modeling: Northern Segment of the Edwards Aquifer, Texas (December 2003), 75 p., <a href="http://www.twdb.texas.gov/publications/reports/numbered reports/doc/R358/Report%20358%20Northern%20Edwards.pdf?d=1503601352574">http://www.twdb.texas.gov/publications/reports/numbered reports/doc/R358/Report%20358%20Northern%20Edwards.pdf?d=1503601352574</a>.
- Kelley, V.A., Ewing, J., Jones, T.L., Young, S.C., Deeds, N., and Hamlin, S., 2014, Updated Groundwater Availability Model of the Northern Trinity and Woodbine Aquifers Draft Final Model Report (August 2014), 990 p., <a href="http://www.twdb.texas.gov/groundwater/models/gam/trnt">http://www.twdb.texas.gov/groundwater/models/gam/trnt</a> n/Final NTGAM Vol% 201%20Aug%202014 Report.pdf?d=1503601407956.
- 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.
- Niswonger, R.G., Panday, S., and Ibaraki, M., 2011, MODFLOW-NWT, a Newton formulation for MODFLOW-2005: United States Geological Survey, Techniques and Methods 6-A37, 44 p.
- Panday, S., Langevin, C.D., Niswonger, R.G., Ibaraki, M., and Hughes, J.D., 2013, MODFLOW–USG version 1: An unstructured grid version of MODFLOW for simulating groundwater flow and tightly coupled processes using a control volume finite-difference formulation: U.S. Geological Survey Techniques and Methods, book 6, chap. A45, 66 p.
- Shi, J., Boghici, R., Kohlrenken, W., and Hutchison, W.R., 2016, Numerical Model Report: Minor Aquifers of the Llano Uplift Region of Texas (Marble Falls, Ellenburger-San Saba, and Hickory). Texas Water Development Board, November 2016, 435p.

http://www.twdb.texas.gov/groundwater/models/gam/llano/Llano Uplift Numeri cal Model Report Final.pdf?d=1503601525245.

Texas Water Code, 2011, <a href="http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf">http://www.statutes.legis.state.tx.us/docs/WA/pdf/WA.36.pdf</a>.

January 19, 2018 Page 63 of 102

#### Appendix A

# Comparison between Desired Future Conditions and Simulated Drawdowns for the Trinity and Woodbine Aquifers

Drawdown values for the Trinity and Woodbine aquifers between 2009 and 2070 were based on the simulated head values at individual model cells extracted from predictive simulation head file submitted by Groundwater Management Area 8.

The Paluxy, Glen Rose, Twin Mountains, Travis Peak, Hensell, Hosston, and Antlers are subunits of the Trinity Aquifer. These subunits and Woodbine Aquifer exist in both outcrop and downdip areas (Figures 1 through 8). Kelley and others (2014) further divided these aquifers into five (5) regions, each with unique aquifer combinations and properties (table below and Figures 1 through 8).

Model Layer	Region 1	Region 2	Region 3	gion 3 Region 4		n 4 Region 5		
2		Woodl	oine	Woodbine (no sand)				
3			Washita/Fredericksburg					
4			Pal	Paluxy (no sand)				
5					Glen Rose			
6	Antlers	Twin			Hensell		Hensell	
7		Mountains	Travis Pe	Travis Peak	Pearsall/Sligo	Travis Peak	Pearsall/Sligo	
8		Mountains			Hosston		Hosston	

Vertically, the Trinity and Woodbine aquifers could contain multiple model layers and some of the model cells are pass-through cells with a thickness of one foot. To account for variable model cells from multiple model layers for the same aquifer, Beach and others (2016) adopted a method presented by Van Kelley of INTERA, Inc., which calculated a single composite head from multiple model cells with each adjusted by transmissivity. This composite head took both the head and hydraulic transmissivity at each cell into calculation, as shown in the following equation:

$$Hc = \frac{\sum_{i=UL}^{LL} T_i H_i}{\sum_{i=UL}^{LL} T_i}$$

Where:

 $H_C$  = Composite Head (feet above mean sealevel)

 $T_i$  = Transmissivity of model layer i (square feet per day)

 $H_i$  = Head of model layer i (feet above mean sealevel)

January 19, 2018 Page 64 of 102

*LL* = Lowest model layer representing the regional aquifer

*UL* = Uppermost model layer representing the regional aquifer.

The average head for the same aquifer in a county (*Hc\_County*) was then calculated using the following equation:

$$Hc\_County = \frac{\sum_{i=1}^{n} Hc_i}{n}$$

Where:

 $H_{Ci}$  = Composite Head at a lateral location as defined in last step (feet above mean sealevel)

n = Total lateral (row, column) locations of an aquifer in a county.

Drawdown of the aquifer in a county (*DD\_County*) was calculated using the following equation:

$$DD\_County = Hc\_County_{2009} - Hc\_County_{2070}$$

Where:

 $Hc\_County_{2009}$  = Average head of an aquifer in a county in 2009 as defined above (feet above mean sea level)  $Hc\_County_{2070}$  = Average head of an aquifer in a county in 2070

as defined above (feet above mean sea level).

Model cells with head values below the cell bottom in 2009 were excluded from the calculation. Also, head was set at the cell bottom if it fell below the cell bottom at 2070.

In comparison with a simple average calculation based on total model cell count, use of composite head gives less weight to cells with lower transmissivity values (such as pass-through cells, cells with low saturation in outcrop area, or cells with lower hydraulic conductivity) in head and drawdown calculation.

January 19, 2018 Page 65 of 102

Per Groundwater Management Area 8, a desired future condition was met if the simulated drawdown from the desired future condition was within five percent or five feet. Using the head output file submitted by Groundwater Management Area 8 and the method described above, the TWDB calculated the drawdowns (Tables <u>A1</u> and <u>A2</u>) and performed the comparison against the corresponding desired future conditions by county (Tables <u>A3</u>, <u>A4</u>, <u>A5</u>, and <u>A6</u>). The review by the TWDB indicates that the predictive simulation meets the desired future conditions (Tables <u>A7</u> and <u>A8</u>).

January 19, 2018 Page 66 of 102

TABLE A1. SIMULATED DRAWDOWN VALUES OF THE TRINITY AND WOODBINE AQUIFERS FOR COUNTIES NOT IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. DRAWDOWNS ARE IN FEET.

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Bell	_	19	83	_	294	137	330	_
Bosque	_	6	49	_	167	129	201	_
Brown	_	_	2	_	1	1	1	2
Burnet	_	_	2	_	16	7	20	_
Callahan	_	_	_	_	_	_	—	1
Collin	459	705	339	526	_	_	_	570
Comanche	_	_	1	_	2	2	3	9
Cooke	2	_	_	_	_	_	_	179
Coryell	_	7	14	_	100	66	130	_
Dallas	123	324	263	463	350	332	351	_
Delta	_	264	181	_	186	_	—	_
Denton	19	552	349	716	_	_	_	398
Eastland	_	_	_	_	_	_	_	3
Ellis	61	107	194	333	305	263	310	_
Erath	_	1	5	6	19	11	31	11
Falls	_	144	215	_	460	271	465	_
Fannin	247	688	280	372	269	_	—	251
Grayson	157	922	337	417	_	_	_	348
Hamilton	_	2	4	_	24	13	35	_
Hill	16	38	133	_	299	186	337	_
Hunt	598	586	299	370	324	_	_	_
Johnson	3	-61	58	156	184	126	235	_
Kaufman	208	276	269	381	323	309	295	_
Lamar	38	93	97	_	114	_	_	122
Lampasas	_	_	1	_	6	1	11	_
Limestone	_	178	271	_	393	183	404	_
McLennan	6	35	133	_	468	220	542	_
Milam	_	_	212	_	344	229	345	_
Mills	_	1	1	_	7	2	13	_
Navarro	92	119	232	_	291	254	291	_
Red River	2	21	36	_	51	_	_	13
Rockwall	243	401	311	426	_	_	_	_
Somervell	_	1	4	31	52	26	83	_
Tarrant	6	101	148	315	_	_	_	149

January 19, 2018 Page 67 of 102

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Taylor	_		_	_	_		_	0
Travis	_	_	85	_	142	51	148	_
Williamson	_		76	_	172	73	176	_

<sup>—:</sup> Not available.

January 19, 2018 Page 68 of 102

TABLE A2. SIMULATED DRAWDOWN VALUES OF THE TRINITY AQUIFER FOR COUNTIES IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. DRAWDOWNS ARE IN FEET.

County	Paluxy	Glen Rose	Twin Mountains	Antlers
Hood (outcrop)	5	7	4	_
Hood (downdip)	_	27	46	_
Montague (outcrop)	_	<del>-</del>	_	18
Montague (downdip)	_	_	_	_
Parker (outcrop)	5	10	1	11
Parker (downdip)	1	28	46	_
Wise (outcrop)	_	_	_	35
Wise (downdip)	_	_	_	142

<sup>—:</sup> Not available.

January 19, 2018 Page 69 of 102

TABLE A3. RELATIVE DIFFERENCE BETWEEN SIMULATED DRAWDOWNS AND DESIRED FUTURE CONDITIONS OF THE TRINITY AND WOODBINE AQUIFERS FOR COUNTIES NOT IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. VALUES GREATER THAN THE ERROR TOLERANCE OF FIVE PERCENT ARE HIGHLIGHTED.

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Bell	_	0%	0%	—	-2%	0%	0%	_
Bosque	_	0%	0%	_	0%	0%	0%	_
Brown	_	_	0%	_	0%	0%	0%	0%
Burnet	_	_	0%	_	0%	0%	0%	_
Callahan	_	_	_	_	_	_	_	0%
Collin	0%	0%	0%	0%	_	_	_	0%
Comanche	_	_	0%	_	0%	0%	0%	0%
Cooke	0%	_	_	_	_	_	_	2%
Coryell	_	0%	0%	_	1%	0%	0%	_
Dallas	0%	0%	0%	0%	1%	0%	0%	_
Delta	_	0%	0%	_	0%	_	_	_
Denton	-16%	0%	0%	0%	_	_	_	1%
Eastland	_	_	_	_	_	_	_	0%
Ellis	0%	0%	0%	0%	1%	0%	0%	_
Erath	_	0%	0%	0%	0%	0%	0%	-9%
Falls	_	0%	0%	_	0%	0%	0%	_
Fannin	0%	0%	0%	0%	0%	_	_	0%
Grayson	-2%	0%	0%	0%	_	_	_	0%
Hamilton	_	0%	0%	_	0%	0%	0%	_
Hill	-25%	0%	0%	_	0%	0%	0%	_
Hunt	0%	0%	0%	0%	0%	_	_	_
Johnson	33%	0%	0%	0%	3%	0%	0%	_
Kaufman	0%	0%	0%	0%	0%	0%	0%	_
Lamar	0%	0%	0%	_	0%	_	_	0%
Lampasas	_	_	0%	_	0%	0%	0%	_
Limestone	_	0%	0%	_	0%	0%	0%	_
McLen—n	0%	0%	0%	_	-1%	0%	0%	_
Milam	_	_	0%	_	0%	0%	0%	_
Mills	_	0%	0%	_	0%	0%	0%	_
—varro	0%	0%	0%	_	0%	0%	0%	_
Red River	0%	0%	0%	_	0%	_	_	0%
Rockwall	0%	0%	0%	0%	_	_	_	_

January 19, 2018 Page 70 of 102

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Somervell	_	0%	0%	0%	2%	0%	0%	
Tarrant	-17%	0%	0%	0%	_	_	_	1%
Taylor	_	_	_	_	_	_	_	0%
Travis	_	_	0%	_	1%	2%	1%	_
Williamson	_	_	-1%	_	-1%	-1%	-1%	

<sup>—:</sup> Not available.

January 19, 2018 Page 71 of 102

TABLE A4. RELATIVE DIFFERENCE BETWEEN SIMULATED DRAWDOWNS AND DESIRED FUTURE CONDITIONS OF THE TRINITY AQUIFER FOR COUNTIES IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. VALUES GREATER THAN THE ERROR TOLERANCE OF FIVE PERCENT ARE HIGHLIGHTED.

County	Paluxy	Glen Rose	Twin Mountains	Antlers
Hood (outcrop)	0%	0%	0%	_
Hood (downdip)	_	-4%	0%	_
Montague (outcrop)	_	_	_	0%
Montague (downdip)	_	_	_	_
Parker (outcrop)	0%	0%	0%	0%
Parker (downdip)	0%	0%	0%	_
Wise (outcrop)	_	_	_	3%
Wise (downdip)	_	_	_	0%

<sup>—:</sup> Not available.

January 19, 2018 Page 72 of 102

TABLE A5. DIFFERENCE BETWEEN SIMULATED DRAWDOWNS AND DESIRED FUTURE CONDITIONS OF THE TRINITY AND WOODBINE AQUIFERS FOR COUNTIES NOT IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. VALUES GREATER THAN THE ERROR TOLERANCE OF FIVE FEET ARE HIGHLIGHTED.

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Bell	_	0	0	_	-6	0	0	_
Bosque	_	0	0	_	0	0	0	_
Brown	_	_	0	_	0	0	0	0
Burnet	_	_	0	_	0	0	0	_
Callahan	_	_	_	_	_	_	_	0
Collin	0	0	0	0	_	_	_	0
Comanche	_	_	0	_	0	0	0	0
Cooke	0	_	_	_	_	_	_	3
Coryell	_	0	0	_	1	0	0	_
Dallas	0	0	0	0	2	0	0	_
Delta	_	0	0	_	0	_	_	_
Denton	-3	0	0	0	_	_	_	3
Eastland	_	_	_	_	_	_	_	0
Ellis	0	0	0	0	4	0	0	_
Erath	_	0	0	0	0	0	0	-1
Falls	_	0	0	_	-2	0	0	_
Fannin	0	0	0	0	0	_	_	0
Grayson	-3	0	0	0	_	_	_	0
Hamilton	_	0	0	_	0	0	0	_
Hill	-4	0	0	_	1	0	0	_
Hunt	0	0	0	0	0	_	_	
Johnson	1	0	0	0	5	0	0	_
Kaufman	0	0	0	0	0	0	0	_
Lamar	0	0	0	_	0	_	_	0
Lampasas	_	_	0	_	0	0	0	_
Limestone	_	0	0	_	1	0	0	_
McLennan	0	0	0	_	-3	0	0	
Milam	_	_	0	_	-1	0	0	_
Mills	_	0	0	_	0	0	0	_
Navarro	0	0	0	_	1	0	0	_
Red River	0	0	0	_	0	_	_	0
Rockwall	0	0	0	0	_	_	_	_

January 19, 2018 Page 73 of 102

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Somervell	_	0	0	0	1	0	0	_
Tarrant	-1	0	0	0	_	_	_	1
Taylor	_	_	_	_	_	_	_	0
Travis	_	_	0	_	1	1	2	_
Williamson	_	_	-1	_	-1	-1	-1	_

<sup>—:</sup> Not available.

January 19, 2018 Page 74 of 102

TABLE A6. DIFFERENCE BETWEEN SIMULATED DRAWDOWNS AND DESIRED FUTURE CONDITIONS OF THE TRINITY AQUIFER FOR COUNTIES IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. NO VALUES ARE GREATER THAN THE ERROR TOLERANCE OF FIVE FEET.

County	Paluxy	Glen Rose	Twin Mountains	Antlers
Hood (outcrop)	0	0	0	_
Hood (downdip)	_	-1	0	_
Montague (outcrop)	_	_	_	0
Montague (downdip)	_	_	_	_
Parker (outcrop)	0	0	0	0
Parker (downdip)	0	0	0	_
Wise (outcrop)	_	_	_	1
Wise (downdip)	_	_	_	0

<sup>—:</sup> Not available.

January 19, 2018 Page 75 of 102

TABLE A7. COMPARISON OF SIMULATED DRAWDOWNS WITH THE DESIRED FUTURE CONDITIONS OF THE TRINITY AND WOODBINE AQUIFERS FOR COUNTIES NOT IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. NO VALUES ARE GREATER THAN BOTH ERROR TOLERRANCES OF FIVE PERCENT AND FIVE FEET AT THE SAME TIME. THUS, PREDICTIVE SIMULATION MEETS ALL DESIRED FUTURE CONDITIONS.

County	Woodbine	Paluxy	Glen	Twin	Travis	Hensell	Hosston	Antlers
County	Woodbille	Paluxy	Rose	Mountains	Peak	пенѕен	позмон	Anuers
Bell	_	MEET	MEET	_	MEET	MEET	MEET	_
Bosque	_	MEET	MEET	_	MEET	MEET	MEET	_
Brown	_	_	MEET	_	MEET	MEET	MEET	MEET
Burnet	_	_	MEET	_	MEET	MEET	MEET	_
Callahan	_	_	_	_	_	_	_	MEET
Collin	MEET	MEET	MEET	MEET		_	_	MEET
Comanche	_	_	MEET	_	MEET	MEET	MEET	MEET
Cooke	MEET	_	_	_	_	_	_	MEET
Coryell	_	MEET	MEET	_	MEET	MEET	MEET	_
Dallas	MEET	MEET	MEET	MEET	MEET	MEET	MEET	_
Delta	_	MEET	MEET	_	MEET	_	_	_
Denton	MEET	MEET	MEET	MEET	_	_	_	MEET
Eastland	_	_	_	_		_	_	MEET
Ellis	MEET	MEET	MEET	MEET	MEET	MEET	MEET	_
Erath	_	MEET	MEET	MEET	MEET	MEET	MEET	MEET
Falls	_	MEET	MEET	_	MEET	MEET	MEET	_
Fannin	MEET	MEET	MEET	MEET	MEET	_	_	MEET
Grayson	MEET	MEET	MEET	MEET	_	_	_	MEET
Hamilton	_	MEET	MEET	_	MEET	MEET	MEET	_
Hill	MEET	MEET	MEET	_	MEET	MEET	MEET	_
Hunt	MEET	MEET	MEET	MEET	MEET	_	_	_
Johnson	MEET	MEET	MEET	MEET	MEET	MEET	MEET	_
Kaufman	MEET	MEET	MEET	MEET	MEET	MEET	MEET	_
Lamar	MEET	MEET	MEET	_	MEET	_	_	MEET
Lampasas	_	_	MEET	_	MEET	MEET	MEET	_
Limestone	_	MEET	MEET	_	MEET	MEET	MEET	_
McLennan	MEET	MEET	MEET	_	MEET	MEET	MEET	_
Milam	_	_	MEET	_	MEET	MEET	MEET	_
Mills	_	MEET	MEET	_	MEET	MEET	MEET	_
Navarro	MEET	MEET	MEET	_	MEET	MEET	MEET	_

January 19, 2018 Page 76 of 102

County	Woodbine	Paluxy	Glen Rose	Twin Mountains	Travis Peak	Hensell	Hosston	Antlers
Red River	MEET	MEET	MEET	_	MEET	_	_	MEET
Rockwall	MEET	MEET	MEET	MEET	_	_	_	_
Somervell	_	MEET	MEET	MEET	MEET	MEET	MEET	_
Tarrant	MEET	MEET	MEET	MEET	_	_	_	MEET
Taylor	_	_	_	_	_	_	_	MEET
Travis	_	_	MEET	_	MEET	MEET	MEET	_
Williamson	_	_	MEET	_	MEET	MEET	MEET	_

<sup>—:</sup> Not available.

January 19, 2018 Page 77 of 102

TABLE A8. COMPARISON OF SIMULATED DRAWDOWNS WITH THE DESIRED FUTURE CONDITIONS OF THE TRINITY AQUIFER FOR COUNTIES IN THE UPPER TRINITY GROUNDWATER CONSERVATION DISTRICT. NO VALUES ARE GREATER THAN BOTH ERROR TOLERRANCES OF FIVE PERCENT AND FIVE FEET AT THE SAME TIME. THUS, PREDICTIVE SIMULATION MEETS ALL DESIRED FUTURE CONDITIONS.

County	Paluxy	Glen Rose	Twin Mountains	Antlers
Hood (outcrop)	MEET	MEET	MEET	_
Hood (downdip)	_	MEET	MEET	_
Montague (outcrop)	_	_	_	MEET
Montague (downdip)	_	_	_	_
Parker (outcrop)	MEET	MEET	MEET	MEET
Parker (downdip)	MEET	MEET	MEET	_
Wise (outcrop)	_	_	_	MEET
Wise (downdip)			_	MEET

<sup>—:</sup> Not available.

January 19, 2018 Page 78 of 102

#### Appendix B

Comparison between Desired Future Conditions and Simulated Saturated Thickness for the Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Brown, Burnet, Lampasas, and Mills Counties

The predictive simulation used to evaluate the desired future conditions and the modeled available groundwater values for the Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Brown, Burnet, Lampasas, and Mills counties within Groundwater Management Area 8 involves rewriting all relevant MODFLOW-USG packages to reflect the predictive simulation. The initial pumping for the predictive simulation was based on the last stress period of the groundwater availability model. In its clarification, Groundwater Management Area 8 also provided estimated pumping to use for the predictive simulation by TWDB (Table B1).

These pumping values from Groundwater Management Area 8 are more than the pumpage from the last stress period of the groundwater availability model. This surplus pumping for each aquifer was redistributed uniformly in each county according to its modeled extent.

The head file from the model output was used to calculate the remaining saturated thickness (*ST*) within the modeled extent for each aquifer between 2009 and 2070 using the following equation:

$$ST = \frac{\sum_{i=1}^{n} (h2070_{i} - e_{i})}{\sum_{i=1}^{n} (h2009_{i} - e_{i})}$$

Where:

n = Total model cells in a county

 $h2009_i$  = Head of 2009 at model cell *i* (feet)

 $h2070_i$  = Head of 2070 at model cell *i* (feet)

 $e_i$  = Bottom elevation of model cell i (feet).

Model cells with head values below the cell bottom in 2009 were excluded from the calculation. Also, head was set at the cell bottom if it fell below the cell bottom at 2070.

January 19, 2018 Page 79 of 102

The comparison between the simulated remaining saturated thickness and the desired future conditions is presented in <u>Table B2</u>. <u>Table B2</u> indicates that the predictive simulation meets the desired future conditions of the Marble Falls, Ellenburger-San Saba, and Hickory aquifers in Brown, Burnet, Lampasas, and Mills counties.

January 19, 2018 Page 80 of 102

TABLE B1. GROUNDWATER PUMPING RATES FOR THE MARBLE FALLS, ELLENBURGER-SAN SABA, AND HICKORY AQUIFERS IN BROWN, BURNET, LAMPASAS, AND MILLS COUNTIES PROVIDED BY GROUNDWATER MNAAGMENT AREA 8.

County	Aquifer	2010 to 2070 (acre-feet per year)
Burnet	Marble Falls	2,736
Lampasas	Marble Falls	2,837
Brown	Marble Falls	25
Mills	Marble Falls	25
Burnet	Ellenburger-San Saba	10,827
Lampasas	Ellenburger-San Saba	2,593
Brown	Ellenburger-San Saba	131
Mills	Ellenburger-San Saba	499
Burnet	Hickory	3,413
Lampasas	Hickory	113
Brown	Hickory	12
Mills	Hickory	36

January 19, 2018 Page 81 of 102

TABLE B2. COMPARISON BETWEEN SIMULATED REMAINING AQUIFER SATURATED THICKESS AND DESIRED FUTURE CONDITIONS OF MARBLE FALLS, ELLENBURGER-SAN SABA, AND HICKORY AQUIFERS IN BROWN, BURNET, LAMPASAS, AND MILLS COUNTIES.

County	Aquifer	Remaining Aquifer Saturated Thickness Defined by Desired Future Condition	Simulated Remaining Aquifer Saturated Thickness	Is Desired Future Condition Met?
Brown	Marble Falls	at least 90%	99.8%	Yes
Brown	Ellenburger-San Saba	at least 90%	99.9%	Yes
Brown	Hickory	at least 90%	99.9%	Yes
Burnet	Marble Falls	at least 90%	98.8%	Yes
Burnet	Ellenburger-San Saba	at least 90%	99.3%	Yes
Burnet	Hickory	at least 90%	99.5%	Yes
Lampasas	Marble Falls	at least 90%	98.2%	Yes
Lampasas	Ellenburger-San Saba	at least 90%	99.0%	Yes
Lampasas	Hickory	at least 90%	99.5%	Yes
Mills	Marble Falls	at least 90%	99.5%	Yes
Mills	Ellenburger-San Saba	at least 90%	99.7%	Yes
Mills	Hickory	at least 90%	99.8%	Yes

January 19, 2018 Page 82 of 102

## Appendix C

Summary of Dry Model Cell Count for the Trinity and Woodbine Aquifers

January 19, 2018 Page 83 of 102

TABLE C1. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (PALUXY) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Collin	Dallas	Denton	Johnson	Tarrant
Total Active Official Aquifer Model Cells	12,062	14,532	3,520	11,627	15,389
2009 (baseline)	0	0	0	17	3
2010	0	0	9	0	3
2011	1	0	49	0	3
2012	4	0	83	0	17
2013	8	0	140	0	47
2014	35	0	196	0	91
2015	49	0	264	0	146
2016	64	0	306	0	209
2017	72	0	349	0	291
2018	83	0	385	0	373
2019	93	0	428	0	460
2020	99	0	482	0	555
2021	109	0	550	0	620
2022	115	0	622	0	684
2023	125	0	695	0	746
2024	129	0	780	0	802
2025	138	0	879	0	862
2026	147	0	957	0	919
2027	151	0	1,018	0	964
2028	159	0	1,087	0	995
2029	166	0	1,171	0	1,038
2030	173	0	1,262	0	1,072
2031	176	0	1,326	0	1,101
2032	180	0	1,379	0	1,137
2033	187	0	1,420	0	1,156
2034	193	0	1,461	0	1,194
2035	201	0	1,492	0	1,224
2036	204	0	1,520	0	1,240
2037	209	0	1,554	0	1,274
2038	212	0	1,584	0	1,292
2039	215	0	1,607	0	1,317
2040	217	0	1,627	0	1,347
2041	224	0	1,659	0	1,362
2042	228	0	1,682	0	1,377

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 84 of 102

Year	Collin	Dallas	Denton	Johnson	Tarrant
2043	235	0	1,710	0	1,409
2044	239	0	1,735	0	1,425
2045	242	0	1,755	0	1,438
2046	247	0	1,777	0	1,455
2047	250	0	1,790	0	1,477
2048	251	0	1,807	0	1,497
2049	253	0	1,823	0	1,517
2050	254	0	1,834	0	1,530
2051	258	2	1,847	0	1,539
2052	264	2	1,860	0	1,562
2053	266	2	1,874	0	1,585
2054	270	3	1,883	0	1,594
2055	272	3	1,893	0	1,606
2056	275	3	1,902	0	1,621
2057	276	3	1,923	0	1,634
2058	280	4	1,929	0	1,650
2059	282	4	1,934	0	1,666
2060	286	4	1,943	0	1,679
2061	288	4	1,947	0	1,693
2062	288	4	1,961	0	1,701
2063	290	5	1,973	0	1,712
2064	291	5	1,977	0	1,726
2065	292	5	1,988	0	1,739
2066	295	5	1,996	0	1,752
2067	297	6	2,002	0	1,760
2068	300	7	2,009	0	1,769
2069	304	7	2,017	0	1,778
2070	305	7	2,024	0	1,784

January 19, 2018 Page 85 of 102

TABLE C2. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (GLEN ROSE) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Bell	Burnet	Coryell	Erath	Hamilton	Hood	Johnson	Mills	Parker	Travis
Total										
Active Official Aquifer Model Cells	23,737	22,534	41,647	20,905	36,944	14,461	12,342	10,615	11,389	14,552
2009 (baseline)	0	0	11	0	0	0	15	0	8	25
2010	0	0	11	0	0	0	15	0	9	29
2011	0	0	11	0	0	0	15	0	12	29
2012	0	0	11	0	0	0	15	0	15	29
2013	0	0	11	1	0	0	15	1	19	29
2014	0	1	11	1	0	1	15	1	22	31
2015	0	1	11	1	0	1	15	1	23	32
2016	0	1	12	1	0	1	15	1	30	33
2017	0	1	12	2	0	2	15	1	37	34
2018	0	1	12	3	0	2	15	1	38	34
2019	0	1	14	3	0	2	16	1	44	34
2020	0	1	14	3	0	2	16	1	46	34
2021	0	1	14	3	0	3	16	1	48	35
2022	0	1	14	3	0	3	16	1	49	38
2023	0	1	14	3	0	3	17	1	54	41
2024	0	1	15	3	0	3	17	1	58	45
2025	0	1	15	3	0	3	17	1	65	47
2026	0	1	15	3	0	5	19	1	72	48
2027	0	1	15	4	0	5	21	1	78	50
2028	0	1	15	4	0	5	21	1	82	51
2029	0	1	15	4	0	6	22	1	84	51
2030	0	1	15	4	0	6	22	1	90	54
2031	0	1	15	8	0	6	22	1	99	54
2032	0	1	15	8	0	8	23	1	103	55
2033	0	1	15	8	0	8	23	1	105	56
2034	0	1	15	9	0	9	23	1	108	56
2035	0	1	15	9	0	10	23	1	109	57
2036	0	1	15	9	0	12	23	1	110	58
2037	0	1	15	9	0	13	23	1	110	58
2038	0	1	15	9	0	14	23	1	113	59

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 86 of 102

Year	Bell	Burnet	Coryell	Erath	Hamilton	Hood	Johnson	Mills	Parker	Travis
2039	0	2	15	9	0	14	23	1	113	59
2040	0	2	15	9	0	14	23	1	116	60
2041	0	2	15	9	0	16	23	1	119	60
2042	0	2	15	10	1	16	23	1	122	61
2043	0	2	15	10	2	16	23	1	124	61
2044	0	2	15	10	2	18	24	1	125	62
2045	0	2	15	10	2	18	25	1	131	63
2046	0	2	15	10	2	18	25	1	131	63
2047	0	2	16	10	3	18	25	1	134	64
2048	0	2	16	10	4	18	26	1	137	64
2049	0	2	16	11	4	20	26	1	139	65
2050	0	2	16	11	4	22	26	1	143	65
2051	0	2	16	12	5	22	29	1	144	66
2052	1	2	16	12	5	22	31	1	147	66
2053	3	2	16	12	7	24	32	1	149	67
2054	4	2	17	12	7	27	32	1	151	67
2055	4	2	17	12	7	27	34	1	152	67
2056	4	2	17	12	7	30	34	1	152	68
2057	6	2	17	13	7	31	34	1	156	69
2058	7	2	17	13	7	31	34	1	159	69
2059	7	2	17	13	7	31	34	1	164	69
2060	7	2	17	13	8	34	34	1	166	69
2061	7	2	17	13	8	34	34	1	165	69
2062	7	2	17	13	9	35	34	1	168	69
2063	7	2	17	14	9	36	34	1	168	69
2064	7	2	17	16	9	36	34	1	172	69
2065	8	2	17	16	9	36	34	2	176	69
2066	8	2	17	16	10	36	34	2	180	69
2067	8	3	17	19	10	36	34	2	184	69
2068	8	3	17	19	11	38	34	2	188	69
2069	8	3	17	20	11	38	34	2	191	69
2070	8	4	17	20	11	41	34	2	194	69

January 19, 2018 Page 87 of 102

TABLE C3. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (TWIN MOUNTAINS) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Denton	Erath	Hood	Johnson	Parker	Tarrant
Total Active Official Aquifer Model Cells	10,560	46,642	37,444	6,816	30,830	40,713
2009 (baseline)	0	20	0	0	0	0
2010	0	27	0	0	0	0
2011	0	33	0	0	0	0
2012	0	40	0	0	0	0
2013	0	44	0	0	0	0
2014	0	48	0	0	0	0
2015	0	53	0	0	0	0
2016	0	56	0	0	0	0
2017	0	61	0	0	0	0
2018	0	65	0	0	0	0
2019	0	68	1	0	0	0
2020	0	71	1	0	0	0
2021	0	76	1	0	1	0
2022	0	80	1	0	4	0
2023	0	81	1	0	8	2
2024	0	85	4	0	13	6
2025	0	88	7	0	16	10
2026	0	91	15	0	17	16
2027	0	94	18	0	18	25
2028	0	97	23	0	18	32
2029	0	101	28	0	23	36
2030	0	107	33	0	24	41
2031	1	108	41	0	25	48
2032	1	111	46	0	25	53
2033	1	119	56	0	26	56
2034	1	122	64	0	27	66
2035	1	123	68	0	27	74
2036	2	126	75	0	29	93
2037	2	131	82	0	29	127
2038	2	134	95	0	30	170
2039	2	136	100	0	31	231
2040	2	137	114	0	32	289
2041	2	143	129	0	32	354

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 88 of 102

Year	Denton	Erath	Hood	Johnson	Parker	Tarrant
2042	2	146	137	0	32	426
2043	2	150	150	0	32	500
2044	2	154	165	0	32	587
2045	3	157	178	0	34	648
2046	4	161	194	0	35	711
2047	4	167	212	0	36	767
2048	4	171	228	0	38	832
2049	5	174	242	0	38	889
2050	7	176	251	0	38	930
2051	8	178	262	0	38	996
2052	8	181	272	2	38	1,057
2053	9	184	282	7	38	1,114
2054	9	186	297	13	39	1,169
2055	9	189	313	19	40	1,234
2056	10	194	320	26	40	1,303
2057	11	196	330	33	41	1,366
2058	14	207	336	41	42	1,435
2059	14	211	341	49	42	1,508
2060	15	221	351	57	42	1,595
2061	16	221	363	67	43	1,681
2062	17	223	368	75	43	1,783
2063	18	224	375	83	43	1,899
2064	20	228	385	94	45	1,988
2065	22	229	393	105	46	2,104
2066	23	231	401	115	47	2,188
2067	24	233	408	130	47	2,285
2068	27	236	416	139	47	2,364
2069	31	240	424	155	47	2,468
2070	35	242	429	168	47	2,553

January 19, 2018 Page 89 of 102

TABLE C4. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (TRAVIS PEAK) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Burnet	Comanche	Erath	Johnson	Lampasas	McLennan	Travis
Total Active Official Aquifer Model Cells	46,474	78,137	39,220	28,386	63,905	50,973	30,318
2009 (baseline)	217	0	0	0	1	0	57
2010	176	0	1	0	1	0	59
2011	186	0	1	0	1	0	60
2012	218	0	1	0	1	0	63
2013	249	0	1	0	1	0	65
2014	271	0	1	0	1	0	68
2015	291	0	1	0	1	0	68
2016	314	0	3	0	1	0	70
2017	331	0	4	0	1	0	70
2018	345	0	5	0	1	0	71
2019	363	0	6	0	1	0	72
2020	378	0	11	0	1	0	72
2021	394	0	17	0	1	0	74
2022	400	0	29	0	1	0	74
2023	414	0	59	0	1	0	76
2024	424	0	93	0	1	0	77
2025	438	1	114	0	1	0	77
2026	450	9	130	0	1	0	79
2027	463	14	160	0	1	0	80
2028	474	14	183	0	1	0	80
2029	483	18	205	0	1	0	82
2030	494	30	238	0	1	0	82
2031	505	34	266	0	1	0	83
2032	512	35	299	0	1	0	83
2033	520	41	328	0	1	0	84
2034	527	54	343	0	1	0	85
2035	533	67	351	0	1	0	85
2036	543	72	370	0	1	0	87
2037	545	77	398	0	1	0	88
2038	554	85	414	0	1	0	88
2039	564	94	421	0	1	0	90
2040	571	103	435	0	1	1	90
2041	579	111	453	0	1	1	91
2042	588	116	481	0	1	1	92

January 19, 2018 Page 90 of 102

Year	Burnet	Comanche	Erath	Johnson	Lampasas	McLennan	Travis
2043	599	116	497	0	1	1	93
2044	604	121	507	0	1	1	93
2045	609	128	520	0	1	1	94
2046	618	138	538	0	1	1	95
2047	623	146	557	0	1	2	97
2048	629	152	590	0	1	2	97
2049	634	160	606	0	1	2	98
2050	640	166	620	0	1	2	99
2051	644	172	638	1	1	2	100
2052	648	180	651	1	1	2	100
2053	654	186	665	1	1	2	101
2054	658	190	678	1	1	2	102
2055	670	194	690	1	1	2	103
2056	675	196	699	1	1	2	103
2057	678	199	711	1	1	2	104
2058	692	206	723	1	1	2	105
2059	702	216	746	1	1	2	106
2060	717	222	774	1	1	2	106
2061	714	225	776	1	1	2	106
2062	719	227	790	1	1	2	107
2063	723	231	799	1	1	3	107
2064	728	235	813	2	1	3	109
2065	730	238	822	3	1	3	109
2066	730	245	832	3	1	3	109
2067	734	252	841	3	1	3	110
2068	741	258	850	3	1	3	110
2069	745	264	861	6	1	3	111
2070	748	269	871	7	1	3	112

January 19, 2018 Page 91 of 102

TABLE C5. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (HENSELL) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Erath	Lampasas
Total Active Official Aquifer Model Cells	21,880	25,364
2009 (baseline)	0	1
2010	0	1
2011	0	1
2012	0	1
2013	0	1
2014	0	1
2015	0	1
2016	0	1
2017	0	1
2018	0	1
2019	0	1
2020	0	1
2021	0	1
2022	0	1
2023	0	1
2024	0	1
2025	0	1
2026	0	1
2027	0	1
2028	0	1
2029	0	1
2030	0	1
2031	0	1
2032	0	1
2033	0	1
2034	0	1
2035	0	1
2036	0	1
2037	0	1
2038	0	1
2039	0	1
2040	1	1
2041	1	1
2042	3	1
2043	3	1

January 19, 2018 Page 92 of 102

Year	Erath	Lampasas
2044	3	1
2045	6	1
2046	7	1
2047	7	1
2048	12	1
2049	14	1
2050	14	1
2051	18	1
2052	20	1
2053	22	1
2054	24	1
2055	25	1
2056	25	1
2057	30	1
2058	31	1
2059	35	1
2060	37	1
2061	37	1
2062	40	1
2063	42	1
2064	42	1
2065	44	1
2066	46	1
2067	46	1
2068	48	1
2069	50	1
2070	52	1

January 19, 2018 Page 93 of 102

TABLE C6. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (HOSSTON) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Burnet	Comanche	Erath	Johnson	McLennan	Travis
Total Active Official Aquifer Model Cells	24,354	41,062	8,464	9,462	16,991	9,480
2009 (baseline)	217	0	0	0	0	57
2010	176	0	1	0	0	59
2011	186	0	1	0	0	60
2012	218	0	1	0	0	63
2013	247	0	1	0	0	65
2014	269	0	1	0	0	68
2015	288	0	1	0	0	68
2016	310	0	1	0	0	70
2017	325	0	1	0	0	70
2018	338	0	1	0	0	71
2019	353	0	1	0	0	72
2020	368	0	1	0	0	72
2021	382	0	2	0	0	74
2022	387	0	9	0	0	74
2023	400	0	25	0	0	76
2024	409	0	51	0	0	77
2025	423	1	66	0	0	77
2026	433	9	75	0	0	79
2027	444	14	93	0	0	80
2028	455	14	99	0	0	80
2029	463	18	105	0	0	82
2030	473	30	111	0	0	82
2031	484	34	118	0	0	83
2032	491	35	127	0	0	83
2033	498	41	132	0	0	84
2034	505	54	138	0	0	85
2035	511	67	143	0	0	85
2036	520	72	151	0	0	87
2037	522	77	158	0	0	88
2038	531	85	162	0	0	88
2039	541	94	162	0	0	90
2040	547	103	166	0	1	90
2041	555	111	174	0	1	91
2042	563	116	183	0	1	92
2043	570	116	187	0	1	93

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 94 of 102

Year	Burnet	Comanche	Erath	Johnson	McLennan	Travis
2044	575	121	192	0	1	93
2045	579	128	198	0	1	94
2046	588	138	206	0	1	95
2047	591	146	211	0	2	97
2048	597	152	219	0	2	97
2049	602	160	222	0	2	98
2050	607	166	227	0	2	99
2051	609	172	229	1	2	100
2052	613	180	232	1	2	100
2053	619	186	239	1	2	101
2054	623	190	246	1	2	102
2055	633	194	253	1	2	103
2056	637	196	259	1	2	103
2057	640	199	263	1	2	104
2058	651	206	269	1	2	105
2059	659	216	283	1	2	106
2060	673	222	294	1	2	106
2061	671	225	295	1	2	106
2062	675	227	297	1	2	107
2063	679	231	299	1	3	107
2064	684	235	305	2	3	109
2065	686	238	307	3	3	109
2066	686	245	310	3	3	109
2067	689	252	315	3	3	110
2068	696	258	317	3	3	110
2069	700	264	320	6	3	111
2070	703	269	323	7	3	112

January 19, 2018 Page 95 of 102

TABLE C7. SUMMARY OF DRY MODEL CELLS FOR THE TRINITY AQUIFER (ANTLERS) FROM THE REVISED PREDICTIVE SIMULATION.

Year	Collin	Comanche	Cooke	Denton	Eastland	Erath	Grayson	Montague	Parker	Tarrant	Wise
Total Active Official Aquifer Model Cells	7,055	23,711	77,143	59,107	44,009	9,287	77,954	56,141	42,539	5,009	92,333
2009 (baseline)	0	123	0	0	74	0	0	0	0	0	0
2010	1	80	0	0	91	6	0	0	0	0	1
2011	3	85	0	5	94	13	0	0	0	0	5
2012	7	92	0	29	99	29	0	0	0	0	6
2013	11	99	0	95	108	34	0	0	0	1	6
2014	16	103	1	201	110	36	0	0	0	6	6
2015	22	111	2	341	111	36	0	0	0	15	8
2016	30	120	3	500	113	36	0	0	0	28	67
2017	37	130	4	616	115	36	2	0	0	40	221
2018	44	141	7	721	117	39	6	0	1	58	372
2019	47	156	10	806	120	44	10	0	1	78	484
2020	53	167	17	901	125	48	22	0	2	94	574
2021	57	176	27	1,017	127	51	29	0	2	111	654
2022	62	186	37	1,199	130	52	36	0	2	124	741
2023	67	202	49	1,375	130	60	48	0	6	140	810
2024	71	230	64	1,543	133	74	57	0	9	151	879
2025	77	270	76	1,692	137	81	72	0	19	158	947
2026	79	294	95	1,803	139	90	90	0	54	162	995
2027	83	327	111	1,903	149	102	101	0	84	167	1,053
2028	86	373	123	1,983	156	110	106	0	112	171	1,109
2029	90	422	140	2,056	162	128	117	0	141	179	1,180
2030	94	448	152	2,121	179	171	122	0	166	183	1,236

January 19, 2018 Page 96 of 102

Year	Collin	Comanche	Cooke	Denton	Eastland	Erath	Grayson	Montague	Parker	Tarrant	Wise
2031	96	478	164	2,180	204	185	134	0	184	190	1,294
2032	100	517	175	2,244	221	197	140	0	206	195	1,368
2033	103	554	185	2,299	233	208	148	0	218	202	1,479
2034	105	617	199	2,364	236	222	152	0	234	208	1,551
2035	110	669	216	2,436	242	225	161	0	244	215	1,628
2036	111	710	222	2,517	249	232	168	0	254	222	1,713
2037	113	771	234	2,623	259	246	175	0	262	229	1,809
2038	116	836	245	2,708	282	262	184	0	270	236	1,879
2039	121	865	256	2,788	304	283	191	0	278	244	1,952
2040	122	913	264	2,879	321	303	195	0	285	256	2,029
2041	123	957	276	2,951	331	313	201	0	292	291	2,085
2042	126	998	292	3,038	344	326	205	0	295	349	2,130
2043	128	1,032	300	3,119	363	334	210	0	303	383	2,174
2044	130	1,074	307	3,189	380	351	215	0	305	414	2,214
2045	131	1,129	314	3,251	397	359	221	0	309	446	2,253
2046	131	1,171	323	3,336	412	372	230	0	312	472	2,291
2047	136	1,221	333	3,405	442	390	233	0	318	501	2,349
2048	137	1,266	340	3,465	453	415	239	0	319	533	2,382
2049	139	1,320	353	3,524	474	440	240	0	325	558	2,413
2050	141	1,351	361	3,589	502	455	244	0	326	583	2,442
2051	141	1,389	367	3,633	525	468	247	0	327	608	2,458
2052	143	1,435	376	3,688	548	482	254	0	331	632	2,480
2053	146	1,469	379	3,745	590	493	257	0	332	652	2,496
2054	147	1,510	384	3,788	619	506	258	0	334	671	2,518
2055	148	1,548	392	3,849	645	526	264	0	335	697	2,533
2056	149	1,585	399	3,897	668	548	267	0	337	719	2,545

January 19, 2018 Page 97 of 102

Year	Collin	Comanche	Cooke	Denton	Eastland	Erath	Grayson	Montague	Parker	Tarrant	Wise
2057	150	1,626	402	3,948	681	564	270	0	340	754	2,558
2058	150	1,703	407	3,981	715	578	274	0	340	788	2,574
2059	152	1,750	411	4,028	733	606	280	1	346	817	2,586
2060	154	1,813	416	4,067	751	627	283	1	346	845	2,594
2061	155	1,846	424	4,115	756	637	283	1	350	872	2,607
2062	156	1,909	428	4,152	777	646	287	1	350	898	2,616
2063	158	1,944	434	4,193	793	673	288	1	350	930	2,629
2064	158	1,968	441	4,232	807	711	292	1	350	953	2,635
2065	158	2,001	448	4,260	821	744	294	1	350	966	2,642
2066	158	2,065	450	4,295	842	770	298	1	352	984	2,653
2067	160	2,117	454	4,335	854	792	301	1	354	1,005	2,665
2068	162	2,154	455	4,360	863	802	303	1	355	1,016	2,676
2069	162	2,198	459	4,395	876	825	303	1	359	1,017	2,684
2070	164	2,268	462	4,438	881	846	307	1	360	1,019	2,691

January 19, 2018 Page 98 of 102

TABLE C8. SUMMARY OF DRY MODEL CELLS FOR THE WOODBINE AQUIFER FROM THE REVISED PREDICTIVE SIMULATION.

Year	Collin	Cooke	Denton	Fannin	Grayson	Johnson	Tarrant
Total Active Model Cells in Official Aquifer Boundary	11,762	5,700	11,991	15,443	17,911	8,407	8,901
2009 (baseline)	0	0	3	3	2	14	2
2010	0	4	3	3	3	16	2
2011	0	4	3	4	3	16	2
2012	0	4	3	4	5	16	2
2013	0	4	3	4	5	19	2
2014	0	4	3	5	6	23	2
2015	0	4	3	6	7	23	2
2016	0	5	3	6	8	23	2
2017	0	5	3	8	9	24	2
2018	0	5	3	9	10	26	2
2019	0	5	3	10	11	26	2
2020	0	5	3	11	11	26	2
2021	0	5	3	12	13	27	2
2022	0	5	3	12	14	28	2
2023	0	5	3	12	14	28	2
2024	0	5	4	13	14	29	2
2025	0	5	5	14	15	29	2
2026	0	5	5	15	15	30	2
2027	0	5	5	15	15	31	2
2028	0	6	5	15	15	33	2
2029	0	6	5	15	15	34	2
2030	0	6	5	15	15	36	2
2031	0	6	5	16	15	37	2
2032	0	6	5	17	16	37	2
2033	0	6	5	18	17	38	2
2034	0	6	5	20	18	40	2
2035	0	6	5	21	19	40	2
2036	0	6	5	22	19	41	2
2037	0	6	5	24	19	41	2
2038	0	6	5	25	23	42	2
2039	0	6	5	26	25	42	2
2040	0	6	5	27	25	42	2
2041	0	6	5	27	25	42	2

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 99 of 102

Year	Collin	Cooke	Denton	Fannin	Grayson	Johnson	Tarrant
2042	0	6	5	27	27	42	2
2043	0	6	5	27	27	42	2
2044	0	6	5	28	30	42	2
2045	0	6	5	29	31	43	2
2046	0	6	6	30	31	43	2
2047	0	6	6	30	31	43	2
2048	0	6	7	32	34	43	2
2049	0	6	8	35	34	43	2
2050	0	7	8	35	35	43	2
2051	0	8	8	35	35	43	2
2052	0	8	8	37	35	43	2
2053	0	8	8	38	35	44	2
2054	0	8	8	38	37	45	2
2055	0	9	8	38	38	45	2
2056	0	10	8	38	38	46	2
2057	0	10	9	39	38	46	2
2058	0	10	9	42	39	50	3
2059	0	10	9	44	40	52	3
2060	0	13	9	47	41	54	3
2061	0	14	9	47	41	53	3
2062	0	14	9	47	41	53	3
2063	0	17	9	47	42	55	3
2064	0	20	9	47	42	55	3
2065	0	21	9	47	42	56	3
2066	1	23	9	47	42	57	3
2067	1	23	9	48	45	58	3
2068	2	24	9	49	45	59	3
2069	2	24	9	50	45	59	3
2070	2	24	9	50	45	60	3

January 19, 2018 Page 100 of 102

### Appendix D

Summary of Dry Model Cell Count for the Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Brown, Burnet, Lampasas, and Mills Counties

January 19, 2018 Page 101 of 102

TABLE D1. SUMMARY OF DRY MODEL CELLS FOR THE MARBLE FALLS, ELLENBURGER-SAN SABA, AND HICKORY AQUIFERS IN BROWN, BURNET, LAMPASAS, AND MILLS COUNTIES FROM THE PREDICTIVE SIMULATION.

**	Burnet	Lampasas	Burnet	Burnet	
Year	Mar	ble Falls	Ellenburger-San Saba	Hickory	
Total Active Cells in modeled extent	10,810	7,614	13,618	14,334	
2009 (baseline)	2298	611	709	111	
2010	2353	631	724	112	
2011	2363	638	735	112	
2012	2376	641	744	113	
2013	2386	642	758	113	
2014	2391	646	769	113	
2015	2395	650	776	113	
2016	2397	653	781	115	
2017	2405	654	787	117	
2018	2406	657	795	117	
2019	2409	659	801	118	
2020	2413	661	804	118	
2021	2419	661	809	118	
2022	2419	661	810	118	
2023	2421	661	811	118	
2024	2422	662	813	119	
2025	2423	662	817	120	
2026	2425	664	821	120	
2027	2426	665	821	120	
2028	2428	666	823	120	
2029	2433	667	824	122	
2030	2433	669	824	123	
2031	2435	670	825	123	
2032	2436	671	828	123	
2033	2438	671	830	123	
2034	2440	672	832	124	
2035	2441	673	832	124	
2036	2441	675	833	124	
2037	2442	676	833	124	
2038	2442	677	834	125	
2039	2443	678	837	126	
2040	2443	678	837	126	

GAM Run 17-029 MAG: Modeled Available Groundwater for the Trinity, Woodbine, Edwards (Balcones Fault Zone), Marble Falls, Ellenburger-San Saba, and Hickory Aquifers in Groundwater Management Area 8

January 19, 2018 Page 102 of 102

<b>X</b> 7	Burnet	Lampasas	Burnet	Burnet
Year	Marb	le Falls	Ellenburger-San Saba	Hickory
2041	2443	680	839	126
2042	2443	680	840	126
2043	2443	680	842	127
2044	2444	680	842	127
2045	2445	680	842	128
2046	2446	680	843	128
2047	2446	680	843	128
2048	2446	680	843	128
2049	2446	680	844	128
2050	2446	680	845	128
2051	2446	681	846	128
2052	2446	681	846	128
2053	2446	681	846	130
2054	2446	681	846	130
2055	2447	681	846	130
2056	2447	681	847	130
2057	2447	681	848	130
2058	2447	682	848	130
2059	2448	682	849	130
2060	2448	682	849	130
2061	2448	682	849	130
2062	2448	682	849	130
2063	2448	682	849	130
2064	2449	682	849	130
2065	2449	683	849	130
2066	2449	683	849	130
2067	2449	683	850	130
2068	2449	683	850	130
2069	2450	683	850	130
2070	2450	683	850	130